



SCALE^{UP}

community-driven
bioeconomy development

WS2 Training Programme Protocol

Proceedings of the training sessions in WS2
Session #1
09 November 2023



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INTEGRATING PRIMARY PRODUCERS INTO BIOBASED VALUE CHAINS

The first session of the second workstream „Integrating primary producers into bio-based value chains“ kicked off at 09:00 am CET on the 9th of November 2023 with 53 participants. The event started in the main room with an engaging warm-up activity prompting participants to reflect on their geographical locations. Following this, Zoritz Kiresiewa from Ecologic Institute introduced the SCALE UP project, its target regions and main focus for the bio-based value chains. Emilija Mihajloska from SDEWES-Skopje then delves into the broader perspective of "Producers in the Value Chains of Bioeconomy" providing a comprehensive overview for the workstream and what would be the topics discussed in the upcoming sessions. The agenda then shifts to the intriguing realm of Miscanthus biomass production and its diverse use cases, presented by Ludivine Mignot of the Chamber of Agriculture of Pyrénées Atlantiques. The session concludes with compelling testimonials from producers, featuring Cvetanco Gjorgiev's insights on the composting plant in North Macedonia and perspectives from Anre Smedberg, a forest owner from Sweden. This comprehensive agenda promises a rich exploration of bioeconomy value chains and practical experiences from producers across diverse regions.

After the presentation, the training transitions into breakout rooms moderated in the participants' respective languages by regional facilitators. Engaging in collective discussions, participants tackle three pivotal questions. Firstly, they delve into the diverse biomass types available from their producers and explore the geographical nuances of production. Secondly, the focus shifts to dedicated crops or by-products from main crops, with an exploration of the main differences. Finally, participants explore the potential for the future, identifying new opportunities and understanding the driving factors, encompassing emerging markets, evolving value chains, changes in practices, and the impact of climate change. The collaborative discussions span for an hour, after which the main room reconvenes for a collective feedback session on key outcomes and questions from the breakout rooms. The session concludes with insightful conclusions on how to move forward. To ensure a comprehensive understanding, participants are invited to provide feedback through a short survey, fostering continuous improvement and refining the training experience.

BREAK-OUT ROOMS

1. What are the biomass types available from your producers? What is produced where?

AUSTRIA (AND GERMANY):

There are different biomass types available in Upper Austria, predominantly wood and wood production side streams. A little bit less than half of the area of Upper Austria are forest areas. Furthermore, agricultural products (e.g. waste and side streams from cereal crops, sugar beets, potatoes and vegetables) as well as straw are common biomass. A main part of the agricultural biomass is produced in the "Eferdinger Becken" (Eferding Basin), but there are biomass producers throughout Upper Austria. Sugar beet production, which is also an integral part of biomass available in Upper Austria, is mainly produced in the Eferding Basin as well.

ANDALUSIA, SPAIN

From producers in Andalusia following types of biomass are available:

The **olives** as a main product. As subproducts are available:

- **the olives pits**, which are used as biofuels, in a quantity that ranges from 7 – 10% in relation to the weight of the crushed olives.

- Olives leaves that can be used:
 - as food in livestock or been used
 - for the energy industries as fuel in thermal power plants that burn biomass
 - Or as raw materials for the production and elaboration of organic compost, that is basically the one our producers are using.
 - The percentage of wet leaves is 5-7%
- The great quantity of biomass generated is pomace, that can represent an equivalent quantity to the total of the weight of crushed olives. In the majority of cases this subproduct is destined to the olive oil extraction, although in the case of one of our contributors today, representing an olive oil cooperative, they keep between 10-20 % depending on the campaign, to use it in their own compost.

FRENCH ATLANTIC ARC, FRANCE

The main biomass types in France are:

- Hemp, flax, straw and miscanthus are the main sources of agricultural biomass in the AC3A area.
- Crop development varies greatly from one region to another, depending on the climate and soil type.
- Flax and hemp are well developed in Normandy
- Differences in development are due to the various levels of structuring of the sectors, with the presence of industrial operators boosting the cultivation of crops. There are interesting examples of development emerging in the south-west of the country, particularly for miscanthus.

STRUMICA, NORTH MACEDONIA

In the Strumica region, an abundant array of biomass types is produced by local farmers and industries. Reed, sourced from wetland areas, stands as a prominent biomass type, offering versatile applications. Agricultural residues, including remnants from the cultivation of peppers, cabbage, peanuts, tomatoes, and watermelons, contribute significantly to the region's biomass output. The wood industry adds to this diversity by providing sawdust, while the pruning's from fruit trees and grapes become valuable biomass resources. The outer layer of watermelons, known as watermelon crust, is utilized as biomass, showcasing the region's commitment to minimizing waste. Additionally, wheat hay, fruit seeds, and the leaves and grass left over from gardening and parks maintenance contribute to the rich biomass landscape. This diversified range of biomass types underscores the region's commitment to sustainable practices and highlights the various sources and applications of biomass production within Strumica.

MAZOVIA, POLAND

In the Masovian region, the use of biomass is low. There is no strategy for the use of biomass. A small part of it is used as an alternative fuel or in biogas plants. There is still considerable potential for biomass use in the region, but there is no data on this subject.

Distribution and types of biomass in the region:

- The production of grain and oil plants is most widespread in the central and northern parts of the region.
- Cow and pig breeding is also widespread in parts of the north-central regions.
- In the southern part of the region, in addition to grain production and animal breeding, the cultivation of apples and vegetables, especially peppers, is also developed. The largest concentration of these crops is here.
- Potatoes and vegetables are also produced throughout the region, but the level of biomass is difficult to determine due to its diversity.

- Forests are distributed throughout the region, although the greatest concentration is in the southern, eastern and northern parts of the region. There are much fewer forests in the western and north-western parts.

NORTHERN SWEDEN

Two forest owners, two cluster organizations and one biorefinery expert participated in the breakout room. We aim to create added value by replacing fossil products and energy with by-products from forestry and the forest industry. Biomass potential and availability in Northern Sweden have been mapped and are available on the following [link](#)

2. Dedicated crop or by-products from main crops: what are the main differences?

AUSTRIA (AND GERMANY):

Following points have been discussed as main differences between dedicated crop or by-products from main crops:

	Dedicated Crop	By-products
Energy Content	More efficient for energy conversion; standardized energy content	Varying energy content makes it difficult to standardize energy production and further processing might be needed
Land Use	May compete with crops for food production or compete with ecosystems for land and resources → it is important to look at the cost-value ratio	Benefit of by-products is, that they do not need additional land, since the crops are used for food production anyway
Economic factors	Good economic factor for the production of renewable energy → crop price can be held at a lower level	Economic benefit: a usually wasted by-product is utilized and therefore still has an economic value. If it would be discarded, farmers often have to pay for the waste fees
Regulatory Framework	Dedicated crop is easier to manage in a regulatory framework, since it is more standardized and has a clear purpose/use; A change in the regulatory directive (e.g. RED II) can prove to be a high challenge	Compliance with regulations might be harder to achieve for by-products, since the biomass sources vary and the traceability is more unclear; if not all by-products can be used due to regulations, the economic and environmental benefits might not be relevant

ANDALUSIA, SPAIN

The differences are established, according to the contributions that have been made in the break-out, to the quantity of humidity that contain and, consequently, to their use. For instance, the olive pits are used exclusively as a biofuel, being very difficult its transformation into organic compost; on the other hand, the leaves and the pomace can be used directly or indirectly as biofuel or as raw material for the production of compost, that could be used again on crops from where they come from, leading to a truly circular economy.

FRENCH ATLANTIC ARC, FRANCE

Particular attention needs to be paid to the balance between co-products from food crops such as wheat and non-food crops such as hemp and miscanthus. There may be competition. The south of the AC3A region has a shortage of wheat straw for its herds, so straw has to be imported from neighbouring regions. Similarly, the use of land for non-food production must be in equitable proportion so as not to destabilise the local economic balance. Corn straw and miscanthus are great opportunities for developing a local and circular bioeconomy.

STRUMICA, NORTH MACEDONIA

The biomass produced in the Strumica region exhibits varying degrees of organic matter, with certain residues, like those from peanuts, being particularly rich. To optimize their utility, these biomass materials are often blended, exemplifying a pragmatic approach to resource management. For instance, hay is combined with wood sawdust or apricot seeds in the pellet production process, enhancing the efficiency and environmental benefits of this renewable energy source. Moreover, hay finds dual purpose, serving not only as fodder for cattle but also contributing to the sustainable cycle of biomass utilization. The innovative use of watermelon crust in food production, particularly in sweet dishes, exemplifies the region's commitment to minimizing waste and promoting circular economy practices. Pruning leftovers from fruit trees and grapes are repurposed for pellet production or compost making, ensuring that agricultural by-products are employed in an eco-friendly manner. Further emphasizing sustainability, the region employs leftovers from food processing to "feed" biogas plants, harnessing energy from organic waste. Additionally, on a smaller scale, initiatives such as composting leaves, particularly in educational institutions, contribute to community-level sustainability efforts, showcasing the region's holistic and diversified approach to biomass utilization.

MAZOVIA, POLAND

Available biomass is determined by agricultural production:

- Waste from cereal and rapeseed production plays an important role - it includes straw, husks and contaminated grain
- Another form of biomass available in the region is manure and slurry from cows and pigs.
- biomass from the production of fruit and fruit products, mainly from apples - pomace and seeds, and orchard residues such as branches and leaves.
- Biomass from forest management, wood and waste from forest clearing.
- Biomass from household waste is still used to a low extent and there are problems with the selective collection of this waste fraction.

NORTHERN SWEDEN

By-products from forest industries are available but hard to access for new users. Forest industries are skeptical of new users and can also regard them as potential competitors for biomass. Classification of by-products can sometimes make it more difficult to access them. By-products from forestry are available but to mobilize them, several actors along the value chain need to make strategic decisions or need to invest. In the scale-up project, we work to support the mobilization of logging residues (tops and branches) by creating multi-actor partnerships and networks.

3. Potential for the future: what could be the new opportunities? What are the driving factors: emerging markets and value chains, change of practices, climate change?

AUSTRIA (AND GERMANY):

The driving factors that in Upper Austria in regards to primary producers in bio-based value chains are for one the regulations and regulatory framework. Since the regulations for bio-based materials and biomass are comparably new and change quite often, it is often hard for primary producers to establish their position in the market since they do not have the know-how how to comply with the regulations and do not have the resources to keep up with the change in regulations. One way to tackle that challenge that has been discussed is an improvement in the support organisations (e.g., farmer unions, ...) and the communication between the farmers and these organisations.

Another factor that has been discussed is the role of large-scale companies in the value chains or when large-scale companies join the markets. This might have a high potential for primary producers to sell all their biomass, since the large-scale companies have the necessary resources. On the other hand, a discussion point was that large-scale companies in the value chain pose the risk of monopolization and that small-scale businesses cannot compete on the market anymore.

ANDALUSIA, SPAIN

In an ever more tough energy market, and the inflation tensions, finding energy sources that are both green and locally sourced and relatively economic, can generate new opportunities for businesses that with low risk can generate considerable benefits and increment local employment. Regarding olive pits, new technologies allow to obtain a clean and dry pit, leading to the possibility for diesel boilers being increasingly replaced by boilers burning directly olive pits, which puts in place a more efficient and sustainable system with the environment. In regard to other materials, either residues or subproducts, as they can be raw materials for the production of compost, it is estimated that the high production of olives, will generate a high production of oil, which will generate a considerable reduction in the price of pomace; this might lead that a percentage of this production can be transformed in compost, which will no damage but benefit the oil mill. This scenario can generate other alternatives more respectful with the environment and providing greater agronomic benefits for both the crops and farmers.

FRENCH ATLANTIC ARC, FRANCE

Fibre plants are interesting low-input crops for areas with major environmental issues (drinking water). They represent real development opportunities for setting up local biobased materials industries for the construction industry, for example. We need to look at development, considering the region's resources. The construction industry has growing needs in terms of meeting environmental standards and decarbonising buildings, both new-build and renovation projects. Some obstacles remain in terms of European agricultural policy regulations: crop diversification and the ban on bare soil can restrict farmers in their use of maize and wheat straw, which is often left in the fields as an alternative to plant cover, for example.

STRUMICA, NORTH MACEDONIA

In the Strumica region, future opportunities lie in agri-voltaics, bio-based packaging (using mycelium), insulation in barns with straw/residues, and turning bread leftovers into beer. These prospects are propelled by a confluence of factors. Firstly, they contribute to national climate change goals, aligning with global efforts. Secondly, there's a shift towards circular economy practices, fostering sustainable resource use and waste management. Additionally, these initiatives address animal welfare concerns by reducing heat stress. The appeal also lies in the potential for cost-effectiveness and the use of eco-friendly materials, making them economically viable and environmentally sound. These emerging opportunities reflect a commitment to sustainability amid changing environmental dynamics.

MAZOVIA, POLAND

In the future, the use of biomass in the region may increase and this is due to several factors. The main factors that influence the use of biomass may be:

- regulations at the EU and national level,
- rising energy prices, switching to mine fuels, searching for alternative energy sources.
- increasing importance of the circular economy and the search for new raw materials that would replace, at least partially, those made from plastics.
- challenges related to climate change(e.g. extreme rainfall or drought) , but also soil sterilization due to intensive agricultural production - growing interest in biological agents used in agricultural production. E.g. - use of biofertilizers derived from composting.
- gradual and slow changes in consumer thinking
- rising prices of fertilizers and chemicals used in agriculture, entrepreneurs will look for alternatives to traditional farming methods.

NORTHERN SWEDEN

EU policies are a big driver for new ways to utilize biomass as a substitute for fossil-based resources but much of the biomass is used by existing forest industries and Combined heat and power plants. The biomass market is highly competitive and because of EU policies, fewer volumes will likely be available in the future. We should work to utilize biomass smarter and to create more added value. Several industry segments are today pushed by EU policies to find alternatives to fossil input, and we see that the chemical industries are working hard to find creative ways around regulations so that they can greenwash their products even though there are no green molecules in them.

Cross-regional conclusions/learnings

This cross-regional biomass overview provides a concise exploration of biomass utilization practices across diverse regions in Europe. From the wood-rich landscapes of Upper Austria to the olive-centric strategies of Andalusia, each region faces unique challenges and opportunities in navigating the evolving biomass landscape. The French Atlantic Arc emphasizes the potential of fibre plants for local bioeconomy amid regulatory hurdles, while Strumica in North Macedonia showcases a pragmatic approach to various biomass sources. In Mazovia, Poland, low biomass utilization is countered by potential driven by regulatory changes and shifting energy landscapes. Finally, Northern Sweden pursues a transformative agenda, aiming to replace fossil products with forest by-products, underscoring the regional commitment to added value, smart utilization, and adaptation to dynamic market conditions. Together, these snapshots provide insights into the diverse approaches and considerations shaping biomass utilization across Europe.

Some of the cross-regional recommendations are:

- *Regulatory Adaptation:* Stay agile in adapting to evolving regulations, particularly in regions where biomass policies are new or frequently changing. Foster improved communication and support systems, involving organizations like farmer unions to help primary producers navigate regulatory complexities.
- *Circular Economy Practices:* Embrace circular economy practices, as seen in Andalusia, Spain, by efficiently utilizing by-products for various applications and minimizing waste.
- *Diversification and Innovation:* Diversify biomass sources and explore innovative uses, such as agri-voltaics, bio-based packaging, and repurposing food waste, as demonstrated in Strumica, North Macedonia.
- *Strategic Collaboration:* Encourage multi-actor partnerships and networks, especially in regions like Northern Sweden, to overcome challenges in accessing forest industry by-products and mobilizing logging residues.

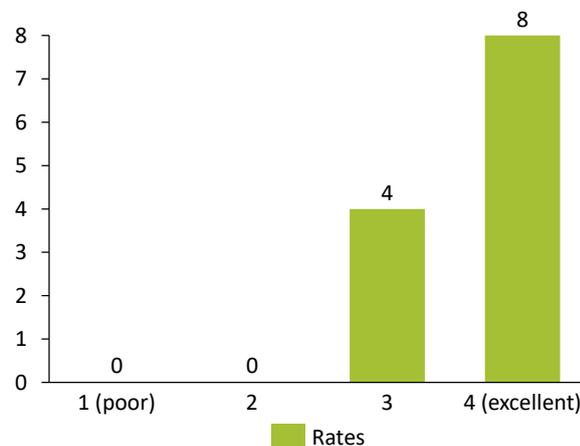
- *Value Addition*: Focus on creating added value from biomass utilization, addressing challenges of biomass competition and the need for smarter utilization, particularly in regions with high biomass market competition.
- *Sustainability Integration*: Align biomass strategies with sustainability goals, considering factors like resource management, eco-friendly practices, and minimizing environmental impact.
- *Awareness and Education*: Promote awareness and education, especially among primary producers, to enhance understanding of biomass regulations, market dynamics, and sustainable practices.
- *Localized Solutions*: Tailor biomass strategies to local conditions, taking into account climate, soil types, and regional variations in crop development, as seen in the French Atlantic Arc.
- *Adaptation to Market Dynamics*: Monitor and adapt to market dynamics, considering factors like rising energy prices, circular economy importance, and changing consumer attitudes, as highlighted in Mazovia, Poland.
- *Mitigating Industry Skepticism*: Address skepticism from existing industries, as observed in Northern Sweden, by building trust and finding synergies rather than seeing new users as potential competitors for biomass resources.

Participant feedback

At the end of the training session, the participants were asked to fill in a short survey to evaluate the training session. In the end, 12 participants responded to the survey, of which 4 from Spain, 3 from Sweden, 3 from Poland, and 1 from Macedonia and 1 from France. No participants from Austria or Germany responded to the survey. The survey gave the following results:

The participants were asked to rate the quality of the training session on a scale from 1 (poor) to 4 (excellent). Out of the 12 participants, 8 gave the quality of the session 4 (excellent), while the remaining 4 participants responded with 3.

How would you rate the quality of the training session?

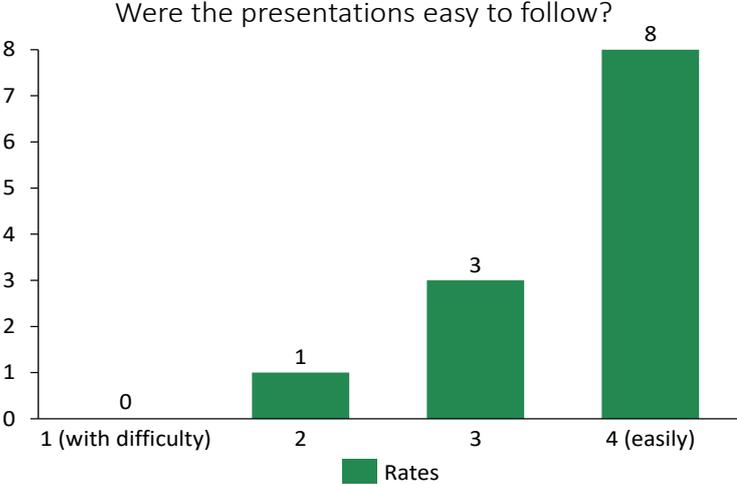


The participants were then asked what went well during the session. This gave many positive responses about the organization, presentations, and overall content of the session, as well as the interesting discussions during the breakout session.

Next, the participants were asked what could have gone better. More than a third of participants stressed that the speaker from France was difficult to follow and that they had problems with the translation. Additionally, a participant mentioned that it would have been useful to have the presentations beforehand, that there were not enough people in the breakout room and that there was not enough time.

The participants were also asked whether the presentations were easy to follow. They were asked to rate this on a scale from 1 (with difficulty) to 4 (easily).

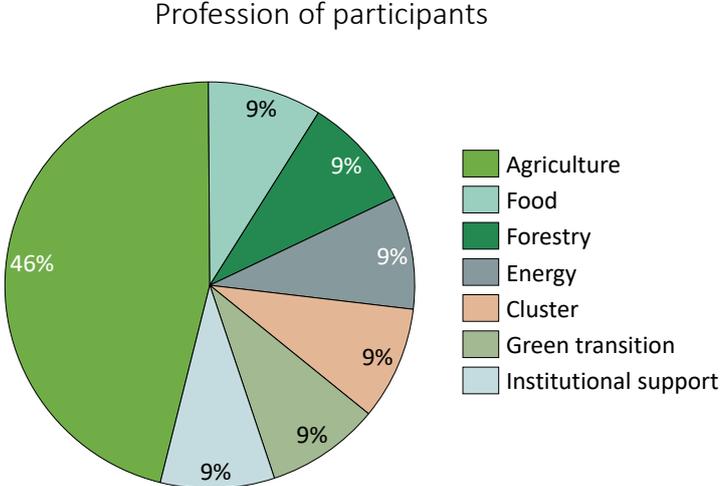
Out of the 12 participants, 8 gave this a score of 4 (easily), three participants a score of 3, and one participant a score of 2. So even though multiple participants mentioned they had problems with the translation, most participants found the presentations relatively easy to follow overall.



When asked which topic was most interesting, we received the following answers:

- The biomass streams from France (new to participant)
- Examples from France and Macedonia
- The use of olive grove remains and its opportunities
- The use of miscanthus
- The presentation held 9.15-9.30 (?)
- Identification of new possibilities in the production and use of biomass
- Possibility to learn about new sources of biomass

The survey concluded with 2 optional questions regarding the participant's level of education and field of occupation. For the level of education, it was noted that all participants graduated from university. For the field of occupation, the participants came from different areas; 5 from agriculture, and one from food, forestry, energy, cluster, the green transition, and institutional support.



Participants:

If you wish to get in touch with one of the participants from this session, please contact someone in the SCALE-EP consortium.

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