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## D2.2 - Report on the Regional bio-based systems cases description

FUNDACION CIRCE

CENTRO DE INVESTIGACION DE RECURSOS Y CONSUMOS ENERGETICOS

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## List of abbreviations

MSW	Municipal Solid Waste	NGO	Non governmental organisations
ha	Hectare	PDO	Protected designation of origin
ICT	Information and Communication Technology	PGI	Protected geographical indication
CAP	Common Agrarian Policy	t	Tonnes
SME	Small to medium-sized enterprises	VET	Vocational education and training
NEETS	not in education, employment, or training	Ind	Individuals
CHP	Combined heat and power	GDP	Gross domestic product

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## 1. Methodology

To reduce climate change impacts and reach the ambitious environmental and social objectives established at European level, all regions need to develop new trends that will lead to profound implications for the entire economic and social model, which in turn will require new approaches. Furthermore, this transition should be implemented by committing to an all-inclusive shift that leaves no one behind, included social marginalised groups which are targeted in BIOLOC. As each region presents different characteristics in terms of resources, technology deployment, population distribution, etc. it is clear that the transition process will be more challenging for some regions than for others and will require more extensive and intense changes in some cases.

The aim of BIOLOC is to advance the role and impact of bio-based and social innovation to revitalise European local communities seeking to accelerate the all-inclusive transition to a resource-efficient and circular bio-based production and consumption system. Task 2.2 provides a detailed description of each region to set the basis to identify and assess the needs, conditions, barriers, and opportunities for bio-based systems that could contribute to the revitalisation of local communities and provide environmental and social benefits particularly for social marginalised groups in each region. WP2 aims to collect data that will be useful for other actions envisaged in the project. More specifically, it aims to contribute to WP3 focused on the development of a catalogue of biobased solutions and good practice examples, and WP4 focused on oriented business models, governance and local capacity building but also to WP5 that will support the development of regional hubs contributing to the deployment of bio-based solutions for the revitalization of local communities. This deliverable replies on the information collected by the regional partners involved in the project which will be further complemented by the information collected by local actors reported in DV2.3. Seeking to support the assessment and development of strategies involving social marginalized groups to promote bio-based value chains in the different regions, a template was developed to collect the information needed. The objective of task 2.1 is to describe the 12 selected references-case local communities covering various bio-based systems representative for Europe based on the data collection process performed by regional partners to contact and consult different data sources.

This initial description will be further complemented by the identification of the barriers, local needs and opportunities identified based on the feedback received from regional actors attending the workshops foreseen task 2.3. Therefore, the outcomes of both (DV2.2 and 2.3) data collection processes seek to be a valuable input for the identification of promising value chains and biobased initiatives for WP3 and the identification of most relevant social marginalised groups to involve in WP5 but mainly the assessment planned in task 4.1. For this reason, internal meetings were scheduled to coordinate the work among WP leaders. Leaders from work packages 3, 4 and 2 worked jointly to combine their requests for information in a unique template. In this sense, and considering the deadline to submit DV4.1, the work planned in tasks 2.2 and 2.3 was performed in advance to make sure the information could be used by Task 4.1.

## 2. Summary of key aspects to describe selected reference-case local communities

The following table summarize the most relevant aspects which include the population distribution, the key sectors, the main bio-based resources, and main sectors of activity in the region, missing actors, social marginalised groups and regional specificities.



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## 2.1. Italy, Campania region

Italy, Campania region	
Population and regional figures	<p><b>Unemployment rate</b> is 19.7%.</p> <p><b>Employment rate of women:</b> Campania 25.9% vs Italy 43.5%. Lower average salary compared to the country average.</p>
Key sectors	Agriculture is the main activity in this area.
Bio-based resources and main sectors of activity	<p>- <b>Agriculture:</b> Is the main activity in the region. 515,545 ha devoted to crop cultivation (lettuce, strawberry, tomato, olives). Employment covered by agriculture 5.3 %. Residual biomass: 5,000-10,000 t of tomato waste. The residual biomass is exploited for fertilizers, animal feed and biogas.</p> <p>- <b>Forestry:</b> 650,620 ha, while 554,000 ha are productive. Administration-owned forestland reaches 51% and the main uses are energy production, bio-based products (paper, pulp and wood-based panels) and soil amendment.</p> <p>- <b>Livestock:</b> 172,000 ha devoted to this activity. Cattle farming is the largest in the region from which 97,000 ha are devoted to cow for milk production, sheep farming is the second (36,000 ha), followed by pig (20,000 ha). Main residues produced are manure and slurry. This activity is responsible for 8% of the national employment.</p> <p>- <b>Agroindustry:</b> 8,000 industries in the region. Tomatoes, mozzarella di bufala, wine, citrus fruits, olive oil artichokes and chestnuts processing are the main agroindustries. 4.4% of employment comes from agroindustries in Campania.</p> <p>Two aspects that highly affect the agroindustries' production system in the region are the small size of the farms and fragmentation of the agriculture fields. The main residues produced by agroindustries are olive mill wastewater, citrus waste (peels, pulp, seeds; exploited to produce essential oils and animal feed), tomato pomace (exploited to produce animal feed, pectin and food additives), wine residues (used to produce animal feed and for fertilizers) and cheese waste (used as animal feed and for biogas production).</p> <p>- <b>Bio-based industries:</b> over 50 biobased companies (includes both startups and established businesses) in the region. Bio-based industries account for 8.8% of the national employment. The main residues produced are wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food processing and preparation (149,900 t/year).</p> <p>Waste from wood processing and the production of panels, furniture, pulp, paper and cardboard accounts for 28,590 t yearly. Waste from the leather, processing and textile industry amounts around 31,313 t/year. Waste from organic chemical processes is 13,042 t/year. Packaging waste absorbents, rags, filter materials and protective clothing not otherwise specified add around 247,362 t/year.</p> <p>Wastes from waste management facilities, off-site wastewater treatment plants and the preparation of water for industrial use: 2,794,679 t.</p> <p>- <b>Energy:</b> energy is produced mainly from non-renewable sources (natural gas), only 17.8% of energy usage comes from renewable sources.</p> <p>- <b>MSW:</b> around 4.2 million t/year are produced. The different fractions are organic waste (50%), paper and cardboard (17%), plastics (12%), glass (7%), metals (3%), textiles (2%) and other materials (9%). Municipal waste (household and comparable waste from commercial and industrial activities as well as from institutions) including separately collected waste are exploited for recycling, composting and biogas production.</p>

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Potential biobased value chains	<ul style="list-style-type: none"> <li>- Agriculture future paths are oriented towards sustainable agriculture (adoption of organic farming methods, regenerative agriculture), technology and innovation (precision farming and artificial intelligence to reduce waste and increase productivity), product diversification (new crops and value-added products). There is a growing interest in the use of residual biomass for the production of bio-based products.</li> <li>- Agroforestry practices seek to combine crops and trees in order to increase biodiversity, soil health, etc..</li> <li>- Valorisation of livestock residues currently focus on organic slurry for energy and compost production.</li> <li>- Biobased raw materials and side-products can be used to develop new biobased products such as bioplastics, biochemicals, and biofuels, which can replace their conventional counterparts and reduce the reliance on fossil resources.</li> <li>- Biobased waste can be transformed into valuable products through processes such as biorefinery and composting, which can reduce waste and provide new revenue streams for industries and communities.</li> <li>- The development of new biobased products requires R&amp;I, which can drive economic growth and create new business opportunities.</li> <li>- The government offers various incentives &amp; funding programs to support renewable energy projects, such as tax credits, feed-in tariffs, and grants.</li> <li>- Increasing the amount of water-reused in agriculture to improve the circularity is a relevant aspect due to potential restrictions.</li> </ul>
Missing actors to promote bio-based value chains	<ul style="list-style-type: none"> <li>- Introduce biobased textile to improve the competitiveness.</li> <li>- Experts in alternative/sustainable agriculture to improve the efficiency and apply innovative technologies (improve access to food).</li> <li>- Technology providers for energy production from biobased wastes (digestors, gasification, etc).</li> <li>- Explore new pathways to valorise residual forestry biomass to produce bio-based products.</li> <li>- Introduce innovative ways to valorise the olive mill wastewater</li> <li>- MSW are currently valorised through recycling, composting and waste-to-energy.</li> </ul>
Targeted marginalised social groups	<p><b>PRELIMINARY SELECTION: Unemployed, low-educated farmers in contaminated rural areas</b></p> <p>Other potential social marginalised groups:</p> <ul style="list-style-type: none"> <li>-Youth: Young people face challenges such as high unemployment rate, limited access to education and training opportunities and social exclusion.</li> <li>- Campania has a high poverty rate, and many people struggle to access basic needs such as food, housing and healthcare.</li> <li>-People living in rural areas: Many rural areas in Campania face economic and social challenges, including limited access to employment opportunities, healthcare and education. Factors hindering their participation are the lack of access to resources, limited knowledge and awareness, discrimination and bias, lack of representation at institutional level, limited access to markets, lack of infrastructures in rural areas and lack of policy support.</li> </ul>
Regional specificities	<ul style="list-style-type: none"> <li>- Erosion rate has reached 16.82 t/ha (consider high risk if erosion rate&gt;12 t/ha.year)</li> <li>- 559 forest fires which burned a total of 5,372 ha of forestland</li> <li>- The Regional Circular Bioeconomy Plan (Piano Regionale della Bioeconomia Circolare) was adopted in 2019.</li> <li>- Jobs at risk affect especially the manufacturing sector, particularly in the textile and clothing industry, which has been declining due to the pandemic. The transportation industry has been impacted as well by the pandemic due to the decrease in travel and mobility restrictions.</li> </ul>

TABLE 1. DESCRIPTION OF ITALY REGION

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BIOLOC focuses on the Italian region of Campania, where the main activity is agriculture while the manufacturing and transportation sectors are declining due to the pandemic. It is relevant to highlight the unemployment rate reaches 19.7%.

There are several sectors with an especial relevance within the region. Firstly, agriculture covers 515,545 ha and is responsible for 5.3% of the employment rate being horticulture and olives the main activities. Secondly, forestry covers 650,620 ha (554,000 ha are productive), of which 51% are owned by the administration and the most common uses are energy production, bio-based products, and soil amendment. In third place, livestock covers 172,000 ha, cattle farming is the largest in the region, followed by sheep and pig farming.

Agroindustry is also important, with 8,000 industries in the region such as tomatoes, mozzarella di buffalo, wine, citrus fruits or olives. Finally, there are over 50 bio-based companies. Regarding the municipality solid waste, the organic part is used for recycling, composting and biogas production. Concerning the energy sector only 17.8% of the total consumption is produced by renewable energies.

Potential bio-based value chains have already been identified. Focusing on the agriculture sector, in the future it could be possible to increase sustainability by adopting organic or regenerative farming methods and introducing technology and innovation. Furthermore, it would be interesting to launch agroindustry practices by combining trees and crops to increase biodiversity and soil fertility. Regarding the waste generated by the agriculture, livestock, forestry and agroindustry sectors, it is necessary to increase the share of by-products and waste valorised. Consequently, new pathways could be introduced which would produce new bio-based products with high added value boosting bioeconomy in the region.

Therefore, there is room to develop new valorisation schemes for which research and innovation institutions could play a key role. Finally, the circularity could be improved if the amount of water reused was higher. To achieve a successful deployment of these potential bio-based value chains, there are missing actors such as experts (biobased textile, alternative agriculture, and new pathways to valorise different bio-based raw materials), technology providers, and researchers that should be attracted to the region and training programmes carried out to improve the existent workforce skills.

These bio-based value chains, existing and potential ones, could represent an opportunity for some marginalized social groups of the region such as youth people who face high unemployment rates; people leaving in poverty; and people living in rural areas who face economic and social challenges.

In brief, Campania is a region where bio-based activities are currently relevant with the presence of forestry, livestock, agroindustry and agriculture, which are the main sectors in the region and could act as first step of the bio-based value chains. The residues generated by these activities could be exploited more broadly and targeting higher added value bioproducts production.

However, it is important to note that agriculture activity can cause damage in the soil in terms of erosion for instance and therefore would require a balanced and optimal exploitation system to avoid such environmental impacts. The changes in the manufacturing sectors of the area could generate a synergic opportunity for the new bio-based value chains and for unemployed people.

Additionally, the high unemployment rate and the potential of marginalized social groups targeted in the region jointly with the existing strategy of circular bioeconomy can lead to create potentially good conditions for starting up bio-based project.



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## 2.2. Czech Republic, Moravian-Silesian region

	Czechia, Moravian-Silesian region
Population and regional figures	<p><b>Unemployment rate</b> is 5.12%.</p> <p>90% of municipalities have with less than 5,000 inhabitants.</p>
Key sectors	<p>The region is one of the industrial regions in Czech Republic. The most traditional and the widespread activity is heavy industry (heavy engineering, metallurgy, and coal mining).</p>
Bio-based resources and main sectors of activity	<ul style="list-style-type: none"> <li>- <b>Agriculture:</b> 50.2% the territory of the region is devoted to agriculture, more specifically to cereal (383,000t t/year), rape (59,000 t/year), potatoes (19,500 t/year) production. Nevertheless, the number of agricultural enterprises has decreased.</li> <li>- <b>Forestry:</b> 35.8% of the territory in the Moravian-Silesian region is forestland, mostly state-owned and the predominant species are coniferous. It is worth highlighting there is a high share of damage caused by wild animals therefore, new approaches are needed to face this problem and to reforest some areas. Due to its mountainous relief, the Moravian-Silesian Region belongs to the regions with a significant share of ecologically managed land, one fifth of agricultural land is managed ecologically (landscaping and extensive agricultural programs are being developed, especially in mountainous areas).</li> <li>- <b>Livestock:</b> 52,406 ha are devoted to cattle, sheep, goat and horse breeding. 3.7% of employment is engaged in agriculture (which involves agriculture and livestock). The average exploitation are small and medium farms. Agricultural entities focused on mixed production cover 61,853 ha (animal breeding and plant production). Currently manure and slurry used for fertilizing purposes.</li> <li>- <b>Agroindustry:</b> The production of dairy products, processing and canning of meat and meat products, bakery, flour products, sugar from sugar beet, processing of fruit and vegetables are the most relevant in the region. Many kinds of agroindustry's residues are produced (leather, horn, fats, offal, blood, bowel, oils, pulp from juice production) and susceptible to be valorise through different pathways for different applications (livestock feed, collagen and gelatine obtaining, meat and fat industry, pharmaceutical applications, composting and cosmetic industry).</li> <li>- <b>Bio-based industries:</b> The most relevant bio-based industries are devoted to the processing of biodegradable waste, energy use of biomass, processing of wood into pulp, natural cosmetics, medicine and supplements.</li> <li>- <b>Energy:</b> Non-renewable energy is the main source of energy, mainly black coal. The use of biogas as a source of electricity is concentrated in the service sectors and agriculture (in agriculture mainly to produce electricity and heat, especially for own consumption). Energy production covers 1.7% of employment.</li> <li>- <b>MSW:</b> 661,961 t are currently managed in the region of which 287,706 t are landfilled.</li> </ul>



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Potential biobased value chains	<ul style="list-style-type: none"> <li>- Using agriculture waste as soil improver could have a significant potential in the area since heavy industry and mining industry are known to produce a negative effect on the soil quality which has led to the development of many projects addressing the potential improvement of soil quality by adding compost.</li> <li>- Additionally, there is a need to look for alternative sources of energy, for example biogas and biomethane, to reduce the consumption of coal currently used for energy purposes.</li> <li>- From the regional perspective, it is optimal to grow energy plants and crops on unused arable land that cannot be devoted to food production, or on existing grasslands which could contribute to further increase the potential biomass available for different bio-based applications.</li> <li>- There is an opportunity to increase bio-based industry to target different applications based on the bio-based raw material specific characteristics.</li> <li>- 70% of forest logging residues could be used for energy purposes in heating plants and power plants while 30% (stumps, roots, leaves and needles) is foreseen to undergo decomposing and return nutrients to the soil.</li> <li>- Diversifying the uses of manure (currently only as fertiliser) could contribute to expand bio-based applications in the region.</li> </ul>
Missing actors to promote bio-based value chains	<ul style="list-style-type: none"> <li>- The region accounts with many experts for different industry applications but not for bio-based industries.</li> <li>- The need for qualified employees turns out to be particularly difficult for larger industries, such as the meat industry or bakeries and confectionery.</li> <li>- Closer cooperation with research institutions and technology providers for energy production from biobased wastes (digestors, gasification, etc) is needed.</li> <li>- New pathways could be developed in the region to valorise residual forestry biomass to produce bio-based products.</li> </ul>
Targeted marginalised social groups	<p><b>PRELIMINARY SELECTION: Unemployed young people</b></p> <p>Other potential social marginalised groups:</p> <ul style="list-style-type: none"> <li>- Moravian-Silesian region is one of the more industrialized regions of Czech Republic but with an ageing population.</li> </ul>
Regional specificities	<ul style="list-style-type: none"> <li>- Industry sector covers most of the employment covered followed by agriculture although agriculture workers are not heavily represented in the country.</li> <li>- The region has lower average salary than the rest of Czech Republic.</li> <li>- The soil quality of the region needs to be improved due to the damage caused by heavy industry and mining industry.</li> <li>- Agricultural enterprises have decreased around 36.4% which is a worrying trend that needs to be addressed.</li> </ul>

TABLE 2. DESCRIPTION OF CZECH REPUBLIC REGION



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In Czech Republic, the specific region targeted is Moravia-Silesia. In this region, most of the municipalities have less than 5,000 inhabitants. Additionally, the most relevant activity is related to industry, and the most widespread is heavy industry.

Concerning the existing economic activities, agriculture covers 50.2% of the area, mainly occupied by cereals although agriculture enterprises are decreasing. Apart from this, forestry covers 35.8% of the territory, occupied mostly by coniferous and mostly state-owned. A high share of forestland is damaged by wild animals, so in the short-term it is foreseen to address this issue by including a programme of protection against insects and wild animals, combined with reforestation of damaged areas. Livestock covers 52,406 ha, focused on cattle, sheep, goat and horse breeding. There are some entities focused on mixed production (animal breeding and plant production), small and medium farms are the most common structure and 3.7% of employment is covered by these two sectors. In general bases livestock residues are used as fertilizers.

Due to its mountainous relief, the Moravian-Silesian region has a significant share of ecologically managed land. One fifth of the agricultural land is managed ecologically (landscaping and extensive agricultural programs are being developed, especially in mountainous areas). Furthermore, agroindustry is focused on production of dairy products, processing and canning of meat and meat products, bakery, flour products, sugar from sugar beet, processing of fruit and vegetables. These agroindustries produce widely diverse residues (leather, horn, fats, offal, blood, bowel, oils, pulp from juice production) that could be valorised through different valorisation schemes targeting different markets (livestock feed, collagen and gelatine, meat and fat industry, pharmaceutical purposes, composting, cosmetic industry). Other bio-based industries process biodegradable waste for energy purposes, processing of wood into pulp, natural cosmetics, medicine and supplements. Finally, non-renewable are the main energy source, black coal has a significant relevance in the energy mix. The use of biogas as a source of electricity is concentrated in the service sectors and agriculture (in agriculture mainly to produce electricity and heat, especially for own consumption). In this sense, there are some potential bio-based value chains that could be developed by diversifying the current uses of the agriculture, forestry and livestock waste (soil conditioners, compost, biorefineries), increasing bio-based industry presence in the region and generating new bio-based products. However, there are some missing actors to materialise these new activities like experts in the bio-based industry and technology providers. Concerning the social marginalised groups in the region, unemployed young people are the most relevant group and therefore the targeted one.

To sum up, Moravia-Silesia is a region where bio-based value chains have enormous potential due to the current low relevance and exploitation of the existent bio-based resources. Moreover, the main activity is heavy industry like the coal industry, which has declining perspectives and negative impacts. In contrast, bio-based value chains development could significantly contribute to promote new development schemes aligned with the Green Deal and the CAP objectives by increasing the valorisation of residues of existing bio-based activities while producing high-added value products.

Alternatively, these new activities, which need experts and technology providers, could bring an opportunity for marginalised group targeted with the right training. Finally, it is worth highlighting that currently there is not an existing circular bioeconomy strategy or roadmap at regional level and there is a lack of information regarding some existing bio-based sectors, which might be due to their low relevance for the economy of the zone. Consequently, this lack of information makes more difficult to establish a well-founded identification of highest potential value chains, design of optimized strategy to promote them and define concrete actions.



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## 2.3. Romania, West region

Romania, West region	
Population and regional figures	<p><b>Unemployment rate:</b> 1.9%</p> <p>The employment rate of agriculture and livestock in the west region of Romania is 17%.</p>
Key sectors	<p>The main economic activity is wholesale and retail trade followed by scientific and technical activities and different types of industry (manufacturing, construction).</p>
Bio-based resources and main sectors of activity	<p>- <b>Agriculture:</b> 769,500 ha are devoted to agriculture and the most relevant crop is corn. 32% of the agricultural land grows corn, 28.37% wheat and 28.37 % rye.</p> <p>23% of the Romanian labour force are employed in agriculture and livestock.</p> <p>- <b>Forestry:</b> West region is not a large forestry area (32.74% territory). This biomass is mainly used for energy purposes, construction, and furniture. Furthermore, it should be noted that this sector has not an important contribution to bioeconomy. The woody residual biomass is harvested by large companies and sold for energy purposes.</p> <p>- <b>Livestock:</b> There are 151,952 ind. of cattle, mainly breeding for milk production. Moreover, the remaining are pigs 541,799 ind., sheep and goats 1,933,611 ind. And poultry 7,081,358 ind. The main stakeholders are large farm, which average size is around 200 cows/farm or 10,000 pigs/farm.</p> <p>Animal manure is the main residue produced, which is valorised by two biogas plants from Regi on West (processing capacity around 100,000 t of animal wastes per year) and the rest is stored in open space and used as fertilizer.</p> <p>- <b>Agroindustries:</b> The main industries in the region are subsectors from agrifood systems associated to cereals, wood, meat and different kinds of semi-finished and finished products obtained from these raw materials. Agroindustries cover 17.8% of employment.</p> <p>The main organic by-products or residues originated are for instance greases and protein wastes from meat industry, whey and sludge from milk industry or sludge from beverage. Furthermore, side products such as straw, stalks, stover, husks, marc, brewery spent cereals etc. are currently integrated in value chain although inappropriate use often generates a high amount of greenhouse gases.</p> <p>- <b>Other bio-based industries:</b> There are different kind of bio-based industries like organic waste management or composting sites, energy crops, digestate and compost are some of the raw materials used. They are responsible for around 1.4% of the employment rate.</p> <p>- <b>MSW:</b> In the West region 569,000 t of waste are produced, being mainly a mixture from households (around 90%). These residues are separated by size and a large fraction is incinerated by cement plants. Moreover, a small fraction is aerated in bio-containers for aerobic degradation and another share is landfilled.</p> <p><b>Existing bio-based solutions:</b></p> <p>- Processing of organic wastes by anaerobic digestion</p>

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	<ul style="list-style-type: none"> <li>- Composting of non-digestible biomass and organic wastes</li> <li>- Vermicomposting, that use the compost as feedstock to produce vermicompost (humus) with higher added value</li> </ul>
Potential bio-based value chains	<ul style="list-style-type: none"> <li>- The biomass generated from the main crop is not used at large scale, there are only two biogas plants in the region. The residual biomass from agriculture is used as co-substrate straw resulted from animal beddings.</li> <li>- Due to a new CAP measure, the area allocated to cover crops cultivation will be increased seeking to reduce soil erosion, improve soil fertility, contribute to the control of weeds, pests, and diseases as well as preserve biodiversity in agroecosystems. This measure will deliver a new type of biomass into the markets and consequently the regional economy.</li> <li>- Currently, biomass production is focused on agricultural residual biomass, however forestry residues could be used too.</li> <li>- There are some perspectives of changes. Firstly, more biogas plants are expected to be built. Also, several small farms could be absorbed by larger exploitations and the investments will mainly focus on large farms and in food processing. Additionally, the number of cattle and pigs is expected to decrease sensitively.</li> <li>- The organic wastes are available in surplus on the market, but the local potential is not quantified. After using organic wastes and biomass in bio-based industrial applications, there are other wastes generated like ash, non-degradable wastes, consumables and parts from processing equipment, CHP units and power plants. These materials can be considered by-products since they hardly can be reused as feedstock in circular bioeconomy.</li> </ul> <p><b>Potential biobased solutions:</b></p> <ul style="list-style-type: none"> <li>- The biomass obtained from polluted areas and marginal land could be reused in biorefineries to produce biofuels, energy and biomaterials (bioplastic).</li> <li>- It would be interesting to valorise by anaerobic digestion all the organic waste generated in agro-food supply chains and in communities to deliver biogas-to-methane or biogas-to-energy and digestate.</li> <li>- Connecting anaerobic digestion as first step, to composting as second step and vermicomposting as final step to deliver high-value and high-quality organic fertilizer in a circular bioeconomy could be a potential route to explore in the region.</li> </ul> <p>Nevertheless there are many technological, regulatory and market challenges to develop such initiatives and should be addressed to successfully promote these bio-based value chains. There is also room to increase the valorisation of MSW.</p>



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<p><b>Missing actors to promote bio-based value chains</b></p>	<ul style="list-style-type: none"> <li>- Availability of experienced and skilled labour force will help to promote bio-based value chains in the region.</li> <li>- Logistic operators could help to improve the management of agricultural and forestry biomass (efficient and exploiting new sources of biomass). This actor is also key to increase the valorisation schemes of MSW</li> <li>- Increase the labour force in processing industries, by introducing modern technologies and raise awareness of the population would contribute to a successful deployment of bio-based initiatives in the territory.</li> </ul> <p><b>Existing ones:</b></p> <ul style="list-style-type: none"> <li>- Individual farmers owning large farms, farmers associations</li> <li>- Thermal energy plants</li> <li>- Organic wastes managers</li> <li>- Biogas plants</li> <li>- Composting sites and bio-humus production facilities</li> <li>- Wastes collection, trading and management</li> <li>- Biobased products commercialization: biogas-CHP to electricity &amp; thermal energy, digestate, compost, vermicompost, organic fertilizers</li> </ul>
<p><b>Targeted marginalised social groups</b></p>	<p><b>PRELIMINARY SELECTION: Workers from the steel production industry, Metallurgical industry, Mining industry, and Extractive industry whose jobs are at risk.</b></p> <p>The West Region has a multi-ethnic and multicultural character. Main characteristics of socially disadvantaged/marginalized groups are:</p> <ul style="list-style-type: none"> <li>-Inadequate competences (especially ICT), hostile attitudes and social norms, excessively rigid working conditions, and difficult access to information</li> <li>-The absence of lifelong learning mindset</li> <li>-Relative poverty rate = 20.7%</li> <li>-Rate of risk of poverty or social exclusion (AROPE) = 25%</li> <li>-The rate of severe material deprivation = 8.6%</li> <li>-The rate of people under 60 from households with very low work intensity = 10.2%</li> <li>-Rate of risk of poverty or social exclusion (AROPE-new definition) = 30.6%</li> <li>-The rate of severe material and social deprivation = 19.2%</li> </ul> <p>The impact foreseen related to their participation in the bio-based circular economy includes the local economy improvement, unemployment would decrease in problematic areas and the foundations of the Circular Bio-based Economy would be laid in the area that could set an example of good practices for other municipalities. It could also contribute to decrease depopulation in vulnerable areas.</p> <p>Factors hindering their participation include:</p> <ul style="list-style-type: none"> <li>-Reluctance to test something new especially when the replication of a best practice from other countries is aimed.</li> <li>-Low levels of self-esteem</li> </ul>

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	<ul style="list-style-type: none"> <li>-Low educational levels</li> <li>-Social models in their area (being passive individuals, not active job searchers for socio-professional (re)integration.</li> </ul>
<b>Regional specificities</b>	<ul style="list-style-type: none"> <li>- Migration determines depopulation in many localities. In the region the main reason for depopulation was closed mines and closure of metallurgical, extractive and steel production industries.</li> <li>- Low unemployment rate (1.9%)</li> <li>- This region is specialised in the metallurgical, chemical and steel industries therefore there is a high educational level. However, there is not much knowledge about bioeconomy and bio-based valorisation schemes.</li> <li>- Erosion and eutrophication are isolated cases in the region.</li> <li>- Main production will continue to be assured in large industrial production facilities while small business will play a marginal role in the economy; large processors will face environmental and financial constraints which could contribute to the development of green technologies integrated in a functional and attractive circular bioeconomy which has to be developed in the region.</li> <li>- There is a regional strategy for 2021-2027 which aims to increase the production of renewable energy and the use of compost. Nevertheless, Romania, or regions in Romania do not have a strategy specifically for circular bioeconomy.</li> <li>- Energy: The main share of energy comes from renewable energies, mainly hydropower and coal fired is also important (43% renewable usage at national level). Bio-based energy sector increase is not expected in the short term.</li> </ul>

TABLE 3. DESCRIPTION OF ROMANIA REGION



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The region targeted is located in the western region of Romania, where the key sector is wholesale and retail trade. There are around 270 municipalities with less than 5,000 inhabitants. The main reason behind it is the migration due to the closure of industries in the region.

Concerning the primary sector activity, agriculture covers 769,500 ha and corn is the most relevant crop. West Romanian does not account with a large forestry area, its biomass is used for energy, construction and furniture, but it doesn't have an important contribution to the regional economy. Additionally, regarding the livestock, there are cattle (milk as the main destination), pigs, sheep and goats and poultry farms, with large farms in the region.

Related to agroindustry, vegetable processing is the most widespread; also, there are other bio-based industries in the area linked to organic waste management, management of farm wastes, biogas plants and bio-humus production.

Finally, most of municipal waste is incinerated in cement factories. It is worth highlighting that the employment rate in agriculture and livestock sectors reaches 23% from which 17.8% in agroindustry.

Otherwise, a large share of the biomass is not exploited, especially biomass coming from agriculture and forestry. Apart from these, there are other potential value chains such as new pathways for organic wastes (biogas, biorefinery, processing by anaerobic digestion) or increasing the valorisation routes of MSW. To set up these new bio-based value chains, it would be necessary to introduce new actors with expertise and experience in these valorisation pathways but also with the right knowledge to valorise different biomass residues and/or by-products. Moreover, education and logistic operators could contribute to overcome technological, regulatory, and market challenges to successfully develop such initiatives.

In the west of Romania, there are different targeted marginalised social groups depending on the focus: people with ICT skills and low levels of education; people in poverty and social exclusion risk; also, there are jobs in some industry activities such as steel production or metallurgical industry that are in risk. These people could be playing a role with the right training in some positions as workforce when promoting bio-based activities in the region.

In short, in the west of Romania, bio-based value chains are not highly widespread and there is no circular bioeconomy strategy in place. Consequently, new bio-based value chains could be seen as an opportunity to generate added value in the region and to increase the knowledge and abilities of local community. Also, the region is facing eutrophication and erosion problems, therefore bioproducts obtained from the by-products or valorised residues such as compost, could be used to remediate these affections and would help to improve these environmental impacts in the region.

Additionally, it is worth highlighting that the region accounts with a regional strategy to increase the production of renewable energy and the use of compost and, currently, 43% of the energy used comes from renewable sources.



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## 2.4.Slovakia, Nitra region

Slovakia, Nitra region	
Population and region figures	<p><b>Population:</b> 676,000 people.</p> <p><b>Area:</b> 6,344 km<sup>2</sup>.</p> <p>Nitra region is densely populated and therefore there are only a few areas under 5,000 inhabitants.</p> <p><b>Unemployment rate:</b> 4.8%.</p>
Key sectors	<p>The most important sectors are agriculture, food industry and different kind of industry (automotive, construction, chemistry). Additionally, sectors like pulp and paper, production of plastic materials and grape growing come into play in the region.</p>
Bio-based resources and main sectors of activity	<ul style="list-style-type: none"> <li>- <b>Agriculture:</b> 1,862,654 ha are devoted to agriculture, specifically 360,000 ha to grains, 720,000 ha to cereals and 290,000 ha to oil seeds at country level. In Nitra region, Potato is the crop with the highest yield producing around 755,355 t/year of residual biomass. There are different kind of stakeholders involved: state farms, foreign farmers, farmer associations, or individual farms.</li> <li>- <b>Forestry:</b> 97,000 ha are forestland, not a huge area because Nitra is a small region. The forestry biomass is used for heating, furniture manufacture and construction. Forests are mainly state-owned. It generates 121 kt of forest biomass residues, mostly exploited for wood chips, heating, pellets and energy production.</li> <li>- <b>Livestock:</b> It covers 512,000 ha producing mainly cow milk, animal products, hen eggs or wool. Farms are owned by individual farmers, farmer associations, state farms or owned by local authorities. The main residue generated is slurry and currently is only used for fertilisation purposes.</li> <li>- <b>Agroindustry:</b> There are 3,800 agrifood industries in Slovakia and the main products are brewing, meat, confectionary, milk, etc. The industry generates different kind of residues like animal skins, bones, eggshells, manure, peels which in general bases are not valorised.</li> <li>- <b>Other bio-based industries:</b> Food and feed industries, commercial biorefineries, pulp and paper are the most relevant. These bio-based industries cover 9.86% of the employment rate and the main actors are farms and food companies.</li> <li>- <b>Energy:</b> The main source is the nuclear energy, which provide 86.45% of the consumed energy. Related to renewable energy, the most important source is hydropower followed by solar energy.</li> <li>- <b>MSW recovery:</b> Around 150kt/year out of 400 kt/year are recovered. There is still an enormous amount of waste that is currently not separated and that can be potentially valorised. For instance, they could be used for energy generation once the separation and waste treatment system become further developed, or for obtaining by-products.</li> </ul>



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<b>Potential bio-based value chains</b>	<ul style="list-style-type: none"> <li>- Diversifying agriculture and agroindustry production in order to increase employment and consumption while reducing imports.</li> <li>- Promotion of new value chains using residues from agriculture. Around 400 kt/year of cereal straw, 55kt oil seed rape straw, 210 kt/year of corn stover, 30kt/year of sugar beet leaves and 65kt/year sunflower straw could be valorised as biomaterials, pulp, textiles and biochemicals.</li> <li>- New value chains using residual forest biomass (availability of 121kt/year) could be used for other purposes besides heating/energy production. For instance, biocomposites that could replace currently used materials used in the automotive sector or new materials for construction.</li> <li>- Use of manure/slurry for energy production, currently they are only used as fertilisers.</li> <li>- Promotion of new value chains based in animal wastes (like skins, bones or peels).</li> <li>- There is further room for investments in biochemical production. For example, bioethanol and biochemicals from lignocellulosic wastes.</li> <li>- It would be possible to increase the share of RE from bio-based wastes, the energy matrix is largely based in non-renewable sources such as nuclear with 53% share while 21.3% is renewable (2021). There are available subsidies to promote renewable energies and to reduce emissions.</li> <li>- Large amount of waste is not currently recycled, so there is an opportunity to increase recycling and valorisation of waste. Also, a further valorisation of MSW is possible to avoid landfilling (186kt/year) for instance by producing energy-dense streams and biomaterials.</li> </ul>
<b>Missing actors to promote bio- based value chains</b>	<ul style="list-style-type: none"> <li>- Know-how providers to modernize value chains, increase efficiency and competitiveness.</li> <li>- Actors with knowhow for the development of new supply chains addressing agri-food and municipal residues.</li> <li>- Technology providers will be essential to set up plants where energy can be obtained from bio-based wastes (digestors, gasification, etc).</li> <li>- Due to the region is densely populated and the unemployment rate, it could be assumed that most likely will be a workforce available which could be redirected towards new renewable energy initiatives implemented in the region although a challenge will need to be overcome since value chains based on traditional fossil resources are more profitable than the new ones based on biomass. Furthermore, solutions often require investments in hardware, which pushes stakeholders back when there is not a very low risk and very high reward for new developments.</li> </ul>
<b>Targeted marginalised social groups</b>	<p><b>PRELIMINARY SELECTION: Small/mid-size farmers and agrifood SMEs</b></p> <p>These groups are relevant as they create jobs, bringing innovation and added value to traditional agriculture and better exploitation of potential.</p>
<b>Regional specificities</b>	<ul style="list-style-type: none"> <li>- Most of the people in Western Slovakia have an upper secondary education (around 25%).</li> <li>- There are more than 25 ethnic minorities, largely dominated by Hungarians.</li> <li>- The agricultural sector employs 3% of the workforce.</li> <li>- Environmental issues identified: Penetration of pesticides from agricultural production. Deforestation (more than 7,000 ha of forests have disappeared in the Low Tatras in the last 15 years). In 2015, the area threatened by water erosion was 770,388 ha, 38.8% of agricultural soils.</li> <li>- HR available due to reduction of employment in the automotive industry, so efforts should be allocated to readapt them to agrifood sector.</li> <li>- Currently there is not a strategy in the region for bioeconomy development, where the automotive industry has a relevant weight in the economy of the zone. Moreover, the lack of public support and subsidies, the competition with other sectors, the reduced importance of the local agrifood products and their uncompetitive prices makes difficult promoting the of bio-based initiatives.</li> </ul>

TABLE 4. DESCRIPTION OF SLOVAKIA REGION

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The project focuses on the region of Nitra, which is a small and densely populated region where the unemployment rate is low (4.8%). The key sectors in the region are agriculture, agroindustry, construction, and several industries (automotive, electrical, chemistry, and textile, among others).

In Slovakia 1,862,650 ha are occupied by the agriculture sector, and the main crops are grains, cereals, and oil seed. Although there is no data about the area and production in Nitra, it can be stated that potato is the crop that reaches the highest yield which in turn generates a total residual biomass of 755,355 tonnes per year. Forestlands cover 97,000 ha and 40% are owned by the state. The biomass generated is used for heating, furniture, manufacturing, and construction and the residues are used to produce wood chips, heating pellets and energy purposes.

Moreover, Livestock covers 512,000 ha in Slovakia, mainly owned by individual farmers, state farms, and local authorities. The main destination of the cattle is cow milk, animal products, eggs, and wool. The main residue generated in this case is slurry, which is used in turn as fertilizer. Regarding the regional agroindustries, some produce brewing, meat, confectionery and milk; and generate mainly animal residues (animal skins, bones, eggshells), mostly not valorised. There are also other bio-based industries like feed industries, biorefineries, and the production of pulp and paper. The MSW recovery is quite low, therefore it would be beneficial to establish valorisation schemes that will enable to improve the recycling process and valorisation of these residues (for energy purposes, compost or production of bioproducts). Finally, it is important to highlight that there is not a relevant share of renewable energies, and the main source is nuclear energy (86.45%).

Apart from the current bio-based value chains, there are several opportunities that have not been exploited yet, such as the diversification of agriculture and agroindustry to target bio-based applications or promoting new value chains using the available residues. For instance, the agriculture residues could be used for biomaterial production or biochemicals. Also, there is an opportunity for investments in biochemical production (bioethanol and chemicals from lignocellulosic wastes) and contributing to increase the share of renewable energies.

Lastly, there is room for improving the amount of MSW residues recycled. However, there are some missing actors that are key to promote these new value chains. Firstly, technicians and knowledge providers could help the stakeholders of the region with the transition to renewable energies and the adoption of new practices (digitalization, sustainable agriculture, organic farm). Also, technology providers for energy production from bio-based wastes (digestor, gasification, etc.) and new bio-based industries could be proposed.

In this region, the targeted marginalised social group could be small/mid-size farmers a SMEs in agri-food. The main aim in this case would be to create jobs and bring innovation to this traditional sector.

In summary, Nitra is a small region where traditional sectors lack of modernization and biomass residues are lowly valorised. Consequently, the promotion of bio-based value chain valorising residues and by-products from the existing productive activities could greatly contribute to develop the economy of Nitra. Furthermore, greater labour force would be available because jobs in the automotive industry will be directly affected in the short term by an activity decrease, and it could be considered as potential working force in bio-based value chains.

Finally, it is important to highlight that there is not so much information available neither at the national or regional level and there is not a circular bioeconomy strategy that could provide a baseline to define more concrete actions to promote bioeconomy and circularity in the region.



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## 2.5.Slovenia, whole country

Slovenia (whole country)	
Population and regional figures	<p><b>Population:</b> 2 million people</p> <p><b>Area:</b> 20,000 km<sup>2</sup> (whole country)</p> <p><b>Unemployment rate:</b> 3.5%</p>
Key sectors	<ul style="list-style-type: none"> <li>- The economic activity in Slovenia is dominated by services and industry (agriculture with less than 5%).</li> <li>- Concerning the primary sector, agriculture is mainly devoted to cereals, corn and grass cultivation. Forestland occupies 1M ha, 59% of Slovenia territory and is 77% private-owned in any case forestry sector is stronger than agriculture. Livestock farming is the dominant sector in Slovenian focusing on cows for milk production followed by meat.</li> </ul>
Bio-based resources and main sectors of activity	<ul style="list-style-type: none"> <li>- <b>Agriculture:</b> Slovenia has a low net added value and the low income in agriculture reflects, among other things, the weak structure of Slovenian agriculture (reduced average farm size, large number of subsistence farms and of non-specialised farms, large share of farms in less-favoured areas). The main stakeholders are cooperatives, associations and companies. It is responsible for 6.0% of employment share.</li> <li>- <b>Forestry:</b> forests occupy around 59% of the territory. Forestlands are mostly productive and mainly devoted to energy purposes (55%), construction (40%), and pulp. Slovenia is a strong exporter of unprocessed roundwood, particularly important for coniferous roundwood. Forestlands are in general owned by private owners (77%). 160,000 t of residual biomass are obtained yearly, and they are either burned by incinerators, recycled, composted and around 54% is intended for other uses. 57% of the raw material used by paper industries come from recycling paper.</li> <li>- <b>Livestock</b> is the dominant productive sector concerning the primary sector. The strongest value chain is the cow milk production (representing 35% of the value of livestock farming) although there are others such as pork, poultry meat, eggs, sheep, goat and horse meat. The sector has traditionally been present in areas where grassland predominates. Intensive cattle farming is typical developed in lowland areas of the country. The main residue is manure and it's mostly used as organic fertilizer (low percentage used for energy purposes). It covers 4% of employment.</li> <li>- <b>Agroindustry:</b> There are 789 enterprises active, and the main ones are dedicated to meat products processing, manufacture of bakery and farinaceous products, manufacture of beef, etc. Agroindustries are responsible for 1.7% of employment. The main residues in the food processing are obtained from the processing of meat, milk, fruits, vegetables, bakery and confectionery products, alcoholic and non-alcoholic beverages industry. The prevailing use of this type of waste is biogas. It is difficult to quantify the amount, which is essential in order to plan the promotion of additional bio-based valorisation value chains.</li> <li>- <b>Energy industry:</b> Hydropower is Slovenia's most significant renewable energy source for electricity. Renewable energy sources other than hydropower (e.g., biofuels, solar PV, waste, and wind) together provided 3.5% of total electricity generation.</li> <li>- <b>MSW:</b> 70% is generated in households. The main share is recycled by composting and a reduce fraction is treated in biogas facilities. Around 25% of organic municipal waste is composted or treated by digestion).</li> </ul>



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<p>Potential bio-based value chains</p>	<ul style="list-style-type: none"> <li>- Value chains targeting the valorisation of vegetable residual biomass, fruit residual biomass, straw, corn stems, hops, oilseeds cake and root crops, dry matter produced by the green cuttings of vines and fruit plants. Although a significant share of the harvest residues is being used to keep the balance of organic matter in the soil.</li> <li>- Value chains from side streams of food industries and or discarded food. High added value examples are oligosaccharides (emulsifiers) from fruit pomace and the extraction of antioxidants from wine production residues, yeast from beer production side streams, fibbers, bran, enzymes. Valorisation schemes could include energy production (as 60%+ comes from non-renewables sources in the country) or the extraction of valuable chemicals or conversion into bio-based materials.</li> <li>- Transformation of forestry biomass instead of exporting unprocessed biomass (increase added-value).</li> <li>- Value chains using forestry wastes (logging residues, discarded wood, bark, and wood residues). Logging residues are largely used for soil protection. The greatest bioeconomic potential in this category can be attributed to bark, which by volume represents around 20% of the cut. It is an important category of raw material for bio-based products due to its content of compounds such as tannins and it is also a good structural material for composting biogenic waste. Some logging residues could also have a commercial potential such as knots and bark of certain tree species, which, with their rich content of polyphenols, have wide applicability in the chemical and pharmaceutical industry, as well as to produce nutritional supplements and resins. Other possible uses are the production of composites, thermal processing into activated carbon or gas, biorefining (processing into methanol, ethanol), use in agriculture and environmental applications (bedding, mulch, greening of degraded areas), and finally also energy use in specialized heating devices.</li> <li>- Value chains using side streams from paper recycling (primary sludge generated during the removal of printing ink from recycled fibres, secondary sludge generated during the wastewater treatment process). Sludges with a high carbohydrate content are suitable to produce biofuels and as fertilizers in agriculture, while sludges with a predominantly inorganic character can be used in the construction industry. Due to the higher content of organic matter, secondary sludge is interesting to produce biogas and, in combination with waste ash, as a building material.</li> <li>- Value chains from slurry (500 kt) and manure (100kt), for which less than 10% is valorised, can be an interesting bio-based resource.</li> <li>- Organic milk and meat production can be valorised by restructuring the current value chains. This can add a premium to the products and enable certifications and broader acceptance from the customer's side.</li> <li>- Production of whey protein and valuable platform chemicals from the side streams of milk processing could also have a potential application that it would be worth to assess.</li> <li>- New businesses could be developed targeting the prevention of food waste by redistributing it to people and livestock before they turn into "non-edible waste".</li> <li>- Considering the chemical composition and technological properties of side streams from food processing, there are untapped potentials in the exploitation of bioactive components or substances with added value before their final use for energy purposes.</li> <li>- Beer grounds are an interesting raw material source for a wide range of products, e.g. as a protein component in cereal products, a substrate to produce enzymes and organic acids, a raw material source for obtaining fractions (e.g. various sugars and organic acids) and in the production of</li> </ul>
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	<p>bio-adsorbents.</p> <ul style="list-style-type: none"> <li>- Increase the valorisation of MSW (1 Mt generated per year, largely consisting of packaging plastic waste)</li> </ul>
Missing actors to promote bio-based value chains	<ul style="list-style-type: none"> <li>- Logistic operators are key as the agriculture and forestry sectors are characterized by a high degree of fragmentation. Furthermore, certain areas are not open to forest roads and trains. This makes residues' collection, storage, standardization and valorisation more difficult and many times unfeasible.</li> <li>- Infrastructures to integrate farms and use the full potential of the current network of biogas plants (oversized) or enable the establishment of new, smaller, decentralized biogas facilities. This type of initiatives would require from governmental support and investments, but there is a high unlocked potential from the manure/slurry underutilised wastes.</li> <li>- Actors with specific expertise to obtain valuable extractives (polyphenols, tannins) from forest residues.</li> <li>- Actors and young workforce able to bring modern machinery and digital tools to increase productivity and efficiency of agro-forest businesses (Slovenia is still dominated by outdated and inefficient machinery, making it less competitive).</li> <li>- Actors with knowhow to "upgrade" current livestock products to organic labelled ones.</li> <li>- Actors with knowhow to valorise food waste and side streams into high added value products: (bio)chemicals, food supplements, bioactive ingredients, etc.</li> </ul>
Targeted marginalised social groups	<p><b>PRELIMINARY SELECTION: group of employed and non-employed chemists, with additional focus on women, elderly, foreigners, and students in the field of chemistry</b> who will be working in biochemical companies (covering bioeconomy topics) in the future.</p>
Regional specificities	<ul style="list-style-type: none"> <li>- There are two traditional national minorities: the Italian and Hungarian national communities and a special Romanian community. Total of &lt;15000 people.</li> <li>- Challenges envisioned: Resistance from the marginalised groups to respond to initiatives, employers not interested in further developing skills, fragmentation of agricultural land (increasing vulnerability of agriculture to climate change).</li> <li>- Growing support to rural economy and strengthening the competitiveness of agrifood sector is a challenge that need to be address. The Strategic Plan of the Common Agricultural Policy for Slovenia foresees coupled income support for protein crop production (play an important role in improving beef and milk production).</li> <li>- The small size of the Slovenian market compared to neighbouring markets within the EU leads to greater price volatility of agricultural products on the Slovenian market. Also, the crop productivity is lower than in other European regions. Therefore, it would be interesting to increase the efficiency and to establish irrigation systems.</li> <li>- Inadequate use of mineral fertilisers and plant protection product is a major cause of soil contamination from agricultural activities in Slovenia, but the consumption of such fertilisers has been decreasing (35% less) between 1992 and 2019.</li> <li>- There is a long-term downward trend in agricultural commodity prices. In Slovenia, a key measure contributing to mitigating market price risks is the co-financing of insurance premiums from the national budget to insure primary agricultural production.</li> </ul>

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	<ul style="list-style-type: none"> <li>- Some areas of agricultural land are at high risk of soil organic matter depletion and some soils are also acidic.</li> <li>- The forestry sector is characterised by a high degree of fragmentation, the number of owners and co-owners of forests, and the unfavourable age structure of owners make it difficult to work professionally and to make best use of the timber in private forests.</li> <li>- Openness to forest roads is not yet optimal in Slovenia. Certain areas are not open to forest roads and trains, which makes timber harvesting more expensive or even impossible and reduces the fire safety of forests.</li> <li>- The existing network of biogas plants (predominantly those with a size between 1 and 4 MW) is oversized considering the way and organization of agricultural production in Slovenia, which causes excessive environmental loads (insufficient areas to fertilize with digestate from biogas plants). In the prevailing conditions of Slovenian agriculture with relatively small and spatially scattered farms, the key challenge is the establishment of smaller biogas plants (of the 250 kW range) on larger farms, or the connection of farms and other users (e.g., local communities) in group investments and the operation of smaller biogas plants. Due to the relatively small size of farms and their dispersed nature, only about one third of this potential is technically exploitable, and rough estimates suggest that currently only 0.2% of the potential of cattle manure, 13.8% of the potential of pig manure and 5.8% of the potential of poultry manure is being exploited.</li> <li>- Slovenia has very favourable conditions for organic meat production because of the abundance of grassland. However, most meat products are not sold as organic because many organic animals are slaughtered as conventional animals.</li> <li>- Wood is the most important renewable energy source, accounting for a 48% share in the country's energy mix.</li> <li>- While there are subsidies in place for sustainable development, inadequately sited biomass processing plants can disturb prices, especially in the case of inappropriate policies (e.g. the negative past experience with biogas installations).</li> <li>- Technology lag and productivity gap in primary bioeconomy sectors, in particular in agriculture together with the poor ability to enable industrially relevant quantities of biomass due to fragmented tenure structures in forestry and agriculture, lack of organisation and inefficient business models need to be addressed to untapped the existing potential.</li> <li>-Low level of wood processing and consequently, low added value of the products commercialized (in 2018, 52% of unprocessed roundwood was exported abroad; softwood roundwood is mostly processed in sawmills (68%) and hardwood roundwood is mostly used for energy purposes).</li> </ul>
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TABLE 5. DESCRIPTION OF SLOVENIA REGION



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The geographical scope in this case is the whole country, with a population of 2 million and an unemployment rate of 3.5%. In Slovenia, services and industries are the dominant sector.

Concerning the existing bio-based value chains, agriculture covers 479,486 ha, and the main crops are cereals, corn, and grass. Slovenia has a low net value added and factor income in agriculture reflecting, among other things, the weaker structure of Slovenian agriculture (low average farm size, large number of subsistence farms, large number of non-specialised farms, large share of farms in less-favoured areas). Forestry covers 59% of the country, out of which 77% is privately owned (stronger sector than agriculture), and the forest biomass is mainly used for energy purposes, construction and pulps.

Slovenia is a strong exporter of unprocessed roundwood. In any case, livestock is the dominant productive sector in Slovenia for the primary sector (4% of employment rate). The products obtained are eggs, meat from pork, poultry, sheep, goats and horse, and the strongest value chain is associated cow milk production. The main residue obtained is manure which is used as organic fertilizer.

Regarding agroindustries, there are 789 enterprises, responsible for 1.7% of employment and their activities are linked to the processing of meat products, manufacture of bakery and farinaceous products and manufacture of beef, among others. Residues in food processing are variable in quality and quantity which makes it difficult to find suitable valorisation schemes.

Regarding the MSW, 70% is generated in households, the majority is recycled by composting and a small part is treated in biogas facilities.

Concerning the energy sector, non-renewable sources are the principal source, and hydropower is Slovenia's most significant renewable energy source.

In respect of the potential bio-based value chains, residues from agriculture such as fruit, straw, corn stems, oilseed and root have a potential that it would be worth assessing. Additionally, if the forestry biomass was transformed in Slovenia instead of exporting it unprocessed, the added value would increase; and the residues generated in the process such as bark could be used for soil improvement, bioproducts manufacture, composting or in the chemical and pharmaceutical industry, according to its characteristics and qualities.

Other possible value chain could be promoted based on the valorisation of the side streams from the paper recycling process. Regarding livestock, producing milk and meat organic, could add value to the products and enable certifications. Also, residues such as manure and slurry are not broadly reused or valorised although they have a significant potential as raw material to produce energy or used as fertilizers.

Other possibilities for livestock residues are producing whey proteins from the side streams of milk-producing. Manure and sludges with a high carbohydrate content, are suitable to produce biofuels and as fertilizers in agriculture, while sludges with a predominantly inorganic character could be used in the construction industry. Finally, residues from agroindustries like side streams in food processing, could be used as bioactive components or for energy purposes. Additionally, beer grounds are an interesting raw material like protein component in cereal products.

To put into practice these potential value chains in the country, it is worth taking into consideration that some of the actors needed to implement these value chains might be missing. Different barriers will need to be faced such as the raw materials logistics to overcome the fragmentation barrier in the



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agriculture and forestry sector. Also, a younger workforce in the agriculture sector would help to develop, modernize, and introduce modern machinery to increase productivity and efficiency.

Actors with expertise in obtaining valuable extractives from forest residues and how to valorise food waste and side-streams into high-value products could contribute to a successful implementation as well as, actors with the knowhow to upgrade current-livestock products to organic labelled ones.

In Slovenia, the marginalized social group that could be targeted in the project could be the employed and non-employed chemists, with an additional focus on women, the elderly, foreigners, and students in the field of chemistry who would be covering bioeconomy topics in the future. Moreover, other groups could be targeted, for instance, the traditional national minorities (Italian and Hungarian) or small farms with low productivity.

To sum up, Slovenia is a country where currently bio-based value chains have a significant potential although some barriers need to be faced (low productivity and efficiency of the primary sector), and their current rate of valorisation is low. Furthermore, there is a bioeconomy strategy in place.



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## 2.6. Germany, Baden-Württemberg region

Germany, Baden-Württemberg region	
Population and regional figures	<p><b>Population:</b> 11 million people</p> <p><b>Area:</b> 35,750 km<sup>2</sup></p> <p><b>Unemployment rate:</b> 3.4%</p>
Key sectors	<p>The main economic activities in the region are linked to technology sectors such as automobile production and mechanical and electrical engineering as well as agri-food industries.</p> <p>There is an interesting ecosystem of bio-based industries (agri-food, fishery, feed, bio-based materials, biotech, waste management, etc.) in the region.</p>
Bio-based resources and main sectors of activity	<ul style="list-style-type: none"> <li>- <b>Agriculture:</b> 1.5 Mha devoted mainly to wheat and barley (23%) and corn (8%). Individual farmers owning is the most frequent structure, but with diverse dimensions. The residual biomass produced is used in different ways such as industrial production of pulp from straw for hygiene products or biogas production.</li> <li>- <b>Forestry:</b> 1.3M ha covered by forest, 38% of the region territory, 65% state-owned. Biomass produced is mainly used for energy production/heating applications and construction. The forest sector already works with a circular approach in which wood products are reused after an initial use, for example in particleboard. After one or two reuses (often limited by the pollutant content), waste wood is used to generate heat and electricity, as are residues generated during the harvesting and processing of wood.</li> <li>- <b>Livestock/agroindustry:</b> Cows and pigs, and milk and meat are the main products (meat and meat processing industries, dairy, bakery and confectionary industry, processed fruits and vegetables). Agriculture, fishery and forestry are responsible for 1.1% of employment.</li> <li>- <b>MSW:</b> The municipal solid waste is mostly generated in households and there is not much public information about its valorisation.</li> </ul>
Potential bio-based value chains	<ul style="list-style-type: none"> <li>- Value chains from agricultural residues (pulp/textiles/materials from straw, biogas from corn cobs) could have a significant potential worth to assess in detail (national waste production of 10.9 Mt).</li> <li>- New perspectives for agriculture include organic farming, regional products, no genetically modified food, agriculture 4.0 through digital solutions.</li> <li>- The share of wood used in construction could be significantly increased.</li> <li>- There is an untapped potential to develop new value chains based on forest materials to produce high added-value materials, such as resins and polyphenols.</li> <li>- Use of manure/slurry for energy production (currently used as fertilisers only) could significantly contribute to improve the current valorisation of these type of raw materials.</li> <li>- Technologies to increase the share of renewable energy (currently at 16%) in the matrix, largely dominated by coal, could contribute to reach the environmental objectives established at country level.</li> </ul>

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<b>Missing actors to promote bio-based value chains</b>	<ul style="list-style-type: none"> <li>- Technology providers for energy production from bio-based wastes (digestors, gasification, etc) are key to promote this value chain in the region.</li> <li>- Knowhow to apply new perspectives for agriculture (organic farm, regional production, agriculture 4.0 through digital solutions) could significantly contribute to set the bases for bio-based valorisation schemes promotion.</li> <li>- Workforce with the required knowhow to develop new value chains from agriculture, agroindustries and forestry residues are essential.</li> </ul>
<b>Targeted marginalised social groups</b>	<p><b>PRELIMINARY SELECTION: Unemployed people, are so-called NEETS, meaning young people not engaged in education, employment, or training (630,000 in Germany).</b></p> <p>These persons can be trained for so-called green jobs to work in the industries of the circular, bio-based economy.</p>
<b>Regional specificities</b>	<ul style="list-style-type: none"> <li>- Jobs in the automotive industry will be directly affected and endangered by the transformation of the industry toward electromobility by 2030. The people affected currently manufacture products linked to combustion engines.</li> <li>- Large share of migrants (26.7%), among those: Turkish background: 3.3%, Polish background: 2.5%, Russian background: 1.5%, Romanian background: 1.2% and Italian background: 1.1%.</li> <li>- High average gross income of 4,815 EUR.</li> <li>- Division of roughly 50-50 in terms of small farms (&lt;20ha) and medium-large farms (&gt;20 ha)</li> <li>- Trends of organic, smart farming, strengthening of regional products</li> <li>- High level of industrialization in agri-food</li> <li>- There is a pilot project to develop a biorefineries in the region.</li> <li>- To achieve climate protection targets and become independent of fossil energy imports, the share of renewable energies in gross electricity consumption must rise to at least 80 percent by 2030. The expansion of wind and solar energy will be accelerated to enable the phase-out of fossil fuels and ensure greater energy efficiency. Apart from this alternative, it would be interesting to promote other sources such as biogas, biorefineries</li> <li>- The most energy-intensive industries in Germany are the steel, metal and paper industries. It is therefore important to focus on these sectors in order to achieve the climate targets.</li> </ul>

TABLE 6. DESCRIPTION OF GERMANY REGION



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The German region involved in the project is the region of Baden-Württemberg, where the unemployment rate is 3.4% and has a high average gross income. Technology sectors such as automotive production, mechanical and electrical engineering and agri-food industries are the key sectors.

If we focus on traditional bio-based sectors (agriculture, forestry, fishery), they are responsible for 1.1% of the employment. In agriculture, the main crops are wheat, barley and corn, occupying 1,564,200 ha. Meanwhile, forestlands occupy 1,353,042 ha., which represents 37.8% of the regional territory, and the forest biomass is mainly used for energy purposes. Forestland is mainly owned by the administration (by Federal State Baden-Württemberg, State of Germany, or by municipalities), only 35.9% is owned by privates. The residues of the forestry sector are mainly used to generate heat and electricity. In addition, livestock in the region is focused on meat and milk production (cows and pigs), and the manure is valorised as fertilizers.

Regarding the agroindustries, meat processing industry, dairy industry, bakery and confectionary industry and the production of processed fruits and vegetables are the most relevant. Some of the residues generated are valorised, for instance, slaughterhouse by-products. Regrettably, there is a lack of detailed information concerning the MSW, apart from that, it is mainly originated in households. Finally, non-renewable energy is the main source and only 16.5% of the energy consumption comes from renewable sources.

Based on the information provided there are some opportunities for potential bio-based value chains related to the primary sector (agriculture, livestock, forestry) and agroindustries since the by-products and residues produced are not highly exploited and they could greatly contribute to diversify the activities of the primary sector and to apply new perspectives such as organic farming, regional products, or agriculture 4.0 through digital solutions. Moreover, agricultural residues represent a suitable raw material for different applications according to their characteristics as well as forestry residues (resins and polyphenols), or manure and slurry with a high potential for energy production. Otherwise, the share of wood used in construction could increase and renewable energy share too. There are some missing actors to put into practice the promotion of bio-based value chains. First, actors with the required knowhow to apply new perspectives for agriculture and adapt the forestry sector to the new necessities. Also, technology providers among others. In Baden-Württemberg, the targeted marginalised group addresses a category of unemployed people. They are so-called NEETS which are young people not engaged in education, employment, or training. With a specific training programme these people could find an employment in the bio-based sector.

To sum up, it is important to highlight that in this region there are some favourable conditions like the high average gross income and the high level of industrialization in agrifood, which generates an interesting ecosystem of bio-based industries (agri-food, fishery, biotech, waste management, etc.). However, traditional bio-based value chains have not a relevant role in the region and there is a lack of information to properly assess the most promising initiatives.

Furthermore, jobs in the automotive industry would be directly affected in the short term and there is a large share of migrants, 26.7%, which could be considered as potential working force in bio-based value chains. Lastly, to achieve climate protection targets and become independent of fossil energy imports, the share of renewable energies in gross electricity consumption must rise especially considering that the most energy-intensive industries in Germany are the steel, metal, and paper industries.



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## 2.7.Spain, Aragon region

Spain, Aragon region	
Population and regional figures	97% of the municipalities have less than 5,000 inhabitants (depopulation of rural areas) <b>Unemployment rate</b> 9.4%.
Key sectors	The key economic activities in the region are the automotive and manufacturing industry as well as agriculture and agroindustry in the rural areas.
Bio-based resources and main sectors of activity	<ul style="list-style-type: none"> <li>- <b>Agriculture:</b> 37.46% of the territory is devoted to crop cultivation, been cereals the main crop (838,000 tones/year in average). Fruits and vineyards are also quite relevant. Most common structure used to be farms owned by families while currently are macro farms or farms owned by big companies.</li> <li>- <b>Forestry:</b> 54.7% of the territory and the share has been increasing producing around 6,000,000 t/year that can be used for biomass. Wood chips are the main product and the main use energy. Forest residues are used in many cases for heating applications (industry and domestic scale).</li> <li>- <b>Livestock:</b> pigs are the most numerous cattle, and mainly devoted to meat production.</li> <li>- <b>Agroindustries:</b> are responsible for 10% of GDP of Aragon. Meat, milk, skins and derivatives of these products such as cheese, butter, cream are the main products commercialized. Residues and by-products from agroindustries are in many cases used within each company to reduce fossil-based fuels consumption seeking to improve the economic profitability and increase their circularity.</li> <li>- <b>Energy:</b> non-renewable energies predominate (natural gas) although renewable energies are increasingly relevant, for instance when considering potential projects targeting hydrogen planned in the region.</li> <li>- <b>MSW:</b> 2,800,000t/year managed and 49% of MSW is organic. There are not very many public sources regarding the valorisation schemes of these materials.</li> </ul>
Potential bio-based value chains	<ul style="list-style-type: none"> <li>- There is an untapped potential of agriculture residues or by-products (waste from woody or herbaceous crops as well as pruning ) and forest residues that could be valorised.</li> <li>- Further work is needed to diversify the valorisation pathways of agricultural wastes/by-products (amendments, biogas, bio-based products)</li> <li>- Introducing biotechnology industries will be key to further promote bio-based value chains in the region.</li> <li>- The production of renewable based energy would greatly contribute to increase the sustainability of the agroindustries and to reduce dependence on fossil raw materials.</li> </ul>



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Missing actors to promote bio-based value chains	<ul style="list-style-type: none"> <li>- Logistic operators are key to develop new bio-based value chains in the region.</li> <li>- Supply information concerning the existing opportunities related to bio-based products and the main stakeholders that would need to be involved in the area are essential to achieve a successful implementation of the bio-based initiative.</li> <li>- New valorisation schemes should be promoted (pharmacy, cosmetics, bioplastics, etc.) at regional level to address different markets.</li> <li>- Experts who can advise farmers how they can adapt agriculture to the new requirements would play a key role to promote bio-based value chains.</li> <li>- Bioeconomy community plan could set the bases to identify specific actions at regional level.</li> </ul>
Targeted marginalised social groups	<p><b>PRELIMINARY SELECTION: rural areas population and women seeking to avoid migration</b></p> <p>Also, in rural areas people have difficulties to find employment, specially over 40' individuals without education.</p>
Regional specificities	<ul style="list-style-type: none"> <li>- An increasing number of companies have established and are establishing extremely ambitious decarbonisation goals.</li> <li>- Forest fire presentation is a key aspect in the region.</li> <li>- Agricultural jobs in risk due to climate change is an issue in the region.</li> <li>- The region account with a high scientific quality and human capital.</li> <li>- Ageing society and depopulation in the rural areas are essential and need to be addressed.</li> <li>- Corrective measures need to be planned and implemented to address soil problems related to erosion and lack of nutrients due to the current drought situation.</li> <li>- The process of globalisation of agricultural markets and the need for high investments needed will require strategic measures to meet the technological and digitalisation challenges that are occurring in the sector to ensure both environmental and economic sustainability that are placing small/family farms at a competitive disadvantage.</li> <li>- The region has developed an strategy for social economy promotion and circularity certification scheme.</li> </ul>

TABLE 7. DESCRIPTION OF SPAIN REGION



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Aragón is a region in Spain characterized by the depopulation of rural areas, 97% of municipalities have less than 5,000 inhabitants, and a significant unemployment rate of 9.4%. The key sectors are the automotive and manufacturing industry; although in the rural areas, agriculture and agroindustries are the main activities.

Concerning the primary sector activity, agriculture covers 37.46% of the region and the main crops are cereals, fruits and vineyards. Nowadays, macro-farms or companies are the main owners, but previously it was common to find family- owned farms. Forestland covers 54.7% of the territory and it is increasing. Wood chips are the main product and heating the main use (industry and domestic scale). Regarding livestock, pigs are the most relevant, mainly for meat consumption.

Furthermore, agroindustries generate 10% of the GDP of Aragón and the main products are meat, milk, skins, and derivatives of these products (cheese, butter, cream).

The information regarding MSW valorisation is not as available and detailed. Nevertheless, considering 49% is organic, it represents a potential raw material for different valorisation schemes.

Finally, non-renewable energy is predominated (natural gas) and renewable energies relevance has been increasing significantly in the past years and currently many projects targeting hydrogen are planned.

Regarding the potential bio-based value chains, residues from agroindustries and agriculture have a significant potential and there is room to further develop initiatives to valorise biomass for different applications. Additionally, new valorisation pathways (biofertilizers or soil amendments, biogas, bioproducts, biochemicals, etc.) could be promoted in the region. Moreover, biotechnology industries could be introduced as well.

The focus in this region lies in rural areas seeking to avoid migration to the cities and therefore depopulation of rural areas. Especially, it would be important to help women and people over 40 years, who have problems finding jobs.

To set up these new bio-based value chains, it would be interesting to introduce coordination operators and supply information to the main stakeholders involved in the bio-based value chains. Also, actors with the needed expertise would help to introduce new biotechnology industries like pharmaceuticals, cosmetics, or bioplastics. Lastly, the development of such initiatives should be aligned with the new requirements from CAP that farmers need to fulfil as well as regulations related to the by-products' valorisation routes prioritisation. The development of bio-based initiatives in rural areas could help the primary sector to modernize their exploitations which is also needed in some cases.

In conclusion, Aragon is a region where primary sector is quite relevant especially in rural areas producing a significant volume of residues and by-product associated to the production processes and therefore has a high potential to develop bio-based value chains that would enable the valorisation of such materials. Main challenges to face at regional level are the rural migration, forest fire prevention and aging of rural population. Moreover, there is not a bioeconomy strategy but there is a social economy promotion plan and a circularity certification scheme (Aragon circular) which could set the baseline for further promotion of bio-based initiatives. Finally, at national and regional level there are many companies that have established highly ambitious decarbonisation goals, which brings a very interesting opportunity to promote this kind of projects.



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## 2.8. Netherlands, Apeldoorn region

Netherlands, Apeldoorn Region	
Population and regional figures	<p><b>Unemployment rate:</b> 3.5% of labour force.</p> <p><b>Employment rate of women:</b> 3.8%</p>
Key sectors	Non-commercial services
Bio-based resources and main sectors of activity	<p>- <b>Agriculture:</b> 473,759 ha are devoted to crop cultivation (vegetables, grains and horticultural vegetables). Agriculture is responsible for 0.22% employment. Different types of farmers and farms can be found in the region. Residual biomass from agriculture led to 298 kt/year (wet), 98% of which is manure partly used to produce fertiliser and biogas.</p> <p>- <b>Forestry:</b> forestland occupies 48 % of the territory, mostly private-owned. Forest biomass main uses are manufacture of board material, sawing, and packaging wood. Nevertheless, some areas are not exploited for wood, there is a small initiative that is growing some wood for energy purposes.</p> <p>- <b>Livestock:</b> The area dedicated to livestock mainly consist of the area devoted to produce feed (442.7 ha). The breakdown of all the livestock includes cows 36,829/130 farms; Milk cows 4,249/55; Goats 710/17; Pigs 27,215/19; Chickens 116,231/5.</p> <p>- <b>Agroindustry:</b> The main products are animal feed and food (food includes meat). The amount of manure produced is causing some problems. A reduction in the number of livestock will affect the slaughterhouses operation and the feed needed produced by the farmers. In general bases the side streams are exported (ears, tails, feet) recycled by the waste industry and used as feed.</p> <p>- <b>Other Bio-based industries:</b> The paper industry also has a relevant role, there are 4 paper mills in the region. Side-products from the process generate 77 kt/year (mainly chemical waste: 30 kt/year, paper waste: 17 kt/year and residual waste: 15 kt/year). Paper is produced by recycled and virgin paper pulp. Although there have been some test and initiatives seeking to use new biobased materials, the paper industry will likely stick to virgin paper from wood and recycled paper.</p> <p>- <b>Energy:</b> Apeldoorn is developing a strategy to be neutral. Currently, wind and solar energy are the main renewable sources.</p> <p>- <b>MSW:</b> Usually, the municipal waste from households is managed by Circulus, a company partly owned by the municipality, covers Apeldoorn and other cities in the region) and waste from companies is managed by a commercial waste collector. MSW composition in 2021 included 32% bio-waste, 4% paper, 8% plastics, 5% Textile and 53% residual. Everything is recycled with the exception of residual waste. Landfill is no longer allowed (except for some specific residues such as asbestors), on industrial scale the waste is separated into a fraction that is sold to other industry (energy, cement) other fractions are burned and used for electricity production. The region accounts with a large composting and biogas production facility, Attero. Currently a company called greenferm is the only manure converter in the region, close by there are biogas digesters. The company produces wastewater and a composted, hygienised solid manure.</p>



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<b>Potential biobased value chains</b>	<ul style="list-style-type: none"> <li>- Due to the surplus of nitrogen in the Netherlands, the number of livestock need to be decreased. In that case, a shift from producing mainly feed crops into other crops could be a suitable option that will leave room to develop new bio-based value chains. One example is the initiative from land to house – farmers produce crops such as hemp, flax or elephant grass which is being used for the construction industry building house out of biobased materials.</li> <li>- Forest land is not exploited for wood. however, some wood is obtained, a small initiative “de A” is growing some wood for energy. Additional applications could be explored in this regard.</li> <li>- Inside the city 85,000 trees can be found, although only about 1% of the forest area is owned by the city (Berg &amp; Bos and Dennenheuvel).</li> <li>- An increasing percentage of the surplus of manure must be treated. Currently a company called greenferm is the only manure converter in the region, close by there are biogas digesters. Therefore, additional pathways could be explored to diversify the valorisation of livestock wastes.</li> <li>- There is a significant potential related to protein transition (from animal protein to plant-based), digitisation and scarcity of raw materials (wood, water, etc.). Furthermore, awareness is raising to find more sustainable solutions (e.g. no bleaching, more recyclable, other food like seaweed).</li> <li>- Energy alternatives for the paper industry (currently, connected emissions is a large concern) should be explore more in detail.</li> <li>- Improving the management of MSW and increasing the valorisation can greatly contribute to green transition in the region. In this regard, one of the main challenges that would need to be addressed concerns the reduction of industrial waste and household waste and how to increase the recycling -reuse of this type of waste.</li> <li>- Currently, there is no electricity plant in Apeldoorn using biomass, hence it could be worth exploring suitable alternatives in this sense.</li> </ul>
<b>Missing actors to promote bio- based value chains</b>	<ul style="list-style-type: none"> <li>- Actors who could increase the exploitation of forestry biomass.</li> <li>- Expert that could contribute to design a strategy allowing to diversify the valued chains for livestock and agricultural waste (Experience, skilled labour force)</li> <li>- Jobs in processing industries most likely will require training about modern technologies and energy-efficient technologies.</li> <li>- Initiatives seeking to adapt the current livestock model to a more sustainable one should be supported in the region and could be used as best practices to further replicate it.</li> <li>- Logistic operators (improve valorisation routes of MSW) will play a key role when deploying new bio-based value chains in the region.</li> </ul>
<b>Targeted marginalised social groups</b>	<p><b>PRELIMINARY SELECTION:</b></p> <ul style="list-style-type: none"> <li>- Disabled people (accessibility)</li> <li>- Poor people: Poverty in our city is greatest among non-Western migrants (17%) and people living on benefits (15.5%).</li> <li>- Elderly (think of loneliness, digital skills, malnutrition)</li> </ul> <p>Working in a local kitchen garden</p>



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Regional specificities	<p>- Eutrophication and water scarcity during the dry season are issues increasingly growing concern at regional and national level. In this sense, a main challenge for the Netherlands is the nitrogen crisis. In some cases, the farmers (mainly ranchers) exploitation is located near the Natura 2000 area (such as the Veluwe – part of our municipality) therefore several farms must stop completely their activity. Therefore, farmers need a different earning model. Additionally, too much nitrogen (cattle breeding) close to Natura2000 areas making it impossible to build extra houses although these extra houses are necessary because of the national housing shortage. Consequently, the livestock sector activity may decrease in the coming years due to Nitrogen surplus.</p> <p>Accordingly, the amount of manure that could be used as fertilizer will need to be adjusted in order to avoid increasing the current surplus and the percentage of manure that will need to be treated will most likely increase.</p> <p>Biobased solutions in the region could set its course towards regional initiatives to connect the requirements of a high housing material demand to farmers looking for new economic activities and native dense forest (6m<sup>2</sup>) serving as meeting place and educational place.</p> <p>Apeldoorn wants to be energy neutral in 2050 and reach in 2030 39% energy neutrality. For this reason, Apeldoorn is working on a regional energy strategy. In 2020 in Apeldoorn the amount was 6.6%, 9.5% for electricity, 5.9% for heat applications and 5.8 for transportation. The goal of the EU/National government is to have the usage of primary raw materials halves by 2030 and have a complete circular economy by 2050. Currently the region does not account with a bioeconomy strategy, but it is a main issue for the department Maintenance of Public Space (specially concerning MSW).</p>
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TABLE 8. DESCRIPTION OF NETHERLANDS REGION



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The region targeted is Apeldoorn, where the unemployment rate is 3.5% and the key sector is non-commercial services. The main challenges in the area are the eutrophication and the necessity to halve the cattle.

Agriculture land covers 473,759ha, and vegetables, grains and horticulture are the main products. There are different types and shapes of farms, and it is responsible for 0.22 % of the employment in this region. The forestland accounts for 48% of the territory and is mostly private owned. The main uses of the extracted wood are board manufacture, sawing and wood packaging. Some initiatives are growing to produce energy with forest biomass in areas that are not currently exploited. Currently 442.7 ha are devoted to livestock, mainly cows, goats, pigs, and chickens. It is foreseen to reduce the number of cattle due to manure is causing environmental problems (excess of nitrogen and eutrophication). Regarding agroindustries, it's worth highlighting that companies dedicated to produce animal feed and food, in general allocate their side products as export and as feed. The paper industry is also quite relevant in the region. Finally, 32% of municipal solid waste is bio-waste, household waste which is collected by the municipality while waste from companies is covered by commercial waste managers. It is important to highlight that landfill is forbidden and consequently, on an industrial scale, the waste is separated into a fraction that is sold to other industry (energy, cement), and the other fraction is burned and used for electricity production.

Apeldoorn is working to increase the amount of renewable energy to achieve energy neutrality. However, currently, the main source of renewable energy is solar, so there is a potential opportunity, and all type of support are available to encourage it. Because of the surplus of nitrogen in the Netherlands, the number of livestock may be decreased in the short-term. In that case, a shift from producing mainly feed crops into other crops might be possible which could lead to an opportunity for other applications development. Regarding the high amount of manure, it could also be valorised for energy purposes, among others. Moreover, there are other potential bio-based value chains related to the protein transition that could have a potential in the region. Lastly, it is also necessary to improve the management of MSW by reducing the amount of waste that is generated and improving the valorisation and recycling of the residues. To address these opportunities, actors from the livestock sector for instance should acquire the knowhow needed which in turn could contribute to increase the sustainability of the sector (diversify value chains, better management of reissues). Furthermore, actions to raise awareness and to introduce modern technologies to enhance efficiency and train skilled and experienced labour force could highly contribute to develop bio-based value chains in the region. The targeted marginalised group in the region could be disabled people, the elderly and poor people. The idea is to employ them in local kitchen gardens because skills required are easily learned. This proposal is also an opportunity to improve their diets and welfare.

In conclusion, the most determinant circumstance in this region is the change required to reduce the environmental impact associated to livestock since a more sustainable production strategy need to be implemented by means of reducing the number of animals or improving the management of manure for example. Therefore, valorisation schemes allowing to valorise this residue are key and a potential opportunity in the region. In addition, the region ambitious energy-neutral objective could contribute to deploy bio-based initiatives and supporting action in this sense. Finally, even if there is no bioeconomy strategy, the region is currently working on it, and there are some bio-based projects planned in the region: from plant to house, which aim to connect the requirements of a high housing material demand to farmers looking for new activities; and tiny forests, that uses a native dense forest as a meeting and educational place.



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## 2.9. Greece, Western Macedonia region

Greece, Western Macedonia region	
Population and regional figures	<p><b>Population:</b> 283,689 people</p> <p><b>Area:</b> 9,451 km<sup>2</sup></p> <p>56% of the population lives in rural areas.</p> <p>Low-density populated region (30 person per km<sup>2</sup>).</p> <p><b>Unemployment rate:</b> 19.1% (the highest in Greece).</p>
Key sectors	<p>-The energy sector has a significant relevance in the region, particularly in terms of coal-based energy production, which serves as a crucial activity. However, this poses a significant challenge as it necessitates a reduction in its operations to align with environmental goals. Consequently, this historical trend has resulted in the contraction of other sectors in the region.</p> <p>- Other manufacturing activities are present in the region, including traditional sectors such as marble, saffron, fruits, local wines, furs and leather manufacturing and specialised arts and crafts, and food delicacies from the region.</p>
Bio-based resources and main sectors of activity	<p>- <b>Agriculture:</b> 270,000 ha are devoted to agriculture and the most widespread crops are wheat and barley. The stakeholders are individual farmers owing small areas and cooperatives or farmer' mixed associations (join livestock + agriculture). Residual biomass is partly exploited for energy purposes (e.g. District heating Amyntaio), biogas (at least 3 Plants, 1.3 kWe in total), fertilizers (e.g. from extraction of aromatic plants, but just on a pilot scale), or pellets (mainly from agriculture).</p> <p>- <b>Forestry:</b> 19% of the territory corresponds to forestland; coniferous is the most common specie. The area is mostly state-owned, and the main activities are technical/industry wood and above all firewood production.</p> <p>- <b>Livestock:</b> The area dedicated to livestock is 73,000 ha, where cows, poultry, goats and sheep are bred. Mainly milk and meat are obtained.</p> <p>- <b>Agroindustries:</b> Western Macedonia is one of the four places in the world, where saffron is cultivated. The plant is cultivated in the region and packed as food ingredient. Further added value processing for medicine and cosmetics is also carried out, but in other regions. Other delicacies produced in the region are mushrooms, red Florina Peppers, prespa beans, and aromatic and pharmaceutical plants. Around 15 family-owned businesses are producing essential oils, hydrolates and cosmetics derived from cultivation of aromatic and medicinal plants. Plus, the commercial exploitation of all hive products, other than honey, such as royal jelly, propolis and pollen.</p> <p>-<b>Other bio-based industries:</b> 3 biogas units operate in the region processing livestock and agricultural residues as raw materials, with a total (small) capacity of 1,350 kWe. So far, no biofuel for transport, neither biomethane to be injected in the natural gas grid and no heat applications have been developed.</p> <p>- <b>MSW:</b> Around 92,000 t/year are produced in the region and the organic fraction is composted.</p>



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Potential bio-based value chains	<ul style="list-style-type: none"><li>- The restructuring of agriculture towards high value activities linked to food processing would promote a new development model for the region. Indicatively, these would include aromatic and pharmaceutical plants – Kozani; legumes – Florina, Kozani, Kastoria; apples and peaches – Kozani, Kastoria; saffron – Kozani; wine grapes – Florina, Kozani; dairy products – Grevena, Kozani and Florina. Several of the region’s agricultural products have been certified as Protected Designation of Origin (PDO) and Protected Geographical Indication (PGI) products.</li><li>- High value activities could also include greenhouses and hydroponics, producing fresh vegetables.</li><li>- The implementation of small-scale biogas units could be feasible to exploit livestock and agricultural waste. Furthermore, farmers groups or other associations could explore the possibility to build an Electricity and Heat Co-production Unit. The electricity generated could be injected into the network and thermal energy could meet the needs of district heating networks and greenhouses. These would also benefit from the gas network under construction in the region.</li><li>- The cultivation of energy crops (for instance in the depleted mines) can serve to meet the needs of potential CBE activities/undertakings.</li><li>- It would be worth exploring new value chains from forestry wastes (10-15kt/year), for different applications such as construction, fibbers, and resins. In this regard, Greek Forest Management Plans imposes that a significant amount of residual biomass must be left in the forest for nutrient recycling purposes.</li><li>- There are some private forests that have been out of management for many years and could be exploited again. Also, some public forests are mismanaged due to lack of personnel in the forest service. These could produce a significant amount of timber if managed correctly.</li><li>- Valorisation of livestock wastes (ca. 800,000-850,000 t of manure, wet basis) could be valorised to produce added value products or energy.</li><li>- Valorisation of biomass wastes from agriculture (such as straw and crop residues after distillery in the case of aromatic plants) should be considered due to existent potential at regional level.</li><li>- Further expansion of production and business development of local delicacies such as essential oils and hive products could be considered as these value chains are aligned with the values and history of the region, there is knowledge available on them, and they have a high market value. Moreover, developing agroindustries to process local food and to get higher value might represent a potential opportunity in the region worth to assess.</li><li>- Valorisation of the digestate currently produced in the 3 biogas plants as a soil conditioner could significantly contribute to promote bio-based value chains in the region.</li></ul>
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<p><b>Missing actors to promote bio-based value chains</b></p>	<ul style="list-style-type: none"> <li>- Coordination and monitoring mechanisms as well as services, infrastructures and support mechanism are needed to successfully deploy bio-based initiatives in the region.</li> <li>- Experienced, skilled labour force would be needed if new bio-based value chain are implemented in the region.</li> <li>- Greek Rural Development Programme (RDP) and farm investment support should refrain from the current (rather) generic approach and target (through region-specific eligibility and selection criteria and higher co-financing rates) productive investments on farms specializing in high value activities.</li> <li>- Higher rates of support for farm and agri-food investments by farms/firms which take part in contract farming, as well as income tax reductions could be considered as options which can help such schemes.</li> <li>- Logistics adapted to the region, which addresses challenges related to its geography (mountainous) and therefore can be costly will play a key role to successful implement green transition initiatives. High added value products can justify and foster new supply chains.</li> <li>- Energy costs are high on national level and in addition the bureaucratic procedures and tax costs are also major limitations to get bio-based projects started.</li> <li>- Cooperatives/clusters can contribute to overcome challenges of a scattered agri-food sector consisted of mostly small farms and SMEs. By joining forces, these actors can facilitate the logistics, developments, and waste valorisation solutions in their value chain, as well as exchange knowledge and build new expertise together. Other expected outcomes are economies of scale, promotion of innovation and entrepreneurship and ultimately, the development of an internationally competitive agri-food sector, by using scientific knowledge and innovative technologies. Potential clusters could use the services of the regional institution (regional authority and its development organisation).</li> </ul>
<p><b>Targeted marginalised social groups</b></p>	<p><b>PRELIMINARY SELECTION: Within the project the target group will most likely be disabled persons.</b></p> <ul style="list-style-type: none"> <li>-For municipalities, the disabled are the most important vulnerable group of the population, while the elderly are the most important special group of the population, with priority given to those who either face health problems and are uninsured or unable to access social care services or health services or live with low incomes.</li> <li>- Other groups that need support are the unemployed and especially the long-term unemployed, single-parent families, large families with low incomes, etc.</li> </ul> <p>Greece holds the highest unemployment rate, 37.2% in the EU-28, for disabled persons. This logically creates an increase in poverty and social exclusion indicators. The main age group is 18 to 45 years and only few are in the age group of 45-65. Most disabled workers are characterized by mobility impairment, followed closely by severe disabilities such as kidney disease, diabetes, etc. Accessibility seems to be the most important issue for people with disabilities. Although most are happy with the working environment, the difficulty of moving and accessing work is still the main inhibiting factor for many. Moreover, people who are working in coal mines are being affected by mine closures. Here, there is an opportunity to readapt to new jobs linked to green energies, by implementing reskilling and upskilling activities, where appropriate.</p>



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<p><b>Regional specificities</b></p>	<ul style="list-style-type: none"> <li>- Western Macedonia is an important energy centre of Greece, supplying lignite-based electricity for decades. Nonetheless, that situation had resulted in shrinking all the other traditional professional skills such as the agricultural sector and other economic activities. A high negative environmental impact was caused, with strong pressure both on human and natural environment. According to the Greek government decision, all the coal (lignite) activities will have to be ceased until 2028, and 16,000 jobs are at risk.</li> <li>- Since the regional bioeconomy is based on agriculture and agroindustry (small sized farms/companies and cooperatives) marginal and vulnerable groups will most probably be engaged in small-scale workshops and labs.</li> <li>- The management of manure includes safe collection, transport, storage, handling; processing and final use as substrate to produce soil improvement (highest part) or biogas production.</li> <li>- Low-density populated region (30 inhabitants per km<sup>2</sup>, as compared to the country's average of 82 per km<sup>2</sup>) which is mainly due to the mountainous nature of the region. Existence of remote mountainous areas with difficulty of accessibility to social structures and services which cannot be mitigated due to the limited resources for transportation costs.</li> <li>- Currently, a very considerable part of the agriculture sector in Western Macedonia specializes in low value and low labour requirements crop and livestock activities.</li> <li>- The same applies for forestry: The region has some forestry activity, but it is focused on low value products/commodities. E.g., around 190.000 m<sup>3</sup> of wood are harvested each year of which 70% is being firewood.</li> <li>- The Energy Communities established or under development (around 260 by 2023) in the area could support the development of bio-based value chain. Forestry residues and residues from cereals, vineyards and tree crops can be utilized.</li> <li>- The region is currently constructing an extensive natural gas network.</li> <li>- There is no specific limitation regarding the soil quality which is, on average good at regional level.</li> </ul>
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TABLE 9. DESCRIPTION OF GREECE REGION



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Western Macedonia is a region in Greece characterized by a low-density population, with approximately 56% of its residents living in rural areas. The region also has the highest unemployment rate in Greece, 19.1%. The coal-based energy sector has long been the dominant industry, but there is a pressing need for its replacement due to environmental concerns. Moreover, this historical reliance on coal has had far-reaching implications for other sectors of the economy. Other manufacturing activities include traditional sectors such as marble, saffron, fruits, local wines, furs, leather manufacturing and specialised arts and crafts, and food delicacies from the region.

Related to bio-based resources, there are 270,000 ha cultivated and the most common crops are wheat and barley. Different structures can be found, cooperatives or farmers associations (joining livestock and agriculture) but also individual farmers owning small fields. In general bases, residues generated are exploited for energy purposes, biogas, fertilizers and pellets. The forestry sector occupies 180,000 ha of the territory and it is mainly state-owned. The collected wood is mostly used for firewood and for technical and industrial purposes. Additionally, 73,000 ha are devoted to livestock, mostly cows, poultry, goats and sheep, for milk and meat production.

Regarding agroindustries, Western Macedonia in Greece is one of the four places in the world where saffron is cultivated. The plant is cultivated and packed as a food ingredient. Also, there are other products that are grown such as mushrooms, Red Florina Peppers, Prespa beans and aromatic and pharmaceutical plants. From these last ones, around 15 family-owned businesses are producing essential oils, hydrolats, and cosmetics. In the region, 3 biogas units process livestock and agriculture residues. As well 92,000 tonnes per year of municipal solid waste are recovered, whose organic fraction is composted.

A restructuring of agriculture toward high added value products would promote a new development model in the region (greenhouses and hydroponics, or the cultivation of energetic crops for instance in depleted mines). Jointly, further expansion of the production and business development of local raw materials such as hives, essential oils or further added value processing for medicine and cosmetics with saffron. Moreover, there is a potential to valorise residual biomass from livestock and agriculture activities through different pathways targeting diverse markets (whey, energy, or soil improvers). Related to the regional forestlands, they are mismanaged and could be exploited seeking to prevent forest fires and supply potential bio-based value chain targeting lignocellulosic raw materials. Finally, apart from the currently existing biogas units, more small-scale facilities could contribute to exploit livestock and agricultural waste at local level, and the digestate produced could be used as a soil conditioner.

In order to establish these potential bio-based value chains, there are some missing actors. Initially, it would be interesting to introduce coordination and monitoring systems that can help to promote the new initiatives for the agriculture sector, jointly with services, infrastructure and support, above all, to overcome geographic barriers of the region (mountains) and technical aspects. Additionally, experienced and skilled labour force would encourage bio-based industries deployment. Lastly, if small farms in the agriculture sector join forces, they could work together and facilitate the logistic, developments of waste valorisation solutions at local level as well as the exchange of knowledge.

The region could find interesting targeting three specific marginalised social groups. The main one is disabled people, whose unemployment rate is 37.2%, the highest in the EU-28 and the lack of income makes the situation worse. Moreover, unemployed people, especially elderly people which represent an important group and sometimes face health problems, are unable to access social care or health



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services or live with low incomes. Thirdly, people who are working in coal mines are being affected by mine closure, and bio-based value chain developed in the region could be an opportunity to readapt to new jobs linked to green transition.

Summarizing, Western Macedonia is an important energy centre of Greece, but until now, this energy is based on non-renewable sources which has caused negative environmental impacts. According to the Greek government, all coal activities will have to be ceased by 2028. Therefore, there is an opportunity to push bio-based value chains in the region and contribute to improve the situation since many jobs are at risk. Moreover, it is a region low-density populated, and the mountainous nature makes difficult some logistic activities. Current bioeconomy activities are based in agriculture and agroindustry, consequently, the target marginalised groups are meant to engage in small-scale workshops and labs focused on circularity and industrial symbiosis.



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## 2.10. Croatia, Adriatic region

Croatia, Adriatic region	
Population and regional figures	<p><b>Area:</b> 24,705 km<sup>2</sup></p> <p>A relatively large share of Croatia's population lives in rural areas; in 2017, 43% of the Croatian population lived in rural areas compared to 19.2% in the EU-28.</p> <p><b>Unemployment rate:</b> 9.4%</p>
Key sectors	<p>The main economic activities in the region are wholesale and retail trade, transport, accommodation and food service activities, information and communication. Agriculture and fisheries constitute as well a relevant economic sector in rural and coastal communities.</p>
Bio-based resources and main sectors of activity	<ul style="list-style-type: none"> <li>- <b>Agriculture:</b> 38,000 ha are devoted mainly to cereals (maize the most important), soybeans, fruits (apples, plums) vegetables, lavender cultivation. By-products from arable crops production are mainly in a form of straw, stalk corn and corn cobs. They are used for traditional purposes (bedding) and lately, emerging agropellets for fuel and feed. Current use of by-products from managing permanent crops is at very basic level. Pruning is used either for slow burning as a frost prevention or for heating purposes, although most remain on field or are burned. Also, biodiesel is produced from agricultural biomass.</li> <li>- <b>Forestry:</b> Forest area in the region covers 96,840 ha (36.0 % forestland of Adriatic region) and is mainly state-owned. The main products obtained include sawn wood, chips and wood, wood pellets and agglomerates, furniture, charcoal, wood chips from forest residues and wood briquettes or pellets from forest residues. Almost 50% was allocated for households while the remaining 50% was allocated for other energy purposes (cogeneration of electricity and heat, pellet or briquette production and charcoal production), industry (paper, plywood, furniture...) and export.</li> <li>- <b>Livestock:</b> there are 140,000 ha devoted to this activity. The region counts around 742 livestock farms (Adriatic region – data 2020) which is 20.3% of the total livestock farms in Croatia. The average farm size is 8.3 livestock units. Farms are predominantly focus on milk production. Residues of livestock production process obtained include wool, manure and other animal by-products. In general bases they are reused as fertilizers (the number of livestock residues has been reduced during the last 20 years).</li> <li>- <b>Food processing industry:</b> The most relevant agroindustries in the region target the wine, olive oil, fish, salt markets. The entire food production chain employs 10% of all employees in Croatia.</li> <li>- <b>Other bio-based industries:</b> Companies linked to the development and the production of bio-based biodegradable and compostable thermoplastic materials; pharmaceutical and cosmetic products and wastewater treatment are also quite relevant in the area.</li> <li>- <b>Energy:</b> The region accounts with 7 biomass power plants, production of liquid biofuels, leading to 31.7% share of renewable energy.</li> <li>- <b>MSW:</b> About 20% of the generated biowaste is sent to recovery (composting, anaerobic digestion, etc.) (HR) and 7% to recycling of recovered MSW. Different companies are involved in the valorisation of these residues (composting, anaerobic digestion, mechanical-biological treatment).</li> </ul>

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**Potential  
bio-based  
value chains**

- There is still a significant potential of biomass resources that could be mobilised, and the current valorisation pathways could be optimized.
- The amount of marginal/unused land is quite relevant, therefore there is an opportunity to produce low-ILUC biomass on abandoned lands that should be assessed in detail to confirm the feasibility of this value chain at regional level.
- Expansion of family farms (both in continental and coastal area) into tourism sector seeking to diversify their activity to other potential sectors (entrance to new market – ecotourism) which would allow to generate additional incomes for the farmers could contribute to improve the profitability of the exploitations.
- Production of healthy food for a European market which has grown significantly in the past year could bring new opportunities to the agricultural sector.
- There is a possibility of expansion to use of bio-based products considering the increasing consumer demand and the supporting government policies. Bio-based industries promotion could represent an opportunity to revitalise rural areas in the region.
- There is forest and agriculture biomass (primary producers of biomass) available in the region to further exploit valorisation schemes which establishes a good starting point to further develop different bio-based value chain targeting diverse applications according to market potential.
- Current livestock activity requires robotization and modernization of farms.
- Wine producers have considered pelletizing grape pomace for either feed or biofuel production but without achieving a significant market uptake. Pomace is usually processed to hard spirit. There is room to improve competitiveness by increasing the use of by-products in the wine-making process in Croatia.
- The use of olive oil residues has been considered in numerous projects but with little success. Helios Gea d.o.o. is the only company in the world that produces processed organic olive pomace for cosmetics applications and is engaged in the production and distribution of natural organic cosmetics, based on the respect for all ecological values.
- There is an increasing focus on the digital agriculture model that leads to ecological production and rural development. There is a need to connect agricultural production with food processing industry, which presents an important opportunity for Croatia considering that food processing industry creates strong impacts on the whole economy, in terms of added value and new job openings.
- Production of bio-based products such as biofuels, bioplastics, and bio-composites could play a key role to revitalise rural economies while contributing to integrate social marginalised groups trained adequately.
- Regarding MSW, the objective is to Dispose of less than 25% of the produced municipal waste in landfills therefore additional valorisation schemes should be put in place.
- Currently, most biomass is exported and burnt, which generates costs. It could be interesting to invest in infrastructures that would allow valorisation of different types of biomasses (energy, compost, etc) and make a profit that would stay in the region.
- There is an untapped potential related to the application of bioeconomy to aquaculture seeking to make use of the waste generated by aquatic organisms as well as of the value chain of fisheries to design highly innovative products with zero environmental impact. For instance, fish and shellfish, and in particular their by-products, are increasingly being used in innovative applications and new products in the pharmaceutical industry.

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<p><b>Missing actors to promote bio-based value chains</b></p>	<ul style="list-style-type: none"> <li>- In order to improve the management of forestland owned privately there is a need of training and educational/informative activities targeting forestland private owners at regional level.</li> <li>- Bio-based value chains can contribute to open new job positions but the processing industries, but specific skills might be needed to improve knowledge regarding modern technologies and energy-efficient technologies.</li> <li>- Infrastructures to mobilise biomass need to be improved at regional level with a special focus on areas that are more remote and establish a group of private forest owners to manage their land more successfully. Furthermore, restrictions on the type of biomass that can be utilised to avoid competition with other uses to allow currently established flows to operate should be set.</li> <li>- There is a lack of logistic operators (link between agriculture and agroindustry) that need to be addressed to successfully implement bio-based value chain in the region.</li> <li>- At a micro-scale there are several stakeholders that could play a key role when developing new bio-based initiatives such as feedstock suppliers; agro-chemical manufacturers and suppliers; machinery and equipment manufacturers and suppliers; farmers; produce marketers and sellers; food processors; suppliers of food additives; packaging suppliers; transport companies; food retailers; consumers; and waste processors. Another strategic stakeholder is formed by private and public research centres in the different subsectors of the agri-food sector.</li> </ul>
<p><b>Targeted marginalised social groups</b></p>	<p><b>PRELIMINARY SELECTION: Women, small family farms, energy poor households</b></p> <p>Some regional and national aspects that should be considered to select the targeted social marginalised group are:</p> <ul style="list-style-type: none"> <li>-Rural areas in Croatia are characterized by a lower labour force participation rate than in other EU countries. In Croatia in 2019, 14.8% of the population had arrears on utility bills, while for in the EU this percentage was 6.2%.</li> <li>- Poverty in Croatia has a strong rural dimension and remains linked to agriculture.</li> <li>- In 2019, 6.6% of the population could not afford to keep their house warm, while for the EU this percentage was 6.9%.</li> <li>- Unemployment rate and elderly people are two main concerns at national and regional level.</li> <li>- Women and single mothers have more difficulty paying their energy bills than men, according to Eurofound data from 2022. This is often a consequence of lower average incomes and more frequent work poorly paid, insecure jobs, as well as part-time work.</li> <li>- Small family farms are faced with continuous economic pressures. In addition to the daily struggle to maintain income and survive, more and more environmental requirements are imposed on them that they need to fulfil.</li> </ul>
<p><b>Regional specificities</b></p>	<ul style="list-style-type: none"> <li>- The share of ethnics in the region is 10.63 % and at country level 8.37%.</li> <li>- A large share of Croatia's population lives in rural areas; in 2017, 43% of the Croatian population lived in rural areas compared to 19.2 % in the EU. Poverty in Croatia has a strong rural dimension and remains linked to agriculture.</li> <li>- Women are the main drivers and actors in the fight against energy poverty.</li> <li>- There is a lack of education and lack of information about the opportunities offered and lack of mobility and poor connection with city centres and the urban environment hindering the participation of potential marginalised groups.</li> <li>- Soil erosion in the entire area of the karst Adriatic region is a very strong and extremely negative process that calls into question the balance in the environment of this area. In consequent, the soil is losing nutrients that are needed for crop cultivation and maintain healthy ecosystems.</li> </ul>

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	<ul style="list-style-type: none"><li>- Only 1% of the utilized agricultural area is irrigated. In general, the soil quality is good, and the farming conditions are relatively similar to the European averages.</li><li>- Both current and new generations of farmers need to be educated to apply new practices, new technology and strike a balance between greater production and environmental protection. Education is key to spreading new knowledge and applying it.</li><li>- In pork, beef and milk subsectors, there is a trend of movement towards larger farming units because of the lack of competitiveness and market connection among small and medium-sized family farms.</li><li>- Around 34,000 ha of forestland in Croatia (~1%), including Adriatic, is under mined areas which means that is temporary out of the management. The removal of mines is expected to increase in the future.</li><li>- Energy consumption is addressed by liquid fuels 37.6% followed by electricity 20.4%.</li><li>- Strengthen the security of energy supply through the growth of domestic production and the connection of energy infrastructure, as well as the introduction of Capacity Remuneration Mechanisms and increase energy efficiency in all parts of the energy chain will be key in the short and mid-term.</li><li>- The region has a potential of biomass that could be available for bio-based promotion, but also initiatives to promote bio-based products and the consumers are keen on sustainable products. Additionally, there is a potential of applying bioeconomy in aquaculture sector and high potential of knowledge.</li><li>-Adriatic Croatia lacks strategic integration and cross-sectoral interaction which should be addressed. It is precisely the connection of different sectors, such as bioeconomy and tourism, that is seen as a powerful driver of rural and coastal areas. The lack of knowledge; depopulation and migration; low investment of the business sector and lack of applied research could hinder the deployment of bio-based initiatives in the region.</li></ul>
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Table 10. Description of Croatia region



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The region targeted is located in the Adriatic region of Croatia, where the unemployment rate is 9.4% and the key sectors are wholesale and retail trade, services, information and communication. It worth to highlight that a large share of Croatia's population lives in rural areas (43%) and agriculture and livestock are the key activities in these areas.

Focusing on the main economic activities, the agricultural land covers 38,000 ha and the main crops are cereals, soybeans, fruits, vegetables, and lavender. In this region, most of the farms are state-owned, and the residual biomass generated is devoted to traditional applications such as bedding and lately, emerging agro-pellets for fuel or heating and production of by-products at a basic level. The forestry activity occupies 96,800 ha, and the main products are sawn wood, chips, wood pellets and agglomerates, and furniture, among others. Half of this production is destined for households and the other half, for energy purposes and exports. Related to livestock, there are 742 livestock farms (140,000 ha) mainly focused on milk production. The residues generated are slurry and manure, only valorised as fertilizers.

Food processing industries such as wine, olive, oil, or salt, which are responsible for 10% of employment in Croatia. In addition, there are other bio-based industries like biotechnology industries with different purposes like the obtention of biodegradable thermoplastic material, or pharmaceutical and cosmetic industries, as well as wastewater treatment. Regarding the MSW, 20% of generated biowaste is sent to recovery, and different companies are involved in the process of valorisation of these residues. Only 31.7% out of the total energy consumption comes from renewable sources and there are 7 biomass power plants.

On the other hand, there are biomass and land resources that are unused. Therefore, there is a potential to develop bio-based value chains. For instance, a significant fraction of the biomass is exported and burnt, so it would be interesting to invest on infrastructures where biomass could be valorised and obtain high added value products. Moreover, agriculture and livestock have an opportunity to modernize and introduce digital tools and also, family farms could expand their economy activities into the tourism sector (ecotourism).

Additionally, there is a further room to develop bio-based industries and to obtain different products (biofuels, bioplastics, bio-composites, cosmetics). Also, these new industries could start to valorise residues such as grape pomace or olive oil residues. Lastly, the amount of municipal waste disposed in landfills should be reduced and consequently, other valorisation schemes should be put in place.

Rural areas in Croatia are characterized by a lower labour force participation rate than in other EU countries. In Croatia in 2019, 14.8% of the population had arrears on utility bills, while for the EU this percentage was 6.2%. Therefore, the bioeconomy sector could be seen as an opportunity to increase employment opportunities.

For instance, education and training of primary sector's workers could help to improve the management and to adapt the sector to the new necessities (robotization, new processes, digitalization, and education about modern technologies and energy-efficient technologies to encourage bio-based industries development). Moreover, it would be convenient to find logistic operators who could link agriculture and agroindustry; and actors who could contribute to improve infrastructure to mobilize biomass.

As mentioned above, the rural areas in Croatia are key and poverty has a strong rural dimension. Thus, this is one of the targeted groups. Additionally, other groups which have lack of opportunities



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are the elderly, unemployed, women, and single and small family farms. Finally, in some households there are energy-poor situations, so the promotion of the production of renewable energy in the region could be an opportunity to address this problem.

To sum up, rural areas in the Adriatic region have a special interest due to the large share of the population living there and the strong rural dimension of poverty. In the primary sector, the most important conditions are the soil degradation situation (erosion and eutrophication), lack of irrigation affect most of the agriculture areas, and the transition to new generations of farmers who need education about new practices and available technologies. Jointly, livestock is moving toward larger farming to improve their market position.

Furthermore, the energy sector needs some improvements such as strengthening the security supply or increasing efficiency. It is worth highlighting that there is a significant potential of biomass that could be available, an increasing number of initiatives to promote bio-based products and the potential of applying bioeconomy in different sectors. However, some issues need to be overcome like the strategic integration and cross-sectorial interaction, lack of knowledge and expertise, depopulation and migration, low investment and lack of applied research.



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## 2.11. Bulgaria, Plovdiv region

Bulgaria (Plovdiv)	
Population and regional figures	<p><b>Population:</b> 663,000 people (Plovdiv).</p> <p><b>Area:</b> 6,000 km<sup>2</sup> in the South-central zone.</p> <p><b>Unemployment rate:</b> 3.2%.</p> <p>Share of urban population: 75.1%.</p>
Key sectors	Diverse region in terms of business with wine producers, leather, cosmetics, machine building, recycling, fishing, textile, pharma, pulp and paper, NGOs and research organizations.
Bio-based resources and main sectors of activity	<ul style="list-style-type: none"> <li>- <b>Agriculture:</b> 68% of the area is devoted to crop cultivation, mainly cereals (particularly wheat 140,000 ha) sunflower seeds (120,000 ha), corn (20,000 ha) and other vegetables (10,000 ha). Major stakeholders involved in crop production are the private farmers and farmers associations. Agriculture residues produced in the region are rice straw, cereals straw, maize stover which are used in horticulture and livestock breeding. Vine and fruit tree pruning were used as fuel in the past.</li> <li>- <b>Forestry:</b> forestland covers 25% of total territory, which corresponds to 151,9156ha mostly state-owned. The main products obtained are timber, cellulose, wood mulch and pellets. The main uses of forestry biomass are construction, followed by shredded paper and chipboards.</li> <li>- <b>Livestock:</b> This activity is focused on dairy from cows, sheep, buffalos. It should be noted that currently there is a decrease in the number of cattle due varied reasons. The size of farms is usually small. The largest number of dairy cows is in Plovdiv. The residues generated include slurry and manure, residues from animal slaughterhouses and meat processing factories, compost and pellets. Currently around 85% of the residues are exploited.</li> <li>- <b>Primary food processing</b> is mainly focused on plant-based oils from seeds, greenhouse owners of vegetables and fruits.</li> <li>- <b>Other bio-based industries:</b> Textile manufacturing has also a relevant role in the region.</li> <li>- <b>Energy:</b> Only 13% of energy comes from renewable energy sources and the main resource of renewable energy is from hydro power plants.</li> </ul>
Potential bio-based value chains	<ul style="list-style-type: none"> <li>- The renewable energy share could be increased (only 13% of electricity production is provided by renewables currently) considering the use of agri-residues for energy purposes is not widespread (opportunity to face the problem of expensive energy).</li> <li>- There is a potentially large quantity of forest biomass available that can be exploited for different applications.</li> <li>- Value chains using the following agro-residues as feedstocks: wheat straw (125kt/year), sunflower straw (58kt/year), rice straw (13kt/year), corncobs (7 kt/year) have a significant potential in the region considering the large volume of feedstock managed. Currently around 20 % of straw is utilised for energy purposes (share based on collection capacity). Taking advantage of the textile manufacturing knowhow in the region bio-based value chains targeting textiles production from agricultural residues such as straw could be worth assessing more in detail at regional level (see <a href="https://www.fortum.com/media/2019/10/fortum-and-spinnova-present-worlds-first-wheat-straw-based-clothing">https://www.fortum.com/media/2019/10/fortum-and-spinnova-present-worlds-first-wheat-straw-based-clothing</a>). There is a strong push for developing natural fibbers from other materials than cotton and wood.</li> <li>- Other value chains using lignocellulosic residue (forest residues 120kt/year) could target high value applications in cosmetics/leather</li> </ul>

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	<p>producing/pharma considering that these sectors are already present in the region.</p> <ul style="list-style-type: none"> <li>- Value chains using livestock residues as feedstocks (slurry and manure, residues from animal slaughterhouses and meat processing factories...) could have a significant potential in the region that might be worth evaluated in detail.</li> </ul>
<b>Missing actors to promote bio-based value chains</b>	<ul style="list-style-type: none"> <li>- Logistic operators, considering that the crop production is produced in a decentralized way (small farmers/farm associations) are key to promote bio-based value chains in the region due to the difficulty to collect, store, achieve standardization and valorisation of these bio-based materials in a optimize way.</li> <li>- Qualified labour and stakeholders to leverage such residues to high value applications are needed.</li> <li>- Intermediate actors linking bio-based sectors with research and universities can play a determinant role.</li> </ul>
<b>Targeted marginalised social groups</b>	<p><b>PRELIMINARY SELECTION: 1) small-scale farmers, small-scale agri-food SMEs and crop/animal growers with low income; 2) seasonally employed single families in agriculture (crop, animal farms) and/or in food and waste-processing businesses, 3) seasonally (or part-time) self-employed workers in bioeconomy sectors.</b></p> <p>These groups are very important for the region in the light of increasing depopulation of rural municipalities, lack of available skilled workforce and demands of the bioeconomy sectors for (at least primary/secondary or VET) educated labour.</p> <p>It is worth noting that around 6,500 people are currently living in small villages (&lt;5,000 inhabitants) and the main ethnic minorities in the area are Turks (6.5%) and Romanians (4.9%).</p>
<b>Regional specificities</b>	<ul style="list-style-type: none"> <li>- Plovdiv region' poverty levels exceed the national average. The share of the population living with material deprivation amounts to 24.3%, versus 19.4% at national level.</li> <li>- Lastly there has been a significant decrease in the annual work units in the agriculture sector in the region, with a 56% decrease in the last ten years alone. This is a result of a modernization process, but it is also due to the low profitability of the agricultural sector compared to other sectors. A significant decrease has also occurred in the livestock sector.</li> <li>- Forest areas occupy more than a quarter of the region area (25% of total territory). 38% of the country is covered by forests. Forestry waste amounts up to 50% of wood harvests. Forestlands are mostly dominated by state-owned enterprises, which represents an opportunity to reactivate bioeconomy (state support).</li> <li>- A total of about 69% of the land in Bulgaria is threatened by soil water and wind erosion. Soil is contaminated by heavy metals and arsenic from metallurgical sites located nearby.</li> <li>- Crop production affected (9% less area planted) by drought and heat but also pests' disease proliferation led to higher production costs which in turn implies high fluctuation in prices. Nonetheless, the cereals production is overall robust and could guarantee raw material quite predictability (constant supply).</li> <li>- Limitations for development include energy costs, costs of fertilizer and plant protection products, seeds, forage for livestock, certifications as well as insufficient qualified labour.</li> <li>- There is a need to increase the focus on bioeconomy opportunities for creating new value chains.</li> </ul>

TABLE 11. DESCRIPTION OF BULGARIA REGION

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Plovdiv is the region targeted, which concentrates its population in urban areas. There are diverse kind of economic activities such as wine production, leather, cosmetics, machine building, recycling, fishing, textile, pharma, pulp and paper.

One of the main sectors of activity is agriculture, which covers 68% of the territory and the main crops are cereals (particularly wheat), sunflower seeds, corn, and other vegetables. The main stakeholders are private farmers or associations. Otherwise, there are some food-processing industries like plant-based oils from seeds or greenhouse owners of vegetables and fruits. In the forestry sector, the main product is timber, cellulose, wood and pellets, which are used mainly for construction, shredded paper and chipboards. 50% of the wood harvested is currently discarded. Additionally, dairy farms of cows, sheep and buffaloes are the most common in the livestock sector, although the number of cattle is decreasing. Also, there are some bio-based industries such as textile manufacturing. Finally, the energy sector in Bulgaria is based on non-renewable energy, only 13% comes from renewable sources, mainly hydropower plants.

Based on the characteristics of the region, there are some potential opportunities that it would be worth assessing more in detail considering the availability of a high amount of forest and agricultural biomass which could be exploited more efficiently, and the residual biomass that could be valorised through different pathways for different applications such as energy production or the use of lignocellulosic residues for pharmaceutical or cosmetic applications or leather production. The same applies to the agriculture and livestock residues, which are currently poorly exploited and could be exploited for instance for breeding livestock, fertilization, composting or production of energy. Also, natural fibbers from other materials different than cotton and wood could be pushed and used in the textile manufacturing. To develop these new bio-based value chains, there might be some missing actors. Primarily, qualified labour and stakeholders who could contribute to improve the efficiency of forest exploitation and the management of primary raw materials obtained (modernization, innovative technologies) and also new pathways to obtain high added value by-products could be promoted. Then, the logistic operators are essential as the farms are decentralized, making the logistic of the residues challenging. In the end, researchers and educators could have a key role to play as enablers and intermediaries of bio-based sectors.

The targeted marginalized social groups are small-scale farmers, seasonally employed single families in agriculture and seasonally self-employed workers (mostly from the Roma ethnic minority origin) in bioeconomy sectors. These groups are particularly important for the region considering the increasing depopulation of rural municipalities, lack of available skilled workforce and the demand of bio-based industries (at least primary/secondary or VET) of skilled labour.

To summarize, Plovdiv is a region with a significant potential for bioeconomy promotion due to the availability of biomass that could be used in the bio-based industries to produce different bio-products. However, the agricultural workforce is decreasing and/or having low qualifications (in the various sectors of the regional bioeconomy). Environmental conditions are also deteriorating such as the soil quality and structure leading to erosion, decreasing yields due to climate change and poor agroecological conditions, high prices of inputs and shrinking markets. All the above factors should be considered when drawing the strategy to promote bioeconomy and green transition in the region. Training and capacity building programmes could contribute to increase the skilled workforce, create new jobs and enhance bioeconomy initiatives at regional level. In this respect, considering the high energy prices and the large amount of biomass available, the development of projects seeking to increase the production of renewable energy could be also evaluated.



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## 2.12. Hungary, Észak-Magyarország region

Hungary, Észak-Magyarország region	
Population and regional figures	<p><b>Population:</b> 1.2 million people</p> <p><b>Area:</b> 14000 km<sup>2</sup>.</p> <p><b>Unemployment rate:</b> 4.4%.</p> <p>55.7% of settlements have less than 5,000 inhabitants.</p>
Key sectors	<p>The economic activity in the region is dominated by services, followed by industry (agriculture with less than 5%). The primary sector includes agriculture activity which is focused on 3 crops (wheat, sunflower, corn), forestry (400,000 ha representing 30% of region territory), livestock (dairy sector from cows and meat) and agrifood (meat, dairy, condiments, beer, frozen foods, beverages).</p>
Bio-based resources and main sectors of activity	<ul style="list-style-type: none"> <li>- <b>Agriculture:</b> the main crops cultivated in the region are corn (55,000 ha), wheat (120,000 ha) and sunflower (85,000 ha). Mainly large landowners, individuals and companies. 3.3% of employment covered by agriculture activity.</li> <li>- <b>Forestry:</b> 9.7% of the territory is devoted to this activity, mainly state-owned (60%). Main uses are firewood (53%), logwood (20%), paper wood (16%) and other industrial wood (11%).</li> <li>- <b>Livestock:</b> The sector focus on milking cows and meat cattle and the main residues generated are slurry and manure, which are currently exploited.</li> <li>- <b>Bio-based industries:</b> The main agroindustries in the region focus on meat production, dairy, frozen foods, condiments, beer, beverages, pastures, crops, forage, plants and fruits. These agroindustries are responsible for 6.5% of employment. In general bases they are individual companies.</li> <li>- <b>Energy:</b> 3.5% is the share of electric energy consumption based on biomass within the total energy consumption while solar is the main renewable energy source.</li> <li>- <b>MSW:</b> Currently the valorisation scheme of this type of bio-based material focus on the conversion of municipal solid waste (total 365kt) into energy by incinerators.</li> </ul>
Potential bio-based value chains	<ul style="list-style-type: none"> <li>- At regional level the value chains targeting the agro sector (include crop cultivation mainly of straw, corn cobs; wood residues; manure (370kt) and slurry (63kt)) have a significant untapped potential that could be worth assessing more in detail for different application, for instance for energy purposes (only 12% renewable energy share) and added value products.</li> <li>- At national level the estimated quantity of residues reaches 3 Mt that are currently not valorised.</li> <li>- Value chains from MSW could be further developed since there is currently a low share converted into energy.</li> </ul>
Missing actors to	<p>- Currently there is lack of actors with the required knowhow to modernize current value chains, design pathways to valorise residues and guarantee an efficient coordination among the actors involved as decentralization is a trend in the primary sector (agriculture and forest).</p>

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<b>promote bio-based value chains</b>	<ul style="list-style-type: none"> <li>- The whole sector needs development as bio-based solutions are seldomly applied in the region.</li> <li>- Actors able to develop and invest in infrastructure to promote efficient logistics and processing of bio-based side streams could be key to promote bio-based value chains in the region.</li> <li>- Cooperatives and hubs can greatly contribute to promote sustainable developments and foster cooperation between stakeholders.</li> </ul> <p>Governmental support and incentives can unlock the deployment of bio-based initiatives.</p>
<b>Targeted marginalised social groups</b>	<b>PRELIMINARY SELECTION: Rural dwellers (due to peripheral location and bad infrastructure, generally disadvantaged population).</b>
<b>Regional specificities</b>	<ul style="list-style-type: none"> <li>- Currently 24% of jobs are at risk, of which 11% with university degree.</li> <li>- 9.4% of Romanian are classified as ethnic minority (2011 data).</li> <li>- In the North Hungary region, the quality of arable land is affected by lowering of the water table, intensive agricultural production, excessive pesticide use, soil erosion, deforestation and construction.</li> <li>- There are strong players present in the agri-food industry such as Coca-cola, Nestlé, Dr Oetker, Friesland Campina.</li> <li>- Greatest threats faced at regional level include labour force scarcity; lack of up-to-date cutting-edge knowledge and information, lack of capital for investment, reduction methane level in waste (biogas productivity decrease).</li> <li>- Bio-based value chain with a great potential at regional level include biogas production linked to waste management, organic animal husbandry and bio-based materials for construction applications.</li> <li>- High energy prices (as facilitator) and the growing general demand for bio-based products can contribute to establish a regional framework adequate to bio-based value chain deployment although there is a lack of social cooperation that should be addressed.</li> </ul>

TABLE 12. DESCRIPTION OF HUNGARY REGION



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North Hungary is the targeted region, which accounts for 1.2 million people; 55.7% of the settlements have less than 5,000 inhabitants and the unemployment rate is 4.4%. The key sectors of the region are services, followed by industry.

Concerning the main economic activities in the region, agricultural land covers 260,000 ha and is responsible for 3.3% of the employment in the region. Corn, wheat, and sunflower are the main crops and there are many large landowners, apart from individuals and companies. The forest activity covers 9.7% of the territory and the harvested biomass is used for firewood, logwood, paper-wood and other industrial wood manufacture. Forestland is mostly state-owned. Furthermore, livestock farms are based on milking cows and meat cattle, and slurry and manure are the main residues that are exploited.

Additionally, there are some agroindustries targeting different markets such as meat dairy, frozen foods, condiments, beer, beverages, forage, or pastures. These industries account for 6.5% of employment and are owned by individual companies. Finally, municipal solid waste is converted into energy by incinerators.

Only 3.5% of the energy consumed comes from biomass, and the main renewable energy source is solar. Therefore, there are potential bio-based value chains that could be promoted in the north of Hungary. Initially, the valorisation of residual biomass should be improved. It is estimated that most of the 3 million tonnes of residues produced are not valorised. Therefore, there is a large untapped potential for using them to produce energy, fertilizers or other bio-products. Also, diversifying current value chains could contribute to increase the primary sector resilience. Currently, only a reduce share of the municipal solid waste is converted into energy, so pathways to valorise these residues could have a high potential.

In order to address bio-based initiatives deployment, cooperatives and hubs are key to promote sustainable developments and foster cooperation between stakeholders, jointly with governmental support actions and incentives. Moreover, education institutions, actors with the required knowhow and a qualified labour force could help to modernize current value chains, valorise underused residues and guarantee an efficient coordination.

The targeted marginalized group chosen is rural dwellers, due to peripheral location and bad infrastructure. People located in these areas are generally disadvantaged populations.

In conclusion, even if the north of Hungary counts with a significant amount of bio-based raw materials, it is necessary to improve its management. Among the strengths of this region can be listed the natural capital, the presence of primary sector actors and the increasing interest in bio-based products. In addition, the increase in the energy prices could help to promote other sources of energy. However, low educational level, poor logistics infrastructures and current management of bio-based sectors and bad quality of arable land (excessive pesticide, soil erosion, deforestation) are barriers that should be considered. Finally, another regional specificity is the presence of strong players in the agri-food industry such as Coca-Cola, Nestlé, Dr Oetker and Friesland Campina.



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### 3. Similarities and differences

Table 13 depicts the similarities and differences that have been identified based on the information collected from the different regions. Cells labelled in green are used for the regions that meet the statement while those regions in which the statement is not fulfilled or relevant are labelled in blue.

	IT - Campania	CZ - Moravian-Silesian region	RO - West region	SK - Nitra region	SI - whole country	DE - Baden-Württemberg	ES - Aragon	NL - Apeldoorn	EL - Western Macedonia	HR - Adriatic region	BG - Plovdiv	HU - Észak-Magyarország
<i>Existing strategy for circular bioeconomy</i>	Green	Blue	Blue	Blue	Green	Green	Blue	Blue	Blue	Blue	Green	Blue
<i>Automotive and different industrial activities as key sectors</i>	Blue	Green	Blue	Blue	Green	Green	Green	Blue	Blue	Blue	Blue	Green
<i>Primary sectors (agriculture, livestock, forestry, agroindustry) as key sectors</i>	Green	Blue	Blue	Green	Blue	Blue	Green	Blue	Blue	Green	Blue	Blue
<i>Bio-based industries as key sectors</i>	Blue	Blue	Blue	Blue	Blue	Green	Green	Blue	Green	Green	Green	Blue
<i>Soil damaged (erosion, acidification)</i>	Green	Green	Green	Blue	Green	Blue	Green	Blue	Blue	Green	Green	Green
<i>Eutrophication problems</i>	Blue	Blue	Green	Blue	Blue	Blue	Blue	Green	Blue	Green	Blue	Blue
<i>Young unemployed people as one of the targeted marginalized social groups</i>	Green	Green	Blue	Blue	Blue	Green	Blue	Blue	Blue	Blue	Green	Blue
<i>Elderly people as one of the targeted marginalized social groups</i>	Blue	Blue	Blue	Blue	Blue	Green	Blue	Blue	Green	Green	Blue	Blue
<i>Depopulation area</i>	Blue	Blue	Green	Blue	Blue	Blue	Green	Blue	Green	Blue	Blue	Blue
<i>Migration problem</i>	Blue	Blue	Green	Blue	Blue	Blue	Green	Blue	Blue	Blue	Green	Blue
<i>High Unemployment rate</i>	Green	Blue	Blue	Blue	Blue	Blue	Green	Blue	Green	Blue	Blue	Blue
<i>Low share of renewable energy</i>	Green	Blue	Blue	Green	Blue	Green	Green	Blue	Blue	Green	Green	Blue

TABLE 13. SIMILARITIES AND DIFFERENCES BETWEEN REGIONS



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Based on the information collected on Table 13 it worth to analyse which is the situation on each region, and which conditions are recurring. This research requires some specific consideration when designing the approach to address bioeconomy promotion in the regions. Firstly, there is a common problem of depopulation and migration towards cities in the rural areas, while the Nitra region and Slovakia region are densely populated. Therefore, in Nitra, there would most likely be a higher availability of workforce while for the rest of the regions, bio-based sectors can be seen as an opportunity to fix the population. Jointly, in Croatia, there is high rate of people living in rural areas, and poverty has a strong rural dimension. Therefore, a circular bioeconomy strategy could help to revitalise the region and improve the quality of life.

Another relevant social characteristic to consider is the unemployment rate, which is especially high in Western Macedonia and Campania, so bioeconomy sectors could have an impact and contribute to increase the available employees. Furthermore, the targeted marginalized groups are often young unemployed people, disabled people, or people linked to rural areas and primary sector with social disadvantages (low income, seasonal employers, low education level) in IT, GER, CZ, BG, which signifies the relevance of the capacity building programmes for these groups. Nevertheless, Slovenia has chosen highly qualified people as the targeted group.

Furthermore, natural resources are essential to deploy bio-based value chains, although most region account with a significant potential availability of these raw material this information should be assess carefully to extract inputs regarding its availability which is not always available or even exists. Additionally, many regions have pointed out that they are struggling with environmental impacts related to soils that are damaged due to erosion or eutrophication. Consequently, the region is looking for actions that could contribute to improve its quality and reduce the impact. However, this problem does not affect Croatia, whose soil quality is good. Also, in other regions, the substandard quality of the soil is linked to industrial activity or to the production of energy from non-renewable sources. To solve these situations, it would be necessary to deploy initiatives that could adapt to different biomass types and could stimulate valorisation of the residual or waste biomass.

Some regions have a very strong primary sector such as Italy, Spain and Slovakia regions, while in other regions the service or industrial sector is more relevant. Therefore, regions where the primary, secondary or service sector are underdeveloped should most likely address the promotion of bio-based value chains differently. In the regions where the industry is one of the key sectors, the availability of qualified workforce and technification can help the promotion of new bio-based industries targeting high added-value products (pharmaceutical, cosmetics, biochemicals).

Concerning the energy sector, most of the regions have a low share of renewable energy. However, West Romania is an exception.

Lastly, only in four regions, there is the Bioeconomy strategy: Campania, Slovenia, Germany and Bulgaria. Regions without this strategy might need to allocate more effort in this sense.



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## 4. Conclusions

Based on the information provided each region is facing challenges and present specificities that require a detailed assessment to identify the most promising bio-based value chains in each region. One of the first steps required is to carry out a resource assessment which involves a data collection process with a certain degree of details to determine not only the biomass potential but also the availability. These inputs are not always available or even exist.

The identification of needed actors along the value chain is key. Based on the descriptions provided, there are several similarities between the region that can help to set up general recommendations, but always considering the specific barriers, strengths and weaknesses of that each region is facing which is essential to achieve a successful deployment of bio-based solutions. Knowledge transfer can play also a key role.

Moreover, the recommendations and actions implemented must be aligned with the different goals established by the European Union, at national and regional level such as decarbonization, climate change mitigation, increasing organic agriculture or improving the quality of soils, bioeconomy awareness raising or capacity building, among other.

On the other hand, having a document where it has been collected the current situation of bio-based sectors, together with the particularities of them could be a useful tool. Firstly, when regions have some bioeconomy activities well developed, them could be seen as examples and could help to the less developed. Furthermore, regions with similarities regarding weaknesses and threats, could collaborate in order to elaborate a plan to overcome and boost bioeconomy, in addition to economy and social conditions.



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## Annex 1: Italy Region profile

INFORMATION FOR STATISTICAL ANALYSIS		
REGIONS (EUROSTAT NUTS 2 – Level)		
(Please indicate for your region which NUTS 2-Regions are relevant or add additional regions in the comment section.)		
Question	Suggested NUTS 2 regions	Comments
1) Germany – Region of Baden-Württemberg	<input type="checkbox"/> Stuttgart (please translate to English) <input type="checkbox"/> Karlsruhe (please translate to English) <input type="checkbox"/> Freiburg (please translate to English) <input type="checkbox"/> Tübingen (please translate to English)	
2) Spain – Region of Aragon	<input type="checkbox"/> Zaragoza (please translate to English) <input type="checkbox"/> Huesca (please translate to English) <input type="checkbox"/> Teruel (please translate to English)	
3) Greece – Region of Western Macedonia	<input type="checkbox"/> Dyitiki Makedonia (please translate to English)	
4) Bulgaria – Region of Plovdiv	<input type="checkbox"/> Yuzhen tsentralen (please translate to English)	
5) Slovakia – Nitra Self-Governing Region	<input type="checkbox"/> Západné Slovensko (please translate to English)	
6) Slovenia – Whole Country	<input type="checkbox"/> Vzhodna Slovenija (please translate to English) <input type="checkbox"/> Zahodna Slovenija (please include the traduction)	
7) Croatia – Region Adriatic Croatia	<input type="checkbox"/> Jadranska Hrvatska (please translate to English)	
8) Hungary – Region North Hungary	<input type="checkbox"/> Észak-Magyarország (please translate to English)	
9) Romania – West region	<input type="checkbox"/> Vest (please translate to English)	
10) Czechia – Region BIOEAST	<input type="checkbox"/> Praha (please translate to English) <input type="checkbox"/> Střední Čechy (please translate to English) <input type="checkbox"/> Jihozápad (please translate to English) <input type="checkbox"/> Severozápad (please translate to English) <input type="checkbox"/> Severovýchod (please translate to English) <input type="checkbox"/> Jihovýchod (please translate to English) <input type="checkbox"/> Střední Morava (please translate to English) <input type="checkbox"/> Moravskoslezsko (please translate to English)	
11) Netherlands – Region Apeldoorn	<input type="checkbox"/> Gelderland (please translate to English)	
12) Italy – Region Campania	<input type="checkbox"/> Campania	



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#### How to identify socially marginalised groups?

SOCIALLY MARGINALISED GROUPS		
Questions	Answer	Comments
1) Population area with less than 5.000 inhabitants	342 municipalities	
2) Unemployment rate in the area	19.7	
3) Employment rate of women in the region and at national level	Campania: 25.9 Italy: 43.5	
4) Main economic activity in the area	Agriculture	
5) Jobs at risk	Jobs in the manufacturing sector: The manufacturing sector in Campania, particularly in the textile and clothing industry, has been declining for years due to competition from lower-cost countries.  Jobs in the transportation industry: The transportation industry in Campania, including taxi and bus drivers, has been impacted by the pandemic and the resulting decrease in travel and mobility.	
6) Main breadwinner of the family nucleus	Traditionally, the father has been seen as the primary breadwinner, particularly in more traditional families. However, with changing social and economic conditions, this is no longer the case in all families.	
7) Average educational level and share of population with different school attainment	1,0% analphabet population 4,3% analphabet population without a qualification 15,7% primary school 31,9% lower secondary education 33,7% upper secondary education 13,2% tertiary education 0,3% PhD	
8) Population age structure in the region and at national level	Campania: 43.6 years Italy: 46 years	
9) Share of ethnics minorities in the region and at national level	Campania: 4,3% Italy: 8,5%	
10) Emigration rate in the region and at national level	Campania: 1.9% Italy: 2.0%	
11) Average salary or household income in the region and at national level	Campania: 26 626 euro Italy: 32 812 euro	
12) Please describe the structure and the characteristics of relevant socially disadvantaged/ marginalized groups in your region	Youth: Young people in Campania face challenges such as high unemployment rates, limited access to education and training opportunities, and social exclusion. People living in poverty: Campania has a high poverty rate, and many people struggle to access basic needs such as food, housing, and healthcare. People living in rural areas: Many rural areas in Campania face economic and social challenges, including limited access to employment opportunities, healthcare, and education.	
13) Please comment the potential impact of their participation in Circular Bio-based Economy	New job opportunities, increase resource efficiency, improved access to food	
14) Please indicate the factors hindering their possible participation?	<ul style="list-style-type: none"> <li>- Lack of access to resources</li> <li>- Limited knowledge and awareness</li> <li>- Discrimination and bias</li> <li>- Lack of representation and voice</li> <li>- Limited access to markets</li> <li>- Lack of infrastructure</li> <li>- Lack of policy support</li> </ul>	
15) Indicate the selected marginal group/s that will be targeted during the project and relevance in the region	Unemployed, low-educated, farmers in contaminated rural areas	
16) Average educational level of targeted marginalized groups	Low	
17) Description of the occupied post, considering the type of work performed and the qualification required by the targeted marginalized groups (question 13)		

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# Situation of main economic sectors

PRIMARY SECTOR		
AGRICULTURE		
Questions	Answer	Comments
18) How large is the surface of cultivable areas? (you can check databases such as Eurostat: <a href="https://ec.europa.eu/eurostat/web/agriculture/data/database">https://ec.europa.eu/eurostat/web/agriculture/data/database</a> )	515.545 ha	
19) Which are the main crops in the area (surface in hectares of percentage of the cultivable area occupied by each crop)	lettuce 122.400 ha strawberry 107.030 ha tomato 93.220 ha olives 74.941 ha	
20) Which is the average annual production (dry basis) of the most relevant crops (listed in question 19)?	lettuce 333.878 t strawberry 45.420 t tomato 68.746 t olives 136.532 t	
21) Average yield (dry basis) for the most relevant crops (listed in question 15)?	Lettuce: 2.72 t/ha Strawberry: 0.42 t/ha Tomato: 0.73 t/ha Olives: 1.82 t/ha	
22) What is the percentage of employment covered by agriculture?	5,3%	
23) Are state subsidies received by the farmers (CAP or others)? Please shortly mention the crops and the aim of the subsidy (equipment modernisation, yield increase, etc.	CAP	One of the main subsidy programs in Italy is the Common Agricultural Policy (CAP). In addition, the Italian government also provides subsidies and support for specific crops and farming practices, such as organic farming, conservation agriculture, and agroforestry.
24) What is the current situation of the soils (erosion, eutrophication, pollution...)?	Erosion 16,82 t/ha	
25) Who are the main stakeholders involved in the crops production (cooperatives or farmers associations, individual farmers owning large or small areas, etc.)?	Farmers, agricultural suppliers	
26) How much residual biomass is produced? Please indicate for the most relevant crops (question 14) the residues that are produced during the processing	5.000-10.000 t of tomato waste	
27) Is the residual biomass (question 21) exploited (energy production, chemicals, fertilizers, etc.)?	Fertilizers, animal feed, biogas	
28) Average selling price for the main crops (€/dry tonnes) (listed in question 15)? When possible, also include the production cost.	Lattuce: 0,85 €/Kg Strawberry: 4,01 €/Kg Tomato: 1,81 €/Kg Olives: 0.70 €/Kg	
29) Which are the future perspectives? (Technologies, increase of the area dedicated to certain crops, new crops development, new biomass or residual biomass value chain development, employment)	Sustainable agriculture (adoption of organic farming methods), Technology and innovation (precision farming and artificial intelligence to reduce waste and increase productivity), Product diversification (new crops and value-added products)	
FORESTRY		
Questions	Answer	Comments
30) Forest area in the region (please indicate the hectares and percentage occupied by forestland in the region)?	650.620 ha	

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31)	Productive forest area share (exploited for wood)?	554.000 ha	
32)	Which are the main uses of forestry biomass?	Energy production, bio-based products (paper, pulp and wood-based panels), soil amendment	
33)	Share of forestland owned by the administration and private owners?	Administration-owned forestland: 51% (state, regional government, and municipalities) Private-owned forestland: 49%	
34)	Are state subsidies received by the forestry sector?	Yes	The Italian government provides a range of incentives and funding programs to support sustainable forestry practices, including the management of forest resources, the production of timber and non-timber forest products, and the conservation of forest ecosystems.
35)	Who are the main stakeholders involved in the forest biomass production?	Forest owners, biomass processors, energy producer, government agencies, research and development organizations	
36)	Please indicate if possible the forest biomass production cost and the average selling price (€/dry tonnes)?	50-70 euros per tonne for wood chips and 70-90 euros per tonne for pellets. The average selling price for wood chips is approximately 72 euros per tonne, while the average selling price for pellets is around 203 euros per tonne.	
37)	What is the percentage of employment covered by forestry?	0.1%	
38)	How much residual biomass is produced in the region?	1.7 million t	
39)	Is the residual biomass (question 34) exploited? (Indicate)	Heat and energy production. there is growing interest in the use of residual biomass for the production of bio-based products	
40)	Which are the future perspectives? (Technology, forestry, employment increase, increase of exploited areas, etc.)	Employment increase, integrate forestry practices into agricultural systems, increase of exploited areas for planting more diverse and resilient forest ecosystems to reduce the risk of wildfires and support carbon sequestration and biodiversity conservation	agroforestry practices, which involve the intentional combination of trees and crops on the same land, could help to support soil health, biodiversity, and carbon sequestration while also providing additional sources of income for farmers
41)	Share of forestland area affected by forest fires the last year?	559 forest fires which burned a total of 5.372 hectares of forestland	
<b>LIVESTOCK</b>			
	Questions	Answer	Comments
42)	How large is the area dedicated to livestock in the region?	172.000 ha	
43)	Average farm size (cows, pigs, chicken, or other) in the region?	Cattle farming is the largest component of livestock farming in Campania, with about 97,000 hectares of land dedicated to cattle rearing. Sheep farming is the second largest component, with about 36,000 hectares of land dedicated to sheep rearing, followed by pig farming with about 20,000 hectares.	
44)	Which is the daily livestock maintenance cost (€/head)?	dairy cow = €3-4 per day beef cattle = €1-2 per day sheep and goats = €0.50-1.50 per day.	
45)	Which is the main destination of the cattle? (Meat, milk, wool...)	Milk	
46)	What is the employment rate covered by livestock?	8%	
47)	Are state subsidies received for farming?	state subsidies and support from the European Union's CAP	
48)	Who are the main stakeholders involved in the production?	Farmers and ranchers, feed and equipment suppliers, meat and dairy processors	

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49) Which is the main residue produced in each case?	Manure and slurry	
50) How much slurry/manure/other residue is produced in average (t/head) and in the region (total)?	Cattle: 1,319,000 t Pigs: 266,000 t Poultry: 167,000 t Sheep and goats: 92,000 t Other animals: 62,000 t	
51) Is the slurry/manure/other exploited? (Indicate the percentage that is currently used) If not, how are the residues managed?	Organic fertiliser	
52) Average selling price for the slurry/manure/other?		
53) Which are the future perspectives? (Valorisation technologies, cattle, employment rate, farm modernisation, increase of large exploitations, decrease of livestock production, etc.)	i) Sustainability (sustainable livestock practices that prioritize animal welfare, environmental protection, and social responsibility) ii) new technologies and innovations to improve productivity, efficiency, and sustainability iii) Market demand (Changes in consumer preferences and dietary habits affect the demand for livestock products) iv) Changes in policies and regulations to influence the future direction of the livestock sector	
<b>SECONDARY SECTOR</b>		
<b>AGROINDUSTRY</b>		
Questions	Answer	Comments
54) How many agrifood industries are there in the region?	8.000 industries	
55) Which are the main products produced?	<ul style="list-style-type: none"> <li>- Tomatoes: Campania is famous for its San Marzano tomatoes, which are considered some of the best tomatoes in the world. These tomatoes are used in many Italian dishes, including pizza and pasta sauce.</li> <li>- Mozzarella di Bufala: This is a type of cheese made from the milk of water buffalo. Campania is the largest producer of mozzarella di bufala in Italy, and it is used in many traditional dishes in the region.</li> <li>- Wine: Campania produces several types of wine, including Falanghina, Aglianico, and Fiano di Avellino.</li> <li>- Citrus fruits: Campania is known for its lemons and oranges, which are used in many dishes and desserts in the region.</li> <li>- Olive oil: Campania produces high-quality extra-virgin olive oil, which is used in many dishes in Italian cuisine.</li> <li>- Artichokes: Campania is the largest producer of artichokes in Italy, and they are used in many traditional dishes in the region.</li> <li>- Chestnuts: Chestnuts are a popular ingredient in many dishes in Campania, and the region is one of the largest producers of chestnuts in Italy.</li> </ul>	
56) Which is the annual average production in the main agrifood industries?	<ul style="list-style-type: none"> <li>- Tomatoes: Campania produces around 500,000-600,000 t of tomatoes per year, with San Marzano tomatoes accounting for a significant portion of that.</li> <li>- Mozzarella di Bufala: Campania produces around 33,000 t of mozzarella di bufala per year.</li> <li>- Wine: Campania produces around 1.5 million hectoliters of wine per year.</li> <li>- Citrus fruits: Campania produces around 300,000-400,000 t of citrus fruits per year, including lemons and oranges.</li> <li>- Olive oil: Campania produces around 20,000-25,000 t of extra-virgin olive oil per year.</li> <li>- Artichokes: Campania produces around 35,000-40,000 t of artichokes per year.</li> </ul>	

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	- Chestnuts: Campania produces around 6,000-7,000 t of chestnuts per year.	
57) Are companies producing organic or agrifood products receiving subsidies?	Yes, through the rural development program	
58) What is the percentage of employment covered by agroindustries?	In 2020 4.4% of the total workforce in Campania (187,000 number of people employed)	it's important to note that the data available may not differentiate between agricultural and agro-industrial employment, making it difficult to provide an exact percentage for agro-industry employment in Campania.
59) What is the main economic limitation (energy cost, supply chain...) faced by agroindustries?	fragmentation of agricultural land and the small size of farms	
60) Which type of wastes/side-products/residues are produced?	Olive mill wastewater Citrus waste (peels, pulp, seeds) Tomato pomace Wine residues Cheese waste	
61) How much wastes/side-products/residues are produced?	Olive mill wastewater = 1.5 to 6.7 million cubic meters per year Citrus waste = 900,000 tonnes per year Tomato pomace = 200,000 tonnes per year Wine lees = 72,000 t per year Cheese waste → cheese way = 104,000 t per year; cheese byproducts= 17,000 t per year	
62) Are the wastes/side-products/residues exploited? (Please specify for which application)	Citrus waste is exploited to produce essential oils and animal feed Tomato Pomace is exploited to produce animal feed, pectin and food additives Wine residues is used as animal feed and for fertilizer production Cheese waste is used as animal feed and for the production of biogas	
63) What are the future perspectives? (Techniques, products, production, employment)	i) integration of new technologies and innovation can help to increase the efficiency and productivity ii) The adoption of circular economy principles can help to reduce waste and promote the reuse of resources in the agroindustry iii) develop new and innovative products that can meet the changing needs of consumers and expand export markets iv) agroindustry sector can also contribute to the development of sustainable tourism (diversify the local economy, create new job opportunities, and promote the cultural and natural heritage of the region)	
64) Which are the main stakeholders of the local agrifood industry?	Farmers: primary stakeholders that are responsible for producing the crops and livestock that form the basis of the industry.  Processors and manufacturers: responsible for turning raw agricultural products into processed and packaged food products.  Distributors and retailers: These stakeholders are responsible for getting food products from the manufacturers to the consumers. They may include wholesalers, supermarkets, and specialty food stores.  Consumers: ultimate users of the products.  Government agencies: Government agencies such as the Ministry of Agriculture and the regional government of	

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	<p>Campania play an important role in regulating the industry and promoting its growth.</p> <p>Research institutions and universities: help to improve the productivity and sustainability of the industry.</p> <p>Non-governmental organizations (NGOs) and community groups: promote sustainable farming practices, supporting small-scale farmers, and advocating for consumer rights and food safety.</p>	
<b>OTHER BIO-BASED INDUSTRIES</b>		
Questions	Answer	Comments
65) Is there a mapping of the current bio-based industrial activities in your area?		
66) How many biobased industries are there in the region? Please specify the main biobased products produced	over 50 biobased companies (includes both startups and established businesses)	
67) Out of the previous list indicate the three more relevant in terms of revenues and role to meet the government strategic objectives (decarbonistaion, CO <sub>2</sub> emissions, circular economy, etc.)	<p>Novamont</p> <p>Industria Monouso Beneventana</p> <p>Re.Ma.Plast</p> <p>Seri Industrial</p> <p>Stazione Sperimentale per l'Industria delle Pelli e delle Materia</p> <p>Concianti</p> <p>Ecospray Technologies</p> <p>Fater SpA</p>	
68) Are state subsidies received to promote sustainable production by these industries?	Yes	
69) What is the percentage of employment covered by biobased industries?	8.8% (166.000 employed)	
70) How many t of biobased materials/products are produced per year? Please specify by typology (renewable energies, biofuels, biomaterials, biochemicals, biobased cosmetics/pharmacy, others)	Renewable energy: 11466,3 GWh	
71) Which type of wastes/by-product, residue are produced in the production process?	<p>Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food processing and preparation: 149,900 t</p> <p>Waste from wood processing and the production of panels, furniture, pulp, paper and cardboard: 28,590 t</p> <p>Waste from the leather and fur processing and textile industry: 31,313 t</p> <p>Waste from organic chemical processes: 13,042 t</p> <p>Packaging waste. Absorbents, rags, filter materials and protective clothing not otherwise specified: 247,362 t</p> <p>Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water for industrial use: 2,794,679 t</p> <p>Municipal waste (household and comparable waste from commercial and industrial activities as well as from institutions) including separately collected waste: 89,728 t</p>	
72) What are the biobased materials, side-products, waste or residues used as raw materials in the productive process?		
73) Where are these raw materials obtained or cultivated?		



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74)	Which are the main stakeholders/actors supplying these raw materials?	Farmers and agricultural producers, Forestry industry, Waste management companies, Aquaculture industry	
75)	Which is the price of these biobased raw materials used (€/ton)?		
76)	Which is the price of the main biobased products produced in the region (€/ton)?		
77)	Which are the perspectives in the use of these biobased raw materials/side-products/waste?	<p>i) Development of new biobased products: Biobased raw materials and side-products can be used to develop new biobased products such as bioplastics, biochemicals, and biofuels, which can replace their conventional counterparts and reduce the reliance on fossil resources.</p> <p>ii) Waste valorization: Biobased waste can be transformed into valuable products through processes such as biorefinery and composting, which can reduce waste and provide new revenue streams for industries and communities.</p> <p>iii) Climate change mitigation: The use of biobased raw materials and products can reduce greenhouse gas emissions and contribute to mitigating climate change.</p> <p>iv) Circular economy: Biobased materials and products can contribute to the transition towards a circular economy by reducing waste, increasing resource efficiency, and creating new value chains and business models.</p>	
78)	Which are the perspectives in the consumption of these biobased products?	<p>i) Sustainability: Biobased products are often produced from renewable resources, which have a lower environmental impact than conventional products derived from fossil fuels.</p> <p>ii) Health and safety: Biobased products are often free from harmful chemicals and additives that are commonly found in conventional products. This can benefit consumers' health and safety by reducing exposure to potentially hazardous substances.</p> <p>iii) Innovation: The development of new biobased products requires research and innovation, which can drive economic growth and create new business opportunities</p> <p>iv) Consumer demand: The growing interest in sustainable and eco-friendly products among consumers can create new markets for biobased products and drive demand for more sustainable practices across industries.</p>	
79)	Please mention the 3 bio-based solutions with more relevance in your region (that can be taken as an example of implementation or good practice for other regions) and provide contact details if possible.		
80)	Please mention 3 bio-based solution in your region that have high deployment potential in your region but still need support to accelerate-unlock its potential ( please mention what technological, regulatory and market challenges are and provide contact details if possible)		
<b>ENERGY INDUSTRY</b>			
	Questions	Answer	Comments
81)	How many energy industries are there?		
82)	Does the main part of energy come from renewable or non-renewable energy?	Non-renewable energy	
83)	What is the main source of renewable energy?	Solar power	

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84)	What is the main source of non-renewable energy?	Natural gas	
85)	Are state subsidies received to promote renewable energies?	The government offers various incentives and funding programs to support renewable energy projects, such as tax credits, feed-in tariffs, and grants.	
86)	What is the percentage of employment covered by the energy sector?	0.3%	
87)	Which is the average price of energy (€/kW h)? (Differences between renewable and non)	Renewable energy: 0.2-0.25 €/kW h Non-renewable energy: 0.25-0.3 €/kW h	
88)	Which percent of energy usage comes from renewable energy?	17.8%	
89)	Which are the future perspectives?	i) Increase the share of renewable energy in the region's energy mix ii) energy efficiency measures to reduce energy consumption and greenhouse gas emissions iii) promoting the development of energy storage systems, which will enable the region to better manage the intermittency of renewable energy sources and ensure a stable and reliable energy supply	i) To achieve the first goal, the region is promoting the development of new renewable energy projects, including solar, wind, hydro, and geothermal power. ii) The second goal includes initiatives to improve the energy efficiency of buildings, transportation, and industrial processes. The aim is to reduce energy costs, increase competitiveness, and contribute to the transition towards a low-carbon economy.
<b>MUNICIPAL SOLID WASTE (MSW)</b>			
	Questions	Answer	Comments
90)	How many tonnes of MSW are generated per year?	4.2 million t/year	
91)	Which is their main composition?	Organic waste (50%), Paper and cardboard (17%), Plastics (12%), Glass (7%), Metals (3%), Textiles (2%), Other materials (9%)	
92)	Are the wastes exploited? (Indicate how)	Recycling, composting and biogas production from organic waste	
93)	Where are the MSW generated?	Major Urban cities and rural areas	MSW is mainly produced in major cities in Campania, such as Naples, Salerno and Caserta. In addition to urban areas, MSW is also generated in rural areas of Campania, particularly in agricultural regions where organic waste is produced. This includes areas such as the Amalfi Coast, the Cilento National Park, and the Sannio Hills.
94)	Who are the main stakeholders involved in the MSW management?	Local municipalities and Waste management companies	Local municipalities: Municipalities in Campania are responsible for collecting and managing MSW within their jurisdictions, often with support from regional and national government agencies.  Waste management companies: Private companies are contracted by municipalities and

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		regional authorities to manage MSW collection, transport, and disposal. Some of the largest waste management companies operating in Campania include the companies that manage the waste-to-energy plants in the region.
95) How is MSW valorised? (Added-value products)	recycling, composting, waste-to-energy (Compost, biogas)	
96) Which is the price of MSW added value-products?	Compost prices can range from around 10 to 40 euros per cubic meter	
Which are the future perspectives? (Techniques, wastes)	<ul style="list-style-type: none"> <li>i) Improve waste management practices and infrastructure</li> <li>ii) Develop new technologies and processes for waste treatment and disposal</li> <li>iii) Encourage the reuse and recycling of waste materials, as well as supporting the development of sustainable waste-to-energy solutions that can produce energy from waste while also reducing the amount of waste sent to landfills.</li> </ul>	



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# Regional bioeconomy development and promotion. Policy framework

CROSS-CUTTING ISSUES		
Questions	Answer	Comments
97) Does your region have a strategy for circular bioeconomy?	Yes, Campania has a strategy for circular bioeconomy, which is outlined in the Regional Circular Bioeconomy Plan (Piano Regionale della Bioeconomia Circolare) adopted in 2019.	
98) Existence of bioeconomy hubs, clusters or any other association in the region?	<a href="#">Campania Digital Innovation Hub</a> <a href="#">Campania Bioscience</a> <a href="#">campania aerospace district</a> <a href="#">BioPmed</a>	
99) Existing of hubs or cluster targeting other topic or sectors? (please specify)		
100) What environmental indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (GHG decrease achieved with bioeconomy initiatives, resources depletion, implementation strategy aiming zero waste, etc.) ?	Waste reduction, biodiversity conservation, GHG reduction, improve energy efficiency	
101) What economic indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (turnover linked to biobased companies (forestry, agriculture, other-biobased industries), existence of funding programmes/schemes targeting bioeconomy, existence of supporting measures promoting partnerships between industries and enterprises in the region, etc.) ?	i) Job creation ii) Economic growth: development of new industries and the expansion of existing ones. The increase in Gross Domestic Product (GDP) and Gross Value Added (GVA) can be used as indicators of economic growth in the circular bioeconomy. iii) Resource efficiency (reduction in resource use and cost savings) iv) Innovation: The number of patents filed, new products developed, and innovation in circular economy practices can be used as indicators of progress in the circular bioeconomy. v) Amount of Investment	
102) What social indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (available skilled workforce, number or jobs created in the last 5 years un bio-based industries, communications to society regarding bio-based activities (seminars, trainings, etc.), willingness to pay for bio-based products, etc.) ?	i) Social inclusion ( employment opportunities and economic benefits to disadvantaged communities) ii) public awareness of circular economy practices and the level of engagement in these practices iii) community resilience by building local economies and reducing dependence on external resources (the number of local businesses and the level of economic diversification in the region can be used as indicators of progress) iv) Education and training (skilled workforce with knowledge of circular economy practices)	
103) Current economic and social characteristics of your territory not reported in previous questions that could enable the development of the circular bioeconomy?		
104) Are there any bio-based production districts / specializations in your Region? (Please, provide a description of these activities, including data, focusing on Circular Bio-based Economy potentials and material/immaterial assets as well as existing barriers)	forum dell'economia e bioeconomia circolare L.R. n. 23 del 28 luglio 2017; Bioeconomy its part of the RIS3; Terranext (accelerator)	
105) What are the strengths/weaknesses of your area regarding the development of the circular bioeconomy?	Strengths: skilled workforce, agricultural resources (diverse range of crops), well established renewable energy industry  Weakness: waste management problems, lack of awareness, limited financial resources and limited institutional support	
106) Please, identify actors with a natural interest in a project due to their existing businesses and market in your territory	On going	

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## Annex 2: Czech Republic Region profile

INFORMATION FOR STATISTICAL ANALYSIS		
REGIONS (EUROSTAT NUTS 2 – Level)		
(Please indicate for your region which NUTS 2-Regions are relevant or add additional regions in the comment section.)		
Question	Suggested NUTS 2 regions	Comments
1) Germany – Region of Baden-Württemberg	<input type="checkbox"/> Stuttgart <input type="checkbox"/> Karlsruhe <input type="checkbox"/> Freiburg <input type="checkbox"/> Tübingen	<i>This is already an example of the indication of the regions that we should consider in T2.1</i>
2) Spain – Region of Aragon	<input type="checkbox"/> Aragón	
3) Greece – Region of Western Macedonia	<input type="checkbox"/> Dytiki Makedonia (Western Macedonia?)	
4) Bulgaria – Region of Plovdiv	<input type="checkbox"/> Yuzhen tsentralen	
5) Slovakia – Nitra Self-Governing Region	<input type="checkbox"/> Západné Slovensko	
6) Slovenia – Whole Country	<input type="checkbox"/> Vzhodna Slovenija <input type="checkbox"/> Zahodna Slovenija	
7) Croatia – Region Adriatic Croatia	<input type="checkbox"/> Jadranska Hrvatska	
8) Hungary – Region North Hungary	<input type="checkbox"/> Észak-Magyarország	
9) Romania – West region	<input type="checkbox"/> Vest	
10) Czechia – Region BIOEAST	<input type="checkbox"/> <u>Moravskoslezsko</u>	
11) Netherlands – Region Apeldoorn	<input type="checkbox"/> Gelderland	
12) Italy – Region Campania	<input type="checkbox"/> Campania	

### How to identify socially marginal groups?

SOCIALY MARGIN GROUPS		
Questions	Answer	Comments
1) Population area with less than 5.000 inhabitants	a total of 300 municipalities out of the total number of 332 municipalities in the region have less than 5,000 inhabitants <sup>1</sup>	

<sup>1</sup> <https://www.czso.cz/csu/xt/bilance-poctu-obyvatel-v-obcich-moravskoslezskeho-kraje>

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2) Unemployment rate in the area	Share of unemployed persons 5.12% (41,902 job seekers)	<a href="https://www.czso.cz/csu/xt/nezamestnanost-v-moravskoslezskem-kraji-k-31-12-2022">https://www.czso.cz/csu/xt/nezamestnanost-v-moravskoslezskem-kraji-k-31-12-2022</a>
3) Women employment rate	5.23% (5.02% men)	
4) Main economic activity in the area	The Moravian-Silesian Region is one of the most industrial regions of the Czech Republic. The traditional and most widespread is heavy industry (mainly heavy engineering, metallurgy and coal mining).	
5) Jobs in risk	Moravian Silesian Region belongs to the Just Transition Funding Region – the job in risk are associated with mining and heavy industry	The Just Transition Funding Instrument was planned to support the transformation
6) Main breadwinner of the family nucleus	men	
7) Average educational level	secondary education and apprenticeship without high school diploma (35.1%) and complete high school with a high school diploma, including higher vocational and extension (29.4%). A fifth of people (21.0%) had the highest primary education and 11.2% completed university studies. It can thus be evaluated in comparison with other regions  the overall level of education of residents over the age of 15 living in the Moravian-Silesian Region as an average of up to slightly below average.	
8) Average age	43.3 years	which ranks it among the regions with a higher average age
9) Percent of immigrants	over 27.7 thousand foreigners	2.3% of the region's population
10) Emigration rate	The balance of moving was negative only among the population of the Moravian-Silesian region, for which it is typical in the long term, however its decline migration recorded in 2021 (–104 persons) was the mildest within the last decade 2012-2021 and historically it was the third smallest decrease	<a href="https://www.czso.cz/documents/10180/165591255/13015722.pdf/8465dc92-8d69-40c6-b399-b4b1d16b2f8b?version=1.3">https://www.czso.cz/documents/10180/165591255/13015722.pdf/8465dc92-8d69-40c6-b399-b4b1d16b2f8b?version=1.3</a>
11) Average salary	36,588 CZK and compared to the same period of the previous year it increased by 7.1%, in real terms it decreased by 8.9%	average salary CZK 40,353 in the Czech Republic
12) Indicate the selected marginal group/s that will be targeted during the project and relevance in the region	Young unemployed people	We would like to support bioeconomy implementation in the region both in the education, as an inspiration for research and development

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13) Please describe the structure and the characteristics of socially disadvantaged/ marginalized groups in your region, the potential impact of their participation in Circular Bio-based Economy and the factors hindering such participation?	At the moment they are not much organised, there are several organisations that care for unemployed people	
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#### Situation of main economic sectors

PRIMARY SECTOR		
AGRICULTURE		
Questions	Answer	Comments
14) How large is the surface of cultivable areas?	Agricultural land makes up more than half of the territory of the Moravian-Silesian Region, Agricultural land occupied 50.2% of the area of the region	With an area of 0.22 ha of agricultural land per inhabitant, the region is far below the level of the Czech Republic (0.42 ha/inhabitant).  50.2% which was the seventh smallest share within the republic (for the entire republic, this share reached a value of 53.2%).
15) Which are the main crops in the area (surface in hectares of percentage of the cultivable area occupied by each crop)	383.0 thousand t of cereals in total (60.4% wheat winters)	<a href="https://www.czso.cz/csu/xt/sklizen-zemedelskych-plodin-v-moravskoslezskem-kraji-v-roce-2022">https://www.czso.cz/csu/xt/sklizen-zemedelskych-plodin-v-moravskoslezskem-kraji-v-roce-2022</a>
16) Which is the average annual production (dry basis) of the most relevant crops (listed in question 14)?	crop production 2019  cereals 351 ths, rape 59 ths., potatoes 19,5 ths.	
17) Average yield (dry basis) for the most relevant crops (listed in question 14)?	Per hectare yields of selected crops harvested by Region in 2019  cereals 5,53 ths, wheat 5,72, barley 5,25, potatoes 25,10 ths., industrial sugar beet 62, 74 ths, rape 3,05, permanent grass 2,88 ths	
18) What is the percentage of employment covered by agriculture?	3.7% of employees	Although agricultural workers are not heavily represented in this county, agriculture is second only to industry
19) Are state subsidies received by the farmers (CAP or others)? Please shortly mention the crops and the aim of the subsidy (equipment modernisation, yield increase, etc.	if they meet the requirements (conditions) of the program, everyone will receive subsidies - (equipment modernisation, yield increase, cooperation, innovation	<a href="https://eagri.cz/public/app/SZR/SubsidyReports/Rreport/GrantByProgram?page=184&amp;rok=&amp;kraj=132&amp;loaded=true">https://eagri.cz/public/app/SZR/SubsidyReports/Rreport/GrantByProgram?page=184&amp;rok=&amp;kraj=132&amp;loaded=true</a>

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20) What is the current situation of the soils (erosion, eutrophication, pollution...)?	Heavy industry and mining industry had a negative effect on the soil quality, there are a lot of projects how to improve soil quality with compost	<a href="https://eagri.cz/public/web/file/697802/Puda_2021_Web.pdf">https://eagri.cz/public/web/file/697802/Puda_2021_Web.pdf</a>
21) Who are the main stakeholders involved in the crops production (cooperatives or farmers associations, individual farmers owning large or small areas, etc.)?	Cooperatives, farmers, individual farmers	agricultural enterprises decreased by more than a third (-36.4%).
22) How much residual biomass is produced? Please indicate for the most relevant crops (question 14) the residues that are produced during the processing	in progress, it is rather difficult to find the answer	
23) Is the residual biomass (question 21) exploited (energy production, chemicals, fertilizers, etc.)?	in progress, it is rather difficult to find the answer	
24) Average selling price for the main crops (€/dry tonnes) (listed in question 14)? When possible, also include the production cost.	We came across big difficulties to find any information of this kind on the national let aside the region level.	There is only one study (in Czech) about the biomass potential from the energy perspective (in the neighbour region)
25) Which are the future perspectives? (Technologies, increase of the area dedicated to certain crops, new crops development, new biomass or residual biomass value chain development, employment)	<p>The majority of biogas stations are now closely linked to agricultural activity, as they can equally well process slurry, manure, but also other materials without market use. They will produce energy that farmers and their neighbors will use for their own operations.</p> <p>/</p> <p>In the MS region, biogas is not used outside the premises of the company operating BPS, and excess heat from cogeneration units is not used outside the company's operations.</p> <p>/</p> <p>The main reason for the Czech Republic's lagging behind in the development of biomethane was legislative and technical barriers. When Europe started biomethane at the beginning of the last decade, it was deleted from the Act on Supported Resources in the Czech Republic, and until the beginning of 2022 there was no legal regulation that would define, regulate and support biomethane. Outdated gas regulations made injecting biomethane into the gas network very complicated and sometimes practically impossible. The requirements for the quality of biomethane, the</p>	<p><a href="https://sdeleni.idnes.cz/zpravy/bioplyn-a-biometan-mohou-nahradit-20-zemniho-plynu.A220624_144900_zpr_sdeleni_zuje/">https://sdeleni.idnes.cz/zpravy/bioplyn-a-biometan-mohou-nahradit-20-zemniho-plynu.A220624_144900_zpr_sdeleni_zuje/</a></p> <p>/</p> <p><a href="https://portal.cenia.cz/eiasea/download/U0VBX01TSzAyN0tfbmF2cmhfODUxMTc0MjlyMDkzNjkxNjgyMC5wZGY/MSK027K_navrh.pdf">https://portal.cenia.cz/eiasea/download/U0VBX01TSzAyN0tfbmF2cmhfODUxMTc0MjlyMDkzNjkxNjgyMC5wZGY/MSK027K_navrh.pdf</a> /</p> <p>/ <a href="https://sdeleni.idnes.cz/zpravy/bioplyn-a-biometan-mohou-nahradit-20-zemniho-plynu.A220624_144900_zpr_sdeleni_zuje/">https://sdeleni.idnes.cz/zpravy/bioplyn-a-biometan-mohou-nahradit-20-zemniho-plynu.A220624_144900_zpr_sdeleni_zuje/</a></p> <p>/ <a href="https://www.msk.cz/kraj/zastupitelstvo/prilohy_usneseni.html?cp=1&amp;rz=z&amp;s=14&amp;cu=1717&amp;d=2019-12-12/">https://www.msk.cz/kraj/zastupitelstvo/prilohy_usneseni.html?cp=1&amp;rz=z&amp;s=14&amp;cu=1717&amp;d=2019-12-12/</a></p>

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	<p>conditions for its measurement and injection into the gas network were modified this year by the issuance of new Decree No. 78/2021 Coll. After the adoption of the Act on Supported Energy Sources (POZE), it will be possible from 2022 or 2023, biomethane to promote, certify and issue guarantees of origin.</p> <p>In some places, agricultural land is threatened by wind and water erosion, because the landscape lacks protective elements in the form of ties, alleys, windbreaks, etc. The most endangered places are mainly in the Opava region, the Krnov region, and along the Odra river in the Novojičín region.</p>	
<b>FORESTRY</b>		
Questions	Answer	Comments
26) Forest area in the region (please indicate the hectares and percentage occupied by forestland in the region)?	<p>Forest area as of 31.12.2021: 188057 ha</p> <p>Forest coverage of the region according to vegetation: 34.6%</p>	<a href="https://www.cenia.cz/publikace/statisticka-rocenka-zivotniho-prostredi-cr/statisticka-rocenka-zivotniho-prostredi-cr-2021/">HTTPS://WWW.CENIA.CZ/PUBLIKACE/STATISTICKA-ROČENKA-ZIVOTNIHO-PROSTREDI-CR/STATISTICKA-ROČENKA-ZIVOTNIHO-PROSTREDI-CR-2021/</a> /
27) Productive forest area share (exploited for wood)?	<p>2021</p> <p>Forest management area in the region: 159184 ha</p> <p>Productive forest area share: 84.65%</p>	<a href="https://www.cenia.cz/publikace/statisticka-rocenka-zivotniho-prostredi-cr/statisticka-rocenka-zivotniho-prostredi-cr-2021/">HTTPS://WWW.CENIA.CZ/PUBLIKACE/STATISTICKA-ROČENKA-ZIVOTNIHO-PROSTREDI-CR/STATISTICKA-ROČENKA-ZIVOTNIHO-PROSTREDI-CR-2021/</a> /
28) Which are the main uses of forestry biomass?	<p>2021</p> <p>Forest logging residues (FLR) are called branches and tree tops of trees up to a diameter of 7 cm (expertly not hollowed out) when logs with a diameter of more than 7 cm (expertly hollowed out) are called. Logging residues cannot be left in the clearing, as they would prevent the growth of the next generation of forest. Therefore, about 70% of FR is used and 30% (stumps, roots, leaves and needles) decomposes and returns nutrients to the soil.</p> <p>70% of the FLR can be used for energy (heating plants and power plants)</p>	<a href="#">UEK_2022.PDF (MSK.CZ)</a> /
29) Share of forestland owned by the administration and private owners?	Area and ownership of forests as of 31 December 2021 – the entire Czech Republic (data for the region is not available)	<a href="https://www.czso.cz/documents/10180/165278795/100004222k25.pdf/37ac2390-a6c9-4794-bbd6-60927d0c40bc?version=1.1">HTTPS://WWW.CZSO.CZ/DOCUMENTS/10180/165278795/100004222k25.PDF/37AC2390-A6C9-4794-BBD6-60927D0C40BC?VERSION=1.1</a>
30) Are state subsidies received by the forestry sector?	<p>2022</p> <p>The current scope of support for forestry and hunting</p>	<a href="https://eagri.cz/public/web/file/668791/prehled-financovani_lh_20220615.pdf">HTTPS://EAGRI.CZ/PUBLIC/WEB/FILE/668791/PREHLED-FINANCOVANI_LH_20220615.PDF/</a>



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	<p>The following financial contributions and support programs are available to forest owners, forest management entrepreneurs and hunting users:</p> <ul style="list-style-type: none"> <li>- contributions to forest management from the budget of the Ministry of Agriculture,</li> <li>- contributions to forest management from the regional budget,</li> <li>- contributions to selected hunting activities,</li> <li>- a contribution to support the adaptation of forest ecosystems to climate change,</li> <li>- payment of costs according to the Forestry Act, <ul style="list-style-type: none"> <li>- services provided to forest owners,</li> <li>- support of accredited consulting activities in forestry,</li> </ul> </li> <li>- subsidies for the protection and reproduction of the gene pool of forest trees,</li> <li>- selected operations of the Rural Development Program for the period 2014–2020 and information for the transitional period 2021–2022,</li> <li>- selected programs of the Agricultural and Forestry Support and Guarantee Fund,</li> <li>- refund of tax on diesel fuel consumed during forest management.</li> </ul>	
31) Who are the main stakeholders involved in the forest biomass production?	<p>Most of the forests in the MS region are owned by the state (approximately 75.8%), managed mainly by Lesy České republiky, s.p.</p> <p>The state participates in the production of forest biomass, specifically the enterprise Lesy České republiky, s.p.</p>	<p>/</p> <p><a href="https://www.msk.cz/cs/temata/zivotni_prostredi/zakladni-informace-a-legislativa/-lesy-1286/">https://www.msk.cz/cs/temata/zivotni_prostredi/zakladni-informace-a-legislativa/-lesy-1286/</a></p>
32) Please indicate if possible the forest biomass production cost and the average selling price (€/dry tonnes)?	<p>2022</p> <p>Purchase price of residues after logging 33 CZK/GJ (moisture approx. 50%, volume weight is approx. 300 kg/m³ and calorific value usually varies between 8-12 GJ/t.)</p> <p>Wood chips (dried and chipped wood biomass) 130 CZK/GJ</p>	<p>Calculation:</p> <p>Residues after logging: calorific value 10 GJ/t</p> <p>Price 330 CZK/t</p> <p>uniform exchange rate 2022 CZK 24.54/EUR</p> <p>Residues after logging: 13.5 EUR/t</p> <p>Dry wood chips (20%): calorific value 14 GJ/t</p> <p>Price 1820 CZK/t</p> <p>Dry wood chips: EUR 74/t</p> <p>Transport, chipping and drying costs: EUR 60.5/t</p>
33) What is the percentage of employment covered by forestry?	<p>2021</p> <p>Classification of economic activities (CZ-NACE): Agriculture, forestry, fishing</p>	<p><a href="https://vdb.czso.cz/vdbvo2/faces/cs/index.jsf?PAGE=VYSTUP-OBJEKT&amp;z=T&amp;f=TABULKA&amp;filtr=G%7EF_M%7EF_Z%7EF_R%7ET_P%7E_S%7E_NULL_NULL_&amp;katalog=">https://vdb.czso.cz/vdbvo2/faces/cs/index.jsf?PAGE=VYSTUP-OBJEKT&amp;z=T&amp;f=TABULKA&amp;filtr=G%7EF_M%7EF_Z%7EF_R%7ET_P%7E_S%7E_NULL_NULL_&amp;katalog=</a></p>

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	Employed 11.4 thousand persons older than or equal to 15 years	<a href="#">30853&amp;PVO=ZAM03&amp;STR=v221&amp;U=v228_VUZEM</a> <a href="#"> _100_3140#w=/</a>
34) How much residual biomass is produced in the region?	According to the statistical data of the Institute for Forest Management in 2009, the potential of forest harvesting residues in the Moravian-Silesian Region in dry matter is 32,692 t/y. After deducting 30% for biological fertilization of the forest, the theoretical occurrence of dry matter for energy use is 22,884 t/y.	<a href="https://www.msk.cz/assets/temata/chytry_region/uek_2022.pdf">HTTPS://WWW.MSK.CZ/ASSETS/TEMATA/CHYTRY_REGION/UEK_2022.PDF /</a>
35) Is the residual biomass (question 33) exploited? (Indicate)	70% of forest logging residues will be used for energy purposes in heating plants and power plants.  30% (stumps, roots, leaves and needles) decomposes and returns nutrients to the soil.	
36) Which are the future perspectives? (Technology, forestry, employment increase, increase of exploited areas, etc.)	In the case of wood, the use is determined by the extent of extraction. The use of forest waste is not possible to a greater extent.  Enable a better balance of the stressed wood mass, including the remains of hard-to-access locations.  In the Moravian-Silesian region, wood was most often obtained as part of random harvesting due to damage by insects, especially bark beetles. This logging accounted for 35.6% of the total processed incidental logging in the region. Only a slightly lower share (35.5%) of accidental wood extraction was caused by natural causes.  Foresters in the Moravian-Silesian Region reported the fourth highest share (10.8%) of damage caused by wild animals out of all Czech regions.  Protection from damage by insects and animals. A gradual increase in the share of deciduous trees in the forests of the Moravian-Silesian Region can be observed since 2000, which is in line with the trend of approaching the recommended forest composition throughout the Czech Republic.  In the region, Lesy ČR (the majority owner of the forests) registers - 1,908 hectares of bare areas as of 12/31/2022. In 2023, the plan is to reforest 1,183 hectares and plant five million seedlings.	<a href="https://lesy-cr.cz/media/kurovec-caste-dotazy/moravskoslezsky-kraj/">/ HTTPS://LESYCR.CZ/MEDIA/KUROVEC-CASTE-DOTAZY/MORAVSKOSLEZSKY-KRAJ/ /</a>
37) Share of forestland area affected by forest fires the last year?	Forest fires in the MS region in 2021  Number: 79	<a href="https://www.cenia.cz/wp-content/uploads/2023/01/statisticka_rocenka_zp_cr_2021.pdf">HTTPS://WWW.CENIA.CZ/WP-CONTENT/UPLOADS/2023/01/STATISTICKA_ROCENKA_ZP_CR_2021.PDF</a>

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	Affected: 6.4 ha	
<b>LIVESTOCK</b>		
Questions	Answer	Comments
38) How large is the area dedicated to livestock in the region?	<p>Agricultural entities focused on cattle, sheep, goat and horse breeding - cattle and animal breeding cattle breeding and other grazing livestock: <b>52406 ha</b></p> <p>Agricultural entities focused on mixed production (Mixed production)</p> <p>– animal breeding and plant production: <b>61853 ha</b></p>	<p>2020</p> <p><a href="https://www.czso.cz/csu/czso/prilohy-k-casti-i/">https://www.czso.cz/csu/czso/prilohy-k-casti-i/</a></p>
39) Average farm size (cows, pigs, chicken, or other) in the region?	<p>Average acreage of agricultural area of holdings of natural persons and legal persons by type of farming and economic size in regions</p> <p>Cattle breeding and other grazing livestock</p> <p>Holdings of natural persons - Economic size:</p> <p>Small: 16,1 ha</p> <p>Medium: 159,1 ha</p> <p>Large: -</p> <p>Holdings of legal persons - Economic size:</p> <p>Small: 16,7 ha</p> <p>Medium: 450,0 ha</p> <p>Large: 1380,7 ha</p> <p>Mixed production</p> <p>Holdings of natural persons - Economic size:</p> <p>Small: 10,1 ha</p> <p>Medium: 89,7 ha</p> <p>Large: 807,8 ha</p> <p>Holdings of legal persons - Economic size:</p> <p>Small: 2,2 ha</p> <p>Medium: 337,3 ha</p> <p>Large: 1614,4 ha</p> <p>Horses: 1,3 Head per 100 ha of the utilised agricultural area</p> <p>Cattle: 41,0 Head per 100 ha of the utilised agricultural area</p>	<p>2020</p> <p><a href="https://www.czso.cz/csu/czso/13-zemedelstvi-4atjxn5i2z/">https://www.czso.cz/csu/czso/13-zemedelstvi-4atjxn5i2z/</a></p>



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	<p>Cows: 18,5 Head per 100 ha of the utilised agricultural area</p> <p>Sheep: 7,8 Head per 100 ha of the utilised agricultural area</p> <p>Pigs: 30,8 Head per 100 ha of the arable land</p> <p>Sows: 1,8 Head per 100 ha of the arable land</p> <p>Poultry: 767,6 Head per 100 ha of the arable land</p> <p>Hens: 366,0 Head per 100 ha of the arable land</p>	
40) Which is the daily livestock maintenance cost (€/head)?	<p>The total cost per <b>cow</b> / day is 6.3 to 11.0 EUR</p> <p>The total cost per <b>pig</b> / day is 0.43 EUR</p> <p>The cost of raising sheep and goats depends on the number of animals in the herd.</p> <p>Poultry - laying hens</p> <p>In cage breeding of laying hens at 450 – 750 cm<sup>2</sup> / piece, fixed costs range from 48.15 CZK/piece to 75.15 CZK/pc, in aviaries around 84.57 CZK/pc, on deep litter 88.44 CZK/pc and in the paddock to 58.73 CZK/pc. (Cage breeding only until 2027)</p> <p>(work from 2007, values from 2001 - probably somewhere else entirely these days)</p> <p>Slaughter poultry</p> <p>The total cost per head in 2000 was CZK 32.36 at 1.5 kg of live weight</p> <p>(can be calculated, but also very old data)</p> <p><a href="https://naschov.cz/vykrm-kurat/">https://naschov.cz/vykrm-kurat/</a></p> <p>E.g. The farm in Čekanice near Tábor falls under the company Vodňanská Kuře s.r.o., in 2014</p> <p>Fattening on permanent litter, cost 0.03 CZK/day/chicken.</p>	
41) Which is the main destination of the cattle? (Meat, milk, wool...)	<p>Milk: 193 735 thous l.</p> <p>Production of cattle for slaughter: 9329 tonnes of live weight</p> <p><u>Fertilizer consumption per economic year</u></p> <p>Manure: 360326 t</p> <p>Manure: 153276 t</p> <p>Urea: 40373 t</p> <p>Other farm fertilizers: 145081 t</p>	<p>2022</p> <p><a href="https://www.czso.cz/csu/czso/definitivni-udaje-o-sklizni-zemedelskych-plodin-2022/">https://www.czso.cz/csu/czso/definitivni-udaje-o-sklizni-zemedelskych-plodin-2022/</a></p> <p><a href="https://www.czso.cz/csu/czso/stavy-skotu-loni-vzrostly-ubylo-ale-prasat-i-drubeze/">https://www.czso.cz/csu/czso/stavy-skotu-loni-vzrostly-ubylo-ale-prasat-i-drubeze/</a></p>
42) What is the employment rate covered by livestock?	<p>Since crop and livestock production are intertwined, the number of workers in agriculture is reported.</p> <p>Total people working in agriculture: 9868 people</p>	<p>2020</p>

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	<p>A total of 567.4 thousand people were employed in the MS region in 2020. persons older than or equal to 15 years</p> <p>The employment rate covered by agriculture is 1.74%.</p> <p>(According to the standardized methodology of the European Union, data on the entry of the workforce into the sector</p> <p>agriculture is expressed in so-called annual work units (English "Annual Work Unit", the abbreviation used is AWU).</p> <p>The labor force in agriculture recalculated according to the described AWU methodology in 2020 was</p> <p>5613 full-time jobs, i.e. 56.88% share of the total number of people working in agriculture.</p>	
43) Are state subsidies received for farming?	<p>For 2023</p> <p>Ministry of Agriculture - provision of subsidies financed exclusively from national sources</p> <p>20. Improvement of living conditions in livestock breeding</p> <p>20.A. Improvement of living conditions in dairy farming</p> <p>20.A.a. Support for supplying dairy cows with tempered water in the winter</p> <p>20.A.b. Support for carrying out on-farm diagnostics of the causative agents of dairy cow mastitis</p> <p>20.A.c. Supporting the reduction of harmful pathogenic microorganisms in the stable environment</p> <p>dairy cows</p> <p>20.A.d. Support for treatment of limbs according to the individual needs of dairy cows</p> <p>20.A.e. Support for measures to reduce the heat stress of dairy cows in the summer</p> <p>20.B. Improvement of living conditions in poultry farming</p> <p>subsidy subprogramme: 20.B.a. Support for the improvement of the poultry environment</p> <p>subsidy subprogramme: 20.B.b. Promoting the gentle handling of poultry</p> <p>subsidy subprogramme: 20.B.c. Support for the improvement of poultry housing conditions in halls</p> <p>subsidy subprogramme: 20.B.d. Support for the improvement of poultry barn microclimate</p> <p>subsidy subprogram: 20.B.e. Supporting the gentle treatment of ducks</p>	<p>2023</p> <p>/</p> <p><a href="https://www.cschms.cz/DOC_DOTACE_formulare/239_Zasady_-_narodni_dotace_2023.pdf">https://www.cschms.cz/DOC_DOTACE_formulare/239_Zasady_-_narodni_dotace_2023.pdf</a> /</p>



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	<p>subsidy subprogramme: 20.B.f. Support for improving the housing conditions of ducks in halls</p> <p>20.C. Improvement of living conditions in pig farming</p> <p>subsidy subprogramme: 20.C.a. Support measures to reduce the heat stress of pigs in the summer period</p> <p>subsidy subprogramme: 20.C.b. Support for improving the stable microclimate of pigs</p> <p>subsidy subprogramme: 20.C.c. Support for the improvement of the pig environment</p> <p>subsidy subprogramme: 20.C.d. Support measures to ensure an improved light regime</p> <p>subsidy subprogramme: 20.C.e. Support for gentle methods of pig castration</p> <p>subsidy subprogramme: 20.C.f. Support for increasing the unslatted area of pig pens</p> <p>subsidy subprogramme: 20.C.g. Support for increased care for sows and piglets in farrowing wards</p> <p>20.D. Improving the living conditions of cattle reared in the non-market breeding system</p> <p>milk production</p> <p>subsidy subprogramme: 20.D.a. Support for feeding cows reared in a non-market farming system</p> <p>milk production (hereinafter referred to as "KBTPM") in the winter season with tempered water</p> <p>subsidy subprogramme: 20.D.b. Support for increasing the surface area of the wintering area in the winter</p> <p>period for KBTPM</p> <p>subsidy subprogramme: 20.D.c. Support for sectional operation of the wintering grounds in the winter season at</p> <p>KBTPM</p> <p>subsidy subprogramme: 20.D.d. Support for the implementation of KBTPM treatment in the summer period</p> <p>against annoying insects</p> <p>subsidy subprogramme: 20.D.e. Support for treatment of limbs according to the individual needs of KBTPM</p> <p>subsidy subprogramme: 20.D.f. Support for the breeding of calves born by KBTPM calf breeding technology</p>	
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	<p>Kindergarten way</p> <p>20.E. Improvement of living conditions in the breeding of fattened bulls</p> <p>subsidy subprogramme: 20.E.a. Support for feeding fattened bulls in winter</p> <p>tempered water</p> <p>subsidy subprogramme: 20.E.b. Support for the implementation of measures in the stable to reduce thermal</p> <p>stress of fattened bulls in summer</p> <p>subsidy subprogramme: 20.E.c. Support for increasing the area of the lying area in breeding</p> <p>of fattened bulls in a barn with litter operation technology</p> <p>subsidy subprogramme: 20.E.d. Support for increasing the area of the pen in the breeding of fattened bulls in</p> <p>stables with full-slat housing technology</p> <p>subsidy subprogramme: 20.E.e. Support for the breeding of fattened bulls kept in stables with</p> <p>technology of litter operation with treated deep bedding</p> <p>subsidy subprogramme: 20.E.f. Support for the breeding of fattened bulls kept in stables with</p> <p>technology of litter operation with frequently changed bedding</p>	
44) Who are the main stakeholders involved in the production?	<p>Number of agricultural holdings by type of farming</p> <p>Dairying: Economic size Small 26</p> <p>Medium 17</p> <p>Large 10</p> <p>Cattle – rearing and fattening: Economic size Small 401</p> <p>Medium 149</p> <p>Large 4</p> <p>Cattle – dairying, rearing and fattening combined:</p> <p>Economic size Small 22</p> <p>Medium 6</p> <p>Large 1</p> <p>Sheep, goats and other grazing livestock:</p>	Czech statistical office



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	<p>Economic size Small 199</p> <p>Medium 13</p> <p>Large 0</p> <p>Pig breeding: Economic size Small 7</p> <p>Medium 1</p> <p>Large 1</p> <p>Poultry farming: Economic size Small 2</p> <p>Medium 6</p> <p>Large 7</p> <p>Various granivores combined: Economic size Small 1</p> <p>Medium 0</p> <p>Large 0</p> <p>Mixed production: Economic size Small 161</p> <p>Medium 79</p> <p>Large 34</p>	
45) Which is the main residue produced in each case?	Livestock manure	
46) How much slurry/manure/other residue is produced in average (t/head) and in the region (total)?	<p>Annual amount of feces, i.e. undiluted slurry or of fresh poultry droppings per animal</p> <p>unit:</p> <p>Cattle: 13.90 t/y</p> <p>Pigs: 3.70 t/year</p> <p>Poultry: 0.07 t/y</p> <p>Sheep, goats: 0.55 t/y</p> <p>Horses: 6.4 t/y</p> <p>/ Appendix No. 3 to Decree No. 274/1998 Coll. (recalculated according to the average weight of the animal) /</p> <p>Total production of faeces by number of animals in MS region as of 1/4/2022</p> <p>(i.e. also what remains, e.g. on pasture)</p> <p>Cattle: 88,034 pcs. 1,224 thousand t/y</p> <p>Pigs: 30012 pcs. 111 thousand. t/y</p> <p>Poultry: 994.4 thousand pcs. 69 thousand t/y</p>	

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	<p>Sheep, goats: 15,211 pcs. 8 thousand t/y</p> <p>Horses: 2747 pcs. 17 thousand t/y</p> <p>Total: 1429 thousand t/y</p>	
<p>47) Is the slurry/manure/other exploited? (Indicate the percentage that is currently used) If not, how are the residues managed?</p>	<p>Use of farm fertilizers on agricultural land - consumption in MS for 2022: 699156 t.</p>	<p>Publication 2022 - CZ</p> <p>Use as an input substrate of biogas stations – less than 20% of farmyard manure production</p> <p><a href="https://www.czbiom.cz/wp-content/uploads/casopis_Biom_2022_0_20220906-FIN-WEB.pdf/">https://www.czbiom.cz/wp-content/uploads/casopis_Biom_2022_0_20220906-FIN-WEB.pdf/</a></p> <p>Publication 2017 – Czech Republic</p> <p>Cattle and pig slurry and manure (46%) are most often used to produce biogas in the Czech Republic.</p> <p>(<a href="https://www.komunalniekologie.cz/info/bioplyn-muze-nahradit-zemni-plyn-ve-ctvrtine-households-and-also-by-a-quarter-increase-the-share-of-organic-matter-in-the-farm">https://www.komunalniekologie.cz/info/bioplyn-muze-nahradit-zemni-plyn-ve-ctvrtine-households-and-also-by-a-quarter-increase-the-share-of-organic-matter-in-the-farm</a>)</p>
<p>48) Average selling price for the slurry/manure/other?</p>	<p>It can be used to evaluate the waste products of animal production (slurry, manure) for the production of biogas</p> <p>the same principle as in the case of using these products for fertilization in plant production (Poláčková a et al., 2010). This means that the amount of nutrients contained in slurry and manure is valued according to relative purchase prices of nutrients in industrial fertilizers.</p> <p>Under the conditions considered in the above calculations, an average price of manure can be proposed</p> <p>for the calculation of own costs in the amount of 250 CZK/t of manure. Recommended average price of manure for</p> <p>the calculation of own costs is 150 CZK/t slurry.</p>	<p>2013</p>
<p>49) Which are the future perspectives? (Valorisation technologies, cattle, employment rate, farm modernisation, increase of large exploitations, decrease of livestock production, etc.)</p>	<p>By 2050, a significant reduction in pig and poultry breeding is expected in most regions of the Czech Rep., a</p> <p>on the contrary, a significant increase in the number of sheep, horses and goats kept. The use of biogas as a source of electricity in particular is concentrated in the service sectors</p>	<p><a href="https://portal.cenia.cz/eiasea/download/U0VBX01TSzAyN0tfbmF2cmhfODUxMTc0MjlyMDkzNjksNjg">https://portal.cenia.cz/eiasea/download/U0VBX01TSzAyN0tfbmF2cmhfODUxMTc0MjlyMDkzNjksNjg</a></p> <p>yMC5wZGY/MSK027K_navrh.pdf /</p>

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	<p>and agriculture. In agriculture, these are biogas stations using residual biomass and slurry from agricultural and animal production for the production of electricity and heat, especially for own consumption.</p> <p>The production of biogas in "farm" BPS requires for the preparation of the input substrate to fermenter, especially corn silage or other crops with a higher gas yield. Farmed animals are only a source of slurry and manure, which has a very low gas yield and serves primarily to dilute the substrate for the fermenter of the biogas station.</p> <p>Wolves cause considerable damage to small farmers of sheep and goats. Therefore Moravian-Silesian Region compensates to them for the losses caused by this still critically endangered animal in herds.</p>	
SECONDARY SECTOR		
AGROINDUSTRY		
Questions	Answer	Comments
50) How many agrifood industries are there in the region?	<p>Production of dairy products, treatment of milk</p> <p>Production, processing and canning of meat and meat products</p> <p>Production of bakery, confectionery and other flour products</p> <p>Production of sugar from sugar beet</p> <p>Processing and canning of fruits and vegetables</p> <p>Production of mill and starch products</p>	
51) Which are the main products produced?	<p>Milk and milk products</p> <p>Meat and meat products, eggs</p> <p>Bakery and confectionery products</p> <p>Sugar</p> <p>Potato semi-finished products, processed vegetables, fresh vegetable and fruit juices</p> <p>Flour, starch, fine fermentable grain spirit</p>	
52) Which is the annual average production in the main agrifood industries?	<p><b>2021</b></p> <p>Milk production, total: 181,1 mil. L</p> <p>Production of livestock for slaughter - Cattle: 9544 tonnes of live weight</p> <p>- Pigs: 5687 tonnes of live weight</p> <p>Meat production in terms of carcass weight:</p> <p>- Beef 2989 tonnes</p> <p>- Veal 7 tonnes</p> <p>- Pigmeat 14256 tonnes</p>	<p><a href="https://www.czso.cz/csu/czso/11-zemedelstvi-rumfyzqa27/">https://www.czso.cz/csu/czso/11-zemedelstvi-rumfyzqa27/</a></p> <p>/ <a href="https://www.mjm.cz/skrobarna-lihovar-mlyn/">https://www.mjm.cz/skrobarna-lihovar-mlyn/</a></p>

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	<p>Production of poultry for slaughter: 7089 tonnes of live weight</p> <p>Production of eggs for consumption, total: 18,2 mil. Pieces</p> <p>The annual capacity of the distillery represents the production of approximately 1.4 million liters of absolute alcohol. During the beet campaign, 12,500 t of beet are processed per day. One sugar beet weighs approximately 0.75 kg and contains 16-18% sugar.</p> <p>Calculation: 7.5.10-4 t of beet contains 0.12 kg of sugar, 12,500 t of beet contains 2,000 t of sugar, i.e. 2000 t of sugar are produced daily</p>	
53) Are companies producing organic or agrifood products receiving subsidies?	<p>EU funds and national support contribute to increasing the competitiveness of domestic producers. These are mainly instruments of the Common Agricultural Policy (CAP) and other funds.</p> <p>In 2020, milk processors were supported by national subsidies focusing on the quality of production. This was the national subsidy program 19. A – milk quality regime, to which 500 million CZK was allocated, within the framework of 20. A – improved conditions for breeding dairy cows, 450 million CZK was allocated. As part of direct payments, dairy farmers were paid voluntary production-linked support (VCS) for sensitive commodities (the rate was CZK 4,012.38/VDJ). As part of the Rural Development Program to improve the welfare of animals, dairy farmers received compensation payments in the amount of CZK 629 million.</p> <p>Subsidy program 13. SUPPORT FOR THE PROCESSING OF AGRICULTURAL PRODUCTS</p> <p>Organic food producers, including farm processors, are supported under the Rural Development Program under Operation 4.2.1 Processing and marketing of agricultural products.</p>	<p>/ <a href="https://www.szif.cz/cs/nd-dotacni-programy-13/">https://www.szif.cz/cs/nd-dotacni-programy-13/</a></p> <p>/ <a href="https://pro-bio.cz/pro-zpracovatele/dotace-a-legislativa-zpracovatelu/">https://pro-bio.cz/pro-zpracovatele/dotace-a-legislativa-zpracovatelu/</a></p> <p><a href="https://eagri.cz/public/web/file/720074/Panorama_potravinarskeho_prumyslu_2020_WEB.pdf/">https://eagri.cz/public/web/file/720074/Panorama_potravinarskeho_prumyslu_2020_WEB.pdf/</a></p>
54) What is the percentage of employment covered by agroindustries?	<p>2021</p> <p>Classification of economic activities (CZ-NACE): Manufacturing industry - 162.5 thousand people older than or equal to 15 years</p> <p>(it would like to ask CZSO about CZ-NACE C 10 production of food products and C 11 Production of beverages.</p> <p>Similar to forestry and logging, animal husbandry and mixed farming)</p>	<p><a href="#">Výstupní objekt VDB (czso.cz)/</a></p>



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<p>55) What is the main economic limitation (energy cost, supply chain...) faced by agroindustries?</p>	<p>Among the factors affecting economic development are the difficulty of conditions associated with COVID-19, the war conflict in Ukraine or the energy crisis.</p> <p>What complicated the situation for food producers were the hygiene rules during production, which are set relatively high, especially in some fields. It also concerned employees. These measures increased the cost of production, while in some cases prices remained below cost.</p> <p>Recruiting was becoming another key issue. The need for qualified employees turns out to be particularly difficult for larger industries, such as the meat industry or bakeries and confectionery. Motivation using higher wages is not enough, because in the meat industry it is physically quite demanding work and in bakeries it is a four-shift work operation. In some fields, employment is seasonal.</p> <p>In the production of food, which includes a relatively large range of companies, there is constant strong competition, which is further intensified by the import of foreign food, especially from EU countries.</p> <p>Some of the food businesses have ceased operations and a decisive part is looking for cost-saving measures to survive. One of the tools in which they are looking for a solution is the price increase that occurs throughout the food chain.</p>	<p><a href="https://eagri.cz/public/web/file/720074/Panorama_potravinarskeho_prumyslu_2020_WEB.pdf">https://eagri.cz/public/web/file/720074/Panorama_potravinarskeho_prumyslu_2020_WEB.pdf</a> /</p>
<p>56) Which type of wastes/side-products/residues are produced?</p>	<p>By-products / residues / waste - meat industry</p> <p>Fats, giblets, blood, parts of the digestive tract, bones, skin, skin products, horn, gland, feathers, egg waste, shells / waste water, bedding, unused parts of animals slaughtered in slaughterhouses.</p> <p>In the dairy industry, there are mainly by-products such as buttermilk and whey, which are perfectly usable.</p> <p>Only centrifuge sludge can be called waste, which contains various mechanical impurities (hair, feed, litter, dust), can be contaminated with pathogens, and is therefore processed in rendering plants or incinerated.</p> <p>Fruit and vegetable processing</p> <p>Presses from the pressing of fruit juices (mainly apple), cores, stones.</p> <p>Waste from bakeries and confectionery factories</p> <p>Raw materials unsuitable for consumption or processing, for example: yeast</p> <p>Waste preservatives</p>	<p>/ <a href="https://docplayer.cz/44633462-Otpady-z-potravinarskych-vyrob-masny-prumysl-kafilerni-zpracovani-odpadu-pitna-voda-nealko.html">https://docplayer.cz/44633462-Otpady-z-potravinarskych-vyrob-masny-prumysl-kafilerni-zpracovani-odpadu-pitna-voda-nealko.html</a> /</p> <p>/ <a href="http://odpadovy-hospodar.cz/oduad-2/mlekarensky-prumysl/">http://odpadovy-hospodar.cz/oduad-2/mlekarensky-prumysl/</a> /</p> <p>/ <a href="http://odpadovy-hospodar.cz/oduad-2/zpracovani-ovoce-a-zeleniny/">http://odpadovy-hospodar.cz/oduad-2/zpracovani-ovoce-a-zeleniny/</a> /</p> <p>/ <a href="https://www.katalogodpadu.cz/odpad/odpady-z-pekaren-a-vyroby-cukorvinek/">https://www.katalogodpadu.cz/odpad/odpady-z-pekaren-a-vyroby-cukorvinek/</a> /</p> <p>/ <a href="https://www.mjm.cz/mlin-krnov/">https://www.mjm.cz/mlin-krnov/</a> /</p> <p>/ <a href="https://www.korunnickr.cz/o-nas/vyroba/">https://www.korunnickr.cz/o-nas/vyroba/</a> /</p>

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	<p>Sludge from wastewater treatment at the point of origin</p> <p>Production of mill and starch products</p> <p>They are produced in the mill as a by-product of the production of wheat bran.</p> <p>Byproducts of sugar production - feed pellets, molasses, calcium carbonate.</p> <p>Waste is soil from cleaning and washing beets, waste water.</p>	
57) How much wastes/side-products/residues are produced?	<p>The problem of determining production and preventing the creation of food waste is currently being solved within the project SS02030008 "Environmental Research Center: Waste and Recycling Management and Environmental Safety (CEVOOH)", where a methodology for measuring food waste is being prepared in close cooperation with the MoE. The finding so far is the fact that obtaining reliable data from the first three stages of the food chain is very problematic. It is practically impossible to get into the operations for direct measurement, questionnaire surveys carried out for the phases of the food chain, primary production and processing and production, have a low success rate and little informative value. These conclusions are also confirmed by other studies conducted under the auspices of the Ministry of the Czech Republic, similar to foreign research.</p>	<p><a href="https://cevooh.cz/wp-content/uploads/2023/02/SS02030008-V32_casopis-VTEI-4-22-Problematika-potravinovych-odpadu.pdf/">https://cevooh.cz/wp-content/uploads/2023/02/SS02030008-V32_casopis-VTEI-4-22-Problematika-potravinovych-odpadu.pdf/</a></p>
58) Are the wastes/side-products/residues exploited? (Please specify for which application)	<p>By-products / residues / waste - meat industry</p> <p>Use of leather</p> <p>The hides are processed into leather in tanneries or used in the production of collagen and gelatin.</p> <p>The use of horn</p> <p>Horns (hooves, years, hooves, hooves) are the raw material for the production of protein hydrolysates, feed mixtures, hoof oil, etc., bristles and hair are used in brush shops.</p> <p>Utilization of fats</p> <p>Fats (pork lard, beef tallow, fat trap contents) are raw materials in the meat and fat industry.</p> <p>Use of offal</p> <p>Offal (kidneys, liver, tongues, meat from the heads, etc.) are processed together with meat into meat products, delivered frozen for sale or used for pharmaceutical purposes.</p> <p>Use of blood</p> <p>Blood is used in meat products, preserves or also in feed.</p>	<p>/ Meat processing - Waste manager (odpadovy-hospodar.cz) /</p> <p>/ <a href="http://odpadovy-hospodar.cz/oduad-2/zpracovavani-ovoce-a-zeleniny/">http://odpadovy-hospodar.cz/oduad-2/zpracovavani-ovoce-a-zeleniny/</a> /</p> <p>/ <a href="https://www.mjm.cz/mlyn-krnov">https://www.mjm.cz/mlyn-krnov</a></p> <p>/ <a href="https://www.korunnickr.cz/o-nas/vyroba/">https://www.korunnickr.cz/o-nas/vyroba/</a> /</p>



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	<p>Bowel utilization</p> <p>Intestines are used as packaging for meat products or for making strings and sewing leather.</p> <p>Use of the digestive tract</p> <p>The contents of the digestive tract are processed by composting.</p> <p>Use of glands</p> <p>The glands are used in the pharmaceutical industry to produce drugs.</p> <p>Use of bones</p> <p>Bones are used to make gelatin, feed flour, and fertilizers.</p> <p>Use of feathers</p> <p>Feathers are used as a filling for bedding, for the production of nitrogenous fodder, and lightweight building materials.</p> <p>Fruit and vegetable processing</p> <p>The most important by-product is the pulp from the pressing of fruit juices (mainly apple), which can be fed and also used for the production of apple pectin and dietary fiber. Oils used in the pharmaceutical and cosmetic industry are obtained from the kernels and seeds by extraction. Other such oils are fed after extraction. Seed shells can be used as a filler in building materials.</p> <p>Production of mill and starch products</p> <p>The bran goes back to local farmers as livestock feed.</p> <p>Sugar production</p> <p>Molasses is a valuable raw material for the yeast and feed industry, as well as for alcohol production. The leached cuttings are sold as animal feed after a mechanical pressing process. The non-sugar substances in the raw juice bind to the lime produced in the own limestone and precipitate into calcium carbonate, which is again supplied to the soil.</p>	
59) What are the future perspectives? (Techniques, products, production, employment)	<p>The characteristics of the Food Products Manufacturing sector are characterized by fragmentation, not only by sector, but above all by the wide range of production offered to consumers. Entrepreneurially active producers will continue to innovate the existing food assortment. Food and agricultural products bearing the marks of the European Product Name Protection System also have increased protection.</p>	<p><a href="https://eagri.cz/public/web/file/720074/Panorama_potravinarskeho_prumyslu_2020_WEB.pdf">https://eagri.cz/public/web/file/720074/Panorama_potravinarskeho_prumyslu_2020_WEB.pdf</a> /</p>

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	<p>The engine for these activities is both internal and external competition. Food self-sufficiency should gradually increase, regardless of the difficulty of conditions associated with COVID-19, the war conflict in Ukraine or the energy crisis.</p> <p>A measure to deal with unfair business practices, which is also being transformed from the EU to the national level, should contribute to the improvement of market rules. The legislative process is still ongoing. Small and medium-sized enterprises in particular should be better protected.</p> <p>It can be assumed that with the support of the state administration and the EU, the modernization of technological equipment will continue. Funds invested in robotics and digitization should enable technological improvements, strengthen product and technological innovations, and save manpower. Closer cooperation with research institutions and the research component should also contribute to this.</p> <p>On the other hand, in the coming years, the already relatively "tough" hygiene measures in the production sectors will be tightened.</p> <p>The differentiation of consumers who are changing their eating habits will also continue. In addition to vegetarians and vegans, consumers will be more differentiated according to their purchasing power, and the assortment will adapt to this in terms of quality and price, from delicacies to standard production.</p> <p>It makes no sense to predict specific data in ever-changing macroeconomic conditions with high inflation. It is highly likely that the assessed sector will fulfill the strategic objectives of the MZE and strive for long-term sustainability.</p>	
60) Which are the main stakeholders of the local agrifood industry?	<p>Milk and milk products</p> <ul style="list-style-type: none"> <li>- EKOMILK a.s., MILKEFFEKT, a.s., Mlékárna Kunín, s.r.o.</li> </ul> <p>Meat and meat products (Production, processing and preservation of meat and meat products)</p> <ul style="list-style-type: none"> <li>- SLAUGHTERHOUSE - KURKA s.r.o., TÚŠÍNSKÉ JATKY HOLDING, S.R.O., PENSAM s.r.o.</li> </ul> <p>Bakery and confectionery products (Manufacture of bakery, confectionery and other flour products)</p> <ul style="list-style-type: none"> <li>- Opava is home to the largest and most modern biscuit factory of Mondelēz International in Europe. Opavia</li> </ul> <p>Production of sugar from sugar beet</p> <ul style="list-style-type: none"> <li>- Moravskoslezské cukrovarny s.r.o. - spin-off plant Opava</li> </ul> <p>Processing and canning of fruits and vegetables</p> <ul style="list-style-type: none"> <li>- Beskyd Fryčovice, a.s.</li> </ul>	

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	Production of mill and starch products, distillery - MJM agro, a.s.	
<b>BIO-BASED INDUSTRIES</b>		
Questions	Answer	Comments
61) Is there a mapping of the current bio-based industrial activities in your area?	No.	
62) How many biobased industries are there in the region? Please specify the main biobased products produced	<p>Organic agriculture and organic animal husbandry - milk and dairy products, bread, spices, flour, pasta, eggs, chicken, pork and beef, fruit, vegetables, dried fruit</p> <p>Processing of biodegradable waste, sewage sludge, including animal by-products – compost, biofuels, fertilizer</p> <p>Energy use of biomass - bioenergy</p> <p>Biogas stations – biogas, fertilizer, compost</p> <p>Processing of wood into pulp - pulp, biorefinery products, energy</p> <p>Production of woolen blankets and other bedding - woolen blankets and other bedding</p> <p>Production of wood pellets from wood and wood biomass - biofuel</p> <p>Production of natural cosmetics, oils and ointments - herbal ointments, oils from herbs and plant extracts, creams</p> <p>Production of stone wool - insulating materials - ROCKWOOL</p> <p>Production of medicines and supplements - Walmark Třinec, Teva Czech Industries s.r.o.</p>	
63) Out of the previous list indicate the three more relevant in terms of revenues and role to meet the government strategic objectives (decarbonisation, CO2 emissions, circular economy, etc.)	<p>Organic agriculture and organic animal husbandry</p> <p>Processing of wood into pulp - pulp, biorefinery products, energy</p> <p>Production of wood pellets from wood and wood biomass - biofuel</p>	
64) Are state subsidies received to promote sustainable production by these industries?	<p>Organic food producers, including farm processors, are supported under the Rural Development Program under Operation 4.2.1 Processing and marketing of agricultural products.</p> <p>State agricultural intervention fund - 23.70 - Ecological agriculture</p> <p>The Ministry of Agriculture announced the 14th round of receiving applications for subsidies in the</p>	<p>/ <a href="https://pro-bio.cz/pro-zpracovatele/dotace-a-legislativa-zpracovatelu/">https://pro-bio.cz/pro-zpracovatele/dotace-a-legislativa-zpracovatelu/</a> /</p> <p>/ <a href="https://eagri.cz/public/web/mze/dotace/szp-pro-obdobi-2021-2027/rozvoj-venkova/ekologicke-zemedelstvi/ekologicke-zemedelstvi/x23-70-ekologicke-zemedelstvi.html/">https://eagri.cz/public/web/mze/dotace/szp-pro-obdobi-2021-2027/rozvoj-venkova/ekologicke-zemedelstvi/ekologicke-zemedelstvi/x23-70-ekologicke-zemedelstvi.html/</a></p>

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	<p>Rural Development Program for 6.4.1 Investments in non-agricultural activities - plan c) Construction and modernization of equipment for the production of shaped biofuels.</p> <p>Operational program Environment - specific objective 1.5 Support for the transition to a circular economy using resources efficiently - biogas stations</p> <p>HEAT Call No. 1/2022 - Modernization of heating plants (SZTE)</p> <p>SFŽP CR, Modernization fund, support programs</p> <p>(Currently known subsidy titles practically do not allow financing of equipment for energy or other use of SKO.</p> <p>A certain possibility is offered with a new EU initiative, which is the so-called "Coal Platform for Regions in Transition". The aim of this platform is to compensate for the effects in the given regions, in our case it is the Moravian-Silesian Region, which reduce coal mining and gradually switch to "clean energy". The construction of a ZEVO or two ZEVOs falls under the project "Optimization of MSK's heating system", which must reflect gradual decarbonization, which is also enhanced by the intended termination of hard coal mining in OKD s.s. in a 5- to 10-year horizon."</p>	<p>/ <a href="https://energie21.cz/dotace-na-vyrobu-pelet-z-biomasy/">https://energie21.cz/dotace-na-vyrobu-pelet-z-biomasy/</a> /</p> <p>/ <a href="https://www.odpadovapradsenska.cz/dotace-z-opzp/">https://www.odpadovapradsenska.cz/dotace-z-opzp/</a></p> <p><a href="https://www.sfzp.cz/dotace-a-pujcky/modernizacni-fond/vyzvy/detail-vyzvy/?id=19">https://www.sfzp.cz/dotace-a-pujcky/modernizacni-fond/vyzvy/detail-vyzvy/?id=19</a></p> <p><a href="https://www.sfzp.cz/dotace-a-pujcky/modernizacni-fond/programy/">https://www.sfzp.cz/dotace-a-pujcky/modernizacni-fond/programy/</a></p> <p><a href="https://www.msk.cz/assets/temata/zivotni_presti/navrhova-cast-ps-poh-msk_2.pdf">https://www.msk.cz/assets/temata/zivotni_presti/navrhova-cast-ps-poh-msk_2.pdf</a> )</p>
65) What is the percentage of employment covered by biobased industries?	<p>Due to its mountainous relief, the Moravian-Silesian Region belongs to the regions with a significant share of ecologically managed land. Permanent grasslands predominate here, which are used in the organic farming regime for cattle, sheep, goats and horses, and organic fruit growing is also developing here. In 2021, the area of ecologically managed land was 59.5 thousand ha, while the share of ecologically managed land on the area of agricultural land of the region recorded in the LPIS was 27.6%. The Moravian-Silesian Region ranks among the regions with the highest number of eco-farms, in 2021 their number was 433 out of a total of 4,794. In the Moravian-Silesian Region, 65 organic food producers out of a total of 944 organic food producers in the Czech Republic were registered in 2021 according to their headquarters.</p> <p>Processing of wood into pulp - The production plant in Paskov is used for the sustainable production of fibers in the Lenzing group - 520 employees.</p>	<p>/ <a href="https://www.cenia.cz/wp-content/uploads/2023/02/Kraje_MORAVSKOSLEZSKY_2021.pdf/">https://www.cenia.cz/wp-content/uploads/2023/02/Kraje_MORAVSKOSLEZSKY_2021.pdf/</a></p> <p>/ <a href="https://kportal.vsb.cz/company/6b9cf6c8-1908-486b-81b0-87745629562a/">https://kportal.vsb.cz/company/6b9cf6c8-1908-486b-81b0-87745629562a/</a></p> <p>/ <a href="https://www.teva.cz/news-and-media/feature-stories/cesi-chteji-leky-vyrobeny-v-evrope/">https://www.teva.cz/news-and-media/feature-stories/cesi-chteji-leky-vyrobeny-v-evrope/</a></p>



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	<p>Pharmaceutical production: Walmark approx. 500 employees</p> <p>Teva Czech Industries s.r.o. - the production plant Teva Czech Industries, s.r.o., which employs more than 1,500 people</p> <p>(Employment is generally problematic, even considering that it is not very clear which manufacturing sector to include)</p>	
<p>66) How many tonnes of biobased materials/products are produced per year? Please specify by typology (renewable energies, biofuels, biomaterials, biochemicals, biobased cosmetics/pharmacy, others)</p>	<p>Processing of wood for pulp: 282167 t of pulp/ 2021</p> <p>The production cycle of the line is 20 seconds and one bale of pulp is produced. 178 packages are produced per hour (22 units per hour). About 830 t of pulp are produced in 24 hours.</p> <p>Production of woolen blankets and other bedding: In our manufactory, we have been producing and improving blankets for 30 years, and more than 40,000 people sleep under them. That is approx. 1300 blankets per year.</p> <p>Besky woolen blankets — woolen blankets made of genuine sheep's wool from the Beskydy Mountains</p> <p>Teva Czech Industries s.r.o. - Delivers over 18 million packages of medicine to the Czech health system annually.</p>	<p><a href="https://www.lenzing.com/cs/lenzing-group/locations/lenzing-biodel-paskov">https://www.lenzing.com/cs/lenzing-group/locations/lenzing-biodel-paskov</a></p> <p><a href="https://digilib.k.utb.cz/bitstream/handle/10563/49990/v%C3%A1kov%C3%A1_2021_dp.pdf?sequence=-1">/https://digilib.k.utb.cz/bitstream/handle/10563/49990/v%C3%A1kov%C3%A1_2021_dp.pdf?sequence=-1 /</a></p> <p><a href="https://www.ceskeprikryvky.cz">/ceskeprikryvky.cz</a></p> <p><a href="https://www.teva.cz/news-and-media/feature-stories/cesi-chteji-leky-vyrobeny-v-evrope">/ https://www.teva.cz/news-and-media/feature-stories/cesi-chteji-leky-vyrobeny-v-evrope /</a></p>
<p>67) Which type of wastes/by-product, residue are produced in the production process?</p>	<p>Organic farming and breeding waste and by-products are practically the same as in non-organic, only they are probably organic.</p> <p>Production of pellets - separation of fine particles of the so-called scrap /</p> <p>Production of natural cosmetics - biodegradable waste, moldings</p> <p>Production of wool blankets and other bedding - biodegradable waste</p> <p>Production of stone wool - production waste 100% recyclable</p> <p>Processing of wood into pulp - magnesium lignosulfonate, Soda (sodium carbonate), cellulose leachates from the biorefinery</p>	<p><a href="https://www.drevenepelety.cz/jak-se-vyrabi-drevni-pelety/">https://www.drevenepelety.cz/jak-se-vyrabi-drevni-pelety/ /</a></p> <p><a href="https://www.lenzing.com/cs/lenzing-group/locations/lenzing-biodel-paskov/udrzitelnost/">https://www.lenzing.com/cs/lenzing-group/locations/lenzing-biodel-paskov/udrzitelnost /</a></p>
<p>68) What are the biobased materials, side-products, waste or residues used as raw materials in the productive process?</p>	<p>Wood, wood chips, wood biomass - processing of wood into pulp, wood pellets</p> <p>Sheep's wool - production of wool blankets and other bedding</p> <p>Herbs, seeds and nuts - production of natural cosmetics, oils and ointments, medicines</p>	

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	<p>Farm fertilizers - organic agriculture</p> <p>Natural stone - basalt, possibly gabbro or diabase - stone wool production</p> <p>Plant biomass, slurry - biogas stations</p> <p>Cellulose leachates – production of energy and heat</p>	
69) Where are these raw materials obtained or cultivated?	<p>Wood, wood chips, wood biomass - forest growth</p> <p>Sheep wool - sheep breeding</p> <p>Herbs, seeds and nuts - farmed land</p> <p>Farm fertilizers - animal husbandry</p> <p>Plant biomass, slurry - agriculture, cultivation of energy plants, animal husbandry</p> <p>Cellulose leachates – biorefineries</p>	
70) Which are the main stakeholders/actors supplying these raw materials?	<p>433 eco-farms in 2021</p> <p>Wood - Forests of the Czech Republic</p> <p>Cellulose leachates - Lenzing Biocel Paskov a.s.</p> <p>Raw materials for biogas stations - ZEMSPOL Studénka s.r.o., VÍTKOVSKÁ ZEMĚDĚLSKÁ s.r.o.</p> <p>AGRICULTURAL a.s. Opava-Kylešovice: provision of storage and logistics of plant raw materials (medicinal plants) for Tevu Industries s.r.o., manure for own biogas station.</p> <p>(Currently, the only recipient of TAPs produced at MoravianSilesian region is the cement plant in Hranice. It is preparing the investment construction of a multi-fuel fluid boiler capable of burning coal, biomass and TAPs (40,000t/year). Part of the commodities from the sorting of plastics and paper from private companies (FCC Czech Republic, s.r.o., Marius Pedersen a.s.) is exported from MoravianSilesian region to the surrounding regions for the production of TAP. The current most important producer of TAPs in MoravianSilesian region is the company OZO Ostrava s.r.o., which annually produces approximately 20 to 25,000t and which delivers them to the cement plant in Hranice. ejections from the sorting line of separately collected plastics and industrial waste. Industrial waste makes up approx. 70-80% of input material.</p> <p>Upcoming projects To meet the needs of MoravianSilesian region as well as parts of the surrounding regions, capacity expansion of TAP production at the OZO Ostrava s.r.o. facility is being prepared from the current capacity of 20,000 to 25 000t, up to the amount of 45,000t, where the input raw material will be waste from sorting lines and selected industrial waste. This capacity is coordinated with the expected sales of TAPs produced in the Hranice cement plant. Since OZO Ostrava s.r.o. has long-term experience in the production of TAPs in the mentioned manner, then it is desirable that this service be used for the entire MoravianSilesian region. A theoretical alternative to the use of TAP in the Hranice cement plant from the</p>	<p><a href="https://www.cenia.cz/wp-content/uploads/2023/02/Kraje_MORAVSKOSLEZSKY_2021.pdf">https://www.cenia.cz/wp-content/uploads/2023/02/Kraje_MORAVSKOSLEZSKY_2021.pdf</a></p> <p><a href="https://www.zasok.cz/onas/">https://www.zasok.cz/onas/</a></p> <p><a href="https://www.msk.cz/assets/temata/zivotni_prostredi/navrhova-cast-ps-poh-msk_2.pdf">https://www.msk.cz/assets/temata/zivotni_prostredi/navrhova-cast-ps-poh-msk_2.pdf</a></p>

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	<p>operation of OZO Ostrava s.r.o. a multi-fuel boiler of the company Veolia Energie ČR, a.s. is also being prepared in Teplárna Karviná. With this alternative, the manufacturer of TAPs, i.e. OZO Ostrava s.r.o. does not count and focuses on increasing the energy use of TAPs for Cement Hranice. Other fuel production projects are also being prepared by private collection companies such as Marius Pedersen a.s. Even if the production of TAP from materially unusable components of municipal waste (other than mixed municipal waste) is environmentally and economically advantageous, it does not reduce the amount of landfilling of mixed municipal waste, it must be remembered that this alternative will not contribute to the fulfillment of the EP and Council Directive 2018/851, as it is not a material use of municipal waste .</p>	
71) Which is the price of these biobased raw materials used (€/ton)?	<p>Residues after logging: 13.5 EUR/t</p> <p>Dry wood chips: EUR 74/t</p> <p>Basalt approx. 200 CZK/t - approx. 9 EUR/t</p> <p>Plant biomass, slurry, farm fertilizers, herbs, seeds and nuts are mostly self-produced</p> <p>Cellulose leachates: an intermediate product further processed for the production of energy and heat</p>	<p>/ <a href="https://kamenzbraslav.cz/wp-content/uploads/2017/11/cenikdobkovicky.pdf">https://kamenzbraslav.cz/wp-content/uploads/2017/11/cenikdobkovicky.pdf</a> /</p>
72) Which is the price of the main biobased products produced in the region (€/ton)?	<p>People can now buy the cheapest wood pellets in the MS region for 7.6 crowns, the price of the most expensive exceeded ten crowns per kilogram. – approx. 320 EUR/t to 420 EUR/t</p> <p>Rock wool thermal insulation:</p> <p>Earthenware plate approx. 100 kg/m<sup>3</sup> – 5000 CZK/m<sup>3</sup> i.e. 50000 CZK/t i.e. 2117 EUR/t</p> <p>Stone wool granules intended for thermal insulation 45 CZK/kg without VAT 21%, 54.45 CZK/kg with VAT - 54450 CZK/t, i.e. 2305 EUR/t</p>	<p>/ <a href="https://polar.cz/zpravy/moravskoslezsky-kraj/cely-ms-kraj/11000031307/energie-a-kraj-ceny-pelet-leti-vzhuru/">https://polar.cz/zpravy/moravskoslezsky-kraj/cely-ms-kraj/11000031307/energie-a-kraj-ceny-pelet-leti-vzhuru/</a></p> <p>/ <a href="https://www.rockwool.com/siteassets/rw-cz/dokumenty/cen%C3%ADk-a-katalogy/rockwool-katalog-cenik-cz-2023.pdf">https://www.rockwool.com/siteassets/rw-cz/dokumenty/cen%C3%ADk-a-katalogy/rockwool-katalog-cenik-cz-2023.pdf</a> /</p>
73) Which are the perspectives in the use of these biobased raw materials/side-products/waste?	<p>The positive development of organic agriculture (EC) is related to the setting of the conditions for EC measures within the framework of the PRD during the transition period of the Common Agricultural Policy. In 2021, entry into the EZ measures in the form of shortened annual commitments was made possible for all, including completely new applicants. The same conditions will also be in force for 2022, so a further increase in the interest of farms to enter the EZ measure is expected in this so-called transition period, before the new Strategic Plan and five-year commitments for the period 2023-2027 come into effect.</p>	<p>/ <a href="http://eagri.cz">eagri.cz</a> /</p> <p>/ <a href="#">cenia energetics MS region.pdf</a> /</p> <p>/ <a href="https://polar.cz/zpravy/moravskoslezsky-kraj/cely-ms-kraj/11000031307/energie-a-kraj-ceny-pelet-leti-vzhuru/">https://polar.cz/zpravy/moravskoslezsky-kraj/cely-ms-kraj/11000031307/energie-a-kraj-ceny-pelet-leti-vzhuru/</a></p>

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	<p>In addition, it is necessary to look for alternative sources for energy use, for example biogas and biomethane, in order to reduce the expected reduction of coal energy sources.</p> <p>Furthermore, according to the statistical data of the Institute for Forest Management in 2009, the potential of forest logging residues (LTZ) in the Moravian-Silesian Region in dry matter is 32,692 t/y. After deducting 30% for biological fertilization of the forest, the theoretical occurrence of dry matter for energy use is 22,884 t/y. With a dry wood calorific value of 17 GJ/t, the usable potential of LTZ is 389,035 GJ/year. LTZ can mainly be used in the form of wood chips and thus burned in REZZO 1 and 2 sources. They are also used to make wood pellets and briquettes for households.</p> <p>However, the increase in the prices of wood pellets and briquettes would not be so significant if the state prevented the mass export of wood and wood fuels from the Czech Republic.</p>	
74) Which are the perspectives in the consumption of these biobased products?	<p>Almost a fifth of the territory of the Moravian-Silesian Region is a protected area. Large-scale specially protected areas include the Beskydy Protected Area, the Jeseníky Protected Area and the Poodří Protected Area. The trend of a gradual reduction in the share of arable land in favor of permanent grassland continues. The share of non-agricultural land is also growing. The area of ecologically farmed land has increased.</p> <p>It will be necessary to focus primarily on more intensive promotion and visibility of high-quality Czech food and products and to use consumer interest in high-quality products and cosmetics.</p> <p>For decades, the region was dominated by heavy industry and the associated high energy consumption. Currently, most of the energy in the region is produced from coal (more than 80%). Due to the expected reduction of coal energy sources, the region will turn from being energy self-sufficient to a region importing energy from other regions of the Czech Republic and from abroad. Therefore, it is necessary to focus on the production of energy through renewable sources.</p> <p>Rockwool stone wool insulation materials are made from natural raw materials and are fully recyclable, thereby contributing to reducing the impact of the production process. Furthermore, a system of taking back these materials is practiced for the garden product Grodan used in greenhouses as planting blocks, which reduces the amount of waste to be disposed of.</p>	<p>/</p> <p><a href="https://www.czso.cz/documents/11288/17832997/33013422.pdf/e61f6dd3-a55b-4ee1-8c1c-0072e97e4eb0?version=1.1">https://www.czso.cz/documents/11288/17832997/33013422.pdf/e61f6dd3-a55b-4ee1-8c1c-0072e97e4eb0?version=1.1</a> /</p> <p><a href="https://www.msk.cz/kraj/zastupitelstvo/prilohy_usneseni.html?cp=1&amp;rz=z&amp;s=14&amp;cu=1717&amp;d=2019-12-12">https://www.msk.cz/kraj/zastupitelstvo/prilohy_usneseni.html?cp=1&amp;rz=z&amp;s=14&amp;cu=1717&amp;d=2019-12-12</a></p> <p><a href="https://www.rockwool.com/cz/odborne-rady-a-inspiration/vyhody-kamenne-vlny/renovitelnost-a-jak-se-vyrabi-kamenna-vlna/">https://www.rockwool.com/cz/odborne-rady-a-inspiration/vyhody-kamenne-vlny/renovitelnost-a-jak-se-vyrabi-kamenna-vlna/</a></p> <p><a href="https://www.growgarden.cz/grodan-rockwoolove-sadbovaci-kostky/?gclid=CjwKCAjwyeujBhA5EiwA5WD7_QSGPSVfGkFigtQQaPIlpVQPpx4-H4lip6IYL9W3ihF2_SpdJskDEdBoC5xwQAvD_BwE">https://www.growgarden.cz/grodan-rockwoolove-sadbovaci-kostky/?gclid=CjwKCAjwyeujBhA5EiwA5WD7_QSGPSVfGkFigtQQaPIlpVQPpx4-H4lip6IYL9W3ihF2_SpdJskDEdBoC5xwQAvD_BwE</a></p> <p>/https://www.lenzing.com/cs/lenzing-group/locations/lenzing-biodel-paskov/products /</p>



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	<p>The main product of the Lenzing Biocel Paskov company is chlorine-free bleached pulp, which is made from spruce wood. This pulp is used for the production of lyocell and viscose fibers. By-products are soda ash used for example as a cleaning agent in the glass and paper industry and magnesium lignosulfonate, which is the basis for a number of products: from animal feed to the ceramic industry, the production of refractory bricks and the tannery industry or the production of fiberboard and chipboard. It also serves as an additive for the construction industry and fertilizers.</p> <p>At the same time, the company is the largest source of biomass in the Moravian-Silesian region - so-called cellulose leachates, which are the most important source of energy. An amount of leachate with an energy content of 6,500,000 GJ/year is currently burned in the regeneration and sodium boilers, and in the KK steam boiler, approximately 1,000,000 GJ/year of the bark wood mixture created during wood processing is burned.</p>	
75) Please mention the 3 bio-based solutions with more relevance in your region (that can be taken as an example of implementation or good practice for other regions) and provide contact details if possible.	<p>The region itself and some cities develop above-standard activities within the Czech Republic in the area of climate impact mitigation (SECAP in Ostrava, reducing energy intensity, support of renewable energy sources), and especially adaptation to climate change, e.g. Ostrava, Hlučín, Opava, Hives. Processing the vulnerability of the territory, adaptation strategies and action plans can be a guide for other cities and regions of the region that have not yet progressed in considering the response to drought, heat, extreme weather conditions, etc.</p> <p>In the region, which in the past was among the most polluted in the Czech Republic, there are both intensive industrial and ideal recreational areas. Landscaping and extensive agricultural programs are currently being developed, especially in mountainous areas, in which organic farming has a significant presence. Almost a fifth of the agricultural land in the Moravian-Silesian Region is managed ecologically. Ecological pastures with cows, sheep, goats and horses are predominant here. Fruit growing and farm processing of meat and dairy products are developing successfully. Farms in the mountains and foothills of the Beskydy and Jeseník mountains offer accommodation and catering from farm produce.</p> <p>Production of wood pellets from wood and wood biomass - companies Revosolar, MADER lesnická firma, s.r.o.</p>	<p><a href="https://www.msk.cz/kraj/zastupitelstvo/prilohy_u_sneseni.html?cp=1&amp;rz=z&amp;s=14&amp;cu=1717&amp;d=2019-12-12">https://www.msk.cz/kraj/zastupitelstvo/prilohy_u_sneseni.html?cp=1&amp;rz=z&amp;s=14&amp;cu=1717&amp;d=2019-12-12</a></p> <p>Specific farms: <a href="https://eagri.cz/public/web/file/483208/Nahled_Bio_Moravskoslezsky_kraj.pdf">https://eagri.cz/public/web/file/483208/Nahled_Bio_Moravskoslezsky_kraj.pdf</a></p>
76) Please mention 3 bio-based solution in your region that have high deployment potential in your region but still	<p>Plantations of energy plants and crops are a potential, but still minimally used source of biomass for energy use. However, this does not apply to cultivated corn, a large part of which is already currently used for the production of biogas in so-</p>	

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need support to accelerate-unlock its potential. ( please mention what technological, regulatory and market challenges are and provide contact details if possible)	<p>called "farm" biogas stations, and also to rapeseed oil, from which biodiesel is mainly produced (by esterification of unsaturated fatty acids from rapeseed oil), which, however, is used almost exclusively in transport.</p> <p>It is optimal to grow energy plants and crops on unused arable land freed from use for food purposes, or on existing grasslands. In addition to unused arable land (1,550 ha), it would be possible to use part of the still unused area of permanent grassland (3,590 ha) for the cultivation of energy crops and plants.</p> <p>Another area that can be used for growing energy crops and plants is areas of reclamation. In 2017, the area affected by mining in the Moravian-Silesian Region was 12,421.7 ha, which corresponds to 2.3% of the area of the region. Furthermore, in this year there were 672 ha of reclamation in progress and 2,607 ha of completed reclamation. However, the condition for their use is the completion of the basic phase of recultivation and the subsequent creation of full-fledged agricultural land. The potential of the area for purposefully grown energy crops is therefore set at <math>3,590+672+2,607 = 6,869</math> ha.</p>	
<b>ENERGY INDUSTRY</b>		
Questions	Answer	Comments
77) How many energy industries are there?	<p>More than four fifths of the installed capacity of power plants in the Moravian-Silesian Region in 2021 consisted of steam power plants (86.2%). Gas-fired (6.4%), photovoltaic (4.2%), wind (1.9%) and water (1.2%) power plants participated in the remaining installed capacity.</p> <p>Almost 96% of the electricity in 2021 was produced in the Moravian-Silesian region by steam and gas-fired power plants (85.1% and 10.8%, respectively). The remaining less than 4.0% of electricity was produced in power plants using "renewable sources"</p> <ul style="list-style-type: none"> <li>- 1.3% of energy was produced by photovoltaic power plants, 1.3% by hydroelectric power plants and 1.5% by wind power plants.</li> </ul>	<p>/ <a href="https://www.czso.cz/csu/xt/energetika-v-moravskoslezskem-kraji-v-roce-2021/">https://www.czso.cz/csu/xt/energetika-v-moravskoslezskem-kraji-v-roce-2021/</a></p>
78) Does the main part of energy come from renewable or non-renewable energy?	Non-renewable energy	
79) What is the main source of renewable energy?	Wind power plant	
80) What is the main source of non-renewable energy?	Black coal	
81) Are state subsidies received to promote renewable energies?	A Just Transition Mechanism for Coal Regions	<p>/ <a href="https://www.msk.cz/cs/temata/cestovni_ruch/sp-ravedliva-transformace-kraje-2617/">https://www.msk.cz/cs/temata/cestovni_ruch/sp-ravedliva-transformace-kraje-2617/</a></p>

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	<p>The modernization fund as a tool for the energy transformation of the region</p> <p>Objective: The modernization fund provides support for the transformation of the energy sector itself.</p> <p>Increasing the share of renewable resources in accordance with the contribution of the Czech Republic determined by the National Plan for Energy and Climate</p> <p>Amount of support: CZK 0.5 million - EUR 15 million In the case of multiple projects, the project must not be artificially divided in such a way that the maximum subsidy amount of EUR 15 million per enterprise and investment project is exceeded.</p> <p>Level of support: for the MS region • 80% - small business, • 70% - medium-sized business, • 60% - large business.</p> <p>ENVIRONMENT OPERATIONAL PROGRAM 2021–2027</p> <p>SPECIFIC OBJECTIVE 1.2 Renewable energy sources</p>	<p>/</p> <p><a href="https://www.mpo.cz/assets/cz/podnikani/dotace-a-podpora-podnikani/2022/8/Obnovitelne-zdroje-energie.pdf">https://www.mpo.cz/assets/cz/podnikani/dotace-a-podpora-podnikani/2022/8/Obnovitelne-zdroje-energie.pdf</a> /</p> <p><a href="https://opzp.cz/files/documents/storage/2023/02/23/1677159007_OP%C5%BDP%202021_LET%C3%A1KY%20A4_SC%202022.PDF">/https://opzp.cz/files/documents/storage/2023/02/23/1677159007_OP%C5%BDP%202021_LET%C3%A1KY%20A4_SC%202022.PDF</a> /</p>
82) What is the percentage of employment covered by the energy sector?	<p>In 2021, the energy sector covers 1.7% of employment.</p> <p>Classification of economic activities (CZ-NACE): Production and distribution of electricity, gas, heat and air conditioning</p> <p>Employed 9.5 thousand persons older than or equal to 15 years</p> <p>A total of 557.7 thousand people were employed in the MS region. persons older than or equal to 15 years</p>	<p>/ <a href="https://vdb.czso.cz/">https://vdb.czso.cz/</a> /</p>
83) Which is the average price of energy (€/kW h)? (Differences between renewable and non)	<p>2020</p> <p>Renewable sources: 51 EUR/MWh = 0.051 EUR/kWh</p> <p>2022</p>	<p>/</p> <p><a href="https://www.cez.cz/webpublic/file/edee/ospol/file_export/investors/investment-stories/2022-09_investment-story_cj.pdf">https://www.cez.cz/webpublic/file/edee/ospol/file_export/investors/investment-stories/2022-09_investment-story_cj.pdf</a> /</p>

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	<p>Non-renewable sources 103-107 EUR/ MWh = 0.103 – 0.107 EUR/kWh</p> <p>(Dětmárovice power plant)</p>	
84) Which percent of energy usage comes from renewable energy?	<p>2021 Moravian-Silesian Region</p> <p>The share of RES (renewable energy sources) and DZ (secondary sources), including energy utilization of waste, in primary energy consumption – 9%.</p>	<p><a href="https://portal.cenia.cz/eiasea/download/U0VBX01TSzAyN0TFEMF2ZXJtdGFuXzG1NzI5Mzg5MjcwOTYOMDE4MzUucGRm/MSK027K_ZAVERSTAN.PDF">/HTTPS://PORTAL.CENIA.CZ/EIASEA/DOWNLOAD/U0VBX01TSzAyN0TFEMF2ZXJtdGFuXzG1NzI5Mzg5MjcwOTYOMDE4MzUucGRm/MSK027K_ZAVERSTAN.PDF</a> /</p>
85) Which are the future perspectives?	<p>A large increase in the consumption of waste, production of electricity and heat from waste is related to the expected construction of facilities for the energy use of waste or its incineration in modified existing coal sources.</p> <p>Possibilities of use and potential of renewable and secondary resources</p> <p>Wind energy</p> <p>Suitable locations are mostly at higher altitudes, where the wind reaches higher average speeds (above 6 m/s). The peaks of Hrubé Jeseník, Nízké Jeseník, Zlatohorská vrchovina and Hanušovická vrchovina in the Moravian-Silesian region are the highest average wind speed, and therefore the most suitable locations for the location of wind power plants. The area of the Moravian-Silesian Beskydy Mountains is not a suitable location both for reasons of nature protection and because of the low speeds of the prevailing winds.</p> <p>Small wind power plants are particularly suitable for partial coverage of own electricity consumption. The construction of a small wind power plant with supply to the grid is currently unprofitable without subsidy support.</p> <p>Solar energy</p> <p>Large PV plants are installed on open areas, mainly on originally agricultural land. Made by el. energy is almost exclusively supplied to the network at an initially favorable purchase price. Since 2013, after the purchase price was reduced to less than half, the construction of large PV parks is not worthwhile for investors.</p> <p>After the end of the life of the solar panels at the existing PV sites, they can be expected to be replaced with new ones. However, the next new construction of PV plants on agricultural land will already be zero. It is thus appropriate to use the</p>	<p><a href="https://portal.cenia.cz/eiasea/download/U0VBX01TSzAyN0TFBMF2CMHFODUxMTc0MjlyMDkzNjkxNjYMC5wZGY/MSK027K_NAVRH.PDF">HTTPS://PORTAL.CENIA.CZ/EIASEA/DOWNLOAD/U0VBX01TSzAyN0TFBMF2CMHFODUxMTc0MjlyMDkzNjkxNjYMC5wZGY/MSK027K_NAVRH.PDF</a></p> <p><a href="#">/ MSK027K_NAVRH.PDF (CENIA.CZ) /</a></p>

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	<p>potential of PV power in particular in brownfields and reclaimed mining areas, where it can reach several hundred MWp and also on the roofs of family and apartment buildings, public administration buildings, industrial and agricultural buildings and cover a part of one's own electricity consumption.</p> <p>The existing total installed el. the performance of PV plants in households cannot be determined precisely (ERÚ does not provide data on the operator due to GDPR), only technical data. However, installations below 30 kWp make up a total of 18.79 MWp, which is only 2.3% of the technical potential in households. In the horizon until 2044, the construction of new photovoltaic power plants on the roofs of houses with a total output of up to 300 MWp (approximately 8 MWp per year) can be expected, depending on the setting of support in the form of an hourly green bonus for sources up to 1 MW in the draft amendment to the Act on Supported Energy Sources.</p> <p>Landfill gas potential</p> <p>Currently, there are landfill gas cogeneration units in the Moravian-Silesian Region with a total electrical installed capacity of 1.1 MWe and an electricity production of 8,732 MWh/year. This corresponds to the amount of energy in landfill gas of 78,596 GJ/yr. The energy utilization potential of landfill gas has not yet been exhausted and there is a technical potential for the production of approx. 3500 MWh/year of electricity from landfill gas.</p> <p>The potential of using waste as a source of energy</p> <p>The combined variant of the construction of one or two facilities for the energy utilization of waste in MSK in the location of Elektrárny Dětmárovice and Ostrava, supplemented by the construction of a unit for mechanical-biological treatment of waste, whose capacity for the production of solid alternative fuels (TAP) will correspond to the capacity of the multi-fuel boiler in Teplárna Karviná, capable of energetically use fuels produced from waste.</p> <p>Waste heat</p> <p>In the Moravian-Silesian region there is a source of heat that is currently blocked because no use has been found for it, or the necessary agreements have not been reached between the heat producer and the customer. These sources of heat are biogas stations, industrial operations, a hazardous waste incinerator in Ostrava and facilities for cogeneration</p>	
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	production of electricity and heat from mine and degassing gas.	
<b>MUNICIPAL SOLID WASTE (MSW)</b>		
Questions	Answer	Comments
86) How many tonnes of MSW are generated per year?	<p>The total production of municipal waste is 661961 t for the year 2021.</p> <p>Source: <a href="https://isoh.mzp.cz/VISOH/">https://isoh.mzp.cz/VISOH/</a></p> <p>(Due to a change in methodology, from 2020 waste catalog numbers 20 02 02 (soil and stones) and 20 03 06 (waste from sewage treatment) are not included in municipal waste management and total municipal waste production.</p>	
87) Which is their main composition?	<p>The total production of municipal waste – hazardous waste is 1500 t for 2021.</p> <p>The total production of municipal waste – other waste is 660460 t for the year 2021, of which the total production of mixed municipal waste is 283828 t for the year 2021.</p> <p>Municipal waste (waste from households and similar trade, industrial waste and waste from offices) including components from separate collection.</p>	it is not for the region, but for the Czech Republic as a whole
88) Are the wastes exploited? (Indicate how)	<p>The amount of municipal waste used is 331,522 t in 2021, of which</p> <p>the amount of materially used municipal waste is 287706 t for the year 2021 and</p> <p>the amount of energetically used municipal waste is 23815 t for the year 2021.</p> <p>The amount of municipal waste removed by landfilling is 378,049 t in 2021.</p> <p>The amount of municipal waste removed by incineration is 1181 t in 2021.</p> <p>Composting 115489 t of total compostable waste for 2021.</p>	



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<p>89) Where are the MSW generated?</p>	<p>Groups of waste according to Decree No. 8/2021 Coll., on the Catalog of waste and assessment of waste properties (Waste Catalog)</p> <p>§ 5 paragraph 3</p> <p>Waste that meets the definition of municipal waste according to the law is classified in group 20. No other waste may be classified in this group.</p> <p>§ 5 paragraph 4</p> <p>Waste type 20 03 01 Mixed municipal waste includes only residual other municipal waste that cannot be classified in another type of waste in group 20.</p> <p>Annex No. 1 to Decree No. 8/2021 Coll.</p> <p>20 - Municipal waste (waste from households and similar trade, industrial waste and waste from offices) including components from separate collection.</p>	
<p>90) Who are the main stakeholders involved in the MSW management?</p>	<p>Waste dump:</p> <p>BorsodChem MCHZ, s.r.o. ičo: 26019388</p> <p>SOMA Markvartovice a.s. ičo: 47677902</p> <p>ECO - Chlebičov a.s. ičo: 47676591</p> <p>Waste storage:</p> <p>RUMPOLD s.r.o. ičo: 61459364</p> <p>Technical services Opava s. r. o. ID number: 64618188</p> <p>Liberty Ostrava a.s. ičo: 45193258</p> <p>Bekaert Bohumín s.r.o. ičo: 64613828</p> <p>AVELI ECO s.r.o. ičo: 27836444</p> <p>Waste collection:</p> <p>141 companies</p> <p>Waste burning:</p> <p>SMOLO HB s.r.o. ičo: 25834061</p>	<p>(source: <a href="https://isoh.mzp.cz/RegistrZarizeni/Main/StacionarniZarizeni">https://isoh.mzp.cz/RegistrZarizeni/Main/StacionarniZarizeni</a>)</p>

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	<p>Incinerator (Stationary equipment according to Act No. 185/2001 Coll.)</p> <p>Recovera Utilization of resources a.s. ičo: 25638955</p> <p>OZO Ostrava s.r.o. id: 62300920</p> <p>SOMA Markvartovice a.s. ičo: 47677902</p> <p>TAMEH Czech s.r.o. ičo: 28615425</p> <p>ENERGETIKA TRINEC, a.s. ičo: 47675896</p> <p>Composting plant - Biological processes according to Act No. 541/2020 Coll.</p> <p>16 companies</p> <p>Composting plant Stationary equipment according to Act No. 185/2001 Coll.</p> <p>27 companies</p> <p>Recycling</p> <p>37 companies</p> <p>Equipment to be prepared for reuse</p> <p>FOR NORTH CZECH, a.s. ičo: 25834860</p> <p>Production of TAP</p> <p>Marius Pedersen a.s. ičo: 42194920</p> <p>Sorting or post-sorting line</p> <p>10 companies</p> <p>Processing of electronic waste</p> <p>14 companies</p> <p>Waste solidification</p> <p>SMOLO HB s.r.o. ičo: 25834061</p>	
91) How is MSW valorised? (Added-value products)	<p>Appropriate choice of vessels, containers and collection equipment with regard to space and handling options</p> <p>Separation of waste with regard to other waste treatment options for more efficient disposal</p>	<p><a href="https://moravskoslezsky.trideni.cz/uvod/nas-kraj/odpady-v-kraji/">HTTPS://MORAVSKOSLEZSKY.TRIDENI.CZ/UVOD/NAS-KRAJ/ODPADY-V-KRAJI/</a></p>

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	<p>How waste is sorted in the Moravian-Silesian Region 2021</p> <p>The yield of paper, plastics, glass and beverage cartons is 54.4 kg/rev. (kg/capita)</p> <p>The yield of paper, plastics, glass, beverage cartons and metals is 73.7 kg/rev.</p> <p>Paper yield: 22.6 kg/roll</p> <p>Plastic yield: 17.0 kg/rev</p> <p>Glass yield: 14.4 kg/rev</p> <p>Beverage carton yield: 0.3 kg/rev</p> <p>Metal yield: 19.4 kg/rev</p> <p>Residents of the Moravian-Silesian Region currently have the option of sorting their waste into 8,488 paper containers, 10,629 plastic containers and 7,841 glass containers. Then to 102 separate containers for beverage cartons and 579 separate containers for metal. In addition, there are 7,819 smaller containers for paper and 10,383 for plastic, which people have right at their homes. One publicly accessible collection point thus serves an average of 129 residents.</p> <p>The processing of glass (from containers) produces material of very high purity on the sorting line - for example, the output clear shards from some sorters reach a quality of up to 99.6%. Sorting lines in the Czech Republic can meet the requirements of all glass factories in Europe and thus significantly support the circular economy.</p> <p>Recycling - return of electronic products,</p>	
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	<p>Asekol company, red containers. 359 collection points in the Vmoravsko-Silesian region.</p> <p>Source: <a href="https://www.cervenekontejnery.cz/">https://www.cervenekontejnery.cz/</a></p> <p>Ekolamp - take back lamps and light sources.</p> <p>163 collection points in the Vmoravsko-Silesian Region.</p> <p>Recycling of electrical equipment is largely dependent on manual disassembly, but light sources are recycled on a processing line. Thanks to ecological recycling, it is possible to use around 90% of materials as secondary raw materials.</p> <p>Recycled raw materials are further used for further production as technical material.</p> <p>Source: <a href="https://www.ekolamp.cz/">https://www.ekolamp.cz/</a></p> <p>ELEKTROWIN a.s.</p> <p>take-back of retired electrical appliances in the Czech Republic</p> <p>161 collection points in the Vmoravsko-Silesian region</p> <p>Source: <a href="https://www.elektrowin.cz/">https://www.elektrowin.cz/</a></p> <p>Rema system, Rema battery (<a href="https://www.rema.cloud/">https://www.rema.cloud/</a>) Map of collection points, only the entire region cannot be entered, only individual cities and surroundings.</p>	
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	<p>Plastics recycling - sorting, crushing, plastic granulate</p> <p>Crushes function as an input raw material for the production of various plastic products such as composters, grass paving or plastic bags. Modern technologies of casting, blowing, injection into molds or extrusion are used in the process of producing crumb.</p> <p>Source: <a href="https://www.puruplast.cz/produkty/">https://www.puruplast.cz/produkty/</a></p> <p>Plastic packaging and crates of regranulate.</p> <p><a href="https://www.tbaplast.cz/">https://www.tbaplast.cz/</a></p> <p>Energy utilization of waste in incinerators - The output of energy processing of waste is:</p> <p>heat (steam or hot water),</p> <p>electrical energy,</p> <p>a small part of solid secured products (ash, slag, fly ash - approx. 1/10 of the input amount of waste),</p> <p>separated iron scrap and metals for further use,</p> <p>flue gases, which after thorough cleaning are discharged into the chimney.</p> <p>Wood waste - recycling</p> <p>"dead wood" - crushing into the required fraction of crushers, then the raw material is transported to the processor for the production of chipboards, or for other processing.</p> <p>Tire recycling, alternative fuel production</p> <p>The result of recycling tires and rubber waste is the certified alternative fuel ALTPAL MP-05 (crumb rubber fraction approx. 50 x 50 x 200 mm). This fuel then serves as an input raw material in the technological process of cement production at Cement Hranice, a.s</p> <p>Source: <a href="https://www.mariuspedersen.cz/">https://www.mariuspedersen.cz/</a></p>	
92) Which is the price of MSW added value-products?	<p>Recycling plastics: composters, grass paving or plastic bags (</p> <p>grass paving 299 – 489 CZK/m<sup>2</sup>, composters and bags on request.</p>	<a href="https://www.puruplast.cz/produkty/">https://www.puruplast.cz/produkty/</a>

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	<p>Market Cyrkl</p> <p>Optimized use of materials for a circular future</p> <p><a href="https://cyrkl.com/cs">https://cyrkl.com/cs</a></p>	
Which are the future perspectives? (Techniques, wastes)	<p>Potential locations for the construction of ZEVO with a capacity from 10 kt/year in terms of demand for ZEVO heat</p> <p>(equipment for energy utilization of waste)</p> <p>Moravian-Silesian Region: 10 potential locations, total demand for heat 10510 TJ/year (Source: Energy Regulatory Office of the Czech Republic)</p> <p>There have already been three attempts to build ZEVO in the Moravian-Silesian Region. Unfortunately, the public perceives any "incinerators" of municipal or hazardous waste very negatively. The TAP usage path appears as real also in terms of public acceptance.</p> <p>/</p> <p><a href="https://www.caoh.cz/">https://www.caoh.cz/</a></p> <p>In the Moravian-Silesian Region, the first use of municipal waste, which ends up in landfills without any use, is being prepared for the production of heat and electricity for local residents. The company OZO Ostrava is building a new municipal waste sorting line, supplemented by the production of so-called solid alternative fuels suitable for heating plants. The Veolia group will use them in new modern boilers.</p> <p>/</p> <p><a href="https://www.enviweb.cz/">https://www.enviweb.cz/</a></p> <p>According to the informant, the multi-fuel boiler would</p> <p>Veolia</p> <p>was supposed to be in operation from about 2026. Incinerator</p> <p>should have a capacity of 150,000 t of TAP per year, thus several times exceeding the production of waste in</p> <p>Karviné, the rest should thus be imported from the wider area of the Moravian-Silesian Region.</p> <p>/</p> <p><a href="https://arnika.org/">https://arnika.org/</a></p> <p>"CEVYKO Project", notifier: CEVYKO a.s., Havířov. The object of the plan is to build a modern technical equipment that, thanks to optical sorting technology</p> <p>í will make it possible to sort usable raw materials from Mixed Municipal Waste and at the same time</p>	

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	<p>to sort secondary raw materials from separation to very good quality. Waste for which</p> <p>there is no market application of secondary raw materials, which, however, have energy potential, will be processed</p> <p>to solid waste-based alternative fuel (TAP).</p> <p>Support for the sorting of bio-waste in households, The sorted bio-component significantly reduces the amount of mixed municipal waste, in addition, it can find meaningful use in composting plants or biogas stations</p>	
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#### Regional bioeconomy development and promotion. Policy framework

CROSS-CUTTING ISSUES		
Questions	Answer	Comments
93) Does your region have a strategy for circular bioeconomy?	no	
94) What environmental indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (GHG decrease achieved with bioeconomy initiatives, resources depletion, implementation strategy aiming zero waste, etc.) ?	GHG decrease achieved with bioeconomy initiatives, resources depletion, implementation strategy aiming zero waste, share of energy from renewable sources in total consumption, share of cars with ecological drive, reduction of the share of landfilled waste, volume of sorted waste components	
95) What economic indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (turnover linked to biobased companies (forestry, agriculture, other-biobased industries), existence of funding programmes/schemes targeting bioeconomy, existence of supporting measures promoting partnerships between industries and enterprises in the region, etc.) ?	percentage employed in the bio-sector, amounts invested in innovations linked to the bio-economy	
96) What social indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (available skilled workforce, number or jobs created in the last 5 years in bio-based industries, communications to society regarding bio-based activities (seminars, trainings, etc.), willingness to pay for bio-based products, etc.) ?	available skilled workforce, number or jobs created in the last 5 years in bio-based industries, communications to society regarding bio-based activities	
97) Current economic and social characteristics of your territory not reported in previous questions that	all of the above - this is a Just Transition Funding region	



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could enable the development of the circular bioeconomy?		
98) Are there any bio-based production districts / specializations in your Region? (Please, provide a description of these activities, including data, focusing on Circular Bio-based Economy potentials and material/immaterial assets as well as existing barriers)	Mentioned above	
99) What are the strengths/weaknesses of your area regarding the development of the circular bioeconomy?	it is not a political priority, the willingness of some companies to innovate, young people leave the region after graduation	
100) Please, identify actors with a natural interest in a project due to their existing businesses and market in your territory	regional chamber of commerce	

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## Annex 3: Romania region profile

INFORMATION FOR STATISTICAL ANALYSIS		
REGIONS (EUROSTAT NUTS 2 – Level)		
<i>(Please indicate for your region which NUTS 2-Regions are relevant or add additional regions in the comment section.)</i>		
Question	Suggested NUTS 2 regions	Comments
1) Germany – Region of Baden-Württemberg	<input type="checkbox"/> Stuttgart (please translate to English) <input type="checkbox"/> Karlsruhe (please translate to English) <input type="checkbox"/> Freiburg (please translate to English) <input type="checkbox"/> Tübingen (please translate to English)	
2) Spain – Region of Aragon	<input type="checkbox"/> Zaragoza (please translate to English) <input type="checkbox"/> Huesca (please translate to English) <input type="checkbox"/> Teruel (please translate to English)	
3) Greece – Region of Western Macedonia	<input type="checkbox"/> Dytiki Makedonia (please translate to English)	
4) Bulgaria – Region of Plovdiv	<input type="checkbox"/> Yuzhen tsentralen (please translate to English)	
5) Slovakia – Nitra Self-Governing Region	<input type="checkbox"/> Západné Slovensko (please translate to English)	
6) Slovenia – Whole Country	<input type="checkbox"/> Vzhodna Slovenija (please translate to English) <input type="checkbox"/> Zahodna Slovenija (please include the traduction)	
7) Croatia – Region Adriatic Croatia	<input type="checkbox"/> Jadranska Hrvatska (please translate to English)	
8) Hungary – Region North Hungary	<input type="checkbox"/> Észak-Magyarország (please translate to English)	
9) Romania – West region	<input type="checkbox"/> X West Region (Regiunea Vest)	
10) Czechia – Region BIOEAST	<input type="checkbox"/> Praha (please translate to English) <input type="checkbox"/> Střední Čechy (please translate to English) <input type="checkbox"/> Jihozápad (please translate to English) <input type="checkbox"/> Severozápad (please translate to English) <input type="checkbox"/> Severovýchod (please translate to English) <input type="checkbox"/> Jihovýchod (please translate to English) <input type="checkbox"/> Střední Morava (please translate to English) <input type="checkbox"/> Moravskoslezsko (please translate to English)	
11) Netherlands – Region Apeldoorn	<input type="checkbox"/> Gelderland (please translate to English)	
12) Italy – Region Campania	<input type="checkbox"/> Campania (please translate to English)	



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# How to identify socially marginalised groups?

SOCIALLY MARGINALISED GROUPS		
Questions	Answer	Comments
1) Population area with less than 5.000 inhabitants	<p>Timiș = 79 localities</p> <p>Arad = 62 localities</p> <p>Caraș-Severin = 69 localities</p> <p>Hunedoara = 56 localities</p>	<p>-Migration determines depopulation in many localities.</p> <p>-In Caraș - Severin and Hunedoara the main reason for depopulation was closed mining and metallurgical, extractive, and steel production industries.</p>
2) Unemployment rate in the area	1.9%	In the West Region the unemployment rate is below the national average
3) Employment rate of women in the region and at national level	<p>West Region level = 42.95%</p> <p>National level = 44.6%</p>	In the West Region the employment rate is below the national average
4) Main economic activity in the area	<p>Wholesale and retail trade (28%)</p> <p>Professional, scientific and technical activities (11%)</p> <p>Manufacturing industry (10%)</p> <p>Construction industry (10%)</p> <p>Transport and storage (9%)</p> <p>Hotels and restaurants (6%)</p> <p>Agriculture, forestry and fishing (5%)</p> <p>Administrative service activities (5%)</p> <p>Other (16%)</p>	
5) Jobs at risk	<p>1. Steel production industry</p> <p>2. Metallurgical industry</p> <p>3. Mining industry</p> <p>4. Extractive industry</p> <p>5. Coal power plants</p>	The workers from these area are our target group
6) Main breadwinner of the family nucleus	Generally, both partners are breadwinners (based on the rate from question 3)	
7) Average educational level and share of population with different school attainment	<p>In West Region:</p> <p>nursery = 6.7%</p> <p>preschool = 8.4%</p> <p>primary and secondary school = 8.2%</p> <p>highschool = 8.9%</p> <p>Bachelor / MD / PhD = 13.72%</p>	Data from 2019-2020



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8) Population age structure in the region and at national level	<p>Region/National level (2021)</p> <p>0-4 years old = 8.64% / 5.30%</p> <p>5-9 years old = 8.33% / 5.17%</p> <p>10-14 years old = 8.24% / 5.61%</p> <p>15-19 years old = 8.26% / 5.40%</p> <p>20-24 years old = 8.58% / 5.12%</p> <p>25-29 years old = 9.42% / 5.14%</p> <p>30-34 years old = 9.63% / 6.74%</p> <p>35-39 years old = 9.13% / 6.62%</p> <p>40-44 years old = 8.79% / 7.75%</p> <p>45-49 years old = 8.96% / 7.68%</p> <p>50-54 years old = 9.19% / 8.46%</p> <p>55-59 years old = 9.41% / 5.29%</p> <p>60-64 years old = 9.41% / 6.39%</p> <p>65-69 years old = 9.35% / 6.34%</p> <p>70-74 years old = 9.48% / 5.09%</p> <p>75-79 years old = 8.81% / 3.18%</p> <p>80-84 years old = 8.64% / 2.61%</p> <p>over 85 years old = 7.66% / 2.02%</p>	<p>The West Region = 1.714.438 individuals (8.96%)</p> <p>The national population = 19.126.302</p>
9) Share of ethnics minorities in the region and at national level	<p>In West Region/national level</p> <p>Romanians = 82.23% / 83.4%</p> <p>Hungarians = 4.96%</p> <p>Serbiens = 0.88%</p> <p>Germans = 0.84%</p> <p>Ukrainians = 0.54%</p> <p>Slovakians = 0.34%</p> <p>Bulgarians = 0.28%</p> <p>Croatians = 0.29%</p> <p>Romani = 2.50%</p>	<p>The West Region has an multiethnic and multicultural character</p>
10) Emigration rate in the region and at national level	<p>Emigration rate in the West Region = 11.57%</p>	<p>The West region is on third place regarding to national level</p>
11) Average salary or household income in the region and at national level	<p>Average salary in West Region = 3.313 Ron (about 660 Euro)</p> <p>Average salary at the national level = 3.416</p>	<p>The West Region is on second place after Bucharest</p>
12) Please describe the structure and the characteristics of relevant socially disadvantaged/ marginalized groups in your region	<p>In West Region characteristics of socially disadvantaged/marginalized groups are:</p> <p>-Inadequate competences (especially TIC), hostile attitudes and social norms, excessively rigid working conditions, and difficult access to information</p>	<p>There are large gaps between the 4 counties (Timiș, Arad, Hunedoara, and Caraș-Severin)</p>

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	<ul style="list-style-type: none"> <li>-The absence of lifelong learning mindset</li> <li>-Relative poverty rate = 20.7%</li> <li>-Rate of risk of poverty or social exclusion (AROPE) = 25%</li> <li>-The rate of severe material deprivation = 8.6%</li> <li>-The rate of people under 60 from households with very low work intensity = 10.2%</li> <li>-Rate of risk of poverty or social exclusion (AROPE-new definition) = 30.6%</li> <li>-The rate of severe material and social deprivation = 19.2%</li> </ul>	
13) Please comment the potential impact of their participation in Circular Bio-based Economy	Through their involvement, the local economy would increase, unemployment would decrease in problematic areas, and the foundations of the Circular Bio-based Economy would be laid in the area, which could represent examples of good practices for other localities. Another impact could be to decrease depopulation in vulnerable areas.	
14) Please indicate the factors hindering their possible participation?	<ul style="list-style-type: none"> <li>-reluctance/resistance in doing something new especially in the situations of examples from other countries.</li> <li>-low levels of self-esteem</li> <li>-low education levels</li> <li>-social models in their area (being passive individuals, not active job searchers for socio-professional (re)integration.</li> </ul>	
15) Indicate the selected marginal group/s that will be targeted during the project and relevance in the region	<p>People working in</p> <ol style="list-style-type: none"> <li>1. Steel production industry</li> <li>2. Metallurgical industry</li> <li>3. Mining industry</li> <li>4. Extractive industry</li> </ol>	This category is in the greatest danger of losing their job.
16) Average educational level of targeted marginalized groups	<ul style="list-style-type: none"> <li>-There were many monotowns</li> <li>-Higher education and vocational education (in mining and heavy industry)</li> </ul>	The existence of huge metallurgical, petrochemical and steel platforms required a concentration of a highly qualified workforce.
17) Description of the occupied post, considering the type of work performed and the qualification required by the targeted marginalized groups (question 13)	We did not target a certain professional category.	Metallurgical, extractive, and steel production industries employed all professional categories.



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# Situation of main economic sectors

PRIMARY SECTOR		
AGRICULTURE		
Questions	Answer	Comments
18) How large is the surface of cultivable areas? (you can check databases such as Eurostat: <a href="https://ec.europa.eu/eurostat/web/agriculture/data/database">https://ec.europa.eu/eurostat/web/agriculture/data/database</a> )	769508ha	
19) Which are the main crops in the area (surface in hectares or percentage of the cultivable area occupied by each crop)	Corn 32% Wheat and Rye 28.37% Rape 7.95% Sunflower 7.45% Soy beans 3.35% Barley 2.38 % Oat 1%	
20) Which is the average annual production (dry basis) of the most relevant crops (listed in question 15)?	Corn 1 336 543 t Wheat 1 135 537 t Raps 186 395 t Sunflower 139 620 t Barley 93 260 t Soy beans 49 280 t Rye 967 t	
21) Average yield (dry basis) for the most relevant crops (listed in question 15)?	Rye 983 kg/ha Wheat 5224 kg/ha Barley 5095 kg/ha Oat 2949 kg/ha Corn 5426 kg/ha Sunflower 2438 kg/ha Rape 3045 kg/ha Soy beans 1914 kg/ha	
22) What is the percentage of employment covered by agriculture?	23% of the Romanian labour force are employed in agriculture	
23) Are state subsidies received by the farmers (CAP or others)? Please shortly mention the crops and the aim of the subsidy (equipment modernisation, yield increase, etc.	CAP support: Subsidies for retechnology in agriculture and the food industry Measure 11 – organic crops Measure 10 – agro-environment Practices beneficial for the environment applied in arable land Young farmers	

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	Basic and complementary support for the purpose of sustainability  Support for environmentally friendly agriculture  Direct payments in the livestock sector	
24) What is the current situation of the soils (erosion, eutrophication, pollution...)?	Erosion and eutrophication are isolate cases in the region. Polluted soils are found in several industrial areas in Hunedoara and Caras Severin counties	
25) Who are the main stakeholders involved in the crops production (cooperatives or farmers associations, individual farmers owning large or small areas, etc.)?	Individual farmers owning large farms, farmers associations	
26) How much residual biomass is produced? Please indicate for the most relevant crops (question 14) the residues that are produced during the processing	For cereals, grain:straw rate proportion is between 1:0.8 – 1:1.3. Total cereal straw and corn stalks as by-products after harvest: Corn 1.5 mill. t; Wheat 1 mill. t.  Sunflower (1 : 4.1 grain:stalks): 572000 t; Rape (1 : 2.9 grain:stalks): 540000 t	
27) Is the residual biomass (question 21) exploited (energy production, chemicals, fertilizers, etc.)?	Not at large scale. Only two biogas plants in the region use as co-substrate straw resulted from animal beddings, contained in animal wastes	
28) Average selling price for the main crops (€/dry tonnes) (listed in question 15)? When possible, also include the production cost.	Oat 260 E/t  Corn 245 E/t  Wheat 247 E/t  Raps 436 E/t  Sunflower 620 E/t	
29) Which are the future perspectives? (Technologies, increase of the area dedicated to certain crops, new crops development, new biomass or residual biomass value chain development, employment)	Due to a new CAP measure, will increase areas cultivated with cover crops to reduce soil erosion, improve soil fertility, help the control of weeds, pests, and diseases, and preserve biodiversity in agroecosystems. This measure will deliver new type of biomass into the economy.	
<b>FORESTRY</b>		
Questions	Answer	Comments
30) Forest area in the region (please indicate the hectares and percentage occupied by forestland in the region)?	Forest surface 1048.8 thousands of hectares (32.74%)  Softwood 139.4 thousands of hectares (4.35 %)  Deciduous forest 909.4 thousands of hectares (28.4%)  Other lands 20.4 thousands of hectares (0.63%)	
31) Productive forest area share (exploited for wood)?	Data not available	
32) Which are the main uses of forestry biomass?	Energy, construction, furniture	
33) Share of forestland owned by the administration and private owners?	60% state owned, 40% private owners	
34) Are state subsidies received by the forestry sector?	Support for reforestation, establishment of forest curtains	



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35) Who are the main stakeholders involved in the forest biomass production?	In our region forestry sector is not involved. We focus on agricultural residual biomass and marginal lands for biomass production	
36) Please indicate if possible the forest biomass production cost and the average selling price (€/dry tonnes)?	Varies much depending on the use of wood. 1 c.m. of wood used for furniture can reach 700 Euro.	
37) What is the percentage of employment covered by forestry?	Data not available	
38) How much residual biomass is produced in the region?	Data not available	
39) Is the residual biomass (question 34) exploited? (Indicate)	Woody residual biomass is harvested by large companies and sold for energy use	
40) Which are the future perspectives? (Technology, forestry, employment increase, increase of exploited areas, etc.)	West region is not a large forestry area. No important contribution to bioeconomy	
41) Share of forestland area affected by forest fires the last year?	Insignificant	
<b>LIVESTOCK</b>		
Questions	Answer	Comments
42) How large is the area dedicated to livestock in the region?	In West region of Romania, in 2021 the livestock number was as follow: cattle – 151.952 individuals; pigs – 541.799 ind., sheep and goats – 1.933.611 ind., poultry – 7081358 ind. According to statistics at national level, livestock per 100 hectares of land are: 14.4 bovine, 42.1 pigs, 91.3 sheep and goats. The livestock of cattles, sheep and goats are related to the arable land + pastures + meadows and the pigs are related to the arable land.	Source: ***INS, 2022, Efectivele de animale și producțiile de animale în anul 2021,  ***INS, 2022, Anuarul Statistic al României
43) Average farm size (cows, pigs, chicken, or other) in the region?	Cows: 200; Pigs: 10000	
44) Which is the daily livestock maintenance cost (€/head)?	Data not available	
45) Which is the main destination of the cattle? (Meat, milk, wool...)	The main destination of the cattle is milk, only 35.541 ind. from a total number of 151.952 ind. being slaughtered for meat in 2021	Source: INS, 2022, Efectivele de animale și producțiile de animale în anul 2021
46) What is the employment rate covered by livestock?	17% in general agriculture including animal sector, no specific data available for livestock	Source: Planul de dezvoltare regional al regiunii ADR Vest 2021-2027, pg 241
47) Are state subsidies received for farming?	Yes. The state subsidies are granted by Agency for Payments and Interventions in Agriculture	<a href="https://apia.org.ro">https://apia.org.ro</a>
48) Who are the main stakeholders involved in the production?	Large farms	
49) Which is the main residue produced in each case?	Animal manure	
50) How much slurry/manure/other residue is produced in average (t/head) and in the region (total)?	cattle – 1.9 mill t of manure; pigs – 1.3 mill. c.m. of slurry/year; poultry - 450000 t of wastes	13 t of manure/cow/year  2.4 c.m. of slurry/pig/year  65 t of wastes per 1000 hens/year



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51) Is the slurry/manure/other exploited? (Indicate the percentage that is currently used) If not, how are the residues managed?	The two biogas plants from Region West can process around 100000 t of animal wastes per year. The rest is stored in open space and used as fertilizer	
52) Average selling price for the slurry/manure/other?	The price of the manure is highly variable depending by the origin (the animal species from which it comes), the composition, age, but generally it is contained between 10 and 50 Euro/tonne	
53) Which are the future perspectives? (Valorisation technologies, cattle, employment rate, farm modernisation, increase of large exploitations, decrease of livestock production, etc.)	More biogas plants are expected to be built; several small farms can be absorbed by larger exploitations; number of cattle and pigs is expected to decrease sensitively; investments are expected in large farms and food processing	
<b>SECONDARY SECTOR</b>		
<b>AGROINDUSTRY</b>		
Questions	Answer	Comments
54) How many agrifood industries are there in the region?	Subsectors from the agrifood systems: crops, livestock, forestry, aquaculture, and fisheries. <i>(Agrifood refers to all the processes in the agricultural food chain. That is, all the actions required to produce agricultural products, their processing, but also their availability on store shelves. Schematically, we are talking about the processes involved in getting agricultural production from the field to the shelf).</i>	<a href="https://joistpark.eu/en/agrifo-od-technology-examples-benefits/">https://joistpark.eu/en/agrifo-od-technology-examples-benefits/</a>
55) Which are the main products produced?	Agricultural products (cereals, oleaginous, feed crops), forestry (wood), livestock & freshwater (sheep, pigs, cattle, poultry, fish), semi-finished products and finished products obtained from these raw materials and semi-finished products, including foodstuffs.	Source: <a href="https://www.fao.org/faolex/r esults/details/en/c/LEX-FAOC182606/">https://www.fao.org/faolex/r esults/details/en/c/LEX-FAOC182606/</a>
56) Which is the annual average production in the main agrifood industries?	In 2018, a value of agricultural production of 2.1 billion Euro was recorded, representing 11% of the national total.  The vegetable branch of agriculture is the most widespread and has a share of 70.3%, while the animal branch has a share of 28.9%, and agricultural services only 0.8%.	Source: <a href="https://adrvest.ro/wp-content/uploads/2020/11/Strategie-PDR-Regiunea-Vest.pdf">https://adrvest.ro/wp-content/uploads/2020/11/Strategie-PDR-Regiunea-Vest.pdf</a>
57) Are companies producing organic or agrifood products receiving subsidies?	Yes, CAP:  Measure 11 - Ecological Agriculture: Support for conversion to organic farming practices and methods; support for maintaining organic farming practices; Package 1 – agricultural crops on arable land (including fodder plants); Package 2 – vegetables; Package 3 – orchards; Package 4 – vineyard	Source: <a href="https://apia.org.ro/wp-content/uploads/2021/11/Pr ezentare_APIA .pdf">https://apia.org.ro/wp-content/uploads/2021/11/Pr ezentare_APIA .pdf</a>
58) What is the percentage of employment covered by agroindustries?	17,8%	Source: <a href="https://adrvest.ro/wp-content/uploads/2020/11/Strategie-PDR-Regiunea-Vest.pdf">https://adrvest.ro/wp-content/uploads/2020/11/Strategie-PDR-Regiunea-Vest.pdf</a>



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59) What is the main economic limitation (energy cost, supply chain...) faced by agroindustries?	All necessary production cost : high energy costs, long supply chain, indirect costs (Climate Change, Scarcity of Resources: Water and Land, Urbanization and land scarcity, Invasive species and diseases)	Source: <a href="https://farmtogether.com/learn/blog/global-threats-on-agriculture">https://farmtogether.com/learn/blog/global-threats-on-agriculture</a>
60) Which type of wastes/side-products/residues are produced?	Main organic wastes challenging the value chain are generated in meat industry (abattoir wastes, sludge from industrial WWTPs, greases, protein wastes etc); milk industry (whey, sludge); beverages (sludge, spent fermented cereals, yeast,); panification (refused grains&meals, expired dough); sludge from other food industry. Side products such as straw, stalks, stover, husks, marc, brewery spent cereals etc are currently integrated in value chain although inappropriate use often generate high amount of greenhouse gases.	
61) How much wastes/side-products/residues are produced?	The organic wastes are available in surplus on the market. The local potential is not quantified. As an example, one biogas plant in the region is processing each year: 150 t sludge from one meat and one milk processor, 100 t of whey from one milk processor, 50 t of meat processing wastes	
62) Are the wastes/side-products/residues exploited? (Please specify for which application)	Only a small portion, in one biogas plant in the region (see answer 61)	
63) What are the future perspectives? (Techniques, products, production, employment)	Main production will continue to be assured in large industrial production facilities while small business will play marginal role in the economy; large processors will face environmental and financial constraints which will contribute to development of green technologies integrated in a functional and attractive circular bioeconomy which have to be constructed in the region	
64) Which are the main stakeholders of the local agrifood industry?	Farm suppliers, Farmers, Food Processors & packagers, Waste industry, Logistic, Retailers, Consumers	Source: <a href="https://www.tecnoali.com/files/emensa/D3/Report%20Ainia.pdf">https://www.tecnoali.com/files/emensa/D3/Report%20Ainia.pdf</a>
<b>OTHER BIO-BASED INDUSTRIES</b>		
Questions	Answer	Comments
65) Is there a mapping of the current bio-based industrial activities in your area?	RINA Consulting on behalf of the Bio-based Industries Consortium delivered "MAPPING THE POTENTIAL OF ROMANIA FOR THE RO BIO-BASED INDUSTRY" ( <a href="https://biconsortium.eu/downloads/country-report-romania">https://biconsortium.eu/downloads/country-report-romania</a> ). The mapping need to be updated	
66) How many biobased industries are there in the region? Please specify the main biobased products produced	<ul style="list-style-type: none"> <li>- Thermal energy plants</li> <li>- Organic wastes management</li> <li>- Management of farm wastes</li> <li>- Biogas plants</li> <li>- Composting sites</li> <li>- Biohumus production</li> <li>- Wastes collection, trading and management</li> </ul> Biobased products: biogas-CHP to electricity & thermal energy, digestate, compost, vermicompost, organic fertilizers	
67) Out of the previous list indicate the three more relevant in terms of revenues and role to meet the government strategic	Biogas plants, thermal energy plants, composting sites	

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objectives (decarbonisation, CO <sub>2</sub> emissions, circular economy, etc.)		
68) Are state subsidies received to promote sustainable production by these industries?	Green certificate scheme	
69) What is the percentage of employment covered by biobased industries?	1,4-1.6%	Source: Eurostat
70) How many tonnes of biobased materials/products are produced per year? Please specify by typology (renewable energies, biofuels, biomaterials, biochemicals, biobased cosmetics/pharmacy, others)	Plant biomass – 1 1249 000 TOE Biogas - 587 000 TOE Urban waste - 544 000 TOE	
71) Which type of wastes/by-product, residue are produced in the production process?	After using organic wastes and biomass in biobased industrial applications, mainly the following wastes are generated: ash, non-degradable wastes, consumables and parts from processing equipment, CHP units and power plants. These materials can be considered wastes since they hardly can be reused as feedstock in circular bioeconomy	
72) What are the biobased materials, side-products, waste or residues used as raw materials in the productive process?	Energy crops, digestate (as fertilizer and co-substrate in composting process), compost (fertilizer), sludge (feedstock for anaerobic digestion), ash (to be used as raw material in construction)	
73) Where are these raw materials obtained or cultivated?	Energy crops, biogas and vermicomposting plants are located in Arad and Timis counties. In Caras Severin and Hunedoara counties are located coal fired power plants delivering ash, hydroelectric plants delivering energy, farms and food processing delivering organic wastes as feedstock for circular bioeconomy	
74) Which are the main stakeholders/actors supplying these raw materials?	Farmers (crops and livestock) Biogas producers Waste management companies Municipalities	
75) Which is the price of these biobased raw materials used (€/ton)?	Wastes in general are associated to negative costs. Biogas plants, composting sites, thermal energy plants sign contracts with wastes suppliers to process at certain prices the wastes to integrate them in circular economy. Regarding energy crops, prices are around 50 Euro/ton (corn silage).	
76) Which is the price of the main biobased products produced in the region (€/ton)?	Electricity is delivered at around 120 Euro / MWh. There is no feed-in-tariff specific for certain sources of energy. The income is differentiated according to the number of green certificates obtained per MWh of electricity delivered in the grid. Biogas plants can receive 1-3 green certificates / MWh depending on the feedstock used and capitalization of thermal energy from CHP unit. Green certificates are sold on the dedicated national stock market (OPCOM) at 30-55 Euro/ certificate. Digestate and compost can be sold in bulk at around 50 Euro/ton. Bio-certified vermicompost at prices around 450 Euro/cubic meter.	
77) Which are the perspectives in the use of these biobased raw materials/side-products/waste?	There is a regional strategy for 2021-2027 which aims to increase the production of renewable energy and the use of compost	Source: Strategia Regionala de Vest 2021-2027



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78) Which are the perspectives in the consumption of these biobased products?	There is a regional strategy for 2021-2027 which aims to increase the consumption of the biobased products	Source: Strategia Regionala de Vest 2021-2027
79) Please mention the 3 bio-based solutions with more relevance in your region (that can be taken as an example of implementation or good practice for other regions) and provide contact details if possible.	<ul style="list-style-type: none"> <li>- Processing of organic wastes by anaerobic digestion</li> <li>- Composting of non-digestible biomass and organic wastes</li> <li>- Vermicomposting, that use the compost as feedstock to produce vermicompost (humus) at higher added value</li> </ul>	
80) Please mention 3 bio-based solution in your region that have high deployment potential in your region but still need support to accelerate-unlock its potential ( please mention what technological, regulatory and market challenges are and provide contact details if possible)	<ul style="list-style-type: none"> <li>- Biorefinery of biomass obtained in polluted areas and marginal land to deliver biofuels, energy and biomaterials (bioplastic);</li> <li>- Processing by anaerobic digestion of all organic (waste) materials generated in agro-food supply chain and in communities to deliver biogas-to-methane or biogas-to-energy and digestate;</li> <li>- Connecting anaerobic digestion as first step to composting as second step and vermicomposting as final step to deliver high-value and high-quality organic fertilizer in a circular bioeconomy avoiding side effects such as unfinished side-products, unpleasant smells which leads to reticence of general public such as "no garbage handling in my back-yard" mentality.</li> </ul>	There are many technological, regulatory and market challenges. Not the space to be approached here.
<b>ENERGY INDUSTRY</b>		
Questions	Answer	Comments
81) How many energy industries are there?	Hydro-energy (three plants), coal fired power plants (two plants) and biogas (two plants)	
82) Does the main part of energy come from renewable or non-renewable energy?	Renewable energy (Hydro energy)	
83) What is the main source of renewable energy?	Hydro energy	835 MW installed power from hydro and 2.5 MW installed power biogas-CHP
84) What is the main source of non-renewable energy?	Coal fired power plants	998 MW total installed power. The largest power plant of 865 MW is closed
85) Are state subsidies received to promote renewable energies?	Yes	1-6 Green Certificates depending on the energy source, traded at stock exchange
86) What is the percentage of employment covered by the energy sector?	No specific data available exclusively for energy sector. 168000 workers in "Manufacturing, extractive industry, electricity and water distribution sector" out of 2 millions inhabitants in West Region = 8.4%	
87) Which is the average price of energy (€/kW h)? (Differences between renewable and non)	0.150 Euro / kWh electricity 0.075 Euro / kWh natural gas	No feed-in tariff, no differences between renewable and non  Energy prices from: <i>Bursa Română de mărfuri (Romanian Commodities Exchange)</i>
88) Which percent of energy usage comes from renewable energy?	43% at national level. West Region is interconnected to national energy grid.	
89) Which are the future perspectives?	Expected important increase of photovoltaic sector and lower progress expected in bio-energy sector	
<b>MUNICIPAL SOLID WASTE (MSW)</b>		

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Questions	Answer	Comments
90) How many tonnes of MSW are generated per year?	569000 t	Per counties:  154000 – Arad  63000 – Caras Severin  117000 - Hunedoara  235000 – Timis
91) Which is their main composition?	Mixtures from households – around 90%	
92) Are the wastes exploited? (Indicate how)	Size separation, large fraction combustible incinerated in cement factories. Small fraction aerated in bio-containers for aerobic degradation and landfilled	
93) Where are the MSW generated?	Households, city administration	
94) Who are the main stakeholders involved in the MSW management?	ADID – Agenții de Dezvoltare Intracomunitară (Intracommunity development agencies) established in each county  Waste management companies	
95) How is MSW valorised? (Added-value products)	No valorisation, some small portions of clean organics can be directed to one biogas plant in the region	
96) Which is the price of MSW added value-products?	No added value	
Which are the future perspectives? (Techniques, wastes)	Separate collection combined with systems for organic recycling (anaerobic digestion for volatile reduction to biogas, combined with composting of digestate in controlled composting systems). Non-recyclable and non-biodegradable fraction still to be landfilled.	

#### Regional bioeconomy development and promotion. Policy framework

CROSS-CUTTING ISSUES		
Questions	Answer	Comments
97) Does your region have a strategy for circular bioeconomy?	Romania, or regions in Romania does not have a strategy for circular bioeconomy	
98) Existence of bioeconomy hubs, clusters or any other association in the region?	No specialised hubs. BIOEAST EU-project established the national contact point at the <b>Ministry of Agriculture and Rural Development</b> to interact and coordinate the national views with other bioeconomy related ministries  <a href="https://bioeast.eu/romania-ministry-of-agriculture-and-rural-development/">https://bioeast.eu/romania-ministry-of-agriculture-and-rural-development/</a>	
99) Existing of hubs or cluster targeting other topic or sectors? (please specify)	There are clusters <a href="mailto:health@bioeconomy">health@bioeconomy</a> ( <a href="https://rohealth.ro/en">https://rohealth.ro/en</a> ), biomass-green energy ( <a href="https://www.greencluster.ro/english/">https://www.greencluster.ro/english/</a> ), green energy cluster located in West region: ROSENC <a href="http://rosenc.ro/">http://rosenc.ro/</a>	
100) What environmental indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (GHG decrease achieved with bioeconomy initiatives, resources depletion, implementation strategy aiming zero waste, etc.) ?	<ul style="list-style-type: none"> <li>- GHG emissions decrease achieved by implementation of bioeconomy initiatives;</li> <li>- Reduction of wastes generated in agro-food supply chain and recycling of organic fraction from MSW;</li> <li>- Fossil fuel replacement with bio-based fuels produced locally;</li> <li>- Rehabilitation of polluted and marginal lands using bio-based conditioners and fertilizers such as digestate,</li> </ul>	

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	compost and vermicompost to prevent depletion of soil fertility and restore soil health&biodiversity	
101) What economic indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (turnover linked to biobased companies (forestry, agriculture, other-biobased industries), existence of funding programmes/schemes targeting bioeconomy, existence of supporting measures promoting partnerships between industries and enterprises in the region, etc.?	<p>The main indicator for the progress of the circular bioeconomy can be measured by turnover linked to biobased companies applying or connected to circular bioeconomy.</p> <p>Others subsequent indicators (existence of funding programmes/schemes targeting bioeconomy, existence of supporting measures promoting partnerships between industries and enterprises in the region) should deliver the progress measurable by the main indicator stated above.</p>	
102) What social indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (available skilled workforce, number or jobs created in the last 5 years un bio-based industries, communications to society regarding bio-based activities (seminars, trainings, etc.), willingness to pay for bio-based products, etc.?	The impact of the progress of the circular bioeconomy on social sector can be measured by awareness raised in general population and properly informed individuals (especially in young population) regarding approaches and activities to be taken by each person and communities in order to develop functional circular bioeconomy. This can be achieved by appropriate communications to society regarding elementary, simple and attractive circular bioeconomy information (in social media, in all education cycles and all education sectors, but also in other social structures). Subsequently and after economic progress is observed, other quantitative indicators can be measured, such as number of jobs created in bio-based industries, available skilled workforce, or willingness to pay for more expensive-than-fossil-based bio-based products	
103) Current economic and social characteristics of your territory not reported in previous questions that could enable the development of the circular bioeconomy?	Bioeconomy and renewable energy legal frame work is not entirely adequate to EU strategies in this sectors. Economic entities currently applying circular bioeconomy does not report significant profit. These characteristics decrease the willingness of local entities to take steps forward in implementing circular bioeconomy.	
104) Are there any bio-based production districts / specializations in your Region? (Please, provide a description of these activities, including data, focusing on Circular Bio-based Economy potentials and material/immaterial assets as well as existing barriers)	The main example of bio-based production district / community in West Region is University of Life Science from Timișoara campus comprising 173729 m <sup>2</sup> . Besides the didactic and research area, owns animal and crops farms, greenhouse, orchard, vineyard and food processing. The main activities are focused on R&D in agriculture, bio-economy and management of bioresources. Currently under construction a combined heat and power cogeneration biogas plant (88 kW) and already installed PV roof-top solar system (150 kW). The circular bioeconomy is transferred by curricula to students and by extension activities to economic sector and society.	
105) What are the strengths/weaknesses of your area regarding the development of the circular bioeconomy?	<p>Strengths are mainly linked to the regional potential regarding strong agriculture, food industry and related material flow in the regional bioeconomy.</p> <p>Weaknesses: E.U. and global green strategies are not correlated to market situation and legal framework. Big finance and investors are rather attracted by sectors with higher and faster turnover (health-biotech, IT, non-renewable energy etc). Policy makers act rather according to populist measures attracting votes then to strategies and agreements signed by world and EU leaders. Specific example: the region has lost opportunity to host the largest cellulosic biorefinery in Europe because of local policy makers.</p>	



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106) Please, identify actors with a natural interest in a project due to their existing businesses and market in your territory	Main actors are listed in the stake holders list	
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## Annex 4. Western Slovakia region profile

INFORMATION FOR STATISTICAL ANALYSIS		
REGIONS (EUROSTAT NUTS 2 – Level)		
(Please indicate for your region which NUTS 2-Regions are relevant or add additional regions in the comment section.)		
Question	Suggested NUTS 2 regions	Comments
1) Germany – Region of Baden-Württemberg	<input type="checkbox"/> Stuttgart (please translate to English) <input type="checkbox"/> Karlsruhe (please translate to English) <input type="checkbox"/> Freiburg (please translate to English) <input type="checkbox"/> Tübingen (please translate to English)	
2) Spain – Region of Aragon	<input type="checkbox"/> Zaragoza (please translate to English) <input type="checkbox"/> Huesca (please translate to English) <input type="checkbox"/> Teruel (please translate to English)	
3) Greece – Region of Western Macedonia	<input type="checkbox"/> Dyitiki Makedonia (please translate to English)	
4) Bulgaria – Region of Plovdiv	<input type="checkbox"/> Yuzhen tsentralen (please translate to English)	
5) Slovakia – Nitra Self-Governing Region	<input type="checkbox"/> Západné Slovensko (please translate to English) Western Slovakia	
6) Slovenia – Whole Country	<input type="checkbox"/> Vzhodna Slovenija (please translate to English) <input type="checkbox"/> Zahodna Slovenija (please include the traduction)	
7) Croatia – Region Adriatic Croatia	<input type="checkbox"/> Jadranska Hrvatska (please translate to English)	
8) Hungary – Region North Hungary	<input type="checkbox"/> Észak-Magyarország (please translate to English)	
9) Romania – West region	<input type="checkbox"/> Vest (please translate to English)	
10) Czechia – Region BIOEAST	<input type="checkbox"/> Praha (please translate to English) <input type="checkbox"/> Střední Čechy (please translate to English) <input type="checkbox"/> Jihozápad (please translate to English) <input type="checkbox"/> Severozápad (please translate to English) <input type="checkbox"/> Severovýchod (please translate to English) <input type="checkbox"/> Jihovýchod (please translate to English) <input type="checkbox"/> Střední Morava (please translate to English) <input type="checkbox"/> Moravskoslezsko (please translate to English)	
11) Netherlands – Region Apeldoorn	<input type="checkbox"/> Gelderland (please translate to English)	
12) Italy – Region Campania	<input type="checkbox"/> Campania (please translate to English)	



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How to identify socially marginalised groups?

SOCIALLY MARGINALISED GROUPS																									
Questions		Answer				Comments																			
1)	Population area with less than 5.000 inhabitants	About 400 areas.				The Nitra region is densely populated and therefore there are only a few areas under 5000 inhabitants. These areas are mainly at the level of municipalities and precise statistics on the number of municipalities are not kept.																			
2)	Unemployment rate in the area	<table><tr><td></td><td>Slovakia</td><td>Western Slovakia</td><td>Nitra region</td></tr><tr><td>Unemployment rate</td><td>6,76%</td><td>4,41%</td><td>4,8%</td></tr></table>					Slovakia	Western Slovakia	Nitra region	Unemployment rate	6,76%	4,41%	4,8%	Unemployment rate in Slovakia was 6,76% and in 2020 was 7,57%, in Western Slovakia in 2021 was 4,41% (0,96% decrease compare to 2020) and in Nitra region unemployment decreases about 0,7%.											
	Slovakia	Western Slovakia	Nitra region																						
Unemployment rate	6,76%	4,41%	4,8%																						
3)	Employment rate of women in the region and at national level	<table><tr><td></td><td>Slovakia</td><td>Western Slovakia</td><td>Nitra region</td></tr><tr><td>Unemployment rate (women)</td><td>7,78%</td><td>5,39%</td><td>6,12%</td></tr></table>					Slovakia	Western Slovakia	Nitra region	Unemployment rate (women)	7,78%	5,39%	6,12%	In Slovakia, female employment is not reported, so we present female unemployment in 2021. Female unemployment has fallen by 0.7 compared to 2020.											
	Slovakia	Western Slovakia	Nitra region																						
Unemployment rate (women)	7,78%	5,39%	6,12%																						
4)	Main economic activity in the area	Agriculture, food industry, automotive, construction, industry, electrical engineering, chemistry, production of plastic materials, shoe industry, textile industry, lignite mining, grape growing, etc.																							
5)	Jobs at risk	Automotive and food industry																							
6)	Main breadwinner of the family nucleus	Both																							
7)	Average educational level and share of population with different school attainment	<table><tr><td>Educational level</td><td>Slovakia</td><td>Western Slovakia</td><td>Nitra region</td></tr><tr><td>Without completed education (0-14 years)</td><td>11,44%</td><td>10%</td><td>9,69%</td></tr><tr><td>primary education</td><td>16,97%</td><td>16,28%</td><td>17,67%</td></tr><tr><td>secondary vocational (apprenticeship) education (without matriculation)</td><td>19,22%</td><td>22,47%</td><td>22,08%</td></tr><tr><td>upper secondary education (with matriculation)</td><td>24,66%</td><td>25,42%</td><td>24,7%</td></tr></table>	Educational level	Slovakia	Western Slovakia	Nitra region	Without completed education (0-14 years)	11,44%	10%	9,69%	primary education	16,97%	16,28%	17,67%	secondary vocational (apprenticeship) education (without matriculation)	19,22%	22,47%	22,08%	upper secondary education (with matriculation)	24,66%	25,42%	24,7%	Data for 1.1.2021 The most people in Western Slovakia have an upper secondary education (around 25%), next is higher education and primary education.		
Educational level	Slovakia	Western Slovakia	Nitra region																						
Without completed education (0-14 years)	11,44%	10%	9,69%																						
primary education	16,97%	16,28%	17,67%																						
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upper secondary education (with matriculation)	24,66%	25,42%	24,7%																						



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	<table><tr><td>higher vocational education</td><td>4,91%</td><td>5,25%</td><td>5%</td></tr><tr><td>higher education</td><td>18,38%</td><td>16,17%</td><td>16,05%</td></tr><tr><td>without school education (15+ years)</td><td>0,28%</td><td>0,24%</td><td>0,27%</td></tr></table>	higher vocational education	4,91%	5,25%	5%	higher education	18,38%	16,17%	16,05%	without school education (15+ years)	0,28%	0,24%	0,27%																					
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without school education (15+ years)	0,28%	0,24%	0,27%																															
8) Population age structure in the region and at national level	<table><tr><td>Age level</td><td>Slovakia</td><td>Western Slovakia</td><td>Nitra region</td></tr><tr><td>0-14</td><td>15,92%</td><td>14,18%</td><td>13,79%</td></tr><tr><td>15-64</td><td>67,03%</td><td>67,44%</td><td>67,59%</td></tr><tr><td>65+</td><td>17,05%</td><td>18,37%</td><td>18,63%</td></tr></table>	Age level	Slovakia	Western Slovakia	Nitra region	0-14	15,92%	14,18%	13,79%	15-64	67,03%	67,44%	67,59%	65+	17,05%	18,37%	18,63%	Data for 1.1.2021 Most of the population is in productive age, which also reflects the overall age distribution of Slovakia's population.																
Age level	Slovakia	Western Slovakia	Nitra region																															
0-14	15,92%	14,18%	13,79%																															
15-64	67,03%	67,44%	67,59%																															
65+	17,05%	18,37%	18,63%																															
9) Share of ethnics minorities in the region and at national level	<table><tr><td>Minorities</td><td>Slovakia</td><td>Western Slovakia</td><td>Nitra region</td></tr><tr><td>Romans</td><td>1,23%</td><td>0,27%</td><td>0,39%</td></tr><tr><td>Rusyn</td><td>0,44%</td><td>0,02%</td><td>0,02%</td></tr><tr><td>Hungarian</td><td>7,75%</td><td>14,7%</td><td>22,31%</td></tr><tr><td>Czech</td><td>0,53%</td><td>0,56%</td><td>0,45%</td></tr><tr><td>German</td><td>1,72%</td><td>0,04%</td><td>0,03%</td></tr><tr><td>Russian</td><td>0,06%</td><td>0,04%</td><td>0,04%</td></tr><tr><td>Ukrainian</td><td>0,17%</td><td>0,08%</td><td>0,07%</td></tr></table>	Minorities	Slovakia	Western Slovakia	Nitra region	Romans	1,23%	0,27%	0,39%	Rusyn	0,44%	0,02%	0,02%	Hungarian	7,75%	14,7%	22,31%	Czech	0,53%	0,56%	0,45%	German	1,72%	0,04%	0,03%	Russian	0,06%	0,04%	0,04%	Ukrainian	0,17%	0,08%	0,07%	Data for 1.1.2021 Slovakia is a very diverse country, which is also reflected in the number of ethnics minorities. In Slovakia is more than 25 ethnics minorities. We describe top 7 minorities. Other minorities are for example Moravian, Polish, Vietnamese, Bulgarian, Croatian, etc.
Minorities	Slovakia	Western Slovakia	Nitra region																															
Romans	1,23%	0,27%	0,39%																															
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German	1,72%	0,04%	0,03%																															
Russian	0,06%	0,04%	0,04%																															
Ukrainian	0,17%	0,08%	0,07%																															
10) Emigration rate in the region and at national level	<table><tr><td></td><td>Slovakia</td><td>Western Slovakia</td><td>Nitra region</td></tr><tr><td>Emigration rate (inhabitatnts)</td><td>3395</td><td>1131</td><td>384</td></tr></table>		Slovakia	Western Slovakia	Nitra region	Emigration rate (inhabitatnts)	3395	1131	384	The number of inhabitants in 2021 who left Slovakia to live abroad increase by 967 inhabitants in Slovakia compared to 2020. In total, there are around 2.2 million Slovaks living in the world.																								
	Slovakia	Western Slovakia	Nitra region																															
Emigration rate (inhabitatnts)	3395	1131	384																															
11) Average salary or household income in the region and at national level	<table><tr><td></td><td>Slovakia</td><td>Western Slovakia</td><td>Nitra region</td></tr><tr><td>Average salary</td><td>1679€</td><td>-</td><td>1644€</td></tr></table>		Slovakia	Western Slovakia	Nitra region	Average salary	1679€	-	1644€	In 2021, we have seen a decline in household income both nationally and regionally. The decrease was due to the pandemic, high price rises and energy bills.																								
	Slovakia	Western Slovakia	Nitra region																															
Average salary	1679€	-	1644€																															
12) Please describe the structure and the characteristics of relevant socially disadvantaged/ marginalized groups in your region	Relevant disadvantaged group in the region are a. Unemployed b. Uneffective farmers with low income (due to competition from countries/regions with stronger support of agriculture) c. Uneffective entrepreneurs in agrifood d. People with jobs at risk (lot of employees in machinery)																																	
13) Please comment the potential impact of their participation in Circular Bio-based Economy	Participation of disadvantaged groups together with innovation in entire value chain may change structure of local economy in terms of focus on traditional agriculture and food production with exploiting local potential.																																	
14) Please indicate the factors hindering their possible participation?	Factors are • Lack of subsidies (comparing to neighbour countries) makes their final products uncompetitive • Strong focus on machinery and higher salary in this sector • Lack of innovation in agrifood • Ignoring local agrifood products by wholesale chains																																	

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	<ul style="list-style-type: none"> <li>Uncompetitive prices compare to low quality products form big producers</li> </ul>	
15) Indicate the selected marginal group/s that will be targeted during the project and relevance in the region	<ul style="list-style-type: none"> <li>Small/mid-size farmers</li> <li>SMEs in agrifood</li> </ul> <p>The relevance of this groups is in creating jobs, bringing innovation and added value to regionally traditional sector of agriculture, better exploitation of local potential.</p>	
16) Average educational level of targeted marginalized groups	Lower-secondary, higher-secondary, high-school	
17) Description of the occupied post, considering the type of work performed and the qualification required by the targeted marginalized groups (question 13)	The qualification is satisfactory in terms of basic knowledge needed, but at specific posts there is gap of specific knowledge mostly in the area of marketing, business skills etc.	

#### Situation of main economic sectors

PRIMARY SECTOR						
AGRICULTURE						
Questions		Answer				Comments
18)	How large is the surface of cultivable areas? (you can check databases such as Eurostat: <a href="https://ec.europa.eu/eurostat/web/agriculture/data/database">https://ec.europa.eu/eurostat/web/agriculture/data/database</a> )	1 862 653,72 ha				Total area of cultivated agricultural land in 2020 compared decreased by 1,4% compared to 2016 and amounted to 1 862 653,72 ha.
19)	Which are the main crops in the area (surface in hectares of percentage of the cultivable area occupied by each crop)	Main crops (in ha)	Slovakia	Western Slovakia	Nitra region	Data for 2021
		Grains	356969 ha	-	-	
		Cereals	717695 ha	-	-	
		Oil seeds	289801 ha	-	-	
		Potatoes	6072 ha	-	-	
20)	Which is the average annual production (dry basis) of the most relevant crops (listed in question 15)?	Sugar-beet	21804 ha	-	-	Data for 2021
		Main crops (in ha)	Slovakia	Western Slovakia	Nitra region	
		Grains	5,93	6,56	6,71	
		Cereals	6	6,63	6,78	
		Oil seeds	2,71	2,96	3,05	
21)	Average yield (dry basis) for the most relevant crops (listed in question 15)?	Potatoes	24,88	29,5	20,61	Average yield for all crops combined in 2021.
		Sugar-beet	62,57	63,27	63,1	
		Slovakia	Western Slovakia	Nitra region		
		1258222,4	951756,2	454705,7		
22)	What is the percentage of employment covered by agriculture?	3% - Total share of people working in agriculture in the number of people working in the Slovak Republic				The agricultural sector employs 3% of the workforce, representing 45 400 employees, a decrease of 3 100 employees compared to 2020.
23)	Are state subsidies received by the farmers (CAP or others)? Please shortly mention the crops and the aim of the subsidy (equipment modernisation, yield increase, etc.	YES				E.g.: - aid to compensate for damage caused by animal diseases and to reimburse certain costs of eradicating animal diseases in the form of a subsidy - aid for the removal and disposal of dead livestock - Support for operating costs and recovery - Support for investment in infrastructure relating to the development, modernisation or

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		adaptation of agriculture and forestry			
24) What is the current situation of the soils (erosion, eutrophication, pollution...)?	<ul style="list-style-type: none"><li>Penetration of pesticides from agricultural production.</li><li>Deforestation (more than 7000 hectares of forests have disappeared in the Low Tatras in the last 15 years).</li><li>Erosion: In 2015, 38.8% (770 388 ha) of agricultural soils were potentially threatened by water erosion. Compared to water erosion, wind erosion is not a major problem and 6.9% (137 002 ha) of agricultural soils were potentially at risk in that year.</li></ul>				
25) Who are the main stakeholders involved in the crops production (cooperatives or farmers associations, individual farmers owning large or small areas, etc.)?	State farms, foreign farmers, farmers associations, farms owned by local authorities, individual farmers.				
26) How much residual biomass is produced? Please indicate for the most relevant crops (question 14) the residues that are produced during the processing		Slovakia	Western Slovakia	Nitra region	In t for 2021
	Cereals straw	1106752	998724	398376	
	Oil seed rape straw	184279	137934	55574	
	Maize stover	559421	523799	209383	
	Sugar-beet leaves	69425	69404	28534	
	Sunflower straw	183881	161123	63488	
	Total	2103759	1890442	755355	
27) Is the residual biomass (question 21) exploited (energy production, chemicals, fertilizers, etc.)?	YES				In Slovakia, 8 crops were grown exclusively for energy purposes in 2021, 0.56% of the total sown area was used.
28) Average selling price for the main crops (€/dry tonnes) (listed in question 15)? When possible, also include the production cost.	Main crops (in ha)	€/dry tonnes			
	Grains	-			
	Cereals	295			
	Oil seeds	-			
	Potatoes	295			
	Sugar-beet	36,34			
29) Which are the future perspectives? (Technologies, increase of the area dedicated to certain crops, new crops development, new biomass or residual biomass value chain development, employment)	<ul style="list-style-type: none"><li>Introduce a micro-loan scheme for small, young, family and beginning farmers.</li><li>To expand fruit, vegetable, potato cultivation and processing in order to increase employment, consumption and reduce imports.</li><li>Continue to expand vegetable cultivation using non-traditional energy sources (e.g. use of geothermal energy).</li></ul>				
FORESTRY					
Questions	Answer				Comments
30) Forest area in the region (please indicate the hectares and percentage occupied by forestland in the region)?	Forest area	Slovakia	Western Slovakia	Nitra region	The area of forest cover in Slovakia in 2022 reached 2 029 034 ha and in western Slovakia it is at the level of 25% and the long-term trend of its increase persists.
	hectares	2 029 034	385 034	96 992	
	percentage	41,38%	25,68%	4,78%	
31) Productive forest area share (exploited for wood)?	487,3 mil. m <sup>3</sup>				The total stock of wood on forest land in 2021 was 487.3 million m <sup>3</sup> of gross wood without bark. This represents an increase of 2.8 million m <sup>3</sup> compared to 2020.

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32) Which are the main uses of forestry biomass?	<ul style="list-style-type: none"><li>• Heating</li><li>• Furniture manufacture</li><li>• Use in construction (houses, gazebos, cottages)</li><li>• Art</li></ul>				
33) Share of forestland owned by the administration and private owners?	Owner	Share of forestland			
	State forest	40,4%			
	Private	12,0%			
	Communal	16,6%			
	Church	2,3%			
	Municipality	7,8%			
	Agricultural cooperatives	0,3%			
34) Are state subsidies received by the forestry sector?	Yes				The total public support for forestry in 2021 was €36.69 million. Compared to 2020, the volume of support has decreased, mainly due to a lower uptake of funds from the Rural Development Programme 2014-2022. In 2021, the amount of funding from the RDP SR 2014-2022 was € 4.04 million.
35) Who are the main stakeholders involved in the forest biomass production?	State-owned forests, individual owners, urbarium – circa 20.				
36) Please indicate if possible the forest biomass production cost and the average selling price (€/dry tonnes)?	Selling price: 190€/m³				The price is volatile, depending on supply and demand.
37) What is the percentage of employment covered by forestry?	Circa 16 800 employees				Forestry in the Slovak Republic directly employs approximately 8.3 thousand employees. In addition, there are approximately 8.5 thousand self-employed persons working in the Forestry Industry of the Slovak Republic, which amounts to a total of around 16.8 thousand persons working in the Forestry Industry of the Slovak Republic
38) How much residual biomass is produced in the region?		Slovakia	Western Slovakia	Nitra region	Primary biomass residues potential from forests in Kt.
	Total (Kt)	2088	432	121	
39) Is the residual biomass (question 34) exploited? (Indicate)	<ul style="list-style-type: none"><li>• Wood chips</li><li>• Heating</li><li>• Pellets</li><li>• Energy production</li></ul>				
40) Which are the future perspectives? (Technology, forestry, employment increase, increase of exploited areas, etc.)	<ul style="list-style-type: none"><li>• The development of rural business activities (including the involvement of business entities in cooperation projects) in relation to the creation of new value chains in the circular bioeconomy and the long-term improvement of the position in the value chains.</li><li>• Increasing demand for timber and other services.</li><li>• Non-state forestry sector support through rural development program.</li></ul>				
41) Share of forestland area affected by forest fires the last year?	159 ha (0.008 %)				According to the records of the Fire Technical and Expertise Institute of the Ministry of the Interior of the Slovak Republic, the 101 forest fires with a total damaged area of 159

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		ha (0.008 %) were registered in 2021 of forest area and the damage caused 206 thousand euro.
LIVESTOCK		
Questions	Answer	Comments
42) How large is the area dedicated to livestock in the region?	512 042 ha in Slovakia	2021
43) Average farm size (cows, pigs, chicken, or other) in the region?	73,6 ha	2016
44) Which is the daily livestock maintenance cost (€/head)?	Data are not monitored by the state or region	
45) Which is the main destination of the cattle? (Meat, milk, wool...)	<ul style="list-style-type: none"><li>• Animal products</li><li>• Cow’s milk</li><li>• Hen eggs</li><li>• Wool</li></ul>	
46) What is the employment rate covered by livestock?	5 574 employees	5 574 employees in livestock production in 2021
47) Are state subsidies received for farming?	YES	
48) Who are the main stakeholders involved in the production?	Individual farmers, farmers associations, state farms, foreign farmers, farms owned by local authorities	
49) Which is the main residue produced in each case?	Manure	
50) How much slurry/manure/other residue is produced in average (t/head) and in the region (total)?	Data not available	
51) Is the slurry/manure/other exploited? (Indicate the percentage that is currently used) If not, how are the residues managed?	Data not available	Manure/ slurry is only used for fertilisation, it is not used for energy.
52) Average selling price for the slurry/manure/other?	From 13€/10kg for manure	
53) Which are the future perspectives? (Valorisation technologies, cattle, employment rate, farm modernisation, increase of large exploitations, decrease of livestock production, etc.)	<ul style="list-style-type: none"><li>• Long-term decline in all major commodities - pig production, poultry production, beef and milk production</li><li>• decline in self-sufficiency of production, rising feed prices, shortage of slaughterhouses.</li><li>• Decline in pigs, cattle, sheep and chickens.</li></ul>	
SECONDARY SECTOR		
AGROINDUSTRY		
Questions	Answer	Comments
54) How many agrifood industries are there in the region?	3800 agrifood industries in Slovakia	
55) Which are the main products produced?	Brewing, meat, confectionery, milk, pastry, etc.	
56) Which is the annual average production in the main agrifood industries?		Revenue in ths. eur
	Brewing	116,177
	Meat	107,091
	Confectionery	84,328
	Milk	72,700
	Pastry	53,168
57) Are companies producing organic or agrifood products receiving subsidies?	Subsidies are available but not specifically dedicated to the purpose	
58) What is the percentage of employment covered by agroindustries?	56 700 employees	
59) What is the main economic limitation (energy cost, supply chain...) faced by agroindustries?	<ul style="list-style-type: none"><li>• Supply chain</li><li>• Less competent agroindustry - foreign products/industries are more encouraged/subsidised</li></ul>	
60) Which type of wastes/side-products/residues are produced?	<ul style="list-style-type: none"><li>• Animal skins</li><li>• Bones</li></ul>	

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		<ul style="list-style-type: none"> <li>• Eggshells</li> <li>• Feathers</li> <li>• Manure</li> <li>• Peels</li> </ul>	
61)	How much wastes/side-products/residues are produced?	Data not available	
62)	Are the wastes/side-products/residues exploited? (Please specify for which application)	<ul style="list-style-type: none"> <li>• Manure (fertilizing soil)</li> <li>• Eggshells (fertilizing soil)</li> <li>• Peel (fertilizing soil)</li> </ul>	
63)	What are the future perspectives? (Techniques, products, production, employment)	<ul style="list-style-type: none"> <li>• assumption of labour availability due to the reduction of employment in the automotive industry (efforts to return them to agrifood)</li> <li>• Techniques, products and production are not subject of the strategy</li> </ul>	
64)	Which are the main stakeholders of the local agrifood industry?	NPPC (National Agricultural and Food Centre), Agrifood companies, Farms in region	
<b>OTHER BIO-BASED INDUSTRIES</b>			
	Questions	Answer	Comments
65)	Is there a mapping of the current bio-based industrial activities in your area?	No	Responses are incomplete due to lack of data at state and regional level.
66)	How many biobased industries are there in the region? Please specify the main biobased products produced	Food and feed ingredients industries (flavourings, spices, red pepper) Commercial biorefineries (bioethanol, vegetable oil, biorefinery products) Pulp and paper initiatives (sanitary paper, cellulose for paper)	
67)	Out of the previous list indicate the three more relevant in terms of revenues and role to meet the government strategic objectives (decarbonisation, CO <sub>2</sub> emissions, circular economy, etc.)	Going green farming systems and more efficient use of the food produced could be achieved 49% net reduction greenhouse gas emissions. Decarbonisation is part of the Recovery and Resilience Plan - reducing emissions by 55% by 2030.	
68)	Are state subsidies received to promote sustainable production by these industries?	There is no systematic government assistance, only intermittent, which is not sufficient.	
69)	What is the percentage of employment covered by biobased industries?	9,86%	
70)	How many tonnes of biobased materials/products are produced per year? Please specify by typology (renewable energies, biofuels, biomaterials, biochemicals, biobased cosmetics/pharmacy, others)	Paper – more than 66 000 t Sanitary paper – 77 899 436 pc Bioethanol - 145,000 m3 Flavourings, spices, red pepper – 26 657 161 pc Bioethanol – 175 000m3	
71)	Which type of wastes/by-product, residue are produced in the production process?	Water from production, residues of processed raw materials (stems, seeds, poor quality crops), corn stover (a by-product of bioethanol production)	
72)	What are the biobased materials, side-products, waste or residues used as raw materials in the productive process?	Dried pulp, waste paper, food waste, petrochemical residues, residues from other industries (e.g. fat, oil, grease, used coffee grounds)	
73)	Where are these raw materials obtained or cultivated?	Slovakia (wood, corn), import from Czech or Hungary (e.g. spices)	
74)	Which are the main stakeholders/actors supplying these raw materials?	Farms, foods companies, agriculture	
75)	Which is the price of these biobased raw materials used (€/ton)?	Corn – 137,5€/ton Wood – 190€/m3	
76)	Which is the price of the main biobased products produced in the region (€/ton)?	Bioethanol – circa 4€/litre Spices – 12€/kg Flavourings – 5€/kg Red pepper (ground) – 20€/kg	
77)	Which are the perspectives in the use of these biobased raw materials/side-products/waste?	<ul style="list-style-type: none"> <li>• Opportunities in investments in pulp and paper industry</li> <li>• Space for investments in biochemical production</li> <li>• Large space for investments in food processing</li> </ul>	

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	<ul style="list-style-type: none"> <li>Possibilities for investments in furniture industry</li> </ul>																
78) Which are the perspectives in the consumption of these biobased products?	<ul style="list-style-type: none"> <li>Increase in the consumption</li> <li>Wider product range</li> </ul>																
79) Please mention the 3 bio-based solutions with more relevance in your region (that can be taken as an example of implementation or good practice for other regions) and provide contact details if possible.	<ul style="list-style-type: none"> <li>Local production of foodstuff (direct sale to the consumers)</li> <li>Local biomass processing for pellets</li> <li>Recycling of paper and pulp</li> </ul>																
80) Please mention 3 bio-based solution in your region that have high deployment potential in your region but still need support to accelerate-unlock its potential (please mention what technological, regulatory and market challenges are and provide contact details if possible)	<ul style="list-style-type: none"> <li>Wood processing</li> <li>Local production of foodstuff</li> <li>Local processing of biomass for energy production</li> </ul>																
<b>ENERGY INDUSTRY</b>																	
Questions	Answer	Comments															
81) How many energy industries are there?	<table border="1"> <thead> <tr> <th></th><th>Number</th><th>%</th></tr> </thead> <tbody> <tr> <td>Nuclear power plants</td><td>2</td><td>86,45</td></tr> <tr> <td>Fossil-fuel plants</td><td>2</td><td>5,33</td></tr> <tr> <td>Hydro-electric power plants</td><td>34</td><td>8,21</td></tr> <tr> <td>Photovoltaic</td><td>2</td><td>&lt;0,1</td></tr> </tbody> </table>		Number	%	Nuclear power plants	2	86,45	Fossil-fuel plants	2	5,33	Hydro-electric power plants	34	8,21	Photovoltaic	2	<0,1	In Slovakia there are two nuclear power plants (Mochovce, Jaslovské Bohunice), two thermal power plants (Nováky, Vojany), 34 hydroelectric power plants (mainly on the Váh and Hron rivers) and two solar power plants (Mochovce, Vojany).
	Number	%															
Nuclear power plants	2	86,45															
Fossil-fuel plants	2	5,33															
Hydro-electric power plants	34	8,21															
Photovoltaic	2	<0,1															
82) Does the main part of energy come from renewable or non-renewable energy?	Non-renewable energy	Slovakia obtains most of its energy from non-renewable sources, mainly nuclear energy, which accounts for up to 53%.															
83) What is the main source of renewable energy?	1, Water (16%) 2, Solar energy (3%) 3, Biomass energy 4, Wind 5, Geothermal	The share of renewable energies rises from 17.77% (2020) to 21.3% in 2021.															
84) What is the main source of non-renewable energy?	1, Nuclear energy (53%) 2, Thermal energy (5%) 3, Oil and gas																
85) Are state subsidies received to promote renewable energies?	YES	Within the framework of the Operational Programme Quality of the Environment is the project "Green Households", the main objective of which is to reduce greenhouse gas emissions by supporting the purchase and installation of heating equipment that is based on renewable energy sources.															
86) What is the percentage of employment covered by the energy sector?	Estimation: 5%	Exact data are not available															
87) Which is the average price of energy (€/kW h)? (Differences between renewable and non)	0,12-0,18 €/kWh (2022)																
88) Which percent of energy usage comes from renewable energy?	17,41% (2021), 17,34% (2020), 16,89% (2019)	In 2021, 17,41 percent of energy usage comes from renewable energy. We are seeing a positive trend in the use of renewables.															
89) Which are the future perspectives?	Use of nuclear energy as a carbon-free source.																

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	Use of secondary energy sources. Reducing dependence on fossil fuel imports.				
MUNICIPAL SOLID WASTE (MSW)					
Questions		Answer			Comments
90) How many tonnes of MSW are generated per year?		Slovakia	Western Slovakia	Nitra region	2021
	T of MSW (2021)	2 702 186,26 t	1 038 329 t	386 640,8 t	
91) Which is their main composition?	Main composition		T		2021
	Mixed municipal waste		1 128 546 t		
	Metals		443 939,14 t		
	Biodegradable waste		350 112,29 t		
	Paper and cardboard		224 669,51 t		
	Bulky waste		187 243,97 t		
	Plastics		94 627,20 t		
92) Are the wastes exploited? (Indicate how)		Slovakia	Western Slovakia	Nitra region	2021
	Materially recovered	583815,1 t	215941,2 t	82 635,7 t	
	Energy recovered	219368,8 t	568,6 t	413 t	
	Recovered by recovering organic matter	736981,5 t	319117,1 t	11255,4 t	
	Composting	419093,9 t	192144 t	76348,4 t	
	Landfill	1099288,1 t	483884,4 t	186 534,2 t	
	Combustion without energy recovery	269,4 t	53 t	9,1 t	
93) Where are the MSW generated?	Area		%		In 2018
	Industrial production		33,7		
	Construction		5,3		
	Wholesale and retail		6		
	Agriculture, forestry, fishing		5,2		
	Transport and storage		16,7		
	Extraction and quarrying		2,7		
	Supply of electricity, gas, steam		9,6		
Water supply, waste water		15			
94) Who are the main stakeholders involved in the MSW management?	TSR Slovakia, ŽP EKO QELET, Zberné suroviny, ADA WASTE, SAKER, Marius Pedersen, FCC Environment, Brantner, T+T, AVE SK odpadové hospodárstvo, OLO and Kosit, ENVI-PAK and NATUR-PACK.				
95) How is MSW valorised? (Added-value products)	Data not available				
96) Which is the price of MSW added value-products?	The price of the products is higher because they undergo more demanding processing.				
Which are the future perspectives? (Techniques, wastes)	<ul style="list-style-type: none"><li>• Still an enormous amount of waste that is not separated and that can be recycled, reused, used for energy generation once the separation and waste treatment system become further developed<ul style="list-style-type: none"><li>• Empowering bioeconomy through circular economy. Good opportunity for companies to invest in and improve the circular economy. E.g. instead of landfilling, using biowaste like retail food waste to empower the bioeconomy potential. More recycling.</li><li>• Increasing the efficiency of metal processing and of electricity generation from lignite could immensely increase the overall resource efficiency of the economy<ul style="list-style-type: none"><li>• Gradually increase the landfill tax.</li><li>• Consider ICT for useful recycling.</li></ul></li></ul></li></ul>				

Regional bioeconomy development and promotion. Policy framework

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CROSS-CUTTING ISSUES		
Questions	Answer	Comments
97) Does your region have a strategy for circular bioeconomy?	In Slovakia are not national or regional strategies for circular economy. There are only partial strategies.	
98) Existence of bioeconomy hubs, clusters or any other association in the region?	Bioeconomy Cluster Nitra Inovato	
99) Existing of hubs or cluster targeting other topic or sectors? (please specify)	Inovato is involved in many areas such as automotive, healthcare, energy, mobility, food and others.	
100) What environmental indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (GHG decrease achieved with bioeconomy initiatives, resources depletion, implementation strategy aiming zero waste, etc.) ?	<ul style="list-style-type: none"> <li>• GHG decrease</li> <li>• Utilization of local resources in the region (in this moment lot of resources are exported)</li> <li>• Introducing of local strategy of bioeconomy including environmental measures</li> </ul>	
101) What economic indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (turnover linked to biobased companies (forestry, agriculture, other-biobased industries), existence of funding programmes/schemes targeting bioeconomy, existence of supporting measures promoting partnerships between industries and enterprises in the region, etc.)?	<ul style="list-style-type: none"> <li>• Turnover linked to biobased industries</li> <li>• Occupation in bioeconomy</li> <li>• Funding/support programmes focusing on bioeconomy</li> </ul>	
102) What social indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (available skilled workforce, number or jobs created in the last 5 years in bio-based industries, communications to society regarding bio-based activities (seminars, trainings, etc.), willingness to pay for bio-based products, etc.)?	<ul style="list-style-type: none"> <li>• Higher employment</li> <li>• Focus on local products</li> <li>• Development of traditional – agricultural sector</li> </ul>	
103) Current economic and social characteristics of your territory not reported in previous questions that could enable the development of the circular bioeconomy?	<ul style="list-style-type: none"> <li>• R and D strengths in the region with tradition in the area of agriculture</li> <li>• Strong University and education potential for agriculture</li> </ul>	
104) Are there any bio-based production districts / specializations in your Region? (Please, provide a description of these activities, including data, focusing on Circular Bio-based Economy potentials and material/immaterial assets as well as existing barriers)	There is no specialized production district, the biggest barrier of their development is fact that public support (financial, material, spatial) is focusing on development of machinery production mainly in the area of automotive with short-term positive impact on occupation. All start-up initiatives in area of bioeconomy are facing lack of public support and competition of products from other countries with stronger public support. The biggest immaterial asset is tradition, education and research and development in agriculture and agrifood and suitable land for agricultural production.	
105) What are the strengths/weaknesses of your area regarding the development of the circular bioeconomy?	<b>Strengths</b> Tradition (specially for agriculture and agrifood) Education (Agricultural university) Research and development (research institutes) Suitable land for agriculture with potential of bioeconomy development <b>Weaknesses</b> No strategy in the region for bioeconomy development Lack of public support	

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	Competition of other sectors	
106) Please, identify actors with a natural interest in a project due to their existing businesses and market in your territory	<p>Centrum pre vedu a výskum, s.r.o., Mochovce</p> <p>Atómové elektrárne Mochovce, Mochovce</p> <p>VÚSAPL, a.s., Nitra</p> <p>OSRAM, a.s., Nové Zámky</p> <p>Duslo, a.s., Šaľa</p> <p>SES, a.s., Tlmače</p> <p>Plastika, a.s., Nitra</p> <p>Nanogate Slovakia, s.r.o., Vráble</p> <p>VÚEZ, a.s., Tlmače</p> <p>Mühlbauer Technologies s.r.o., Nitra</p> <p>SE Bordnetze – Slovakia s.r.o., Nitra</p> <p>Remarkplast compounding, a.s., Vráble</p> <p>NZES energy s.r.o., Nové Zámky</p> <p>Agentúra pre rozvoj vidieka, Nitra</p> <p>AGRO Business s.r.o., Nitra</p> <p>AGREF, spol. s r.o., Komárno</p>	



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## Annex 5. Slovenia whole country profile

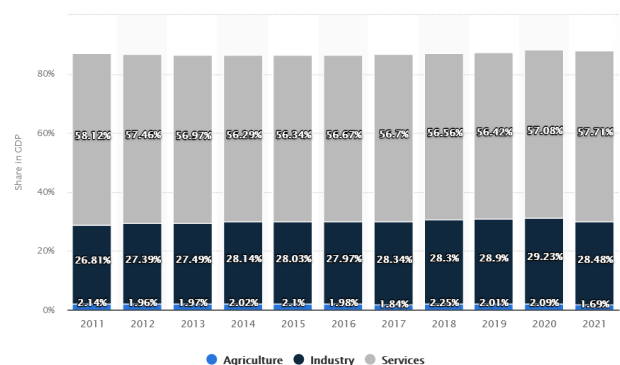
INFORMATION FOR STATISTICAL ANALYSIS		
REGIONS (EUROSTAT NUTS 2 – Level)		
(Please indicate for your region which NUTS 2-Regions are relevant or add additional regions in the comment section.)		
Question	Suggested NUTS 2 regions	Comments
1) Germany – Region of Baden-Württemberg	<input type="checkbox"/> Stuttgart (please translate to English) <input type="checkbox"/> Karlsruhe (please translate to English) <input type="checkbox"/> Freiburg (please translate to English) <input type="checkbox"/> Tübingen (please translate to English)	
2) Spain – Region of Aragon	<input type="checkbox"/> Zaragoza (please translate to English) <input type="checkbox"/> Huesca (please translate to English) <input type="checkbox"/> Teruel (please translate to English)	
3) Greece – Region of Western Macedonia	<input type="checkbox"/> Dyitiki Makedonia (please translate to English)	
4) Bulgaria – Region of Plovdiv	<input type="checkbox"/> Yuzhen tsentralen (please translate to English)	
5) Slovakia – Nitra Self-Governing Region	<input type="checkbox"/> Západné Slovensko (please translate to English)	
6) Slovenia – Whole Country	<input type="checkbox"/> East Slovenia <input type="checkbox"/> West Slovenia	
7) Croatia – Region Adriatic Croatia	<input type="checkbox"/> Jadranska Hrvatska (please translate to English)	
8) Hungary – Region North Hungary	<input type="checkbox"/> Észak-Magyarország (please translate to English)	
9) Romania – West region	<input type="checkbox"/> Vest (please translate to English)	
10) Czechia – Region BIOEAST	<input type="checkbox"/> Praha (please translate to English) <input type="checkbox"/> Střední Čechy (please translate to English) <input type="checkbox"/> Jihozápad (please translate to English) <input type="checkbox"/> Severozápad (please translate to English) <input type="checkbox"/> Severovýchod (please translate to English) <input type="checkbox"/> Jihovýchod (please translate to English) <input type="checkbox"/> Střední Morava (please translate to English) <input type="checkbox"/> Moravskoslezsko (please translate to English)	
11) Netherlands – Region Apeldoorn	<input type="checkbox"/> Gelderland (please translate to English)	
12) Italy – Region Campania	<input type="checkbox"/> Campania (please translate to English)	

How to identify socially marginalised groups?



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SOCIAALLY MARGINALISED GROUPS																																																		
Questions	Answer	Comments																																																
1) Population area with less than 5.000 inhabitants	Slovenia is included in the project as a whole country.																																																	
2) Unemployment rate in the area	3,5 %	<a href="https://www.stat.si/StatWeb/News/Index/10920">https://www.stat.si/StatWeb/News/Index/10920</a>  Unemployment rate represents unemployed persons as a percentage of the labour force (unemployed and employed persons combined). Last data for period: 4 <sup>th</sup> quarter 2022																																																
3) Employment rate of women in the region and at national level	3,8 %	<a href="https://www.stat.si/StatWeb/News/Index/10920">https://www.stat.si/StatWeb/News/Index/10920</a>  Last data for period: 4 <sup>th</sup> quarter 2022																																																
4) Main economic activity in the area	Services 57,7% (2021)	<a href="https://www.statista.com">https://www.statista.com</a>  Slovenia: Share of economic sectors in the gross domestic product (GDP) from 2011 to 2021   <table><thead><tr><th>Year</th><th>Agriculture (%)</th><th>Industry (%)</th><th>Services (%)</th></tr></thead><tbody><tr><td>2011</td><td>1.44</td><td>26.81</td><td>56.81</td></tr><tr><td>2012</td><td>1.96</td><td>27.39</td><td>57.46</td></tr><tr><td>2013</td><td>1.97</td><td>27.49</td><td>56.97</td></tr><tr><td>2014</td><td>2.02</td><td>28.14</td><td>56.29</td></tr><tr><td>2015</td><td>2.1</td><td>28.03</td><td>56.84</td></tr><tr><td>2016</td><td>1.98</td><td>27.97</td><td>56.67</td></tr><tr><td>2017</td><td>1.84</td><td>28.34</td><td>56.77</td></tr><tr><td>2018</td><td>2.25</td><td>28.3</td><td>56.56</td></tr><tr><td>2019</td><td>2.01</td><td>28.9</td><td>56.47</td></tr><tr><td>2020</td><td>2.09</td><td>29.23</td><td>57.08</td></tr><tr><td>2021</td><td>1.69</td><td>28.48</td><td>57.71</td></tr></tbody></table>	Year	Agriculture (%)	Industry (%)	Services (%)	2011	1.44	26.81	56.81	2012	1.96	27.39	57.46	2013	1.97	27.49	56.97	2014	2.02	28.14	56.29	2015	2.1	28.03	56.84	2016	1.98	27.97	56.67	2017	1.84	28.34	56.77	2018	2.25	28.3	56.56	2019	2.01	28.9	56.47	2020	2.09	29.23	57.08	2021	1.69	28.48	57.71
Year	Agriculture (%)	Industry (%)	Services (%)																																															
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2020	2.09	29.23	57.08																																															
2021	1.69	28.48	57.71																																															
5) Jobs at risk	Manufacturing, factory work, construction, agriculture, data entry	<a href="https://sobotainfo.com/novica/globalno/oecd-najbolj-so-ogrozena-delovna-mesta-v-sloveniji-na-ceskem/475445">https://sobotainfo.com/novica/globalno/oecd-najbolj-so-ogrozena-delovna-mesta-v-sloveniji-na-ceskem/475445</a>  OECD working report 2018; OECD Skills Outlook 2019  The OECD has included jobs such as manufacturing, factory work, construction, agriculture, data entry, and similar jobs in the group of vulnerable occupations that are most at risk of automation and where workers need the most training to retrain for less vulnerable occupations. These are jobs that can already be successfully replaced by robots and jobs that can be done by artificial intelligence.  Slovenia has the second highest share of jobs that could be fully automated among the 32 member countries of the OECD. On average across the OECD, 14% of jobs are at high risk of automation, while in Slovenia the figure is 25%, according to the report.																																																
6) Main breadwinner of the family nucleus	Male																																																	
7) Average educational level and share of population with different school attainment	22,2% - primary education or less  52,8% - secondary school	<a href="https://www.stat.si/StatWeb/News/Index/10011">https://www.stat.si/StatWeb/News/Index/10011</a>																																																



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	<p>25,0% - tertiary education (ISCED 5-8)</p> <p>According to the data, the average level of education is completed secondary school.</p>	
8) Population age structure in the region and at national level	<p>Population of Slovenia: 2.110,574</p> <p>Mean age of the population: 43,9 years</p> <p>15,0% aged 0 – 14 63,6% aged 15 – 64 21,3% aged 65+</p> <p>8,6% foreign citizens among population</p>	<p><a href="https://www.stat.si/StatWeb/Field/Index/17/104">https://www.stat.si/StatWeb/Field/Index/17/104</a></p>
9) Share of ethnics minorities in the region and at national level	<p>2022: 0,14% Italians (2.914 residents)</p> <p>0,03% Hungarians (657 residents)</p> <p>2020: Romany: estimate between 0,33% and 0,57% (between 7,000 and 12,000 residents) assessments by various institutions</p>	<p><a href="https://pxweb.stat.si/SiStatData/pxweb/sl/Data/-/05E1008S.px">https://pxweb.stat.si/SiStatData/pxweb/sl/Data/-/05E1008S.px</a></p> <p><a href="https://pxweb.stat.si/SiStatData/pxweb/sl/Data/-/05E1008S.px/table/tableViewLayout2/">https://pxweb.stat.si/SiStatData/pxweb/sl/Data/-/05E1008S.px/table/tableViewLayout2/</a></p> <p><a href="https://pxweb.stat.si/SiStatData/pxweb/sl/Data/-/05E1008S.px/table/tableViewLayout2/">https://pxweb.stat.si/SiStatData/pxweb/sl/Data/-/05E1008S.px/table/tableViewLayout2/</a></p> <p><a href="https://www.delo.si/novice/slovenija/romi-zivijo-dvajset-let-manj-kot-ostali-slovenci/">https://www.delo.si/novice/slovenija/romi-zivijo-dvajset-let-manj-kot-ostali-slovenci/</a></p> <p><a href="https://www.gov.si/podrocja/drzava-in-druzba/clovekove-pravice-in-enake-moznosti/narodne-manjsine-in-varstvo-romske-skupnosti/">https://www.gov.si/podrocja/drzava-in-druzba/clovekove-pravice-in-enake-moznosti/narodne-manjsine-in-varstvo-romske-skupnosti/</a></p> <p>In the Republic of Slovenia, we have two traditional national minorities – the Italian and Hungarian national communities – and a special Roma community. All three communities are guaranteed special rights by the constitution.</p>
10) Emigration rate in the region and at national level	<p>2019: 15.106 citizens of Slovenia who emigrated abroad; (0,7%)</p>	<p><a href="https://www.stat.si/StatWeb/News/Index/8971">https://www.stat.si/StatWeb/News/Index/8971</a></p>
11) Average salary or household income in the region and at national level	<p>2022: 2.023,92 € gross 1.318,64 € net</p>	<p><a href="https://www.stat.si/StatWeb/Field/Index/15/74">https://www.stat.si/StatWeb/Field/Index/15/74</a></p>
12) Please describe the structure and the characteristics of relevant socially disadvantaged/ marginalized groups in your region	<ul style="list-style-type: none"> <li>Freedom of conscience and religion</li> <li>National and ethnic communities</li> <li>Employed and unemployed</li> <li>Women</li> <li>Children</li> <li>People with disabilities</li> <li>Elderly</li> </ul>	<p><a href="https://www.varuh-rs.si/letno-porocilo-2020/2-vsebina-dela-in-pregled-obravnavanih-zadev/a-obravnavane-ranljive-skupine/">https://www.varuh-rs.si/letno-porocilo-2020/2-vsebina-dela-in-pregled-obravnavanih-zadev/a-obravnavane-ranljive-skupine/</a></p> <ul style="list-style-type: none"> <li><a href="#">Freedom of conscience and religion</a></li> <li><a href="#">National and ethnic communities</a></li> <li><a href="#">Employed and unemployed</a></li> <li><a href="#">Women</a></li> <li><a href="#">Children</a></li> </ul>

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	<ul style="list-style-type: none"> <li>• LGBTI+</li> <li>• Foreigners</li> <li>• Students</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">People with disabilities</a></li> <li>• <a href="#">Elderly</a></li> <li>• <a href="#">LGBTI+</a></li> <li>• <a href="#">Foreigners</a></li> </ul>
13) Please comment the potential impact of their participation in Circular Bio-based Economy	If we consider employed and unemployed people, women, elderly, people with disabilities, foreigners, and students, we believe that by providing trainings in the field of green transition, circular economy and especially in bioeconomy, we could create a new strategic workforce that is no longer marginalized.	
14) Please indicate the factors hindering their possible participation?	Obstacles we currently see may be that members of the marginalised groups mentioned above <b>do not want to respond to our initiative</b> or that <b>employers are not interested in developing the skills of all individuals who want additional training and upskilling.</b>	
15) Indicate the selected marginal group/s that will be targeted during the project and relevance in the region	Association of Chemical Industries of Slovenia is an employers' association and it is in our interest to work exclusively with chemical companies. Therefore, we want to work primarily with a marginalised group of <b>employed and non-employed chemists, with additional focus on women, elderly, foreigners, and students in the field of chemistry</b> who will be working in chemical companies (covering bioeconomy topics) in the future.	<p>Association of Chemical Industries of Slovenia supports the improvement of skills and competences of employees at all levels of the chemical industry: the planned tectonic change in our society requires completely new complex knowledge. We believe that everything starts with people and good chemistry, so this has been our slogan for many years.</p> <p>In international and European strategy papers, the chemical industry is mentioned as a driver of development. To play the desired role in the future, the chemical industry must also change, and for this it needs strong support.</p>
16) Average educational level of targeted marginalized groups	Slovenia does not keep statistics on average educational level of targeted marginalized groups, but we want to further empower them to contribute to value chains that focus on the circular economy, and additionally on digitalization and green transformation as essential support for the circular economy.	It can be assumed that education levels are distributed differently, and it can be said that everyone, employed or unemployed, has a lack of knowledge and competencies or skills for a green and digital transition, as well as a lack of skills for a bio-based circular economy.
17) Description of the occupied post, considering the type of work performed and the qualification required by the targeted marginalized groups (question 13)	There is a shortage of suitably qualified personnel, both employed and unemployed, with different levels of qualification and skills. We see the possibility of searching inside the pool of before mentioned individuals for candidates who can be employed in small, medium and large biobased companies in different occupations and with different skill levels. We see the opportunity to provide these potential candidates with both	Many employees do not have the required competences, which discredits them and can lead to psychosocial risks or stress. This is especially true for older workers who cannot fit into newly changed jobs without the necessary support or mentoring in advanced digital, green and bio-based work areas.

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	the knowledge and the necessary skills.	
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#### Situation of main economic sectors

PRIMARY SECTOR		
AGRICULTURE		
Questions	Answer	Comments
18) How large is the surface of cultivable areas? (you can check databases such as Eurostat: <a href="https://ec.europa.eu/eurostat/web/agriculture/data/database">https://ec.europa.eu/eurostat/web/agriculture/data/database</a> )	479,486 ha	Data for 2021, Statistical Office of the Republic of Slovenia, <a href="https://pxweb.stat.si/SiStatData/pxweb/en/Data/-/1502401S.px/">https://pxweb.stat.si/SiStatData/pxweb/en/Data/-/1502401S.px/</a>
19) Which are the main crops in the area (surface in hectares of percentage of the cultivable area occupied by each crop)	<ul style="list-style-type: none"> <li>• Grain maize and corn cob mix: 41,402 ha (8.6%)</li> <li>• Green maize: 29,663 ha (6.2%)</li> <li>• Wheat and spelt: 26,785 ha (5.6%)</li> <li>• Barley: 21,863 ha (4.6%)</li> <li>• Grasses, grass mixtures and grass-clover mixtures (Grass-clover mixtures): 16,234 ha (3.4%)</li> <li>• Grasses, grass mixtures and grass-clover mixtures (Grasses, including mixtures): 11,694 ha (2.4%)</li> <li>• Triticale: 5,152 ha (1.1%)</li> <li>• Pumpkins for oil: 4,491 ha (0.9%)</li> <li>• Clover: 4,086 ha (0.9%)</li> <li>• Lucerne: 3,949 ha (0.8%)</li> <li>• Rape and turnip rape: 2,806 ha (0.6%)</li> <li>• Potatoes: 2,734 ha (0.6%)</li> <li>• Hops: 1,535 ha (0.3%)</li> <li>• Oats: 1,195 ha (0.2%)</li> </ul>	Data for 2021, Statistical Office of the Republic of Slovenia, <a href="https://pxweb.stat.si/SiStatData/pxweb/en/Data/-/H200S.px/">https://pxweb.stat.si/SiStatData/pxweb/en/Data/-/H200S.px/</a>
20) Which is the average annual production (dry basis) of the most relevant crops (listed in question 19)?	<ul style="list-style-type: none"> <li>• Green maize: 1,291,487 t</li> <li>• Grain maize and corn cob mix: 334,120 t</li> <li>• Wheat and spelt: 153,507 t</li> <li>• Grasses, grass mixtures and grass-clover mixtures (Grass-clover mixtures): 107,614 t</li> <li>• Barley: 95,833 t</li> <li>• Potatoes: 78,404 t</li> <li>• Grasses, grass mixtures and grass-clover mixtures (Grasses, including mixtures): 52,655 t</li> <li>• Lucerne: 31,184 t</li> <li>• Triticale: 22,231 t</li> <li>• Clover: 20,812 t</li> <li>• Rape and turnip rape: 10,546 t</li> <li>• Oats: 4,068 t</li> <li>• Pumpkins for oil: 2,643 t</li> <li>• Hops: 2,210 t</li> </ul>	<p>Average annual production for the period 2012-2021, Statistical Office of the Republic of Slovenia, <a href="https://pxweb.stat.si/SiStatData/pxweb/en/Data/-/1502402S.px">https://pxweb.stat.si/SiStatData/pxweb/en/Data/-/1502402S.px</a></p> <p>The estimate of average output in different crops refers to different state of plants (fresh, dry) and different parts of plants (tubers, leaves, seeds). These states are agreed within the EU statistical system (Eurostat crop production methodology (Regulation (EC) No 543/2009)) and are valid due to comparability of data in all EU Member States.</p>
21) Average yield (dry basis) for the most relevant crops (listed in question 19)?	<ul style="list-style-type: none"> <li>• Green maize: 43.9 t/ha</li> <li>• Potatoes: 25.1 t/ha</li> <li>• Grain maize and corn cob mix: 8.6 t/ha</li> <li>• Lucerne: 7.1 t/ha</li> <li>• Grasses, grass mixtures and grass-clover mixtures (Grass-clover mixtures): 6.6 t/ha</li> <li>• Grasses, grass mixtures and grass-clover mixtures (Grasses, including mixtures): 6.1 t/ha</li> <li>• Clover: 5.7 t/ha</li> <li>• Wheat and spelt: 5.2 t/ha</li> <li>• Barley: 4.8 t/ha</li> </ul>	Average yield for the period 2012-2021, Statistical Office of the Republic of Slovenia, <a href="https://pxweb.stat.si/SiStatData/pxweb/en/Data/-/1502402S.px">https://pxweb.stat.si/SiStatData/pxweb/en/Data/-/1502402S.px</a>

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	<ul style="list-style-type: none"> <li>• Triticale: 4.6 t/ha</li> <li>• Oats: 3.2 t/ha</li> <li>• Rape and turnip rape: 2.7 t/ha</li> <li>• Hops: 1.5 t/ha</li> <li>• Pumpkins for oil: 0.7 t/ha</li> </ul>	
22) What is the percentage of employment covered by agriculture?	6.0%	Data for 2021 (A 01 – Crop and animal production, hunting and related service activities), Statistical Office of the Republic of Slovenia, <a href="https://pxweb.stat.si/SiStatData/pxweb/en/Data/-/0301975S.px/">https://pxweb.stat.si/SiStatData/pxweb/en/Data/-/0301975S.px/</a>
23) Are state subsidies received by the farmers (CAP or others)? Please shortly mention the crops and the aim of the subsidy (equipment modernisation, yield increase, etc.	<p>In Slovenia, measures are implemented under the Common Agricultural Policy, where they are partly or fully financed by the EU's common budget, and national measures, which are financed solely from the national budget.</p> <p>In 2021, the CAP measures continued to implement direct payment schemes: the basic payment, the green component, the young farmers' premium, the payment for areas with natural constraints and the parallel scheme for small farmers. In addition, farms were also able to benefit from coupled payments for cereal stover and vegetable crops.</p> <p>The amount of the national envelope was slightly reduced compared to the previous two years, amounting to 131.5 million EUR. Implementation of the measures defined in the Rural Development Plan 2014-2020 also continued. Due to the delay in the adoption of the CAP reform, the programming period was extended until the end of 2022. Throughout the previous programming period, 15 measures were implemented, for which 1.5 billion EUR was available. By the end of 2021, 1.17 billion EUR or 78% of the programme's available funding has been committed, with 936 million EUR (62%) already paid. Of this, almost two thirds (64%) of the funds paid are for measures implemented in the context of the application campaign, relating to the annual payment of compensation for environmental measures, organic farming, animal welfare and less-favoured areas. In 2021, 27 calls for tenders were also launched, continuing the investment cycle in the Slovenian countryside.</p> <p>In addition to the regular measures, some temporary emergency measures were also implemented in 2021 to assist specific sectors that had suffered economic damage either as a result of the effects of the second wave of the COVID-19 epidemic or as a result of market disruptions or adverse weather conditions. In order to mitigate the effects of the second wave of the epidemic, financial compensation was made available to viticulture and winegrowing, apple production, ware potato production and to the pursuit of complementary activities on the farm.</p> <p>Payments for agriculture from the national budget amount to 402.0 million EUR in 2021, an increase of almost 3% compared to 2020 and the highest since 2009, when agriculture received the most funding ever. The main reason for the increase in payments in 2021 is the increased volume of national funding for various compensation and other exceptional payments. It is precisely because of the increased volume of payments From the national budget that the share of EU co-financing of agriculture has decreased markedly, to 65% in 2021 (last 5-year average: 71%).</p> <p>Market measures and direct support to producers accounted for the largest share of payments (47% or 189.2 million EUR), followed by rural development measures and agricultural</p>	<p>Data for 2021, "Poročilo o stanju kmetijstva, živilstva, gozdarstva in ribištva", <a href="https://www.kis.si/f/docs/Porocila_o_stanju_v_kmetijstvu/ZP_2021_splosno_priloge_6.9.2022.pdf">https://www.kis.si/f/docs/Porocila_o_stanju_v_kmetijstvu/ZP_2021_splosno_priloge_6.9.2022.pdf</a>, p. 17 and 19.</p> <p>Common Agricultural Policy Strategic Plan 2023-2027 for Slovenia, <a href="https://skp.si/wp-content/uploads/2022/11/SN-SKP_izpis-iz-SFC-7.11.2022.docx">https://skp.si/wp-content/uploads/2022/11/SN-SKP_izpis-iz-SFC-7.11.2022.docx</a>, p. 79.</p>



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	<p>structural policy (41% or 165.9 million EUR), while the share of funding for general services to agriculture remained relatively small (12% or 46.9 million EUR).</p> <p>Under market measures and direct support to agriculture, payments increased by 6.1% compared to 2020. The increase is mainly due to the implementation of measures to help mitigate the effects of the loss of income in agriculture due to the COVID-19 epidemic and other exceptional payments to support agriculture, which were significantly higher in 2021 compared to previous years. Within market measures and direct support, payments for direct payments continue to represent the bulk of support (70%). Within the Rural Development and Structural Policies group of measures, payments decreased slightly (by just under 2%) compared to 2020. Within this group of measures, a good half of the total funds were devoted to measures providing environmental and other social benefits; the funds of this group of measures remained at the level of the previous year. On the other hand, funding for strengthening the competitiveness of agriculture and the agrifood sector decreased significantly, while funding to support the rural economy and population increased. Funding for general services for agriculture increased by almost 7% compared to 2020, the highest ever. Almost all measures for the provision of general services to agriculture have been financially strengthened.</p> <p>The Strategic Plan of the Common Agricultural Policy for Slovenia foresees coupled income support for protein crop production. It is intended to increase the volume of protein crop production and improve the competitiveness of production. The coupled payment for protein crops is a form of coupled income support under direct payments and takes the form of an annual payment per eligible hectare. The problems faced by protein crop production are the small size of the landholding structure, the fragmentation of arable land, which in most cases is located in less-favoured areas, and the lower technological level of protein crop production, which reduces the competitiveness of protein crop production. Protein crops play an important role in improving beef and milk production.</p>	
24) What is the current situation of the soils (erosion, eutrophication, pollution...)?	<p>With increasing population demands and climate change, soils are exposed to a number of threats and degradation processes, including erosion, soil organic matter depletion, salinisation, soil compaction, soil biodiversity loss, flooding, land cover and sealing with various impermeable materials or land development, and soil pollution.</p> <p>In agriculture, accelerated soil loss (soil erosion) is mainly linked to inappropriate soil management. Areas at high risk of soil erosion occur locally in Slovenia and are strongly influenced by relief, vegetation, soil type and use, and climatic characteristics. Water erosion is predominant, but wind erosion, snow erosion and arable erosion also occur. The high estimated rate of soil loss due to water erosion in Slovenia, calculated on the basis of the RUSLE model (Panagos et al., 2015), of 7.42 t/ha/year, proved to be overestimated using more accurate input data. Using the same method, but with significantly more accurate data, the study of the Agricultural Institute of Slovenia (KIS) estimated the average annual erosion in Slovenia at 3.18 t/ha, or 2.63 t/ha when excluding areas with slopes &gt; 50%.</p> <p>The analysis of the data, the soil map and the soil types in relation to the different uses of agricultural land in Slovenia shows that organic matter is lower in the upper soil horizon on land that is cultivated (arable land and gardens, hop fields, vineyards, etc.) than on land that is not ploughed or rigorously cultivated (meadows, extensive orchards, etc.) The KIS study</p>	<p>Common Agricultural Policy Strategic Plan for Slovenia 2023-2027, Annex II: Specific objective 5: Promoting sustainable development and efficient management of natural resources such as water, soil and air, <a href="https://skp.si/wp-content/uploads/2023/02/02.05-Priloga-II-Analiza-stanja-in-SWOT-za-specificni-cilj-5-Spodbujanje-trajnostnega-razvoja-in-ucinkovitega-upravljanja.docx">https://skp.si/wp-content/uploads/2023/02/02.05-Priloga-II-Analiza-stanja-in-SWOT-za-specificni-cilj-5-Spodbujanje-trajnostnega-razvoja-in-ucinkovitega-upravljanja.docx</a>, p. 57-58.</p>



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	<p>also shows that the soil organic matter is lower in the upper soil horizon on land that is not cultivated or rigorously cultivated (meadows, extensively cultivated, etc.). In general, soils are well supplied with organic matter for Slovenian conditions, with data showing that 86.2% of agricultural land has an organic matter content of more than 2% and 30.9% of land has an organic matter content of more than 4%. Nevertheless, from the point of view of the environmental and agricultural quality of soils, some areas of agricultural land are at high risk of soil organic matter depletion, particularly in the north-eastern part of Slovenia, where the proportion of organic matter in the soil needs to be increased.</p> <p>In some areas of Slovenia, soils are also acidic as a result of the non-carbonate parent substrate and also nutrient leaching.</p> <p>Soil salinisation has not been detected in Slovenia to the extent that it would be classified as a soil degradation process.</p> <p>In Slovenia, soils are mostly unpolluted, with some areas that are contaminated with some inorganic (e.g. cadmium, lead, arsenic, copper) and organic pollutants (e.g. degradation products of plant protection products). The most contaminated areas with inorganic pollutants are the Meža valley, the Celje basin, Idrija and Jesenice and its surroundings.</p> <p>Inadequate use of mineral fertilisers and plant protection product is a major cause of soil contamination from agricultural activities. Mineral fertilisers of poorer quality can also lead to heavy metal contamination (e.g. phosphate mineral fertilisers can be a source of cadmium contamination). The consumption of mineral fertilisers in Slovenia has decreased by 35% between 1992 and 2019, and the same is true for plant protection products. According to data on sales of these products in Slovenia, their consumption has more than halved over the last 28 years, from 2,031 t in 1992 to 942 t in 2019.</p> <p>The identified threats to soil in Slovenia and in the European area are soil development (e.g. asphalts, concretes) and soil consolidation or compaction (due to the use of heavy machinery, etc.), as well as urbanisation. Changes in the use of large areas of land are noticeable especially on the outskirts of settlements for industry and trade and along the routes of large infrastructure facilities (motorways). There is no systematic data collection on soil compaction in Slovenia, so it is impossible to assess the extent of this problem in Slovenia. However, in 2021, an amendment to the Agriculture Act established the legal basis for systematic collection of such data in the future.</p> <p>Action is needed to preserve agricultural soils (maintaining the fertility of agricultural soils, reducing the risk of erosion, reducing or in some cases prohibiting the application of plant protection products and fertilisers to or on the soil, preventing soil compaction).</p>	
25) Who are the main stakeholders involved in the crops production (cooperatives or farmers associations, individual farmers owning large or small areas, etc.)?	<ul style="list-style-type: none"> <li>• Chamber of Agriculture and Forestry of Slovenia</li> <li>• Cooperative Association of Slovenia</li> <li>• Farmers' Union of Slovenia</li> <li>• Association of Slovenian Rural Youth</li> <li>• Slovenian Hop Growers Association</li> <li>• Panvita d.o.o. (company)</li> <li>• Paradajz d.o.o. (company)</li> <li>• Evrosad d.o.o. (company)</li> <li>• Meja Šentjur, d.d. (company)</li> <li>• Puklavec Family Wines d.o.o. (company)</li> <li>• Radgonske gorice d.o.o. (company)</li> </ul>	

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<p>26) How much residual biomass is produced? Please indicate for the most relevant crops (question 19) the residues that are produced during the processing</p>	<ul style="list-style-type: none"> <li>• 83,000 t of vegetable residual biomass</li> <li>• 20,000 t of fruit residual biomass</li> <li>• 300,000 t of dry matter of straw</li> <li>• 250,000 t of dry matter of corn stems</li> <li>• 100,000 t of dry matter of hops, the remains of vegetables, oilseeds and root crops</li> <li>• 30,000 t of dry matter produced by the green cuttings of vines and fruit plants</li> </ul>	<p>Strategic Concept Paper for Bioeconomy: Slovenia, p. 30.</p>
<p>27) Is the residual biomass (question 26) exploited (energy production, chemicals, fertilizers, etc.)?</p>	<p>Considering the above mentioned limited resources for crop production in Slovenia, and taking into account the 'food first' principle by which primary agricultural products should be intended for the food chain, better exploitation of agricultural biomass relates primarily to the residues and side-streams of agricultural biomass. Residues from the horticultural production offer a greater potential for value adding (bioactive compounds, extractives), but quantities are low. Since this is a rapidly perishable and heterogeneous biomass, the most rational solution remains composting, or biogas production. Among the secondary crops and harvest residues, grains and corn stand out in terms of quantity. In the conditions in which Slovenian agriculture operates, it is expedient to continue to use the majority of harvest residues to maintain the balance of organic matter in the soil, whereby the dominant method of use (plowing, litter) could be replaced by conservation farming methods. Hops, the remains of vegetables, oilseeds and root crops represent additional biomass. In addition to the use of residues for fodder or for plowing, residues of various crops can have potential uses in (lingo-cellulose) biorefining, or energy use. This type of use is also possible with the green cuttings of vines and fruit plants, in the case of vine cuttings, due to the content of bioactive compounds, a combination with prior extraction is also advisable. With respect to the commercial of residues and by-products of horticultural, or arable production, examples of good practices can be found in the production of own packaging from fibrous waste streams and in the extraction of bioactive compounds.</p>	<p>Strategic Concept Paper for Bioeconomy: Slovenia, p. 30.</p>
<p>28) Average selling price for the main crops (€/dry tonnes) (listed in question 19)? When possible, also include the production cost.</p>	<ul style="list-style-type: none"> <li>• Green maize: 293.41 EUR/t</li> <li>• Wheat: 314.93 EUR/t</li> <li>• Barley: 278.26 EUR/t</li> <li>• Turnip rape seeds: 620 EUR/t</li> <li>• Hops: 6,920 EUR/t</li> <li>• Oil pumpkin seeds: 3,600 EUR/t</li> <li>• Early potatoes: 560 EUR/t</li> <li>• Main crop potatoes: 340 EUR/t</li> </ul>	<p>Average selling price in 2022, Statistical Office of the Republic of Slovenia, <a href="https://pxweb.stat.si/SiStatData/pxweb/en/Data/-/1505000S.px/">https://pxweb.stat.si/SiStatData/pxweb/en/Data/-/1505000S.px/</a></p>
<p>29) Which are the future perspectives? (Technologies, increase of the area dedicated to certain crops, new crops development, new biomass or residual biomass value chain development, employment)</p>	<p>Agricultural production is exposed to fluctuations in markets, mainly due to the nature of production, which is predominantly outdoors and weather-dependent, as well as the impact of globalisation of markets. Plant production is even more volatile than animal production. Extreme weather events are becoming more frequent and the impact of climate change is increasing. Production and market conditions are also affected by the emergence of diseases and pests. Slovenia uses so-called <i>ad hoc</i> measures to deal with catastrophic risks: measures under the Regulation on aid for unforeseeable events in agriculture, measures to remedy the consequences of natural disasters in agricultural production. Fiscal and social policy measures also play an important role in managing the risks faced by agricultural holdings, as they are specifically tailored to agricultural holdings. Risk management measures will also be implemented in the fruit and vegetables sector, in the context of producer organisations through the operational programme.</p> <p>The small size of the Slovenian market compared to neighbouring markets within the EU leads to greater price volatility of agricultural products on the Slovenian market. Fluctuations in prices and volumes of agricultural production can cause liquidity problems for farmers, while income</p>	<p>Common Agricultural Policy Strategic Plan 2023-2027 for Slovenia, <a href="https://skp.si/wp-content/uploads/2022/11/SN-SKP_izpis-iz-SFC-7.11.2022.docx">https://skp.si/wp-content/uploads/2022/11/SN-SKP_izpis-iz-SFC-7.11.2022.docx</a>, p. 75, 98, 127-128, 217-218, 239.</p>

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	<p>uncertainty and low productivity lead to stagnation of investment and, in the long term, to a reduction in competitiveness and stagnation or even contraction of agricultural production. There is a long-term downward trend in agricultural commodity prices. In Slovenia, a key measure contributing to mitigating market price risks is the co-financing of insurance premiums from the national budget to insure primary agricultural production.</p> <p>Slovenia has one of the lowest levels of entrepreneurial income, net value added and factor income in agriculture in the EU, reflecting, among other things, the weaker structure of Slovenian agriculture (low average farm size, large number of subsistence farms, large number of non-specialised farms, large share of farms in less-favoured areas). The resilience, competitiveness as well as viability of agricultural holdings are influenced by public support, on which certain agricultural sectors are much more dependent than others. While public funding for agriculture is declining in the long term, the conditions for accessing it are also becoming more stringent, which may have an impact on the maintenance of agricultural activity and the volume of agricultural production.</p> <p>Public support in the form of direct payments (basic income support and complementary redistributive support for sustainability) and payments for natural and other constraints are an important factor which, at least in part, improve the weak income situation of agricultural holdings and, due to their stability, reduce income fluctuations. In the distribution of direct payments, particular attention should be paid to the resilience of agricultural holdings, in particular small holdings and those in areas with natural or other constraints to farming. Payments for natural and other constraints further compensate for differences in income levels and contribute to sustainable incomes and the maintenance of farming activity in areas with more difficult farming conditions. Income coupled support is also an important income support contributing to improving the situation and competitiveness of agricultural sectors in difficulty. All these supports can be seen as buffers against fluctuations in agriculture, thereby stabilising incomes and maintaining production potential. Public support is also important to help with income losses in the event of emergencies.</p> <p>Slovenia is one of the countries where the decline in the agricultural workforce in recent years has been significantly less pronounced than the EU average. As in recent years, the share of employment in agriculture continues to decline. Slovenia's net value added per unit of labour is significantly below the EU average. Total factor productivity in Slovenia over the period 2005-2016 was mostly below the EU average. In Slovenia, agricultural output declined, while inputs remained largely stable and unchanged. Productivity is linked to the small size of the geographical agricultural land use unit, the high fragmentation of agricultural land and limited access to agricultural land. This also increases the vulnerability of agriculture to climate change.</p> <p>Land fragmentation is also one of the main problems of Slovenian agriculture. The average Slovenian agricultural holding is 7 ha in size and is divided into several parcels. Land consolidation and agro-remediation are the basis for improving the situation and making it easier to cultivate, thus leading to higher yields per hectare and better yields. In addition to the permanent change of land use, the overgrowth of agricultural land is a key factor in the loss of agricultural land. In areas with constraints, farming efficiency is lower.</p>	
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	<p>In order to increase agricultural production while ensuring sustainable production, improving animal welfare, better adapting to climate change and increasing competitiveness, agriculture needs to use resources more efficiently, reduce production losses and reduce waste. The establishment of irrigation systems is also important.</p> <p>Support aimed at promoting collective forms of cooperation in the agriculture aims to achieve greater producer integration, with a particular focus on the integration of producers involved in quality schemes and their joint marketing and promotion of quality scheme products. The establishment of a regional approach linking local actors with agricultural holdings will strengthen local supply and consumption of products with higher added value. It will also make it possible to make better use of the development potential of the territory included in the area. Raising consumer awareness of safe, quality and locally processed food is key.</p> <p>Conserving habitats and landscapes is also important for providing ecosystem services. In Slovenia, due to the diverse geographical conditions and thousands of years of land cultivation, a mosaic landscape prevails, which consists of fine structures (watercourses and other water phenomena, individual trees or groups of trees, hedges, borders, drywoods, avenues), extensive agricultural areas, a mosaic intermingling of arable fields with different crops, and sustainably managed forest. The simplification of the landscape, which leads to the disappearance of natural structures and cultural elements in the landscape, reduces the mosaic character of the landscape and thus landscape diversity and biodiversity.</p> <p>Slovenia is one of the countries with the highest proportion of permanent grassland in the structure of agricultural land. Analysis of data on permanent grassland shows that the proportion of permanent grassland remains stable at national level, but that at lower spatial levels, grassland is changing due to agricultural development processes, while elsewhere it is threatened by overgrowth. Due to the consequently more difficult mechanical cultivation, grassland is predominant in areas with more difficult growing conditions. Two thirds of grassland habitats are in unfavourable condition. Most of the permanent grassland in Slovenia has the characteristics of high natural value agricultural land. It is in the general interest to maintain farming on these grasslands. The conservation of nature-valuable extensive grasslands therefore requires appropriate management to maintain or enhance biodiversity.</p> <p>The age structure of the holders of agricultural holdings has an impact on labour productivity in agriculture. Slovenia faces an unfavourable age structure of holders of agricultural holdings. There remains a need to encourage an increase in the number of young farmers in order to reduce the average age of the holders of agricultural holdings, or at least to mitigate the current sharp increase in the average age. There is also a trend of young people emigrating from rural areas. The income from farming is unattractive for young people, as it is on average below that of other economic activities. However, young farmers are more receptive to technological innovation and more willing to cooperate and network. We want to see an effective generational rejuvenation of agricultural holdings in order to preserve and develop agriculture.</p>	
<b>FORESTRY</b>		
Questions	Answer	Comments
30) Forest area in the region (please indicate the hectares and percentage occupied by forestland in the region)?	1,196,728 ha – 59.0% of Slovenia's land area	Data for 2021, Poročilo o stanju kmetijstva, živilstva, gozdarstva in ribištva, <a href="https://www.kis.si/f/docs/Porocila_o_stanju_v_kmet">https://www.kis.si/f/docs/Porocila_o_stanju_v_kmet</a>

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		<a href="#">ijstvu/ZP_2021_splosno_priloge_6.9.2022.pdf</a> , p. 160.
31) Productive forest area share (exploited for wood)?	1,068,288 ha	Data for 2021, Poročilo o stanju kmetijstva, živilstva, gozdarstva in ribištva, <a href="https://www.kis.si/f/docs/Porocila_o_stanju_v_kmetijstvu/ZP_2021_splosno_priloge_6.9.2022.pdf">https://www.kis.si/f/docs/Porocila_o_stanju_v_kmetijstvu/ZP_2021_splosno_priloge_6.9.2022.pdf</a> , p. 160.
32) Which are the main uses of forestry biomass?	<ul style="list-style-type: none"> <li>• Roundwood: 3,815,000 m<sup>3</sup></li> <li>• Sawlogs and veneer logs: 1,977,000 m<sup>3</sup></li> <li>• Firewood: 1,115,000 m<sup>3</sup></li> <li>• Pulpwood, round and split: 673,000 m<sup>3</sup></li> <li>• Other industrial roundwood: 50,000 m<sup>3</sup></li> </ul> <p>More than half of the hardwood (55 %) is currently used as firewood, the rest is evenly distributed between pulpwood and panel wood (24%) and roundwood (19%). The total share of industrial roundwood is about 2% of total production. The largest domestic consumer of roundwood is the sawnwood industry (1.74 million m<sup>3</sup> in 2021), followed by the composite wood, pulp and chemical industries with a total processing volume of 0.513 million m<sup>3</sup>. A large consumer of roundwood is the household sector, which consumes over 1 million m<sup>3</sup> of firewood per year. This more or less ends domestic wood consumption and the rest of the forest wood production is almost entirely exported. With an annual export volume of 3 million m<sup>3</sup>, Slovenia is a strong exporter of unprocessed roundwood, particularly pronounced in the category of coniferous roundwood, which amounted to 1.35 million m<sup>3</sup> in 2021.</p>	<p>Data for 2021, Statistical Office of the Republic of Slovenia, <a href="https://pxweb.stat.si/SiStatData/pxweb/en/Data/-/1673145S.px">https://pxweb.stat.si/SiStatData/pxweb/en/Data/-/1673145S.px</a></p> <p>Strategic Concept Paper for Bioeconomy: Slovenia, p. 27.</p>
33) Share of forestland owned by the administration and private owners?	<ul style="list-style-type: none"> <li>• 77% owned by private owners</li> <li>• 20% owned by the State</li> <li>• 3% owned by the municipalities</li> </ul>	Data for 2021, Poročilo o stanju kmetijstva, živilstva, gozdarstva in ribištva, <a href="https://www.kis.si/f/docs/Porocila_o_stanju_v_kmetijstvu/ZP_2021_splosno_priloge_6.9.2022.pdf">https://www.kis.si/f/docs/Porocila_o_stanju_v_kmetijstvu/ZP_2021_splosno_priloge_6.9.2022.pdf</a> , p. 160.
34) Are state subsidies received by the forestry sector?	<p>Under the Rural Development Programme 2014-2020, forestry enterprises could receive aid for investments in forestry infrastructure, aid for the repair of forest damage and aid for investments in forestry technologies and the processing, mobilisation and marketing of forestry products.</p> <p>Four tenders for forest infrastructure improvement have been launched by the end of 2021, with 5.4 million EUR approved for 666 applications and 3.0 million EUR already paid out for 474 applications.</p> <p>The objectives of the forest damage repair grants are to repair damage and restore forests damaged by natural disasters and to install forestry trains necessary for the rehabilitation of forests. For the entire programme period, 14.1 million EUR have been earmarked for this purpose. For this aid measure, eight tenders and one public procurement for the purchase of forest tree seedlings have been launched until the end of 2021. Five tenders for forest damage repair and reforestation approved 1,324 applications for a total of 5.7 million EUR, which have already been paid out. By the end of 2021, 13 applications for the purchase of forest trees amounting to 3.5 million EUR were also approved and paid out, resulting in the afforestation of 1,895 hectares of forest. In addition, three tenders were launched for forest railways. By the end of 2021, 203 applications were approved and paid out (worth 0.8 million EUR). During the programme period until the end of</p>	Data for 2021, Poročilo o stanju kmetijstva, živilstva, gozdarstva in ribištva, <a href="https://www.kis.si/f/docs/Porocila_o_stanju_v_kmetijstvu/ZP_2021_splosno_priloge_6.9.2022.pdf">https://www.kis.si/f/docs/Porocila_o_stanju_v_kmetijstvu/ZP_2021_splosno_priloge_6.9.2022.pdf</a> , p. 84-85.



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	<p>2021, 147 km of forest trains were built, and 50 km were rehabilitated.</p> <p>Under the aid for investments in forestry technologies and in the processing, mobilisation and marketing of forestry products, it was possible to apply for investments for the purchase of new machinery and equipment for logging and timber harvesting, as well as investments in pre-industrial wood processing. Until the end of 2021, three tenders for the acquisition of new machinery and equipment for logging and timber harvesting and four tenders for investments in pre-industrial wood processing were launched. Under the three calls for the purchase of forestry machinery and equipment, 17.4 million EUR was approved for 577 investments and 9.7 million EUR was paid out by the end of 2021 (for 373 completed investments). In the calls for investments in pre-industrial wood processing, 341 applications were approved for a total amount of 15.7 million EUR. By the end of 2021, 200 investments in pre-industrial wood processing were completed, for which 8.6 million EUR in public funds were paid out.</p>	
35) Who are the main stakeholders involved in the forest biomass production?	<ul style="list-style-type: none"> <li>• Slovenian Forest Service</li> <li>• Slovenian Forestry Institute</li> <li>• Forest Owners Association of Slovenia</li> <li>• Chamber of Agriculture and Forestry of Slovenia</li> <li>• Wood and Furniture Industry Association within the Chamber of Commerce and Industry of Slovenia</li> <li>• Association of the Paper and Paper Converting Industry within the Chamber of Commerce and Industry of Slovenia</li> <li>• Slovenski državni gozdovi d.o.o. (company that manages the state forests)</li> <li>• Metropolitana d.o.o. (company that manages the forests of the Archdiocese of Ljubljana)</li> <li>• Soško gozdo gospodarstvo Tolmin d.o.o. (forestry company)</li> <li>• Gozdno gospodarstvo Bled d.o.o. (forestry company)</li> <li>• Gozdno gospodarstvo Novo mesto d.d. (forestry company)</li> <li>• Lesoteka, d.o.o. (forestry company)</li> <li>• Gozdarstvo Grča d.o.o. (forestry company)</li> </ul>	
36) Please indicate if possible the forest biomass production cost and the average selling price (€/dry tonnes)?	<p>Average prices in 2022:</p> <ul style="list-style-type: none"> <li>• Sawlogs: 102.0 EUR/m<sup>3</sup></li> <li>• Firewood: 56.8 EUR/m<sup>3</sup></li> <li>• Pulpwood, round and split: 47.1 EUR/m<sup>3</sup></li> <li>• Other industrial roundwood: 54.0 EUR/m<sup>3</sup></li> </ul> <p>According to the data from Statistical Office of the Republic of Slovenia, the average annual purchase prices (excluding VAT) of coniferous logs between 2012 and 2020 ranged between 57.41 EUR/m<sup>3</sup> (2020) and 73.25 EUR/m<sup>3</sup> (2013). In 2021, there was a marked increase in the prices of these assortments, with an average annual purchase price of 83.28 EUR/m<sup>3</sup>, the highest in the last ten years. Prices for hardwood logs have been increasing in recent years. The most pronounced increase is observed for oak logs, which have been increasing since 2012. According to the data, the average price of all forest wood products combined in 2021 increased by 16% compared to 2020. With the exception of lower quality industrial hardwood and hardwood firewood, prices in 2021 were at record highs for all groups of forest wood products.</p> <p>The average wood purchase price for spruce pulpwood and panels in 2021 was 26.7 EUR/m<sup>3</sup>, compared to 24.3 EUR/m<sup>3</sup> in 2020. The highest prices for coniferous pulpwood were recorded in the second half of 2021.</p>	<p>Data for 2022, Statistical Office of the Republic of Slovenia, <a href="https://pxweb.stat.si/SiStatData/pxweb/en/Data/-/1656402S.px">https://pxweb.stat.si/SiStatData/pxweb/en/Data/-/1656402S.px</a></p> <p>Data for 2021, Poročilo o stanju kmetijstva, živilstva, gozdarstva in ribištva, <a href="https://www.kis.si/f/f/docs/Porocila_o_stanju_v_kmetijstvu/ZP_2021_splosno_priloge_6.9.2022.pdf">https://www.kis.si/f/f/docs/Porocila_o_stanju_v_kmetijstvu/ZP_2021_splosno_priloge_6.9.2022.pdf</a>, p. 168.</p>



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	Pulpwood and beech panel prices were also high in August and November 2021. The average price in both months was 48 EUR/m <sup>3</sup> .	
37) What is the percentage of employment covered by forestry?	0.6%	Data for 2021 (A 02 – Forestry and logging), Statistical Office of the Republic of Slovenia, <a href="https://pxweb.stat.si/SiStatData/pxweb/en/Data/-/03019755.px/">https://pxweb.stat.si/SiStatData/pxweb/en/Data/-/03019755.px/</a>
38) How much residual biomass is produced in the region?	<ul style="list-style-type: none"> <li>119,000 t of processed wood waste</li> <li>40,000 t of discarded wood and wood residues</li> </ul>	Data for 2017, Strategic Concept Paper for Bioeconomy: Slovenia, p. 28.
39) Is the residual biomass (question 38) exploited? (Indicate)	<p>The use of processed wood waste consisted of incineration and co-incineration of waste as fuel (36%), recycling including composting of waste (10%), and the rest (54%) was intended for other preprocessing methods.</p> <p>The potential of logging residues for collection and processing in industrially relevant quantities is limited, as the removal of logging residues in (predominant) tractor harvesting is not cost-efficient. In addition to this, most of the logging residues in mechanical logging and harvesting are used for soil protection. The greatest bioeconomic potential in this category can be attributed to bark, which by volume represents around 20% of the cut. It is an important category of raw materials for bio-based products due to its content (e.g. tannins) and is also a good structural material for composting biogenic waste. We also point out the (niche) commercial potential of logging residues, such as knots and bark of certain tree species, which, with their rich content of polyphenols, have wide applicability in the chemical and pharmaceutical industry, as well as nutritional supplements.</p> <p>The bioeconomic potential of residues in wood processing is eloquently testified by the data on material yield, which in the primary processing of log wood into sawn assortments amounts to approximately 50%, while in the production of solid wood furniture it varies between 5 and 20%. When we add to this the discarded wood, we arrive at the current annual amount of processing of 40,000 t. The predominant ways of using discarded wood and wood residues today are disposal in the form of inert waste and incineration in domestic boilers. In both cases, it is a questionable use in terms of harmful effects on the environment, low energy and practically no material utilization. Alternatives to the current use of wood residues and discarded wood have already been tested in practice: various processing procedures (physico-chemical, thermal and electrochemical procedures), production of composites, thermal processing into activated carbon or wood gas, biorefining (processing into methanol, ethanol), use in agriculture and environmental applications (bedding, mulch, greening of degraded areas), last but not least also energy use in specialized heating devices.</p> <p>Considering the fact that more than half (57%) of the raw materials in the Slovenian paper industry come from paper for recycling, we can say that it is an industry that already works largely in line with the principle of circularity. In the production and processing of paper or cardboard, various wastes are generated, which represent a secondary source of biomass or cellulose fibres. The main sources of waste biomass are primary sludge (generated during the removal of printing ink from recycled fibres), secondary sludge (generated during the wastewater treatment process), wood waste (generated in paper mills with integrated wood production) and smaller amounts of paper dust (generated during paper cutting). Paper mills use part of the waste biomass as an energy source in</p>	Data for 2017, Strategic Concept Paper for Bioeconomy: Slovenia, p. 28-29.



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	<p>their own production, while significant amounts of ash remain. The delivery of primary sludge to different consumers for further use is decreasing due to various reasons, so the need for cross-border disposal is increasing, which is an expensive and unsustainable solution. Primary sludges offer several more interesting alternatives depending on their physical, chemical and microbiological properties. Sludges with a high carbohydrate content are suitable for the production of biofuels and as fertilizers in agriculture, while sludges with a predominantly inorganic character can be used in the construction industry. Due to the higher content of organic matter, secondary sludge is interesting for the production of biogas and, in combination with waste ash, as a building material.</p>	
<p>40) Which are the future perspectives? (Technology, forestry, employment increase, increase of exploited areas, etc.)</p>	<p>The forestry sector is characterised by a high degree of fragmentation, the number of owners and co-owners of forests, and the unfavourable age structure of owners, which make it difficult to work professionally and to make optimal use of the timber in private forests. Openness to forest roads is not yet optimal in Slovenia. Certain areas are not open to forest roads and trains, which makes timber harvesting more expensive or even impossible and reduces the fire safety of forests. Forestry activity has traditionally been an integral part of many farms, which, through strong synergies, also makes an important contribution to strengthening the competitiveness of primary agricultural production on these farms. Slovenia is still dominated by outdated and inefficient forestry machinery. In its forest management, Slovenia follows the principles of the EU's New Forest Strategy 2030.</p> <p>According to the assessments, the largest differences between the estimated potentials and the quantities that actually entered the market are recorded for wood of lower quality. From the point of view of the long-term perspective, this is the category that will gain in importance with changes in forest stands (increasing proportion of beech). Unexploited possibilities are therefore especially in the categories of wood, which are a suitable input raw material for biorefining processes and the subsequent production of new bio-based materials.</p> <p>Secondary sources of raw materials (waste biomass, wood, lignocellulosic fibers) that are produced in the processes of extraction, processing and consumption in the forest-wood-paper chain are also prospective raw materials for adding value in the cascade processing process.</p>	<p>Common Agricultural Policy Strategic Plan 2023-2027 for Slovenia, <a href="https://skp.si/wp-content/uploads/2022/11/SN-SKP_izpis-iz-SFC-7.11.2022.docx">https://skp.si/wp-content/uploads/2022/11/SN-SKP_izpis-iz-SFC-7.11.2022.docx</a>, p. 99.</p> <p>Strategic Concept Paper for Bioeconomy: Slovenia, p. 27-29.</p>
<p>41) Share of forestland area affected by forest fires the last year?</p>	<p>124 ha</p>	<p>Data for 2021, Poročilo Zavoda za gozdove Slovenije o gozdovih 149pplica 2021, <a href="http://www.zgs.si/fileadmin/zgs/main/img/PDF/LETNA_POROCILA/2021_Porocilo_o_gozdovih_ZGS.pdf">http://www.zgs.si/fileadmin/zgs/main/img/PDF/LETNA_POROCILA/2021_Porocilo_o_gozdovih_ZGS.pdf</a>, p. 11</p>
<b>LIVESTOCK</b>		
Questions	Answer	Comments
<p>42) How large is the area dedicated to livestock in the region?</p>	<p>343,052 ha</p>	<p>Data for 2021, Poročilo o stanju kmetijstva, živilstva, gozdarstva in ribištva, <a href="https://www.kis.si/f/docs/Porocila_o_stanju_v_kmetijstvu/ZP_2021_splosno_priloge_6.9.2022.pdf">https://www.kis.si/f/docs/Porocila_o_stanju_v_kmetijstvu/ZP_2021_splosno_priloge_6.9.2022.pdf</a>, p. 197. The area under livestock farming includes areas under fodder roots and the like and green fodder from arable land,</p>

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		as well as permanent meadows and pastures.
43) Average farm size (cows, pigs, chicken, or other) in the region?	<ul style="list-style-type: none"> <li>9.1 livestock size units per farm</li> <li>16.7 cattle per farm</li> <li>19.3 pigs per farm</li> <li>260.8 poultry per farm</li> <li>22.8 sheep per farm</li> <li>8.3 goats per farm</li> <li>20.9 deer per farm</li> <li>9.1 rabbits per farm</li> <li>3.5 equidae per farm</li> </ul>	2020 Agricultural census, Statistical Office of the Republic of Slovenia, <a href="https://pxweb.stat.si/SiStatData/pxweb/en/Data/-/15P1000S.px">https://pxweb.stat.si/SiStatData/pxweb/en/Data/-/15P1000S.px</a>
44) Which is the daily livestock maintenance cost (€/head)?	/	No data available.
45) Which is the main destination of the cattle? (Meat, milk, wool...)	<ul style="list-style-type: none"> <li>Cow milk: 640,000 t</li> <li>Beef and veal: 45,000 t</li> <li>Pork: 69,067 t</li> <li>Poultry meat: 72,200 t</li> <li>Eggs: 24,900 t</li> <li>Sheep and goat meat: 1,800 t</li> <li>Horse meat: 619 t</li> </ul>	Data for 2021, Živinoreja in živalski proizvodi, <a href="https://www.gov.si/podrocja/kmetijstvo-gozdarstvo-in-prehrana/kmetijstvo-in-razvoj-podezelja/zivinoreja-in-zivalski-proizvodi/">https://www.gov.si/podrocja/kmetijstvo-gozdarstvo-in-prehrana/kmetijstvo-in-razvoj-podezelja/zivinoreja-in-zivalski-proizvodi/</a>
46) What is the employment rate covered by livestock?	Ca. 4.0%	<p>The estimate of employment in livestock farming is based on the number of livestock farms. According to the 2020 agricultural census, there are 68,331 agricultural holdings in Slovenia, 44,976 of which are livestock farms, or two thirds. Estimated employment in livestock farming therefore represents two thirds of employment in agriculture as a whole (see answer to question 22).</p> <p>Poročilo o stanju kmetijstva, živilstva, gozdarstva in ribištva, <a href="https://www.kis.si/f/docs/Porocila_o_stanju_v_kmetijstvu/ZP_2021_splosno_priloge_6.9.2022.pdf">https://www.kis.si/f/docs/Porocila_o_stanju_v_kmetijstvu/ZP_2021_splosno_priloge_6.9.2022.pdf</a>, p. 23 and 26</p>
47) Are state subsidies received for farming?	<p>In Slovenia, measures are implemented under the Common Agricultural Policy, where they are partly or fully financed by the EU's common budget, and national measures, which are financed solely from the national budget.</p> <p>In 2021, the CAP measures continued to implement direct payment schemes: the basic payment, the green component, the young farmers' premium, the payment for areas with natural constraints and the parallel scheme for small farmers. In addition, farms were also able to benefit from coupled payments for cattle rearing, milk production in mountain areas and, for the first time in 2021, for small livestock farming.</p> <p>In addition to the regular measures, some temporary emergency measures were also implemented in 2021 to assist specific sectors that had suffered economic damage either as a result of the effects of the second wave of the COVID-19 epidemic or as a result of market disruptions or adverse weather conditions. In order to mitigate the effects of the second wave of the epidemic, financial compensation was made available to beef production, pig production, small</p>	<p>Data for 2021, Poročilo o stanju kmetijstva, živilstva, gozdarstva in ribištva, <a href="https://www.kis.si/f/docs/Porocila_o_stanju_v_kmetijstvu/ZP_2021_splosno_priloge_6.9.2022.pdf">https://www.kis.si/f/docs/Porocila_o_stanju_v_kmetijstvu/ZP_2021_splosno_priloge_6.9.2022.pdf</a>, p. 17 and 19.</p> <p>Common Agricultural Policy Strategic Plan 2023-2027 for Slovenia, <a href="https://skp.si/wp-content/uploads/2022/11/SN-SKP_izpis-iz-SFC-7.11.2022.docx">https://skp.si/wp-content/uploads/2022/11/SN-SKP_izpis-iz-SFC-7.11.2022.docx</a>, p. 78-79.</p> <p>See answer to question 23 for other details on state subsidies in agriculture.</p>

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	<p>livestock farming. Independently of the implementation of the epidemic-related measures, exceptional financial support was also provided in 2021 for beekeeping (poor honey production due to frost) and pig farming (due to the deterioration of the economic situation in the sector).</p> <p>The Common Agricultural Policy Strategic Plan 2023-2027 for Slovenia foresees income-related support in livestock farming.</p> <p>The coupled income support for cattle rearing is mainly aimed at maintaining the volume of fattened cattle. Cattle meat production is one of the most important production lines in Slovenian agriculture and has been facing a deteriorating economic situation in recent years. Cattle farming allows farms to benefit from the advantage of grassland and the less-favoured areas that predominate in Slovenia. Support for cattle fattening will help to maintain cattle farms and also to make the sector more competitive. However, by linking the support only to cattle born and slaughtered in Slovenia, the objective of improving quality is pursued alongside the objective of improving competitiveness. The coupled income support takes the form of a single, annual payment per bovine animal.</p> <p>The coupled income support for suckler cows is primarily aimed at maintaining the volume of suckler cows and improving competitiveness in a sector in difficulty. Suckler cow rearing is one of the less economically efficient agricultural sectors. Suckler cows are an important means of utilising grassland, which accounts for more than half of all agricultural land in use in Slovenia and is particularly characteristic of the less-favoured areas. They also prevent overgrowth through grazing. The coupled nature of the payments is therefore important, both from an environmental point of view and from the economic point of view of maintaining this type of production in these areas. The coupled income support takes the form of an annual payment per animal and is intended for holders of suckler cow farms.</p> <p>The coupled income support for milk in mountain areas is intended in particular to maintain the number of dairy cows in mountain areas. The coupled income support takes the form of an annual payment per animal and is intended for holders of agricultural holdings engaged in milk production in mountain areas and is granted annually as a payment per dairy cow. The income support strengthens the market orientation of farms and improves the competitiveness of dairy farms in mountain areas, as their net value added is significantly lower than that of farms outside these areas.</p> <p>The coupled income support for small livestock farming is an income support aimed in particular at maintaining the volume of small livestock. The problems facing the poultry sector in Slovenia are the decline in the number of animals, the low stocking density of poultry holdings, the small size of herds on holdings, mainly traditional breeds and also indigenous breeds with a critical and endangered status. By regulating the economic situation of farms in particular, income support contributes to the maintenance of smallholder livestock farms and to the competitiveness of the sector.</p>	
48) Who are the main stakeholders involved in the production?	<ul style="list-style-type: none"> <li>• Chamber of Agriculture and Forestry of Slovenia</li> <li>• Cooperative Association of Slovenia</li> <li>• Farmers' Union of Slovenia</li> <li>• Association of Slovenian Rural Youth</li> <li>• Perutnina Ptuj d.o.o. (company)</li> <li>• Pivka d.d. (company)</li> <li>• Panvita Agromerkur d.o.o. (company)</li> <li>• Panvita prašičereja d.o.o. (company)</li> <li>• Farne lhan KPM d.o.o. (company)</li> </ul>	

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49) Which is the main residue produced in each case?	Livestock excrements	
50) How much slurry/manure/other residue is produced in average (t/head) and in the region (total)?	By far the most extensive by-product of livestock production are livestock excrements, the annual amount of which (expressed in t of dry matter) is in the range of 500,000 t for slurry, 60,000 t for poultry manure and 65,000 t for stable manure.	Strategic Concept Paper for Bioeconomy: Slovenia, p. 30
51) Is the slurry/manure/other exploited? (Indicate the percentage that is currently used) If not, how are the residues managed?	<p>Livestock excrement is, of course, a key component of organic fertilizers, important for the growth and development of plants or crops, as well as improving soil quality (organic matter, water retention capacity and reducing soil compaction). Livestock manure can also be an important source in obtaining heat, electricity (and potentially also biogas), the utilization of which today is well below 10% of the potential (slightly higher only in the case of pig farming).</p> <p>The existing network of biogas plants ('redominantly those with a size between 1 and 4 MW) is oversized for the way and organization of agricultural production in Slovenia, which causes point excessive environmental loads (insufficient areas for fertilizing with digestate from biogas plants). In the prevailing conditions of Slovenian agriculture with relatively small and spatially dispersed farms, the key challenge is the establishment of smaller biogas plants (of the 250 Kw range) on larger farms, or the connection of farms and other users (e.g. local communities) in group investments and the operation of smaller biogas plants. In the case of the latter, if it were to be combined with other organic waste as a substrate, it would be an additional challenge in the environmentally friendly use of digestate.</p>	Strategic Concept Paper for Bioeconomy: Slovenia, p. 30-31.
52) Average selling price for the slurry/manure/other?	<p>In normal years, the price of manure and slurry (excluding labour and machinery costs) ranges between 6 and 8 EUR/t.</p> <p>The Agricultural Institute of Slovenia estimated the average value of manure and slurry at 14 EUR/t at the beginning of 2022. Taking into account labour and machinery costs, the price of manure or slurry was estimated at 19.48 EUR/t.</p>	Kmečki glas (Slovenian newspaper specialising in agriculture), 6 January 2022, <a href="https://mmjevnika.kmeckiglas.com/post/617420/po-koliko-sta-hlevski-gnoj-in-gnojevka">https://mmjevnika.kmeckiglas.com/post/617420/po-koliko-sta-hlevski-gnoj-in-gnojevka</a>
53) Which are the future perspectives? (Valorisation technologies, cattle, employment rate, farm modernisation, increase of large exploitations, decrease of livestock production, etc.)	<p>Livestock farming is the dominant production sector in Slovenian agriculture. Sustainable development, which incorporates environmental and climatic conditions and emphasises animal welfare, is gaining importance in the development of agriculture and livestock farming. Animal welfare is a very important factor in the concept of food quality, as consumers expect their food of animal origin to be produced in an animal and environmentally friendly way. By improving animal welfare, we expect fewer injuries and illnesses, better animal welfare and thus fewer treatments, better production and better quality of animal products. This includes the responsible use of antimicrobials/antibiotics. Improving animal welfare will contribute to improving the conditions under which animals are kept and to adapting farms to implement the above-standard requirements in the area of animal welfare.</p> <p>Next to milk production, beef production is the most important production trend in Slovenian agriculture. In recent years, cattle have contributed between 11% and 13% to the value of agricultural production (12.1% in 2021) and between 26% and 29% to the value of livestock farming (28.6% in 2021). The sector has traditionally been present in areas where absolute grassland predominates, as it makes it possible to make use of natural resources. Intensive cattle farming is typical of the lowland areas of the country. Trends show that the number of cattle holdings is decreasing, while the number of animals and the volume of production are largely stable. The sector is undergoing a slow but steady restructuring, including through intensive investment in recent years. Production is thus being concentrated on the one hand, while</p>	Common Agricultural Policy Strategic Plan 2023-2027 for Slovenia, <a href="https://skp.si/wp-content/uploads/2022/11/SN-SKP_izpis-iz-SFC-7.11.2022.docx">https://skp.si/wp-content/uploads/2022/11/SN-SKP_izpis-iz-SFC-7.11.2022.docx</a> , p. 144, 146, 273, 369-370, 374.

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	<p>on the other hand smaller holdings are being abandoned. Smaller holdings are being extensified (farms are moving from dairy production to fattening), followed by the abandonment of fattening. On the one hand, extensive livestock farming prevents the overgrowth of farmland, thus contributing to the conservation of grassland habitats and, consequently, to the preservation of biodiversity. Intensive livestock farming, however, can lead to negative pressures on water, soil, air and biodiversity. Within livestock farming, cattle farming is the most important agricultural source of GHG and ammonia emissions. There is a downward trend in economic efficiency. Slovenian cattle farming is lagging behind the EU average in terms of development, mainly due to structural (small, fragmented farms) and natural constraints (areas with restrictions on agricultural activity – less-favoured areas, water protection areas, Karst).</p> <p>Slovenia has very favourable conditions for organic meat production because of the abundance of grassland. However, most meat products are not sold as organic because many organic animals are slaughtered as conventional animals.</p> <p>Cow's milk production is the most important trend in Slovenian agriculture. In recent years, it has contributed around 14% to the total value of agricultural production (14.7% in 2021) and around 33% to the value of livestock farming (34.6% in 2020). The sector is undergoing intensive processes of restructuring, modernisation and concentration of livestock farming. Over the last 15 years, the number of dairy farmers delivering milk to dairies has fallen from 13,900 to around 5,000 holdings. Although the number of dairy cows has also been declining over the years, milk production is fairly stable (in 2021: 630,000 tonnes), indicating an improvement in farming efficiency. The average milk yield is 6,300 kg of milk per dairy cow. The dairy sector is an export-oriented sector, but for many years the structure of total exports has been dominated by raw milk exports. In terms of the level of the farm-gate milk price, Slovenia is in the bottom third of EU countries over time, i.e. among countries with a low farm-gate milk price. The dairy sector is experiencing, on the one hand, concentration and specialisation and, on the other hand, the abandonment of milk production on small and medium-sized holdings in areas with more difficult farming conditions. Farms that are abandoning milk production are moving towards suckler cow farming. In the long term, the abandonment of milk and meat production on small and medium-sized holdings in hill and mountain areas could lead to the abandonment of agriculture and the depopulation of rural areas. Slovenia has favourable conditions for organic milk production due to its natural characteristics (large amount of permanent grassland).</p> <p>Due to the relatively well-developed livestock industry, livestock fertilisers represent a significant potential for biogas production. A theoretical calculation shows that 315 GWh of electricity and 245 GWh of heat could be produced from cattle, pig and poultry manure. Due to the relatively small size of farms and their dispersed nature, only about one third of this potential is technically exploitable, and rough estimates suggest that we are currently exploiting 0.2% of the potential of cattle manure, 13.8% of the potential of pig manure and 5.8% of the potential of poultry manure. It should be borne in mind that the key issue for agriculture is that, as set out in the Integrated National Energy and Climate Plan, livestock manure represents a significant potential for biogas production due to the relatively well developed livestock industry, and that the use of land for the production of feedstocks (e.g. biogas from agriculture) should take into account the fact that the main crops are not used, bearing in mind that agricultural land is intended for food production.</p>	
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	In the area of livestock farming, measures to mitigate heat stress and reduce GHG emissions should be encouraged. With feed additives, we expect to reach the target of an 8% reduction in greenhouse gases from livestock farming before 2040, so that we have a target of -21% for livestock farming in the specific climate strategies by 2050.	
<b>SECONDARY SECTOR</b>		
<b>AGROINDUSTRY</b>		
Questions	Answer	Comments
54) How many agrifood industries are there in the region?	<p>There are 789 enterprises active in the agrifood industries. Main agrifood industries are:</p> <ul style="list-style-type: none"> <li>• Processing of meat and production of meat products (100 enterprises)</li> <li>• Manufacture of bakery and farinaceous products (336 enterprises)</li> <li>• Manufacture of dairy products (29 enterprises)</li> <li>• Processing and preserving of fruit and vegetables (42 enterprises)</li> <li>• Manufacture of other food products (134 enterprises)</li> <li>• Manufacture of wine from grape (33 enterprises)</li> <li>• Manufacture of beer (40 enterprises)</li> <li>• Manufacture of soft drinks and production of mineral waters and other bottled waters (21 enterprises)</li> </ul>	Data for 2021, Poročilo o stanju kmetijstva, živilstva, gozdarstva in ribištva, <a href="https://www.kis.si/f/docs/Porocila_o_stanju_v_kmetijstvu/ZP_2021_splosno_priloge_6.9.2022.pdf">https://www.kis.si/f/docs/Porocila_o_stanju_v_kmetijstvu/ZP_2021_splosno_priloge_6.9.2022.pdf</a> , p. 73.
55) Which are the main products produced?	<ul style="list-style-type: none"> <li>• Meat and meat products: 712.2 million EUR turnover or 29.2% of the total turnover in the agrifood industries</li> <li>• Dairy products: 407.3 million EUR turnover or 16.7% of the total turnover in the agrifood industries</li> <li>• Bakery and farinaceous products: 378.0 million EUR turnover or 15.5% of the total turnover in the agrifood industries</li> <li>• Other food products: 361.0 million EUR turnover or 14.8% of the total turnover in the agrifood industries</li> <li>• Beer: 170.7 million EUR turnover or 7.0% of the total turnover in the agrifood industries</li> <li>• Fruit and vegetable products: 117.1 million EUR sales revenue or 4.8% of the total sales revenue in the agrifood industries</li> </ul>	Data for 2021, Poročilo o stanju kmetijstva, živilstva, gozdarstva in ribištva, <a href="https://www.kis.si/f/docs/Porocila_o_stanju_v_kmetijstvu/ZP_2021_splosno_priloge_6.9.2022.pdf">https://www.kis.si/f/docs/Porocila_o_stanju_v_kmetijstvu/ZP_2021_splosno_priloge_6.9.2022.pdf</a> , p. 73.
56) Which is the annual average production in the main agrifood industries?	<ul style="list-style-type: none"> <li>• Processing of meat and production of meat products: 114,507 t</li> <li>• Manufacture of bakery and farinaceous products: 94,172 t</li> <li>• Manufacture of dairy products: 68,675 t</li> <li>• Processing and preserving of fruit and vegetables: 13,028 t</li> <li>• Manufacture of other food products: 25,468 t and 31,510 hl</li> <li>• Manufacture of wine from grape: 495,836 hl</li> <li>• Manufacture of soft drinks and production of mineral waters and other bottled waters: 2,415,129 hl</li> </ul>	Data for 2021, Statistical Office of the Republic of Slovenia, <a href="https://pxweb.stat.si/SiStaData/pxweb/en/Data/-/17060405.px">https://pxweb.stat.si/SiStaData/pxweb/en/Data/-/17060405.px</a>
57) Are companies producing organic or agrifood products receiving subsidies?	The objective of the aid measure under the Rural Development Programme 2014-2020 for investment in the processing/marketing and/or development of agricultural products is to improve the competitiveness and environmental performance of food-processing establishments and to increase the added value of agricultural products. By the end of 2021, six calls for tenders had been launched and 367 applications had been approved for a total value of 64.9 million EUR. By the end of 2021, 29.4 million EUR had been paid out for 253 completed investments. Together with the commitments made under the Rural Development Programme 2007-2013, 32.3 million EUR had been paid out under this aid	Data for 2021, Poročilo o stanju kmetijstva, živilstva, gozdarstva in ribištva, <a href="https://www.kis.si/f/docs/Porocila_o_stanju_v_kmetijstvu/ZP_2021_splosno_priloge_6.9.2022.pdf">https://www.kis.si/f/docs/Porocila_o_stanju_v_kmetijstvu/ZP_2021_splosno_priloge_6.9.2022.pdf</a> , p. 84.



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	measure, which represents 33% of the total funds available for this aid measure.	
58) What is the percentage of employment covered by agroindustries?	1.7%	<p>Data for 2021, Poročilo o stanju kmetijstva, živilstva, gozdarstva in ribištva, <a href="https://www.kis.si/f/docs/Porocila_o_stanju_v_kmetijstvu/ZP_2021_splosno_priloge_6.9.2022.pdf">https://www.kis.si/f/docs/Porocila_o_stanju_v_kmetijstvu/ZP_2021_splosno_priloge_6.9.2022.pdf</a>, p. 73.</p> <p>Statistical Office of the Republic of Slovenia, <a href="https://pxweb.stat.si/SiStatData/pxweb/en/Data/-/0775355S.px/">https://pxweb.stat.si/SiStatData/pxweb/en/Data/-/0775355S.px/</a></p>
59) What is the main economic limitation (energy cost, supply chain...) faced by agroindustries?	<p>The main economic limitations faced by the agroindustries in Slovenia are:</p> <ul style="list-style-type: none"> <li>• Fluctuations in agricultural product and energy prices</li> <li>• Limited access to capital</li> <li>• Low self-sufficiency in agricultural products</li> <li>• The scale and structure of organic production does not match demand</li> <li>• Negative agrifood trade balance and low value added of agrifood exports</li> <li>• Lower productivity of agrifood industries relative to other manufacturing activities</li> </ul> <p>Since 2010, the food processing industry has made a stable contribution to value added and employment. The period after Slovenia's EU accession has been marked by a rapid decline in the shares in value added and employment. Ownership consolidation processes have also contributed to the decline in these values and further to stagnation. In some food-processing companies, performance deteriorated sharply, and for some companies even resulted in bankruptcy or liquidation.</p> <p>In 2017, productivity in the food processing industry fell below the manufacturing average for the first time in two decades. This trend continued in 2018. Value added per employee in 2018 in the food processing industry amounted to 39,000 EUR, while the value added of the manufacturing industry as a whole amounted to 44,415 EUR. While the food processing industry as a whole generated around 8% more total value added in real terms in 2018 than in the previous year, the growth in employment was slightly higher than in the previous year, which counteracted the growth in the relative indicator.</p> <p>The lagging productivity and thus "ompe'ltiveness of the food processing industry is shown by the fact that among the top 100 companies in Slovenia in terms of value added (2019), only three companies from the food processing industry are ranked 42<sup>nd</sup>, 60<sup>th</sup> and 80<sup>th</sup>.</p> <p>Despite the favourable business results in the post-crisis period, the Slovenian food processing industry is characterised by lower net value added per employee and lower productivity relative to other industries. In 2019, around half of the net profit was generated by employees in four groups of companies: meat and meat products, bakery products, dairy processing and fruit and vegetable processing. The key is to develop a competitive food processing industry based on domestic raw materials and long-term, fair and equitable links in the food chain. It is also important to develop and promote the use of modern technological know-how and to keep abreast of trends in production and marketing.</p>	<p>Common Agricultural Policy Strategic Plan 2023-2027 for Slovenia, <a href="https://skp.si/wp-content/uploads/2022/11/SN-SKP_izpis-iz-SFC-7.11.2022.docx">https://skp.si/wp-content/uploads/2022/11/SN-SKP_izpis-iz-SFC-7.11.2022.docx</a>, p. 39, 90, 92 and 95.</p>

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60) Which type of wastes/side-products/residues are produced?	Residues in the food processing (e.g. processing of meat, milk, fruits, vegetables, bakery and confectionery products, alcoholic and non-alcoholic beverages industry)	Strategic Concept Paper for Bioeconomy: Slovenia, p. 31
61) How much wastes/side-products/residues are produced?	<ul style="list-style-type: none"> <li>30,000 t annually of side streams in the food processing industry, which is classified as waste</li> <li>130,000 t annually of discarded food</li> </ul> <p>Determining the available quantities of food processing residues, which is essential for the planning of their further valorisation, is difficult. It is often the case with these residues that, depending on the use, the same substances can be by-products (when they are used) or waste (when they are thrown away). A publicly accessible database is maintained only for the latter.</p>	Strategic Concept Paper for Bioeconomy: Slovenia, p. 31, 32
62) Are the wastes/side-products/residues exploited? (Please specify for which application)	The prevailing use of this type of waste is biogas (50-100%, for most streams between 70-90%). The exception is waste edible oils, where the main method of processing is refining, or other methods of reuse and by-products of animals that are processed into various products with added value (production of proteins and fats as raw materials for animal nutrition, chemical, pharmaceutical and cosmetic industries etc.).	Strategic Concept Paper for Bioeconomy: Slovenia, p. 31
63) What are the future perspectives? (Techniques, products, production, employment)	<p>As the next link in the food supply chain, the agrifood industries are particularly important in maintaining primary agricultural production. Food and beverage production is one of the strategically important activities of the Slovenian economy and has one of the highest multiplier effects on the national economy due to its strong involvement in domestic sourcing. It contributes around 1.5% to the total value added of the national economy in recent years, and around 1.7% to total employment. In terms of trends in key performance indicators, including productivity, it still lags behind other manufacturing activities, although performance has improved slightly in recent years.</p> <p>A key objective of the agrifood companies following the business consolidation is to focus on further technological and organisational modernisation, which includes modernising vertical relationships with suppliers of agricultural raw materials.</p> <p>Digital technologies in the agrifood industries allow for continuous change and adaptation of business models to changing market conditions.</p> <p>Considering the chemical composition and technological properties of side streams in food processing, there are untapped potentials in the exploitation of bioactive components or substances with added value before their final use for energy purposes (which is the predominant use today). Usually, these preliminary processes of extraction of target substances do not affect the substrate properties for its (final) use in the biogas plant. In the case of animal by-products, improvements (of the already well functioning processing system) could lead to the strengthening of production possibilities and the quality of the final products, as well as to new methods of enzymatic processing and fermentation.</p> <p>Unexploited reserves are pronounced in the side streams of milk processing, where the most interesting substrate is whey. The processing options are diverse and are linked either to the extraction of individual fractions (e.g. lactose, proteins, bioactive peptides) or to biotechnological processes, the associated extraction of platform chemicals (e.g. alcohols, polysaccharides, organic acids, biosurfactants, biologically active components and enzymes) or as a raw material for the production of microbial biomass (e.g. meat substitute).</p>	<p>Common Agricultural Policy Strategic Plan 2023-2027 for Slovenia, <a href="https://skp.si/wp-content/uploads/2022/11/SN-SKP_izpis-iz-SFC-7.11.2022.docx">https://skp.si/wp-content/uploads/2022/11/SN-SKP_izpis-iz-SFC-7.11.2022.docx</a>, p. 89, 98-99 and 117.</p> <p>Strategic Concept Paper for Bioeconomy: Slovenia, p. 31-32.</p>



	<p>The quantity, potential for further processing, homogeneous composition, continuous inflow of biomass and consolidated industry characterize the good bioeconomic potential of the residues of the brewing industry. Beer grounds are an interesting raw material source for a wide range of products, e.g. as a protein component in cereal products, a substrate for the production of enzymes and organic acids, a raw material source for obtaining fractions (e.g. various sugars and organic acids) and in the production of bioadsorbents. Another promising residue of beer production is excess brewer's yeast, the possible uses of which range from a functional additive in food to an additive to animal feed to a substrate for microbial cultures. Other beverage production residues offer similar different application possibilities, among which it is worth mentioning the extraction of oligosaccharides (emulsifiers) from fruit pomace and the extraction of antioxidants from wine production residues.</p> <p>The processing of fruits and vegetables also yield In residues with interesting bioeconomic potential, which, however, are limited due to smaller quantities and demanding logistics. The possibilities of use are diverse, from the isolation of biologically active compounds or the production of microbial enzymes from residues (e.g. potato processing), to the isolation of fibres, polysaccharides, polyphenols and other bioactive components from residues in the processing of fruits and vegetables. This group also includes oil cakes and pulp, which are partly already used as food or fodder as well as in fertilization and plant protection, but also offer possibilities for processing into products with high added value (e.g. production of antibiotics, biological pesticides, enzymes, biodegradable polymers, bioadsorbents, etc.). The remains of the milling industry are also an interesting raw material, especially bran, which enables the isolation of fractions or the enrichment of foods with proteins and dietary fibres, polysaccharides, sugars and phytosterols. Bran is also interesting as a substrate for the production of a wide range of enzymes, organic acids (succinic acid, lactic acid, etc.) and antibiotics. Interesting applications are also the use of obtained fibrous material for the production of paper and packaging, as well as the production of yeast from bakery waste.</p> <p>Discarded food represents a significant source of waste, the current amounts of which (on average 130,000 t/year) are a multiple of the amount of waste in food production. In relation to wasted food, due to the high nutritional value, ethical aspects, as well as the high energy and development input in the preparation of the final food, it is expedient to develop strategies in the following order: (1) minimizing the amount of wasted food; (2) inclusion of usable food waste for human consumption; (3) the use of waste food for animal nutrition and only lastly (4) the use of waste food not related to nutrition. In the case of streams of discarded food that are not suitable for consumption, from a technological point of view, it is also necessary to take into account that their use is limited by short or questionable stability (need for hygienization or additional stabilization) and high heterogeneity. The current use of waste food, which is not suitable for consumption, is at best energy (biogas), but it could also potentially be used to obtain valuable components in the fractionation process. In order to plan economic activities that would effectively exploit the bioeconomic potential of side streams in food production, it would be necessary to improve the method of collecting data on side streams, preferably in interaction between the food processing industry (simplicity, up-to-date flow) and interested users of these streams.</p>	
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64) Which are the main stakeholders of the local agrifood industry?	<ul style="list-style-type: none"> <li>Chamber of Agricultural and Food Enterprises within the Chamber of Commerce and Industry of Slovenia</li> <li>Chamber of Agriculture and Forestry of Slovenia</li> <li>Cooperative Association of Slovenia</li> <li>Farmers' Union of Slovenia</li> <li>Perutnina Ptuj d.o.o. (company)</li> <li>Ljubljanske mlekarne d.o.o. (company)</li> <li>Atlantic Droga Kolinska d.o.o. (company)</li> <li>Pivovarna Laško Union d.o.o. (company)</li> <li>Žito d.o.o. (company)</li> <li>Celjske mesnine d.o.o. (company)</li> <li>Incom d.o.o. (company)</li> <li>Jata Emona d.o.o. (company)</li> <li>Panvita MIR d.d. (company)</li> <li>Mlekarna Celeia, d.o.o. (company)</li> <li>Mlinotest d.d. (company)</li> <li>Pekarna Pečjak d.o.o. (company)</li> <li>Fructal d.o.o. (company)</li> </ul>	
<b>OTHER BIO-BASED INDUSTRIES</b>		
Questions	Answer	Comments
65) Is there a mapping of the current bio-based industrial activities in your area?	SRIP Circular Economy seems as the most appropriate candidate for this mapping task. Nonetheless, this is only done periodically, if commissioned specifically, for example within the BBI project CELEBIO or Bridge2Bio.	
66) How many biobased industries are there in the region? Please specify the main biobased products produced	Data-Modelling platform of resource economics (2023) list 116,600 people being employed within SI bio-economy, primarily within agriculture (65%), food (19%), wood (12%), forestry, paper and textiles.	
67) Out of the previous list indicate the three more relevant in terms of revenues and role to meet the government strategic objectives (decarbonisation, CO <sub>2</sub> emissions, circular economy, etc.)	EIT Climate-KIC Circular, Regenerative Economies Deep Demonstration pinpointed supporting the decarbonisation in key value chains: general processing industry, forest wood chain, food, building and mobility.	
68) Are state subsidies received to promote sustainable production by these industries?	Yes. Nonetheless, inadequately sited biomass processing plants can disturb prices, especially in the case of inappropriate subsidy policies (e.g. the negative past experience with biogas (installations)).	
69) What is the percentage of employment covered by biobased industries?	The share of primary sector employment (agriculture, forestry and fishing) in Slovenia is 65%, which is below the average of the BIOEAST region (70%), but in comparison with the EU27 average (57%) (AT, DE, FI...).	
70) How many tonnes of biobased materials/products are produced per year? Please specify by typology (renewable energies, biofuels, biomaterials, biochemicals, biobased cosmetics/pharmacy, others)	In Slovenia, wood is the most important renewable energy source, accounting for a 48% share in the country's energy mix (2019 data). In 2020, the primary energy production from the biogas in Slovenia amounted to 27 metric kt of oil (equivalent). Besides wood, biomaterials or biochemical are produced typically in quantities, less than a ton. Other biofuel platforms are not being produced.	
71) Which type of wastes/by-product, residue are produced in the production process?	Sludge is general quite challenging. The network for biogas is oversized for the organization of the production in Slovenia, which causes excessive environmental loads (digestate is the main residual product).	
72) What are the biobased materials, side-products, waste or residues used as raw materials in the productive process?	Wood/other lignocellulosic biomass are typically considered for nano-cellulose, extractives and (non-refined) cellulose. Lignin is the primary side product of processing, exclusively used for energy.	
73) Where are these raw materials obtained or cultivated?	In high value-added applications, e.g. the encapsulation of extractives or being formulated. Moreover, other biomass streams provide the potentials for technologically/economically sound uses.	
74) Which are the main stakeholders/actors supplying these raw materials?	Presently, mostly forestry, as well as agriculture. Considering the composition/ properties of the streams in processes, there are the potentials in the extraction of compounds/application of biotechnology.	
75) Which is the price of these biobased raw materials used (€/ton)?	The price of wood was (2022) as follows: 99.06 (conifers), 308.24 (oak), 99.65 (beech), 70.96 (mixed), which will also	

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	largely depend on the timing of purchase. For extractives, oak/chestnut seems more relevant.	
76) Which is the price of the main biobased products produced in the region (€/ton)?	Tanin Sevnica is one of the producers of the tannin from the oak/chestnut in Europe. Firm initially produced tannin mainly for textile/leather, whereas nowadays they are oriented globally (price is >€1000/ton).	
77) Which are the perspectives in the use of these biobased raw materials/side-products/waste?	In Slovenia, the potential for products, arising from the residual biomass flows of agriculture/food supply chain remains untapped. Due to a diversity of activities, residues offer a diverse economic potential.	
78) Which are the perspectives in the consumption of these biobased products?	Some side streams provide a very good source of antioxidants, being antibacterial/ antifungal, which could be used to stabilize others. Nano-cellulose can be primarily used as filler (bioplastics) or with pulp/paper.	
79) Please mention the 3 bio-based solutions with more relevance in your region (that can be taken as an example of implementation or good practice for other regions) and provide contact details if possible.	Tanin ( <a href="http://www.tanin.si/">http://www.tanin.si/</a> ) Navitas ( <a href="https://www.bioeco-platform.eu/company/navitas-d-o-o/">https://www.bioeco-platform.eu/company/navitas-d-o-o/</a> ) CEL CYCLE ( <a href="https://celkrog.si/?lang=en">https://celkrog.si/?lang=en</a> ) Lignin is valorised (TRL3–6).	
80) Please mention 3 bio-based solution in your region that have high deployment potential in your region but still need support to accelerate-unlock its potential ( please mention what technological, regulatory and market challenges are and provide contact details if possible)	Currently, there are no lignocellulosic bio-refineries in Slovenia that would provide the most technologically, economically, and environmentally prospective exploitation model of residual biomass utilization. Considering the dispersion of resources, associated high costs and unsubsidized (barrier) price–expenditure risks, the concept of a network of modular spatially-dispersed bio-refineries makes more sense.	

#### ENERGY INDUSTRY

Questions	Answer	Comments
81) How many energy industries are there?	The total primary supply (TPES) in Slovenia was 6.80 Mtoe in 2019. In 2019, production was 16.1 TWh, while consumption was 14.9 TWh ( <a href="https://www.iea.org/data-and-statistics/data-sets">https://www.iea.org/data-and-statistics/data-sets</a> ).	
82) Does the main part of energy come from renewable or non-renewable energy?	Non-renewable. The three greatest sources of energy in Slovenia during 2019 were oil (34.0%), nuclear (22.0%) and coal (16.0%) ( <a href="https://www.iea.org/data-and-statistics/data-sets">https://www.iea.org/data-and-statistics/data-sets</a> ).	
83) What is the main source of renewable energy?	Hydropower is the Slovenia's most significant renewable energy source for electricity; biofuels provided a contribution to needs. ( <a href="https://www.iea.org/data-and-statistics/data-sets">https://www.iea.org/data-and-statistics/data-sets</a> ).	
84) What is the main source of non-renewable energy?	The three greatest sources of energy in Slovenia during 2019 were oil (34.0%), nuclear (22.0%) and coal (16.0%) ( <a href="https://www.iea.org/data-and-statistics/data-sets">https://www.iea.org/data-and-statistics/data-sets</a> ).	
85) Are state subsidies received to promote renewable energies?	In Slovenia, electricity from renewable sources is promoted through a two-round tender process, which determines the recipient and the level ( <a href="http://www.res-legal.eu/search-by-country/slovenia/">http://www.res-legal.eu/search-by-country/slovenia/</a> ).	
86) What is the percentage of employment covered by the energy sector?	Energy supply services list 10,800 employees (1%) ( <a href="https://www.cedefop.europa.eu/en/tools/skills-intelligence/employed-population-occupation-and-sector?year=2020&amp;country=EU#1">https://www.cedefop.europa.eu/en/tools/skills-intelligence/employed-population-occupation-and-sector?year=2020&amp;country=EU#1</a> ).	
87) Which is the average price of energy (€/Kw h)? (Differences between renewable and non)	The price for the consumers in Slovenia in the 2 <sup>nd</sup> quarter of 2022 was 0.157 EUR/kWh, while without value added tax for non-household consumers was 0.162 EUR/kWh ( <a href="https://www.stat.si/StatWeb/en/News/Index/10535">https://www.stat.si/StatWeb/en/News/Index/10535</a> ).	
88) Which percent of energy usage comes from renewable energy?	Renewable energy sources other than hydropower (e.g., biofuels, solar PV, waste, and wind) together provided 3.5% of total electricity generation in 2019 ( <a href="https://www.iea.org/data-and-statistics/data-sets">https://www.iea.org/data-and-statistics/data-sets</a> ).	
89) Which are the future perspectives?	Renewables (RES) set out a target to reach at least a 27% share in the energy end use by 2030, i.e. at least 2/3 buildings utilisation from the RES by 2030 (the share of the RES without electricity/district heat applications).	

#### MUNICIPAL SOLID WASTE (MSW)

Questions	Answer	Comments
90) How many tonnes of MSW are generated per year?	1.091.177	Data for 2021

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91) Which is their main composition?	Waste packaging	
92) Are the wastes exploited? (Indicate how)	1676 tonnes – fuel 273030 tonnes recycled of which 126.322 tonnes where composted and 25 718 tonnes treated in biogas facilities	Almost 56000t were landfilled in 2021
93) Where are the MSW generated?	70% in households	Additional sources can be retail, private and public offices, hospitality industry for waste similar to household wastes
94) Who are the main stakeholders involved in the MSW management?	Public utilities	Municipal waste management is in the domain of public utilities
95) How is MSW valorised? (Added-value products)	?*	
96) Which is the price of MSW added value-products?	?*	
Which are the future perspectives? (Techniques, wastes)	?*	

\* The questionnaire does not follow the reporting method established in the EU so that it is very difficult to answer the questions



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# Regional bioeconomy development and promotion. Policy framework

CROSS-CUTTING ISSUES		
Questions	Answer	Comments
97) Does your region have a strategy for circular bioeconomy?	SRIP Circular Economy has an Action Plan ( <a href="https://www.stajerskagz.si/administracija/wp-content/uploads/2017/08/ANG-S4_Kljucne_usmeritve_SRIP_Mreze_za_prehod_v_krožno_gospodarstvo_končna.pdf">https://www.stajerskagz.si/administracija/wp-content/uploads/2017/08/ANG-S4_Kljucne_usmeritve_SRIP_Mreze_za_prehod_v_krožno_gospodarstvo_končna.pdf</a> ), but it is broader than bioeconomy alone.	
98) Existence of bioeconomy hubs, clusters or any other association in the region?	The Strategic Research and Innovation Partnership – Networks for the transition into circular economy (SRIP – Circular economy) is a connection of Slovenian business subjects, educational and research institutions (RRI), non-governmental organisations and other interested parties, in collaboration with the state, into new value chains ( <a href="https://srip-circular-economy.eu/srip-circular-economy/about-us/">https://srip-circular-economy.eu/srip-circular-economy/about-us/</a> ).	
99) Existing of hubs or cluster targeting other topic or sectors? (please specify)	SRIP PsiDL represents one of the nine key long-term development partnerships in support of the Smart Specialization Strategy of Slovenia (S4), whose ambition is for Slovenia to move from a follower to a co-creator of global trends in niche areas. SRIP PsiDL brings together members working in the broad field of smart and sustainable buildings, covering both building products, wood and wood-based materials, components, devices and systems, both for installation / equipment.	
100) What environmental indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (GHG decrease achieved with bioeconomy initiatives, resources depletion, implementation strategy aiming zero waste, etc.) ?	The national effort sharing target is set at a reduction of emissions by 15% by 2030. It includes indicative targets for reducing greenhouse gas emissions in different effort sharing sectors by 2030 compared to 2005, specifically for transport (+12%), agriculture (-1%), buildings (-70%), as well as for non-ETS industry (-43%), waste management (-65%), and non-ETS energy (-34%) ( <a href="http://www.energetika-portal.si/fileadmin/dokumenti/publikacije/nepn/priporocila_e_k/assessment_necp_sl.pdf">http://www.energetika-portal.si/fileadmin/dokumenti/publikacije/nepn/priporocila_e_k/assessment_necp_sl.pdf</a> ).	
101) What economic indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (turnover linked to biobased companies (forestry, agriculture, other-biobased industries), existence of funding programmes/schemes targeting bioeconomy, existence of supporting measures promoting partnerships between industries and enterprises in the region, etc.?)	Two main goal indicators were defined by S4 (see above): improvement of the material efficiency of the economy and new value chains with closed material loops. The S4 strategy included 656 million euro per year of private and public development investments for the three year period 2016-2018. Aside from these financial incentives, there are also tax reliefs; companies creating profit are entitled to a tax relief equal to 100 % of the value of their R&D investments – this way the companies have an edge with their R&D activities ( <a href="https://celebio.eu/wp-content/uploads/2020/07/Slovenia-Country-Report.pdf">https://celebio.eu/wp-content/uploads/2020/07/Slovenia-Country-Report.pdf</a> ).	
102) What social indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (available skilled workforce, number of jobs created in the last 5 years in bio-based industries, communications to society regarding bio-based activities (seminars, trainings, etc.), willingness to pay for bio-based products, etc.?)	Methodology could adhere to the JRC. For the last three years, the JRC jointly with the nova-Institute for Ecology and Innovation has been testing a methodology for the quantification of bioeconomy jobs and economic performance in the EU. The methodology meets the criteria of (i) being applicable to the different sectors of the bioeconomy, (ii) using harmonised data across EU Member States and (iii) permitting annual updates ( <a href="https://publications.jrc.ec.europa.eu/repository/bitstream/JRC113252/jrc113252_eubce2018_proceedings_final_1.pdf">https://publications.jrc.ec.europa.eu/repository/bitstream/JRC113252/jrc113252_eubce2018_proceedings_final_1.pdf</a> ).	

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103) Current economic and social characteristics of your territory not reported in previous questions that could enable the development of the circular bioeconomy?	Technology lag and productivity gap in primary bioeconomy sectors, in particular in agriculture. Poor ability to enable industrially relevant quantities of biomass due to fragmented tenure structures in forestry and agriculture, lack of organisation, and efficient business models. Low level of wood processing and consequently low added value (in 2018, 52% of unprocessed roundwood was exported abroad; softwood roundwood is mostly processed in sawmills (68%) and hardwood roundwood is mostly used for energy purposes (67%)) (BIOEASTsUP, Strategic Concept Paper for Bioeconomy: Slovenia, 2023).	
104) Are there any bio-based production districts / specializations in your Region? (Please, provide a description of these activities, including data, focusing on Circular Bio-based Economy potentials and material/immaterial assets as well as existing barriers)	JTF can contribute to bio-economy/bio-refining. Slovenia will receive more than €258 million under the Just Transition Fund (JTF) following the adoption of the single Cohesion Policy programme that includes its Territorial Just Transition Plan (TJTP). This EU support will help deliver a just climate transition in the Slovenian regions of Savinjsko-Saleška (SAŠA) and Zasavje. Energy restructuring in Savinjsko-Saleška In SAŠA, the coal mining in Velenje and the Šoštanj thermal power plant's coal blocks (TEŠ) will close by 2033. The JTF will help diversify the local economy by investing in research and development related to innovation ( <a href="https://ec.europa.eu/commission/presscorner/detail/en/ip_22_7744">https://ec.europa.eu/commission/presscorner/detail/en/ip_22_7744</a> ).	
105) What are the strengths/weaknesses of your area regarding the development of the circular bioeconomy?	Strengths are following (weaknesses in 103). Diverse and sustainably managed resources in agricultural and forestry production, associated with several ecosystem services, untapped potential for valorisation High percentage of forest areas (58% of country area) and the consequent high production potential of Slovenian forests. Under-exploited flows of residual biomass from (diversified) primary agricultural production and by-products of food production, well-organized organic waste management system (BIOEASTsUP, Strategic Concept Paper for Bioeconomy: Slovenia, 2023).	
106) Please, identify actors with a natural interest in a project due to their existing businesses and market in your territory	SRIP Circular Economy or GZS members would be a good mapping start ( <a href="https://srp-circular-economy.eu/members/">https://srp-circular-economy.eu/members/</a> ).	

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## Annex 6. Germany region profile

INFORMATION FOR STATISTICAL ANALYSIS		
REGIONS (EUROSTAT NUTS 2 – Level)		
(Please indicate for your region which NUTS 2-Regions are relevant or add additional regions in the comment section.)		
Question	Suggested NUTS 2 regions	Comments
1) Germany – Region of Baden-Württemberg	<input checked="" type="checkbox"/> Stuttgart (please translate to English) <input checked="" type="checkbox"/> Karlsruhe (please translate to English) <input checked="" type="checkbox"/> Freiburg (please translate to English) <input checked="" type="checkbox"/> Tübingen (please translate to English)	
2) Spain – Region of Aragon	<input type="checkbox"/> Zaragoza (please translate to English) <input type="checkbox"/> Huesca (please translate to English) <input type="checkbox"/> Teruel (please translate to English)	
3) Greece – Region of Western Macedonia	<input type="checkbox"/> Dyitiki Makedonia (please translate to English)	
4) Bulgaria – Region of Plovdiv	<input type="checkbox"/> Yuzhen tsentralen (please translate to English)	
5) Slovakia – Nitra Self-Governing Region	<input type="checkbox"/> Západné Slovensko (please translate to English)	
6) Slovenia – Whole Country	<input type="checkbox"/> Vzhodna Slovenija (please translate to English) <input type="checkbox"/> Zahodna Slovenija (please include the traduction)	
7) Croatia – Region Adriatic Croatia	<input type="checkbox"/> Jadranska Hrvatska (please translate to English)	
8) Hungary – Region North Hungary	<input type="checkbox"/> Észak-Magyarország (please translate to English)	
9) Romania – West region	<input type="checkbox"/> Vest (please translate to English)	
10) Czechia – Region BIOEAST	<input type="checkbox"/> Praha (please translate to English) <input type="checkbox"/> Střední Čechy (please translate to English) <input type="checkbox"/> Jihozápad (please translate to English) <input type="checkbox"/> Severozápad (please translate to English) <input type="checkbox"/> Severovýchod (please translate to English) <input type="checkbox"/> Jihovýchod (please translate to English) <input type="checkbox"/> Střední Morava (please translate to English) <input type="checkbox"/> Moravskoslezsko (please translate to English)	
11) Netherlands – Region Apeldoorn	<input type="checkbox"/> Gelderland (please translate to English)	
12) Italy – Region Campania	<input type="checkbox"/> Campania (please translate to English)	



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# How to identify socially marginalised groups?

SOCIALLY MARGINALISED GROUPS		
Questions	Answer	Comments
1) Population area with less than 5.000 inhabitants	Baden-Württemberg has in total 11,124,642 inhabitants (2021)	<a href="https://www.statistik-bw.de/BevoelkGebiet/Bevoelkerung/99025010.tab?R=LA">https://www.statistik-bw.de/BevoelkGebiet/Bevoelkerung/99025010.tab?R=LA</a>
2) Unemployment rate in the area	3.4% in Baden-Württemberg (2022)	<a href="https://www.statistik-bw.de/Arbeit/Arbeitslose/03033022.tab?R=LA">https://www.statistik-bw.de/Arbeit/Arbeitslose/03033022.tab?R=LA</a>
3) Employment rate of women in the region and at national level	Germany: 72,2% (2021) Baden-Württemberg: 76% (Women with children, 2021), 87,4% (Women without children)	<a href="https://www.statistik-bw.de/Presse/Pressemitteilungen/2021349">https://www.statistik-bw.de/Presse/Pressemitteilungen/2021349</a>
4) Main economic activity in the area	Technology sectors such as automobile production and mechanical and electrical engineering	<a href="https://wm.baden-wuerttemberg.de/fileadmin/redaktion/m-wm/intern/Publikationen/Wirtschaftsstandort/Wirtschaftsdaten2022_eng.pdf">https://wm.baden-wuerttemberg.de/fileadmin/redaktion/m-wm/intern/Publikationen/Wirtschaftsstandort/Wirtschaftsdaten2022_eng.pdf</a>
5) Jobs at risk	Jobs in the automotive industry will be directly affected and endangered by the transformation of the industry toward electromobility by 2030. The people affected manufacture products linked to combustion engines.	
6) Main breadwinner of the family nucleus	In the majority of German families today, both parents are employed. However, it is still generally mothers who limit their scope of employment over a longer period of time in order to reconcile family and career. This also affects their career opportunities and livelihood options.	
7) Average educational level and share of population with different school attainment	Baden-Württemberg: <ul style="list-style-type: none"> <li>- Less than primary, primary and lower secondary education: 6.2%</li> <li>- Upper secondary and post-secondary non-tertiary education: 49.5%</li> <li>- Tertiary education: 33.5%</li> </ul>	Eurostat
8) Population age structure in the region and at national level	Germany (2021): <ul style="list-style-type: none"> <li>- Below 20: 18,5%</li> <li>- 20 – 40: 24,4%</li> <li>- 40 – 60: 27,7%</li> <li>- 60 – 80: 22,0%</li> <li>- 80 – 100: 7,3%</li> <li>- Above 100: 0%</li> </ul> Baden-Württemberg (2021): <ul style="list-style-type: none"> <li>- Below 15: 14,3%</li> <li>- 15 – 25: 10,6%</li> <li>- 25 – 45: 25,8%</li> <li>- 45 – 65: 28,5%</li> <li>- Above 65: 20,8%</li> </ul>	Eurostat
9) Share of ethnic minorities in the region and at national level	<u>National Minorities (national numbers)</u> Danes: approx. 50,000 persons Frisians: approx. 60,000 persons German Sinti and Roma: approx. 30,000 persons Sorbs: [no data found]  <u>Population with migration background national (share of total population)</u> <ul style="list-style-type: none"> <li>- Population with migration background total: 26.7%</li> <li>- Population with Turkish background: 3.3%</li> <li>- Population with Polish background: 2.5%</li> <li>- Population with Russian background: 1.5%</li> <li>- Population with Romanian background: 1.2%</li> <li>- Population with Italian background: 1.1%</li> </ul>	Data from 2020  The Federal Government regards as national minorities those population groups who meet the following five criteria:  they are German nationals; they differ from the majority population in having their own language, culture and history and thus their own distinct identity; they wish to maintain this identity;

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	<p><u>Population with migration background regional</u></p> <ul style="list-style-type: none"> <li>- Total Population with migration background: 34.8%</li> </ul>	<p>they have traditionally been resident in Germany (usually for centuries); they live in Germany within traditional settlement areas.</p> <p><a href="https://www.bmi.bund.de/EN/topics/community-and-integration/national-minorities/national-minorities-node.html">https://www.bmi.bund.de/EN/topics/community-and-integration/national-minorities/national-minorities-node.html</a></p> <p><a href="https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Bevoelkerung/Migration-Integration/Publikationen/Downloads-Migration/migrationshintergrund-endergebnisse-2010220207004.pdf?__blob=publicationFile">https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Bevoelkerung/Migration-Integration/Publikationen/Downloads-Migration/migrationshintergrund-endergebnisse-2010220207004.pdf?__blob=publicationFile</a></p>
10) Emigration rate in the region and at national level	National level: 488,138	Eurostat
11) Average salary or household income in the region and at national level	Germany (2021): 4.100€ average monthly gross income Baden-Württemberg (2021): 4.815€ average monthly gross income	<a href="https://www.handelsblatt.com/unternehmen/gehalt-wie-setzt-sich-das-durchschnittseinkommen-in-deutschland-zusammen/26628226.html">https://www.handelsblatt.com/unternehmen/gehalt-wie-setzt-sich-das-durchschnittseinkommen-in-deutschland-zusammen/26628226.html</a>
12) Please describe the structure and the characteristics of relevant socially disadvantaged/marginalized groups in your region	<p>In 2021, 44.7% of people at risk of poverty in Baden-Württemberg were unemployed. The longer the period of unemployment, the less likely they are to find one's way back into the world of work.</p> <p>One category of unemployed people, we want to pay special attention to are so-called NEETS, meaning young people not engaged in education, employment or training.</p>	<a href="https://wm.baden-wuerttemberg.de/fileadmin/redaktion/m-wm/intern/Publikationen/Arbeit/12-2022_Broschuere_IdeenwettbewerbArbeitsmarkt.pdf">https://wm.baden-wuerttemberg.de/fileadmin/redaktion/m-wm/intern/Publikationen/Arbeit/12-2022_Broschuere_IdeenwettbewerbArbeitsmarkt.pdf</a>
13) Please comment the potential impact of their participation in Circular Bio-based Economy	These persons can be trained for so-called green jobs to work in the industries of the circular, bio-based economy.	
14) Please indicate the factors hindering their possible participation?	Missing incentives to train for these kind of jobs, nescience of the possibility of jobs for a CBE, etc.	
15) Indicate the selected marginal group/s that will be targeted during the project and relevance in the region	NEETS (= young persons not engaged in education, employment or training); In Germany, more than 630,000 young people are not engaged in education, employment or training. But there lies the potential to find new people for so-called green jobs in the CBE in Baden-Württemberg	
16) Average educational level of targeted marginalized groups	No data	
17) Description of the occupied post, considering the type of work performed and the qualification required by the targeted marginalized groups (question 13)		

#### Situation of main economic sectors

PRIMARY SECTOR		
AGRICULTURE		
Questions	Answer	Comments

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18)	How large is the surface of cultivable areas? (you can check databases such as Eurostat: <a href="https://ec.europa.eu/eurostat/web/agriculture/data/database">https://ec.europa.eu/eurostat/web/agriculture/data/database</a> )	1.564.200 ha (2022)	<a href="https://www.statistik-bw.de/Landwirtschaft/Bodenutzung/LF-NutzngKultFrucht.jsp">https://www.statistik-bw.de/Landwirtschaft/Bodenutzung/LF-NutzngKultFrucht.jsp</a>
19)	Which are the main crops in the area (surface in hectares of percentage of the cultivable area occupied by each crop)	Wheat: 14% Barley: 9% Maize: 8%	<a href="https://www.statistik-bw.de/Landwirtschaft/Bodenutzung/LF-NutzngKultFrucht.jsp">https://www.statistik-bw.de/Landwirtschaft/Bodenutzung/LF-NutzngKultFrucht.jsp</a>
20)	Which is the average annual production (dry basis) of the most relevant crops?	Maize: 8,78 t/ha Wheat: 7,46 t/ha Barley: 6,59 t/ha	<a href="https://www.statistik-bw.de/Landwirtschaft/Ernte/Feldfruechte-M.jsp">https://www.statistik-bw.de/Landwirtschaft/Ernte/Feldfruechte-M.jsp</a>
21)	Average yield (dry basis) for the most relevant crops?	No data	
22)	What is the percentage of employment covered by agriculture?	1,1% (agriculture, forestry, fishery)	<a href="https://www.statistik-bw.de/Arbeit/Erwerbstaetige/ET_wirtschSektoren.jsp#:~:text=So%20arbeiteten%202021%20in%20Berlin,knapp%2031%20%25%20im%20Produzierenden%20Gewerbe.">https://www.statistik-bw.de/Arbeit/Erwerbstaetige/ET_wirtschSektoren.jsp#:~:text=So%20arbeiteten%202021%20in%20Berlin,knapp%2031%20%25%20im%20Produzierenden%20Gewerbe.</a>
23)	Are state subsidies received by the farmers (CAP or others)? Please shortly mention the crops and the aim of the subsidy (equipment modernisation, yield increase, etc.		
24)	What is the current situation of the soils (erosion, eutrophication, pollution...)?	"The impact of climate change on the soils in Baden-Württemberg can only be described in qualitative terms at present. No precise figures or local projections are available [...]" ; degree of erosion, pollution, etc. depends on climate conditions.	<a href="https://www.baden-wuerttemberg.de/fileadmin/redaktion/mum/intern/Dateien/documents/publication/Climate_Change.pdf">https://www.baden-wuerttemberg.de/fileadmin/redaktion/mum/intern/Dateien/documents/publication/Climate_Change.pdf</a>
25)	Who are the main stakeholders involved in the crops production (cooperatives or farmers associations, individual farmers owning large or small areas, etc.)?	Individual farmers owning less than 5ha: 15,7% Individual farmers owning 5-10ha: 17,9% Individual farmers owning 10-20ha: 20,6% Individual farmers owning 20-50ha: 22,2% Individual farmers owning over 50ha: 23,6%	<a href="https://www.statistik-bw.de/Landwirtschaft/Agrarstruktur/">https://www.statistik-bw.de/Landwirtschaft/Agrarstruktur/</a>
26)	How much residual biomass is produced? Please indicate for the most relevant crops the residues that are produced during the processing	No data	
27)	Is the residual biomass exploited (energy production, chemicals, fertilizers, etc.)?	These are examples of how german companies use residual biomass.  Wheat: Essity in Mannheim will be the first company in Europe to industrially produce pulp from straw for hygiene products.  Maize: use of residual biomass for biogas production	<a href="https://www.umweltwirtschaft.com/news/abfallwirtschaft-und-recycling/Verwertung-landwirtschaftlicher-Reststoffe-Aus-StrohPapier-herstellen-25242">https://www.umweltwirtschaft.com/news/abfallwirtschaft-und-recycling/Verwertung-landwirtschaftlicher-Reststoffe-Aus-StrohPapier-herstellen-25242</a>  <a href="https://www.lfl.bayern.de/ipz/mais/076707/index.php">https://www.lfl.bayern.de/ipz/mais/076707/index.php</a>
28)	Average selling price for the main crops (€/dry tonnes)? When possible, also include the production cost.	Wheat: 285.25€/ton Maize: 30.19€/kilogram Barley: 27.91€/kilogram	<a href="https://de.statista.com/statistik/daten/studie/1293736/umfrage/taeglicher-preis-von-weizen/">https://de.statista.com/statistik/daten/studie/1293736/umfrage/taeglicher-preis-von-weizen/</a>  <a href="https://de.statista.com/statistik/daten/studie/457619/umfrage/verkaufspreis-von-mais-in-deutschland/#:~:text=Die%20statistik%20zeigt%20die%20durchschnittlichen,durchschnittlich%20rund%2030%2C19%20Euro.">https://de.statista.com/statistik/daten/studie/457619/umfrage/verkaufspreis-von-mais-in-deutschland/#:~:text=Die%20statistik%20zeigt%20die%20durchschnittlichen,durchschnittlich%20rund%2030%2C19%20Euro.</a>

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		<a href="https://de.statista.com/statistik/daten/studie/457570/umfrage/verkaufspreis-von-futtergerste-in-deutschland/#?text=Die%20Statistik%20zeigt%20die%20durchschnittlichen,durchschnittlich%20rund%2027%2C91%20Euro.">https://de.statista.com/statistik/daten/studie/457570/umfrage/verkaufspreis-von-futtergerste-in-deutschland/#?text=Die%20Statistik%20zeigt%20die%20durchschnittlichen,durchschnittlich%20rund%2027%2C91%20Euro.</a>
29) Which are the future perspectives? (Technologies, increase of the area dedicated to certain crops, new crops development, new biomass or residual biomass value chain development, employment)	Organic farming, regional products, no genetically modified food, agriculture 4.0 through digital solutions (e.g. smart farming)	<a href="https://www.baden-wuerttemberg.de/de/bw-gestalten/nachhaltiges-baden-wuerttemberg/landwirtschaft">https://www.baden-wuerttemberg.de/de/bw-gestalten/nachhaltiges-baden-wuerttemberg/landwirtschaft</a>
<b>FORESTRY</b>		
Questions	Answer	Comments
30) Forest area in the region (please indicate the hectares and percentage occupied by forestland in the region)?	1.353.042 ha (2021) 37,8%	<a href="https://www.destatis.de/DE/Themen/Branchen-Unternehmen/Landwirtschaft-Forstwirtschaft-Fischerei/Wald-Holz/Tabellen/waldflaeche-bundeslaender.html">https://www.destatis.de/DE/Themen/Branchen-Unternehmen/Landwirtschaft-Forstwirtschaft-Fischerei/Wald-Holz/Tabellen/waldflaeche-bundeslaender.html</a>
31) Productive forest area share (exploited for wood)?	No data	
32) Which are the main uses of forestry biomass?	Energy production/heating	
33) Share of forestland owned by the administration and private owners?	Forestland owned by Federal State Baden-Württemberg: 23,6% Forestland owned by State Germany: 0,5% Forestland owned by municipalities: 40% Forestland owned by private owners: 35,9%	Data from 2014 <a href="https://mlr.baden-wuerttemberg.de/de/unse-re-themen/wald-und-naturerlebnis/landesforstverwaltung/waldland-baden-wuerttemberg/">https://mlr.baden-wuerttemberg.de/de/unse-re-themen/wald-und-naturerlebnis/landesforstverwaltung/waldland-baden-wuerttemberg/</a>
34) Are state subsidies received by the forestry sector?		
35) Who are the main stakeholders involved in the forest biomass production?	Owner of the forestland, sawmill industry, wood building and construction sector, etc.	
36) Please indicate if possible the forest biomass production cost and the average selling price (€/dry tonnes)?	No data	
37) What is the percentage of employment covered by forestry?	1,1% (agriculture,forestry,fishery)	
38) How much residual biomass is produced in the region?	No data	
39) Is the residual biomass exploited? (Indicate)	"Cascading use": in the sense of a circular bioeconomy, wood products are reused after an initial use, for example in particleboard. After one or two reuses (often limited by the pollutant content), waste wood is used to generate heat and electricity, as are residues generated during the harvesting and processing of wood.	<a href="https://erneuerbare-bw.de/de/themen/studie-holzbasierte-biooekonomie-in-baden-wuerttemberg">https://erneuerbare-bw.de/de/themen/studie-holzbasierte-biooekonomie-in-baden-wuerttemberg</a>
40) Which are the future perspectives? (Technology, forestry, employment increase, increase of exploited areas, etc.)	The further development of economic sectors related to the refinement of wood as a raw material is of outstanding importance, especially for the economic development of rural areas. With the Biomass Action Plan, the state government aims to increase the share of wood in construction and the per capita consumption of sawn wood.	<a href="https://wm.baden-wuerttemberg.de/de/innovation/ausgewaehlte-branchen/holz-und-papierindustrie/">https://wm.baden-wuerttemberg.de/de/innovation/ausgewaehlte-branchen/holz-und-papierindustrie/</a>
41) Share of forestland area affected by forest fires the last year?	No data	
<b>LIVESTOCK</b>		
Questions	Answer	Comments
42) How large is the area dedicated to livestock in the region?	No data	

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43) Average farm size (cows, pigs, chicken, or other) in the region?	20 cows per farm on average 417 pigs per farm on average	<a href="https://www.statistik-bw.de/Service/Veroeff/Monatshette/20211204">https://www.statistik-bw.de/Service/Veroeff/Monatshette/20211204</a>
44) Which is the daily livestock maintenance cost (€/head)?	No data	
45) Which is the main destination of the cattle? (Meat, milk, wool...)	Milk and meat	<a href="https://www.bmel.de/DE/themen/tiere/nutztier/rinder/rinder_node.html">https://www.bmel.de/DE/themen/tiere/nutztier/rinder/rinder_node.html</a>
46) What is the employment rate covered by livestock?	1,1% (agriculture, forestry, fishery)	
47) Are state subsidies received for farming?		
48) Who are the main stakeholders involved in the production?	Livestock owner, processing units (meat, etc.), feed suppliers	
49) Which is the main residue produced in each case?	Manure	
50) How much slurry/manure/other residue is produced in average (t/head) and in the region (total)?	No data	
51) Is the slurry/manure/other exploited? (Indicate the percentage that is currently used) If not, how are the residues managed?	Manure is used for the fertilization of agricultural land.	
52) Average selling price for the slurry/manure/other?	4€/m <sup>3</sup> – 9€/m <sup>3</sup>	<a href="https://www.dlg-mitteilungen.de/mediathek/themenseite/wirtschaftsduenger-plotzlich-ist-guelle-gefragt-wie-nie#:~:text=3%20bis%205%20%E2%82%AC%2Fm3,4%20bis%209%20%E2%82%AC%2Fm3.">https://www.dlg-mitteilungen.de/mediathek/themenseite/wirtschaftsduenger-plotzlich-ist-guelle-gefragt-wie-nie#:~:text=3%20bis%205%20%E2%82%AC%2Fm3,4%20bis%209%20%E2%82%AC%2Fm3.</a>
53) Which are the future perspectives? (Valorisation technologies, cattle, employment rate, farm modernisation, increase of large exploitations, decrease of livestock production, etc.)	Continuous growth of population of single farms and a specialization on only one species is already observable and indicates the trend	<a href="https://www.statistik-bw.de/Service/Veroeff/Monatshette/20211204">https://www.statistik-bw.de/Service/Veroeff/Monatshette/20211204</a>
<b>SECONDARY SECTOR</b>		
<b>AGROINDUSTRY</b>		
Questions	Answer	Comments
54) How many agrifood industries are there in the region?	<ul style="list-style-type: none"> <li>- Meat and meat processing industry</li> <li>- Dairy industry</li> <li>- Bakery and confectionery industry</li> <li>- Production of processed fruits and vegetables</li> </ul>	<a href="https://www.bmwk.de/Redaktion/DE/Artikel/Branchenfokus/Industrie/branchenfokus-lebensmittelindustrie.html">https://www.bmwk.de/Redaktion/DE/Artikel/Branchenfokus/Industrie/branchenfokus-lebensmittelindustrie.html</a>
55) Which are the main products produced?	<ul style="list-style-type: none"> <li>- Meat and processed meat products</li> <li>- Dairy products</li> <li>- Bakery and confectionary products</li> <li>- Processed fruits and vegetables</li> </ul>	<a href="https://www.bmwk.de/Redaktion/DE/Artikel/Branchenfokus/Industrie/branchenfokus-lebensmittelindustrie.html">https://www.bmwk.de/Redaktion/DE/Artikel/Branchenfokus/Industrie/branchenfokus-lebensmittelindustrie.html</a>
56) Which is the annual average production in the main agrifood industries?	No data	
57) Are companies producing organic or agrifood products receiving subsidies?		
58) What is the percentage of employment covered by agroindustries?	In 2021, 577,312 persons were employed in the agrifood industries	<a href="https://de.statista.com/statistik/daten/studie/164961/umfrage/beschaeftigte-in-der-nahrungsmittelindustrie-in-deutschland-seit-2008/#:~:text=Die%20Statistik%20zeigt%20die%20Anzahl,577.312%20Mitarbeiter%20und%20Mitarbeiter%20besch%C3%A4ftigt.">https://de.statista.com/statistik/daten/studie/164961/umfrage/beschaeftigte-in-der-nahrungsmittelindustrie-in-deutschland-seit-2008/#:~:text=Die%20Statistik%20zeigt%20die%20Anzahl,577.312%20Mitarbeiter%20und%20Mitarbeiter%20besch%C3%A4ftigt.</a>

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59) What is the main economic limitation (energy cost, supply chain...) faced by agroindustries?	Increasing energy costs, changing consumption patterns (especially important for the meat and meat processing industry)	
60) Which type of wastes/side-products/residues are produced?	For example slaughter by-products, calves (in the dairy industry)	
61) How much wastes/side-products/residues are produced?	In 2020, waste amounting to 10.9 million t (national) reported to the EU Commission	<a href="https://www.bmel.de/DE/themen/ernaehrung/lebensmittelverschwendung/studie-lebensmittelabfaelle-deutschland.html">https://www.bmel.de/DE/themen/ernaehrung/lebensmittelverschwendung/studie-lebensmittelabfaelle-deutschland.html</a>
62) Are the wastes/side-products/residues exploited? (Please specify for which 171pplication)	The Heidelberg-based startup Spootainable produces sustainable cutlery alternatives from rescued cocoa and oat fibers, which are by-products from the food industry. This is expected to revolutionize the catering industry.	<a href="https://biooekonomie.baden-wuerttemberg.de/Lde/Startseite/Akteure+in+BW/Spootainable_GmbH?search=true&amp;umkreis=10&amp;ort=&amp;textsuche=&amp;themen=Nahrungs-%20und%20Futtermittel&amp;organizationType=&amp;pageld=cbi:///cms/9145107">https://biooekonomie.baden-wuerttemberg.de/Lde/Startseite/Akteure+in+BW/Spootainable_GmbH?search=true&amp;umkreis=10&amp;ort=&amp;textsuche=&amp;themen=Nahrungs-%20und%20Futtermittel&amp;organizationType=&amp;pageld=cbi:///cms/9145107</a>
63) What are the future perspectives? (Techniques, products, production, employment)	Agri-food start-ups are moving away from consumer tech towards the upstream part of the agri-food chain. Agri-food start-ups can be divided into 4 categories: <ul style="list-style-type: none"> <li>- BioTech</li> <li>- AgriTech</li> <li>- FoodTech</li> <li>- ConsumerTech</li> </ul>	<a href="https://agri-food.de/new-agrifood-report-2022/">https://agri-food.de/new-agrifood-report-2022/</a>
64) Which are the main stakeholders of the local agrifood industry?	<ul style="list-style-type: none"> <li>- Alpha-Protein GmbH</li> <li>- Badische Peptide und Proteine (BPP) GmbH</li> <li>- Better Food Consulting</li> <li>- Fraunhofer-Institut für Grenzflächen- und Bioverfahrenstechnik IGB</li> <li>- Geco-Gardens</li> <li>- Hochschule Biberach</li> <li>- IHK Rhein-Neckar</li> <li>- Katz Biotech AG</li> <li>- Kleinblatt GmbH</li> <li>- Landwirtschaftliches Technologiezentrum Augustenberg (LTZ)</li> <li>- ProteinDistillery GmbH</li> <li>- Signature Products GmbH</li> <li>- Spootainable GmbH</li> <li>- Steinbeis Europa Zentrum</li> <li>- Universität Hohenheim</li> <li>- Universität Stuttgart</li> <li>- Foo.net:z – Lebensmittelnetzwerk Rhein-Neckar e.V.</li> </ul>	<a href="https://biooekonomie.baden-wuerttemberg.de/Lde/Startseite/Akteure+in+BW/Online+Kompetenzatlas?search=true&amp;umkreis=10&amp;ort=&amp;textsuche=&amp;themen=Nahrungs-%20und%20Futtermittel&amp;organizationType=">https://biooekonomie.baden-wuerttemberg.de/Lde/Startseite/Akteure+in+BW/Online+Kompetenzatlas?search=true&amp;umkreis=10&amp;ort=&amp;textsuche=&amp;themen=Nahrungs-%20und%20Futtermittel&amp;organizationType=</a>
<b>OTHER BIO-BASED INDUSTRIES</b>		
Questions	Answer	Comments
65) Is there a mapping of the current bio-based industrial activities in your area?	<ul style="list-style-type: none"> <li>- Study on status of bioeconomy in Stuttgart, Baden-Württemberg 2021 (<a href="https://epub.wupperinst.org/frontdoor/deliver/index/docid/7878/file/7878_Biooekonomie.pdf">https://epub.wupperinst.org/frontdoor/deliver/index/docid/7878/file/7878_Biooekonomie.pdf</a>)</li> <li>- Network analysis bioeconomy in Stuttgart, Baden-Württemberg 2023 (link not available yet)</li> <li>- Stakeholder platform bioeconomy Baden-Württemberg (<a href="https://biooekonomie.baden-wuerttemberg.de/Lde/Startseite/Akteure+in+BW/Online+Kompetenzatlas?search=true&amp;umkreis=10&amp;ort=&amp;textsuche=&amp;themen=Nahrungs-%20und%20Futtermittel&amp;organizationType=">https://biooekonomie.baden-wuerttemberg.de/Lde/Startseite/Akteure+in+BW/Online+Kompetenzatlas?search=true&amp;umkreis=10&amp;ort=&amp;textsuche=&amp;themen=Nahrungs-%20und%20Futtermittel&amp;organizationType=</a>)</li> </ul>	
66) How many biobased industries are there in the region? Please specify the main biobased products produced	<ul style="list-style-type: none"> <li>- Agriculture</li> <li>- Forestry</li> <li>- Fishery and aquaculture</li> <li>- Food</li> <li>- Feed</li> <li>- Biobased materials</li> <li>- Bioenergy</li> </ul>	

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	<ul style="list-style-type: none"> <li>- Conversion technologies</li> <li>- Biotechnology</li> <li>- Waste</li> <li>- Etc.</li> </ul>	
67) Out of the previous list indicate the three more relevant in terms of revenues and role to meet the government strategic objectives (decarbonisation, CO <sub>2</sub> emissions, circular economy, etc.)	The most energy-intensive industries in Germany are the steel, metal and paper industries. It is therefore important to focus on these sectors in order to achieve the climate targets.	<a href="https://www.ifo.de/DocDL/sd-2022-01-bundefreudig-forum-industrie.pdf">https://www.ifo.de/DocDL/sd-2022-01-bundefreudig-forum-industrie.pdf</a>
68) Are state subsidies received to promote sustainable production by these industries?		
69) What is the percentage of employment covered by biobased industries?	No data	
70) How many tonnes of biobased materials/products are produced per year? Please specify by typology (renewable energies, biofuels, biomaterials, biochemicals, biobased cosmetics/pharmacy, others)		
71) Which type of wastes/by-product, residue are produced in the production process?		
72) What are the biobased materials, side-products, waste or residues used as raw materials in the productive process?		
73) Where are these raw materials obtained or cultivated?		
74) Which are the main stakeholders/actors supplying these raw materials?		
75) Which is the price of these biobased raw materials used (€/ton)?		
76) Which is the price of the main biobased products produced in the region (€/ton)?		
77) Which are the perspectives in the use of these biobased raw materials/side-products/waste?		
78) Which are the perspectives in the consumption of these biobased products?		
79) Please mention the 3 bio-based solutions with more relevance in your region (that can be taken as an example of implementation or good practice for other regions) and provide contact details if possible.	-	
80) Please mention 3 bio-based solution in your region that have high deployment potential in your region but still need support to accelerate-unlock its potential ( please mention what technological, regulatory and market challenges are and provide contact details if possible)	<ul style="list-style-type: none"> <li>- Biorefineries (<a href="https://www.uni-hohenheim.de/organisation/projekt/b4b-bioraffinerie-fuer-die-biooekonomie-in-baden-wuerttemberg">https://www.uni-hohenheim.de/organisation/projekt/b4b-bioraffinerie-fuer-die-biooekonomie-in-baden-wuerttemberg</a>)</li> </ul>	
<b>ENERGY INDUSTRY</b>		
Questions	Answer	Comments
81) How many energy industries are there?	<ul style="list-style-type: none"> <li>- Fossil energies <ul style="list-style-type: none"> <li>o Hard coal</li> <li>o Heating oil</li> <li>o Natural gas</li> </ul> </li> <li>- Electricity <ul style="list-style-type: none"> <li>o Hydroelectric power</li> <li>o Wind energy</li> <li>o Photovoltaic</li> </ul> </li> </ul>	<a href="https://um.baden-wuerttemberg.de/fileadmin/redaktion/m-um/intern/Dateien/Dokumente/2_Presse_und_Service/Publikationen/Energie/Erneuerbare-Energien-2021-barrierefrei.pdf">https://um.baden-wuerttemberg.de/fileadmin/redaktion/m-um/intern/Dateien/Dokumente/2_Presse_und_Service/Publikationen/Energie/Erneuerbare-Energien-2021-barrierefrei.pdf</a>

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	<ul style="list-style-type: none"> <li>o Solid biogenic substances</li> <li>o Liquid biogenic substances</li> <li>o Biogas</li> <li>o Sewage gas</li> <li>o Landfill gas</li> <li>o Geothermal energy</li> <li>o Biogenic fraction of waste</li> <li>- Heating <ul style="list-style-type: none"> <li>o Solid biogenic substances</li> <li>o Liquid biogenic substances</li> <li>o Biogas, sewage gas, landfill gas</li> <li>o Solar thermal heating</li> <li>o Deep geothermal heating</li> <li>o Environmental heat</li> <li>o Biogenic fraction of waste</li> </ul> </li> <li>- Fuels <ul style="list-style-type: none"> <li>o Biodiesel</li> <li>o Bioethanol</li> <li>o Biomethane</li> <li>o Vegetable oils</li> </ul> </li> </ul>	
82) Does the main part of energy come from renewable or non-renewable energy?	Non-renewable energy	
83) What is the main source of renewable energy?	Photovoltaics	
84) What is the main source of non-renewable energy?	Hard coal	
85) Are state subsidies received to promote renewable energies?		
86) What is the percentage of employment covered by the energy sector?	In 2017, 20,963 persons were employed in the energy sector	
87) Which is the average price of energy (€/kW h)? (Differences between renewable and non)		
88) Which percent of energy usage comes from renewable energy?	16.5% in 2021	
89) Which are the future perspectives?	. The expansion of wind and solar energy will be accelerated to enable the phase-out of fossil fuels and ensure greater energy efficiency.	<a href="https://www.bundesregierung.de/breg-de/themen/klimaschutz/energiewende-beschleunigen-2040310">https://www.bundesregierung.de/breg-de/themen/klimaschutz/energiewende-beschleunigen-2040310</a>
<b>MUNICIPAL SOLID WASTE (MSW)</b>		
Questions	Answer	Comments
90) How many tonnes of MSW are generated per year?	Germany: 4.824 kg/capita	
91) Which is their main composition?	Household waste, bulk waste, compost, recyclable materials	<a href="https://um.baden-wuerttemberg.de/de/presse-service/pressemitteilung/pid/abfall-als-ressource-die-bilanz-fuer-2021">https://um.baden-wuerttemberg.de/de/presse-service/pressemitteilung/pid/abfall-als-ressource-die-bilanz-fuer-2021</a>
92) Are the wastes exploited? (Indicate how)		
93) Where are the MSW generated?	In households	
94) Who are the main stakeholders involved in the MSW management?		
95) How is MSW valorised? (Added-value products)		
96) Which is the price of MSW added value-products?		
Which are the future perspectives? (Techniques, wastes)		



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Regional bioeconomy development and promotion. Policy framework

CROSS-CUTTING ISSUES		
Questions	Answer	Comments
97) Does your region have a strategy for circular bioeconomy?	Yes	
98) Existence of bioeconomy hubs, clusters or any other association in the region?	<ul style="list-style-type: none"> <li>- Bioökonomie in der Metropolregion Rhein-Neckar: Creation and networking of a cluster for the circularly-oriented bioeconomy in the Metropolregion Rhein-Neckar</li> <li>- FFF: Fibres for Food and Fabric – Plant-based fibers for regional value chains</li> </ul>	<a href="https://biooekonomie.baden-wuerttemberg.de/Len/Clusterinitiativen">https://biooekonomie.baden-wuerttemberg.de/Len/Clusterinitiativen</a>
99) Existing of hubs or cluster targeting other topic or sectors? (please specify)	“digital hubs” for fostering digital innovation in Baden-Württemberg	<a href="https://wm.baden-wuerttemberg.de/de/innovation/initiative-wirtschaft-40-baden-wuerttemberg/digital-hubs-baden-wuerttemberg/">https://wm.baden-wuerttemberg.de/de/innovation/initiative-wirtschaft-40-baden-wuerttemberg/digital-hubs-baden-wuerttemberg/</a>
100) What environmental indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (GHG decrease achieved with bioeconomy initiatives, resources depletion, implementation strategy aiming zero waste, etc.) ?	<ul style="list-style-type: none"> <li>- CO2 emissions</li> <li>- Energy use</li> <li>- Waster generation</li> <li>- Fertilizer consumption</li> <li>- Share of agricultural area</li> <li>- Share of forestry area</li> </ul>	
101) What economic indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (turnover linked to biobased companies (forestry, agriculture, other-biobased industries), existence of funding programmes/schemes targeting bioeconomy, existence of supporting measures promoting partnerships between industries and enterprises in the region, etc.) ?	<ul style="list-style-type: none"> <li>- Number of biotechnology patents</li> <li>- Human Resources in bio-based industries</li> <li>- R&amp;D expenditures</li> <li>- GDP</li> </ul>	
102) What social indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (available skilled workforce, number or jobs created in the last 5 years un bio-based industries, communications to society regarding bio-based activities (seminars, trainings, etc.), willingness to pay for bio-based products, etc.) ?	<ul style="list-style-type: none"> <li>- Education level</li> <li>- Gini coefficient</li> </ul>	
103) Current economic and social characteristics of your territory not reported in previous questions that could enable the		

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development of the circular bioeconomy?		
104) Are there any bio-based production districts / specializations in your Region? (Please, provide a description of these activities, including data, focusing on Circular Bio-based Economy potentials and material/immaterial assets as well as existing barriers)		
105) What are the strengths/weaknesses of your area regarding the development of the circular bioeconomy?		
106) Please, identify actors with a natural interest in a project due to their existing businesses and market in your territory		

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## Annex 7. Spain region profile

INFORMATION FOR STATISTICAL ANALYSIS		
REGIONS (EUROSTAT NUTS 2 – Level)		
(Please indicate for your region which NUTS 2-Regions are relevant or add additional regions in the comment section.)		
Question	Suggested NUTS 2 regions	Comments
1) Germany – Region of Baden-Württemberg	<input type="checkbox"/> Stuttgart (please translate to English) <input type="checkbox"/> Karlsruhe (please translate to English) <input type="checkbox"/> Freiburg (please translate to English) <input type="checkbox"/> Tübingen (please translate to English)	
2) Spain – Region of Aragon	<input checked="" type="checkbox"/> Zaragoza (please translate to English) <input type="checkbox"/> xHuesca (please translate to English) <input type="checkbox"/> xTeruel (please translate to English)	
3) Greece – Region of Western Macedonia	<input type="checkbox"/> Dyitiki Makedonia (please translate to English)	
4) Bulgaria – Region of Plovdiv	<input type="checkbox"/> Yuzhen tsentralen (please translate to English)	
5) Slovakia – Nitra Self-Governing Region	<input type="checkbox"/> Západné Slovensko (please translate to English)	
6) Slovenia – Whole Country	<input type="checkbox"/> Vzhodna Slovenija (please translate to English) <input type="checkbox"/> Zahodna Slovenija (please include the traduction)	
7) Croatia – Region Adriatic Croatia	<input type="checkbox"/> Jadranska Hrvatska (please translate to English)	
8) Hungary – Region North Hungary	<input type="checkbox"/> Észak-Magyarország (please translate to English)	
9) Romania – West region	<input type="checkbox"/> Vest (please translate to English)	
10) Czechia – Region BIOEAST	<input type="checkbox"/> Praha (please translate to English) <input type="checkbox"/> Střední Čechy (please translate to English) <input type="checkbox"/> Jihozápad (please translate to English) <input type="checkbox"/> Severozápad (please translate to English) <input type="checkbox"/> Severovýchod (please translate to English) <input type="checkbox"/> Jihovýchod (please translate to English) <input type="checkbox"/> Střední Morava (please translate to English) <input type="checkbox"/> Moravskoslezsko (please translate to English)	
11) Netherlands – Region Apeldoorn	<input type="checkbox"/> Gelderland (please translate to English)	
12) Italy – Region Campania	<input type="checkbox"/> Campania (please translate to English)	



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## How to identify socially marginalised groups?

SOCIALLY MARGINALISED GROUPS		
Questions	Answer	Comments
1) Population area with less than 5.000 inhabitants	706 municipalities have less than 5,000 inhabitants, out of a total of 731 municipalities.	<a href="https://idearagon.aragon.es/atlas/Aragon/info/poblacion/poblacion-residente/poblacion-total-municipal">https://idearagon.aragon.es/atlas/Aragon/info/poblacion/poblacion-residente/poblacion-total-municipal</a>
2) Unemployment rate in the area	9,4%	
3) Employment rate of women in the region and at national level	11,5% in Aragón 15,1% in Spain	
4) Main economic activity in the area	automotive and manufacturing industry	
5) Jobs at risk	climate-related jobs in agriculture	
6) Main breadwinner of the family nucleus	the wage	
7) Average educational level and share of population with different school attainment	illiterate or not educated 7,95% higher studies 18,54%	<a href="https://bi.aragon.es/analytics_pub/saw.dll?Go">https://bi.aragon.es/analytics_pub/saw.dll?Go</a>
8) Population age structure in the region and at national level	In the Aragonese population pyramid, the highest percentage of the population is concentrated in the 44-54 age bracket, which shows a fairly aged population. The same is true at the national level.	
9) Share of ethnics minorities in the region and at national level	Not data available	
10) Emigration rate in the region and at national level	Aragon has 173,111 registered foreigners, which represents 12.83% of its total population and places the Autonomous Community slightly above the national average of 12.14%.	
11) Average salary or household income in the region and at national level	In Aragon, the average monthly salary in 2020 was 2,009 euros, below the national average of 2,097 euros.	
12) Please describe the structure and the characteristics of relevant socially disadvantaged/marginalized groups in your region	Disadvantaged groups are concentrated in the most depopulated areas considered as demographic desert, also older unemployed people over 40 with no education and difficulty in finding a job.	
13) Please comment the potential impact of their participation in Circular Bio-based Economy	The circular economy accounts for 6.98% of Aragon's total GVA, so the impact in terms of employment and dynamisation of socially marginalised and sparsely populated areas is much greater.	

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14)	Please indicate the factors hindering their possible participation?	The main obstacles to the project are the knowledge that small producers may have of the project.	
15)	Indicate the selected marginal group/s that will be targeted during the project and relevance in the region	Agricultural sector in depopulated areas Unemployed women with higher education Over 40s at risk of unemployment Disabled	
16)	Average educational level of targeted marginalized groups	Approximately 23% of the marginalised group has tertiary education, as part of this group is made up of unemployed women with tertiary education.	
17)	Description of the occupied post, considering the type of work performed and the qualification required by the targeted marginalized groups (question 13)	Not data available	



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# Situation of main economic sectors

PRIMARY SECTOR		
AGRICULTURE		
Questions	Answer	Comments
18) How large is the surface of cultivable areas? (you can check databases such as Eurostat: <a href="https://ec.europa.eu/eurostat/web/agriculture/data/database">https://ec.europa.eu/eurostat/web/agriculture/data/database</a> )	1.78 million hectares, representing 37.46 % of its surface area	
19) Which are the main crops in the area (surface in hectares or percentage of the cultivable area occupied by each crop)	47% of Aragon's arable land is occupied by cereals. 47% of Aragon's arable land is occupied by cereals, almost all of it barley and wheat, with a certain predominance of the former. Irrigated maize is the third crop in terms of surface area in the cereals area of the cereals group and the largest irrigated irrigated crops in the whole region. In terms of fruit fruit trees (4.1% of the area under rainfed cultivation and 2.1% of the area under irrigated cultivation) are the third most important of the cultivated area in rainfed and 2.8% in irrigated), the predominant area is dedicated to nuts and dried fruits, also noteworthy for their quality are the cherry trees in the Jalón valley cherry in the Jalón valley and peaches in Lower Aragón. Lower Aragon. Another important crop is fodder crops, mostly irrigated, with leguminous plants standing out in terms of surface area. Vineyards account for barely 3% of the total cultivated area. 3% of the total cultivated area.	
20) Which is the average annual production (dry basis) of the most relevant crops (listed in question 15)?	The average annual production of cereals in Aragon is 838,302.62 Among them, barley is the main cereal with 441,749.17	
21) Average yield (dry basis) for the most relevant crops (listed in question 15)?	The average yield in Aragon for winter cereals as a whole was around 4 tonnes per hectare, higher than the average of the last four seasons, which was 3.59 tonnes per hectare, and slightly lower than the 2020 season with 4.62 tonnes per hectare.	
22) What is the percentage of employment covered by agriculture?	The unemployment rate in the agricultural sector in Aragon is 4.4%.	
23) Are state subsidies received by the farmers (CAP or others)? Please shortly mention the crops and the aim of the subsidy (equipment modernisation, yield increase, etc.	They receive, among the most important: Common Agricultural Policy Rural Development Programme Various Aragon-specific	
24) What is the current situation of the soils (erosion, eutrophication, pollution...)?	Given the current drought situation, agricultural soils do not have adequate nutrients.	
25) Who are the main stakeholders involved in the crops production (cooperatives or farmers associations, individual farmers owning large or small areas, etc.)?	Farmers themselves, the government and society as a whole	
26) How much residual biomass is produced? Please indicate for the most relevant crops (question 14) the residues that are produced during the processing	According to data provided by the Director General of Forestry Management, the capacity of forestry harvests that can be used for biomass, originating in the forests of the Autonomous Community of Aragon, amounts to some 600,000 tonnes per year.	Latest data available for 2014
27) Is the residual biomass (question 21) exploited (energy production, chemicals, fertilizers, etc.)?	Royal Decree 661/2007 of 25 May 2007, which regulates the activity of electricity production under the special regime, established the legal framework for the production of electricity and thermal energy from biomass. However, no concrete data are available.	
28) Average selling price for the main crops (€/dry tonnes) (listed in question 15)? When possible, also include the production cost.	By type of cereal, soft wheat has risen by 47%, barley by 67%, durum wheat by 94% and maize by 37%.	<a href="https://www.elperiodicodearagon.com/aragon/2022/01/27/precio-cereal-aragon-subio-media-61993920.html">https://www.elperiodicodearagon.com/aragon/2022/01/27/precio-cereal-aragon-subio-media-61993920.html</a>
29) Which are the future perspectives? (Technologies, increase of the area dedicated to certain crops, new crops development, new biomass or	Family farming has traditionally been the model on which primary food production in Aragon has been based. production in Aragon and which has been decisive in shaping our rural environment, its landscape and its environmental values.	

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residual biomass value chain development, employment)	<p>However, the process of globalisation of agricultural markets, as well as the need for high investments in order to meet the challenges</p> <p>of high investments to meet the technological and digitalisation challenges that are occurring in the sector to ensure the</p> <p>in the sector to ensure both environmental and economic sustainability, is placing these types of farms at a competitive disadvantage compared to other models of corporate agriculture that are increasingly</p> <p>with respect to other models of corporate farming that are becoming increasingly widespread.</p> <p>In fact, the fraction of Aragon's final agricultural production and of total agricultural income attributable to the family model</p> <p>attributable to the family model has a decreasing weight. Already showing worryingly low values, their evolution reflects less and less the behaviour of production, value added and income attributable to farmers themselves.</p> <p>Thus, the family farming</p> <p>not only suffers from a serious income gap, but its contribution to the agricultural macro-magnitudes is gradually decreasing, to the point of being seriously threatened.</p> <p>seriously threatened. The limitations in terms of economy of scale imposed by the small scale</p> <p>The limitations imposed by the small economic size of farms in terms of economy of scale must be borne in mind. In Aragon, little more than a third of family farms exceed 25,000</p> <p>25,000 of standard production and less than 3% exceed 150,000 euros.</p>	
<b>FORESTRY</b>		
Questions	Answer	Comments
30) Forest area in the region (please indicate the hectares and percentage occupied by forestland in the region)?	The forest area in Aragon is 2,608,312 ha, 54.7% of the total regional area.	
31) Productive forest area share (exploited for wood)?	The forest area in Aragon is 2,608,312 hectares, which represents 54.7% of the total regional area, and it is increasing. More than two thirds of Aragonese municipalities are rural forest municipalities.	
32) Which are the main uses of forestry biomass?	the regulation of the use of forest biomass as an energy resource	
33) Share of forestland owned by the administration and private owners?	No data available	
34) Are state subsidies received by the forestry sector?	The forestry sector receives state subsidies from the European Union.	
35) Who are the main stakeholders involved in the forest biomass production?	Existing forest biomass in the natural environment is an excellent source of energy for biomass boilers. The most common solid biofuel obtained from forest biomass is wood chips	
36) Please indicate if possible the forest biomass production cost and the average selling price (€/dry tonnes)?	The price of biomass is around €0.500/kg, although it depends on the material and its quality. This price is variable depending on whether you opt for pellets, wood chips or olive pits.	
37) What is the percentage of employment covered by forestry?	The agriculture, forestry and fishing sectors occupy only 4% of the total number of workers in Spain. These data have been published by the Institute of Economic Studies (IEE).	
38) How much residual biomass is produced in the region?	In Spain, the potential biomass resources calculated in the Renewable Energy Plan (PER) are around 19,000 ktoe, of which more than 13,000 ktoe correspond to residual biomass and almost 6,000 ktoe to energy crops.	
39) Is the residual biomass (question 34) exploited? (Indicate)	Biomass energy (bioenergy) can be generated both in the domestic environment, by means of a boiler, and on a large scale in an industrial building. ... It consists of the transformation of wood biomass through heat.	
40) Which are the future perspectives? (Technology, forestry, employment increase, increase of exploited areas, etc.)	Not data available	

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41)	Share of forestland area affected by forest fires the last year?	Not data available	
<b>LIVESTOCK</b>			
	Questions	Answer	Comments
42)	How large is the area dedicated to livestock in the region?	As we do not have data on the livestock area in Aragon, the total number of farms in Aragon is: 11467.	
43)	Average farm size (cows, pigs, chicken, or other) in the region?	Aragon was one of the regions with the largest average size per farm in 2020, with 53.75 hectares. Pigs were the species with the largest number of livestock holdings.	
44)	Which is the daily livestock maintenance cost (€/head)?	The public prices for livestock farms in the Autonomous Community of Aragon, broken down by species, are: Cattle: 0,466 EUR/kg. Other species: 0.171 euros/kg. Poultry 0,116 euros/kg.9 Jan 2023	
45)	Which is the main destination of the cattle? (Meat, milk, wool...)	The main destination of livestock is meat for direct consumption or industrial consumption.	
46)	What is the employment rate covered by livestock?	Unemployment rate in livestock farming in Aragon is 4,4%.	
47)	Are state subsidies received for farming?	Some 300,000 farmers will benefit from direct subsidies with a budget of 300 million euros.	
48)	Who are the main stakeholders involved in the production?	There are four factors of production: land, labour, capital and technology. From an economic point of view, the factor of production is a structural element of the productive process. Moreover, they are the starting point that enables the production of goods to satisfy needs.	
49)	Which is the main residue produced in each case?	Plastics, pipes for water conduction Fertiliser and fertiliser containers. Pallets, boxes for transporting products. Pruning and crop residues, manure and slurry	
50)	How much slurry/manure/other residue is produced in average (t/head) and in the region (total)?	In Aragón, 462.9 kilograms of waste were collected per inhabitant in 2020. inhabitant in 2020, TOTAL WASTE in Aragón 616.192	
51)	Is the slurry/manure/other exploited? (Indicate the percentage that is currently used) If not, how are the residues managed?	Waste management is the collection, transport and treatment of waste, including the supervision of these operations, as well as post-closure maintenance of landfills, including acting as a dealer or agent.	
52)	Average selling price for the slurry/manure/other?	The average fertiliser value of cattle slurry is 3.02 kg N/m3, 1.42 kg P2O5/ m3 and 3.54 kg K2O/ m3 of slurry.	
53)	Which are the future perspectives? (Valorisation technologies, cattle, employment rate, farm modernisation, increase of large exploitations, decrease of livestock production, etc.)	Between 2023 and 2027, Aragon will have 107 million euros for the incorporation of young farmers and the modernisation of farms.	
<b>SECONDARY SECTOR</b>			
<b>AGROINDUSTRY</b>			
	Questions	Answer	Comments
54)	How many agrifood industries are there in the region?	The agri-food industry supports more than 11,000 jobs in Aragon The Agri-Food Agri-Food Complex represents 10% of the GDP of Aragon NUMBER OF COMPANIES 1027	
55)	Which are the main products produced?	meat, milk, skins, derivatives of these products such as cheese, butter, cream and the manufacture of utensils using the skins of animals such as sheep, goats, pigs, bulls and cows.	
56)	Which is the annual average production in the main agrifood industries?	the agri-food industry has grown in terms of in terms of production, with an annual average of 2.9 2.9 per cent	
57)	Are companies producing organic or agrifood products receiving subsidies?	If subsidies are granted to companies producing organic products	

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58) What is the percentage of employment covered by agroindustries?	In the agri-food sector, the number of employed persons in the fourth quarter of 2022 is 1,311,600 persons (6.4% of the total economy), having increased by 46,000 employed persons (3.63%) compared to the previous quarter, although it decreases by 45,800 employed persons (-3.37%) compared to the previous year.	
59) What is the main economic limitation (energy cost, supply chain...) faced by agroindustries?	Growth in energy consumption double GDP growth, which is unsustainable.	
60) Which type of wastes/side-products/residues are produced?	Agricultural waste is waste from woody or herbaceous crops (e.g. vineyards, cereals, etc.). There are two types of agricultural waste: fertilisers and pesticides (fungicides, insecticides, acaricides, etc.).	
61) How much wastes/side-products/residues are produced?	secondary sector are heavy industry, foodstuffs, fashion, handicrafts, vehicle manufacturing, electronics, petroleum products, etc.	
62) Are the wastes/side-products/residues exploited? (Please specify for which application)	Agricultural residues can be burned directly for energy production or be thermally or mechanically processed into solid biofuels such as charcoal, briquettes or pellets.	
63) What are the future perspectives? (Techniques, products, production, employment)	Among other smart farming technologies, farmers have chosen five that they consider the best: GIS and GPS software for agriculture. Satellite imagery. Drone and other aerial imagery.	
64) Which are the main stakeholders of the local agrifood industry?	Agri-food industry and pig industry.	
<b>OTHER BIO-BASED INDUSTRIES</b>		
Questions	Answer	Comments
65) Is there a mapping of the current bio-based industrial activities in your area?	We do not have a map of bioindustrial activities in Aragon, but there is a directory of industry foundations.	<a href="https://www.aragon.es/documentos/20127/1981389/Directorio+de+Fundaciones+en+Arag%C3%B3n.pdf/86122f60-0f2b-017a-da5c-e916ff8899c4?t=1564486133005">https://www.aragon.es/documentos/20127/1981389/Directorio+de+Fundaciones+en+Arag%C3%B3n.pdf/86122f60-0f2b-017a-da5c-e916ff8899c4?t=1564486133005</a>
66) How many biobased industries are there in the region? Please specify the main biobased products produced	I REFER TO A LINK	<a href="https://www.aragon.es/notificacion-de-primer-uso-de-agentes-biologicos-de-los-grupos-2-3-o-4">https://www.aragon.es/notificacion-de-primer-uso-de-agentes-biologicos-de-los-grupos-2-3-o-4</a>
67) Out of the previous list indicate the three more relevant in terms of revenues and role to meet the government strategic objectives (decarbonisation, CO <sub>2</sub> emissions, circular economy, etc.)	BACTERIA, VIRUSES, PARASITES AND FUNGI	<a href="https://www.insst.es/documentos/94886/96076/agen_bio.pdf/f2f4067d-d489-4186-b5cd-994abd1505d9">https://www.insst.es/documentos/94886/96076/agen_bio.pdf/f2f4067d-d489-4186-b5cd-994abd1505d9</a>
68) Are state subsidies received to promote sustainable production by these industries?	YES	
69) What is the percentage of employment covered by biobased industries?	NO DATA AVAILABLE	<a href="https://transparencia.aragon.es/sites/default/files/documentos/plan_accion_es_trategia_aragonesa_sst_2022_2027.pdf">https://transparencia.aragon.es/sites/default/files/documentos/plan_accion_es_trategia_aragonesa_sst_2022_2027.pdf</a>
70) How many tonnes of biobased materials/products are produced per year? Please specify by typology (renewable energies, biofuels, biomaterials, biochemicals, biobased cosmetics/pharmacy, others)	Municipal solid waste. This consists of all the domestic solid waste described above. Industrial waste. ... Hazardous waste. ... Agricultural waste. ... Medical and laboratory waste. ... Radioactive waste.	<a href="https://www.aragon.es/documentos/20127/674325/PLAN_GIRA_2018_2022.pdf/e80d9f8f-6745-e819-b918-dd025ea5c40b">https://www.aragon.es/documentos/20127/674325/PLAN_GIRA_2018_2022.pdf/e80d9f8f-6745-e819-b918-dd025ea5c40b</a>
71) Which type of wastes/by-product, residue are produced in the production process?	A substance or object, resulting from a production process, the primary purpose of which is not the production of that substance or object, can be is not the production of that substance or object, may be considered as a by-product under the following conditions: by-product under the following conditions: (a) it is certain that the substance or object is intended for further use, (b) the substance or object can be used directly without further processing other than normal industrial practice,	

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	(c) the substance or object is produced as an integral part of a production process; and (d) the subsequent use complies with all relevant requirements relating to products as well as to the protection of human health and the environment, and does not give rise to overall adverse impacts on human health or the environment.	
72) What are the biobased materials, side-products, waste or residues used as raw materials in the productive process?	There are three types of classifications for waste: According to its composition (packaging, paper and cardboard, glass, etc.). According to their biodegradability (organic and inorganic). According to their origin (household, industrial, hospital, construction, etc.).	
73) Where are these raw materials obtained or cultivated?	DEPENDS ON WHETHER THEY ARE ORGANIC, INORGANIC, BIOLOGICAL, ETC.	
74) Which are the main stakeholders/actors supplying these raw materials?	different groups of people who influence a company.	
75) Which is the price of these biobased raw materials used (€/ton)?	NO DATA AVAILABLE	
76) Which is the price of the main biobased products produced in the region (€/ton)?	NO DATA AVAILABLE	
77) Which are the perspectives in the use of these biobased raw materials/side-products/waste?	to reuse them in order to make them serviceable	
78) Which are the perspectives in the consumption of these biobased products?	are products that have hitherto been derived from fossil raw materials or from chemical synthesis. These chemical products are based on the fermentation of renewable resources with low environmental impact and without requiring hazardous production steps.	
79) Please mention the 3 bio-based solutions with more relevance in your region (that can be taken as an example of implementation or good practice for other regions) and provide contact details if possible.	Carbon footprint reduce dependence on fossil raw materials create green jobs in rural areas	
80) Please mention 3 bio-based solution in your region that have high deployment potential in your region but still need support to accelerate-unlock its potential ( please mention what technological, regulatory and market challenges are and provide contact details if possible)	biotechnology transformation and strategic alliances bio-waste	
<b>ENERGY INDUSTRY</b>		
Questions	Answer	Comments
81) How many energy industries are there?	the number of companies dedicated to energy in 2021 in Aragon was 492, last published year	
82) Does the main part of energy come from renewable or non-renewable energy?	Although non-renewable energies predominate, there are many initiatives to change the model, such as; The Department of Industry, Competitiveness and Business Development of the Government of Aragon, through the Hydrogen Foundation, promoted in 2021 an action plan for the GetHyGA initiative, as an industrial ecosystem based on hydrogen, with the objective of consolidating a hydrogen energy and technology pathway in Aragon, creating a "hydrogen valley" based industrial ecosystem, with the aim of consolidating an energy and technological hydrogen pathway in Aragon, creating a "hydrogen valley".	
83) What is the main source of renewable energy?	WIND ENERGY	
84) What is the main source of non-renewable energy?	Natural gas	
85) Are state subsidies received to promote renewable energies?	There are several lines of subsidies for energy efficiency and also within the European Regional Development Fund in Aragon, whose motto is "Building Europe from Aragon".	

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86) What is the percentage of employment covered by the energy sector?	Renewables are expected to generate 80,000 jobs and 6% of GDP in Aragon by 2024	
87) Which is the average price of energy (€/kW h)? (Differences between renewable and non)	0.21504 €/kWh	
88) Which percent of energy usage comes from renewable energy?	Aragon produces 150% of the electricity it consumes from renewable sources.	
89) Which are the future perspectives?	The Autonomous Community produces more renewable electricity than it consumes and the figures are set to increase due to the large number of projects pending authorisation. The main sources are wind and photovoltaic.	
<b>MUNICIPAL SOLID WASTE (MSW)</b>		
Questions	Answer	Comments
90) How many tonnes of MSW are generated per year?	The latest available data for 2020 is 2,793,174 solid urban waste generated in Aragón.	
91) Which is their main composition?	49% of MSW is organic, followed in proportion by paper and cardboard (14%), Plastics (15%), Glass (3%), Metals (2%), others (18%).	
92) Are the wastes exploited? (Indicate how)	<p>The GIRA Plan 2018-2022 is the Integrated Waste Management Plan of Aragon for the period from 2018 to 2022, currently in force.</p> <p>It is the overall waste planning document of the Autonomous Community of Aragon, which allows the Administrations and social agents to have the objectives, action programmes and tools necessary for an environmentally friendly management and sustainable development.</p> <p>It aims to minimise the amount of waste generated, its reuse and recycling, and when this is not possible, to guarantee its correct disposal. It also aims to achieve greater environmental awareness.</p>	
93) Where are the MSW generated?	Municipal waste is waste generated in private households, shops, offices and services, as well as all waste of the same nature as these.	
94) Who are the main stakeholders involved in the MSW management?	Public administrations are involved in the waste management cycle. The Autonomous Communities are responsible, through planning, for the implementation of the hierarchy principle at all levels of management. They also intervene in waste production and management activities through authorisation, monitoring, inspection and sanctioning, guaranteeing that they are carried out without risk to health or the environment.	
95) How is MSW valorised? (Added-value products)	In accordance with Directive 2008/98/EC on waste	
96) Which is the price of MSW added value-products?	no data available	
Which are the future perspectives? (Techniques, wastes)	<p>Currently in draft form, the GIRA Plan 2018-2022 needs to be revised to comply with the new provisions included in 2018 in the Waste Framework Directive (Directive 2008/98/EC, as amended by Directive (EU) 2018/851).</p> <p>The need to draw up new waste planning is also due to the fact that the Cohesion Policy for the period 2021-2027 includes as a condition for European investment funding the fulfilment of certain requirements, including the existence of waste management plans, with the minimum content established in the Waste Framework Directive, as amended by Directive (EU) 2018/851.</p>	



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# Regional bioeconomy development and promotion. Policy framework

CROSS-CUTTING ISSUES		
Questions	Answer	Comments
97) Does your region have a strategy for circular bioeconomy?	At the moment we have a plan for Aragón Circular, but it is not related to the bioeconomy.	
98) Existence of bioeconomy hubs, clusters or any other association in the region?	We have the Centre for Innovation in Rural Bioeconomy in Teruel.	
99) Existing of hubs or cluster targeting other topic or sectors? (please specify)	We have several clusters that have adhered to the Institutional Declaration of Aragón Circular, such as Automotive, Water and Energy.	
100) What environmental indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (GHG decrease achieved with bioeconomy initiatives, resources depletion, implementation strategy aiming zero waste, etc.) ?	We are working on a set of indicators such as; CO2 emissions avoided by recovery and reuse of materials per year Ozone depletion per unit of product Bio fuel consumption per year etc	
101) What economic indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (turnover linked to biobased companies (forestry, agriculture, other-biobased industries), existence of funding programmes/schemes targeting bioeconomy, existence of supporting measures promoting partnerships between industries and enterprises in the region, etc.?	increasing pressure on land for mitigation (carbon sequestration) and adaptation (carbon sequestration) and adaptation, protection of nature (e.g. biodiversity) and provision of biodiversity) and biomass supply increased demand for materials and bioenergy bioenergy	
102) What social indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (available skilled workforce, number or jobs created in the last 5 years un biobased industries, communications to society regarding bio-based activities (seminars, trainings, etc.), willingness to pay for bio-based products, etc.?	Number of people working in R&D in the bioeconomy HR mobilised for the implementation of the bioeconomy Number of workers in the bioeconomy Job creation for recycling activities	
103) Current economic and social characteristics of your territory not reported in previous questions that could enable the development of the circular bioeconomy?	Funding to increase biomass production in the region Increasing the specialised industrial sector Extending the knowledge network	
104) Are there any bio-based production districts / specializations in your Region? (Please, provide a description of these activities, including data, focusing on Circular Bio-based Economy potentials and material/immateral assets as well as existing barriers)	<a href="https://citarea.cita-aragon.es/citarea/bitstream/10532/3546/1/2016_307.pdf">https://citarea.cita-aragon.es/citarea/bitstream/10532/3546/1/2016_307.pdf</a>	
105) What are the strengths/weaknesses of your area regarding the development of the circular bioeconomy?	scientific quality (72%) Human capital (54%)	
106) Please, identify actors with a natural interest in a project due to their existing businesses and market in your territory	As can be seen from the structure of this document, the various regional economic, social and environmental policy economic, social and environmental policy measures at the regional level are classified into four broad categories: territorial	

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	four main categories: territorial recovery, recovery of public policies, recovery of the productive economy and recovery in the productive economy and recovery in employment. A total of total of 273 proposals. In addition, the annex contains the measures to be submitted to the Spanish Government.	
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Monreal Rams M., (January 27, 2022) El precio del cereal en Aragón subió de media más de un 60% durante el 2021. *El Periódico* <https://www.elperiodicodearagon.com/aragon/2022/01/27/precio-cereal-aragon-subio-media-61993920.html>

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<https://www.aragon.es/documents/20127/1981389/Directorio+de+Fundaciones+en+Arag%C3%B3n.pdf/86122f60-0f2b-017a-da5c-e916ff8899c4?t=1564486133005>

<https://www.aragon.es/-/notificacion-de-primer-uso-de-agentes-biologicos-de-los-grupos-2-3-o-4>

[https://www.insst.es/documents/94886/96076/agen\\_bio.pdf/f2f4067d-d489-4186-b5cd-994abd1505d9](https://www.insst.es/documents/94886/96076/agen_bio.pdf/f2f4067d-d489-4186-b5cd-994abd1505d9)

[https://transparencia.aragon.es/sites/default/files/documents/plan\\_accion\\_estrategia\\_aragonesa\\_sst\\_2022\\_2027.pdf](https://transparencia.aragon.es/sites/default/files/documents/plan_accion_estrategia_aragonesa_sst_2022_2027.pdf)

Plan integral de gestión de residuos.

[https://www.aragon.es/documents/20127/674325/PLAN\\_GIRA\\_2018\\_2022.pdf/e80d9f8f-6745-e819-b918-dd025ea5c40b](https://www.aragon.es/documents/20127/674325/PLAN_GIRA_2018_2022.pdf/e80d9f8f-6745-e819-b918-dd025ea5c40b)



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## Annex 8. Netherlands region profile


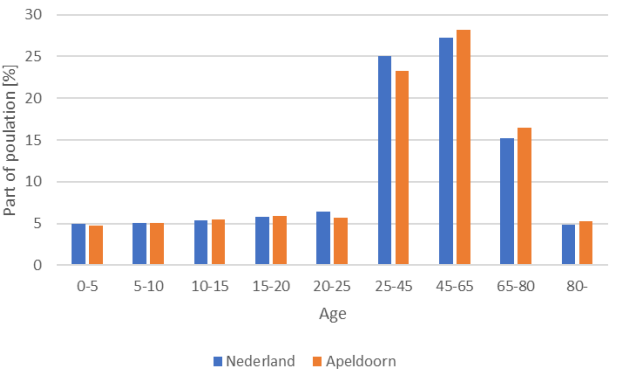
INFORMATION FOR STATISTICAL ANALYSIS		
REGIONS (EUROSTAT NUTS 2 – Level)		
(Please indicate for your region which NUTS 2-Regions are relevant or add additional regions in the comment section.)		
Question	Suggested NUTS 2 regions	Comments
1) Germany – Region of Baden-Württemberg	<input type="checkbox"/> Stuttgart (please translate to English) <input type="checkbox"/> Karlsruhe (please translate to English) <input type="checkbox"/> Freiburg (please translate to English) <input type="checkbox"/> Tübingen (please translate to English)	
2) Spain – Region of Aragon	<input type="checkbox"/> Zaragoza (please translate to English) <input type="checkbox"/> Huesca (please translate to English) <input type="checkbox"/> Teruel (please translate to English)	
3) Greece – Region of Western Macedonia	<input type="checkbox"/> Dyitiki Makedonia (please translate to English)	
4) Bulgaria – Region of Plovdiv	<input type="checkbox"/> Yuzhen tsentralen (please translate to English)	
5) Slovakia – Nitra Self-Governing Region	<input type="checkbox"/> Západné Slovensko (please translate to English)	
6) Slovenia – Whole Country	<input type="checkbox"/> Vzhodna Slovenija (please translate to English) <input type="checkbox"/> Zahodna Slovenija (please include the traduction)	
7) Croatia – Region Adriatic Croatia	<input type="checkbox"/> Jadranska Hrvatska (please translate to English)	
8) Hungary – Region North Hungary	<input type="checkbox"/> Észak-Magyarország (please translate to English)	
9) Romania – West region	<input type="checkbox"/> Vest (please translate to English)	
10) Czechia – Region BIOEAST	<input type="checkbox"/> Praha (please translate to English) <input type="checkbox"/> Střední Čechy (please translate to English) <input type="checkbox"/> Jihozápad (please translate to English) <input type="checkbox"/> Severozápad (please translate to English) <input type="checkbox"/> Severovýchod (please translate to English) <input type="checkbox"/> Jihovýchod (please translate to English) <input type="checkbox"/> Střední Morava (please translate to English) <input type="checkbox"/> Moravskoslezsko (please translate to English)	
11) Netherlands – Region Apeldoorn	<input type="checkbox"/> Gelderland (please translate to English)	Englisch = Dutch
12) Italy – Region Campania	<input type="checkbox"/> Campania (please translate to English)	



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## How to identify socially marginalised groups?

SOCIALLY MARGINALISED GROUPS		
Questions	Answer	Comments
1) Population area with less than 5.000 inhabitants		
2) Unemployment rate in the area	3.5% of labour force	CBS, 2022
3) Employment rate of women in the region and at national level	3.8 and 3.8	CBS, 2022
4) Main economic activity in the area	non-commercial services	CBS, 2021
5) Jobs at risk	?	
6) Main breadwinner of the family nucleus	74.301 households, 37% 1 person, 33% households with kids, 31% multiple persons, without kids	Kadastrale kaart/com, based on CBS
7) Average educational level and share of population with different school attainment	Low 34680 Medium 53040 High 35480	Cbs, 2021
8) Population age structure in the region and at national level		
9) Share of ethnic minorities in the region and at national level	Immigration background Western    Non-western Apeldoorn 8.4    10.3 Nederland 10.9    14.4	
10) Emigration rate in the region and at national level	Apeldoorn 2022: 898 Netherlands 173469	
11) Please describe the structure and the characteristics of relevant socially disadvantaged/marginalized groups in your region	<ul style="list-style-type: none"> <li>Disabled people (accessibility) – 13.564 WMO (Social Support Law)<sup>2</sup> clients</li> <li>Poor people (7.320 people) - Poverty in our city is greatest among non-Western migrants (17%) and people living on benefits (15.5%).</li> </ul> Elderly (think of loneliness, digital skills, malnutrition) – 10,1% is 75+ is a small 17.000 people	In de Buurt <sup>3</sup> Apeldoorn in Cijfers <sup>4</sup>

<sup>2</sup> Note: Disabled and WMO clients are not the same, but this figure may give an indication. Source:

<https://apeldoorn.incijfers.nl/dashboard//apeldoorn-in-cijfers/sociaal>

<sup>3</sup> <https://indebuurt.nl/apeldoorn/gemeente/zoveel-inwoners-in-apeldoorn-leven-in-armoede~81249/>

<sup>4</sup> <https://apeldoorn.incijfers.nl/dashboard//apeldoorn-in-cijfers/bevolking>

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12) Please describe the structure and the characteristics of relevant socially disadvantaged/marginalized groups in your region	<ul style="list-style-type: none"> <li>Disabled people (accessibility) – 13.564 WMO (Social Support Law)<sup>5</sup> clients</li> <li>Poor people (7.320 people) - Poverty in our city is greatest among non-Western migrants (17%) and people living on benefits (15.5%).</li> </ul> <p>Elderly (think of loneliness, digital skills, malnutrition) – 10,1% is 75+ is a small 17.000 people</p>	In de Buurt <sup>6</sup> Apeldoorn in Cijfers <sup>7</sup>
13) Please comment the potential impact of their participation in Circular Bio-based Economy	Poor people and elderly mainly eat unhealthy. Participating in a local kitchen garden can offer a healthier diet and a social network.	
14) Please indicate the factors hindering their possible participation?	They are not informed/aware, are not able (physically or for other reasons) or not interested.	
15) Indicate the selected marginal group/s that will be targeted during the project and relevance in the region	Not determined yet	
16) Average educational level of targeted marginalized groups	See above	
17) Description of the occupied post, considering the type of work performed and the qualification required by the targeted marginalized groups (question 13)	Working in a local kitchen garden requires some gardening and communication skills, which can all be learned if there is willing. For elderly people it depends on how fit they are, but in most cases everyone can do something.	

<sup>5</sup> Note: Disabled and WMO clients are not the same, but this figure may give an indication. Source:

<https://apeldoorn.incijfers.nl/dashboard//apeldoorn-in-cijfers/sociaal>

<sup>6</sup> <https://indebuurt.nl/apeldoorn/gemeente/zoveel-inwoners-in-apeldoorn-leven-in-armoede~81249/>

<sup>7</sup> <https://apeldoorn.incijfers.nl/dashboard//apeldoorn-in-cijfers/bevolking>

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Situation of main economic sectors

PRIMARY SECTOR		
AGRICULTURE		
Questions	Answer	Comments
18) How large is the surface of cultivable areas? (you can check databases such as Eurostat: <a href="https://ec.europa.eu/eurostat/web/agriculture/data/database">https://ec.europa.eu/eurostat/web/agriculture/data/database</a> )	473759 Are Cultivated land	
19) Which are the main crops in the area (surface in hectares of percentage of the cultivable area occupied by each crop)	Field vegetables 1338 are Grains 20581 are Horticultural vegetables 1448	
20) Which is the average annual production (dry basis) of the most relevant crops (listed in question 15)?	Total 52 kt (wet)	Ad 20
21) Average yield (dry basis) for the most relevant crops (listed in question 15)?	Out of 52kt/year, 925 is Maize, 6% sugar beat and 2% starch potatoes (wet basis)	Regiotool, 2018?
22) What is the percentage of employment covered by agriculture?	0,2 thousand employees of 91 thousand total Agriculture forestry and fishery	2021
23) Are state subsidies received by the farmers (CAP or others)? Please shortly mention the crops and the aim of the subsidy (equipment modernisation, yield increase, etc.	Yes, There are several schemes for farmers and farms: <ul style="list-style-type: none"> <li>• business takeover fund for start-up farmers and horticulturists;</li> <li>• income support;</li> <li>• Greening payment;</li> <li>• additional payment to young farmers;</li> <li>• graasdierpremie;</li> <li>• Agricultural Guarantee Credit (BL);</li> <li>• Agricultural Nature Management Scheme (SNL);</li> <li>• Nature and Landscape Quality Impulse Scheme (SKNL);</li> <li>• Compensation for the premium of broad weather insurance.</li> </ul>	Landbouwsubsidies rijksoverheid 2023
24) What is the current situation of the soils (erosion, eutrophication, pollution...)?	Eutrophication and water scarcity part of the year are increasing problems	Apeldoorn door-grond
25) Who are the main stakeholders involved in the crops production (cooperatives or farmers associations, individual farmers owning large or small areas, etc.)?	In the Netherlands we have a lot of coopearatives on large and small scale. For Apeldoorn we do not have the numbers available	
26) How much residual biomass is produced? Please indicate for the most relevant crops (question 14) the residues that are produced during the processing	Residual biomass from agriculture is 298 Kt/year (wet) 98% is manure	Regiotool, 2018?
27) Is the residual biomass (question 21) exploited (energy production, chemicals, fertilizers, etc.)?	Partly for production of fertiliser and biogas A company Greenferm produces waste water and a composted, hygienised solid manure	Ad 27
28) Average selling price for the main crops (€/dry tonnes) (listed in question 15)? When possible, also include the production cost.	The economy of farmers is hard to grasp and changes rapidly Maize: 90-95 €/ton (wet) Sugarbeet: 70 €/ton (wet) Starchpotato: 100 €/ton (wet)	Ad 28 & Nieuwe oogst.nl 2022
29) Which are the future perspectives? (Technologies, increase of the area dedicated to certain crops, new crops development, new biomass or residual biomass value chain development, employment)	Because of the surplus of nitrogen in the Netherlands, the amount of livestock may be decreased. In that case a shift from producing mainly feedcrops into other crops is a possible option	
FORESTRY		
Questions	Answer	Comments

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30) Forest area in the region (please indicate the hectares and percentage occupied by forestland in the region)?	Apeldoorn 34113 Ha, Forest: 16495 Agricultural 8323 Glashouses 5	2015
31) Productive forest area share (exploited for wood)?	Areas are not exploited for wood, however some wood is obtained, a small initiative "de A" is growing some wood for energy	Bosbeheerplan apeldoorn 2022-2031
32) Which are the main uses of forestry biomass?	54% Board material, 33% sawing and packaging wood, 7% firewood, 6% paper.	SBB 2021
33) Share of forestland owned by the administration and private owners?	Inside the city 85000 trees are located, the forest area only for about 1% owned by the city (Berg & Bos and Dennenhevel)	Gemeente Apeldoorn
34) Are state subsidies received by the forestry sector?	There are several subsidies aimed at maintaining and improving the quality of the forest.	Rijksoverheid.nl
35) Who are the main stakeholders involved in the forest biomass production?	Kroondomein Het Loo, Natuumonumenten/Staatsbosbeheer en gemeente Apeldoorn	
36) Please indicate if possible the forest biomass production cost and the average selling price (€/dry tonnes)?	The prices of wood are rapidly increasing because of the energy crises. In 2020 they were 50-70 €/m3.	
37) What is the percentage of employment covered by forestry?	< 1%	
38) How much residual biomass is produced in the region?	This is included in the normal harvest	
39) Is the residual biomass (question 34) exploited? (Indicate)	Yes, included in normal harvest and/or left in the forest	
40) Which are the future perspectives? (Technology, forestry, employment increase, increase of exploited areas, etc.)	Things are not going well for our Apeldoorn forests This year and years to come, you will see changes in the forest. For example, we place fences around young trees so that animals do not eat them. We also remove coniferous trees scattered throughout the forest and plant different types of deciduous trees. This means that the forest is better protected against forest fires and more animal and plant species occur.	<a href="https://www.apeldoorn.nl/water-en-natuur/bomen-en-bossen-in-apeldoorn/het-gaat-niet-goed-onze-apeldoornse-bossen">https://www.apeldoorn.nl/water-en-natuur/bomen-en-bossen-in-apeldoorn/het-gaat-niet-goed-onze-apeldoornse-bossen</a> 7 July 2022
41) Share of forestland area affected by forest fires the last year?	No mayor forest fire last year, yearly there are minor forest fires, risks are increasing	
<b>LIVESTOCK</b>		
Questions	Answer	Comments
42) How large is the area dedicated to livestock in the region?	The area dedicated to livestock mainly consist of the area to produce feed. 442 7 ha	CBS, 2019
43) Average farm size (cows, pigs, chicken, or other) in the region?	Cows 36829/130 farmers Milkcows 4249/55 Goats 710/17 Pigs 27215/19 Chickens 116231/5	CBS
44) Which is the daily livestock maintenance cost (€/head)?	Farmer incomes are complicated	Ad 28
45) Which is the main destination of the cattle? (Meat, milk, wool...)	See 43	
46) What is the employment rate covered by livestock?	<1 %	
47) Are state subsidies received for farming?	Yes	
48) Who are the main stakeholders involved in the production?	Farmers	
49) Which is the main residue produced in each case?	Manure/feathers etc..	
50) How much slurry/manure/other residue is produced in average (t/head) and in the region (total)?	See question 26	
51) Is the slurry/manure/other exploited? (Indicate the percentage that is currently used) If not, how are the residues managed?	An increasing percentage of the surplus of manure has to be treated. Currently a company called greenferm is the only manure converter in the region, closeby there are biogas digesters	

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52) Average selling price for the slurry/manure/other?	In general farmers have to pay to get rid of the surplus of manure, about 20 €/ton, however prices fluctuate and differ between pigs/cows/chickens	
53) Which are the future perspectives? (Valorisation technologies, cattle, employment rate, farm modernisation, increase of large exploitations, decrease of livestock production, etc.)	A main challenge for the Netherlands is the nitrogen crisis – the farmers (mainly ranchers) have to halve their cattle and near the Natura 2000 area (such as the Veluwe – part of our municipality) several have to stop completely. The farmers need a different earning model. The livestock sector may decrease in the coming years due to Nitrogen surplus. The percentage of manure treated will increase.	
<b>SECONDARY SECTOR</b>		
<b>AGROINDUSTRY</b>		
Questions	Answer	Comments
54) How many agrifood industries are there in the region?	Agrifood industry (agriculture, forestry and fishery) 300 companies. There are five large slaughterhouses in Apeldoorn.	CBS The definition of Agroindustry is not completely clear, most of the agricultural land is used to produce feed for livestock, are they secondary? Most data found does include the primary sector.
55) Which are the main products produced?	The main products are animal feed and food. Food includes meat	Regiotool
56) Which is the annual average production in the main agrifood industries?	1049 kt/year	Regiotool
57) Are companies producing organic or agrifood products receiving subsidies?	-	
58) What is the percentage of employment covered by agroindustries?	n.a.	
59) What is the main economic limitation (energy cost, supply chain...) faced by agroindustries?	For agriculture: the amount of manure produced. A reduction in the amount of livestock will have an effect on the slaughterhouses and on the feed producing farmers.	
60) Which type of wastes/side-products/residues are produced?	From food production: Mainly animal and plant waste, mineral/stones, sludge and mixed waste	
61) How much wastes/side-products/residues are produced?	In total: 319 kt/year Mainly animal and plant waste (225), mineral/stones (26), sludge(39) and mixed waste (17)	Regiotool
62) Are the wastes/side-products/residues exploited? (Please specify for which application)	They are recycled by the waste industry and used as feed.	
63) What are the future perspectives? (Techniques, products, production, employment)	Unclear because of the possible restrictions on the amount of livestock	
64) Which are the main stakeholders of the local agrifood industry?	Slaughterhouses, cooperations like Agrifirm, industrial waste companies like Prezero Apeldoorn	
<b>OTHER BIO-BASED INDUSTRIES</b>		
Questions	Answer	Comments
65) Is there a mapping of the current bio-based industrial activities in your area?	Not in a single map, mapping of paperindustry, energy, shops etc are available	
66) How many biobased industries are there in the region? Please specify the main biobased products produced	Mainly the paperindustry, 4 paper mills	
67) Out of the previous list indicate the three more relevant in terms of revenues and role to meet the government strategic objectives (decarbonisation, CO <sub>2</sub> emissions, circular economy, etc.)	The energy use of the paperindustry and the connected emissions is a large concern	



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68)	Are state subsidies received to promote sustainable production by these industries?	All kind of subsidies are possible to reduce the amount of energy used and the emissions	
69)	What is the percentage of employment covered by biobased industries?	N.A.	
70)	How many tonnes of biobased materials/products are produced per year? Please specify by typology (renewable energies, biofuels, biomaterials, biochemicals, biobased cosmetics/pharmacy, others)	Paper: 920 kt/Year	regiotool
71)	Which type of wastes/by-product, residue are produced in the production process?	77kt/year. Mainly chemical waste: 30, Paperwaste: 17 and residual waste: 15	regiotool
72)	What are the biobased materials, side-products, waste or residues used as raw materials in the productive process?	Both recycled and virgin paperpulp	
73)	Where are these raw materials obtained or cultivated?	Virgin paperpulp originates from all over the world. Recycled paper is bought mainly in the region	
74)	Which are the main stakeholders/actors supplying these raw materials?	Paper companies and consortia	
75)	Which is the price of these biobased raw materials used (€/ton)?	Virgin pulp will be about 1000 €/ton recycled paper can be 200 €/ton prices fluctuated rapidly	
76)	Which is the price of the main biobased products produced in the region (€/ton)?	-	
77)	Which are the perspectives in the use of these biobased raw materials/side-products/waste?	Although there have been trials using new biobased materials, the paper industry will likely stick to virgin paper from wood and recycled paper.	
78)	Which are the perspectives in the consumption of these biobased products?	The production may increase slightly in the coming years, it is difficult to expand rapidly because the industry is very capital intensiv	
79)	Please mention the 3 bio-based solutions with more relevance in your region (that can be taken as an example of implementation or good practice for other regions) and provide contact details if possible.	<ol style="list-style-type: none"> <li>Loenen energie -Biofermentation (<a href="https://loenenenergie.nl/">https://loenenenergie.nl/</a>)</li> <li>Attero -Household biowaste to compost &amp; biogas (<a href="https://www.attero.nl/nl/onze-verwerking/">https://www.attero.nl/nl/onze-verwerking/</a>)</li> </ol>	The answers in this question are not concentrating on the paper industry, but on other possibilities.
80)	Please mention 3 bio-based solution in your region that have high deployment potential in your region but still need support to accelerate-unlock its potential ( please mention what technological, regulatory and market challenges are and provide contact details if possible)	<p>One main challenge is how to reduce the household waste and how to increase the recycling -reuse of this type of waste.</p> <p>From plan to house: a regional initiative to connect the requirements of a high housing material demand to farmers looking for new economic activities.</p> <p>Tiny forest: native dense forest (6m2) serving as meeting place and educational place.</p>	The answers in this question are not concentrating on the paper industry, but on other possibilities.
<b>ENERGY INDUSTRY</b>			
	Questions	Answer	Comments
81)	How many energy industries are there?	10	CBS, 2022 Companies are emerging that are providing heat, they are not included in this number
82)	Does the main part of energy come from renewable or non-renewable energy?	Apeldoorn wants to be energy neutral in 2050. In 2030 39% energynutrality Apeldoorn is working on a regional energy strategy	Apeldoorn, energymonitor ambitie
83)	What is the main source of renewable energy?	Wind and sun energy	Res 1.0
84)	What is the main source of non-renewable energy?	There is no electricity plant in Apeldoorn using biomass, coal, nuclear energy of gas	
85)	Are state subsidies received to promote renewable energies?	All kind of subsidies are present	

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86) What is the percentage of employment covered by the energy sector?	A very small percentage <1 % working in energy production	Cbs, 2021
87) Which is the average price of energy (€/kW h)? (Differences between renewable and non)	In 2022, 3 <sup>rd</sup> quarter the gasprices for households was 59 €/GJ, small Industry 31,6 €/GJ and large consumers 45.9 €/GJ. In 2021: 28,1/24.0/12.4 Electricity 2022, 3 <sup>rd</sup> quarter 0,063 €/kwh / 0,206 / 0,234 In 2021: 0,134/0,143/0,105	
88) Which percent of energy usage comes from renewable energy?	In the netherlands in 2020 it was 11.1 percent of total energy consumption In 2020 in Apeldoorn the amount was 6.6% 9,5% for electricity, 5,9% for heat and 5.8 for transportation	Cbs Klimatmonitor
89) Which are the future perspectives?	Apeldoorn wants to be energy neutral in 2050. In 2030 39% energyneutrality Apeldoorn is working on a regional energy strategy	
<b>MUNICIPAL SOLID WASTE (MSW)</b>		
Questions	Answer	Comments
90) How many tonnes of MSW are generated per year?	Municipal solid waste is collected by Circulus, a company that covers Apeldoorn and other cities in the region In 2021 93 kg per person was collected	Jaarverslag circulus 2021
91) Which is their main composition?	As a municipality we are responsible for collecting waste from households. Waste from companies is covered by commercial waste collector. Our policy for households is based on the following: a. Raw materials (biowaste, paper/cardboard, plastic/metals/drink cartons (PMD)) are picked up by the home (service) b. Residual waste has to be brought to the container by the citizens themselves c. Bulky waste is brought to the recycle station of Circulus (our waste collector). 21 Waste streams are separated and recycled as much as possible. d. The biowaste is brought to Attero and they make compost (different qualities) and biogas from it.  Composition MSW 2021: Bio-waste 32%, Paper 4%, plastics 8%, Textile 5%, residual: 53%	Jaarverslag circulus
92) Are the wastes exploited? (Indicate how)	Landfill is no longer allowed, on industrial scale the waste is separated into a fraction that is sold to other industry (energy, cement) other fraction is burned and used for electricity production	Circulus, 2023
93) Where are the MSW generated?	Inside the city	
94) Who are the main stakeholders involved in the MSW management?	Circulus, partly owned by the city	
95) How is MSW valorised? (Added-value products)	Energy and raw material for cement and lime industry	
96) Which is the price of MSW added value-products?	?	
Which are the future perspectives? (Techniques, wastes)	The main challenges for us – concerning the household waste – are: <ul style="list-style-type: none"> <li>How to get to 30 kilogram fine residual waste per person per year (we are currently at 61 kg)? We need to focus more on prevention and re-use.</li> <li>How to get each waste stream as pure as possible? There is still biowaste in residual waste and vice versa. The reason it needs to be pure is to have a high recycle rate.</li> <li>Biowaste at high rise buildings is still a problem, because they don't have room for a extra container at their apartment and there isn't always a underground container nearby. And on top of that there are still a few high rise building which have a 1.100 liter container which covers all waste (no separation).</li> </ul>	

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	<ul style="list-style-type: none"><li>• Goal of the EU/National government is to have the usage of primary raw materials halves by 2030 and have a complete circular economy by 2050.</li></ul>	
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# Regional bioeconomy development and promotion. Policy framework

CROSS-CUTTING ISSUES		
Questions	Answer	Comments
97) Does your region have a strategy for circular bioeconomy?	Not in general, but within the department Maintenance of Public Space circularity is a main issue. For our household biowaste we focus on high circularity in terms of prevention, creating biogas and compost.	
98) Existence of bioeconomy hubs, clusters or any other association in the region?	Attero is our large composting and biogas production facility. Other examples are a local kitchen garden preventing food waste (see my memo).	
99) Existing of hubs or cluster targeting other topic or sectors? (please specify)	Our recycle station may be seen as a hub collecting products that can directly be used in the thrift shop or recycled. At the thrift shop they have several facilities such as a repair café, a sewing workshop, wood workshop and a laundry. At CODA (culture centre) they offer workshops in their Experience Lab such as Fixing Fashion, Plastic Recycling and a Bio design Lab (see <a href="https://www.coda-apeldoorn.nl/nl/locations/experiencelab">https://www.coda-apeldoorn.nl/nl/locations/experiencelab</a> ).	
100) What environmental indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (GHG decrease achieved with bioeconomy initiatives, resources depletion, implementation strategy aiming zero waste, etc.) ?	<ul style="list-style-type: none"> <li>The amount of virgin material used (e.g. wood).</li> <li>The amount of residual bio material used.</li> </ul> How tight a biological loop can be closed. E.g. preventing biowaste at home by cooking with leftovers and having your own compost heap at home. Reusing the water used in the paper mill over and over, which is possible up to 90% <sup>8</sup> .	
101) What economic indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (turnover linked to biobased companies (forestry, agriculture, other-biobased industries), existence of funding programmes/schemes targeting bioeconomy, existence of supporting measures promoting partnerships between industries and enterprises in the region, etc.) ?	The ecological impact of companies using biobased products.	
102) What social indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (available skilled workforce, number or jobs created in the last 5 years in biobased industries, communications to society regarding bio-based activities (seminars, trainings, etc.), willingness to pay for bio-based products, etc.) ?	The amount of biobased material used in construction. The amount of farmers growing crops for biobased construction material.  The amount of people buying locally from farmers or the amount of farmers selling their products locally.	
103) Current economic and social characteristics of your territory not reported in previous questions that could enable the development of the circular bioeconomy?		
104) Are there any bio-based production districts / specializations in your Region? (Please, provide a description of these activities, including data,	Largely present in Apeldoorn is the food industry (slaughter houses and calf farms) and paper mills. Both intensive industries regarding biobased products. Potentials are the protein transition (from animal protein	

<sup>8</sup> <https://paperontherocks.com/nl/2019/07/26/waterverspilling-papierindustrie-waterverbruik-productie-houtpulp-papier/> Other options are using material or techniques which doesn't require so much water (e.g. bamboo).

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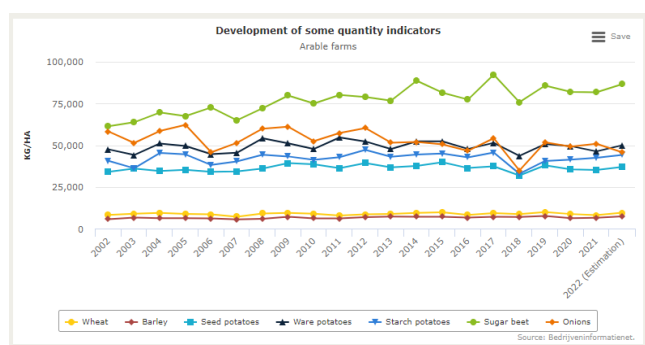
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focusing on Circular Bio-based Economy potentials and material/immaterial assets as well as existing barriers)	to plant-based), digitisation and scarcity of raw materials (wood, water, etc.). And also the cry for more sustainable solutions (e.g. no bleaching, more recyclable, other food like seaweed).	
105) What are the strengths/weaknesses of your area regarding the development of the circular bioeconomy?	Too much nitrogen (cattle breeding) close to Natura2000 areas making it impossible to build extra houses. These extra houses are necessary because of the national housing shortage.	
106) Please, identify actors with a natural interest in a project due to their existing businesses and market in your territory	<ul style="list-style-type: none"> <li>• People who want to live healthy</li> <li>• People who want to enlighten their neighbourhood by doing something together</li> </ul> Farmers (or other companies) who feel to urge to change	

## Ad 20

2022*				
Arable crops	Area under cultivation ha	Harvested area ha	Gross yield per ha 1 000 kg	Gross yield, total
Wheat (total)	6,321	6,242	8.7	54,209
Wheat, winter	5,120	5,053	9.2	46,286
Wheat, spring	1,201	1,189	6.7	7,923
Barley, winter	841	841	7.9	6,640
Barley, spring	1,658	1,617	6.3	10,128
Rye	332	332	4.5	1,483
Oats	158	158	6.1	962
Triticale	339	336	4.2	1,424
Grain maize	2,269	2,269	14.1	31,891
Green maize	34,419	34,299	42.4	1,455,936
Maize, corn cob mix	1,142	1,142	11.1	12,684
Kidney beans	3	3	2.3	6
Turnip rape (total)	267	267	4.8	1,294
Fibre flax	9	9	5.2	45
Linseed	9	9	1.0	9
Chicory	40	40	43.4	1,754
Hemp	29	29	8.4	242
Potatoes (total)	6,301	6,295	40.5	254,819
Ware potatoes (total)	3,588	3,583	43.2	154,726
Ware potatoes on clay soil	-	-	-	-
Ware potatoes on sandy or peat soil	-	-	-	-
Seed potatoes (total)	1,710	1,710	34.9	59,702
Seed potatoes on clay soil	-	-	-	-
Seed potatoes on sandy or peat soil	-	-	-	-
Starch potatoes	1,002	1,002	40.3	40,391
Sugar beet	3,035	3,035	75.9	230,325
Seed onions (total)	541	532	42.1	22,420
Seed onions: yellow	418	410	42.8	17,548
Seed onion: red	123	123	39.8	4,871
Seed onions (exc. loss)	-	-	-	-
Onion sets (2nd year)	51	51	39.9	2,050

Source: CBS



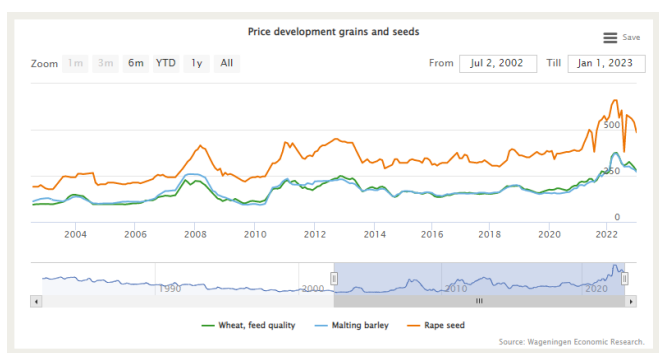
## Ad 28.

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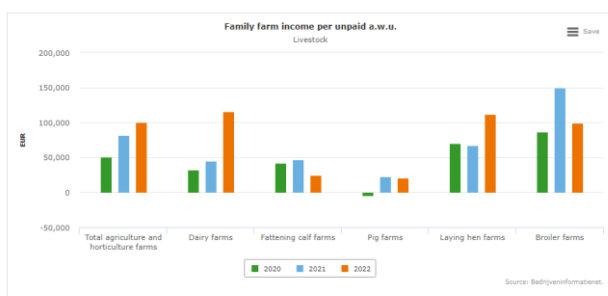
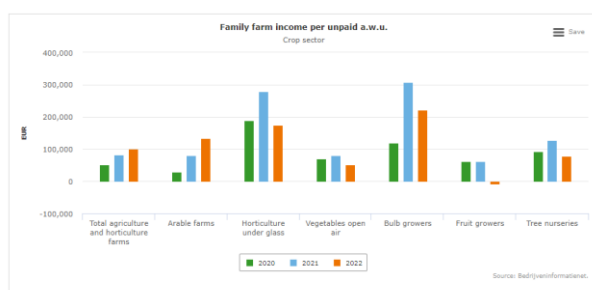


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<https://www.agrimatie.nl/ThemaResultaat.aspx?subpubID=2232&themaID=2272&indicatorID=2046> (more information on dutch webpage)



## References:

<https://apeldoorn.incijfers.nl/dashboard//apeldoorn-in-cijfers/sociaal>

<https://www.apeldoorn.nl/water-en-natuur/bomen-en-bossen-in-apeldoorn/het-gaat-niet-goed-onze-apeldoornse-bossen>

[Regiotool](#)

[Circulus, 2023](#)



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## Annex 9. Greece region profile

INFORMATION FOR STATISTICAL ANALYSIS		
REGIONS (EUROSTAT NUTS 2 – Level)		
(Please indicate for your region which NUTS 2-Regions are relevant or add additional regions in the comment section.)		
Question	Suggested NUTS 2 regions	Comments
1) Germany – Region of Baden-Württemberg	<input type="checkbox"/> Stuttgart (please translate to English) <input type="checkbox"/> Karlsruhe (please translate to English) <input type="checkbox"/> Freiburg (please translate to English) <input type="checkbox"/> Tübingen (please translate to English)	
2) Spain – Region of Aragon	<input type="checkbox"/> Zaragoza (please translate to English) <input type="checkbox"/> Huesca (please translate to English) <input type="checkbox"/> Teruel (please translate to English)	
3) Greece – Region of Western Macedonia	<input type="checkbox"/> Dyitiki Makedonia (please translate to English)	
4) Bulgaria – Region of Plovdiv	<input type="checkbox"/> Yuzhen tsentralen (please translate to English)	
5) Slovakia – Nitra Self-Governing Region	<input type="checkbox"/> Západné Slovensko (please translate to English)	
6) Slovenia – Whole Country	<input type="checkbox"/> Vzhodna Slovenija (please translate to English) <input type="checkbox"/> Zahodna Slovenija (please include the traduction)	
7) Croatia – Region Adriatic Croatia	<input type="checkbox"/> Jadranska Hrvatska (please translate to English)	
8) Hungary – Region North Hungary	<input type="checkbox"/> Észak-Magyarország (please translate to English)	
9) Romania – West region	<input type="checkbox"/> Vest (please translate to English)	
10) Czechia – Region BIOEAST	<input type="checkbox"/> Praha (please translate to English) <input type="checkbox"/> Střední Čechy (please translate to English) <input type="checkbox"/> Jihozápad (please translate to English) <input type="checkbox"/> Severozápad (please translate to English) <input type="checkbox"/> Severovýchod (please translate to English) <input type="checkbox"/> Jihovýchod (please translate to English) <input type="checkbox"/> Střední Morava (please translate to English) <input type="checkbox"/> Moravskoslezsko (please translate to English)	
11) Netherlands – Region Apeldoorn	<input type="checkbox"/> Gelderland (please translate to English)	
12) Italy – Region Campania	<input type="checkbox"/> Campania (please translate to English)	



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How to identify socially marginalised groups?

SOCIALLY MARGINALISED GROUPS																																																							
Questions	Answer		Comments																																																				
1) Population area with less than 5.000 inhabitants	<p>Although Western Macedonia (short WM or RWM) covers a total surface of 9,451 km<sup>2</sup> (3,649 sq mi) (7.2% of country's total), it has a total population of 283,689 inhabitants (2.6% of the country's total), thus it is a low-density populated region (30 per km<sup>2</sup>, as compared to the country's 81.96 per km<sup>2</sup> average). This is mainly due to the mountainous nature of the region, as 82% of the total surface are mountainous and semi-mountainous areas. This is also reflected in the population distribution, as a majority of the population (56%) lives in rural areas. The capital of the region is Kozani with 53,880 inhabitants. Other main towns are Ptolemaida (37,289), Grevena (17,610), Florina (19,985) and Kastoria (16,958).</p> <p>The seat of the regional authority is based at Kozani and is divided into four regional units (the pre-Kallikratis prefectures). It comprises 12 municipalities (down from 61 pre-Kallikratis local administrative units).</p> <table border="1"> <thead> <tr> <th></th><th>Municipality</th><th>Population</th><th>Seat</th></tr> </thead> <tbody> <tr> <td>1.</td><td><a href="#">Kozani</a></td><td>71,388</td><td><a href="#">Kozani</a></td></tr> <tr> <td>2.</td><td><a href="#">Eordaia</a></td><td>45,592</td><td><a href="#">Ptolemaida</a></td></tr> <tr> <td>3.</td><td><a href="#">Voio</a></td><td>18,386</td><td><a href="#">Siatista</a></td></tr> <tr> <td>4.</td><td><a href="#">Servia-Velventos</a></td><td>14,830</td><td><a href="#">Servia</a></td></tr> <tr> <td>5.</td><td><a href="#">Deskati</a></td><td>5,852</td><td><a href="#">Deskati</a></td></tr> <tr> <td>6.</td><td><a href="#">Grevena</a></td><td>25,905</td><td><a href="#">Grevena</a></td></tr> <tr> <td>7.</td><td><a href="#">Nestorio</a></td><td>2,646</td><td><a href="#">Nestorio</a></td></tr> <tr> <td>8.</td><td><a href="#">Orestida</a></td><td>11,802</td><td><a href="#">Argos Orestiko</a></td></tr> <tr> <td>9.</td><td><a href="#">Kastoria</a></td><td>35,874</td><td><a href="#">Kastoria</a></td></tr> <tr> <td>10.</td><td><a href="#">Prespes</a></td><td>1,560</td><td><a href="#">Laimos</a></td></tr> <tr> <td>11.</td><td><a href="#">Florina</a></td><td>32,881</td><td><a href="#">Florina</a></td></tr> <tr> <td>12.</td><td><a href="#">Amyntaio</a></td><td>16,973</td><td><a href="#">Amyntaio</a></td></tr> </tbody> </table>			Municipality	Population	Seat	1.	<a href="#">Kozani</a>	71,388	<a href="#">Kozani</a>	2.	<a href="#">Eordaia</a>	45,592	<a href="#">Ptolemaida</a>	3.	<a href="#">Voio</a>	18,386	<a href="#">Siatista</a>	4.	<a href="#">Servia-Velventos</a>	14,830	<a href="#">Servia</a>	5.	<a href="#">Deskati</a>	5,852	<a href="#">Deskati</a>	6.	<a href="#">Grevena</a>	25,905	<a href="#">Grevena</a>	7.	<a href="#">Nestorio</a>	2,646	<a href="#">Nestorio</a>	8.	<a href="#">Orestida</a>	11,802	<a href="#">Argos Orestiko</a>	9.	<a href="#">Kastoria</a>	35,874	<a href="#">Kastoria</a>	10.	<a href="#">Prespes</a>	1,560	<a href="#">Laimos</a>	11.	<a href="#">Florina</a>	32,881	<a href="#">Florina</a>	12.	<a href="#">Amyntaio</a>	16,973	<a href="#">Amyntaio</a>	
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2) Unemployment rate in the area	Western Macedonia has consistently had the highest unemployment rate in Greece (19,1% compared to 11,6% in Greece for 2022).		Source: Hellenic Statistical Authority																																																				
3) Employment rate of women in the region and at national level	The employment rate of women at national level is 45%.																																																						
4) Main economic activity in the area	<p>Western Macedonia is an important energy center of Greece, providing lignite-based electricity for decades. Nonetheless, that situation had resulted in shrinking all the other traditional professional skills such as the agricultural sector and other economic activities.</p> <p>A high negative environmental impact was caused, with strong pressure both on human and natural environment. According to the Greek government decision, all the coal (lignite) activities will have to be ceased until 2028. The</p>																																																						

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	<p>main goal is the Transition of RWM to a post-lignite era by structuring a new sustainable economic model. This can be achieved by maintaining the Region as the energy centre of Greece in terms of “clean energy” by exploitation of renewable resources and investing in the primary sector, especially in specific products which already dominate on the national and international market or are gaining ground every day.</p> <p>Other manufacturing activities include traditional sectors such as marble, saffron, fruits, local wines, furs and leather manufacturing and specialised arts and crafts. In the services sector, retail and wholesale trade, some tourism and public administration services are the most important sectors in terms of value-added.</p>																																									
5) Jobs at risk	<p>According to World Bank’s study, an estimated total number of 16,000 jobs are potentially affected directly and indirectly by the power plants / mines closure.</p>	<p>Source: “Managing the Lignite Transition for Coal Regions in Western Macedonia, Greece Towards a Just Coal Transition in Western Macedonia, Greece - What Does the Labor Market Look Like?”</p>																																								
6) Main breadwinner of the family nucleus	<p>In the regional context, the male breadwinner–female homemaker nucleus family is the ‘traditional’ family structure.</p>																																									
7) Average educational level and share of population with different school attainment	<p>In Greece, 44% of 25-34 year-olds had a tertiary qualification in 2021 compared to 47% on average across OECD countries.</p> <p>In Greece, the share of women among general upper secondary graduates is 53% (OECD average 55%). Men make up 63% of all vocational upper secondary graduates, above the OECD average (55%).</p> <p>The share of part-time students at the tertiary level in Greece is 1%, below the OECD average (22%).</p>	<p>OECD (2022), "Greece", in Education at a Glance 2022: OECD Indicators, OECD Publishing, Paris, <a href="https://doi.org/10.1787/a7cb9e0d-en">https://doi.org/10.1787/a7cb9e0d-en</a>.</p>																																								
8) Population age structure in the region and at national level	<p>Age Distribution in Greece and the Region of Western Macedonia.</p> <table><tr><th>Age Group</th><th>Greece (%) 2018</th><th>2018 Western Macedonia (%)</th><th>2019 Western Macedonia (%)</th><th>2020 Western Macedonia (%)</th></tr><tr><td>0-14</td><td>14.37</td><td>13.74</td><td>13.57</td><td>13.23</td></tr><tr><td>15-19</td><td>5.12</td><td>6.3</td><td>6.32</td><td>6.70</td></tr><tr><td>20-24</td><td>4.65</td><td>4.22</td><td>3.97</td><td>3.73</td></tr><tr><td>25-29</td><td>5.33</td><td>5.00</td><td>4.70</td><td>4.47</td></tr><tr><td>30-44</td><td>21.03</td><td>18.33</td><td>18.12</td><td>17.89</td></tr><tr><td>45-64</td><td>27.87</td><td>29.30</td><td>29.61</td><td>30.11</td></tr><tr><td>65+</td><td>21.64</td><td>23.37</td><td>23.71</td><td>23.87</td></tr></table>	Age Group	Greece (%) 2018	2018 Western Macedonia (%)	2019 Western Macedonia (%)	2020 Western Macedonia (%)	0-14	14.37	13.74	13.57	13.23	15-19	5.12	6.3	6.32	6.70	20-24	4.65	4.22	3.97	3.73	25-29	5.33	5.00	4.70	4.47	30-44	21.03	18.33	18.12	17.89	45-64	27.87	29.30	29.61	30.11	65+	21.64	23.37	23.71	23.87	<p>Tranoulidis, A.; Sotiropoulou, R.-E.P.; Bithas, K.; Tagaris, E. Decarbonization and Transition to the Post-Lignite Era: Analysis for a Sustainable Transition in the Region of Western Macedonia. Sustainability 2022, 14, 10173. <a href="https://doi.org/10.3390/su141610173">https://doi.org/10.3390/su141610173</a></p>
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9) Share of ethnics minorities in the region and at national level	<p>According to a report from the U.S. government, the total population of Greece is estimated at 10.6 million (midyear 2021). According to research polls, 81 to 90 % of the population identifies as Greek Orthodox, 4 to 15 % atheist, and 2 % Muslim.</p> <p>Approximately 140,000 Muslims live in Thrace, according to government sources using 2011 data; they are largely descendants of the officially recognized Muslim minority according to the 1923 Treaty of Lausanne.</p> <p>According to a Pew Research Center study released in November 2017, an additional 520,000 Muslims – mostly asylum seekers, refugees, and other migrants from Southeastern Europe, South and Southeast Asia, the Middle East, and North Africa – reside throughout the</p>	<p>Source: <a href="https://www.state.gov/reports/2021-report-on-international-religious-freedom/greece/">https://www.state.gov/reports/2021-report-on-international-religious-freedom/greece/</a></p>																																								

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	<p>country, many clustered in communities by their countries of origin or in reception facilities. Government sources estimate half reside in Athens.</p> <p>Members of other religious communities that together constitute less than 5 % of the population include Old Calendarist Orthodox, Catholics (mostly Roman Catholics and smaller numbers of Eastern Rite Catholics), Protestants, Jehovah's Witnesses, Jews, members of polytheistic Hellenic religions, Scientologists, Baha'is, members of The Church of Jesus Christ of Latter-day Saints, Sikhs, Seventh-day Adventists, Buddhists, and members of the International Society of Krishna Consciousness (ISKCON). Independent and media sources estimate Ethiopian Orthodox number 2,500 and Assyrians less than 1,000. According to the Armenian Orthodox Archbishop, interviewed in 2018, approximately 100,000 Armenian Orthodox live in the country.</p>	
10) Emigration rate in the region and at national level	<p>Until 2020, around 1,900 refugees and migrants were registered in the Region of Western Macedonia.</p> <p>In 2021, they left both for Structures throughout the country and abroad, following a decision by the Ministry of Immigration and Asylum.</p> <p>At the national level: 750,000 legal immigrants were registered on 1/2023 nationally for a total of 9,716,889 citizens (2021 census)</p>	
11) Average salary or household income in the region and at national level	<p>The average salary in Greece was 16,235 euros per year in 2021, compared with 16,178 in 2020.</p> <p>The Gross domestic product (GDP) of the province of W. M. was 4.0 billion € in <b>2018</b>, accounting for 2.1% of Greek economic output. GDP per capita adjusted for purchasing power was 17,700 € or 59% of the EU27 average in the same year. The GDP per employee was 79% of the EU average.</p> <p>Verdict: the regional average salary is lower than the national one and the national one is lower than the EU average.</p>	<p>Source: <a href="https://www.statista.com/statistics/416209/average-annual-wages-greece-y-on-y-in-euros/">https://www.statista.com/statistics/416209/average-annual-wages-greece-y-on-y-in-euros/</a></p>
12) Please describe the structure and the characteristics of relevant socially disadvantaged/ marginalized groups in your region	<p>According to the Regional Strategy for the Social Integration of the Region of Western Macedonia the main (based on quantitative criteria) vulnerable groups are as follows:</p> <ul style="list-style-type: none"> <li>• (A1) people with disabilities, amounting to 3,616,</li> <li>• (B1) registered unemployed, who benefit from corresponding social services and benefits, amounting to 4,282 people, of which 525 (12.3%) do not have an unemployment card (B2),</li> <li>• (B3) the unemployed over 54 to 65 years old, amounting to 487 people,</li> <li>• (B4) the members of large families with low family income, amounting to 684 people,</li> <li>• (C4) workers with low family income, amounting to 3,510 people,</li> <li>• (C5) pensioners with low family income, amounting to 3,145 people.</li> <li>• The rest of the categories of Vulnerable Groups (include less than 500 people per group, e.g.</li> </ul> <p>B.6 Women, victims of abuse A.2 Addicted or rehabilitated individuals A.4 Prisoners/released from prison B.10 Returnees C.3 Homeless or people excluded from housing</p>	

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	<p>B.7 Children, victims of abuse C.2 Marginalized Communities (e.g. Roma) A.3 HIV-positive A.5 Juvenile offenders B.9 Refugees and asylum seekers</p>	
13) Please comment the potential impact of their participation in Circular Bio-based Economy	<p>Since the regional bio-economy is based on agriculture and agro industry (small sized farms/companies and cooperatives) marginal and vulnerable groups will be most probably engaged in small scale workshops and labs.</p> <p>General and not restricted to the CBE, we could say that for some vulnerable groups it is a matter of survival (financial interest, poor households) whilst for others the social factor will be dominant (occupation, especially for disabled persons).</p> <p>Many persons from vulnerable groups face discrimination with respect to opportunities, treatment and outcomes in the world of work, both from the quantitative and qualitative angle.</p> <p>Quantitatively, there is disproportionately low representation of persons in the labour market.</p> <p>Qualitatively, even when persons are employed, they face obstacles such as poor promotional prospects and poor working conditions. They are also more likely to be in contingent, part-time and low-paid jobs (especially women).</p> <p>This is mostly not out of choice but as a consequence of a lack of opportunities in the formal economy and in the absence of other means of livelihood.</p>	
14) Please indicate the factors hindering their possible participation?	<p><b>Lack of coordination &amp; monitoring mechanisms</b></p> <p>Local social policy is implemented at the territorial level of Municipalities with complementary, but more often, overlapping activities of Municipalities and Social Agencies and Social Solidarity Agencies.</p> <p>There is an inability to universally cover the areas of responsibility by the Municipalities, especially with regard to the elderly and the uninsured, because the Municipalities are particularly extensive, while the settlements are sparsely populated.</p> <p><b>Access to services, infrastructure and support</b></p> <p><b>Lack of experienced and skilled specialists</b></p> <p>With regard to public health, which is a "new" competence at the level of the Municipalities, there are problems of lack of staff and related resources to effectively deal with public health issues (e.g. vaccinations of vulnerable groups).</p> <p>From the "umbrella" of the local social policy, the "identification" of the beneficiaries and the coherent support of their integration and their promotion to employment positions are characterized as deficient.</p> <p>Addressing this critical lack is a challenge for the new Regional Social Inclusion Strategy of Western Macedonia.</p> <p>Specialists /scientists and tools are required to support the implementation of social research and subsequently, the preparation of personalized social integration programs. Staffing of Social Structures is deficient and is evaluated by Municipalities and the Regional authority as follows (weaknesses):</p> <ul style="list-style-type: none"> <li>- Existence of remote mountainous areas with difficulty of accessibility to social structures and services, which cannot</li> </ul>	

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	<p>be mitigated due to the limited resources for transportation costs.</p> <p>- The insufficient funding for the effective operation of the existing ones as well as the creation of new social structures and services in order to cover the increased needs of the vulnerable groups of the population of the Municipalities.</p> <p>- The lack of personnel (especially specialized) of the social structures.</p>																							
15) Indicate the selected marginal group/s that will be targeted during the project and relevance in the region	<p>For municipalities, the disabled are the most important vulnerable group of the population, while the elderly are the most important special group of the population, with priority given to those who either face health problems and are uninsured or unable to access social care services or health services or live with low incomes.</p> <p>Other groups that need support are the unemployed and especially the long-term unemployed, single-parent families, large families with low incomes, etc.</p> <p><b>Within the project we will most probably focus on disable persons.</b></p>																							
16) Average educational level of targeted marginalized groups	<p>Access to education is an important daily activity, in which people with limitations or disabilities are experiencing exclusion. Greece is a country with significant shortages in the provision of infrastructures in the educational sector, for people with disabilities.</p> <p>The Greek Center for the Development of Educational Policy, in collaboration with the <b>Disability Issues Observatory of the National Confederation of People with Disabilities</b>, presented in May 2018, the research “Basic Sources of Special Education: Discrimination in Education and Work” describing how limitations and disabilities affect the educational path of the Greek people.</p> <p>According to this study, Greece has huge differences compared to other European Member States, in terms of providing infrastructure and opportunities. Exclusion in access to educational system, regarding people with disabilities, is particularly high.</p> <p>Persons with disabilities stop at a much lower level of education, in comparison with non-disabled persons, showing a significantly lower level of education, higher rates of early school leaving and higher NEETs (not in employment, education, or training).</p> <p>Direct result of the above is the high unemployment rate of these people. Greece holds the highest unemployment rate, 37.2% in the EU-28, for disabled persons. This logically creates an increase in poverty and social exclusion indicators.</p> <p>E.g. Tertiary graduates aged 30-39 (2016) 23.6% with moderate or severe disability vs 40.5% without disability</p> <div><p>Μαθητές με αναπηρία ή/και ειδικές εκπαιδευτικές ανάγκες στη γενική πρωτοβάθμια και δευτεροβάθμια εκπαίδευση και ειδικό υποστηρίκτη (Δεχ. έτος 2017-18)</p><p>Ποσοστά μαθητών Πρωτοβάθμιας και Δευτεροβάθμιας Εκπαίδευσης / Όλη τη σχολική Παιδεία, σύμφωνα με τον ΕΠΕΑΕΚ 2000-2006</p><table><thead><tr><th>Κατηγορία</th><th>Ποσοστό (%)</th></tr></thead><tbody><tr><td>Μαθητές με αναπηρία ή/και ειδικές εκπαιδευτικές ανάγκες στην ειδική δευτεροβάθμια εκπαίδευση</td><td>31%</td></tr><tr><td>Μαθητές με αναπηρία ή/και ειδικές εκπαιδευτικές ανάγκες στην ειδική πρωτοβάθμια εκπαίδευση</td><td>15%</td></tr><tr><td>Μαθητές με αναπηρία ή/και ειδικές εκπαιδευτικές ανάγκες στην ειδική δευτεροβάθμια εκπαίδευση με υποστηρίκτη</td><td>7%</td></tr><tr><td>Μαθητές με αναπηρία ή/και ειδικές εκπαιδευτικές ανάγκες στην ειδική πρωτοβάθμια εκπαίδευση με υποστηρίκτη</td><td>6%</td></tr><tr><td>Μαθητές με αναπηρία ή/και ειδικές εκπαιδευτικές ανάγκες στην ειδική δευτεροβάθμια εκπαίδευση χωρίς υποστηρίκτη</td><td>4%</td></tr><tr><td>Μαθητές με αναπηρία ή/και ειδικές εκπαιδευτικές ανάγκες στην ειδική πρωτοβάθμια εκπαίδευση χωρίς υποστηρίκτη</td><td>3%</td></tr><tr><td>Μαθητές με αναπηρία ή/και ειδικές εκπαιδευτικές ανάγκες στην ειδική δευτεροβάθμια εκπαίδευση με υποστηρίκτη (αποφοίτοι)</td><td>2%</td></tr><tr><td>Μαθητές με αναπηρία ή/και ειδικές εκπαιδευτικές ανάγκες στην ειδική πρωτοβάθμια εκπαίδευση με υποστηρίκτη (αποφοίτοι)</td><td>1%</td></tr><tr><td>Μαθητές με αναπηρία ή/και ειδικές εκπαιδευτικές ανάγκες στην ειδική δευτεροβάθμια εκπαίδευση χωρίς υποστηρίκτη (αποφοίτοι)</td><td>0%</td></tr><tr><td>Μαθητές με αναπηρία ή/και ειδικές εκπαιδευτικές ανάγκες στην ειδική πρωτοβάθμια εκπαίδευση χωρίς υποστηρίκτη (αποφοίτοι)</td><td>0%</td></tr></tbody></table></div>	Κατηγορία	Ποσοστό (%)	Μαθητές με αναπηρία ή/και ειδικές εκπαιδευτικές ανάγκες στην ειδική δευτεροβάθμια εκπαίδευση	31%	Μαθητές με αναπηρία ή/και ειδικές εκπαιδευτικές ανάγκες στην ειδική πρωτοβάθμια εκπαίδευση	15%	Μαθητές με αναπηρία ή/και ειδικές εκπαιδευτικές ανάγκες στην ειδική δευτεροβάθμια εκπαίδευση με υποστηρίκτη	7%	Μαθητές με αναπηρία ή/και ειδικές εκπαιδευτικές ανάγκες στην ειδική πρωτοβάθμια εκπαίδευση με υποστηρίκτη	6%	Μαθητές με αναπηρία ή/και ειδικές εκπαιδευτικές ανάγκες στην ειδική δευτεροβάθμια εκπαίδευση χωρίς υποστηρίκτη	4%	Μαθητές με αναπηρία ή/και ειδικές εκπαιδευτικές ανάγκες στην ειδική πρωτοβάθμια εκπαίδευση χωρίς υποστηρίκτη	3%	Μαθητές με αναπηρία ή/και ειδικές εκπαιδευτικές ανάγκες στην ειδική δευτεροβάθμια εκπαίδευση με υποστηρίκτη (αποφοίτοι)	2%	Μαθητές με αναπηρία ή/και ειδικές εκπαιδευτικές ανάγκες στην ειδική πρωτοβάθμια εκπαίδευση με υποστηρίκτη (αποφοίτοι)	1%	Μαθητές με αναπηρία ή/και ειδικές εκπαιδευτικές ανάγκες στην ειδική δευτεροβάθμια εκπαίδευση χωρίς υποστηρίκτη (αποφοίτοι)	0%	Μαθητές με αναπηρία ή/και ειδικές εκπαιδευτικές ανάγκες στην ειδική πρωτοβάθμια εκπαίδευση χωρίς υποστηρίκτη (αποφοίτοι)	0%	<p>Data elaboration: ESAmEA Disability Issues Observatory Sources: Hellenic Statistical Authority</p>
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17) Description of the occupied post, considering the type of work performed and the qualification required by the targeted marginalized groups (question 13)																								



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	 <p>The number of unemployed disabled people in the private sector seems to be quite small. People with disabilities are more inclined to work in public institutions, because of the better working conditions mainly in office /white collar positions, due to more secure insurance and medical coverage and a small but stable income.</p> <p>The main age group is 18 to 45 years and only few are in the age group of 45-65, which shows that the older unemployed are no longer working either because of the full pension they managed to obtain, or they live with serious health problems that do not allow them to work.</p> <p>The majority of disabled workers are characterized by mobility impairment, followed closely by severe disabilities such as kidney disease, diabetes, etc.</p> <p>In terms of mental as well as physical health, a significant percentage feel better when they work from home and do not come into conflict with colleagues and employers.</p> <p>Although the majority work for a living and face no problems, many feel uncomfortable in the workplace. Stress, disadvantage, depreciation, bullying, are just some of the issues they have to deal within the workplace.</p> <p>Accessibility seems to be the most important issue for people with disabilities. Although most are happy with the working environment, the difficulty of moving and accessing work remains the main inhibiting factor for many.</p>	
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#### Situation of main economic sectors

PRIMARY SECTOR		
AGRICULTURE		
Questions	Answer	Comments
18) How large is the surface of cultivable areas? (you can check databases such as Eurostat: <a href="https://ec.europa.eu/eurostat/web/agriculture/data/database">https://ec.europa.eu/eurostat/web/agriculture/data/database</a> )	total cultivated area: <b>269.185,8 ha</b> (OPEKEPE,2021)	OPEKEPE is the Greek Payment Authority of Common Agricultural Policy (C.A.P.)
19) Which are the main crops in the area (surface in hectares of percentage of the cultivable area occupied by each crop)	The main cultivated crops include: Fodder crops: 68.132,42 (25,31%) Common wheat: 25.690,81 (9,54%) Durum wheat: 19.357,59 (7,19%) Barley: 9.637,06 (3,58%) Legumes: 9.615,95 (3,57%) Sunflower: 6.217,21 (2,31%) Corn: 4.437,12 (1,65%) Triticale: 4.277,78 (1,59%) Peach trees: 3.051,92 (1,13%) Nut crops (almonds; walnuts etc.): 2.990,01 (1,11%) Aromatic plants: 2.714,49 (1,01%) Apples: 2.585,06 (0,96%) Vineyards: 1.817,15 (0,68%) Potatoes: 1.324,18 (0,49%) Cherry trees: 826,7 (0,31%) Oats: 651,47(0,24%) Nectarines: 392,4 (0,15%)	#1: Area in ha #2: pastures cover 72.844,99 of land area



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20) Which is the average annual production (dry basis) of the most relevant crops (listed in question 15)?	Common wheat: 145.000 Durum wheat: 112.000 Barley: 69.000 Corn: 236.000 Peach trees: 32.000	Source: Hellenic Statistical Authority
21) Average yield (dry basis) for the most relevant crops (listed in question 15)?	Common wheat: 2,8 tn/ha Durum wheat: 1,93 tn/ha Barley: 2,91 tn/ha Corn: 10,43 tn/ha Peach trees: 21,28 tn/ha	Source: Hellenic Statistical Authority
22) What is the percentage of employment covered by agriculture?	1.385 permanent workers 18.391 seasonal workers  Employment rate 12,21 % (regional) vs 17,47 %national (2014)	Source: Hellenic Statistical Authority, 2016
23) Are state subsidies received by the farmers (CAP or others)? Please shortly mention the crops and the aim of the subsidy (equipment modernisation, yield increase, etc.	<ul style="list-style-type: none"> <li>• Durum wheat 100 € / h</li> <li>• Common wheat 100 € / h</li> <li>• Barley 100 € / h</li> <li>• Corn 550 € / h</li> <li>• Beans 57 € / h</li> <li>• Fodder crops 83 € / h</li> <li>• Trees 407 € / h</li> <li>• Legumes 285 € / h</li> <li>• Apples 472 € / h</li> </ul> <p>For Equipment see Q57</p>	(CAP 2023-2027)
24) What is the current situation of the soils (erosion, eutrophication, pollution...)?	Good soil quality, without erosion, eutrophication and pollution.	
25) Who are the main stakeholders involved in the crops production (cooperatives or farmers associations, individual farmers owning large or small areas, etc.)?	<ul style="list-style-type: none"> <li>• Total amount of cultivation areas =20.047</li> <li>• 37 cooperatives or farmers' associations (both livestock and agriculture) in WM</li> <li>• Individual farmers owning small areas</li> </ul>	Source: Hellenic Statistical Authority
26) How much residual biomass is produced? Please indicate for the most relevant crops (question 14) the residues that are produced during the processing	<ul style="list-style-type: none"> <li>• Florina: 97.703 Tonnes / year</li> <li>• Kozani: 103.912 Tonnes / year</li> </ul> <p>Plus Grevena and Kastoria</p>	LDK
27) Is the residual biomass (question 21) exploited (energy production, chemicals, fertilizers, etc.)?	Partly exploited for <ul style="list-style-type: none"> <li>• Energy Production (e.g. District heating Amyntaio)</li> <li>• Biogas (at least 3 Plants, 1.3 kWe in total)</li> <li>• Fertilizers (e.g. from extraction of aromatic plants)</li> <li>• Pellets (mainly from agricultural cultivation)</li> </ul>	
28) Average selling price for the main crops (€/dry tonnes) (listed in question 15)? When possible, also include the production cost.	<ul style="list-style-type: none"> <li>• Durum Wheat 425 €/t</li> <li>• Common Wheat 386 €/t</li> <li>• Barley 270 €/t</li> <li>• Corn 312 €/t</li> <li>• Apples 180-250 €/t</li> </ul>	Source: Agronews
29) Which are the future perspectives? (Technologies, increase of the area dedicated to certain crops, new crops development, new biomass or residual biomass value chain development, employment)	Currently, a very considerable part of agriculture in Western Macedonia specializes in <b>low value and low labor requirements crop and livestock activities</b> . The restructuring of agriculture towards high value activities directly linked to food processing would promote a new development model for the region. Indicatively, these would include aromatic and pharmaceutical plants – Kozani; legumes – Florina, Kozani, Kastoria; apples and peaches – Kozani, Kastoria; saffron – Kozani; wine grapes – Florina, Kozani; dairy products – Grevena, Kozani and Florina. Several of the region's agricultural products have been certified as Protected Designation of Origin (PDO) and Protected Geographical Indication (PGI) products. In this framework, Greek Rural Development Programme (RDP) farm investment support should refrain from the current (rather) generic approach and target (through region-specific eligibility and selection criteria and higher co-financing rates) productive investments on farms specializing in high value activities.	FOUNDATION FOR ECONOMIC & INDUSTRIAL RESEARCH

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	<p>Support for more localized agro-processing would further add value to production, but also generate more jobs in the region.</p> <p>High value activities could also include greenhouses and hydroponics, producing fresh vegetables, through the use of district heating.</p> <p>The region faces a significant <b>deficit in agricultural value chain development</b>. Western Macedonia specializes in the production of several agricultural products, both traditional (apples, peaches, legumes - especially beans, potatoes, saffron, sheep and goat meat, dairy products, barley) and new (aromatic and pharmaceutical plants).</p> <p><b>Contract farming</b> in the region has been associated with several success stories in the last few years, especially since the banking sector's involvement. In this context, the banking sector covers the entire production, supply and processing chain of agricultural production, by supporting carefully planned, mutually beneficial partnerships between farmers and businesses that trade in, process and sell agricultural products. Banks guarantee the necessary liquidity for farmers, so that not only can they continue to produce but, thanks to better planning of their inputs, can achieve better prices, improve growing conditions and guarantee a higher quality end-product. Most contract farming initiatives in the region have generated new jobs and products have penetrated export markets. Hence, higher rates of support for farm and agri-food investments by farms/firms which participate in contract farming, as well as income tax reductions could be considered as options which can facilitate such schemes.</p> <p><b>Biomass production</b> is another alternative activity which would generate jobs in the region. Establishing and managing a biomass trade centre could help organise the biomass supply chain and guarantee both the quantity and quality of the biomass, which is a critical factor for the installation and operation of a biomass unit for the production of electricity and heat.</p> <p>The <b>Energy Communities</b> established or under development (around 260 by 2023) in the area could support this endeavour. Forestry residues and residues from cereals, vineyards and tree crops can be utilized.</p> <p>The implementation of <b>small scale biogas units</b> could be feasible in order to exploit livestock and agricultural waste. Further, farmers groups or other associations can build an Electricity and Heat Co-production Unit (e.g. as the 3 biogas plants). The electricity generated could be injected into the network and thermal energy could meet the needs of district heating networks and greenhouses.</p> <p>Last but not least, the cultivation of <b>energy crops</b> (for instance in the depleted mines) can serve the needs of potential CBE activities/undertakings.</p>	
<b>FORESTRY</b>		
Questions	Answer	Comments
30) Forest area in the region (please indicate the hectares and percentage occupied by forestland in the region)?	180.918,3 ha 19,15%	Source: Greek forest service
31) Productive forest area share (exploited for wood)?	91,1%	Source: Greek forest service
32) Which are the main uses of forestry biomass?	<p>The stem wood is used as:</p> <ol style="list-style-type: none"> <li>1. technical wood</li> <li>2. industrial wood</li> </ol> <p>forest biomass</p> <ol style="list-style-type: none"> <li>3. thermal generation (firewood) at households</li> </ol>	<p>Assumption: As forestry biomass is defined the biomass resulting from logging procedures</p> <p>The forest residues produced in the course of</p>

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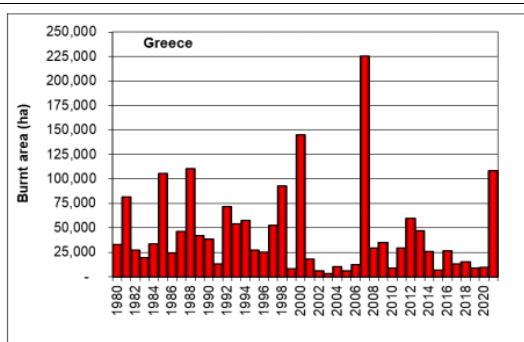
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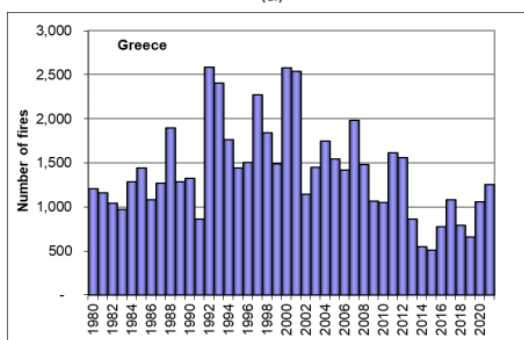
		logging procedures remain on the ground to enhance the forest soil's sustainability and fertility
33) Share of forestland owned by the administration and private owners?	Administration 61,1% Private 38,9%	Source: Greek forest service
34) Are state subsidies received by the forestry sector?	Yes, Greece funds forestry measures through their national rural development programmes. These measures mostly support investments in forest technologies, mobilising, processing and marketing of forest products	
35) Who are the main stakeholders involved in the forest biomass production?	Forest labour cooperatives (which have the exclusive right to engage in logging activities in public forests), villagers, wood industry	
36) Please indicate if possible the forest biomass production cost and the average selling price (€/dry tonnes)?	<u>conifers</u> Industrial wood: 43,40-63,40€/m3 Technical wood: 21,30-36,50€/m3 Wood poles for street lamps and telecommunications: 79,20-84,30€/m3 Firewood: 13,90-14,30€/m3  <u>Broadleaves</u> Industrial wood: 44,70-81,00 €/m3 Technical wood: 40,20-136,20€/m3 Wood poles for street lamps and telecommunications: 53,10-81,90€/m3 Firewood: 15,80-29,20€/m3	Y.A. YPEN/ΔΔΔ/67067/2059/1 4.07.2021 (B' 3328) – GREEK VERSION
37) What is the percentage of employment covered by forestry?	≈0,57% (half of them work in wood processing factories)	The percentage is for entire Greece. There are no data for Western Macedonia
38) How much residual biomass is produced in the region?	10.000-15.000 (dry) tn	Taking into account the type of the tree species, the moisture content and the availability
39) Is the residual biomass (question 34) exploited? (Indicate)	No. Greek Forest management plans imposes that a significant amount of residual biomass must be left in the forest for nutrient recycling purposes	
40) Which are the future perspectives? (Technology, forestry, employment increase, increase of exploited areas, etc.)	There are some private forests that are out of management for many years that can be exploited again. Also some public forests are mismanaged due to lack of personnel in the forest service. These could produce a significant amount of timber if managed correctly.	
41) Share of forestland area affected by forest fires the last year?	2021 was an extreme year for fires in Greece, and resulted in the highest mapped burnt area since the historically bad year of 2007. A total of 131 254 ha was mapped from 222 fires. However, there is a high fluctuation of the number of fires and burned area within each decade, as you will see below.	San-Miguel-Ayanz, J., Durrant, T., Boca, R., Maianti, P., Libertá, G., Artés-Vivancos, T., Oom, D., Branco, A., de Rigo, D., Ferrari, D., Pfeiffer, H., Grecchi, R., Onida, M., Löffler, P. 2022. Forest Fires in Europe, Middle East and North Africa 2021, Publications Office of the European Union, Luxembourg, 2022, doi:10.2760/34094, JRC130846.



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(a)



(b)

Table 68. Distribution of burnt area (ha) in Greece by land cover types in 2021.

Land cover	Area burnt	% of total
Broadleaf forest	4803	3.7
Coniferous forest	23611	18.0
Mixed forest	16994	12.9
Transitional	17349	13.2
Sclerophyllous vegetation	18873	14.4
Other Natural Land	4882	3.7
Agriculture	43048	32.8
Artificial Surfaces	1664	1.3
Other Land Cover	31	0.0
<b>TOTAL</b>	<b>131254</b>	<b>100</b>

LIVESTOCK		
Questions	Answer	Comments
42) How large is the area dedicated to livestock in the region?	Pastures: 72.844,99ha	
43) Average farm size (cows, pigs, chicken, or other) in the region?	<p>Cows: 40.233 animals Pigs: 9.093 animals Goats: 146.500 animals Sheeps: 392.391 Poultry: 104.336 animals</p> <p>cowsheds: 803 pig houses: 234 sheep farms: 2.141 goat farms: 1.478 poultry farms: 1.906</p>	<p>Number of animals and number of holdings</p> <p>Source: Hellenic Statistical Authority, 2021</p>
44) Which is the daily livestock maintenance cost (€/head)?	<p>90.503 units of livestock</p> <p>Beef calf (11-12 months): ≈6,07 €/head Beef calf (14-24 months): ≈5,65 €/head In general: 2,35 €/head</p>	CAP 2023-2027
45) Which is the main destination of the cattle? (Meat, milk, wool...)	Meat and milk	



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46) What is the employment rate covered by livestock?	20.000 persons exclusive and full time, 4135 part time (2020)	Hellenic Stat. ΕΛΛΗΝΙΚΗ ΣΤΑΤΙΣΤΙΚΗ ΑΡΧΗ Πειραιώς 2022
47) Are state subsidies received for farming?	See also 57 <ul style="list-style-type: none"> <li>• Transportation 0,017-0,139 €/km</li> <li>• Feeding costs</li> <li>• Organic farming</li> <li>• Sheeps 256,59 €/head</li> <li>• Goats 231,73 €/head</li> <li>• Dairy Cows 350,30 €/head</li> <li>• Beef cows 280,83 €/head</li> <li>• Bees 33 €/beekeeper/hive</li> </ul>	CAP 2023-2027
48) Who are the main stakeholders involved in the production?	Dairy industry (approx. 40 SMEs), slather houses, biogas plants (3), animal feed industry, animal by-product rendering plants (2)	
49) Which is the main residue produced in each case?	The main residues include a mixture of manure, fodder residues and water	
50) How much slurry/manure/other residue is produced in average (t/head) and in the region (total)?	dairy cows: 19,7 wet tn/animal/year cattle: 2,6 young cattle: 9,6 cattle (except dairy): 12 sows: 2,5 piglets: 0,4 fattening pigs: 2 horses: 8 poultry: 0,022 sheep and goats: 0,64  Taking into account the animal kind and the manure production ratio of each kind the annual manure production in the RWM ranges from 800.000 to 850.000 wet tn	
51) Is the slurry/manure/other exploited? (Indicate the percentage that is currently used) If not, how are the residues managed?	According to the Code of Good Agricultural Practices (ΦΕΚ Β' 477/06-04-2000), the management of manure includes safe collection, transport, storage, handling, Processing and final use as substrate for the production of soil improvement (highest part) or biogas production (see below).	
52) Average selling price for the slurry/manure/other?	Poultry digested manure: 160€/tn (market price)	
53) Which are the future perspectives? (Valorisation technologies, cattle, employment rate, farm modernisation, increase of large exploitations, decrease of livestock production, etc.)	The increase of fertilizers market prices in combination with European and National laws regarding the protection of soil and water from N pollution will lead to infrastructures development of the livestock farms which will be followed by the further exploitation of manure for soil improvements and biogas production.  See also Q29	FOUNDATION FOR ECONOMIC & INDUSTRIAL RESEARCH Η συνεισφορά των εισορών στην αγροτική παραγωγή και το μέλλον του αγροτικού τομέα στην Ελλάδα (in GR)
<b>SECONDARY SECTOR</b>		
<b>AGROINDUSTRY</b>		
Questions	Answer	Comments
54) How many agrifood industries are there in the region?	Around 100, mainly dairy farms and relevant small scale industry (around 50), cooperatives (37) of any kind and some food processing industry (mainly SMEs)	Greek Agricultural Organization Demeter
55) Which are the main products produced?	Krokos/saffron: The Greek "crocus" is used nowadays in medicine, cosmetics, food, beverage industry. Greece is one of the four places in the world, where saffron is cultivated. The plant is cultivated in the region and packed as food ingredient. Further added value processing for medicine and cosmetics is done in other regions.  Dairy products: Feta cheese (PDO), kasseri (hard cheese), kefalotyri and kefalograviera are of the most important traditional dairy products of the region. They are made of high quality milk from sheep and goats living in the alpine pasturelands of the region.	ANKO S.A.

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	<p>Mushroom products: In Pindos paths has grown over thousand species of mushrooms and their collection is the favourite occupation of the residents.</p> <p>Red Florina Peppers: After the long trip from South America (Brazil) they arrived in the Western Macedonia region. The Florina peppers constituted for years the established local delicacy of the homonymous region and an integral part of the daily diet of the residents.</p> <p>Prespa Beans: The main occupation of the Prespa residents today, is the cultivation of beans. Prespa beans are very tasty and considered among the best in the world.</p> <p>Aromatic and pharmaceutical plants: around 15 family owned businesses are producing essential oils, hydrolates and cosmetics derived from cultivation of aromatic and medicinal plants.</p> <p>Royal Jelly: The commercial exploitation of all hive products, other than honey, such as royal jelly, propolis, pollen and beekeepers, orientates new beekeepers. The Beekeepers' Center of Western Macedonia that started its operation in Kozani.</p>	
56) Which is the annual average production in the main agrifood industries?	<p>According to ELGO Dimitra, in the year 2021 approximately 87.000 t of raw milk were produced by 2.800 producers.</p> <p>Most of the raw milk that is produced in WM is not being processed in the local dairies, but outside of the region.</p>	Mapping the dairy value chain in Western Macedonia Region - Technical Report- Dr. Ioannis E. Kaimakamis, April 2022
57) Are companies producing organic or agrifood products receiving subsidies?	<p>Types of support provided:</p> <p>Tax exemption</p> <p>Subsidy</p> <p>Lease subsidy</p> <p>Subsidy of costs of newly created employment</p> <p>Usually through:</p> <ul style="list-style-type: none"> <li>Operational Programme Competitiveness, Entrepreneurship and Innovation (EPAnEK)</li> <li>Regional Operational Programme</li> <li>Community Led Local Development – CLLD - LEADER</li> <li>Development Law: e.g. programme "Agrifood - Primary Production and Processing of Agricultural Products", which aims to strengthen business activities of primary agricultural production and the processing of agricultural products.</li> </ul>	
58) What is the percentage of employment covered by agroindustries?	Those statistical data are not measured either on national or on regional level.	
59) What is the main economic limitation (energy cost, supply chain...) faced by agroindustries?	Due to the mountainous area logistics costs are much higher compared with other regions. Energy cost is also high on national level and in addition the bureaucratic procedures and tax costs are also major limitations.	
60) Which type of wastes/side-products/residues are produced?	<p>Dairy industry: whey</p> <p>Agri-food industry: biowastes</p> <p>Aromatic plants and distillery: crop residues and residues after the distillery</p> <p>Cereals: crop residues</p>	
61) How much wastes/side-products/residues are produced?	<p>Dairy industry: no data available since most quantities of milk are processed outside the region</p> <p>Data for other agroindustry: Not available</p>	
62) Are the wastes/side-products/residues exploited? (Please specify for which application)	Whey for biogas production	
63) What are the future perspectives? (Techniques, products, production, employment)	<p><b>Dairy industry</b></p> <p>The way forward for many cheese and whey investments will be big cheese plants with more generic styles of cheese, such as mozzarella, and with whey processing capabilities planned,</p>	Green Region Pathway for Western Macedonia Chrysostomos Karachalios FINAL June 2020

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	<p>including derivatives and fractionation (which is now not the case, due to the small size and the scattered location of the industry). In this context, it may be more reasonable for smaller cheese manufacturers from WM region to work together through various partnerships (a cluster of dairy producers has just been created) to capture the added whey value for their businesses.</p> <p>As said, the production of cheese results in volumes of byproducts, which are often not properly valorized in WM and as a result parts of this edible food are wasted.</p> <p>One of the main stages of the supply chain where food waste takes place is processing. The need to more efficiently utilize food resources and the environmental impact of the disposal of byproducts induce scientists, producers and entrepreneurs to place more focus on the further processing of these byproducts.</p> <p><b>Agro industry</b></p> <p>Given the current business structure in the agri-food sector, the creation of strong, competitive regional agri-food clusters and productive alliances could be another priority. There have been proposals for the establishment of two (food, wine) or a single agri food cluster. The main goal of the cluster should be to utilize economies of scale, promote innovation and entrepreneurship and the coordination and ultimately, the development of an internationally competitive agri-food sector, through the utilization of scientific knowledge and new technologies. Potential clusters can utilize the services of the regional institution.</p>	
64) Which are the main stakeholders of the local agrifood industry?	<p>Department of Rural Economy of Western Macedonia Region: Farmers, breeders and SME's in food sector get assistance and information on the utilization of EU funding and the implementation of national and regional legislation</p> <p>Planning Directorate of Region of Western Macedonia: SME's get assistance and information on the utilization of EU funding (<a href="http://www.pdm.gov.gr">www.pdm.gov.gr</a>).</p> <p>Managing Authority of ROP 2014 – 2020 (<a href="http://www.pepdym.gr">www.pepdym.gr</a>)</p> <p>Chambers of Commerce and Industry (Kozani, Kastoria, Florina, Grevena): Chambers enhance and promote business initiatives for their members (SMEs)</p> <p>Economic Chamber – Department of Western Macedonia: The Chamber for economy enhances and promotes business initiatives on behalf of its members</p> <p>ANKO SA – Development Agency of Western Macedonia (<a href="http://www.anko.gr">www.anko.gr</a>): SMEs in food sector get assistance and information on the utilization of EU funding in rural areas.</p> <p>Producers, farmers, local industry, clusters, feed industry</p>	ANKO S.A.
<b>OTHER BIO-BASED INDUSTRIES</b>		
Questions	Answer	Comments
65) Is there a mapping of the current bio-based industrial activities in your area?	<p>In principal there is only biogas production (could be counted as biobased economy, according to the Venn diagram on p. 32, but please advise if not).</p> <p>In the past (2016), the Development Agency of Western Macedonia (ANKO S.A., member of EEN) provided a mapping on the regional bioeconomy sector which in principal was focused on agrifood industry.</p>	BRIDGES Policy learning / Mapping and understanding the innovation potential of bio-economy businesses in the partner regions. The case of W. Macedonia, Greece, focused in Agri-Food.



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66) How many biobased industries are there in the region? Please specify the main biobased products produced	3 biogas units operate in the region, which process <b>livestock and agricultural residues</b> as raw material, with a total capacity of 1,350 kW <sub>e</sub> . In addition to biogas, the digested residue (digest), a by-product of anaerobic digestion is rich in nutrients that make it suitable for use as a soil conditioner after proper treatment, enhancing thus the circular bio-economy. However, due to numerous legislative and operational/management issues, the digestate does not undergo any special treatment and is considered just a by-product.	
67) Out of the previous list indicate the three more relevant in terms of revenues and role to meet the government strategic objectives (decarbonisation, CO <sub>2</sub> emissions, circular economy, etc.)		
68) Are state subsidies received to promote sustainable production by these industries?	<p><b>The Greek Subsidy System</b>  <b>Premium tariff (Feed-in Premium)</b>          From 2016, RES and CHP plants to be connected to the transmission system participate in the electricity market and are awarded a <b>sliding feed-in premium</b> (called "Operating support based on a differential compensation price"). From 2017, feed-in premium is granted through tenders. Exemptions apply to <b>smaller installations</b>, which are eligible for a <b>feed-in tariff</b>.</p> <p>20 years <b>state-fixed feed-in tariffs</b> are anchored in law 4414/2016.          Landfill biogas: Fermentable waste and organic sewage sludge from wastewater treatment</p> <ul style="list-style-type: none"> <li>• ≤ 2 MW: 129 €/MWh</li> <li>• &gt;2 MW: 106 €/MWh</li> </ul> <p>Biogas from biomass: Organic residues and wastes from livestock and agriculture</p> <ul style="list-style-type: none"> <li>• ≤ 3 MW: 225 €/MWh</li> <li>• &gt; 3 MW: 204 €/MWh</li> </ul> <p>According to the criteria above an upper limit for new biogas plants was set to speed up growth in the biogas market.  <b>Those tariffs only apply to new installed electrical connections up to 50 megawatts per year.</b>          Once this number is reached in a calendar year, tariffs for electricity from biogas are tendered until the end of that year. This process is already in effect since 2017 in Greece for photovoltaic and wind power plants.          The <b>new investment law 4399/2016</b> approved in June 2016 foresees support for the development of biogas in the electricity and heating sector: such as <b>income tax relief, subsidised expenditure, leasing subsidy, stabilisation of income tax coefficient or the subsidy of investment risk</b>.</p>	
69) What is the percentage of employment covered by biobased industries?	Negligible	
70) How many tonnes of biobased materials/products are produced per year? Please specify by typology (renewable energies, biofuels, biomaterials, biochemicals, biobased cosmetics/pharmacy, others)	Just 1.35 MWe of electricity only, so far no biofuel for transport, no biomethane to be injected in the natural gas grid (the region is currently constructing an extensive natural gas network) and no heat.	
71) Which type of wastes/by-product, residue are produced in the production process?	Digestate	
72) What are the biobased materials, side-products, waste or residues used as raw materials in the productive process?	See also Q66, it is mainly crops, plant by-products, animal by-products and industrial and commercial organic waste (no biowaste from households, which is directed to the landfill gas production, which is also present in the region but not counted in this category).	
73) Where are these raw materials obtained or cultivated?	Companies (food processing industry) farmers in and outside of the region	



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74)	Which are the main stakeholders/actors supplying these raw materials?	Producer of livestock and agricultural wastes, agro industry	
75)	Which is the price of these biobased raw materials used (€/ton)?		
76)	Which is the price of the main biobased products produced in the region (€/ton)?		
77)	Which are the perspectives in the use of these biobased raw materials/side-products/waste?	Further support for digestate used as organic fertilizer / soil conditioner making agriculture more sustainable and cost competitive.	
78)	Which are the perspectives in the consumption of these biobased products?	See Q77, Upgrading of biogas to biomethane in order to meet the standards for use as vehicle fuel or for injection in the natural gas grid. Renewable gases, including biogas and biomethane, will be central to achieve carbon-neutrality by 2050 and help the EU become less dependent in external energy supplies.	Hellenic Association of Biogas Producers
79)	Please mention the 3 bio-based solutions with more relevance in your region (that can be taken as an example of implementation or good practice for other regions) and provide contact details if possible.		
80)	Please mention 3 bio-based solution in your region that have high deployment potential in your region but still need support to accelerate-unlock its potential (please mention what technological, regulatory and market challenges are and provide contact details if possible)		
<b>ENERGY INDUSTRY</b>			
	Questions	Answer	Comments
81)	How many energy industries are there?	Public Power Corporation S.A. (coal power plants) is the dominant industry.	
82)	Does the main part of energy come from renewable or non-renewable energy?	Greece relies on a range of sources for electricity, with no source accounting for more than 50%. In August 2022, natural gas and renewable sources, such as wind and solar, accounted for the most power. According to Independent Power Transmission Operator (IPTO) the electricity mix share for 2022 is: 10.9% lignite, 35.4% fossil gas, 38.5% RES, 8.2% large hydro, 6.6% Net imports.	
83)	What is the main source of renewable energy?	In Region of Western Macedonia were installed (2022): Wind Parks: 201,50 MW Small Hydro: 24,32 MW PV's: 460,43 MW Biomass/Biogas: 3,74 MW	Source: <a href="https://www.dapeep.gr/">https://www.dapeep.gr/</a>
84)	What is the main source of non-renewable energy?	Lignite	
85)	Are state subsidies received to promote renewable energies?	See Q68	
86)	What is the percentage of employment covered by the energy sector?	Not available data	
87)	Which is the average price of energy (€/kW h)? (Differences between renewable and non)	Greece, June 2022: The price of electricity is 0.187 €/kWh for households and 0.117€/kWh for businesses which includes all components of the electricity bill such as the cost of power, distribution and taxes.	
88)	Which percent of energy usage comes from renewable energy?	According to Independent Power Transmission Operator (IPTO) the electricity mix share for 2022 is: 10.9% lignite, 35.4% fossil gas, 38.5% RES, 8.2% large hydro, 6.6% Net imports.	
89)	Which are the future perspectives?	The National Energy and Climate Plan of the Hellenic Republic, sets the following goals for the year 2030. Share of participation of renewable energy sources of at least 35% in the gross final energy consumption, a percentage higher than the central European target for renewable energy sources which is 32%. In addition, an energy transformation is sought	

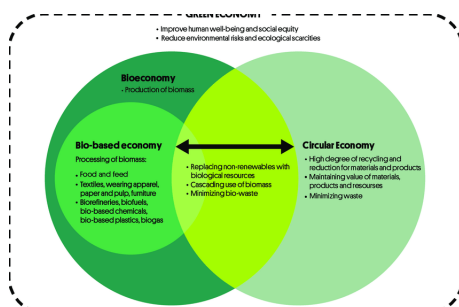
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	in the power generation sector with the share of renewable energy sources in electricity consumption exceeding 60%.			
MUNICIPAL SOLID WASTE (MSW)				
Questions		Answer	Comments	
90)	How many tonnes of MSW are generated per year?	For 2021: 91,975 tn/y		
91)	Which is their main composition?	Organic fraction	39.4891 %	
		Mixed paper	21.01056%	
		Plastic	14.07479%	
		Metals	2.163881%	
		Glass	2.603058%	
		Rubbers/Leathers/Woods/T extiles	7.391036%	
		Idle	1.947028%	
		Rest	10.68394%	
		Bulky	0.427159%	
		WEEE	0.058852%	
		Green	0.150597%	
92)	Are the wastes exploited? (Indicate how)	The organic fraction together with the green waste is composted, the recyclables are sold in the market, the bulky and WEEE are recycled by private companies.		
93)	Where are the MSW generated?	Western Macedonia Region		
94)	Who are the main stakeholders involved in the MSW management?	DIADYMA SA, municipalities, EDADYM		
95)	How is MSW valorised? (Added-value products)	The organic fraction is composted		
96)	Which is the price of MSW added value-products?	-		
Which are the future perspectives? (Techniques, wastes)		Separate collection of spent coffee grounds for valorisation, Valorisation of Used Cooking Oils, Valorisation of plastic waste streams towards products with higher added value		





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# Regional bioeconomy development and promotion. Policy framework

CROSS-CUTTING ISSUES		
Questions	Answer	Comments
97) Does your region have a strategy for circular bioeconomy?	<p>There is no dedicated bioeconomy strategy, but only national related strategies, such as the National Action Plan on Circular Economy, the National Climate Change Adaptation Strategy, CAP's Rural Development Program, the National Strategic Framework for Research and Innovation and the National Energy and Climate Plan.</p> <p>Regional strategies are occasionally elaborated within EU funded projects, however in the most cases they remain non binding. E.g. the bioeconomy Research Driven Innovation Strategy within the BIOECO – R.D.I project or nowadays through the EU funded project (BIOMODEL4REGIONS). On a national level the CEE2ACT EU project is building the roadmap for the national bioeconomy strategy.</p>	
98) Existence of bioeconomy hubs, clusters or any other association in the region?	<p>In Greece, both research in the bioeconomy /bio based economy field as information and promotion policies are lagging behind at national and especially regional level, compared to the European counterparts.</p> <p>On a regional level:</p> <p>Cluster of Bioeconomy and Environment of Western Macedonia (CluBE) is a non-profit organization based in Kozani where the five pillars of the regional economy can cooperate. CluBE develops R&amp;D and business activities in the fields of bioeconomy, circular economy, bioenergy and environment, in order to strengthen the green economy in the region.</p> <p>DIADYMA SA, the intermunicipal - regional waste management company is strongly involved in the circular economy and bioeconomy field. The company's plans for the next period includes the conversion of the Integrated Waste Management Central facilities (IWMCF) into a Circular Economy Park, in order to achieve the objectives of the National Waste Management Plan.</p> <p>Agrifood Partnership of Western Macedonia is a civic non-profit-making organization that was established to support agri-food products of Western Macedonia. APWM has 28 members, comprising municipalities, chambers of commerce, agricultural cooperatives, federations, and private enterprises.</p>	
99) Existing of hubs or cluster targeting other topic or sectors? (please specify)	Amyndeon Oenos Wine cluster - The wine cluster is developed in the region of Western Macedonia, including more than 20 wineries of the Amyndeon area.	



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	<p>AgriDiverCluster - Cluster of the producers of aromatic plants (national)</p> <p>Cluster of dairy producers (regional)</p> <p>Coalition Excellence Hub in Widening regions (running since 01/2023) focused on sustainable energy. COALition intends to strengthen the regional innovation ecosystems in coal-dependent areas through the creation of regional excellence hubs and the definition of a joint strategic agenda for sustainable energy in GR, BG and Ro.</p> <p>Under establishment</p> <p>Hydrogen Innovation Hub (under establishment). Establishment and Development of a H<sub>2</sub> Innovation HUB for conducting research in H<sub>2</sub> Applications and circular economy</p> <p>Sunergyn (is a competence centre under establishment, that has received Seal of Excellence and will be financed by national resources)</p>	
<p>100) What environmental indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (GHG decrease achieved with bioeconomy initiatives, resources depletion, implementation strategy aiming zero waste, etc.) ?</p>	<p><b>Environmental awareness</b></p> <p><b>KPI: Awareness and information campaigns on the benefits of industrial symbiosis/zero waste strategies</b></p> <ul style="list-style-type: none"> <li>• <b>Number of initiatives - programs, projects, strategies</b></li> </ul> <p>Promote awareness and information campaigns on the benefits and advantages of undertaking activities in the CBE sector through participatory processes aimed at the implementation of zero waste programs, projects or strategies.</p>	
<p>101) What economic indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (turnover linked to biobased companies (forestry, agriculture, other-biobased industries), existence of funding programmes/schemes targeting bioeconomy, existence of supporting measures promoting partnerships between industries and enterprises in the region, etc.) ?</p>	<p><b>Investment framework</b></p> <p><b>KPI: Special incentives provided for value chain development and integration</b></p> <ul style="list-style-type: none"> <li>• <b>Number of incentives</b></li> <li>• <b>Number of initiatives</b></li> </ul> <p>The region faces a significant deficit in agricultural value chain development. Western Macedonia specializes in the production of several agricultural products, both traditional and new / innovative. However, despite several successful exemptions, vertical and horizontal integration of value chains is limited.</p> <p>In the context of the Greek Rural Development Program these should include special (higher) <b>co-financing rates</b> of support for investments which promote vertical integration. These special rates could target both food processing firms linked to local production and especially vertically integrated firms in all four regional administration units. Investments should especially target the establishment of new firms, the upgrade of equipment, the utilization of specialized personnel and the introduction of innovation, including digital agriculture. Special incentives designed for the establishment of producer organizations (PO) and farm cooperatives and for supporting their entrepreneurial capacity;</p> <p><b>Partnerships established</b></p> <p><b>KPI: Partnerships between industries and enterprises in the region</b></p> <p><b>Number of initiatives</b></p> <p>Contract farming in the region has been associated with several success stories in the last few years, especially</p>	<p>According to ANKO S.A. in BRIDGES Policy learning / Mapping and understanding the innovation potential of bio-economy businesses in the partner regions. The case of W. Macedonia, Greece, focused in Agri-Food:</p> <p>Bio-economy businesses that have received public support (as appliers or part of a partnership) for innovative products development and which have invested for the product development during the last 3 years</p> <p>Bio-economy businesses that have utilised advanced research services (e.g. material research measurements) during the last 3 years; single, short term cooperation.</p> <p>Bio-economy businesses that have been developing products through Research2Business innovation partnerships</p>

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	<p>since the banking sector's involvement. In this context, the banking sector covers the entire production, supply and processing chain of agricultural production, by supporting carefully planned, mutually beneficial partnerships between farmers and businesses that trade in, process and sell agricultural products. Most contract farming initiatives in the region have generated new jobs and products have penetrated export markets.</p> <p><b>KPI: Research2Business innovation partnerships</b></p> <p><b>Number of partnerships</b></p> <p><b>Number of research - experimental - pilot projects developed</b></p> <p><b>Number of new products / processes developed</b></p> <p>Entrepreneurship supported especially for sectors which are highly productive and characterized by innovation and competitiveness, aiming to link research and entrepreneurship. This would support local human resources to identify new business opportunities and entrepreneurship fields, carry out research - experimental - pilot projects, develop new products and production/marketing processes.</p> <p><b>KPI: agri-food clusters and productive alliances</b></p> <p><b>Number of entities / memberships</b></p> <p>Given the current business structure in the agri-food sector, the creation of strong, competitive regional agri-food clusters and productive alliances could be another indicator. Also sub-regional initiatives on productive alliances involving agri-food can be another option which would boost incomes and employment, especially for skilled and youth labor.</p> <p><b>KPI: Additional profit generation possibilities</b></p> <p><b>Number of employees in sector</b></p> <p><b>Turnover of sector</b></p> <p><b>Biomass</b> production is another alternative activity which would generate jobs in the region. Establishing and managing a biomass trade centre could help organise the biomass supply chain and guarantee both the quantity and quality of the biomass.</p> <p>The <b>Energy Communities</b> established or under development (around 260 as of 2023) in the area could support this endeavour. Forestry residues and residues from cereals, vineyards and tree crops can be also utilized (since they are only partly utilized for one district heating plant).</p> <p>The diffusion of small scale biogas units could be feasible in order to exploit livestock and agricultural waste. Further, <b>farmers groups</b> or other associations can build an Electricity and Heat Co-production Unit (e.g. as the 3 biogas plants). The electricity generated could be injected into the network and thermal energy could meet the needs of district heating networks and greenhouses.</p>	<p>during the last 3 years; long term, comprehensive cooperation.</p> <p>Bio-economy businesses that have applied for patents (biotechnology) and /or IPR during the last 3 years.</p>
102) What social indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (available skilled workforce, number or jobs created in the last 5 years in bio-based industries, communications to society regarding bio-based activities	<p><b>Skills and competencies of human resources</b></p> <p><b>KPI: Available skilled workforce</b></p> <p><b>Number of Curricula and courses offered</b></p> <p><b>Number of persons participating</b></p>	

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<p>(seminars, trainings, etc.), willingness to pay for bio-based products, etc.?</p>	<p>Skills and competencies of human resources in agri-food strengthened (through upgrading education infrastructures and developing skill-acquisition programs and provision of advice and technical support).</p> <p>Training and skills acquisition coordinated by the Faculty of Agriculture of the University of Western Macedonia or other entities.</p> <p><b>Communication and Dissemination activities to society</b></p> <p><b>KPI: increase awareness and knowledge in the domain</b></p> <p><b>Number of tools used/developed</b> (online collaboration platforms and social networks, library of regional bio-based products, development of training materials, social hack days, co-creation workshops, etc.)</p> <p>communication, promotion and diffusion of new bio-based products and applications and fuller explanation of their benefits, targeting society at large.</p> <p>raise public awareness of bio-based products potential, promote their applications and benefits as well as provide the means to follow ongoing developments in the industry and research.</p> <p>provide a wide range of integrated, high level activities and tools with recognized added value for communication programmes, having citizens as their main target.</p>	
<p>103) Current economic and social characteristics of your territory not reported in previous questions that could enable the development of the circular bioeconomy?</p>	<p>Well as said, since the regional decarbonisation strategy will require to cease the coal-fired power plants in the near future, some thousands of coal miners and other related professions will have to be re or upskilled, since they will lose their jobs. This will comprise an opportunity also for the bioeconomy domain in the region.</p>	
<p>104) Are there any bio-based production districts / specializations in your Region? (Please, provide a description of these activities, including data, focusing on Circular Bio-based Economy potentials and material/immaterial assets as well as existing barriers)</p>		
<p>105) What are the strengths/weaknesses of your area regarding the development of the circular bioeconomy?</p>	<p><u>Strengths</u></p> <ul style="list-style-type: none"> <li>• Superior quality of foods, linked to authentic local products.</li> <li>• Strong link of the Greek to the Mediterranean diet, an UNESCO Cultural Heritage of Humanity.</li> <li>• Agriculture and animal husbandry represents a significant portion of the regional economic activity, with sizable growth potential, if combined with modern ICT tools.</li> <li>• Livestock is one of the most important sectors in the region, the animal capital, as well as the milk production that ranks among the first in Greece, despite the fact that the livestock producers' income is continuously declining the last decade.</li> <li>• Diverse soil and good climate conditions, allowing for a variety of products.</li> <li>• A multitude of university departments that offer quality education.</li> <li>• Connections between companies and institutions within the supply chain, through clusters' formation and the cooperation and synergies of farmers,</li> </ul>	

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	<p>manufacturers and trade companies are gaining ground.</p> <ul style="list-style-type: none"> <li>• The number of holdings practicing organic farming has increased.</li> <li>• The cultivation and manufacturing of aromatic plants due to the region's unique nature, flora and fauna has also increased significantly.</li> </ul> <p><u>Weaknesses</u></p> <ul style="list-style-type: none"> <li>• Aging farming population and limited entrepreneurial activity of farmers.</li> <li>• Agriculture high production cost and low productivity and production.</li> <li>• Small size and high fragmentation of land, with limited use of new technologies.</li> <li>• Limited innovation and technology integration and lack of strategic planning and investments towards R&amp;D (agriculture, industry).</li> <li>• The manufacturing base is in traditional sectors (fruits, wines) mostly in small, family owned enterprises.</li> <li>• Insufficient communication, coordination and collaboration between companies, universities and research institutions.</li> <li>• Non-existing long-term agri-food policy and insufficient regulatory framework for promoting innovation and technology.</li> <li>• High costs of transport due to the mountainous area and the lack of logistic infrastructures.</li> </ul>	
106) Please, identify actors with a natural interest in a project due to their existing businesses and market in your territory	<p>Potential regional actors that could be interested for a circular bioeconomy project:</p> <ul style="list-style-type: none"> <li>• Cluster of Bioeconomy and Environment of Western Macedonia (CluBE)</li> <li>• DIADYMA (regional waste management company)</li> <li>• ANKO (regional development organisation)</li> <li>• Aromatic plantations and distillery companies (e.g. Dioscourides, Herbs and Oils, Enteka, etc.)</li> <li>• Amyntaio District Heating Company (DETEPA) (co-firing of biomass)</li> <li>• Wood processing companies (e.g. Chliapas, Alfa Wood etc.).</li> <li>• Biogas plants (MAVIK, Bisiritsas, Matmouazel)</li> <li>• Animal feed company (MAVIZ)</li> <li>• Animal by products processing (Bioexis - Animal By-product Rendering company)</li> </ul> <p>Not on regional, but on a national level, however easily transferable and with a high regional interest :</p> <p>Exploitation of postfire timber (usable wood after wildfires), which has a market potential and is used by companies such as <a href="https://coco-mat.bike/about/">https://coco-mat.bike/about/</a> to produce wooden items such as bikes.</p> <p>In addition, some academia are using this kind of timber for the construction of like-minded products such as toys (University of Thessaly), in combination with training</p>	

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	seminars / workshops and fab - labs addressed to vulnerable people such as disabled persons.	
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ESAmEA Disability Issues Observatory

Agronews

FOUNDATION FOR ECONOMIC & INDUSTRIAL RESEARCH

Greek forest service

Υ.Α. ΥΠΕΝ/ΔΔΔ/67067/2059/14.07.2021 (Β' 3328) – GREEK VERSION

San-Miguel-Ayaz, J., Durrant, T., Boca, R., Maianti, P., Libertá, G., Artés-Vivancos, T., Oom, D., Branco, A., de Rigo, D., Ferrari, D., Pfeiffer, H., Grecchi, R., Onida, M., Löffler, P. 2022. Forest Fires in Europe, Middle East and North Africa 2021, Publications Office of the European Union, Luxembourg, 2022, doi: 10.2760/34094, JRC130846.

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Hellenic Association of Biogas Producers

<https://www.dapeep.gr/>



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## Annex 10. Croatia region profile

INFORMATION FOR STATISTICAL ANALYSIS		
REGIONS (EUROSTAT NUTS 2 – Level)		
(Please indicate for your region which NUTS 2-Regions are relevant or add additional regions in the comment section.)		
Question	Suggested NUTS 2 regions	Comments
1) Germany – Region of Baden-Württemberg	<input type="checkbox"/> Stuttgart (please translate to English) <input type="checkbox"/> Karlsruhe (please translate to English) <input type="checkbox"/> Freiburg (please translate to English) <input type="checkbox"/> Tübingen (please translate to English)	
2) Spain – Region of Aragon	<input type="checkbox"/> Zaragoza (please translate to English) <input type="checkbox"/> Huesca (please translate to English) <input type="checkbox"/> Teruel (please translate to English)	
3) Greece – Region of Western Macedonia	<input type="checkbox"/> Dyitiki Makedonia (please translate to English)	
4) Bulgaria – Region of Plovdiv	<input type="checkbox"/> Yuzhen tsentralen (please translate to English)	
5) Slovakia – Nitra Self-Governing Region	<input type="checkbox"/> Západné Slovensko (please translate to English)	
6) Slovenia – Whole Country	<input type="checkbox"/> Vzhodna Slovenija (please translate to English) <input type="checkbox"/> Zahodna Slovenija (please include the traduction)	
7) Croatia – Region Adriatic Croatia	<input type="checkbox"/> Jadranska Hrvatska (Adriatic Croatia)	
8) Hungary – Region North Hungary	<input type="checkbox"/> Észak-Magyarország (please translate to English)	
9) Romania – West region	<input type="checkbox"/> Vest (please translate to English)	
10) Czechia – Region BIOEAST	<input type="checkbox"/> Praha (please translate to English) <input type="checkbox"/> Střední Čechy (please translate to English) <input type="checkbox"/> Jihozápad (please translate to English) <input type="checkbox"/> Severozápad (please translate to English) <input type="checkbox"/> Severovýchod (please translate to English) <input type="checkbox"/> Jihovýchod (please translate to English) <input type="checkbox"/> Střední Morava (please translate to English) <input type="checkbox"/> Moravskoslezsko (please translate to English)	
11) Netherlands – Region Apeldoorn	<input type="checkbox"/> Gelderland (please translate to English)	
12) Italy – Region Campania	<input type="checkbox"/> Campania (please translate to English)	



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# How to identify socially marginalised groups?

SOCIALLY MARGINALISED GROUPS		
Questions	Answer	Comments
1) Population area with less than 5.000 inhabitants	-24 705 km <sup>2</sup> - area of entire Adriatic	<a href="https://hrcak.srce.hr/file/391532">https://hrcak.srce.hr/file/391532</a> <a href="https://ec.europa.eu/eurostat/web/rural-development/methodology">https://ec.europa.eu/eurostat/web/rural-development/methodology</a> <a href="https://ghsl.jrc.ec.europa.eu/CFS.php">https://ghsl.jrc.ec.europa.eu/CFS.php</a> <a href="https://observatory.rural-vision.europa.eu/place?lng=en&amp;ctx=RUROBS&amp;tu=HR03&amp;tl=2&amp;ts=RUROBS&amp;pil=level-indicator&amp;is=Default&amp;cl=rural&amp;clc=highlights&amp;fvs=false">https://observatory.rural-vision.europa.eu/place?lng=en&amp;ctx=RUROBS&amp;tu=HR03&amp;tl=2&amp;ts=RUROBS&amp;pil=level-indicator&amp;is=Default&amp;cl=rural&amp;clc=highlights&amp;fvs=false</a>
2) Unemployment rate in the area	9.4%	<a href="https://ec.europa.eu/eurostat/databrowser/view/tgs00010/default/table?lang=en">https://ec.europa.eu/eurostat/databrowser/view/tgs00010/default/table?lang=en</a> - ADR, 2021
3) Employment rate of women in the region and at national level	Adriatic Croatia: 56.7 % Croatia: 58.6 %	<a href="https://ec.europa.eu/eurostat/databrowser/view/LFST_R_LFE2EMPRT_custom_4932678/default/table?lang=en">https://ec.europa.eu/eurostat/databrowser/view/LFST_R_LFE2EMPRT_custom_4932678/default/table?lang=en</a> - 2021
4) Main economic activity in the area	(180.57 k employed in Adriatic Croatia)	<a href="https://www.iz.sk/en/projects/eu-regions/HR03">https://www.iz.sk/en/projects/eu-regions/HR03</a> ; <a href="https://observatory.rural-vision.europa.eu/place?lng=en&amp;is=Default&amp;ts=RUROBS&amp;tl=2&amp;tu=HR03&amp;cl=rural&amp;clc=labour-20market&amp;ctx=RUROBS">https://observatory.rural-vision.europa.eu/place?lng=en&amp;is=Default&amp;ts=RUROBS&amp;tl=2&amp;tu=HR03&amp;cl=rural&amp;clc=labour-20market&amp;ctx=RUROBS</a> - 2019
5) Jobs at risk		
6) Main breadwinner of the family nucleus		
7) Average educational level and share of population with different school attainment	Adriatic Croatia, age 25-64: Level 0-2: 10.6% Level 3-4: 64.8% (Upper secondary and post-secondary non-tertiary education) Level 5-6: 24.6%  Adriatic Croatia: Attainment of higher education 23.7% Attainment of tertiary education 38% Lifelong education 3%	<a href="https://ec.europa.eu/eurostat/databrowser/view/EDAT_LFSE_04_custom_4943272/default/table?lang=en">https://ec.europa.eu/eurostat/databrowser/view/EDAT_LFSE_04_custom_4943272/default/table?lang=en</a> -  <a href="https://prigoda.hr/wp-content/uploads/2022/03/Plan-za-industrijsku-tranziciju-Jadranske-Hrvatske.pdf">https://prigoda.hr/wp-content/uploads/2022/03/Plan-za-industrijsku-tranziciju-Jadranske-Hrvatske.pdf</a>  <a href="https://ec.europa.eu/eurostat/databrowser/view/TGS00109_custom_5055609/default/table?lang=en">https://ec.europa.eu/eurostat/databrowser/view/TGS00109_custom_5055609/default/table?lang=en</a> :Tertiary educational attainment, age group 25-64: 24%
8) Population age structure in the region and at national level	Adriatic Croatia: 0-19 years: 18.37%; 20-39 years: 22.50%; 40-64 years: 34.62%; 65+: 24.51 % (Counties of Adriatic Croatia individually: Primorje Gorski: 0-19 years: 16.58%; 20-39 years: 21.57%; 40-64 years: 36%; 65+ :25.85% Lika-Sinj: 0-19 years: 17.19%; 20-39 years: 21.56%; 40-64 years: 35%; 65+ :26.25% Zadar county: 0-19 years: 19.52%; 20-39 years: 22.91%; 40-64 years: 33.59%; 65+: 23.98% Šibenik-Knin county: 0-19 years: 17.28%; 20-39 years: 21.3%; 40-64 years: 34%; 65+: 27.42 % Split-Dalmatia County: 0-19 years: 20.05 %; 20-39 years: 24.12%; 40-64 years: 34.08%; 65+: 21.75% Istria county: 0-19 years: 17.54 %; 20-39 years: 22.17%; 40-64 years: 36.14%; 65+: 24.15%	<a href="https://dzs.gov.hr/vijesti/objavljeni-konacni-rezultati-popisa-2021/1270">https://dzs.gov.hr/vijesti/objavljeni-konacni-rezultati-popisa-2021/1270</a> <a href="https://observatory.rural-vision.europa.eu/place?lng=en&amp;is=Default&amp;ts=RUROBS&amp;tl=2&amp;tu=HR03&amp;cl=rural&amp;clc=demography-20-26-20migration&amp;ctx=RUROBS">https://observatory.rural-vision.europa.eu/place?lng=en&amp;is=Default&amp;ts=RUROBS&amp;tl=2&amp;tu=HR03&amp;cl=rural&amp;clc=demography-20-26-20migration&amp;ctx=RUROBS</a>

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	Dubrovnik-Neretva County: 0-19 years: 20.1 %; 20-39 years: 23.86%; 40-64 years: 33.51%; 65+: 22.53%)  Croatia: 0-19 years: 19.14%; 20-39 years: 23.40%; 40-64 years: 35%; 65+: 22.46%	
9) Share of ethnics minorities in the region and at national level	Adriatic Croatia: 10.63% Croatia: 8.37%	<a href="https://podaci.dzs.hr/hr/podaci/stanovnistvo/2021">https://podaci.dzs.hr/hr/podaci/stanovnistvo/2021</a>
10) Emigration rate in the region and at national level	Adriatic Croatia: Crude rate of net migration plus statistical adjustment 1.2; net migration plus statistical adjustment 1679 (2020) Croatia: Crude rate of net migration plus statistical adjustment -0.2; net migration plus statistical adjustment - 632 (2020)  In 2021, 35,912 people immigrated to the Republic of Croatia from abroad, and 40,424 people moved abroad. The balance of migration of the population of the Republic of Croatia with foreign countries was negative and amounted to -4512.	<a href="https://ec.europa.eu/eurostat/databrowser/view/DEMO_R_GIND3_custom_5256874/default/table?lang=en">https://ec.europa.eu/eurostat/databrowser/view/DEMO_R_GIND3_custom_5256874/default/table?lang=en</a>  <a href="https://ec.europa.eu/eurostat/databrowser/view/TGS00099_custom_4943664/default/table?lang=en">https://ec.europa.eu/eurostat/databrowser/view/TGS00099_custom_4943664/default/table?lang=en</a>
11) Average salary or household income in the region and at national level	Annual basis (2020): Adriatic Croatia: 10 045.91 million EUR Croatia: 31 919.61 million EUR  Monthly individual basis (12/2022): Adriatic Croatia: 982.14 Croatia: 1,041.34 EUR	<a href="https://ec.europa.eu/eurostat/databrowser/view/NAMA_10R_2HHINC_custom_4934928/default/table?lang=en">https://ec.europa.eu/eurostat/databrowser/view/NAMA_10R_2HHINC_custom_4934928/default/table?lang=en</a> <a href="https://ec.europa.eu/eurostat/databrowser/view/NAMA_10_FTE_custom_4938524/default/table?lang=en">https://ec.europa.eu/eurostat/databrowser/view/NAMA_10_FTE_custom_4938524/default/table?lang=en</a> <a href="https://podaci.dzs.hr/2022/hr/31509">https://podaci.dzs.hr/2022/hr/31509</a>
12) Please describe the structure and the characteristics of relevant socially disadvantaged/ marginalized groups in your region	Poverty in Croatia has a strong rural dimension and remains linked to agriculture. A relatively large share of Croatia's population lives in rural areas; in 2017, 43% of the Croatian population lived in rural areas compared to 19.2% in the EU-28.53 However, rural areas in Croatia are characterized by a lower labor force participation rate than in other EU countries. In 2014, labor force participation in rural areas in Croatia was 51% compared to 56.7% in the EU28 and 55% in the EU-13.54 In addition, poverty in Croatia tends to concentrate in rural areas. Recent poverty maps developed by the World Bank show that the highest geographical concentration of factors influencing the share of people at risk of poverty can be found in rural areas as well as small towns and settlements in the east and the southeast of the country, mainly along the borderline with Bosnia and Herzegovina (BiH) and Serbia (which are also the areas that were most affected by the Homeland War in the 1990s.) Energy poverty: In Croatia, there no accepted definition of energy poverty. According to data from the National Bureau of Statistics on indicators of poverty and social exclusion the rate of risk of poverty in Croatia in 2019, was 18.3%, while in 2018 it was 19.3%. If social transfers and pensions are excluded from income, this share increases to 41.0% (2019) and 42.9% in 2018. The rate of material deprivation in 2019 was 19.6%. As part of the POWERPOOR project (Horizon2020) DOOR with and other partners produced a report on the current state of energy poverty in the 8 pilot countries of the project (Bulgaria, Croatia, Estonia, Greece, Latvia, Hungary, Portugal and Spain), in which the data and indicators for energy poverty in Croatia are presented. in 2019, 6.6% of	<a href="https://hrvatska2030.hr/wp-content/uploads/2020/10/Agriculture-Fisheries-and-Food-Processing-in-Croatia_s-Food_-Bio-Economy.pdf">https://hrvatska2030.hr/wp-content/uploads/2020/10/Agriculture-Fisheries-and-Food-Processing-in-Croatia_s-Food_-Bio-Economy.pdf</a>

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	<p>the population could not afford to keep their house warm, while for the EU this percentage was 6.9%. In Croatia in 2019, 14.8% of the population had arrears on utility bills, while for the EU this percentage was 6.2%. As part of Energy Poverty Advisory Hub Call for Technical Assistance Application Form city of Zagreb create Energy poverty Mitigation Programme. The Programme will directly contribute to the decrease of energy poor households in Zagreb, an increase of energy savings and energy efficiency, and a decrease in carbon emissions which will on a more global scale contribute to the fulfilment of national climate goals.</p> <p><b>Households on the continent are at a higher risk of poverty compared to Adriatic Croatia,</b> and according to the analyzed risk rates according to activity and age, the most risky categories are the unemployed and people over 65 years old. As part of EmpowerMed (Horizon2020), DOOR mapped 200 households in the area of the city of Zadar and Zadar County, an area belonging to the Mediterranean the focus was placed on women and households exclusively with women who are more affected by energy poverty. On the other hand, women are the main drivers and actors in the fight against energy poverty. As part of the ENPOR project, households that are in the private rental sector are mapped and emphasis is placed on tenants as a group of households that are at risk of energy poverty.</p> <p>Women and single mothers have more difficulty paying their energy bills than men, according to <a href="#">Eurofound</a> data from 2022. This is often a consequence of lower average incomes and more frequent work in poorly paid and insecure jobs, as well as part-time work.</p> <p>Small family farms are faced with continuous economic pressures. In addition to the daily struggle to maintain income and survive, more and more environmental requirements are imposed on them that they need to fulfill. All of this can have a negative impact on farm productivity. Renewable energy sources are a potential that many family farms in the member states already use as an additional source of income.</p> <p>Identify which small family farms are energy poor, and include them in the circular bioeconomy.</p>	
13) Please comment the potential impact of their participation in Circular Bio-based Economy	<p>By including women in the circular bioeconomy, one would achieve an increase in the living standards of women in the region and raise awareness of the problem of women in society in general.</p> <p>The inclusion of family farms in the circular bioeconomy would provide them with additional income, new opportunities on the market and reduction of current costs.</p> <p>By expanding activities, all available resources can be used better and additional income can be generated. This would include subsidies, processing, agritourism or other forms of income</p>	



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	<p>outside of the farm's primary agricultural production.</p> <p>The natural resources of rural areas also provide opportunities for additional income from renewable sources through energy production. Some of the problems that can be solved are the provision of jobs for family members and the wider rural community. Also, a contribution to environmental goals, while ensuring the sustainability of family farms by exploiting resources not only for primary food production.</p>	
14) Please indicate the factors hindering their possible participation?	<p>Lack of education and lack of information about the opportunities offered.</p> <p>Lack of mobility and poor connection with city centers and the urban environment.</p> <p>IT literacy.</p>	
15) Indicate the selected marginal group/s that will be targeted during the project and relevance in the region	<p>Energy poor households</p> <p>Family farm</p> <p>Women</p> <p>+ organizations that work with marginal groups in society (social welfare office, Red Cross, Caritas...)</p>	
16) Average educational level of targeted marginalized groups	No data	
17) Description of the occupied post, considering the type of work performed and the qualification required by the targeted marginalized groups (question 13)	<p>Jobs in innovation production - education on how to become part of the innovation cycle.</p> <p>Jobs in local cooperatives, local and local self-government - education about funding, grants and subsidies. Education about innovations through existing projects, connecting agricultural producers and presenting smart agricultural practices.</p> <p>Jobs in processing industries - education about modern technologies and energy-efficient technologies.</p> <p>Holding various courses for additional education - MS office courses, proposal writing courses, public procurement courses...</p>	



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# Situation of main economic sectors

PRIMARY SECTOR		
AGRICULTURE		
Questions	Answer	Comments
18) How large is the surface of cultivable areas?	38 150 hectares	<a href="https://ec.europa.eu/eurostat/databrowser/view/EF_LAC_MAIN_custom_4938562/default/table?lang=en&amp;page=time:2016">https://ec.europa.eu/eurostat/databrowser/view/EF_LAC_MAIN_custom_4938562/default/table?lang=en&amp;page=time:2016</a> - ADR
19) Which are the main crops in the area (surface in hectares of percentage of the cultivable area occupied by each crop)	<p>Maize (corn) is the most dominant crop in the Republic of Croatia, based on the agricultural area utilized. It accounts for about 25% of the total agricultural area in the country. Other important crops in Croatia include wheat, barley, oats, and soybeans. Sunflower and rapeseed are also significant oil crops grown in Croatia. Additionally, Croatia is known for its production of fruits such as apples, plums, and grapes, as well as vegetables such as tomatoes, peppers, and onions.</p> <p>The Adriatic region has a diverse agriculture industry, but some of the main crops grown in this area include:</p> <p>Olives - Adriatic Croatia is home to many olive groves and produces high-quality extra virgin olive oil.</p> <p>Grapes - Croatia is known for its wine production, and the Adriatic region is no exception. Some popular grape varieties grown in this area include Plavac Mali, Teran, and Malvazija.</p> <p>Citrus fruits - The coastal climate in Adriatic Croatia is ideal for growing citrus fruits such as oranges, lemons, and mandarins.</p> <p>Figs - Figs are a popular crop in this region and are often used in local dishes and desserts.</p> <p>Almonds - Almond trees are commonly found in the Adriatic region and produce a nut that is used in a variety of sweet and savory dishes.</p> <p>Lavender - The islands of Hvar and Vis are known for their lavender production, which is used in the production of essential oils, perfumes, and soaps.</p> <p>Vegetables - Adriatic Croatia produces a range of vegetables, including tomatoes, peppers, zucchini, and eggplant.</p> <p>Medicinal herbs - The region is also known for its production of medicinal herbs such as sage, rosemary, and thyme.</p> <p>Adriatic Croatia:</p> <p>Fruits: mandarins 2044 ha, cherries 1042 ha, plums 670, figs 570 ha, peach and nectarines 315 ha, apple 284 ha, walnut 201 ha, hazelnuts 148 ha.</p> <p>Pear, apricot, strawberries, oranges, lemon each &lt;100 ha</p> <p>Grapes 10 227ha</p> <p>Olives 19 940 ha</p> <p>Vegetables: white and red cabbage 277 ha</p> <p>Field crops: Barley 2139 ha, potato 1813, corn 1638 ha, wheat 1272 ha, oats 1031 ha, aromatic, spicy and medicinal herbs 925</p> <p>Adriatic Croatia:</p> <p>Cereals for the production of grain (including seed) - 38.51% of cultivable area</p> <p>Plants harvested green from arable land – 36.30% of cultivable area</p> <p>Root crops – 7.55% of cultivable area</p>	<p><a href="https://ec.europa.eu/eurostat/databrowser/view/EF_LAC_MAIN_custom_4938562/default/table?lang=en&amp;page=time:2016">https://ec.europa.eu/eurostat/databrowser/view/EF_LAC_MAIN_custom_4938562/default/table?lang=en&amp;page=time:2016</a></p> <p><a href="https://web.dzs.hr/PXWeb/Menu.aspx?px_tableid=B_P4_NUTS2021.px&amp;px_pat h=Poljoprivreda,%20lov,%20%20c5%a1umarstvo%20i%20Oribarstvo_Biljna%20pr oizvodnja&amp;px_language=h r&amp;px_db=Poljoprivreda,%20lov,%20%20c5%a1umarstvo%20i%20Oribarstvo&amp;rxid=396e4ba1-4660-4248-a727-67f6ed293a57">https://web.dzs.hr/PXWeb/Menu.aspx?px_tableid=B_P4_NUTS2021.px&amp;px_pat h=Poljoprivreda,%20lov,%20%20c5%a1umarstvo%20i%20Oribarstvo_Biljna%20pr oizvodnja&amp;px_language=h r&amp;px_db=Poljoprivreda,%20lov,%20%20c5%a1umarstvo%20i%20Oribarstvo&amp;rxid=396e4ba1-4660-4248-a727-67f6ed293a57</a> - adriatic, 2021</p>



20) Which is the average annual production (dry basis) of the most relevant crops (listed in question 15)?



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	<p>sufficiency in the production of oilseeds was 222.50%. In 2017, on the harvested area of 174,895 ha, a total of 462,896 t of oilseeds were produced with an average yield per hectare of 2.6 t. The total production of essential oils, which includes lavender, in Croatia in 2020 was approximately 48.6 tonnes.</p> <p>Average annual production (t) for Adriatic Croatia: Fruits: mandarins 40 468 t, cherries 719 t, plums 700 t, figs 769 t, peach and nectarines 2111 t, apple 2292 t, walnut 4 t, hazelnuts 36 t, apricot 17 t, strawberries 458 t, oranges 548 t, lemon 199 t Grapes 55 905 t Olives 23 867 t Vegetables: white and red cabbage 6965 t Field crops: Barley 7687 t, potato 19972 t, corn 8975 t, wheat 5306 t, oats 2897 t, aromatic, spicy and medicinal herbs 1275 t</p>	
21) Average yield (dry basis) for the most relevant crops (listed in question 15)?	<p>Average annual yield (t/ha) for Adriatic Croatia: Fruits: mandarins 19.8 t/ha, cherries 0.7 t/ha, plums 1 t/ha, figs 1.3 t/ha, peach and nectarines 6.7 t/ha, apple 8.1 t/ha, apricot 0.3 t/ha, strawberries 9 t/ha, oranges 15.7 t/ha, lemon 3.6 t/ha] Grapes 5.5 t/ha Olives 1.2 t/ha Vegetables: white and red cabbage 25.1 t/ha Field crops: Barley 3.6 t/ha, potato 11 t/ha, corn 5.3 t/ha, wheat 4.2 t/ha, oats 2.8 t/ha, aromatic, spicy and medicinal herbs 1.4 t/ha</p>	<p><a href="https://web.dzs.hr/PXWeb/Table.aspx?layout=tableViewLayout1&amp;px_tableid=B_P2_NUTS2021.px&amp;px_pat_h=Poljoprivreda,%20Olov,%20%20c5%a1umarstvo%20i%20Oribarstvo_Biljna%20prizvodnja&amp;px_language=hr&amp;px_db=Poljoprivreda,%20Olov,%20%20c5%a1umarstvo%20i%20Oribarstvo&amp;rxid=396e4ba1-4660-4248-a727-67f6ed293a57">https://web.dzs.hr/PXWeb/Table.aspx?layout=tableViewLayout1&amp;px_tableid=B_P2_NUTS2021.px&amp;px_pat_h=Poljoprivreda,%20Olov,%20%20c5%a1umarstvo%20i%20Oribarstvo_Biljna%20prizvodnja&amp;px_language=hr&amp;px_db=Poljoprivreda,%20Olov,%20%20c5%a1umarstvo%20i%20Oribarstvo&amp;rxid=396e4ba1-4660-4248-a727-67f6ed293a57</a> -adr, 2021</p>
22) What is the percentage of employment covered by agriculture?	<p>Adriatic Croatia: Agriculture and mining - 3,8 % Agriculture, forestry &amp; fishery: 20.56 k</p> <p>Croatia: Agriculture in % of total employment: 6.4 % (Celebio, Cro)</p>	<p><a href="https://ec.europa.eu/eurostat/databrowser/view/LF_ST_R_LFE2EN2_custom_4948922/default/table?lang=en">https://ec.europa.eu/eurostat/databrowser/view/LF_ST_R_LFE2EN2_custom_4948922/default/table?lang=en</a> -</p> <p><a href="https://prigoda.hr/wp-content/uploads/2022/03/Plan-za-industrijsku-tranziciju-Jadranske-Hrvatske.pdf">https://prigoda.hr/wp-content/uploads/2022/03/Plan-za-industrijsku-tranziciju-Jadranske-Hrvatske.pdf</a></p> <p><a href="https://podaci.dzs.hr/medija/erdfes4y/statinfo2021.pdf">https://podaci.dzs.hr/medija/erdfes4y/statinfo2021.pdf</a> - hr</p> <p><a href="https://observatory.rural-vision.europa.eu/place?lng=en&amp;is=Default&amp;ts=RUROBS&amp;tl=2&amp;tu=HR03&amp;cl=rural&amp;clc=labour-20market&amp;ctx=RUROBS&amp;fvs=false">https://observatory.rural-vision.europa.eu/place?lng=en&amp;is=Default&amp;ts=RUROBS&amp;tl=2&amp;tu=HR03&amp;cl=rural&amp;clc=labour-20market&amp;ctx=RUROBS&amp;fvs=false</a> - ADRIATIC</p>
23) Are state subsidies received by the farmers (CAP or others)? Please shortly mention the crops and the aim of the subsidy (equipment modernisation, yield increase, etc.	<p>Yes.</p> <p>1.) CAP - ...</p> <p>2.) National Recovery and Resilience Plan (NPOO) - The reform includes various activities grouped into four measures: (i) establishment of a logistics infrastructure network to strengthen the production market chain in the fruit and vegetable sector; (ii) establishment of a system for agricultural land restructuring and consolidation; (iii) digital transformation of agriculture; (iv) improvement of the food donation system.</p> <p>3.) Support Program for primary agricultural producers who use agricultural land protected as cultural heritage - compensation for reduced</p>	<p><a href="https://agriculture.ec.europa.eu/news/commission-approves-cap-strategic-plans-croatia-slovenia-and-sweden-2022-10-28_en">https://agriculture.ec.europa.eu/news/commission-approves-cap-strategic-plans-croatia-slovenia-and-sweden-2022-10-28_en</a></p> <p><a href="https://seenews.com/news/eu-commission-approves-croatias-95-bln-kuna-126-bln-euro-wage-subsidy-plan-807896">https://seenews.com/news/eu-commission-approves-croatias-95-bln-kuna-126-bln-euro-wage-subsidy-plan-807896</a></p> <p><a href="https://poljoprivreda.gov.hr/nacionalni-plan-oporavka-i-otpornosti/5148">https://poljoprivreda.gov.hr/nacionalni-plan-oporavka-i-otpornosti/5148</a></p>



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	<p>income due to the obligation to comply with regulations on the protection of cultural heritage.</p> <p>3.) Strategic plan of the Common Agricultural Policy</p> <ul style="list-style-type: none"> <li>- Restoration of the agricultural potential, agricultural production insurance, support for the transfer of knowledge, support for the provision of advisory services, support for farmers' participation in quality systems, support for information and promotion activities carried out by groups of producers in the internal market, support for the establishment and work of production organizations, support for the LEADER (CLLD) approach, support to small farmers, business development in rural areas, non-productive investments related to environmental protection, extraordinary temporary support to farmers who are particularly affected by the effect of the Russian invasion of Ukraine .</li> </ul> <p>Rural development program:</p> <p>Tender for sub-measure 10.2. Support for conservation, sustainable use and development of genetic resources in agriculture.</p> <p>Tender for the type of operation 4.2.1 Increasing the added value of agricultural products.</p> <p>Tender for the type of operation 5.2.1. Restoration of agricultural land and production potential</p> <p>Tender for the implementation of measure 22 "Extraordinary temporary support to farmers and SMEs who are particularly affected by the effect of the Russian invasion of Ukraine" - "FARMERS"</p> <p>Tender for the type of operation 4.1.1 Restructuring, modernization and increasing the competitiveness of agricultural holdings - investments in irrigation on the agricultural holding</p> <p>Tender for sub-measure 17.1 Insurance of crops, animals and plants</p> <p>Tender for the type of operation 4.1.1 Restructuring, modernization and increasing the competitiveness of agricultural holdings - investments in storage capacities for cereals and oilseeds</p> <p>Tender for the type of operation 3.1.1 Support for the participation of farmers in quality systems for agricultural and food products.</p> <p>Tender for the type of operation 6.1.1. Support for young farmers.</p> <p>Tender for operation type 1.1.2 Internship training for farmers.</p>	<p><a href="https://poljoprivreda.gov.hr/javni-pozivi-i-natjecaji/1198">https://poljoprivreda.gov.hr/javni-pozivi-i-natjecaji/1198</a></p> <p><a href="https://ruralnirazvoj.hr/indikativni-plan-objave-natjecaja-u-2023/">https://ruralnirazvoj.hr/indikativni-plan-objave-natjecaja-u-2023/</a></p> <p><a href="https://ruralnirazvoj.hr/natjecaj-za-podmjeru-10-2-potpورا-za-ocuvanje-odrzivo-koristenje-i-razvoj-genetskih-izvora-u-poljoprivredi-2/">https://ruralnirazvoj.hr/natjecaj-za-podmjeru-10-2-potpورا-za-ocuvanje-odrzivo-koristenje-i-razvoj-genetskih-izvora-u-poljoprivredi-2/</a></p> <p><a href="https://ruralnirazvoj.hr/natjecaj-za-tip-operacije-4-2-1-povećanje-dodane-vrijednosti-poljoprivrednim-proizvodima-3/">https://ruralnirazvoj.hr/natjecaj-za-tip-operacije-4-2-1-povećanje-dodane-vrijednosti-poljoprivrednim-proizvodima-3/</a></p> <p><a href="https://ruralnirazvoj.hr/natjecaj-za-tip-operacije-5-2-1-obnova-poljoprivrednog-zemljišta-i-proizvodnog-potencijala-9/">https://ruralnirazvoj.hr/natjecaj-za-tip-operacije-5-2-1-obnova-poljoprivrednog-zemljišta-i-proizvodnog-potencijala-9/</a></p> <p><a href="https://ruralnirazvoj.hr/natjecaj-za-provedbu-mjere-22-izvanredna-privremena-potpورا-poljoprivrednicima-i-msp-ovima-koji-su-posebno-pogodeni-ucinkom-ruske-invazije-na-ukrajinu-poljoprivrednici/">https://ruralnirazvoj.hr/natjecaj-za-provedbu-mjere-22-izvanredna-privremena-potpورا-poljoprivrednicima-i-msp-ovima-koji-su-posebno-pogodeni-ucinkom-ruske-invazije-na-ukrajinu-poljoprivrednici/</a></p> <p><a href="https://ruralnirazvoj.hr/natjecaj-za-provedbu-podmjere-4-1-potpورا-za-ulaganja-u-poljoprivredna-gospodarstva-provedba-tipa-operacije-4-1-1-restrukturiranje-modernizacija-i-povećanje-konkurentnosti-3/">https://ruralnirazvoj.hr/natjecaj-za-provedbu-podmjere-4-1-potpورا-za-ulaganja-u-poljoprivredna-gospodarstva-provedba-tipa-operacije-4-1-1-restrukturiranje-modernizacija-i-povećanje-konkurentnosti-3/</a></p> <p><a href="https://ruralnirazvoj.hr/natjecaj-za-podmjeru-17-1-osiguranje-usjeva-zivotinja-i-biljaka-3/">https://ruralnirazvoj.hr/natjecaj-za-podmjeru-17-1-osiguranje-usjeva-zivotinja-i-biljaka-3/</a></p> <p><a href="https://ruralnirazvoj.hr/natjecaj-za-tip-operacije-4-1-1-restrukturiranje-modernizacija-i-povećanje-konkurentnosti-poljoprivrednih-gospodarstava-ulaganja-u-skladišne-kapacitete-za-zitarice-i-uljarice/">https://ruralnirazvoj.hr/natjecaj-za-tip-operacije-4-1-1-restrukturiranje-modernizacija-i-povećanje-konkurentnosti-poljoprivrednih-gospodarstava-ulaganja-u-skladišne-kapacitete-za-zitarice-i-uljarice/</a></p> <p><a href="https://ruralnirazvoj.hr/natjecaj-za-tip-operacije-3-1-1-potpورا-za-sudjelovanje-poljoprivrednika-u-sustavima-kvalitete-za-poljoprivredne-i-prehrambene-proizvode-2/">https://ruralnirazvoj.hr/natjecaj-za-tip-operacije-3-1-1-potpورا-za-sudjelovanje-poljoprivrednika-u-sustavima-kvalitete-za-poljoprivredne-i-prehrambene-proizvode-2/</a></p> <p><a href="https://poljoprivreda.gov.hr/UserDocsImages/dokumenti/poljoprivredna-politika/zeleno_izvjesce/2021">https://poljoprivreda.gov.hr/UserDocsImages/dokumenti/poljoprivredna-politika/zeleno_izvjesce/2021</a></p>
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24) What is the current situation of the soils (erosion, eutrophication, pollution...)?	<p>Common problems of European and Croatian soils include: loss of surface layer caused by erosion or construction interventions and excavations, pollution and acidification.</p> <p>Soil erosion in the entire area of the karst Adriatic region is a very strong and extremely negative process that calls into question the balance in the environment of this area. The peculiarity of the erosion process in the karst is that the area is already bare, so the current erosion is expressed in the usual way, through sediment production, relatively small - significantly less than the energy of the water mass of the precipitation. In addition, a significant mass of erosion sediment is lost in the karst subsoil, therefore, there is no or little surface movement of the soil.</p> <p>According to our estimate (Bašić 2013), the total production of erosion deposits in the Adriatic region amounts to 1.67 million t of soil per year.</p> <p>Erosion: 3.04 tonnes/ha/yr data for Croatia 2012 (Cro, Celebio)</p> <p>The Nitrogen (60 kg of nutrient per ha) and Phosphorus (5 kg of nutrient per ha) nutrient balances show relatively high losses as compared to the European average, which is likely related with relatively large differences between nutrient inputs and the nutrients that are removed by the crop with the harvest. (Cro, Celebio)</p> <p>Only 1% of the utilized agricultural area is irrigated. In dry periods, especially if the soil is not watered, the sown crops begin to yield less and less.</p> <p>Since Adriatic Croatia is a coastal area, soil salinization is also present.</p> <p>In general, the soil quality is good, and the farming conditions are relatively similar to the European averages.</p>	<p><a href="https://ec.europa.eu/eurostat/databrowser/view/AEI_PR_SOILER_custom_4949151/default/table?lang=en">https://ec.europa.eu/eurostat/databrowser/view/AEI_PR_SOILER_custom_4949151/default/table?lang=en</a></p> <p><a href="https://www.fao.org/faostat/en/#data/RP">https://www.fao.org/faostat/en/#data/RP</a></p> <p><a href="https://hrcak.srce.hr/file/179319">https://hrcak.srce.hr/file/179319</a></p>
25) Who are the main stakeholders involved in the crops production (cooperatives or farmers associations, individual farmers owning large or small areas, etc.)?	<p>Agricultural supply chain includes:</p> <ul style="list-style-type: none"> <li>- agricultural input companies and retailers (seed and fertilizer companies – Sjeme d.o.o. Split, Vrtničar Viškovo, Venci d.o.o., Polja Bure d.o.o etc)</li> <li>-farmers and farming industries (family farm, small, medium and large enterprises..)</li> <li>-agricultural credit institutions (e.g. Center for Agriculture and Rural Development of the Primorje - Gorski Kotar County)</li> <li>crop consultants and advisors (Directorate for Professional Support for Agricultural Development, EUOKONZALTING)</li> <li>-aggregators (AGRICULTURAL COOPERATIVE SVIČRE, CROATIAN PROSCIUTTO CLUSTER, Agris cluster...)</li> <li>--government (Ministry of Agriculture - Administration for Agricultural Land, Plant Production and Market).</li> <li>Institute of Agriculture and Tourism</li> </ul>	<p><a href="https://storage.googleapis.com/ag_infographic/EDF%20%20Sustainable%20Ag%20Infographic%20%20Final%20PDF.pdf">https://storage.googleapis.com/ag_infographic/EDF%20%20Sustainable%20Ag%20Infographic%20%20Final%20PDF.pdf</a></p> <p><a href="https://supplychain.edf.org/resources/identify-stakeholders-agriculture/">https://supplychain.edf.org/resources/identify-stakeholders-agriculture/</a></p>
26) How much residual biomass is produced? Please indicate for the most relevant crops (question 14) the residues that are produced during the processing	<p>Croatia has a relatively large cropping sector and therefore the residual biomass potential from crops are certainly of interest. By-products from arable crop production are mainly in a form of straw, stalk corn and corn cobs. They are used for traditional</p>	<p>Celebio 2.1</p>

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	<p>purposes (bedding) and lately, emerging agropellets for fuel and feed. (Celebio)</p> <p>The University of Zagreb's Faculty of Energy, has estimated that on average around 10 million t of agricultural waste, co-products, and by-products (AWCB) are generated every year in Croatia by animal, fruit, cereal and vegetables value chains with the largest volumes generated in the livestock sector in the production of manure</p> <p>An initial World Bank assessment regarding the potential availability of sustainable 137 lignocellulosic materials from agricultural residues shows that between 2 and 3 million dried t of materials could be available annually (with the largest portion of biomass residues deriving from maize stover residues, followed by straws from cereal production)</p>	
27) Is the residual biomass (question 21) exploited (energy production, chemicals, fertilizers, etc.)?	Current use of by-products from managing permanent crops is at very basic level. Pruning is used either for slow burning as a frost prevention or for heating, although most remain on field or are burned. (Celebio, Cro)	
28) Average selling price for the main crops (€/dry tonnes) (listed in question 15)? When possible, also include the production cost.	<p>Wholesale prices (12/2022):</p> <p>Wheat 330 €/t Maize 330 €/t Fodder barley 290 €/t Oats 260 €/t Sunflower 620 €/t Soybean 610 €/t</p> <p>Average prices on market (12/2022):</p> <p>Apple Fiji 1,404.20 €/t Pear 1,949.69 €/t Grapes 2,464.66 €/t Mandarins 1,287.41 €/t Orange 1,676.28 €/t Lemon 2,440.77 €/t Cabbage 1,328.55 €/t Potato 930.38 €/t</p> <p>Average producer prices of selected agricultural products (2022):</p> <p>Wheat 297.75 €/t Barley 294.03 €/t Oat 229.45 €/t Maize 290.41 €/t Rapeseed 638.81 €/t Sunflower 582.07 €/t Soybean 602.75 €/t Cabbage 301.28 €/t Potato 318.53 €/t Apple 435.33 €/t Pear 520.27 €/t Plum 536.20 €/t Peach and nectarines 1,149.37 €/t Mandarins 455.23 €/t Grapes 796.33 €/t</p> <p>Data for Croatia</p>	<p><a href="http://www.tisup.mps.hr/">HTTP://WWW.TISUP.MPS.HR/</a></p> <p>file:///C:/Users/User/Downloads/vip_2023_01m.pdf</p> <p><a href="https://podaci.dzs.hr/2022/HR/29350">HTTPS://PODACI.DZS.HR/2022/HR/29350</a> -</p>
29) Which are the future perspectives? (Technologies, increase of the area dedicated to certain crops, new crops development, new biomass or residual biomass value chain development, employment)	Given the increasing challenges of agricultural production due to climate change, farmers need to think about how to maintain stable and sustainable agricultural production. Both current and new generations of farmers need to be educated to	<p><a href="https://www.youtube.com/watch?v=Tg7fazxmVwA">https://www.youtube.com/watch?v=Tg7fazxmVwA</a></p> <p><a href="https://www.hapih.hr/wp-content/uploads/2022/04/">https://www.hapih.hr/wp-content/uploads/2022/04/</a></p>

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	<p>apply new practices, new technology and strike a balance between greater production and environmental protection. Education is key to spreading new knowledge and applying it. Also, negative agricultural practices in various aspects of agriculture can be mitigated through the proper education of all key stakeholders in the agricultural chain: from the primary producers to the end consumers.</p> <p>Sources of greenhouse gas emissions from agriculture indicate the formation of a chain of activities that will reduce the source of greenhouse gas emissions from animal husbandry, but also integrate it into the reduction of emissions from other agricultural activities. (CELEBIO, Cro)</p> <p>Still many biomass resources that can be mobilised. Because of harbours (coastal and inland), local biomass resources can be combined with imported resources to strengthen security of supply. Unused land resource is significant, so opportunities to produce low-ILUC biomass on abandoned lands. Expansion of family farms (both in continental and coastal area) into tourism sector (and diversification to other potential sectors) to generate additional income, entrance to new market – ecotourism Production of healthy food for a European market (CELEBIO, Cro)</p>	<a href="#">17.-Savjetovanje-uzgajivac%CC%8Ca-goveda-u-RH-2022.-Zbornik-predavanja.pdf</a>
<b>FORESTRY</b>		
Questions	Answer	Comments
30) Forest area in the region (please indicate the hectares and percentage occupied by forestland in the region)?	Forest area in Adriatic region: 596.840 ha (36,0 % forestland of Adriatic region)	<a href="https://hrcak.srce.hr/file/179319">https://hrcak.srce.hr/file/179319</a> -
31) Productive forest area share (exploited for wood)?	Productive forests made about 55 % of total forest area in 2016. (Data for Croatia)	<a href="https://www.hrsume.hr/ot-nama/pristup-informacijama/">https://www.hrsume.hr/ot-nama/pristup-informacijama/</a>  Celebio d2.1  <a href="https://mingor.gov.hr/UseDocs/Images/KLIMA/SZKAI_ZOS/december_nfap_2019.pdf">https://mingor.gov.hr/UseDocs/Images/KLIMA/SZKAI_ZOS/december_nfap_2019.pdf</a> - CRO
32) Which are the main uses of forestry biomass?	<p>Sawn wood – 1298 m3 Wood in the form of chips and wood remains – 463500 m3 Paper and cardboard - 374000 t Wood pellets and other agglomerates - 351700 thousand t Wood-based panels – 267400 m3 Cellulose - 47600 t (Data for Croatia)</p> <p>Wood processing and furniture industry - Charcoal, wood chips, particles and residues, wood pellets, sawn wood, wood-based panels, pulp wood, paper and paperboard, briquettes... Out of the total amount of industrial wood and fuelwood harvested almost 50% was allocated for households while remaining 50% was allocated for other energy purposes (cogeneration of electricity and heat, pellet, briquette and charcoal production), industry (paper, plywood, furniture...) and export. (Celebio, Croatia)</p>	<a href="https://www.sumins.hr/w/p-content/uploads/2017/08/Prirucnik.Biomasa-hrv.pdf">https://www.sumins.hr/w/p-content/uploads/2017/08/Prirucnik.Biomasa-hrv.pdf</a>  D2.1 pg. 58 (CELEBIO)  <a href="https://web.dzs.hr/PXWeb/Table.aspx?layout=tableVjewLayout1&amp;px_tableid=SUM2.px&amp;px_path=Poljoprivreda,%20lov,%20c5%a1umarstvo%20i%20ribarstvo%20i%20umarstvo&amp;px_language=hr&amp;px_db=Poljoprivreda,%20lov,%20c5%a1umarstvo%20i%20ribarstvo&amp;rxid=396e4ba1-4660-4248-a727-67f6ed293a57">https://web.dzs.hr/PXWeb/Table.aspx?layout=tableVjewLayout1&amp;px_tableid=SUM2.px&amp;px_path=Poljoprivreda,%20lov,%20c5%a1umarstvo%20i%20ribarstvo%20i%20umarstvo&amp;px_language=hr&amp;px_db=Poljoprivreda,%20lov,%20c5%a1umarstvo%20i%20ribarstvo&amp;rxid=396e4ba1-4660-4248-a727-67f6ed293a57</a>
33) Share of forestland owned by the administration and private owners?	Private forest - 24.19% Administration?	



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34) Are state subsidies received by the forestry sector?	<p>Ministry of Agriculture:</p> <p>1.) Subsidies for private forests</p> <p>2.) Strategic plan of the Common Agricultural Policy - Subsidies for forest management restrictions (NATURA 2000, NKS), Reconstruction (conversion) of degraded forests</p> <p>Tender for operation type 4.3.3 Investment in forest infrastructure.</p> <p>Tender for implementation of operation type 8.5.1 Conversion of degraded forest stands and forest cultures.</p> <p>Tender for the type of operation 8.6.1 Modernization of technologies, machines, tools and equipment in wood extraction and forestry works</p> <p>Tender for operation type 8.6.2 Modernization of technology, machines, tools and equipment in pre-industrial wood processing</p>	<p><a href="https://www.hsups.hr/subvencije-za-privatne-sume/">https://www.hsups.hr/subvencije-za-privatne-sume/</a></p> <p><a href="https://ruralnirazvoj.hr/indikativni-plan-objave-natjecaja-u-2023/">https://ruralnirazvoj.hr/indikativni-plan-objave-natjecaja-u-2023/</a></p> <p><a href="https://ruralnirazvoj.hr/na-tjecaj-za-tip-operacije-4-3-3-uglavljanje-u-sumsku-infrastrukturu-4/">https://ruralnirazvoj.hr/na-tjecaj-za-tip-operacije-4-3-3-uglavljanje-u-sumsku-infrastrukturu-4/</a></p> <p><a href="https://ruralnirazvoj.hr/na-tjecaj-za-provedbu-tipa-operacije-8-5-1-konverzija-degradiranih-sumskih-sastojina-i-sumskih-kultura/">https://ruralnirazvoj.hr/na-tjecaj-za-provedbu-tipa-operacije-8-5-1-konverzija-degradiranih-sumskih-sastojina-i-sumskih-kultura/</a></p> <p><a href="https://ruralnirazvoj.hr/na-tjecaj-za-tip-operacije-8-6-1-modernizacija-tehnologija-strojeva-alata-i-opreme-u-privredovanju-drva-i-sumskougovornim-radovima/">https://ruralnirazvoj.hr/na-tjecaj-za-tip-operacije-8-6-1-modernizacija-tehnologija-strojeva-alata-i-opreme-u-privredovanju-drva-i-sumskougovornim-radovima/</a></p> <p><a href="https://ruralnirazvoj.hr/na-tjecaj-za-tip-operacije-8-6-2-modernizacija-tehnologija-strojeva-alata-i-opreme-u-predindustrijskoj-preradi-drva-2/">https://ruralnirazvoj.hr/na-tjecaj-za-tip-operacije-8-6-2-modernizacija-tehnologija-strojeva-alata-i-opreme-u-predindustrijskoj-preradi-drva-2/</a></p>
35) Who are the main stakeholders involved in the forest biomass production?	<p>-Forest owners (state/private)</p> <p>-Forestry professionals (engineers and technicians) and workers in the direct forest production</p> <p>-Public supervisory bodies, influential groups or organizations e.g. Public institution for management of marjan park – forest, Croatian Forestry Society branch offices Senj, Dalmacija Split, 5 Croatian Forests Ltd forest administration - branch offices, other Legal bodies founded and owned by the state such as national parks, Faculty of Forestry, Ministry of Defence, "Croatian Waters"</p>	<p><a href="https://www.researchgate.net/figure/Key-stakeholders-and-their-primary-and-secondary-forest-ecosystem-services-ES-stakes_tbl3_322578625">https://www.researchgate.net/figure/Key-stakeholders-and-their-primary-and-secondary-forest-ecosystem-services-ES-stakes_tbl3_322578625</a></p> <p><a href="https://www.sumins.hr/wp-content/uploads/2017/08/Prirucnik.Biomasa-hrv.pdf">https://www.sumins.hr/wp-content/uploads/2017/08/Prirucnik.Biomasa-hrv.pdf</a></p>
36) Please indicate if possible the forest biomass production cost and the average selling price (€/dry tonnes)?	No data for Croatia	
37) What is the percentage of employment covered by forestry?	<p>Forestry and logging- 10.6 K</p> <p>Manufacture of wood – 24.3 K</p> <p>Manufacture of paper and paper products– 4.1 K</p> <p>Manufacture of furniture – 12.2K</p>	<p><a href="https://ec.europa.eu/eurostat/databrowser/view/for_emp_ifs/default/table?lang=sl">https://ec.europa.eu/eurostat/databrowser/view/for_emp_ifs/default/table?lang=sl</a> - hr, 2021</p> <p><a href="https://podaci.dzs.hr/media/erdfes4y/statinfo2021.pdf">https://podaci.dzs.hr/media/erdfes4y/statinfo2021.pdf</a> - hr</p>
38) How much residual biomass is produced in the region?	Croatian Forests Ltd. are by far the largest primary biomass producer and the largest woodchip producer at the domestic market-capacity of around 850,000 mil. m3 (CELEBIO-data for Croatia)	
39) Is the residual biomass (question 34) exploited? (Indicate)	wood chips from forest residues wood briquettes or pellets from forest residues	
40) Which are the future perspectives? (Technology, forestry, employment increase, increase of exploited areas, etc.)	<p>Modernization of technology</p> <p>Around 34,000 ha of forestland in Croatia (~1%), including Adriatic, is under mined areas which means that is temporary out of the management. The removal of mines is expected in the future.</p> <p>Strategy for wood processing and furniture production development (2017) indicates that some other sources estimate availability of 0.75 mil.</p>	<p><a href="https://www.pbir.hr/potij-caji-eu-apprrr-8-6-1/">https://www.pbir.hr/potij-caji-eu-apprrr-8-6-1/</a></p> <p><a href="https://www.apprrr.hr/mjera-8-uglavljanja-u-razvojsumskih-podrucja-i-poboljsanje-odrzivosti-suma/">https://www.apprrr.hr/mjera-8-uglavljanja-u-razvojsumskih-podrucja-i-poboljsanje-odrzivosti-suma/</a></p>



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	<p>m3 of forest coproducts and 2 mil. m3 of fuelwood annually for energy and industrial production</p> <p>To achieve better management, education and information of private forest owners is needed. In future, it is necessary to improve infrastructure to mobilise biomass in areas that are more remote and establish a group of private forest owners to manage their land more successfully. Furthermore, restrictions on the type of biomass that can be utilised to avoid competition with other uses to allow currently established flows to operate should be set.</p>	
41) Share of forestland area affected by forest fires the last year?	- Total burned area of Adriatic Croatia is 14,407 ha (2021).	
<b>LIVESTOCK</b>		
Questions	Answer	Comments
42) How large is the area dedicated to livestock in the region?	140.57k ha	<p><a href="https://observatory.rural-vision.europa.eu/place?lng=en&amp;ctx=RUROBS&amp;tu=HR03&amp;tl=2&amp;ts=RUROBS&amp;pil=level-indicator&amp;is=Default&amp;cl=rural&amp;clc=highlights&amp;fvs=falsel-se-adr">https://observatory.rural-vision.europa.eu/place?lng=en&amp;ctx=RUROBS&amp;tu=HR03&amp;tl=2&amp;ts=RUROBS&amp;pil=level-indicator&amp;is=Default&amp;cl=rural&amp;clc=highlights&amp;fvs=falsel-se-adr</a></p> <p><a href="https://ec.europa.eu/eurostat/databrowser/view/EF_M_FARMLEG_custom_5163680/default/table?lang=en">https://ec.europa.eu/eurostat/databrowser/view/EF_M_FARMLEG_custom_5163680/default/table?lang=en</a></p>
Average farm size (cows, pigs, chicken, or other) in the region?	<p>- 3658 livestock farms (Croatia-data 2020)</p> <p>-742 livestock farms (Adriatic region – data 2020) which is 20.3% of the total livestock farms in Croatia</p> <p>Average farm size: 8,3 livestock units.</p>	<a href="https://www.hapih.hr/wp-content/uploads/2021/06/Godisnje-izvjesce-Govedarstvo-2020-web.pdf">https://www.hapih.hr/wp-content/uploads/2021/06/Godisnje-izvjesce-Govedarstvo-2020-web.pdf</a>
43) Which is the daily livestock maintenance cost (€/head)?	<p>In the structure of the costs of agricultural production in 2016, the most significant are the costs of animal feed, which make up a share of 38.2% of the total costs, followed by costs for fertilizers and soil improvement agents with a share of 12.8%, other goods and services with a share of 9.9%, expenses for energy and lubricants with a share of 8.3%, expenses for agricultural services with a share of 7.9%, expenses for seeds and planting material with a share of 7.6%, expenses means for plant protection and pesticides with a share of 6.8%, veterinary costs with a share of 3.7%, maintenance costs of materials with a share of 2.9% and building maintenance costs with a share of 2.0% .</p> <p>Livestock feed prices (2022):  Starter for calves up to 2 months: 0.52 €/kg  Mixture for dairy cows: 0.33  Super concentrate for dairy cows: 0.50 €/kg  Fodder mixture for fattening beef cattle: 0.29 €/kg  Fodder mixture for fattening pigs: 0.34 €/kg  Chicken starter: 0.51 €/kg</p>	<p><a href="https://agridata.ec.europa.eu/extensions/DashboardFarmEconomyFocus/DashboardFarmEconomyFocus.html">https://agridata.ec.europa.eu/extensions/DashboardFarmEconomyFocus/DashboardFarmEconomyFocus.html</a> - ADR</p> <p><a href="https://www.hapih.hr/wp-content/uploads/2022/04/17.-Savjetovanje-uzgajivac%CC%8Ca-goveda-u-RH-2022.-Zbornik-predavanja.pdf">https://www.hapih.hr/wp-content/uploads/2022/04/17.-Savjetovanje-uzgajivac%CC%8Ca-goveda-u-RH-2022.-Zbornik-predavanja.pdf</a></p> <p><a href="https://zir.nsk.hr/islandora/object/pfos:1510/preview">https://zir.nsk.hr/islandora/object/pfos:1510/preview</a></p> <p><a href="https://podaci.dzs.hr/2022/hr/29350">https://podaci.dzs.hr/2022/hr/29350</a></p>
44) Which is the main destination of the cattle? (Meat, milk, wool...)	<p>1339344 kg of delivered cow's milk (3.2% Cro)</p> <p>1312659 kg is of delivered cow's milk (47.6 % Cro)</p> <p>221635 kg of delivered cow's milk (5.7 % Cro)</p>	<p><a href="https://stocarstvo.mps.hr/">https://stocarstvo.mps.hr/</a></p> <p><a href="https://www.agroklub.com/stocarstvo/nastavak-negativnih-trendova-u-">https://www.agroklub.com/stocarstvo/nastavak-negativnih-trendova-u-</a></p>

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	Generally speaking, in the Republic of Croatia sheep are mostly raised for meat production, especially for the production of light- to medium-weight lamb carcasses, which are desirable for preparation on the spit. Recently, there has been an increased interest in raising sheep for milk production and processing milk on the family farm, especially in cheese. As a result, most of the sheep milk produced is used to feed lambs for slaughter, and only a portion of the remaining milk is used by producers to produce higher value-added sheep milk. (CELEBIO, Cro)	<a href="https://hrvatskom-stocarstvu-stokazu-brojke/76262/">https://hrvatskom-stocarstvu-stokazu-brojke/76262/</a> - <a href="https://podaci.dzs.hr/2022/hr/29394">https://podaci.dzs.hr/2022/hr/29394</a> - <a href="https://poljoprivreda.gov.hr/UserDocsImages/dokumenti/poljoprivredna_politika/zeleno_izvjesce/2122022Zelenolzvjescje_2021.pdf">https://poljoprivreda.gov.hr/UserDocsImages/dokumenti/poljoprivredna_politika/zeleno_izvjesce/2122022Zelenolzvjescje_2021.pdf</a>
45) What is the employment rate covered by livestock?	No data	<a href="https://ec.europa.eu/eurostat/databrowser/view/EF_KVECSLEG_custom_5164276/default/table?lang=en">https://ec.europa.eu/eurostat/databrowser/view/EF_KVECSLEG_custom_5164276/default/table?lang=en</a>
46) Are state subsidies received for farming?	<p>Support program for primary agricultural producers in livestock due to difficult business conditions caused by the COVID-19 pandemic - The COVID-19 pandemic has changed the functioning of food systems around the world and caused changes in the business of everyone in the chain - from food producers, processing industry and logistics to consumers. The situation caused by the spread of the disease COVID-19 initiated the response of the Government of the Republic of Croatia, which introduced legal and institutional measures aimed at limiting the spread of the disease and at providing support to productions that were particularly affected by the implementation of 21 epidemiological measures, which were implemented for farms in the agricultural sector through the Ministry of Agriculture. In addition to the implementation of regular support measures, since the beginning of the outbreak of the COVID-19 pandemic, the Ministry has brought numerous support programs to contribute to the normalization of the situation on the market for agricultural products and to alleviate the consequences caused by the pandemic and disruptions in the market.</p> <p>Subsidies to primary agricultural producers in the crop production sector and livestock sector - livestock sub-sectors: cattle breeding, pig breeding, horse breeding, sheep breeding, goat breeding and poultry breeding. The goal of the Program was to maintain employment and the existing level of production on small farms in the livestock sub-sectors in order to ensure the continuous supply of food to the population and support to primary producers.</p> <p>Decision on the implementation of a temporary emergency aid measure for producers of fattened cattle, fattened pigs and lambs for slaughter with business problems caused by the Covid-19 epidemic and for subjects operating in approved facilities for slaughtering ungulates. - An extraordinary aid measure was implemented for producers of fattened beef cattle, fattened pigs and lambs for slaughter with business problems caused by the COVID-19 disease pandemic and for entities operating in approved facilities for the slaughter of ungulates. The support was intended for farms that delivered heads for slaughter or export, which are not younger than 20 nor older than 28 months. Subsidy for fattening beef producers EUR 132.72</p>	<p><a href="https://agridata.ec.europa.eu/extensions/DashboardFarmEconomyFocus/DashboardFarmEconomyFocus.html">https://agridata.ec.europa.eu/extensions/DashboardFarmEconomyFocus/DashboardFarmEconomyFocus.html</a> - adr</p> <p><a href="https://www.apprrr.hr/program-potpore-primarnim-poljoprivrednim-proizvodacima-u-stocarstvu-zbog-otezanij-uvjeta-poslovanja-uzrokovanih-pandemijom-covid-19/">https://www.apprrr.hr/program-potpore-primarnim-poljoprivrednim-proizvodacima-u-stocarstvu-zbog-otezanij-uvjeta-poslovanja-uzrokovanih-pandemijom-covid-19/</a></p> <p><a href="https://www.apprrr.hr/potpore-primarnim-poljoprivrednim-proizvodacima-u-sektoru-biljne-proizvodnje-i-sektoru-stocarstva/">https://www.apprrr.hr/potpore-primarnim-poljoprivrednim-proizvodacima-u-sektoru-biljne-proizvodnje-i-sektoru-stocarstva/</a></p> <p><a href="https://www.dalmacija.hr/program-mjera-za-ublažavanje-posljedica-pandemije-korona-virusa/mjere-za-gospodarstvo/kategorija/mjere-za-poljoprivredu-i-stocarstvo">https://www.dalmacija.hr/program-mjera-za-ublažavanje-posljedica-pandemije-korona-virusa/mjere-za-gospodarstvo/kategorija/mjere-za-poljoprivredu-i-stocarstvo</a></p> <p><a href="https://ruralnirazvoj.hr/na-tjecaj-za-tip-operacije-4-2-1-povećanje-dodane-vrijednosti-poljoprivrednim-proizvodima-male-klonice/">https://ruralnirazvoj.hr/na-tjecaj-za-tip-operacije-4-2-1-povećanje-dodane-vrijednosti-poljoprivrednim-proizvodima-male-klonice/</a></p> <p><a href="https://ruralnirazvoj.hr/na-tjecaj-za-tip-operacije-4-1-2-zbrinjavanje-rukovanje-i-koristenje-stajskog-gnojiva-u-cilju-smanjenja-stetnog-utjecaja-na-okolis-2/">https://ruralnirazvoj.hr/na-tjecaj-za-tip-operacije-4-1-2-zbrinjavanje-rukovanje-i-koristenje-stajskog-gnojiva-u-cilju-smanjenja-stetnog-utjecaja-na-okolis-2/</a></p> <p><a href="https://poljoprivreda.gov.hr/UserDocsImages/dokumenti/poljoprivredna_politika/zeleno_izvjesce/20211215%20Zeleno%20izvje%C5%A1%C4%87e%2020_final.pdf">https://poljoprivreda.gov.hr/UserDocsImages/dokumenti/poljoprivredna_politika/zeleno_izvjesce/20211215%20Zeleno%20izvje%C5%A1%C4%87e%2020_final.pdf</a></p>

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	<p>per head, Subsidy for slaughterhouses for slaughtering beef EUR 66.36 /head.</p> <p>Support program for small dairies to co-finance the costs of collecting milk produced in the Republic of Croatia - The aim of the program was to provide financial assistance to milk processing facilities faced with business problems caused by measures to combat the COVID-19 pandemic and a significant increase in the costs of collecting and transporting raw milk from suppliers to facilities for processing. Eligible beneficiaries of support from this Program were micro, small and medium-sized enterprises that purchased milk produced in the territory of the Republic of Croatia in the period from September 1, 2020 to August 31, 2021.</p> <p>Support to beekeepers for remediation of damage caused by the destruction of bee colonies in 2022</p> <p>Tender for the type of operation 4.2.1 Increasing the added value of agricultural products - small slaughterhouses</p> <p>Tender for the type of operation 4.1.2 Disposal, handling and use of manure in order to reduce the harmful impact on the environment</p> <p>Tender for the type of operation 4.1.1 Restructuring, modernization and increasing the competitiveness of agricultural holdings - investments in pig fattening</p>	<p><a href="https://www.hapih.hr/wp-content/uploads/2022/04/17.-Savjetovanje-uzgajivac%CC%8Ca-goveda-u-RH-2022.-Zbornik-predavanja.pdf">https://www.hapih.hr/wp-content/uploads/2022/04/17.-Savjetovanje-uzgajivac%CC%8Ca-goveda-u-RH-2022.-Zbornik-predavanja.pdf</a></p>
47) Who are the main stakeholders involved in the production?	<p>Livestock keepers and breeders, associates - Association of Bush Breeders, Association of Istrian Cattle Breeders, Association of Croatian Trakehner Horse Breeders</p> <p>Food suppliers – Zeleni krug d.o.o, Poljoprivredno - trgovački obrt MAMIĆ etc.</p> <p>Veterinarians – Ministry of Agriculture: Directorate for Veterinary Medicine and Food Safety</p> <p>Research institutes: Agency for Rural Development of Istria d.o.o. (AZRRI)</p> <p>Ministry of Agriculture - Directorate for Livestock Breeding and Food Quality - Sector for Livestock Production</p> <p>Croatian Agency for Agriculture and Food: HAGRIS - Single register of domestic animals</p> <p>Branch office of the livestock center in Delnice, Dubrovnik, Gospić, Pazin, Solin, Šibenik and Zadar - Marking and registration of domestic animals, testing the production characteristics of all species and breeds of domestic animals, providing assistance in the implementation of breeding programs</p>	<p><a href="https://www.hapih.hr/cs/djelatnosti-odjeli/">https://www.hapih.hr/cs/djelatnosti-odjeli/</a></p>
48) Which is the main residue produced in each case?	<p>Residues of livestock production process: wool, manure, animal by-products</p> <p>Chemical residues: antibiotics and drenches: pesticides and external parasite products. heavy metals such as lead or cadmium – general data, not data for AR</p>	



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<p>49) How much slurry/manure/other residue is produced in average (t/head) and in the region (total)?</p>	<p>The estimated amount of organic fertilizers in 1991 was about 15 million t, while in 2003, a third less, about 10 million t of organic fertilizers were produced</p> <p>In Croatia, agriculture emits about 11% of total greenhouse gas emissions or 2,720.3 kt CO<sub>2</sub>-eq (MINGOR, 2021)</p> <p>In Croatia, the biggest source of emissions are intestinal fermentations of ruminants (37%), agricultural soils (41%) and manure management (20%).</p>	<p><a href="https://hrcak.srce.hr/file/185436">https://hrcak.srce.hr/file/185436</a></p> <p><a href="https://www.fao.org/faostat/en/#data/GM">https://www.fao.org/faostat/en/#data/GM</a></p> <p><a href="https://www.fao.org/faostat/en/#data/EMN">https://www.fao.org/faostat/en/#data/EMN</a></p>
<p>50) Is the slurry/manure/other exploited? (Indicate the percentage that is currently used) If not, how are the residues managed?</p>	<p>The total area of agricultural households in the Republic of Croatia treated with organic fertilizers is 177,914.22 ha.</p> <p>Organic fertilizers applied to 1/5 (20.7%) of the total agricultural land used by agricultural households in the Republic of Croatia.</p> <p>Organic fertilizers on only 7.6% of the total agricultural land used by business entities in the Republic of Croatia (DZS, 2003).</p> <p>EKO LIKA Greenovation produces the highest quality wool pellet fertilizer. Planned production 390 t of organic fertilizer per day, via purchase of 400 kilos of sheep's wool from Lika-Senj and Zadar county.</p>	<p><a href="https://hrcak.srce.hr/file/185436">https://hrcak.srce.hr/file/185436</a></p> <p><a href="https://www.fao.org/faostat/en/#data/GM">https://www.fao.org/faostat/en/#data/GM</a> - treated manure</p> <p><a href="https://www.eko-lika-greenovation.com/hr/home-hrvatski/">https://www.eko-lika-greenovation.com/hr/home-hrvatski/</a></p>
<p>51) Average selling price for the slurry/manure/other?</p>	<p>The average composition (formulation) of beef manure is 4-2-5 (kg N - P<sub>2</sub>O<sub>5</sub> - K<sub>2</sub>O / m<sup>3</sup> or t). So, for the three basic macronutrients, the price is 1m<sup>3</sup> = 30 EUR</p>	<p><a href="http://www.tisup.mps.hr/aktualno.aspx">http://www.tisup.mps.hr/aktualno.aspx</a> -</p> <p><a href="https://hrcak.srce.hr/file/185436">https://hrcak.srce.hr/file/185436</a></p> <p><a href="https://www.savjetodavna.hr/2022/03/18/stajski-gnoj-je-pravo-bogatstvo-to-napokon-svima-postaje-jasno/?print=print">https://www.savjetodavna.hr/2022/03/18/stajski-gnoj-je-pravo-bogatstvo-to-napokon-svima-postaje-jasno/?print=print</a></p> <p><a href="https://www.agroklub.com/stocarstvo/stajski-gnoj-je-pravo-bogatstvo-to-napokon-svima-postaje-jasno/75429/">https://www.agroklub.com/stocarstvo/stajski-gnoj-je-pravo-bogatstvo-to-napokon-svima-postaje-jasno/75429/</a></p>
<p>52) Which are the future perspectives? (Valorisation technologies, cattle, employment rate, farm modernisation, increase of large exploitations, decrease of livestock production, etc.)</p>	<p>In pork, beef and milk subsectors, there is a trend of movement towards larger farming units because of the lack of competitiveness and market connection among small and medium-sized family farms. Larger units were better able to benefit from economies of scale and national as well as CAP-related transfer.</p> <p>Robotization and modernization of farms.</p> <p>Future perspectives: ensuring a fair income for farmers, increasing competitiveness, strengthening the position of farmers in the food supply chain, combating climate change, caring for the environment, preserving the landscape and biological diversity, encouraging generational renewal, dynamic rural areas, protecting food quality and health, encouraging knowledge and innovation</p> <p>In the Republic of Croatia, the processes of consolidation of agricultural holdings, renewal, modernization of production, as well as recognition of Croatian products have begun. Interventions will be focused on further investments in the production and processing of agricultural products, with a special emphasis on investments in digitization and in general the application of innovations and the so-called green transition,</p>	<p><a href="https://www.hapih.hr/wp-content/uploads/2022/04/17.-Savjetovanje-uzgajivac%CC%8Ca-goveda-u-RH-2022.-Zbornik-predavanja.pdf">https://www.hapih.hr/wp-content/uploads/2022/04/17.-Savjetovanje-uzgajivac%CC%8Ca-goveda-u-RH-2022.-Zbornik-predavanja.pdf</a></p> <p><a href="https://www.hapih.hr/wp-content/uploads/2021/06/Godisnje-izvjesce-Govodarstvo-2020-web.pdf">https://www.hapih.hr/wp-content/uploads/2021/06/Godisnje-izvjesce-Govodarstvo-2020-web.pdf</a></p>

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	<p>which includes investments that do not harm or are beneficial to nature and the environment, such as investments in renewable energy sources. Subsidies will be especially aimed at small and young people with the greatest potential for growth and development of production, as well as encouraging the association of farmers with the aim of strengthening their position on the market. There is a special emphasis on interventions with the aim of transferring knowledge and innovations and encouraging the participation of farmers in research projects. With this goal in mind, the AKIS system will be established, the basic purpose of which is to network all the participants of the mentioned processes with the aim of effective exchange of knowledge and experience. Given the focus of current production on products with low added value (primarily cereals), the interventions will encourage the transition to products with higher added value, to which the aforementioned exchange of knowledge and experiences will contribute. All of the above will ultimately result in an increase in the income of farmers, which is still significantly below the average income of the entire economy. With the aim of supporting agricultural income, direct payment interventions are also planned, with the redirection of support towards small and medium-sized producers. Also, part of the interventions will be focused on activities related to adapting production to climate change, ensuring production, and measures related to the restoration of agricultural potential after disasters will continue. The reform of the CAP also brings increased care for biodiversity and the environment, and in accordance with this, it is the obligation of each member state to allocate part of the funds of the SP CAP for interventions that will contribute to the achievement of these goals. The Republic of Croatia leads the EU in terms of biodiversity and shows that our long-standing national priorities and natural resource management practices are effective. In the area of the environment protection, positive developments and results in the reduction of the use of pesticides and artificial fertilizers and antimicrobial substances were also recorded. Interventions support processes as well as management practices that, for example, increase carbon absorption, increase the use of organic fertilizers, reduce erosion, prevent the loss of organic matter in the soil, and prevent groundwater pollution. Support for the transition from conventional to organic farming will also continue. A set of interventions related to the climate and the environment will provide compensation to farmers for changes in production processes and potentially the level of production with the aim of preserving biodiversity and the environment, which will affect the reduction of soil and water pollution, and provide consumers with safe and high-value food.</p> <p>The Low Carbon Strategy (Official Gazette 63/2021) concludes that "the Republic of Croatia will have significant financial resources at its disposal, but the investment needs significantly exceed the available resources." Therefore, interdepartmental coordination and the use of innovative financial instruments (ESCO model, etc.) will be necessary in order to achieve the greatest possible multiplier</p>	
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	<p>effect in terms of reducing emissions with the limited financial resources at our disposal, given that all sectors will have to contribute to the reduction emissions in order for the Republic of Croatia to fulfill its share of the reduction in the EU goal of -55% by 2030." and to fulfill the goals from the NECP (MINGOR, 2019) and the draft Strategy for the Development of Agriculture (MP, 2020) regarding the increase in the number of UG by 20% for cattle and 35% for pigs for fattening in domestic production, and the target value for poultry at 1,465,100 by 2030, the creation of a model for separating the growth of livestock from the growth of greenhouse gas emissions was started, which would enable the simultaneous fulfillment of several goals of the national development strategy of the Republic of Croatia by 2030.</p> <p>During 2020, the number of dairy farms where milking is performed by robots continued to increase. There were 42 robots for milking on 28 farms, which represents 3% of cows and 0.7% of the herd in milk yield control. As the new Program of rural development period follows, a further increase in the number of milking robots on Croatian farms can be expected.</p>	
<b>SECONDARY SECTOR</b>		
<b>AGROINDUSTRY</b>		
Questions	Answer	Comments
53) How many agrifood industries are there in the region?	<p>Processing industry:</p> <p>Food processing: meat industry Braća Pivac d.o.o, VIR 1898 Dalmatian, Drniš and Krk prosciutto, Poljica pie.</p> <p>Baking industry: Bobis (processing of cereal products)</p> <p>Fish processing: drying, salting, canning - CROMARIS firm</p> <p>Soft drinks processing: Maraska d.d, Agrolaguna d.d., Naturalis d.o.o,</p> <p>Oil mills- family farms</p> <p>Cheese factories and milk processing</p> <p>Large number of wineries</p> <p>Beer production: Istarska pivovara d.o.o.</p> <p>Tea processing – family farms</p> <p>Hemp processing – family farms</p> <p>Beekeeping – family farms</p> <p>Tobacco processing: Tobacco factory Rovinj</p> <p>Salt processing: Solana Pag d.o.o., Solana Nin, Solana Ston</p>	
54) Which are the main products produced?	Wine, olive oil, fish, salt.	<a href="https://sites.google.com/site/primorskahrhatska2/gospodarstvo-primorske-hrvatske">https://sites.google.com/site/primorskahrhatska2/gospodarstvo-primorske-hrvatske</a>
55) Which is the annual average production in the main agrifood industries?	<p>WINE:</p> <p>Wine production of Adriatic Croatia in 2021 was 369,000 hl of wine, which represents 48.24% of Croatia's wine production. The area under vineyards was 10.227,0 ha. 2021 annual production was 55.905,0 t, with yield of 5,5 t/ha.</p> <p>OLIVE OIL:</p> <p>Olive oil production of Adriatic Croatia in 2021 was 32,036 hectolitres, which represents 100% of Croatia's olive oil production. The area under olive groves was 19.940,0 ha. 2021 annual production was 23,867.0 t, with yield of 1,2 t/ha.</p> <p>FISH (2021 data):</p>	<p><a href="https://poljoprivreda.gov.hr/vinogradarstvo-i-vinarstvo/193https://solana-pag.hr/domace-solane-proizvedu-20-000-tona-soli-a-uveze-se-100-tisuca-tona/">https://poljoprivreda.gov.hr/vinogradarstvo-i-vinarstvo/193https://solana-pag.hr/domace-solane-proizvedu-20-000-tona-soli-a-uveze-se-100-tisuca-tona/</a></p> <p><a href="https://www.morski.hr/ulo-v-i-uzgoj-morske-ribe-upadu-no-cijene-rastu/">https://www.morski.hr/ulo-v-i-uzgoj-morske-ribe-upadu-no-cijene-rastu/</a></p>

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	<p>Oily fish dominates with total catch with 55,945 t (2020), and 4,028 t of farmed oily fish from hatchery. Sardines accounted for the largest share of oily fish catch, which was 40,485 t or 19.2 percent less than the year before.</p> <p>Tuna production reached 4 929 t, with tuna farming of 4 028 t, and catch of 901 t.</p> <p>The production of sea bass amounted to 9,039 t, and 11 t from the hatchery, which leads to total amount is 9,050 t, which is 33.7 percent more than the year before. There was a decrease of 2.6 % for sea bream, to 7,702 t, of which 7,519 t are from cultivation.</p> <p>Catch and cultivation of shellfish increased by 54.5 percent, to 1,071 t, crab catch by 10.4 percent, to 1,021 t, while the catch of cephalopods fell by 29.6 percent, to 656 t.</p> <p>Catch and cultivation of other fish amounted to 21,376 t, which is 12.3 percent more than the year before.</p> <p>SALT: Domestic salt factories produce 20,000 t of salt per year.</p> <p>Wool: 1.113 t (HR, 2019)</p>	<p>file:///C:/Users/Sandra%20Slivar/Downloads/diplomski_klanac_final.pdf</p>
<p>56) Are companies producing organic or agrifood products receiving subsidies?</p>	<p>GREEN PAYMENTS - as one of the main goals, it puts the protection of the environment and the impact of agriculture on the environment. Direct payments were intended to ensure income stability and compensate producers for applying environmentally acceptable practices. Thus, as a mandatory part of Direct Payments, the so-called 'The green payment', which is paid in addition to the basic payment, as compensation to producers for environmental and bio-diversity conservation, and includes crop diversity, maintenance of existing permanent grasslands and the existence of an ecologically significant area on agricultural land.</p> <p>IAKS RURAL DEVELOPMENT MEASURES</p> <p>As part of the Rural Development Program, measures are invented with the aim of preserving and improving ecosystems dependent on agriculture, and promoting the efficient use of resources and the transition to low-carbon and climate-tolerant management in agriculture, forestry and the food sector. IAKS includes measures 10, 11 and 13, which are crucial for the payment of environmental subsidies.</p> <p>Measure 10 – Restoring, preserving and improving the ecosystem Special attention is paid to preventing soil erosion, increasing soil fertility and organic matter in the soil, maintaining the quality of water, soil and air, but also preserving the landscape and biodiversity. The goal is to encourage agricultural practices that are beneficial for the environment, mitigate the negative effects of agriculture and increase biodiversity, as well as preserve genetic resources</p>	<p><a href="https://smarter.hr/hrvatska-ekoloska-poljoprivreda-zbog-ogromnih-potporarastu-eko-povrsine-ali-bez-realne-eko-proizvodnje/">https://smarter.hr/hrvatska-ekoloska-poljoprivreda-zbog-ogromnih-potporarastu-eko-povrsine-ali-bez-realne-eko-proizvodnje/</a></p>

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	<p>related to agriculture, the introduction and continued application of sustainable farming methods to reduce pressure on agricultural land.</p> <p>Measure 11 – Ecological farming The aim of the measure is to encourage organic farming practices that are beneficial for the environment - from the point of view of air, soil, water and biodiversity, thus reducing the negative effects of conventional agriculture on the environment.</p> <p>Measure 13: Payments to areas with natural restrictions or other special restriction Some parts of Croatia (usually far from large settlements) are marked as areas under the influence of unfavorable climate or unfavorable soil characteristics, where the problem of population outflow is especially present and the inhabitants have to make more efforts to maintain agricultural production. Agriculture is very often their only source of income, however, due to unfavorable conditions, the yields are below average, and recently also very often affected by climate change. The negative effects of leaving the land were also manifested in the loss of biodiversity, increased soil erosion and unmaintained areas where there is an increased risk of forest fires in certain regions.</p>	
57) What is the percentage of employment covered by agroindustries?	<p>The entire food production chain employs 10% of all employees in Croatia. (Celebio, Cro)</p> <p>Manufacturing industry – 231,291 employees (data for Croatia)</p>	D2.1 celebio
58) What is the main economic limitation (energy cost, supply chain...) faced by agroindustries?	Rising costs in agriculture, rising prices of agricultural products, energy, limited market, outdated railway infrastructure.	
59) Which type of wastes/side-products/residues are produced?	<p>Wine producers have considered pelletizing grape pomace for either feed or fuel but without significant market uptake. Pomace is usually processed to hard spirit. There is room to improve competitiveness through increasing the use of by-products in the wine-making process in Croatia.</p> <p>The use of olive oil residues has been considered in numerous projects but with little success. Recently, a small olive cake pelletizing facility (6,000 t/year) in Istria started producing solid biofuels for the market. The challenge in utilising olive processing waste is their fluctuation over the time: i.e. yield in 2007 (58 hl) and yield in 2014 (11 hl) and high seasonality.</p> <p>Pruning residues of olives - baling of the trimmed mass, where the final product, the so-called "bale", is inserted into the furnace and heat energy is obtained.</p>	<p>Celebio d2.1</p> <p><a href="https://zir.nsk.hr/islandora/object/agr:1263/preview">https://zir.nsk.hr/islandora/object/agr:1263/preview</a></p>
60) How much wastes/side-products/residues are produced?	<p>The University of Zagreb's Faculty of Energy, has estimated that on average around 10 million tonnes of agricultural waste, co-products, and by-products are generated every year in Croatia by animal, fruit, cereal and vegetables value chains with the largest volumes generated in the livestock sector in the production of manure</p> <p>An initial World Bank assessment regarding the potential availability of sustainable 137 lignocellulosic materials from agricultural residues shows that between 2 and 3 million dried tonnes of materials could be available annually (with the</p>	<p><a href="https://hrvatska2030.hr/wp-content/uploads/2020/10/Agriculture-Fisheries-and-Food-Processing-in-Croatia-s-Food-Bio-Economy.pdf">https://hrvatska2030.hr/wp-content/uploads/2020/10/Agriculture-Fisheries-and-Food-Processing-in-Croatia-s-Food-Bio-Economy.pdf</a></p> <p><a href="https://www.haop.hr/sites/default/files/uploads/dokumenti/021_otpad/Projekt_i/OTP_PR_Guidelines_certificate_sain_sectors.pdf">https://www.haop.hr/sites/default/files/uploads/dokumenti/021_otpad/Projekt_i/OTP_PR_Guidelines_certificate_sain_sectors.pdf</a></p>

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	<p>largest portion of biomass residues deriving from maize stover residues, followed by straws from cereal production).</p> <p>Croatia produces around 30,000 t of olives per year, with about 12,000 t are produced olive pomace. (Brlak i sur., 2009.)</p> <p>Conventional waste can also arise from the use of machinery, such as waste oils, filters, old vehicles, used tires, batteries and accumulators, and from maintenance/support operations such as scrap metal, veterinary drugs, and containers and packaging for protective agents plants and mineral fertilizers.</p>	<p><a href="https://www.fao.org/faostat/en/#data/EMN">https://www.fao.org/faostat/en/#data/EMN</a> - livestock manure on pasture, leACHED ITD.</p>
61) Are the wastes/side-products/residues exploited? (Please specify for which application)	<p>In addition to the production of wine, it is also possible to produce oil from waste grape seeds. (Bio Seed Lab company producing in Istria) - added value product</p> <p>Helios Gea d.o.o. is the only company in the world that produces processed organic olive pomace for use in cosmetics, and is engaged in the production and distribution of natural organic cosmetics, based on respect for all ecological values. The olive pomace processing process is protected by a patent and awarded at world fairs for innovators.</p>	<p><a href="https://www.helios-gea.com/">https://www.helios-gea.com/</a></p>
62) What are the future perspectives? (Techniques, products, production, employment)	<p>Positive annual growth rates in the volume of industrial production have continued continuously since December 2020, however due to high inflation and problems with supply chains, there are negative future risks.</p> <p>Decline in the production of sugar beet, sunflower, corn, soybeans (which are important raw materials for further processing).</p> <p>In 2022, Croatia was among the EU countries with the highest increase in costs in agriculture, and it also recorded a double-digit increase in the prices of agricultural products.</p> <p>There is an increasing focus on the digital agriculture model that leads to ecological production and rural development. Croatian agriculture has great potential for the development of digital technology. It could have a significant impact on reducing costs, facilitating the relocation of production resources, increasing productivity and other agricultural needs.</p> <p>The Ministry of Agriculture recognized the advantages of digitization through the systems ARKOD (system for identification of land parcels) and AGRONET (system for filling out requests for incentives and reviewing databases). Digital agriculture enables timely performance of agricultural works, high productivity, reduced number of operations and low labor costs. The main principles of digital agriculture are the collection, processing and application of data and the processing of documentation.</p> <p>Processing factories provide employment opportunities and a source of income for local communities.</p> <p>There is a need to connect agricultural production with food processing industry, which presents an</p>	<p><a href="https://strukturnifondovi.hr/wp-content/uploads/2022/03/WEB_brosura_MinRegRaz.pdf">https://strukturnifondovi.hr/wp-content/uploads/2022/03/WEB_brosura_MinRegRaz.pdf</a></p> <p><a href="https://hrcak.srce.hr/file/406172">https://hrcak.srce.hr/file/406172</a></p>

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	<p>important opportunity for Croatia, since food processing industry creates strong impacts on the whole economy, in terms of added value and new job openings. This is also important in terms of connecting farmers and agriculture sector with other sectors (especially technology development and innovation sectors), that will lead to regional and territorial development. (Celebio, Cro)</p> <p>In the Croatian agricultural sector, data are often vague, scattered or not easily accessible, and in many cases when farmers are to obtain management, market or other information, they rely on informal channels such as a personal network of agricultural contacts (personal account and spoken-information). Therefore, it is necessary to enable agricultural open data ecosystem.</p> <p>Cattle breeding is the largest single source of CH<sub>4</sub> emissions with a share of 39% of total intestinal emissions in 2019, followed by dairy cows with 36%. The aim is to reduce CH<sub>4</sub> emissions from intestinal fermentation by changing the diet of livestock and achieve neutrality through the production of renewable electricity (agrovoltatics), which will be used primarily to meet the needs of the livestock farm complex, and the surplus will be sold to the distributor. Without marketing surpluses of renewable (electrical) energy, it is not possible to achieve carbon neutrality of livestock farmers. Save CH<sub>4</sub> and N<sub>2</sub>O emissions from manure management (sink) through manure processing in AD for the production of biogas and digestate. CH<sub>4</sub> emissions are eliminated from the atmosphere through the combustion of CH<sub>4</sub> from biogas. N<sub>2</sub>O emissions remain in the digestate.</p> <p>Emissions of N<sub>2</sub>O from manure could be reduced through the application of digestate in fertilization / soil humus compared to fertilization with untreated manure or mineral nitrogen fertilizers. Processing manure in AD for 30-60 days at a temperature of 30-38°C reduces the need to apply herbicides due to reduced weed germination. By closing the cycle of digestate application to agricultural soil with the cultivation of catch crops for co-digestion instead of corn silage.</p>	
63) Which are the main stakeholders of the local agrifood industry?	<p>At a micro-scale there are a number of stakeholders such as feedstock suppliers; agro-chemical manufacturers and suppliers; machinery and equipment manufacturers and suppliers; farmers; produce marketers and sellers; food processors; suppliers of food additives; packaging suppliers; transport companies; food retailers; consumers; and waste processors. Another stakeholder is formed by private and public research centres in the different subsectors of the agri-food sector.</p> <p>Main stakeholders:</p> <ul style="list-style-type: none"> <li>-Agricultural producers/ farmers: owners of agricultural land, milk producers, livestock breeders, fishermen and fish farmers, wine producers, family farms, local farms, rural holdings, ecovillages</li> <li>-Suppliers: manufacturers of plant protection products, seedling growers, manufacturers of technological solutions and mechanization in agriculture</li> </ul>	<p><a href="https://www.tecnoali.com/files/emensa/D3/Report%20Ainia.pdf">https://www.tecnoali.com/files/emensa/D3/Report%20Ainia.pdf</a></p> <p><a href="https://hrcak.srce.hr/file/406172">https://hrcak.srce.hr/file/406172</a> -</p>



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	-Management and support organisations: Ministry of Agriculture; Croatian Agency for Agriculture and Food; Agency for Payments in Agriculture, Fisheries and Rural Development, Croatian Agricultural Advisory Service, agriculture producer cooperatives and local partnerships, Croatian Agricultural Society, Croatian Society of Plant Sciences	
<b>OTHER BIO-BASED INDUSTRIES</b>		
Questions	Answer	Comments
64) Is there a mapping of the current bio-based industrial activities in your area?	There is no mapping of bio-based industries exclusively for Adriatic Croatia, but there are several reports, which include some bio-based stakeholders in Croatia.	<a href="https://datam.jrc.ec.europa.eu/datam/mashup/BIOBASED_INDUSTRI/index.html">https://datam.jrc.ec.europa.eu/datam/mashup/BIOBASED_INDUSTRI/index.html</a> <a href="https://www.obzoreuropa.hr/pdf/footer-broschures/obzor2020uspienicetreeizdanje2020_000.pdf">https://www.obzoreuropa.hr/pdf/footer-broschures/obzor2020uspienicetreeizdanje2020_000.pdf</a>
65) How many biobased industries are there in the region? Please specify the main biobased products produced	<p>Biobased industries:</p> <p>FIRM: Bio-Mi d.o.o Location: Rijeka Region: Primorje-Gorski kotar county Type of activity: Development and the production of bio-based, biodegradable and compostable thermoplastic materials Already involved in bio-based activities: First developer of biodegradable and compostable thermoplastics; manufacturing of EN 13432 certified bio-based, biodegradable and compostable thermoplastics (MI family of materials) Bio-based activity involved in: Creation of biodegradable blends based on starch, PLA, PHAs, PBS, PBAT, PCL, fillers, fibers, etc.; participation in over 10 EU-funded innovation projects (CELEBIO)</p> <p>FIRM: Mi-plast d.o.o. Location: Rijeka Region: Primorje-Gorski kotar county Type of activity: Processing of LDPE and HDPE materials, bio-polymers, packaging and production of these materials Already involved in bio-based activities: Research and development of biodegradable biopolymer-based materials Bio-based activity involved in: Participation in numerous research projects within the EU's R&amp;D and Innovation programs (CELEBIO)</p> <p>Firm: Istra papir doo: Pulp and paper industry - production and processing of paper products for household use and hygiene supplies</p> <p>Production of basic bio-based pharmaceutical and cosmetic products: Adriatic Algae Biotech d.o.o, particula-group JADRAN – GALENSKI LABORATORIJ d.d.</p> <p>Processing industry: food, fish, drinks; Food: <a href="#">ViR 1898 - VINDIJA</a> Meat industry: Braća Pivac d.o.o Drink: Maraska d.d, Agrolaguna d.d., Naturalis d.o.o</p>	<p><a href="https://www.haop.hr/sites/default/files/uploads/dokumenti/021_otpad/lzvjesca/ostalo/OTP_vozila_gume_2020_web.pdf">https://www.haop.hr/sites/default/files/uploads/dokumenti/021_otpad/lzvjesca/ostalo/OTP_vozila_gume_2020_web.pdf</a></p> <p><a href="https://www.eizg.hr/userdocsimages/publikacije/serijske-publikacije/sektorske-analize/SA-bioekonomija_velja%C4%8Da_2020.pdf">https://www.eizg.hr/userdocsimages/publikacije/serijske-publikacije/sektorske-analize/SA-bioekonomija_velja%C4%8Da_2020.pdf</a> - hr <a href="https://www.eizg.hr/userdocsimages/publikacije/serijske-publikacije/sektorske-analize/sa_bioekonomija_2021.pdf">https://www.eizg.hr/userdocsimages/publikacije/serijske-publikacije/sektorske-analize/sa_bioekonomija_2021.pdf</a></p> <p><a href="https://eizg.hr/userdocsimages/publikacije/serijske-publikacije/sektorske-analize/SA-Bioekonomija-2022.pdf">https://eizg.hr/userdocsimages/publikacije/serijske-publikacije/sektorske-analize/SA-Bioekonomija-2022.pdf</a></p> <p><a href="https://www.wood-key.eu/hr/materijali/">https://www.wood-key.eu/hr/materijali/</a></p>

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	<p>Fishing processing: CROMARIS</p> <p>Wood processing industry: many factories</p> <p>Waste water treatment: Pazin</p> <p>Processing of waste cars and car tires: ODLAGALIŠTE SIROVINA d.o.o., Holcim</p> <p>BIOBASED PRODUCTS:</p> <ul style="list-style-type: none"> <li>-certified biodegradable, compostable thermoplastics from bio-mi</li> <li>-Processing of LDPE and HDPE materials, bio-polymers, packaging and production of bio-materials by mi-plast</li> <li>-development of environment-friendly coating products with bio-based basis by Hempel</li> <li>-biodiesel fuel by ADRIATIC BIODIZEL d.o.o. (the only biodiesel factory from rapeseed and waste edible oils in Croatia)</li> </ul> <p>BIOENERGY: BIOMASS POWER PLANTS (7)</p>	
66) Out of the previous list indicate the three more relevant in terms of revenues and role to meet the government strategic objectives (decarbonisation, CO <sub>2</sub> emissions, circular economy, etc.)	<p>Bio-Mi: 991.395,58 €</p> <p>Mi-plast: 742.389,81 €</p> <p>Adriatic biodizel: 336,19 € as an example for future developing potential - the first year without a loss. Bio-Mi and Mi-plast are pioneers in Croatia and achieve great profits.</p>	
67) Are state subsidies received to promote sustainable production by these industries?	<p>AID FOR RESEARCH AND DEVELOPMENT PROJECTS:</p> <p>tax relief for research and development projects and feasibility studies (reduction of the tax base)</p> <p>A research and development project includes: basic research, industrial research and experimental development or feasibility study.</p> <p>Incentive measures for investment projects</p> <p>As part of the planned public calls to support the growth and development of innovative start-up companies and SMEs, grants of small value (De minimis grants) will be awarded for the diversification and modernization of production with a grant intensity of up to 95%.</p> <p>Horizontal transformation project to strengthen the regional eco system for entrepreneurs</p> <p>Support for innovation clusters</p> <p>1. 7. 2022. Support to companies for the transition to an energy and resource-efficient economy</p> <p>11/4/2022 Open public invitation "Construction and/or equipping of facilities for sorting separately collected waste paper, cardboard, metal, plastic and other materials within the framework of the National Recovery and Resilience Plan 2021 - 2026."</p> <p>9/14/2022 Public call for submission of a request for authorization to enter into a contract with the Environmental Protection and Energy Efficiency Fund for processing waste electrical and electronic</p>	<p><a href="https://strukturnifondovi.hr/wp-content/uploads/2022/03/WEB_brosura_MinRegRaz.pdf">https://strukturnifondovi.hr/wp-content/uploads/2022/03/WEB_brosura_MinRegRaz.pdf</a></p> <p><a href="https://investcroatia.gov.hr/en/measures-to-promote-research-and-development/">https://investcroatia.gov.hr/en/measures-to-promote-research-and-development/</a></p> <p><a href="https://investcroatia.gov.hr/en/incentive-measures-for-investment-projects/">https://investcroatia.gov.hr/en/incentive-measures-for-investment-projects/</a></p> <p><a href="https://hamagbicro.hr/wp-content/uploads/2019/12/CROATIA-INDUSTRY-4.0_WEB.pdf">https://hamagbicro.hr/wp-content/uploads/2019/12/CROATIA-INDUSTRY-4.0_WEB.pdf</a></p> <p><a href="https://mfin.gov.hr/istaknute teme/koncesije-i-drzavne-potpore/drzavne-potpore/transparentnost-potpore/ministarstvo-gospodarstva-i-odrzivog-razvoja/3092?trazi=1&amp;=page=3">https://mfin.gov.hr/istaknute teme/koncesije-i-drzavne-potpore/drzavne-potpore/transparentnost-potpore/ministarstvo-gospodarstva-i-odrzivog-razvoja/3092?trazi=1&amp;=page=3</a></p> <p><a href="https://ruralnirazvoj.hr/natjecaji/">https://ruralnirazvoj.hr/natjecaji/</a></p>



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	<p>equipment in order to meet the national goals of separate collection and recovery of EE waste</p> <p>13.5.2022. Construction and equipping of facilities for biological treatment of separately collected biowaste</p> <p>Program for awarding state grants for the construction of facilities and/or the purchase of equipment that encourages the processing, recycling and reuse of construction and large (bulky) municipal waste – 2023</p> <p>State aid award program for measure C1.1.1.R4-I1</p> <p>Support for companies for the transition to an energy and resource efficient economy</p> <p>State aid award program for investment in energy efficiency measures and high-efficiency cogeneration in the processing industry</p> <p>SA.101989 State grant award program for investment in the promotion of energy from renewable energy sources</p> <p>Program for awarding state grants for investment in energy efficiency measures</p>	
68) What is the percentage of employment covered by biobased industries?	No data for now	
69) How many tonnes of biobased materials/products are produced per year? Please specify by typology (renewable energies, biofuels, biomaterials, biochemicals, biobased cosmetics/pharmacy, others)	<p>Renewable energies:</p> <p>Biofuels:</p> <p>Biomaterials:</p> <p>Biochemicals:</p>	
70) Which type of wastes/by-product, residue are produced in the production process?		
71) What are the biobased materials, side-products, waste or residues used as raw materials in the productive process?	<p>Rapeseed and waste edible oils – biodiesel</p> <p>Cellulose - paper industry</p> <p>Starch, PLA, PHA, PLA, PHAs, PBS, PBAT, PCL, fillers, fibers, etc for certified biodegradable, compostable thermoplastics from Bio-mi</p> <p>LDPE and HDPE waste - materials by Mi-plast</p> <p>Biomass – bioenergy industries</p> <p>100.13 t of scrap cars, 748.18 t of tires for processing</p>	<a href="https://www.haop.hr/sites/default/files/uploads/dokument/021_otpad/lzvjesca/ostalo/OTP_vozila_gume_2020_web.pdf">https://www.haop.hr/sites/default/files/uploads/dokument/021_otpad/lzvjesca/ostalo/OTP_vozila_gume_2020_web.pdf</a> - 2020
72) Where are these raw materials obtained or cultivated?	<p>Mi-plast: Exclusively licensed collectors of PE waste supply company with waste</p> <p>Biomass (olive pomace/wood chips)</p> <p>Biodiesel from agriculture</p>	<a href="https://www.bioekonomi-e-bw.de/en/bw/definition/bioeconomy-products">https://www.bioekonomi-e-bw.de/en/bw/definition/bioeconomy-products</a>
73) Which are the main stakeholders/actors supplying these raw materials?	No data	
74) Which is the price of these biobased raw materials used (€/ton)?	No data	
75) Which is the price of the main biobased products produced in the region (€/ton)?	No data	
76) Which are the perspectives in the use of these biobased raw materials/side-products/waste?	No data	
77) Which are the perspectives in the consumption of these biobased products?	<p>In Croatia, there are several initiatives and policies aimed at promoting the use of biobased products. Moreover, Croatia is a country with significant agricultural and forestry resources, which could be utilized for the production of biobased products such as biofuels, bioplastics, and biocomposites. The production of biobased products can also</p>	

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	provide new opportunities for the development of rural areas and the creation of new jobs. In terms of consumer behavior, there is some evidence that consumers in Croatia are increasingly interested in sustainable products. For example, a survey conducted by the Croatian Chamber of Economy in 2019 found that 72% of respondents said they would be willing to pay more for environmentally friendly products. However, there are also challenges to the adoption of biobased products in Croatia. These include the higher cost of some biobased products compared to their traditional counterparts, limited consumer awareness and education, and the need for further investment in infrastructure and research and development. Overall, the consumption of biobased products in Croatia is likely to continue to grow in the coming years, driven by both government policies and consumer demand. However, further efforts are needed to address the challenges and realize the full potential of biobased products in Croatia.	
78) Please mention the 3 bio-based solutions with more relevance in your region (that can be taken as an example of implementation or good practice for other regions) and provide contact details if possible.	<p>1. Bio-mi: Pioneers in East and Southeast Europe that manufacture certificated bio-based, biodegradable, and compostable thermoplastics; <a href="https://www.bio-mi.eu/index.php/en/contacts">https://www.bio-mi.eu/index.php/en/contacts</a></p> <p>2. Mi-plast: research and development of biodegradable materials based on biopolymers, and participation in numerous research projects within the EU Program for Research and Development and Innovation - FP7, Horizon2020, Life+ and ESIF. R&amp;D combined with actual manufacturing activities (e.g. biodegradable films and bags from EcoCortec) - good example of intersectoral cooperation ; <a href="https://mi-plast.eu/hr/kontakt/mi-plast-d-o-o">https://mi-plast.eu/hr/kontakt/mi-plast-d-o-o</a></p> <p>3. EKO LIKA Greennovation produces the highest quality wool pellet fertilizer. It is a start-up that will initiate positive socio-economic and ecological development and stop the trend of emigration in Lika and its surroundings through circular and green entrepreneurship. With the construction of the EKO LIKA production facility, the wool center in Lika would become the leading center for wool processing at the national and regional level in 3-5 years; <a href="https://www.eko-lika-greennovation.com/hr/kontakt/">https://www.eko-lika-greennovation.com/hr/kontakt/</a></p>	
79) Please mention 3 bio-based solution in your region that have high deployment potential in your region but still need support to accelerate-unlock its potential (please mention what technological, regulatory and market challenges are and provide contact details if possible)	<p>The key industries in Croatia with important bio-economy growth and development potential identified include agriculture, food processing, aquaculture, and forestry.</p> <p>Primary agriculture and fisheries constitute important economic sectors in Croatia, especially for rural and coastal communities. Due to the access to the sea, the fish processing industry has a great potential that is unused.</p>	<a href="https://hrvatska2030.hr/wp-content/uploads/2020/10/Agriculture-Fisheries-and-Food-Processing-in-Croatia_s-Food-_Bio-Economy.pdf">https://hrvatska2030.hr/wp-content/uploads/2020/10/Agriculture-Fisheries-and-Food-Processing-in-Croatia_s-Food-_Bio-Economy.pdf</a>
<b>ENERGY INDUSTRY</b>		
Questions	Answer	Comments
80) How many energy industries are there?	<p>Fossil fuel industries:</p> <p>JANAF pipeline (international oil transportation system from the tanker and terminal port of Omišalj to domestic and foreign refineries in Eastern and Mid-Europe). Consisting of LNG terminal near Omišalj, Omišalj-Urinj submarine pipeline, OIL REFINERY RIJEKA (URINJ) and further</p> <p>Gas fields in the Croatian subsea:</p>	<p><a href="https://en.wikipedia.org/wiki/Energy_in_Croatia">https://en.wikipedia.org/wiki/Energy_in_Croatia</a></p> <p><a href="https://files.hrote.hr/files/PDF/OIEIK/GI_%202021_HROTE_OIEIK_14032022_final.pdf">https://files.hrote.hr/files/PDF/OIEIK/GI_%202021_HROTE_OIEIK_14032022_final.pdf</a></p> <p><a href="https://repozitorij.etfos.hr/islandora/object/etfos%3">https://repozitorij.etfos.hr/islandora/object/etfos%3</a></p>

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	<p>Gas production in the Adriatic takes place through the North Adriatic Hydrocarbon Exploitation Field, where the operator is INA Jadran, which includes 9 gas fields, 15 platforms and 40 wells, and through the Marica Hydrocarbon Exploitation Field of the same operator, where there are 2 gas fields, 2 platforms and 6 well.</p> <p>Hydropower industry: HE Rijeka, RHE Lepenica, CHE Fužine, HE Vinodol...</p> <p><b>Wind industry:</b> Wind farm Vrataruša, Wind farm ZD6...and many more.</p> <p><b>Thermal industry :</b> TE Rijeka (Fuel oil), Plomin (coal)</p> <p><b>SOLAR ENERGY: MANY</b></p> <p>Biomass power plants (7):</p> <ol style="list-style-type: none"> <li>1. Cogeneration plant 60 kW - SERVICE &amp; ENGINEERING INDUSTRY d.o.o. - Krk</li> <li>2. Biomass cogeneration energy plant Bjelopolje - WHITEFIELD ENERGY d.o.o - Lik-Senj county</li> <li>3. Cogeneration plant Benkovac - BIOMASS TO ENERGY BENKOVAC d.o.o. - Zadar county</li> <li>4. EG1 wood biomass cogeneration plant 5 MW - ENERGAN GOSPIĆ 1 d.o.o - Lika- Senj county</li> <li>5. Biomass energy production project in the municipality Brinje - BE - TO BRINJE d.o.o - Lika- Senj county</li> <li>6. Cogeneration sawmill Krasno 500 kW</li> <li>7. Biomass cogeneration energy plant Lika energo EKO 2</li> </ol> <p>Production of liquid biofuels (!): ADRIATIC BIODIZEL d.o.o</p> <p>Geothermal power plants: 0 Biogas power plants: 0 Gas-fired power plants from wastewater treatment plants:0</p>	<p><a href="#">A3408/datastream/PDF/vi ew</a></p> <p><a href="https://hrcak.srce.hr/file/374216">https://hrcak.srce.hr/file/374216</a></p> <p><a href="https://slobodnadalmacija.hr/vijesti/biznis/posljednji-h-godina-pada-proizvodnja-plina-na-kopnu-i-na-moru-ali-od-2020-ponovno-rastu-kapitalna-ulaganja-u-istrazivanje-i-proizvodnju-1088852">https://slobodnadalmacija.hr/vijesti/biznis/posljednji-h-godina-pada-proizvodnja-plina-na-kopnu-i-na-moru-ali-od-2020-ponovno-rastu-kapitalna-ulaganja-u-istrazivanje-i-proizvodnju-1088852</a></p>
81) Does the main part of energy come from renewable or non-renewable energy?	<p>Non-renewables (CRO)</p> <p>The consumption of <u>liquid fuels</u>, with 109.7 PJ (37.6 %), dominates the structure of energy sources used in final energy consumption, followed by electricity with 59.4 PJ (20.4 %), firewood and biomass with 53.8 PJ (18.5 %), natural gas with 42.1 PJ (14.4 %), heat with 18.3 PJ (6.3 %), coal and coke with 7.4 PJ (2.5 %) and other renewable energy sources with 0.9 PJ (0.3 %).</p> <p>The share of renewable energy sources in gross final energy consumption in 2021 is estimated at 31.7 per cent, 0.64 percentage points higher than in 2020.</p> <p>Production comes from fuel wood and biomass (33.2%), water power (29.8%), renewable sources 12.4%</p>	<p><a href="https://eihp.hr/wp-content/uploads/2023/01/Energija%20u%20HR%2021_WEB_LR.pdf">https://eihp.hr/wp-content/uploads/2023/01/Energija%20u%20HR%2021_WEB_LR.pdf</a></p>
82) What is the main source of renewable energy?	Hydro power plants in Croatia (47.5 % of total produced electricity)	<a href="https://files.hrote.hr/files/PDF/OIEIK/GI_%202021_HROTE_OIEIK_14032022_final.pdf">https://files.hrote.hr/files/PDF/OIEIK/GI_%202021_HROTE_OIEIK_14032022_final.pdf</a>
83) What is the main source of non-renewable energy?	Liquid fuels (consumption)	



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84) Are state subsidies received to promote renewable energies?	<p>RURAL DEVELOPMENT PROGRAM: TENDER FOR TYPE OF OPERATION 4.2.2 USE OF RENEWABLE ENERGY SOURCES</p> <p>Subsidies for renewable energy sources and high-efficiency cogeneration</p> <p>The incentive price at which HROTE pays the privileged producer for electricity delivered to the power system from the facilities of privileged producers, which use OIEiK plants.</p> <p>A total of HRK 3,334,241,330.12 (amount without VAT) was paid in the name of incentive payments in the period from January 1 to December 31, 2021 (HR). Of the stated amount, a part of HRK 832,654.35 (excluding VAT) refers to the payment of incentives at the guaranteed purchase price. 312 facilities in the subsidies system (ADR).</p>	<p><a href="https://files.hrote.hr/files/PDF/OIEiK/GI_%202021_HROTE_OIEiK_14032022_fi_nal.pdf">https://files.hrote.hr/files/PDF/OIEiK/GI_%202021_HROTE_OIEiK_14032022_fi_nal.pdf</a></p> <p><a href="https://ruralnirazvoj.hr/na-tjecaj-za-tip-operacije-4-2-2-koristenje-obnovljivih-izvora-energije-4/">https://ruralnirazvoj.hr/na-tjecaj-za-tip-operacije-4-2-2-koristenje-obnovljivih-izvora-energije-4/</a></p>
85) What is the percentage of employment covered by the energy sector?	Supply of electricity, gas, steam and air conditioning: 14 574 people (1.04%) - data for Croatia, 10/2022	<p><a href="https://podaci.dzs.hr/medija/erdfes4y/statinfo2021.pdf">https://podaci.dzs.hr/medija/erdfes4y/statinfo2021.pdf</a> - hr</p> <p><a href="https://podaci.dzs.hr/2022/hr/29230">https://podaci.dzs.hr/2022/hr/29230</a></p>
86) Which is the average price of energy (€/kWh)? (Differences between renewable and non)	<p>Petroleum product retail prices (€/l) – annual average:</p> <p>Unleaded motor gasoline: 1.40</p> <p>Eurodiesel: 1.35</p> <p>Light fuel oil: 0.66</p> <p>Liquefied petroleum gas: 0.69</p> <p>2022, all taxes and levies incl.:</p> <p>Gas - Households: 0,0405 €/kWh</p> <p>Gas – Non-household: 0,0566 €/kWh</p> <p>Electricity- Household: 0.1377 €/kWh</p> <p>Electricity – Non-household: 0.1755 €/kWh</p> <p>Tariff items for heat production and distribution (without tax) of central district heating systems:</p> <p>Household and Industry and business consumers: 0.045 €/kWh</p>	<p><a href="https://ec.europa.eu/eurostat/databrowser/view/NRG_PC_202_custom_505569/default/table?lang=en">https://ec.europa.eu/eurostat/databrowser/view/NRG_PC_202_custom_505569/default/table?lang=en</a> - gas</p> <p><a href="https://ec.europa.eu/eurostat/databrowser/view/nrg_pc_203/default/table?lang=en">https://ec.europa.eu/eurostat/databrowser/view/nrg_pc_203/default/table?lang=en</a></p> <p><a href="https://ec.europa.eu/eurostat/databrowser/view/nrg_pc_204/default/table?lang=en">https://ec.europa.eu/eurostat/databrowser/view/nrg_pc_204/default/table?lang=en</a></p> <p><a href="https://ec.europa.eu/eurostat/databrowser/view/nrg_pc_205/default/table?lang=en">https://ec.europa.eu/eurostat/databrowser/view/nrg_pc_205/default/table?lang=en</a></p> <p><a href="https://podaci.dzs.hr/medija/rhdfnduh/si-1698_energetska-statistika-u-2021.pdf">https://podaci.dzs.hr/medija/rhdfnduh/si-1698_energetska-statistika-u-2021.pdf</a></p>
87) Which percent of energy usage comes from renewable energy?	Share of renewable energy sources in final energy consumption (RES); 31.3 % (entire Croatia)	<a href="https://ec.europa.eu/eurostat/databrowser/view/NRG_IND_REN_custom_5055560/default/table?lang=en">https://ec.europa.eu/eurostat/databrowser/view/NRG_IND_REN_custom_5055560/default/table?lang=en</a>
88) Which are the future perspectives?	<p>The energy policy and strategy of the Republic of Croatia is aimed at EU goals in terms of reducing greenhouse gas emissions, increasing the share of RES, energy efficiency, security and quality of supply, and the development of the EU's internal energy market, as well as available resources, energy infrastructure, and the competitiveness of the economy and energy sector.</p> <p>All sectors of energy production and consumption will participate in the transformation of the energy</p>	<p><a href="https://mingor.gov.hr/Use%20Images/UPRAVA%20ZA%20ENERGETIKU/Strategija%20planovi%20i%20programi/Strategija%20energetskog%20razvoja%20RH%202030%20s%20pogledom%20na%202050.pdf">https://mingor.gov.hr/Use%20Images/UPRAVA%20ZA%20ENERGETIKU/Strategija%20planovi%20i%20programi/Strategija%20energetskog%20razvoja%20RH%202030%20s%20pogledom%20na%202050.pdf</a></p> <p><a href="https://www.nacional.hr/zbog-rata-u-ukrajini-hrvatska-ce-poceti-">https://www.nacional.hr/zbog-rata-u-ukrajini-hrvatska-ce-poceti-</a></p>



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	<p>sector, as well as the systems that transmit and supply energy and energy products to customers.</p> <p>In its transformation, energy systems must continue to fulfill their basic purpose, which is the safe supply of energy to all customers, at acceptable prices and with minimal impact on the environment.</p> <p>The main future perspectives in the energy sector are:</p> <p>Strengthen the energy market as a supporting component of the development of the energy sector. The key economic mechanism for controlling the speed of the transition is represented by the prices of emission units.</p> <p>Fully integrate the energy market into the international market of energy, technology, research, services, production, and especially the internal energy market of the EU.</p> <p>Strengthen the security of energy supply through the growth of domestic production and the connection of energy infrastructure, as well as the introduction of Capacity Remuneration Mechanisms</p> <p>Increase energy efficiency in all parts of the energy chain (production, transport/transmission, distribution and consumption of all forms of energy).</p> <p>Continuously increase the share of electricity in energy consumption with the aim of reducing the consumption of fossil fuels.</p> <p>Continuously increase electricity production with reduced greenhouse gas emissions - primarily from RES.</p> <p>Development should be based on commercially available technologies, especially the use of water, sun and wind energy and other RES.</p> <p>Direct financial support to the development of bioeconomy and sustainable waste management, as well as research, pilot and demonstration projects.</p> <p>Provide de-risking funds for demanding technologies and borderline commercial technologies. The strategy views the energy transition as an opportunity for the development of the domestic industry through increased investments in innovations in the area of air quality protection, the environment and general human health, while simultaneously increasing the competitiveness of the economy in the area of decarbonization and the development of RES.</p> <p>Stronger gas independence (new wells)</p>	<a href="#">proizvoditi-40-posto-plina-za-vlastite-potrebe/ -</a>
<b>MUNICIPAL SOLID WASTE (MSW)</b>		
Questions	Answer	Comments
89) How many tonnes of MSW are generated per year?	815,871 t (46% of Croatia's total MSW)	<a href="https://www.haop.hr/sites/default/files/uploads/dokumenti/021_otpad/lzvjesca/komunalni/OTP_lzvje%C5%A1%C4%87e%20o%20k">https://www.haop.hr/sites/default/files/uploads/dokumenti/021_otpad/lzvjesca/komunalni/OTP_lzvje%C5%A1%C4%87e%20o%20k</a>

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		<a href="#">omunalnom%20otpadu%20za%202021.%20godinu F V.pdf</a>
90) Which is their main composition?	<p>Estimated composition of mixed municipal waste in the RH (%):</p> <p>Metal 2.1 % Wood 1.0 % Textile/Clothing; 3.7 % Paper and cardboard 23.2 % Glass 3.7 % Plastic 22.9 % Gum 0.2 % Skin/bones 0.5 % Kitchen waste 30.9 % Garden waste 5.7 % Other waste (soil, dust, sand, undefined) 6.3 %</p>	<p><a href="https://www.haop.hr/sites/default/files/uploads/dokumenti/021_otpad/lzvjesca/komunalni/OTP_lzvje%C5%A1%C4%87e%20o%20komunalnom%20otpadu%20za%202021.%20godinu F V.pdf">https://www.haop.hr/sites/default/files/uploads/dokumenti/021_otpad/lzvjesca/komunalni/OTP_lzvje%C5%A1%C4%87e%20o%20komunalnom%20otpadu%20za%202021.%20godinu F V.pdf</a></p> <p><a href="https://mingor.gov.hr/UserDocsImages/UPRAVA-ZA-PROCJENU-UTJECAJA-NA-OKOLIS-ODRZIVO-GOSPODARENJE-OTPADOM/Sektor%20za%20odr%C5%BEivo%20gospodarenje%20otpadom/Ostalo/management_plan_of_the_republic_of_croatia_for_the_period_2017-2022.pdf">https://mingor.gov.hr/UserDocsImages/UPRAVA-ZA-PROCJENU-UTJECAJA-NA-OKOLIS-ODRZIVO-GOSPODARENJE-OTPADOM/Sektor%20za%20odr%C5%BEivo%20gospodarenje%20otpadom/Ostalo/management_plan_of_the_republic_of_croatia_for_the_period_2017-2022.pdf</a></p>
91) Are the wastes exploited? (Indicate how)	<p>Waste treatment:</p> <p>Energy recovery: About 20% of the generated biowaste was sent to recovery (composting, anaerobic digestion, etc.) (HR); 2 composting plants (out of a total of 12 in HR): Krk (capacity 6,000 t), Perušić (capacity 1,200 t). Primorje-Gorski County; the company Ponikve Eko otok Krk d.o.o.; a total of 5,588 t of municipal waste was collected.</p> <p>Recycling: 7 % of recovered MSW (Adriatic)</p> <p>Mechanical-biological treatment of waste (Kaštijun, Marišćina, REGIONAL CENTER OF CLEAN ENVIRONMENT d.o.o. etc): 8% MSW (HR)</p> <p>In MBT plants, waste that is not sent for recycling, after the sorting and biodrying process, is deposited on the bioreactor surfaces. The filling period of the bioreactor surface is five (5) years. It is predicted that the first period of filling bioreactor surfaces in the Republic of Croatia will end by the middle of 2023. After the bioreactor surface is completely filled and after all processing processes are completed, stable waste remains on the bioreactor surface.</p> <p>Other pre-processing procedures (mixing, repackaging...): 2% MSW (HR)</p>	<p><a href="https://ec.europa.eu/eurostat/databrowser/view/ENV_WASOPER_custom_4995736/default/table?lang=en - 2020">https://ec.europa.eu/eurostat/databrowser/view/ENV_WASOPER_custom_4995736/default/table?lang=en - 2020</a></p> <p><a href="https://files.hrote.hr/files/PDF/OIEIK/GI_%202021_HROTE_OIEIK_14032022_final.pdf">https://files.hrote.hr/files/PDF/OIEIK/GI_%202021_HROTE_OIEIK_14032022_final.pdf</a></p>
92) Where are the MSW generated?	<p>MSW comes from homes, schools, kindergarten, hospitals, businesses, service sector, offices, hotels, shops, tourism...</p> <p>Individual housing and smaller residential buildings through done via a 120 l bin, community housing through 240 l and 1100 l bins.</p>	<p><a href="https://narodne-novine.nn.hr/clanci/sluzbeni/2005_11_130_2398.html">https://narodne-novine.nn.hr/clanci/sluzbeni/2005_11_130_2398.html</a></p>
93) Who are the main stakeholders involved in the MSW management?	<p>For MSW are responsible municipalities and cities.</p> <p>Public service providers for the collection of municipal waste: a total of 98 companies in Adriatic Croatia that reported the collection of mixed municipal waste; subcategory:</p> <p>Local self-government units with separate collection - Investments are made in the</p>	<p><a href="https://www.haop.hr/sites/default/files/uploads/dokumenti/021_otpad/lzvjesca/komunalni/OTP_lzvje%C5%A1%C4%87e%20o%20komunalnom%20otpadu%20za%202021.%20godinu F V.pdf">https://www.haop.hr/sites/default/files/uploads/dokumenti/021_otpad/lzvjesca/komunalni/OTP_lzvje%C5%A1%C4%87e%20o%20komunalnom%20otpadu%20za%202021.%20godinu F V.pdf</a></p>



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	<p>infrastructure for separate collection of communal waste, such as containers for separate collection from the doorstep, construction of recycling yards, procurement of vehicles, construction of sorting facilities, etc., which resulted in an increase in the number of LSUs with separate collection; separately collected biowaste from municipal waste, packaging, paper and cardboard, metal, bulky waste, plastic, glass, electrical and electronic waste.</p> <p>Recycling yards: A local self-government unit with more than 1,500 inhabitants is obliged to ensure the functioning of at least one recycling yard and one more for every next 25,000 inhabitants in its territory.</p> <p>A local self-government unit with more than 100,000 inhabitants is obliged to ensure the functioning of at least four recycling yards and one more for every next 30,000 inhabitants in its area.</p> <p>Retailers of waste - purchase of waste from the seller (natural person, citizen) performed by a legal person or a natural person - tradesman. Registered in the Register of Waste Dealers. (approx. 480 companies at HR level)</p> <p>The final processor of waste is a person who processes waste through disposal or processing.</p> <p>Compost plant on the island of Krk - amount of waste taken in 2021 5,588 t</p> <p>MINGOR continuously implements measures to improve the quality of data and waste statistics, through the implementation of projects and regular activities on the improvement of the Management Information System and the implementation of projects aimed at improving individual segments of waste statistics, which together form the basis for monitoring the situation in the area of waste management in the Republic of Croatia and creating further policy in this area. In the coming period, it is expected to continue to improve the quality of the data due to the planned connection of the online application eONTO for keeping the Record Book on the origin and flow of waste with the ROO database.</p>	<p><a href="#">Oza%202021.%20godinu F V.pdf</a></p> <p><a href="https://mingor.gov.hr/o-ministarstvu-1065/djelokrug/uprava-za-procjenu-utjecaja-na-okolis-i-odrzivo-gospodarenje-otpadom-1271/gospodarenje-otpadom/ocevidnici-7589/7589">https://mingor.gov.hr/o-ministarstvu-1065/djelokrug/uprava-za-procjenu-utjecaja-na-okolis-i-odrzivo-gospodarenje-otpadom-1271/gospodarenje-otpadom/ocevidnici-7589/7589</a></p>
94) How is MSW valorised? (Added-value products)	<p>County Center for Waste Management of the Istrian County Kaštijun near Pula - according to information from the Ministry of Environment and Nature Protection, started trial work at the end of July 2016 – MBT plant</p> <p>Bio-mi firm: Thermoplastics with a high proportion of biomass 50%-100%; 100% biodegradable and compostable</p> <p>Compost which has potential for agricultural and industrial application.</p> <p>RDF fuel from waste:</p> <p>The first MBT plant in the Republic of Croatia (also Adriatic) with the production of RD/SRF was opened in Zadar Biljane Donje with a processing capacity of 60,000 t/year by EKO d.o.o. Zadar for Zadar County waste management</p>	<p><a href="https://www.kastijun.hr/hr/">https://www.kastijun.hr/hr/</a></p> <p><a href="https://bio-mi.eu/index.php/hr/proizvodna-linija/odrzivi-termoplasticni-materijali">https://bio-mi.eu/index.php/hr/proizvodna-linija/odrzivi-termoplasticni-materijali</a></p> <p><a href="http://regdoz.azo.hr/Reports/DozvoleGospodarenjeOtpadom.aspx">http://regdoz.azo.hr/Reports/DozvoleGospodarenjeOtpadom.aspx</a></p> <p><a href="https://www.rez.ba/wp-content/uploads/2017/11/Publ-021-Analiza-RDF.pdf">https://www.rez.ba/wp-content/uploads/2017/11/Publ-021-Analiza-RDF.pdf</a></p> <p><a href="https://repozitorij.fkit.unizg.hr/islandora/object/fkit%3A561/datastream/PDF/view">https://repozitorij.fkit.unizg.hr/islandora/object/fkit%3A561/datastream/PDF/view</a></p> <p><a href="https://www.s2biom.eu/i">https://www.s2biom.eu/i</a></p>

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	<p>Center for waste management in Rijeka - County Center for Waste Management of Primorje - Gorski Kotar County Marišćina north of Rijeka (35% of the collected waste ends up as fuel from RDF waste).</p> <p>The Center for Waste Management in Istria Thermal power plants: fuel co-combustion (TP Rijeka, Sveti Juraj Cement Factory in Kaštel Sućurac, Sveti Kajo Cement Factory in Solin)</p> <p>Plants for energy recovery of waste: Cemex, Drniš</p> <p>CEMEX CROATIA - use of wood waste for energy recovery. Fuel from waste is produced in waste management facilities from non-hazardous unsorted municipal waste in accordance with the waste management hierarchy of the European Union.</p> <p>GIRK KALUN – energy recovery, waste is thermally processed</p>	<a href="#">ages/Publications/WP8_Country_Outlook/Final_Roadmaps_March/S2Biom-CROATIA-biomass-potential-and-policies.pdf</a>
95) Which is the price of MSW added value-products?	<p>1m<sup>3</sup> compost - 33,44 EUR (VAT incl.)</p> <p>Fuel from waste is a valuable and renewable energy source. Waste management centers were primarily supposed to sell fuel from waste, however, due to disruptions in the market, the centers have to pay to export that fuel because they cannot store it and there is no infrastructure to use it in Croatia. WMC Marišćina allocates large amounts for the export of fuel that is burned in cement plants outside Croatia.</p> <p>From 2018 to the end of 2021, 16.2 percent of SRF from the total imported mixed municipal waste was produced in the Kaštijun Center, and it is temporarily baled and stored in the Center. The total costs of disposing of fuel from waste amounted to HRK 24 million, and at the end of 2021, about HRK 13 million of fuel was not disposed of. That year, the Fund began to bear 40 percent of the costs of disposing of that fuel, which amounted to HRK 5.6 million in 2021, and another HRK 1 million next year without VAT.</p>	<a href="http://www.ponikve.hr/cjenik-komposta">http://www.ponikve.hr/cjenik-komposta</a> <a href="https://novac.jutarnji.hr/novac/aktualno/luke-traven-za-zbrinjavanje-goriva-iz-otpada-platili-smo-27-milijuna-kuna-15137449">https://novac.jutarnji.hr/novac/aktualno/luke-traven-za-zbrinjavanje-goriva-iz-otpada-platili-smo-27-milijuna-kuna-15137449</a> <a href="https://www.vecernji.hr/vijesti/umjesto-da-prodaju-gorivo-centri-za-gospodarenje-otpadom-placaju-njegovo-zbrinjavanje-1652896">https://www.vecernji.hr/vijesti/umjesto-da-prodaju-gorivo-centri-za-gospodarenje-otpadom-placaju-njegovo-zbrinjavanje-1652896</a>
Which are the future perspectives? (Techniques, wastes)	<p>Future perspectives in terms of goals:</p> <p>Goal 1.1 - by 2022, reduce the total amount of generated municipal waste by 5% compared to 2015, i.e. to 1,571,300 t of waste.</p> <p>Goal 1.2 - by 2022, minimum recovery through recycling and preparation for reuse 52%</p> <p>Goal 1.3 - by 2022, separately collect 40% of the mass of produced biowaste that is an integral part of municipal waste</p> <p>Objective 1.4 - Dispose of less than 25% of the produced municipal waste in landfills.</p> <p>In the coming period, it is necessary to continue the implementation of already existing educational and informative activities aimed at preventing the generation of waste and separating useful waste at all levels.</p> <p>Further investment in infrastructure for separate collection of municipal waste such as containers for separate collection from the doorstep, construction</p>	<a href="https://ec.europa.eu/commission/presscorner/detail/hr/ip_20_420">https://ec.europa.eu/commission/presscorner/detail/hr/ip_20_420</a> <a href="https://www.fzoeu.hr/hr/centri-za-gospodarenje-otpadom/7593">https://www.fzoeu.hr/hr/centri-za-gospodarenje-otpadom/7593</a> <a href="https://narodne-novine.nn.hr/clanci/sluzbeni/2017_01_3_120.html">https://narodne-novine.nn.hr/clanci/sluzbeni/2017_01_3_120.html</a>



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	<p>of recycling yards, procurement of vehicles, construction of sorting facilities.</p> <p>The Waste Management Plan of Croatia foresees the construction of 6 waste management centers for treatment of mixed municipal waste and other waste that was not previously recyclable in Adriatic Croatia. These plants are planned with the concept of mechanical-biological treatment technology (MBT), which contribute to the achievement of goals regarding the decrease of biodegradable waste landfilling and total quantities of landfilled waste, but it is not sufficient in regard to achieving the municipal waste recycling goals. - celebno WMC Biljane Donje under construction.</p> <p>Two waste management centers have been approved for EU funding and are in the construction (Lečevica - Split-Dalmatia County, Lučino Razdolje – Dubrovnik-Neretva county).</p>	
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# Regional bioeconomy development and promotion. Policy framework

CROSS-CUTTING ISSUES		
Questions	Answer	Comments
96) Does your region have a strategy for circular bioeconomy?	Croatia does <u>not</u> have a national nor any regional bioeconomy or bioeconomy relevant strategy. As a country with moderate regional strategic action to deploy bioeconomy, under BIOEAST Initiative is in the process of developing their first national circular bioeconomy strategy. One published strategy with minimum bioeconomy content for one NUTS 3 county (Split-Dalmatian county) was identified - Action plan of the circular economy of SDŽ as part of Circe 2020.	<a href="https://poljoprivreda.gov.hr/istaknute-teme/biogospodarstvo/biogospodarstvo-u-europskoj-uniji/5079">https://poljoprivreda.gov.hr/istaknute-teme/biogospodarstvo/biogospodarstvo-u-europskoj-uniji/5079</a> - EU Strategija za biogospodarstvo 2018, ali ne I HR03 regija <a href="https://publications.jrc.ec.europa.eu/repository/handle/JRC128740">https://publications.jrc.ec.europa.eu/repository/handle/JRC128740</a>
97) Existence of bioeconomy hubs, clusters or any other association in the region?	No. However, national bioeconomy hub is in the process of making under Bioeast project.	<a href="https://bioeast.eu/republic-of-croatia-ministry-of-agriculture-of-republic-of-croatia/">https://bioeast.eu/republic-of-croatia-ministry-of-agriculture-of-republic-of-croatia/</a>
98) Existing of hubs or cluster targeting other topic or sectors? (please specify)	Digital innovation hubs (4): BlueDIH AgriFood Croatia Digital Partnership Centre (DIGIPARC) Digital Innovation Hub for 3D printing (3DJPU)  Culture Hub Croatia (CHC) - Platform for Education, Creativity and Development through Culture  AluTech Development and Innovation Center  Technological center Split  Center for Creative Industries Zadar  Local Action Group (LAG)  AluTech – Business Innovation Center, Šibenik (advanced materials)  Metris - Materials Research Center, Pula (shipbuilding, smart industry)  CEKOM 3LJ, Trilj (medicinal herbs)  Center of creative industries, Zadar (creative and cultural industries)  Center for Innovation and Entrepreneurship Rijeka  Aquaculture Research Center (CIRA) of the University of Dubrovnik  Marine Research Center Institute "Ruđer Bošković" Rovinj  Center for Micro and Nano Sciences and Technologies of the University of Rijeka (CMNZT)  Center for Sustainable Development of GIS Technologies, Split (smart agriculture)  Center for supporting smart and sustainable cities of the University of Rijeka	<a href="https://s3platform.jrc.ec.europa.eu/digital-innovation-hubs-tool?p_p_id=eu_europa_ec_jrc_dih_web_DihWebPortlet&amp;p_p_lifecycle=0&amp;p_p_state=normal&amp;p_p_mode=view">https://s3platform.jrc.ec.europa.eu/digital-innovation-hubs-tool?p_p_id=eu_europa_ec_jrc_dih_web_DihWebPortlet&amp;p_p_lifecycle=0&amp;p_p_state=normal&amp;p_p_mode=view</a> -  <a href="https://prigoda.hr/wp-content/uploads/2022/03/Plan-za-industrijsku-tranziciju-Jadranske-Hrvatske.pdf">https://prigoda.hr/wp-content/uploads/2022/03/Plan-za-industrijsku-tranziciju-Jadranske-Hrvatske.pdf</a>  <a href="https://www.interreg-danube.eu/uploads/media/approved_project_output/0001/09/46b10aaaa1260f0c86d20b0a9a5c04d34d992fbc.pdf">https://www.interreg-danube.eu/uploads/media/approved_project_output/0001/09/46b10aaaa1260f0c86d20b0a9a5c04d34d992fbc.pdf</a>

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	<p>Center for Agriculture and Rural Development of the Primorje-Gorski Kotar County</p> <p>Center for development and education - specialized business incubator for industries that use bee products as raw materials, Poličnik (green growth)</p> <p>Mariculture development center ŠKŽ - under construction (aquaculture)</p> <p>Center for Urban Transition, Architecture and Urbanism of the University of Rijeka - Delta Lab CPZI -</p> <p>Center for the Popularization of Science and Innovation of the Istrian County, Pula</p> <p>Institute of Oceanography and Fisheries, Split (fishery)</p> <p>Institute for Adriatic Cultures and Karst Reclamation, Split (agriculture)</p> <p>Institute for the Sea and Coasts Dubrovnik</p> <p>Institute for Agriculture and Tourism Poreč</p> <p>Department of Biotechnology, University of Rijeka</p> <p>Blue-green center of Zadar County - under preparation (agriculture, fishing)</p> <p>Business and innovation center iNAVIS, Šibenik (blue economy)</p> <p>Production park Torpedo - PORIN (additive technologies)</p> <p>Development Center LSŽ, Gospić (agriculture)</p> <p>Step Ri - Technology Park Rijeka (ICT, smart industries)</p> <p>Technology Park Split (ICT, smart industries)</p> <p>Institute for Mediterranean Cultures, University of Dubrovnik</p>	
99) What environmental indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (GHG decrease achieved with bioeconomy initiatives, resources depletion, implementation strategy aiming zero waste, etc.)?	<p>Lower carbon footprint</p> <p>Carbon neutrality</p> <p>Biodiversity conservation</p> <p>Resource efficiency, waste prevention and waste re-use</p> <p>Fossil fuel use</p> <p>Water quality/contamination</p> <p>Air quality (PM emissions etc)</p> <p>LULUC</p>	<p><a href="https://www.fao.org/3/ca6048en/CA6048EN.pdf">*https://www.fao.org/3/ca6048en/CA6048EN.pdf</a></p> <p><a href="https://forestecosyst.springeropen.com/articles/10.1186/s40663-017-0089-8">https://forestecosyst.springeropen.com/articles/10.1186/s40663-017-0089-8</a></p>
100) What economic indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (turnover linked to biobased companies (forestry, agriculture, other-biobased industries), existence of funding programmes/schemes targeting bioeconomy, existence of supporting measures promoting partnerships between industries and enterprises in the region, etc.)?	<p>Economic development</p> <p>GDP</p> <p>Gross and local value added</p> <p>Employment</p> <p>Rural income diversification</p> <p>Linkages between rural and urban economy</p> <p>Physical infrastructure</p> <p>Financial stability</p> <p>Net trade of raw biomass</p> <p>Value added of processed biomass</p> <p>Net trade of processed biomass</p> <p>Knowledge generation and innovation trade</p>	<p><a href="https://www.fao.org/3/ca6048en/CA6048EN.pdf">https://www.fao.org/3/ca6048en/CA6048EN.pdf</a></p> <p><a href="https://forestecosyst.springeropen.com/articles/10.1186/s40663-017-0089-8">https://forestecosyst.springeropen.com/articles/10.1186/s40663-017-0089-8</a></p>
101) What social indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (available skilled workforce, number or jobs created)	<p>Inclusiveness</p> <p>Gender equality</p> <p>Energy security</p> <p>Employment</p> <p>Food security</p>	<p><a href="https://www.fao.org/3/ca6048en/CA6048EN.pdf">https://www.fao.org/3/ca6048en/CA6048EN.pdf</a></p> <p><a href="https://forestecosyst.springeropen.com/articles/10.1186/s40663-017-0089-8">https://forestecosyst.springeropen.com/articles/10.1186/s40663-017-0089-8</a></p>

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in the last 5 years un bio-based industries, communications to society regarding bio-based activities (seminars, trainings, etc.), willingness to pay for bio-based products, etc.?	Nutrition Disease / hazards prevention (in biomass production and processing) Supply security and self-reliance Occupational health and safety Wages	
102) Current economic and social characteristics of your territory not reported in previous questions that could enable the development of the circular bioeconomy?	Despite its great potential for a sustainable and circular bioeconomy, Adriatic Croatia lacks strategic integration and cross-sectoral interaction. It is precisely the connection of different sectors, such as bioeconomy and tourism, that is seen as a powerful driver of rural and coastal areas. Their development and mobilization of bio-resources aims to positively influence the unfavourable trend of depopulation of the rural Adriatic, which, along with the poverty of the region, stands out as one of the main problems.	
103) Are there any bio-based production districts / specializations in your Region? (Please, provide a description of these activities, including data, focusing on Circular Bio-based Economy potentials and material/immaterial assets as well as existing barriers)	<p>The land part of region leads in the wood and food processing industry, while the coast and islands are dominated by fishing and aquaculture.</p> <p>County of Primorje-Gorski Kotar - wood industry and forestry (Drvenjača LLC., Energy Pellets Ltd., Finvestcorp d.d., The association of small sawmills Primorsko-Goranska County...); specialization bio-mi: the 1st manufacturers of certified biodegradable, compostable thermoplastics on a biological basis in Eastern and Southeastern Europe</p> <p>County of Lika-Senj: wood processing industry</p> <p>County of Zadar - Mariculture and fisheries (72% of the total Croatian mariculture)</p> <p>County of Split-Dalmatia, Istria, Šibenik-Knin: olive cultivation + wine production</p> <p>County of Dubrovnik-Neretva: mandarins</p>	<p><a href="https://www.bio-mi.eu/index.php/hr/">https://www.bio-mi.eu/index.php/hr/</a></p>
104) What are the strengths/weaknesses of your area regarding the development of the circular bioeconomy?	<p><b>Strengths:</b> Great biomass potential from agriculture, fishing and forestry, waste and residues. The enterprises operating in these sectors are suffering significant delays in the green conversion, multi-functioning, technology innovation, cross-sectoral integration.</p> <p>Blue growth sector potential: marine renewable energy, blue bio-economy and blue bio-technology, hydrogen production in the sea</p> <p>Potential of applying bioeconomy to aquaculture is to make use of the waste generated by aquatic organisms as well as of the value chain of fisheries to design highly innovative products with zero environmental impact. For instance, fish and shellfish, and in particular their by-products, are increasingly being used in innovative applications and new products in the pharmaceutical industry.</p> <p>According to the Regional Innovation Scoreboard report (2021) Adriatic Croatia is rated as Emerging Innovator +</p> <p>Above-average digital skills (23% above the EU average)</p> <p>-Significantly developed maritime transport, shipbuilding, port and tourism activities in which the principles of bioeconomy could be implemented</p> <p>Roadside cost relatively low and good road connectivity within the country</p> <p>Existence of state subsidies</p> <p>Large number of existing and active industrial hubs</p>	<p><a href="https://bioecordi.adrioninterreg.eu/">https://bioecordi.adrioninterreg.eu/</a></p> <p><a href="https://strukturnifondovi.hr/wp-content/uploads/2022/03/WEB_brosura_Mi_nRegRaz.pdf">https://strukturnifondovi.hr/wp-content/uploads/2022/03/WEB_brosura_Mi_nRegRaz.pdf</a></p> <p><a href="https://prigoda.hr/wp-content/uploads/2022/03/Plan-za-industrijsku-tranziciju-Jadranske-Hrvatske.pdf">https://prigoda.hr/wp-content/uploads/2022/03/Plan-za-industrijsku-tranziciju-Jadranske-Hrvatske.pdf</a></p>

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	<p>High potential for knowledge transfer (quality schools, universities)</p> <p><u>Weaknesses:</u> Adriatic Croatia lacks strategic integration and cross-sectoral interaction. It is precisely the connection of different sectors, such as bioeconomy and tourism, that is seen as a powerful driver of rural and coastal areas. Their development and mobilization of bio-resources aims to positively influence the unfavourable trend of depopulation of the rural Adriatic, which, along with the poverty of the region, stands out as one of the main problems.</p> <p>Lack of knowledge and awareness on the principles and possibilities of circular economy</p> <p>Adriatic Croatia below the EU average in the level of development of NUTS2 regions</p> <p>Natural depopulation and emigration</p> <p>Low investments of the business sector in research and development (only 10% of the EU average).</p> <p>Unfavourable business climate for the growth and development of SMEs</p> <p>Outdated production technology</p> <p>Insufficient networking of development stakeholders in regional value chains</p> <p>Mismatch of the labor market with the needs of the economy and lack of smart skills for the industrial transition</p> <p>Fragmented land and small average size of farms</p> <p>Lack of applied research</p>	
105) Please, identify actors with a natural interest in a project due to their existing businesses and market in your territory	<p>Technological innovation centre Rijeka (TIC) (retrofitting, innovating &amp; developing solutions to make existing tertiary buildings "greener")</p> <p>Technological centre Split (centre for business development)</p> <p>Institute of Agriculture and Tourism Poreč (Research)</p> <p>Institute of Oceanography and Fisheries – (Research)</p> <p>Faculty of Electrical Engineering, Mechanical Engineering and Shipbuilding, Split (shipbuilding, smart industry)</p> <p>Faculty of Civil Engineering, Architecture and Geodesy, Split (green construction)</p> <p>Study of energy efficiency and renewable sources, Šibenik (green technologies)</p> <p>University of Rijeka (Department of Biotechnology, Agriculture)</p> <p>University of Split (Department of Ecology and Marine Protection and Marine Fisheries)</p> <p>University of Zadar (Department of Ecology, Agronomy and Aquaculture, Center for Karst and Coastal Research, Center for Interdisciplinary Sea and Maritime Research - CIMMAR, Zadar)</p>	

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	<p>Center for Food Technology and Biotechnology within the Faculty of Food Biotechnology, University of Zagreb, Zadar</p> <p>Technical Faculty, Rijeka (smart industry)</p> <p>University in Rijeka, Department of Agriculture Poreč</p> <p>Institute Ruđer Boškovića</p> <p>Istrian Regional Energy Agency (IRENA)</p> <p>Institution Regional Energy Agency Kvarner (REA Kvarner)</p> <p>Dalmatian Energy Agency (DEA)</p> <p>Energy cooperative island Krk</p> <p>Red Cross</p> <p>Ministries</p>	
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## Annex 11. Bulgaria region profile

INFORMATION FOR STATISTICAL ANALYSIS		
REGIONS (EUROSTAT NUTS 2 – Level)		
(Please indicate for your region which NUTS 2-Regions are relevant or add additional regions in the comment section.)		
Question	Suggested NUTS 2 regions	Comments
1) Bulgaria – Region of Plovdiv	x South Central NUTs Region (please translate to English)	<div></div> <div><div><div>► Population (2021)</div><div>► Territory (sq. km)</div><div>► Number of settlements</div><div>► Share of urban population (%)</div></div><div><div>662,907</div><div>5,973</div><div>212</div><div>75.1</div></div></div> <div><a href="https://circabc.europa.eu/webdav/CircaBC/ESTAT/regportraits/Information/bg051_geo.htm">https://circabc.europa.eu/webdav/CircaBC/ESTAT/regportraits/Information/bg051_geo.htm</a></div> <div><p>A major positive feature of Plovdiv region is the considerable human resource in terms of quantity and level of professional qualification. It is also a major academic centre, with numerous educational establishments. The solid research potential of the city of Plovdiv is a further indisputable advantage of the region.</p><p>Another regional advantage is its well-developed economy with a strong services sector. Furthermore, the region enjoys a low unemployment level compared to the national average. A duty free zone plays an important role in the regional economy. The only international trade fair nationally is held here, creating further opportunities for future economic development.</p><p>Major roads of national and international importance cut through the region, and the crossroads location of the region makes it a natural economic and transport centre for South Bulgaria. It has a powerful economic impact on most of the regions in this part of the country. This circumstance, coupled with the</p></div>

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	<p>existing broadly diversified infrastructure, is an important prerequisite for the attraction of foreign and local investors. At the end of 2002, the number of telephone posts (including the installed direct, party-line and supplementary telephone apparatus to the settlements' telephone exchanges) was 251 562 of which 85% for households.</p> <p>The principal problems in the development of the region so far are related to the consequences of restructuring its industry and the agrarian sector. The existing specialisation of certain manufacturers to one or two product lines limits the capacity for flexible technological and product restructuring under present market conditions. The problems in the agrarian sector refer to the slow recovery of the region's position in rice, fruit and vegetable growing.</p> <p>A potential problem is related to the misbalances in the development of the intercity industrial agglomeration of Plovdiv-Assenovgrad-Stamboliyski-Pazardjik, as well as the lack of inter-regional coordination on the implementation of projects such as the southern Bulgarian irrigation canal</p> <p>Several environmental hot spots of soil, air and water pollution have been identified within the region.</p>
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## How to identify socially marginalised groups?

SOCIALLY MARGINALISED GROUPS																						
Questions		Answer			Comments																	
1. Population area with less than 5.000 inhabitants	Population as of 31.12. 2021- Total (number) 662 907 thousand people			NSI web site: <a href="https://www.nsi.bg/en/content/11420/district-plovdiv">https://www.nsi.bg/en/content/11420/district-plovdiv</a>  web site: <a href="http://www.citypopulation.de/en/bulgaria/admin/16_plovdiv/">http://www.citypopulation.de/en/bulgaria/admin/16_plovdiv/</a>																		
	Municipality of Laki – total number of citizens - 2,220																					
	Municipality of Perushtitsa total number of citizens - 4,298			United Nations data <a href="https://worldpopulationreview.com/countries/bulgaria-population">https://worldpopulationreview.com/countries/bulgaria-population</a>																		
	The current population of Bulgaria is 6,718,951 based on projections of the latest United Nations data. The UN estimates the July 1, 2023, population at 6,687,717.																					
2. Unemployment rate in the area	Unemployment rate (%) = 3.2 Unemployed persons registered at the labour offices as of 31.12. (number) is 11 962			NSI web site: <a href="https://www.nsi.bg/en/content/4011/unemployed-and-unemployment-rates-national-level-statistical-regions-districts">https://www.nsi.bg/en/content/4011/unemployed-and-unemployment-rates-national-level-statistical-regions-districts</a>																		
	Unemployment rates of population of 15 - 64 years of age – By sex (thousands) Male - 93.9 Female - 74.7 <b>Total - 168.6</b>																					
	Unemployment rates of population of 15 - 64 years of age in % <b>Total in %: 5.3 %</b> Male in % - 5.6 Female in % - 5.1																					
3. Employment rate of women in the region and at national level	Employees under labour contract by statistical regions and districts total <b>388526</b>			NSI web site: <a href="https://www.nsi.bg/en/content/11420/district-plovdiv">https://www.nsi.bg/en/content/11420/district-plovdiv</a>																		
	<table><tr><th colspan="3">Rural residence</th></tr><tr><th>Total</th><th>Male</th><th>Female</th></tr><tr><td>165154</td><td>81451</td><td>83703</td></tr></table>					Rural residence			Total	Male	Female	165154	81451	83703								
	Rural residence																					
	Total	Male	Female																			
	165154	81451	83703																			
Employees under labour contract by economic activity groupings and sectors in 2021 (Average annual number)																						
<table><tr><th rowspan="2">Economic activity</th><th colspan="3">2021</th></tr><tr><th>Total</th><th>Public sector</th><th>Private sector</th></tr><tr><td>Agriculture, forestry and fishing</td><td>65717</td><td>11019</td><td>54698</td></tr></table>			Economic activity	2021			Total	Public sector	Private sector	Agriculture, forestry and fishing	65717	11019	54698									
Economic activity	2021																					
	Total	Public sector	Private sector																			
Agriculture, forestry and fishing	65717	11019	54698																			
<table><tr><th colspan="7">LABOUR FORCE AND ACTIVITY RATES OF POPULATION AGED 15 YEARS AND OVER IN 2021</th></tr><tr><th rowspan="2">Statistical zones Statistical regions Districts</th><th colspan="3">Labour force - thous.</th><th colspan="3">Activity rates - %</th></tr><tr><th>Total</th><th>Male</th><th>Female</th><th>Total</th><th>Male</th><th>Female</th></tr></table>			LABOUR FORCE AND ACTIVITY RATES OF POPULATION AGED 15 YEARS AND OVER IN 2021							Statistical zones Statistical regions Districts	Labour force - thous.			Activity rates - %			Total	Male	Female	Total	Male	Female
LABOUR FORCE AND ACTIVITY RATES OF POPULATION AGED 15 YEARS AND OVER IN 2021																						
Statistical zones Statistical regions Districts	Labour force - thous.			Activity rates - %																		
	Total	Male	Female	Total	Male	Female																

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	<p><b>Yuzhen tsentralen planning region</b></p> <p>634.4    343.5    290.9    53.1    60.1    46.7</p>	
4. Main economic activity in the area	<p>Region Plovdiv economic activity in the area:</p> <ol style="list-style-type: none"> <li>1. Wine Producing</li> <li>2. Water</li> <li>3. Fuel</li> <li>4. Wood and processing industry</li> <li>5. Livestock Farming</li> <li>6. Leather</li> <li>7. Cosmetics</li> <li>8. Machine Building</li> <li>9. Recycling</li> <li>10. Agriculture Fishseries and Aquaculture</li> <li>11. Food</li> <li>12. Professional Associations</li> <li>13. NGO</li> <li>14. Chambers of Commerce and Industry</li> <li>15. Scientific Centres/ Institutes Educational Institutions,</li> <li>16. Scientific Centers/ Institutes</li> <li>17. Regional Administration</li> <li>18. Textile</li> <li>19. Trade with Biobased Materials</li> <li>20. Pharmaceutical</li> <li>21. Pulp and Paper</li> </ol>	Own research AUP
5. Jobs at risk	<p>Poverty levels exceed the national average. The share of the population living with material deprivation amounts to 24.3%, versus 19.4% nationally, and that of people living below the national poverty line – 26.8%, versus 22.1% countrywide.</p> <p>According to the research of the Agricultural University -Plovdiv based on the information provided by the Regional Craftmanships Chamber – Plovdiv, a traffic light approach and categorization are applied in order to identify the jobs at risk.</p> <p>The AUP research categorizing the jobs at risk as follows:  <b>Red</b> category are the job most vulnerable for future existing;  <b>Yellow</b> category are jobs that less vulnerable to the risk of disappearing.  <b>Green</b> category are for the jobs that are not vulnerable to risks of disappearing.  At this survey the focus will be only to jobs that are categorised in the <b>red</b> and <b>yellow</b> category as follows:  Red category is for most vulnerable handcrafts with an issued certificate for Craft Master are those with less than 10 issued certificates  Yellow category is for less vulnerable handcrafts jobs with 11 or more issued certificate for Craft Master:  In red Category are:</p> <ol style="list-style-type: none"> <li>1. Masonry (6)</li> <li>2. Tailoring (6)</li> <li>3. Vulcanization (6)</li> <li>4. Bell casting (1)</li> <li>5. Repair of bicycles (1)</li> <li>6. Repair of musical instruments (2)</li> <li>7. Handmade and repair of furniture (1)</li> <li>8. Vulcanization (2)</li> <li>9. Engraving (11)</li> <li>10. Zincography (2)</li> <li>11. Vesbarism (10)</li> <li>12. Interior furnishings (3)</li> <li>13. Bagpipes (1)</li> <li>14. Embroidery (2)</li> <li>15. Turning (27)</li> <li>16. Turning (3)</li> <li>17. Makeup (4)</li> <li>18. Shoemaking (10)</li> <li>19. Weaving (4)</li> <li>20. Cooperage (8)</li> <li>21. Cutlery (2)</li> <li>22. Tanning and tanning (3)</li> <li>23. Electric and gas welding (4)</li> </ol>	<p>Регионална занаятчийска камара -Пловдив  <a href="https://www.rzkplovdiv.com/2012/04/registar-na-zanayatchiite.html">https://www.rzkplovdiv.com/2012/04/registar-na-zanayatchiite.html</a></p>

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	<p>24. Manufacturing and maintenance of heating installations and devices (17)</p> <p>25. Making gold plating (5)</p> <p>26. Installation of metal structures (5)</p> <p>27. Household electrical maintenance (38)</p> <p>28. Maintenance of office information technology (7)</p> <p>29. Maintenance of medical equipment (18)</p> <p>30. Maintenance of agricultural machinery (2)</p> <p>31. Bicycle repair (6)</p> <p>32. Manufacture of orthopedic shoes (4)</p> <p>33. Production of signs, illuminated advertisements, design in the region Communes.sr (1)</p> <p>34. Media technique and media design (3)</p> <p>35. Screen printing (2)</p> <p>36. Technical services in the field of media and information (8)</p> <p>37. Manufacture of wrought iron products (10)</p> <p>38. Making folk musical instruments (1)</p> <p>39. 54. Making national dolls (1)</p> <p>40. Crafting an Ancient Weapon (2)</p> <p>41. Painting glass and porcelain (2)</p> <p>42. Icon painting and wall painting (1)</p> <p>43. Coppersmithing (1)</p> <p>44. Cutlery (10)</p> <p>45. Leather processing (1)</p> <p>46. Artistic treatment of leather (5)</p> <p>47. Artistic Casting (2)</p> <p>48. Art knitting (6)</p> <p>49. Making wooden vessels (2)</p> <p>50. Making violins (3)</p> <p>51. Priesthood (1)</p> <p>52. Sausage making (1)</p> <p>53. Basketry (1)</p> <p>54. Milling (1)</p> <p>55. Butchery (1)</p> <p>56. Public catering and catering (8)</p> <p>57. Preparation of Bulgarian Boza or other soft drinks (3)</p> <p>58. Preparation of spirits (6)</p> <p>59. 83. Concrete work: formwork, fittings, concrete. Constructions (5)</p> <p>60. 84. Painting and varnishing (3)</p> <p>61. Masonry (3)</p> <p>62. Building the skeleton (1)</p> <p>63. Made of fireplaces, tiled stoves, air heating (1)</p> <p>64. Making wooden toys (1)</p> <p>65. Production of floors with monolithic coating (1)</p> <p>66. Production of thermal and sound insulation (3)</p> <p>67. Making blinds and blinds (1)</p> <p>68. Plastering and plastering (1)</p> <p>69. Cladding with ceramic and other types of plates (1)</p> <p>70. Roofing works (3)</p> <p>71. Installation of parquet and other flooring (9)</p> <p>72. Building cleaning and recycling (1)</p> <p>73. Upholstery (3)</p> <p>74. Manufacture of glass products by blowing (1)</p> <p>75. Glassmaking and/or glass refining (1)</p> <p><b>Yellow category:</b></p> <p>1. Watchmaking (18)</p> <p>2. Refrigeration and air conditioning equipment maintenance (16)</p> <p>3. Repair of audio and video equipment (19)</p> <p>4. Jewelry making (13)</p> <p>    Making artistic ceramics (11)</p>	
6. Main breadwinner of the family nucleus	Male persons in the family	
7. Average educational level and share of population with different school attainment	Schools (primary, lower and upper secondary educations stage) – the number is 192 thousand people	



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8. Population age structure in the region and at national level	Southern Central Region				<div>NSI</div> <div><a href="https://nsi.bg/en/content/2977/population-statistical-regions-age-place-residence-and-sex">https://nsi.bg/en/content/2977/population-statistical-regions-age-place-residence-and-sex</a></div>																																																																																			
	Age	Total	Male	Female																																																																																				
	Total	458978	228044	230934																																																																																				
	0	3589	1840	1749																																																																																				
	1 - 4	15868	8120	7748																																																																																				
	5 - 9	19844	10290	9554																																																																																				
	10 - 14	21070	10781	10289																																																																																				
	15 - 19	19795	10208	9587																																																																																				
	20 - 24	17965	9467	8498																																																																																				
	25 - 29	21372	11151	10221																																																																																				
	30 - 34	27484	14588	12896																																																																																				
	35 - 39	29299	15816	13483																																																																																				
	40 - 44	30724	16743	13981																																																																																				
	45 - 49	31854	17228	14626																																																																																				
	50 - 54	33970	18155	15815																																																																																				
	55 - 59	34537	17881	16656																																																																																				
	60 - 64	36638	18315	18323																																																																																				
	65 - 69	34375	16242	18133																																																																																				
	70 - 74	29614	12588	17026																																																																																				
	75 - 79	22920	8878	14042																																																																																				
	80 - 84	16133	5817	10316																																																																																				
	85 - 89	9038	3076	5962																																																																																				
	90 - 94	2412	729	1683																																																																																				
	95 - 99	444	124	320																																																																																				
	100 +	33	7	26																																																																																				
9. Share of ethnic's minorities in the region and at national level	Ethnic groups in Plovdiv Province Bulgarians 87.1% Turks 6.5% Roma 4.9% others and indefinable 1.5%				<div><a href="https://en.wikipedia.org/wiki/Plovdiv_Province">https://en.wikipedia.org/wiki/Plovdiv_Province</a></div>																																																																																			
10. Emigration rate in the region and at national level	<div>INTERNATIONAL MIGRATION* BY AGE AND SEX IN 2021</div> <table><tr><th rowspan="2">Sex Age</th><th colspan="3">2021</th></tr><tr><th>Immigrants in the country</th><th>Emigrants from the country</th><th>Migration increase</th></tr><tr><td>Total</td><td>39 461</td><td>26 755</td><td>12 706</td></tr><tr><td>0 - 4</td><td>2 308</td><td>538</td><td>1 770</td></tr><tr><td>5 - 9</td><td>1 571</td><td>696</td><td>875</td></tr><tr><td>10 -14</td><td>970</td><td>910</td><td>60</td></tr><tr><td>15 - 19</td><td>1 787</td><td>2 023</td><td>-236</td></tr><tr><td>20 - 24</td><td>2 917</td><td>3 921</td><td>-1 004</td></tr><tr><td>25 - 29</td><td>3 571</td><td>3 720</td><td>-149</td></tr><tr><td>30 - 34</td><td>3 766</td><td>3 184</td><td>582</td></tr><tr><td>35 - 39</td><td>3 530</td><td>2 705</td><td>825</td></tr><tr><td>40 - 44</td><td>3 352</td><td>2 247</td><td>1 105</td></tr><tr><td>45 - 49</td><td>2 975</td><td>1 757</td><td>1 218</td></tr><tr><td>50 - 54</td><td>2 702</td><td>1 329</td><td>1 373</td></tr><tr><td>55 - 59</td><td>2 726</td><td>1 105</td><td>1 621</td></tr><tr><td>60 - 64</td><td>2 785</td><td>804</td><td>1 981</td></tr><tr><td>65 - 69</td><td>2 356</td><td>757</td><td>1 599</td></tr><tr><td>70 - 74</td><td>1 236</td><td>583</td><td>653</td></tr><tr><td>75 - 79</td><td>535</td><td>337</td><td>198</td></tr><tr><td>80 +</td><td>374</td><td>139</td><td>235</td></tr><tr><td>Male</td><td>21 759</td><td>12 937</td><td>8 822</td></tr></table>				Sex Age	2021			Immigrants in the country	Emigrants from the country	Migration increase	Total	39 461	26 755	12 706	0 - 4	2 308	538	1 770	5 - 9	1 571	696	875	10 -14	970	910	60	15 - 19	1 787	2 023	-236	20 - 24	2 917	3 921	-1 004	25 - 29	3 571	3 720	-149	30 - 34	3 766	3 184	582	35 - 39	3 530	2 705	825	40 - 44	3 352	2 247	1 105	45 - 49	2 975	1 757	1 218	50 - 54	2 702	1 329	1 373	55 - 59	2 726	1 105	1 621	60 - 64	2 785	804	1 981	65 - 69	2 356	757	1 599	70 - 74	1 236	583	653	75 - 79	535	337	198	80 +	374	139	235	Male	21 759	12 937	8 822	<div>International migration by age and sex</div> <div><a href="https://www.nsi.bg/en/content/3072/international-migration-age-and-sex">https://www.nsi.bg/en/content/3072/international-migration-age-and-sex</a></div>
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	0 - 4	1 184	258	926																													
	5 - 9	801	342	459																													
	10 - 14	513	448	65																													
	15 - 19	955	1 000	-45																													
	20 - 24	1 677	1 942	-265																													
	25 - 29	1 881	1 880	1																													
	30 - 34	2 044	1 568	476																													
	35 - 39	1 990	1 314	676																													
	40 - 44	1 978	1 040	938																													
	45 - 49	1 799	822	977																													
	50 - 54	1 586	583	1 003																													
	55 - 59	1 569	502	1 067																													
	60 -64	1 460	403	1 057																													
	65 - 69	1 223	344	879																													
	70 - 74	661	274	387																													
	75 - 79	255	156	99																													
	80 +	183	61	122																													
	Female	17 702	13 818	3 884																													
	0 - 4	1 124	280	844																													
	5 - 9	770	354	416																													
	10 - 14	457	462	-5																													
	15 - 19	832	1 023	-191																													
	20 - 24	1 240	1 979	-739																													
	25 - 29	1 690	1 840	-150																													
	30 - 34	1 722	1 616	106																													
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	40 - 44	1 374	1 207	167																													
	45 - 49	1 176	935	241																													
	50 - 54	1 116	746	370																													
	55 - 59	1 157	603	554																													
	60 - 64	1 325	401	924																													
	65 - 69	1 133	413	720																													
	70 - 74	575	309	266																													
	75 - 79	280	181	99																													
80 +	191	78	113																														
11. Average salary or household income in the region and at national level	<p>GDP per capita in Plovdiv district has continued to grow at a rate similar to the national average. In 2020, it reached 14,600 BGN, but has dropped two places in the ranking (after those of Gabrovo and Vratsa) and is now the seventh highest in the country. Salaries and incomes in the district are also increasing. In 2020, the average annual gross salary of employed people reached 14,200 BGN per year, compared to 16,700 BGN in the country.</p> <table><tr><th rowspan="2">Statistical regions</th><th colspan="5">Quarters 2022</th></tr><tr><th>I</th><th>II</th><th>III</th><th>IV</th><th>IV</th></tr><tr><td></td><td></td><td></td><td></td><td>incl. annual</td><td>bonuse</td></tr><tr><td>Yuzhen tsentralen</td><td>1 280</td><td>1 395</td><td>1 404</td><td>1 507</td><td>1 554</td></tr><tr><td>-Plovdiv</td><td>1 371</td><td>1 490</td><td>1 502</td><td>1 620</td><td>1 679</td></tr></table>			Statistical regions	Quarters 2022					I	II	III	IV	IV					incl. annual	bonuse	Yuzhen tsentralen	1 280	1 395	1 404	1 507	1 554	-Plovdiv	1 371	1 490	1 502	1 620	1 679	<p>Average gross monthly wages and salaries of the employees under labour contract by statistical regions and districts in 2022*</p> <p>Source national statistical institute</p> <p><a href="https://www.nsi.bg/en/content/3930/statistical-regions-district">https://www.nsi.bg/en/content/3930/statistical-regions-district</a></p>
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12. Please describe the structure and the characteristics of relevant socially disadvantaged/ marginalized groups in your region	<p>Total number of inhabitants in Plovdiv region - 634497 Bulgarian – 513249, Turkish – 39585, Roma – 26296.</p> <p>Structure and the characteristics of relevant socially disadvantaged/ marginalized groups:</p> <ul style="list-style-type: none"><li>*Small-scale farmers, small-scale agri-food SMEs and crop/animal growers with low income</li><li>* Seasonally employed minority groups</li><li>* Seasonally employed single families in agriculture (crop, animal farms) and/or in food-processing business or marketing</li><li>* Seasonally (or part-time) self-employed workers in bioeconomy sectors</li><li>* Registered unemployed people</li><li>* Ethnic minorities</li></ul>			<p><a href="https://infostat.nsi.bg/info/stat/pages/reports/result.jsf?x_2=1980">https://infostat.nsi.bg/info/stat/pages/reports/result.jsf?x_2=1980</a></p>																													
13. Please comment the potential impact of their participation in Circular Bio-based Economy	<p>The relevant socially disadvantaged/ marginalized groups are important labour force especially in rural areas of the region of Plovdiv. They participate in agricultural (field and storage) work, animal husbandry, in food processing SMEs, in forestry operations, in factories for producing textiles, small retail and catering, waste collection and utilisation, food catering, administration, etc.</p>			<p>AUP own research</p>																													



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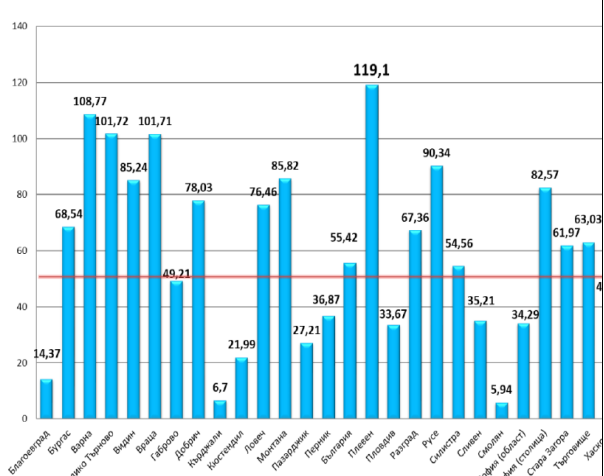
14. Please indicate the factors hindering their possible participation?	<p>The factors hindering their possible participation can be summarised as:</p> <ul style="list-style-type: none"> <li>- Decreasing of the agricultural and industry production in rural</li> <li>- Regional (local) governments does not provide incentives for job creation</li> <li>- Low level of skills and competences of the socially disadvantaged groups – especially entrepreneurship skills and initiative</li> <li>- Low level of education and training, including Vocational Education and Training (VET) which leads to taking occupations requiring low education, skills and competences</li> <li>- Family education and learning does not support early work habits and discipline</li> <li>- Distrust by the employers (fear of low work discipline, thefts, harassment, etc.)</li> <li>- Low integration in society (rejection of obeying the societal rules and law, moral obligations, etc.)</li> <li>- Low level of inclusion in local social communities to get help and integrate.</li> <li>- Municipalities having various instruments to interfere, but usually lack financial capital to backup integration activities</li> <li>- Municipalities are the biggest employer in the rural but prefer qualified workforce with good background</li> <li>- Municipalities must have more funds for job creation, training, education, social inclusion, improving infrastructure, etc.</li> </ul>	Vision as a result of the AUP own research
15. Indicate the selected marginal group/s that will be targeted during the project and relevance in the region	<p>*Small-scale farmers, small-scale agri-food SMEs and crop/animal growers with low income</p> <p>* Seasonally employed single families in agriculture (crop, animal farms) and/or in food-processing business and marketing, and waste collection and utilisation</p> <p>* Seasonally (or part-time) self-employed workers in bioeconomy sectors</p> <p>These groups are very important for the region in the light of increasing depopulation of rural municipalities, lack of available skilled workforce and demands of the bioeconomy sectors for (at least primary/secondary or VET) educated labour.</p>	Vision as a result of the AUP own research
16. Average educational level of targeted marginalized groups	<ul style="list-style-type: none"> <li>- Predominantly primary/secondary or VET from local primary schools or (in good case scenario) professional schools of agriculture, veterinary, food processing, textiles, culinary, etc.;</li> <li>- Rarely higher education</li> </ul>	
17. Description of the occupied post, considering the type of work performed and the qualification required by the targeted marginalized groups (question 13)	<p>Region of Plovdiv labour force especially in rural areas of the region of Plovdiv take work places in:</p> <ul style="list-style-type: none"> <li>- agricultural holdings as field workers and crop growers, plant harvesters, agri-machinery operators, workers in basic processing of raw agricultural produce such as washing, preparing, storage of agri-foods, sorting, packaging, etc.;</li> <li>- animal husbandry – rearing the livestock, grazers of livestock, maintaining pasture land, feeding, cleaning, marketing, etc.</li> <li>- food processing SMEs – workers in machine operations, cleaning, sorting and preparing raw plant and animal material, packers/bottlers, waste collectors and separators, storage workers, maintenance handymen, administration, drivers, sales-person, etc.</li> <li>- forestry operations – cutting trees and processing, workers in furniture factories, paper factories,</li> <li>- textile factories for producing textiles,</li> <li>- small retail and food catering – workers for processing and prepare food ingredients, cooks, sales-person, etc.</li> <li>- waste collection and utilisation – as workers in waste (household, municipality) collection, separation, storage, composting, returning to land and landfills;</li> <li>- administration – secretaries, clerks, accountants and pay-persons</li> </ul>	



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Situation of main economic sectors

PRIMARY SECTOR																												
AGRICULTURE																												
Questions	Answer	Comments																										
18) How large is the surface of cultivable areas? (you can check databases such as Eurostat: <a href="https://ec.europa.eu/eurostat/web/agriculture/data/database">https://ec.europa.eu/eurostat/web/agriculture/data/database</a> se)	<p>Cultivated area in Plovdiv region is: 197 660 ha Cultivated area in Plovdiv region in %: 68.0% Cultivated area in Plovdiv from the total area in country in %: 33.1%</p>  <p>Fig.3 Structure of agricultural holdings at 28 regions of Bulgaria, number of farms. <i>Source:</i> National Statistical System (ISAK, 2019). Legend: blue colour: Scheme for Direct Payments; green: fruits and vegetables; pink: livestock farms.</p> <p>Fig.4 Average size of agricultural holdings, ha. 2019. For Plovdiv region – about 33 ha/farm</p> <p><b>Графика 7 – Среден размер на стопанствата, ха</b></p>  <p>According to data from the 2019 campaign, the number of non-agricultural farms with more than 0.5 ha of agricultural land in the fruit and vegetable sector shows that the largest concentration of farms is observed in the <b>Plovdiv region</b>, which is also determined by the soil and climatic conditions for their cultivation.</p>																											
	19) Which are the main crops in the area (surface in hectares of percentage of the cultivable area occupied by each crop)	<table><tr><td><b>Cereals</b></td><td>191 954 ha</td></tr><tr><td>Wheat</td><td>139 235 ha</td></tr><tr><td>Rye and Triticale meslin</td><td>9 062 ha</td></tr><tr><td>Oats and summer</td><td>1 710 ha</td></tr><tr><td>Barley</td><td>12 123 ha</td></tr><tr><td>Grain maize</td><td>19 770 ha</td></tr><tr><td>Other cereals</td><td>10 054 ha</td></tr><tr><td><b>Industrial crops incl. tobacco</b></td><td><b>7 786 ha</b></td></tr><tr><td>Sunflower</td><td>117 322 ha</td></tr><tr><td>Other oleaginous products</td><td>16 542 ha</td></tr><tr><td><b>Protein crops</b> (peas, broad beans, lentils and others)</td><td>2 021 ha</td></tr><tr><td><b>Forage plants</b></td><td>35 451 ha</td></tr><tr><td>Other forage plants</td><td>328 296 ha</td></tr></table>	<b>Cereals</b>	191 954 ha	Wheat	139 235 ha	Rye and Triticale meslin	9 062 ha	Oats and summer	1 710 ha	Barley	12 123 ha	Grain maize	19 770 ha	Other cereals	10 054 ha	<b>Industrial crops incl. tobacco</b>	<b>7 786 ha</b>	Sunflower	117 322 ha	Other oleaginous products	16 542 ha	<b>Protein crops</b> (peas, broad beans, lentils and others)	2 021 ha	<b>Forage plants</b>	35 451 ha	Other forage plants	328 296 ha
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	Vegetables and horticultural products	10 041 ha	
	Fresh vegetables	9 0333 ha	
	Vineyards	15 882 ha	
	Plants and flowers total	15 092 ha	
	Potatoes (including seeds)	3 031 ha	
	Fruits	39 083 ha	
20) Which is the average annual production (dry basis) of the most relevant crops (listed in question 15)?	<b>Cereals</b>		
	Wheat	7 119,5 thousand tonnes	
	Rye and meslin	16 567	
	Oats and summer	24260	
	Barley	704070	
	Grain maize	3427310	
	Other cereals		
	Triticale	54 210	
	<b>Industrial crops incl. tobacco</b>	<b>6050 tonnes</b>	
	Sunflower	<b>3 376 278</b>	
	Other oleaginous (Rape seed)	372 116	
	<b>Protein crops</b> (peas, broad beans, lentils and others)	5 600	
	<b>Forage plants</b>	NA	
	Other forage plants	NA	
	Vegetables and horticultural products	690 104	
	<b>Fresh vegetables (tomatoes, cucumbers, peppers)</b>	53680 + 116420 + 61 576	
	<b>Vineyards</b>	178300	
	<b>Plants and flowers total</b>	NA	
	<b>Potatoes (including seeds)</b>	195640	
	<b>Fruits</b>	226 118	
21) Average yield (dry basis) for the most relevant crops (listed in question 15)?	<b>Cereals</b>		
	Wheat	60878	
	Rye and meslin		
	Oats and summer	24406	
	Barley	55741	
	Grain maize	59811	
	Other cereals		
	Triticale	34009	
	<b>Industrial crops incl. tobacco</b>	<b>16005 hg/ha</b>	
	Sunflower	23936	

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	Other oleaginous products	28729					
	Protein crops (peas, broad beans, lentils and others)	NA					
	Forage plants						
	Other forage plants	NA					
	Vegetables and horticultural products	NA					
	Fresh vegetables tomatoes, cucumbers and peppers	542222 + 379218 + 19 906					
	Vineyards	62496					
	Plants and flowers total	NA					
	Potatoes (including seeds)	179486					
	Fruits						
22) What is the percentage of employment covered by agriculture?	<p>The census indicated <b>292,000 employees in agriculture</b>, which included family members and hired workers.</p> <p><b>Families accounted for 79 % of all labour.</b> This data refutes the popular notion that farm expansion and consolidation leads to establishment of corporate farming.</p> <p><b>Male labour dominates in all age groups.</b></p> <p>Most of the agricultural labour, about <b>60 %, is at and above 45 years old.</b></p> <p>Employees under labour contract by economic activity groupings - inflows and outflows</p> <p>Agriculture, forestry and fishing data for 2021:</p> <p>Inflows: 1 004 656</p> <p>Outflows: 921 878</p> <p>Employees under labour contract by statistical regions and districts in 2021</p> <p>Total: 388 526</p>						
		Parameters	Unit	2003	2010	2020*	Change 2010-2020
	1	Labour in agriculture	Nr employed	1 348 108	738 634	293 674	-
	including:						
	2	Family labour	Nr employed	1 288 614	681 466	232 610	-
	In which:						
	3	Main/ basic employment	Nr employed	920 530	456 845	87 999	-
	4	Additional employment	Nr employed	368 084	224 621	144 611	-
	5	Non-family labour	Nr employed	59 494	57 168	61 064	-
	6	Hours spent in agriculture	Nr units	791 563	406 519	179 616	-
	<p>The analysis of the data shows a significant decrease in the annual work units in the Agriculture sector, with a 56% decrease in the last ten years alone. On the one hand, the decrease is due to the modernization of agricultural holdings and an increase in their technological equipment, which leads to a decrease in manual labor on the holdings, and on the other hand, it is a reflection of the change in the structure of agricultural holdings and a significant reduction in their number. The biggest decrease in the labor used by family members in the sector, as over the last ten years 66% of those employed in the family farm have switched to another form</p>						
Report Title: 2020 Agricultural Census Confirms Farm Consolidation and Growth Country: Bulgaria Post: Sofia Report Category: Agriculture in the Economy, National Plan, Policy and Program Announcements, Agriculture in the Economy, National Plan, Policy and Program Announcements Prepared By: Mila Boshnakova-Petrova							

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	<p>of employment. The differences in profitability from agricultural activity and from other sectors in the economy is a prerequisite for 50% of those employed in the sector for this activity to form additional employment. For only 30% of those employed in the sector, agriculture is the only or main occupation, and for the period after 2010, people mainly engaged in agriculture have also decreased by over 80%.</p>	
<p><b>23)</b> Are state subsidies received by the farmers (CAP or others)? Please shortly mention the crops and the aim of the subsidy (equipment modernisation, yield increase, etc.</p>	<p>The state subsidies are received by the farmers: CAP and Rural Development Programme (RDP)- subsidies per ha of land + subsidies for organic farming (per ha of land, Measure 11), agroecology (per ha of land, Measure 10), young farmers, equipment modernization 4.1 and adding value to primary production 4.2, etc. Subsidies are also provided as coupled (direct) support for strategic sectors such as fruit production (for Plant Protection Products), vegetable production, protein crops, payments related to strategic animal groups, quantities of production, marketing, etc. Owners (and/or farmers) who have land in the protected zones under NATURA 2000 also receive subsidies through the RDP.</p>	<p>AUP delivered "Analysis of the impact of agriculture on the environment and climate change as a main element of the Strategic Plan for the General Agricultural Policy of the Republic of Bulgaria for the program period 2020-2027" - Technical Report to the Ministry of Agriculture, 2020</p>
<p><b>24)</b> What is the current situation of the soils (erosion, eutrophication, pollution...)?</p>	<div> </div> <p><b>Fig.1 Soil loss in arable lands (t/ha/year).</b> <b>Source: JRC</b></p> <p>Climate change is expected to affect carbon in the long term, but changes in the short term are more likely to be driven by land management practices and land use change. By retaining organic matter, carbon sinks are addressed ( I.11 Enhancing carbon sequestration: increase the soil organic carbon). There is, however, a tendency to decrease the stocks of soil organic matter (C.41 Organic matter in arable land) in the surface layer (European Federation of Conservation Agriculture, 2016), being in the category of low to medium and negative carbon balance in arable land lands [MITERRA/RothCmodel (Smart soil project), WUR, Agricultural markets Task Force, 15-9-2016]. In general, the trend will be to decrease the stocks of soil organic matter in arable land in Bulgaria, and therefore this must be addressed.</p> <p>A total of about 69% of the land in Bulgaria is threatened by soil water and wind erosion.</p> <p><b>Soil pollution</b></p> <p>A coordinated system for inventory of soil pollution has been established in Bulgaria, which works on the basis of approved standards and a system for assessment of the degree of pollution. It includes a range of heavy metals, arsenic, radionuclides, persistent organic pollutants (POPs), pesticides and petroleum products. According to monitoring data, the area of soils in Bulgaria contaminated with various chemicals and radionuclides is estimated as follows:</p>	<p>AUP delivered "Analysis of the impact of agriculture on the environment and climate change as a main element of the Strategic Plan for the General Agricultural Policy of the Republic of Bulgaria for the program period 2020-2027" - Technical Report to the Ministry of Agriculture, 2020.</p> <p><a href="https://eea.government.bg/en/cds/riewplo/riple11.htm">https://eea.government.bg/en/cds/riewplo/riple11.htm</a></p>







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Tomatoes field	8 989	164 003	1 824	-14,3%	-14,4%	-0,2%
Cucumbers field	2 229	44 538	1 998	3,4%	20,6%	16,6%
Pepper field	497	6 904	1 389	-2,0%	-13,2%	-11,5%
Cabbage	2 266	40 732	1 798	-10,3%	-5,4%	5,5%
	1 503	31 627	2 104	22,1%	18,5%	-3,0%
Water melon	3 289	75 964	2 310	-33,2%	-31,1%	3,2%
Melon	2 035	21 011	1 032	-24,7%	-36,0%	-15,1%
Strawberries field	845	5 864	694	0,0%	-10,0%	-10,0%
Tomatoes green-house	474**	49 629	10 470	1,1%	20,3%	19,0%
Cucumbers green-house	462**	53 521	11 585	1,8%	7,4%	5,6%

**Average selling prices at the national level at 11.01.2023 (BG leva BGN/tonne)**

	12.01.2022	4.01.2023	11.01.2023	Change on yearly basis (%)
Wheat for bread	519	552	546	5,2
Fodder wheat	506	540	532	5,1
Barley	456	590	590	29,4
Maize	483	527	525	8,7
Sunflower	1 115	956	943	-15,4

**Average wholesale prices of basic fruits and vegetables as of 13.01.2023, BGN/kg**

Potatoes	0,84	1,28	1,26	50,0
Tomatoes (glasshouse)	2,34	3,37	3,21	37,2
Tomatoes (field)	*	*	*	.
Tomatoes greenhouse	2,31	2,92	3,04	31,6
Tomatoes (import)	3,51	3,58	3,61	2,8
Cucumbers (glasshouse)	3,06	3,00	3,10	1,3
Cucumbers (field)	2,31	3,26	3,41	47,6
Pepper (red import)	0,99	0,88	0,92	-7,1
Cabbage				

Major cereals are trading between 5.1% (feed wheat) and 29.4% (barley) more expensive than at the same time in 2022, while the price of sunflowers is 15.4% below last year.

Overall, the average wholesale prices of the main fruits and vegetables available in the markets at that time were above the levels of a year ago. A significant increase in prices on an annual basis is present for tomatoes (Bulgarian greenhouse and imported), pepper and potatoes - from 31.6% to 50%, and slightly pronounced - for imported cucumbers (by 1.3%).



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	Bulgarian greenhouse cucumbers (with 2.8%) and apples (with 4%). Only cabbage has become cheaper - by 7.1%.	
29) Which are the future perspectives? (Technologies, increase of the area dedicated to certain crops, new crops development, new biomass or residual biomass value chain development, employment)	<p><b>Agricultural biomass of plant origin</b></p> <p>When assessing the contribution of agriculture to sustainable energy, the development of the areas occupied by wheat, corn, sunflower was taken into account, since they significantly exceed the share of other crops, and therefore the contribution of the latter to sustainable energy can be ignored as insignificant. After harvesting, cereal straw and stalks, corn cobs and sunflower cakes are dried. They can then be burned directly, which is not very efficient, or they can be used as feedstock to produce compacted solid biomass fuels (briquettes or pellets). Briquettes and pellets are distinguished by better combustion parameters and allow transportation over considerable distances. Straw can be used for co-firing in fossil power plants, which is economically very efficient and can affect harmful emissions. The use of plant residues for RES is not yet widespread. In addition, burning straw requires special equipment.</p> <p>The areas for the production of some cereals, corn and sunflower in the period 2009-2017, according to data from the Statistical Yearbook of the Republic of Bulgaria, show that the sown areas are kept constant, which means preserving the amount of plant residues and guarantees the predictability of the raw material for the possible production of renewable biofuels, therefore the sustainability of the investments. In various rural development programs (RDP), financial incentives are provided for the production of biofuels for own needs.</p>	the Statistical Yearbook of the Republic of Bulgaria
<b>FORESTRY</b>		
Questions	Answer	Comments
30) Forest area in the region (please indicate the hectares and percentage occupied by forestland in the region)?	Plovdiv district has a significant forest resource as biomass source - forest areas occupy more than a quarter of the region area (25% of total territory, which is 151 915,9 ha). The sector is mostly dominated by state-owned enterprises, which gives reason to believe that the state is interested in reacting quickly in the regulatory framework to support forestry to be part of the local bioeconomy. The bio-waste amounts up to 50% of the wood harvested in the forest holdings. Residual lignocellulose products represent a huge raw material source for industry and energy for the size of the region.	
31) Productive forest area share (exploited for wood)?	47% of 151 915,9 ha	<p>10154.10 sq. km for the South-Central Region BG42.</p> <p>Forest Area in South Central Region BG42 in % is: 45.40 %</p> <p>Forest area in Plovdiv BG421 total 1950.34 sq. km Plovdiv BG421 in %: 32.72 %.</p>
32) Which are the main uses of forestry biomass?	The main uses of forestry biomass are: – for construction 70%; shredded paper – 10%; chipboards – 15%; cellulose – 5% of the produces wood in the region	
33) Share of forestland owned by the administration and private owners?	The sector is mostly dominated by state-owned enterprises – 95% of total area	
34) Are state subsidies received by the forestry sector?	Financial support for forestry development is provided through 4 axes: Axis 1 "Improving the competitiveness of the agricultural and forestry sector"; Axis 2 "Improving the environment and rural areas"; Axis 3 "Quality of life in rural areas and diversification of the rural economy"; Axis 4 "Leader approach". In the RDP 2007-2013, the measures that can be defined as specific and fully dedicated to the development of the forestry sector are measure 122, measure 123, measure 223 and measure 226. In the subsequent RDP 2014-2020, the measures specifically aimed at the development of the sector are: measure 08 and measure 15	



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35) Who are the main stakeholders involved in the forest biomass production?	<p>MS Woodworking Ltd – producer of mulch from wood residues.</p> <p>South central enterprise - management of state forests and producer of timber and other wood products and services;</p> <p>Toplivo – main producer of wood pellets, BGBIOM – NGO in the field of energy management form wood residues.</p> <p>Belovo company – producer of cellulose and paper for domestic application.</p> <p>Energy agency of Plovdiv – NGO - The Energy Agency of Plovdiv was established on April 22, 2000, with the aim of promoting EE and RES on regional and local levels.</p> <p>EAP initiates and coordinates projects aimed at reducing energy consumption and the use of efficient and renewable energy technologies.</p> <p>EAP promotes energy efficiency (EE) and renewable energy sources (RES), develops action plans, and performs feasibility studies promoting sustainable energy development. EAP also develops energy concepts and projects for municipalities and for small and medium-sized enterprises (SMEs), arranges financing, and provides expertise and consultation.</p>	
36) Please indicate, if possible, the forest biomass production cost and the average selling price (€/dry tonnes)?	117,5 euro per tonne	
37) What is the percentage of employment covered by forestry?	5,8 % of total emolument population in the region	
38) How much residual biomass is produced in the region?	119 176 tonnes	
39) Is the residual biomass (question 34) exploited? (Indicate)	85% of 119 176 tonnes	
40) Which are the future perspectives? (Technology, forestry, employment increase, increase of exploited areas, etc.)	Currently Plovdiv region has a significant forest resource. The share of forested land in the district has increased over the last 10 years by 3.93%. At the beginning of 2010, there was an upsurge in the sector in terms of forestry production, which continued until 2019, namely the production of BGN 17 million reached BGN 38 million, an increase of nearly 2.3 times. The expansion of forest areas and the increase in the production of forest products are the factors that have an impact on the export of products produced by the sector. Exports of forest products have increased 1.4 times in the last 10 years.	
41) Share of forestland area affected by forest fires the last year?	2,5 ha per year, which is 0,0016% of total area	
<b>LIVESTOCK</b>		
Questions	Answer	Comments
42) How large is the area dedicated to livestock in the region?	<p><b>At the national level – preliminary data – end of 2022:</b></p> <p>Unfortunately, almost all percentages are negative.</p> <p><b>The number of cows</b> in one year decreased by -5.2%, the number of ewes by – 8.8%, the number of goats by – 12.3%.</p> <p>The biggest decrease is in sows, due to the swine fever disease and the difficult economic situation of pig farming.</p> <p>It is interesting that the number of buffaloes, which was growing in recent years, has now decreased by -3.9%</p> <p><b>Cattle:</b> the number of cows is 381,400, which is 20,000 less in one year. 17,200 heifers will certainly enter a main herd, which is nothing with the minimum 60-70,000 heifers.</p> <p>Next year 2024 will also have a shortage of heifers because there are 50,000 female calves left for breeding. In other words, we can draw the first conclusion: <b>the next 2 years will certainly see a decrease in the number of cows.</b> The number of heifers left is also small. The alternative is to buy from abroad, but that won't happen either because their price is already very high.</p> <p>For the <b>production of meat</b>, one can count on hundreds of thousands of calves. The question is, how many of them will enter our slaughterhouses.</p> <p><b>Buffaloes:</b> in the past few years, the number of buffaloes alone has been growing annually by several thousand. To reach 15,400 in</p>	<p><a href="https://agri.bg/novini/statistika-kolkoselskostopanski-zhivotni-ostanakha-unas-i-kde-se-otglezhdat">https://agri.bg/novini/statistika-kolkoselskostopanski-zhivotni-ostanakha-unas-i-kde-se-otglezhdat</a></p>

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	<p>2021. This year the number is 14,800. The number of buffaloes next year can be maintained because buffalo milk is currently in demand and at a good price, and besides there are quite a few malakini set aside. and the buffalo has both a longer life and a more productive one.</p> <p><b>Sheep:</b> the number of ewes was 924,000 or 89,000 less than last year.</p> <p><b>Region Plovdiv (data 2022):</b> Currently, the largest number of dairy cows in Bulgaria are bred in the <b>Plovdiv</b> region - 25,896. According to the latest data, there are 142,583 beef cows in our country, <b>Plovdiv</b> - 13,084. A clear drop for the year is also visible in the number of sheep. In 2019/20, the number of animals was over 1.3 million, and only 987,488 were entered in the current statistical table. The leading regions in this industry are: Blagoevgrad - 96,645, Burgas - 93,102, and <b>Plovdiv - 87,606</b>, most of them <b>dairy</b>. Dairy sheep in our country are 797,600, and meat sheep - 103,579. For <b>goats</b>, the leading region is Blagoevgrad - 25,327. The total number of these farm animals in the country is 156,443. <b>Buffalo</b> breeding is mainly concentrated in Vratsa - 2924, <b>Plovdiv</b> - 2020, and their total number in our country it is 14,652. In <b>pig</b> breeding (a total of 552,975 pigs), farmers in the Dobrich district raise the most animals - 95,921. <b>Poultry</b> is the number one in Bulgarian livestock breeding. Their total number in our country is 29,716,611.</p>	
43) Average farm size (cows, pigs, chicken, or other) in the region?	<p>The average size of holdings in absolute value calculated mathematically shows that the average size of holdings raising cattle is 33 animals, and those raising sheep and goats and 104 animals. Despite the large number of small ruminants raised in the Blagoevgrad region, the average size of farms there is only 78, which is below the average for the country, compared to the <b>Plovdiv region</b>, where larger farms are concentrated, which raise an average of <b>134 ruminants</b>, which is above the national average.</p> <p><a href="https://www.mzh.government.bg/media/filer_public/2021/11/19/2021_11_19_-_struktura_na_zemedelskite_stopanstva-01.pdf">https://www.mzh.government.bg/media/filer_public/2021/11/19/2021_11_19_-_struktura_na_zemedelskite_stopanstva-01.pdf</a></p>	
44) Which is the daily livestock maintenance cost (€/head)?		
45) Which is the main destination of the cattle? (Meat, milk, wool...)	<p>Meat and Milk production</p>	



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	BULGARIA - PRODUCTION OF MEAT: CATTLE WAS 7.12 THOUSAND TONNES IN DECEMBER OF 2021, ACCORDING TO THE EUROSTAT. TRADING ECONOMICS PROVIDES THE CURRENT ACTUAL VALUE, AN HISTORICAL DATA CHART AND RELATED INDICATORS FOR BULGARIA - PRODUCTION OF MEAT: CATTLE - LAST UPDATED FROM THE <u>EUROSTAT</u> ON MARCH OF 2023.	
46) What is the employment rate covered by livestock?	Analyzes show that the employed in the sector also registered drastic changes. The number of people employed in the sector in 2003 was 1,288,614, and in 2020 they decreased to 232,610. In 2003, the main part of the employed was the so-called "family workforce". Their relative share is 95.63 percent. From 1,288,614 employed in 2003, they reached 232,610 in number, which is 81 percent less. The main employment in the sector is 87,999 people in 2020 and this is a drop of 81 percent compared to 2010. Employees under labour contract by economic activity groupings - inflows and outflows Agriculture, forestry and fishing data for 2021: Inflows: 1 004 656 Outflows: 921 878 Employees under labour contract by statistical regions and districts in 2021 Total: <b>388 526</b>	
47) Are state subsidies received for farming?	Yes, per head of animal group and /or per ha of land (i.e. organic farming)	
48) Who are the main stakeholders involved in the production?	Farmers, food processors, municipalities, NGOs, consumer groups	
49) Which is the main residue produced in each case?	slurry and manure, residues from animal slaughterhouses and meat processing factories, compost, pellets,	
50) How much slurry/manure/other residue is produced in average (t/head) and in the region (total)?	- Only available general information at national level: <a href="https://www.nsi.bg/bg/content/2560/образувани-отпадъци-от-дейността-по-вид">https://www.nsi.bg/bg/content/2560/образувани-отпадъци-от-дейността-по-вид</a>	
51) Is the slurry/manure/other exploited? (Indicate the percentage that is currently used) If not, how are the residues managed?	NA	
52) Average selling price for the slurry/manure/other?	NA	
53) Which are the future perspectives? (Valorisation technologies, cattle, employment rate, farm modernisation, increase of large exploitations, decrease of livestock production, etc.)	Valorisation and innovation technologies, cattle, employment rate, farm modernisation, increase of large exploitations of the agricultural primary residues	
SECONDARY SECTOR		
AGROINDUSTRY		
Questions	Answer	Comments
54) How many agrifood industries are there in the region?	Available at the web-site of the project CAPBIO4BG (coordinated by the Agricultural University of Plovdiv, and executed within the framework of the National Programme "European Scientific Networks" of the Ministry of Education and Science of Bulgaria).	<a href="https://capbio4.bg/html/en/">https://capbio4.bg/html/en/</a>
	FEATHERS AND DOWN PRODUCING	
	MUSHROOMS PRODUCING AND PROCESSING	
	FRUIT PROCESSING AND CANNING	
	TOBACCO PRODUCTION AND PROCESSING	
	HERBS AND SPICES PRODUCTION	
	VEGETABLES GROWING AND PRODUCING	
	FRUIT GROWING AND PRODUCING	
FRUIT AND VEGFTABLES GROWING AND PRODUCING		



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	<div> <div>NUTS PRODUCTION</div> <div>EGGS PRODUCTION</div> <div>COSMETICS PRODUCTION</div> <div>FISH AND CAVIAR PRODUCING</div> <div>MEAT PROCESSING AND MEAT PRODUCTS PRODUCING</div> <div>FRUIT AND VEGETABLES PROCESSING AND CANNING</div> <div>HERBS AND SPICES PRODUCTION</div> <div>SOFT DRINKS PRODUCING</div> <div>GRAINS AND FLOUR PRODUCTION</div> <div>MEAT PRODUCTS AND DAIRY FOODS PRODUCTION</div> <div>DAIRY FOODS PRODUCTION</div> <div>BEE HONEY PRODUCTION</div> <div>VEGETABLE OILS PRODUCTION</div> <div>PASTRY PRODUCTION</div> <div>BY-PRODUCTS PRODUCTION</div> <div>BREAD PRODUCTION</div> <div>CHOCOLATE AND COCOA CONFECTIONERY PRODUCTION</div> <div>BIODIESEL PRODUCTION</div> <div>LEATHER GOODS PRODUCTION</div> <div>FORAGE PRODUCTION</div> <div>MASHINES PRODUCTION FOR TIMBER PROCESSING</div> <div>FOOD SUPPLEMENTS PRODUCTION</div> <div>PAPER PRODUCTION</div> <div>CORRUGATED PACKAGING PRODUCTION</div> <div>WASTE COLLECTION AND RECYCLING</div> <div>TEXTILE FIBRES PRODUCTION</div> <div>TRADE WITH TIMBER</div> <div>TRADE WITH BUILDING AND HEATING MATERIALS</div> <div>TRADE WITH HEATING MATERIALS</div> <div>WASTE WATER PURIFICATION</div> <div>WINEMAKING</div> <div>WOODWORKING AND TIMBER PROCESSING</div> </div>																															
55) Which are the main products produced?	<div> <div>FINAL OUTPUT IN AGRICULTURE AT BASIC PRICE BY STATISTICAL ZONES AND REGIONS IN 2020, (Mio BGN), BG currency leva</div> <table> <tr> <th>Products</th><th>Bulgaria</th><th>South Central Region</th></tr> <tr> <td>Cereal crops</td><td>2 608.5</td><td>259.5</td></tr> <tr> <td>Wheat and spelt</td><td>1 484.1</td><td>174.8</td></tr> <tr> <td>Soft wheat</td><td>1 474.6</td><td>172.5</td></tr> <tr> <td>Durum wheat</td><td>9.5</td><td>2.3</td></tr> <tr> <td>Rye</td><td>3.2</td><td>1.1</td></tr> <tr> <td>Barley</td><td>152.0</td><td>16.3</td></tr> <tr> <td>Oats and cereal mixes</td><td>8.6</td><td>1.4</td></tr> <tr> <td>Corn for grain</td><td>893.7</td><td>20.6</td></tr> <tr> <td>Rice</td><td>46.2</td><td>36.4</td></tr> </table> </div>	Products	Bulgaria	South Central Region	Cereal crops	2 608.5	259.5	Wheat and spelt	1 484.1	174.8	Soft wheat	1 474.6	172.5	Durum wheat	9.5	2.3	Rye	3.2	1.1	Barley	152.0	16.3	Oats and cereal mixes	8.6	1.4	Corn for grain	893.7	20.6	Rice	46.2	36.4	<a href="https://www.nsi.bg/bg/content/877/икономически-сметки-по-статистически-райони">https://www.nsi.bg/bg/content/877/икономически-сметки-по-статистически-райони</a>
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	Other cereals	20.7	8.9	
	Technical cultures	1 667.0	185.3	
	Oil seeds	1 444.0	149.7	
	Canola and canola	193.5	27.3	
	Sunflower	1 244.7	120.7	
	Soy	4.0	-	
	Other oil mills	1.8	1.7	
	Protein crops	47.1	2.9	
	Tobacco	21.6	14.3	
	Sugar beet	.	.	
	Other technical	154.3	18.4	
	Fodder crops	131.2	36.5	
	Maize for silage	49.6	12.2	
	Root fodder	0.0	-	
	Other fodder	81.6	24.3	
	Vegetables	385.8	175.4	
	Fresh vegetables	357.3	173.1	
	Flowers and nurseries	28.5	2.3	
	Potatoes	73.1	20.3	
	Fruits	334.3	93.7	
	Fresh fruit	233.5	60.2	
	Grapes - everything	100.8	33.5	
	Wine	.	.	
	Other vegetable crops	38.1	12.4	
	Crop production	5 238.0	783.1	
	Farm animals	988.2	184.1	
	Cattle	189.0	59.0	
	A pig	319.5	32.9	
	Horses	.	.	
	Sheep and goats	200.5	51.1	
	Birds	279.2	41.1	
	Other animals	.	.	
	Livestock products	973.8	229.0	
	Milk	733.6	187.3	
	Eggs	176.7	35.8	
	Other livestock products	63.5	5.9	
	Livestock production	1 962.0	413.1	
	Production of agricultural goods	7 200.1	1 196.4	
	Production of agricultural services	462.0	110.0	
	Agricultural production	7 662.1	1 306.4	
	Non-agricultural inseparable secondary activities	204.1	33.1	
	Processing of agricultural products	204.1	33.1	
	Other inseparable secondary activities	.	.	
	Production from the 'agriculture' sector	7 866.2	1 339.5	
56) Which is the annual average production in the main agrifood industries?	To be calculated			

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57) Are companies producing organic or agrifood products receiving subsidies?	Yes, the agricultural firms producing primary certified organic produce receive annual subsidies through the Measure 11 of the Rural Development programme of CAP.						
58) What is the percentage of employment covered by agroindustries?	Domains	Indicators					
			2018	2019	2020	2021	
		Population as of 31.12. - Total (number)	668 334	666 801	666 398	662 907	
		Population as of 31.12. - Male (number)	321 176	320 136	319 851	318 186	
		Population as of 31.12. - Female (number)	347 158	346 665	346 547	344 721	
	Demographic statistics	Natural increase rate (per 1 000 persons of the population) - ‰	-5.2	-5.3	-8.3	-11.3	
		Infant mortality rate (per 1 000 live births) - ‰	7.9	5.3	5.6	4.8	
		Mortality rate - Total (per 1 000 population) - ‰	14.7	14.6	17.4	20.6	
		Mortality rate - Male (per 1 000 population) - ‰	15.8	15.7	18.9	21.8	
		Mortality rate - Female (per 1 000 population) - ‰	13.7	13.6	16.0	19.5	
	Labour market	Average annual number of employees under labour contract (number)	221 789	222 236	211 493	216 219	
		Average annual wages and salaries of the employees under labour contract (levs)	11 780	12 996	14 171	15 937	
		Economic activity rate - 15 - 64	72.5	72.0	70.8	68.5	

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		completed years (%)				
		Employment rate - 15 - 64 completed years (%)	69.9	70.3	68.7	66.3
		Unemployment rate (%)	3.6	2.4	2.9	3.2
		Unemployed persons registered at the labour offices as of 31.12. (number)	13 818	13 657	17 122	11 962
		Relative share of the population aged between 25 and 64 years with higher education (%)	27.0	26.0	26.4	26.0
		Relative share of the population aged between 25 and 64 years with secondary education (%)	52.7	53.8	54.0	54.7
		Relative share of the population aged between 25 and 64 years with primary or lower education (%)	20.3	20.2	19.7	19.2
	Health services	Hospital establishments as of 31.12. (number)	34	34	34	34
		Hospital beds in the hospital establishments as of 31.12. (number)	6 549	6 570	6 737	6 748
		Physicians in health establishments as of 31.12. per 10 000 population (number)	51.2	51.0	51.8	52.3

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	Education	Schools (primary, lower and upper secondary education stage) - number	192	194	192	192
		Enrolments in all type of schools (primary, lower and upper secondary education stage) - number	67 836	67 611	66 977	68 619
		Group net enrolment rate of the children in kindergartens (%)	78.5	78.8	78.7	79.3
	Investments	Foreign direct investment in non-financial enterprises as of 31.12. (thousand euro)	1 911 938.6	1 778 214.4	1 990 551.6	2 145 606.9
		Expenditure on acquisition of tangible fixed assets (thousand levs)	1 864 372	2 068 677	1 706 256	2 245 569
	Non-financial enterprises	Turnover (thousand levs)	26 607 016	28 137 522	27 959 402	33 359 045
		Output (thousand levs)	17 237 534	18 663 188	18 117 700	21 463 412
		Value added at factor cost (thousand levs)	5 404 046	5 957 525	6 344 253	6 613 503
		Relative share of enterprises with up to 9 persons employed in total number of enterprises in the district (%)	92.1	92.2	92.5	92.4
		Relative share of enterprises with 10-49 employees in total number	6.4	6.3	6.1	6.2

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		of enterprises in the district (%)				
		Relative share of enterprises with 50-249 employees in total number of enterprises in the district (%)	1.3	1.3	1.2	1.2
		Relative share of enterprises with more than 250 employees in total number of enterprises in the district (%)	0.2	0.2	0.2	0.2
	Transport	Length of motorways (km)	50	50	50	50
		Length of category I roads (km)	129	129	129	129
		Length of category II roads (km)	240	240	240	240
		Length of category III roads (km)	601	601	601	601
		Length of railway lines (km)	324	324	324	324
	R & D	Expenditure on research and development (R & D) - thousand levs	50 753	71 571	71 498	64 223
		Staff engaged in research and development (R & D) - number	3 078	3 582	3 675	3 334
	Information Society	Relative share of households with Internet access (%)	74.4	80.7	79.9	88.9
		Relative share of individuals aged 16-74, regularly using internet	62.8	70.4	69.5	72.8

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		(every day or at least once per week) - %					
	Housing fund	Residential buildings (number)	151 670	151 964	152 281	152 688	
		Dwellings (number)	325 373	326 683	328 589	329 901	
	Tourism	Accommodation establishments (number)	212	242	262	262	
		Nights spent - total (number)	1 069 414	1 129 439	668 450	920 567	
59) What is the main economic limitation (energy cost, supply chain...) faced by agroindustries?	At present: - Energy costs - Costs of inputs – fuel for machineries, mineral fertilisers, plant protection products, seeds, forage for livestock feeding, certifications, etc. - Insufficient (qualified) labour						
60) Which type of wastes/side-products/residues are produced?	- residual plant biomass from agricultural cropping (straw, hay, tree branches, residual fruits and vegetables, etc.) - residuals from manure or compost collected and processed from the animal husbandry farms/ cooperatives - residual biomass from the slaughterhouses and meat factories - residual side-streams from food processing e.g. milk and meat, fruits and vegetables, grain, sunflower oil refineries, essential oils refineries, greenhouses, etc. - organic residuals from the biogas production (after composting) - residues from wood processing factories e.g. furniture chips, etc. - residues from pepper producing factories						
61) How much wastes/side-products/residues are produced?	to be calculated						
62) Are the wastes/side-products/residues exploited? (Please specify for which application)	The <b>agricultural and the food processing</b> sectors are the leading sectors in the national BE and provide opportunities for exploitation of residual biomass sources. <b>Forest biomass</b> potential is also relevant i.e. around 38 % of Bulgarian territory is covered by forests with a relatively high production capacity. <b>Competitive Bulgarian bio-based products for the market</b> are: bio-based production of herbal phyto-pharmaceutical products; rose, lavender and other oil products for plant cosmetics, pharmaceuticals; timber houses, furniture, bio-oils; pellet production, and textiles. <b>The companies are still lagging behind in bio-based R&amp;D</b> e.g. the connection between them and the research institutes and universities is not well established. They are part of different industries and sectors (agricultural production, wood production and processing, pharmaceuticals, energy, pulp and paper, plastics, textile, etc.), focused on traditional manufacturing and processing. There is a need to increase the focus on bioeconomy opportunities for creating new value chains.						
63) What are the future perspectives? (Techniques, products, production, employment)	- support for adding value to primary agricultural production in the region (e.g. grain, fruits, grape/wine, vegetables, essential oil crops, medicinal plants, protein crops, livestock, etc.) - improve quality of existing production of the above-listed crops to serve pharmaceutical and cosmetic industry; - transfer and implementation of circular technologies and business-models for by-products from agriculture and food industry; - support through EU operational programmes and Smart Specialisation Strategies.						
64) Which are the main stakeholders of the local agrifood industry?	- food processing companies; - agricultural producers (primary production) wood processing companies						

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	<ul style="list-style-type: none"> <li>- plant oil producing bio-refineries</li> <li>- greenhouse owners/producers of vegetables and fruits</li> <li>- textile/clothes producing firms</li> </ul>	
<b>OTHER BIO-BASED INDUSTRIES</b>		
Questions	Answer	Comments
65) Is there a mapping of the current bio-based industrial activities in your area?	Available at the web-site of the project CAPBIO4BG (coordinated by the Agricultural University of Plovdiv, and executed within the framework of the National Programme “European Scientific Networks” of the Ministry of Education and Science of Bulgaria).	<a href="https://capbio4.bg/html/en/">https://capbio4.bg/html/en/</a>
66) How many biobased industries are there in the region? Please specify the main biobased products produced	about 166 SMEs and large producers – please see the list in point 55 and point 66 above.	
67) Out of the previous list indicate the three more relevant in terms of revenues and role to meet the government strategic objectives (decarbonistaion, CO <sub>2</sub> emissions, circular economy, etc.)		
68) Are state subsidies received to promote sustainable production by these industries?		
69) What is the percentage of employment covered by biobased industries?		
70) How many tonnes of biobased materials/products are produced per year? Please specify by typology (renewable energies, biofuels, biomaterials, biochemicals, biobased cosmetics/pharmacy, others)		
71) Which type of wastes/by-product, residue are produced in the production process?		
72) What are the biobased materials, side-products, waste or residues used as raw materials in the productive process?		
73) Where are these raw materials obtained or cultivated?		
74) Which are the main stakeholders/actors supplying these raw materials?		
75) Which is the price of these biobased raw materials used (€/ton)?		
76) Which is the price of the main biobased products produced in the region (€/ton)?		
77) Which are the perspectives in the use of these biobased raw materials/side-products/waste?		
78) Which are the perspectives in the consumption of these biobased products?	Not available	
79) Please mention the 3 bio-based solutions with more		

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relevance in your region (that can be taken as an example of implementation or good practice for other regions) and provide contact details if possible.		
<b>80)</b> Please mention 3 bio-based solution in your region that have high deployment potential in your region but still need support to accelerate-unlock its potential (please mention what technological, regulatory and market challenges are and provide contact details if possible)		
<b>ENERGY INDUSTRY</b>		
Questions	Answer	Comments
<b>81)</b> How many energy industries are there?	The economy in Plovdiv region relies mainly on 3 energy industries - electricity production from nuclear power plants - 37%, 39% of electricity production is provided by thermal power plants and 13% of electricity production is provided by power plants using renewable energy resources.	
<b>82)</b> Does the main part of energy come from renewable or non-renewable energy?	No, only 13%.	
<b>83)</b> What is the main source of renewable energy?	Solar panels and photovoltaics also electricity production from hydro power plants	
<b>84)</b> What is the main source of non-renewable energy?	production from hydro power plants	
<b>85)</b> Are state subsidies received to promote renewable energies?	The main tools for investment support in the field of renewable sources is The Energy Efficiency and renewable source fund. The fund provides financial support up to 500 000 euro on annual fee from 4,5 – 6%. This is not a grant, it is a low-rate loan for every costumer who wants to invest in renewable sources. Sources of funding for the production of biofuels and renewable energy is RDP 2014-2020	
<b>86)</b> What is the percentage of employment covered by the energy sector?	1,8% of total employment population	
<b>87)</b> Which is the average price of energy (€/kW h)? (Differences between renewable and non)	0,13 euro per kWh (for household)	
<b>88)</b> Which percent of energy usage comes from renewable energy?	Not available	
<b>89)</b> Which are the future perspectives?	Future perspectives will be in the field of development of renewable energy and production of batteries.	
<b>MUNICIPAL SOLID WASTE (MSW)</b>		
Questions	Answer	Comments
<b>90)</b> How many tonnes of MSW are generated per year?	NA	
<b>91)</b> Which is their main composition?		
<b>92)</b> Are the wastes exploited? (Indicate how)		
<b>93)</b> Where are the MSW generated?		
<b>94)</b> Who are the main stakeholders involved in the MSW management?		
<b>95)</b> How is MSW valorised? (Added-value products)		
<b>96)</b> Which is the price of MSW added value-products?		



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97) Which are the future perspectives? (Techniques, wastes)		
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Regional bioeconomy development and promotion. Policy framework

## References:

CROSS-CUTTING ISSUES		
Questions	Answer	Comments
<b>98)</b> Does your region have a strategy for circular bioeconomy?	yes	
<b>99)</b> Existence of bioeconomy hubs, clusters or any other association in the region?	yes	
<b>100)</b> Existing of hubs or cluster targeting other topic or sectors? (please specify)		
<b>101)</b> What environmental indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (GHG decrease achieved with bioeconomy initiatives, resources depletion, implementation strategy aiming zero waste, etc.) ?		
<b>102)</b> What economic indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (turnover linked to biobased companies (forestry, agriculture, other-biobased industries), existence of funding programmes/schemes targeting bioeconomy, existence of supporting measures promoting partnerships between industries and enterprises in the region, etc.?		
<b>103)</b> What social indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (available skilled workforce, number of jobs created in the last 5 years in bio-based industries, communications to society regarding bio-based activities (seminars, trainings, etc.), willingness to pay for bio-based products, etc.?		
<b>104)</b> Current economic and social characteristics of your territory not reported in previous questions that could enable the development of the circular bioeconomy?		
<b>105)</b> Are there any bio-based production districts / specializations in your Region? (Please, provide a description of these activities, including data, focusing on Circular Bio-based Economy potentials and material/immaterial assets as well as existing barriers)		
<b>106)</b> What are the strengths/weaknesses of your area regarding the development of the circular bioeconomy?		
<b>107)</b> Please, identify actors with a natural interest in a project due to their existing businesses and market in your territory		

Portrait of the regions. *Plovdiv- Geography and history*

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## Annex 12. Hungary region profile

INFORMATION FOR STATISTICAL ANALYSIS		
REGIONS (EUROSTAT NUTS 2 – Level)		
(Please indicate for your region which NUTS 2-Regions are relevant or add additional regions in the comment section.)		
Question	Suggested NUTS 2 regions	Comments
1) Germany – Region of Baden-Württemberg	<input type="checkbox"/> Stuttgart (please translate to English) <input type="checkbox"/> Karlsruhe (please translate to English) <input type="checkbox"/> Freiburg (please translate to English) <input type="checkbox"/> Tübingen (please translate to English)	
2) Spain – Region of Aragon	<input type="checkbox"/> Zaragoza (please translate to English) <input type="checkbox"/> Huesca (please translate to English) <input type="checkbox"/> Teruel (please translate to English)	
3) Greece – Region of Western Macedonia	<input type="checkbox"/> Dyitiki Makedonia (please translate to English)	
4) Bulgaria – Region of Plovdiv	<input type="checkbox"/> Yuzhen tsentralen (please translate to English)	
5) Slovakia – Nitra Self-Governing Region	<input type="checkbox"/> Západné Slovensko (please translate to English)	
6) Slovenia – Whole Country	<input type="checkbox"/> Vzhodna Slovenija (please translate to English) <input type="checkbox"/> Zahodna Slovenija (please include the traduction)	
7) Croatia – Region Adriatic Croatia	<input type="checkbox"/> Jadranska Hrvatska (please translate to English)	
8) Hungary – Region North Hungary	<input type="checkbox"/> Észak-Magyarország (please translate to English)	
9) Romania – West region	<input type="checkbox"/> Vest (please translate to English)	
10) Czechia – Region BIOEAST	<input type="checkbox"/> Praha (please translate to English) <input type="checkbox"/> Střední Čechy (please translate to English) <input type="checkbox"/> Jihozápad (please translate to English) <input type="checkbox"/> Severozápad (please translate to English) <input type="checkbox"/> Severovýchod (please translate to English) <input type="checkbox"/> Jihovýchod (please translate to English) <input type="checkbox"/> Střední Morava (please translate to English) <input type="checkbox"/> Moravskoslezsko (please translate to English)	
11) Netherlands – Region Apeldoorn	<input type="checkbox"/> Gelderland (please translate to English)	
12) Italy – Region Campania	<input type="checkbox"/> Campania (please translate to English)	



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# How to identify socially marginalised groups?

SOCIALLY MARGINALISED GROUPS		
Questions	Answer	Comments
1) Population area with less than 5.000 inhabitants	55.7%	Share of settlements with less than 5000 population, compared to all settlements
2) Unemployment rate in the area	4.4%	as of 01/2023
3) Employment rate of women in the region and at national level	45.7% (North Hungary) vs. 54.5 (all HU)	as of 2022
4) Main economic activity in the area	predominantly services (58.2%) industry (38.5%) agriculture (3.3%)	
5) Jobs at risk	23.9%	share of people at risk of poverty or social exclusion
6) Main breadwinner of the family nucleus	father	
7) Average educational level and share of population with different school attainment	share of those having finished secondary school with graduation: 55.5% (vs. HU 62.9%) share of those with university diploma: 11.5% (vs. HU 34.3%)	
8) Population age structure in the region and at national level	age 0-14: 15.2% age 15-64: 64.1 age 65+: 20.7%	as of 2022
9) Share of ethnics minorities in the region and at national level	Share of Roma ethnic minority 9.4% (North Hungary) 3.1% (Hungary)	outdated data (2011 census)
10) Emigration rate in the region and at national level	North Hungary 3.6% Hungary 3.2%	annual share of internal migration (2022)
11) Average salary or household income in the region and at national level	North Hungary 4155 € Hungary 4980 €	salaries per capita (all population), before tax, as of 2021, in 2021's average €-HUF ratio (1€=360 HUF)
12) Please describe the structure and the characteristics of relevant socially disadvantaged/ marginalized groups in your region	living in villages, living in remote and small peripheral villages, bad infrastructure, male or female, unemployed, odd-jobs, low education level, Roma minority	
13) Please comment the potential impact of their participation in Circular Bio-based Economy	energy price sensitivity; low energy consumption among this population on the average,	
14) Please indicate the factors hindering their possible participation?	education, infrastructure, motivation, lack of capital	
15) Indicate the selected marginal group/s that will be targeted during the project and relevance in the region	rural dwellers (due to peripheral location and bad infrastructure, generally disadvantaged population)	
16) Average educational level of targeted marginalized groups	vocation, high school	
17) Description of the occupied post, considering the type of work performed and the qualification required by the targeted marginalized groups (question 13)		



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# Situation of main economic sectors

PRIMARY SECTOR		
AGRICULTURE		
Questions	Answer	Comments
18) How large is the surface of cultivable areas? (you can check databases such as Eurostat: <a href="https://ec.europa.eu/eurostat/web/agriculture/data/database">https://ec.europa.eu/eurostat/web/agriculture/data/database</a> )	1,300,600 hectares	
19) Which are the main crops in the area (surface in hectares of percentage of the cultivable area occupied by each crop)	wheat, sunflower, corn (2022)	
20) Which is the average annual production (dry basis) of the most relevant crops (listed in question 15)?	t (2022) 481 389 wheat 155 175 corn 145 724 sunflower	
21) Average yield (dry basis) for the most relevant crops (listed in question 15)?	hectares (2022)  120 962 wheat 85 280 sunflower 54 425 corn 23 880 rape 20 732 barley 2 237 oat 294 potato 225 rye	
22) What is the percentage of employment covered by agriculture?	3.3%	
23) Are state subsidies received by the farmers (CAP or others)? Please shortly mention the crops and the aim of the subsidy (equipment modernisation, yield increase, etc.	yes, CAP (and national subsidies). territory-based funding, modernisation, transgenerational land transition	
24) What is the current situation of the soils (erosion, eutrophication, pollution...)?	In the North Hungary region, the quality of arable land are affected by lowering of the water table, intensive agricultural production, excessive pesticide use, soil erosion, deforestation, and construction	
25) Who are the main stakeholders involved in the crops production (cooperatives or farmers associations, individual farmers owning large or small areas, etc.)?	large land owners, individuals and companies	
26) How much residual biomass is produced? Please indicate for the most relevant crops (question 14) the residues that are produced during the processing	No regional data. For Hungary: <b>3.5%</b> is the share of electric energy consumption based on biomass within all energy consumption	as of 2020
27) Is the residual biomass (question 21) exploited (energy production, chemicals, fertilizers, etc.)?	N/A	
28) Average selling price for the main crops (€/dry tonnes) (listed in question 15)? When possible, also include the production cost.	prices: per ton  euro wheat: 328 € feed corn: 344 € sunflower seed: 633 €	as of 2022 Nov; 1€=410 HUF
29) Which are the future perspectives? (Technologies, increase of the area dedicated to certain crops, new crops development, new biomass or residual biomass value chain development, employment)	land concentration, growing monocultures, developing regional food industry; decreasing employment within agriculture	
FORESTRY		
Questions	Answer	Comments
30) Forest area in the region (please indicate the hectares and percentage occupied by forestland in the region)?	399,000 hectares (2019), 29.7%  (the region is 1,342,000 hectares or 13,428 km <sup>2</sup> )	

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31) Productive forest area share (exploited for wood)?	9.7%	
32) Which are the main uses of forestry biomass?	firewood (53%) logwood (20%) paperwood (16%) other industrial wood (11%)	as of 2021
33) Share of forestland owned by the administration and private owners?	state-owned (59%) private (40%) communal (1%)	
34) Are state subsidies received by the forestry sector?	several EU funded projects	
35) Who are the main stakeholders involved in the forest biomass production?	state-owned company (forestry) private companies	
36) Please indicate if possible the forest biomass production cost and the average selling price (€/dry tonnes)?	170 €/ ton selling price production cost: no estimation	According to Central Statistical Office (consumer price), as of 2022
37) What is the percentage of employment covered by forestry?	estimation: 0.4-0.7%	
38) How much residual biomass is produced in the region?	N/A	
39) Is the residual biomass (question 34) exploited? (Indicate)	yes	
40) Which are the future perspectives? (Technology, forestry, employment increase, increase of exploited areas, etc.)	Increase in forested area; preserving biodiversity, protecting water resources, and maintaining soil quality; promoting wood processing and utilization, such as in the production of wood-based products, furniture, and energy	
41) Share of forestland area affected by forest fires the last year?	2-5 hectares annually	
<b>LIVESTOCK</b>		
Questions	Answer	Comments
42) How large is the area dedicated to livestock in the region?	5636 only-livestock farms present in the region, 79,111 hectares (+ mixed production: 59,886 hectares)	as of 2020
43) Average farm size (cows, pigs, chicken, or other) in the region?	average only-livestock farm sizes: 14 hectares	as of 2020
44) Which is the daily livestock maintenance cost (€/head)?	N/A	
45) Which is the main destination of the cattle? (Meat, milk, wool...)	45,200 milking cows 39,200 meat cattle	as of 2022
46) What is the employment rate covered by livestock?	annual labour unit in the region livestock farms: 6,219 plants cultivating farms: 18,297 mixed farm: 2,849	
47) Are state subsidies received for farming?	yes	
48) Who are the main stakeholders involved in the production?	private sector, companies and individual producers	
49) Which is the main residue produced in each case?	manure	
50) How much slurry/manure/other residue is produced in average (t/head) and in the region (total)?	manure 371,112 t in the region slurry 62,900 m3	
51) Is the slurry/manure/other exploited? (Indicate the percentage that is currently used) If not, how are the residues managed?	yes (above data show the used amounts of manure and slurry. otherwise, no data)	
52) Average selling price for the slurry/manure/other?	8 €/ton	
53) Which are the future perspectives? (Valorisation technologies, cattle, employment rate, farm modernisation, increase of large exploitations, decrease of livestock production, etc.)	Increase in animal welfare, Rise in organic farming, Development of new technologies, Focus on sustainable farming, Export growth, Challenges from disease outbreaks	
<b>SECONDARY SECTOR</b>		
<b>AGROINDUSTRY</b>		

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Questions	Answer	Comments
54) How many agrifood industries are there in the region?	13,000	food industry companies as of 2019
55) Which are the main products produced?	meat, dairy, frozen foods, condiments, beer, beverages	
56) Which is the annual average production in the main agrifood industries?	N/A	
57) Are companies producing organic or agrifood products receiving subsidies?	yes, a variety of EU subsidies	
58) What is the percentage of employment covered by agroindustries?	approx. 6.5%	
59) What is the main economic limitation (energy cost, supply chain...) faced by agroindustries?	labour market (workforce), salary prices, lack of capital, administrative loads, supply chain problems	
60) Which type of wastes/side-products/residues are produced?	organic waste, packaging, wastewater, chemicals, by-products	
61) How much wastes/side-products/residues are produced?	3,000,000 t in all Hungary	data originates from a 2008 paper, to be considered as a starting point
62) Are the wastes/side-products/residues exploited? (Please specify for which application)	no (no information on the opposite)	
63) What are the future perspectives? (Techniques, products, production, employment)	Increasing exports; Technological advancements; Increasing demand for healthy and organic food; Growing demand for convenience food; Developing sustainable production practices	
64) Which are the main stakeholders of the local agrifood industry?	Pick Szeged (in Salgótarján); Nestlé; Balaton Hús; Fornetti Ltd., Friesland; Hell Energy; Borsodi Északi Ásványvíz; Gyulai Hús; Coca-Cola; Euro Pék; Magyar Hús; Dr Oetker; Sága; Bonafarm-Bábolna; Sole-Mizo)	
<b>OTHER BIO-BASED INDUSTRIES</b>		
Questions	Answer	Comments
65) Is there a mapping of the current bio-based industrial activities in your area?	yes (national organisations)	
66) How many biobased industries are there in the region? Please specify the main biobased products produced	5129 (HUN) pastures, crops, forage, industrial plants, fruits	data only available for the whole country. As of 2021
67) Out of the previous list indicate the three more relevant in terms of revenues and role to meet the government strategic objectives (decarbonisation, CO <sub>2</sub> emissions, circular economy, etc.)	pastures, crops, forage	
68) Are state subsidies received to promote sustainable production by these industries?	mostly EU subsidies, no national financial contribution is to be found	
69) What is the percentage of employment covered by biobased industries?	no information	Hungarian statistical offices don't consider biobased industry as a specific field
70) How many tonnes of biobased materials/products are produced per year? Please specify by typology (renewable energies, biofuels, biomaterials, biochemicals, biobased cosmetics/pharmacy, others)	<b>Biobased production, HU :</b> Crops: 35,000 hectares Protein plants: 3,479 hectares Root plants: 96 hectares Industrial plants: 17,301 hectares Vegetables: 3,823 hectares Forage: 29,390 hectares Grapes: 1,982 hectares Fruits: 11,850 hectares Pasture: 179,586 hectares Fallow/wasteland: 8,896 hectares	Data on the whole country, as of 2021. Hungarian statistical offices don't consider biobased industry as a specific field
71) Which type of wastes/by-product, residue are produced in the production process?	Animal manures; Cattle manure; Pig manure; Poultry manure; Cattle liquid manure; Pig liquid manure; Field crops; Silage corn; Whole cereal plant; Sugar beet; Beet leaf; Grass silage;	

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	Food industry by-product; Molasses; Grape pomace; Fruit pomace; Beer pomace; Distillery waste; Municipal waste; Kitchen food waste; Sewage sludge; Green cuttings.	
72) What are the biobased materials, side-products, waste or residues used as raw materials in the productive process?	biomass, manure	
73) Where are these raw materials obtained or cultivated?	mostly at individual companies	
74) Which are the main stakeholders/actors supplying these raw materials?	Farmers and agricultural cooperatives, biogas plant, composting facilities, waste management companies Tiszaparti Biogas Plant Felsőzsolca Biogas Plant BorsodChem Biogas Plant	
75) Which is the price of these biobased raw materials used (€/ton)?	cattle manure: ~8 €/ton crop residue ~26 €/ton	
76) Which is the price of the main biobased products produced in the region (€/ton)?	electricity; bioethanol 4,000€ / 1000 litre	retail price
77) Which are the perspectives in the use of these biobased raw materials/side-products/waste?	renewable energy, sustainable agriculture, bioplastic, biochemicals	
78) Which are the perspectives in the consumption of these biobased products?	trends towards organic food consumption and environmental friendly energy use	
79) Please mention the 3 bio-based solutions with more relevance in your region (that can be taken as an example of implementation or good practice for other regions) and provide contact details if possible.	Funky Forest Magyarország Master Good Kft Magosvölgyi Ökológiai Gazdaság Naturgold Hungaria MIVÍZ sewage plant	
80) Please mention 3 bio-based solution in your region that have high deployment potential in your region but still need support to accelerate-unlock its potential ( please mention what technological, regulatory and market challenges are and provide contact details if possible)	The whole sector needs development as biobased solutions are seldomly applied in the region.  Greatest threats: labour force scarcity; lack of up-to-date cutting edge knowledge and information, lack of capital for investment. recuction methane level in waste (biogas productivity decrease)  three potentials are: biogas production and waste management, organic animal husbandry, biobased construction	
<b>ENERGY INDUSTRY</b>		
Questions	Answer	Comments
81) How many energy industries are there?	Mátrai Power Plant (950 MW) (coal, biomass) Sajószöged Power Plant (155 MW) (gasoline) Lőrincz Power Plant (150 MW) (gasoline) Mátravidéki Power Plant (128 MW) Nyíregyháza Power Plant (49 MW) (natural gas) Bükkábrány Power Plant (20MW) (solar) Halmajugra (20MW) (solar) Tisza I Power Plant (12MW) (hydro)	
82) Does the main part of energy come from renewable or non-renewable energy?	non-renewable	
83) What is the main source of renewable energy?	solar	
84) What is the main source of non-renewable energy?	coal, gasoline, natural gas	
85) Are state subsidies received to promote renewable energies?	Subsidizing consumer solar panels (subsidies were ceased in 2022)	
86) What is the percentage of employment covered by the energy sector?	approx. 26,000 people nation-wide in Hungary	as of 2022
87) Which is the average price of energy (€/kW h)? (Differences between renewable and non)	0.1 €/kWh household consumers in Hungary (renewable or non-renewable)	as of 2022 first half

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88) Which percent of energy usage comes from renewable energy?	12% (mostly solar and biomass)	as of 2020
89) Which are the future perspectives?	solar and wind power development, subsidizing household solar development and most importantly energy efficient housing developments	
<b>MUNICIPAL SOLID WASTE (MSW)</b>		
Questions	Answer	Comments
90) How many tonnes of MSW are generated per year?	365,400 ton	As of 2020, in the region
91) Which is their main composition?	227,366 t communal waste 61,182 t recyclables 8,120 t junk	As of 2020, in the region
92) Are the wastes exploited? (Indicate how)	25,299 t energy production	As of 2020, in the region
93) Where are the MSW generated?	Households, settlement public places	
94) Who are the main stakeholders involved in the MSW management?	Municipal companies, such as <b>VGÜ Salgótarjáni Hulladékgazdálkodási és Városüzemeltetési Nonprofit Kft. In Salgótarján</b>	
95) How is MSW valorised? (Added-value products)	Recyclables and energy source (thermal power station, incinerator)	
96) Which is the price of MSW added value-products?	Only prices of takeover are to be known. Such as newspaper 51€/ton PET 26€/ton	
Which are the future perspectives? (Techniques, wastes)	Circular economy, recycling, promoting zero waste solutions, adapting sustainable packaging; energy generation	

Regional bioeconomy development and promotion. Policy framework



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CROSS-CUTTING ISSUES		
Questions	Answer	Comments
97) Does your region have a strategy for circular bioeconomy?	no	
98) Existence of bioeconomy hubs, clusters or any other association in the region?	no	
99) Existing of hubs or cluster targeting other topic or sectors? (please specify)	There are some clusters in the IT sector, motor industry, tourism	
100) What environmental indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (GHG decrease achieved with bioeconomy initiatives, resources depletion, implementation strategy aiming zero waste, etc.) ?	Greenhouse gas emission; energy consumption (energy efficiency among enterprises and dwellers); water usage, waste generation; agricultural biodiversity; natural biodiversity; land used for biobased production	
101) What economic indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (turnover linked to biobased companies (forestry, agriculture, other-biobased industries), existence of funding programmes/schemes targeting bioeconomy, existence of supporting measures promoting partnerships between industries and enterprises in the region, etc.) ?	Value added in local and regional enterprises, companies; Investment in new technologies; Employment; Education level and education opportunities	
102) What social indicators do you consider relevant to measure the progress of the circular bioeconomy in your region (available skilled workforce, number or jobs created in the last 5 years in bio-based industries, communications to society regarding bio-based activities (seminars, trainings, etc.), willingness to pay for bio-based products, etc.) ?	Health, wellbeing; A higher opportunity for involvement in agriculture and sustainable agriculture; jobs; Local communities (such as cultural life, CLLDs, LEADER projects and alternatives)	
103) Current economic and social characteristics of your territory not reported in previous questions that could enable the development of the circular bioeconomy?	N/A	
104) Are there any bio-based production districts / specializations in your Region? (Please, provide a description of these activities, including data, focusing on Circular Bio-based Economy potentials and material/immaterial assets as well as existing barriers)	No relevant biobased production districts are present, the region is rather underdeveloped considering biobased production. Only a few independent examples might be named.	
105) What are the strengths/weaknesses of your area regarding the development of the circular bioeconomy?	STRENGTHS: Natural opportunities, natural capital; Agricultural sector present in the region; High energy prices (as facilitator); Growing general demand for biobased products  WEAKNESSES: Low educational level; Outwards mobility; Bad infrastructure; Lack of social cooperation	
106) Please, identify actors with a natural interest in a project due to their	(Considering short-term interests) Local small-scale farmers; Organic food companies and retail service providers; Subsidy administrators and beneficiaries.	

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existing businesses and market in your territory		
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