



WS4 Training Programme Protocol

Proceedings of the training sessions in WS4 – Session #2
26 September 23



This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No. 101060264.

TRAINING SESSION ON END-USERS' CHALLENGES IN THE LOCAL VALUE CHAIN

On 26th September 2023, the second training session of the SCALE-UP training programme took place. Key highlights included: Presentations in English covering biomass streams and end-users' challenges. Two start-up end users, a biocarbon producer in Sweden and a biocomposite producer in Spain, shared their experiences and challenges. End-user challenges were discussed in 6 different regional breakout rooms with sessions for regional discussions on challenges and solutions with emphasis on long-term biomass availability and important quality parameters for end users. The session encouraged collaborative problem-solving and knowledge sharing among participants, with the aim of enhancing biomass supply chains in their respective regions. In total, around 40 participants joined the session.

Training session & presentations in the main room

Opening the session & Warm-Up

Magnus Matisons (BFR) opened the session and welcomed the participants. A short introduction to the training session was given and a map gave an overview of where the participants came from. Frans Feil (BTG) introduced us to the project and the different biomass streams in the six SCALE-UP regions.

End-users' challenges in the local value chain: Magnus Matisons, Biofuel Region

Further building on the insights from session 1 with a focus on end-users' challenges. The most crucial challenge for end-users is to secure a continuous and long-term (10 + years) supply of biomass. End-users need to establish a reliable and transparent payment method for biomass deliveries that can be a driver for improved quality of deliveries. Setting up a reliable and cost-effective quality control system is challenging since biomass often has a complex and varied nature.

Biocarbon producer perspective on biomass supply and logistics, Tobias Brink, Business developer, ENVIGAS, Sweden

ENVIGAS aims to have large-scale production of high-quality biocarbon from stem wood pellets by 2025 and by 2030 reach a 150,000 tonnes production capacity. To scale up, they need a wider range of woody biomass assortments available in large volumes and at affordable cost. Tobias explained the challenges ENVIGAS is facing and what business strategy they must tackle. He also gave an overview of the technology they are using in the industrial pilot plant located in Bureå, Sweden.

Biocomposites based on olive pruning fibers for automotive and furniture. Industrial end-users and the creation of a biomass value chain, Juan Pablo Ferrer from Fundacio'n Andaltec (R & D + I technological center)

Juan Pablo Ferrer from Fundacion Andaltec (Spain) presented the Life-CompOlive project, in which biocomposites made from olive pruning fibres are applied in industrial settings, such as the automotive industry and furniture. This solution gives value to olive tree pruning waste, avoids burning this waste in the field, and can be used to replace fossil-based materials. Fibres from olive tree prunings are combined with a matrix of polymers, which together form the biocomposite material. The prototypes for different products made from the biocomposite material were shown. Then, the market potential was explained. Some of the main challenges include long-term availability of the biomass supply, barriers to biomass mobilisation (poor accessibility, reduced size of prunings for transportation). The most important biomass quality parameters were also mentioned.

AUSTRIA (AND GERMANY):

1) Long term (+10 years) and continuous infeed of biomass 24/7

2) Payment of biomass – Suitable solution for your region

A joint venture would be a good idea to split the risk, but also splitting the advantages. It is essential to have some changes in politics, funding, or insurance → Bioeconomy must be supported. Payment must be fair. Payment must always reflect the value of the product.

3) Quality control of biomass supply – Suitable solution for your region

Biogas production: the longer it is stored, the less biogas remains. The aim is to have more biogas and less ammonia (which is not great for nature). Possible solution could be small biogas plants or decentralized production sites. Otherwise, fast logistics are necessary.

General: participating bakery uses 50% of their side streams again for their production. The other 50% are used for biogas, plants or feed.

ANDALUSIA, SPAIN

1) Long term (+10 years) and continuous infeed of biomass 24/7

We had 11 participants representing a diverse pool of stakeholders, including bio-based solutions firms, investors, researchers, and public authorities.

During the session, Rafael Castillo, (moderator of the break-out room, CTA) presented regional resources and resources to guarantee a long-term and continuous infeed of biomass focused on:

- Decentralized pre-treatment in relation to transport and storage (chipping, pellet, briquetting, packaging, and liquefaction).
- And pre-treatment and mobile biorefineries (combustion, pyrolysis gasification, fermentation, and anaerobic digestion).

Antonio Carlos Ruiz, speaker from CTA, highlighted the Digital Innovation Hubs (DIH) as a one-stop-shop to support the biomass and bioeconomy ecosystem, facilitating multi-stakeholder collaboration, value creation, and capture from biomass producers and exchange of knowledge to co-create solutions to key issues for the olive biomass in Andalusia, such as the seasonality and the geographical concentration of the production. Marina Barquero, speaker from CTA, presented BioHubs as a win-win collaboration networks of collection points to facilitate biomass supply chains that integrate physical and virtual solutions to secure the continuous infeed of biomass. During the discussion with participants, it was emphasized the fact that both the DIH and the Biohubs can provide platforms for the exchange of knowledge to identify the needs of end users and tackle them.

2) Payment of biomass – Suitable solution for your region

Although payment of biomass was not specifically discussed during the break-out session, the Andalusian Bioeconomy Strategy was presented as a key framework for the valorisation of biomass in the region as well as the DIH and the BioHubs as catalysts for its market development, enhancing R&D and connecting investors with biomass production (we had investor firms among the participants of the session). Within this topic, a table of the current use and properties of the olive biomass was presented summarizing the main intrinsic characteristics of the by-product important for the valorisation process and the economic value of the by-products. As a follow-up from the session, a cooperative firm contacted us to explore further advise in terms of funding for an olive biomass technology development.

3) Quality control of biomass supply – Suitable solution for your region

The seasonal and geographic concentration of the olive biomass supply presents challenges for quality control. In order to guarantee a long-term supply with the right level of quality control, it has to be considered three key aspects:

- Intensification: Variation of biomass production index by crop type (rainfed/irrigated and intensive/extensive*)
- Specialization: Use of the wide frames of the olive grove.
- Mix of biomass sources: sewage sludge, municipal biowaste or biomass from microalgae culture.
- During the discussion the importance of the Platform and forum orchestrated through DIH was highlighted in order to develop bottom-up solutions on quality control that fully integrate the needs of both biomass producers/end users.

FRENCH ATLANTIC ARC, FRANCE

This session was attended by 3 participants: 1 producer of biomass specializing in miscanthus, 1 end-user specializing in biorefinery of biomass for the plastic additives market and the host from business support organization, expert specializing in reeds and sphagnum biomass.

Topics of discussion: criteria of quality and barriers to the availability in biomass.; We did not have enough time to discuss solutions, unfortunately.

Method: the host used a collaborative whiteboard to guide the discussions.

Main conclusions:

We considered during the BOR the quality required to sell miscanthus and the quality expected from the biomass to produce additives for bio-sourced plastic, allowing us to have a 360° discussion from field to market perspective.

- Fractionation of the biomass: micro-level for biorefineries for additives, mm for litter use, cm for transport
- Content in cellulose, lignin, hemicelluloses, high-value molecules (phenols, antioxidants...)
- Calorific value with miscanthus' impact on the type of heater use. It can be at the same time a strength and a weakness
- Content in water, chlorine disturbance to the use
- Contamination by bioaccumulation in the biomass: pollution to chemicals, heavy metals coming from the environment or methods of production
- Contamination with dust: non-usable for the purpose of the miscanthus. But from the perspective of a biorefinery, it has great potential thanks to its content in silicium
- Competition between the feedstock use: energy/building/chemistry/food/feed with a need to create more steps to the value chain to valorise as much by-products as we can

STRUMICA, NORTH MACEDONIA:

1) Long-term (+10 years) and continuous infeed of biomass 24/7

Agriculture is a key biomass-producing sector in Strumica and plays a vital role in the local economy. Although there are numerous ways to utilize agricultural residues, still there is a lack of farmers understanding of benefits that the agricultural residues can offer. Another hurdle that could hamper the long-term and continuous infeed of biomass is limited access and knowledge to suitable machinery

and equipment. On the other hand, developing new business opportunities through research and development has the potential to secure and extend the bio-based value chain. Furthermore, having storage that is owned and managed by composters is another asset to increase the biomass inflow.

2) Payment of biomass – Suitable solution for your region

While specific payment options for biomass were not determined, during the workshop, the stakeholders' discussion revealed a need for bottom-up evaluation of suitable payment options in the region – a potential activity of the regional bioeconomy platform. Additionally, setting a questionnaire with farmers about the break-even payment that motivates their participation was also discussed. Some of the points that the stakeholders were discussing were related to the payment facilitated through digital tools. Digital tools can be also used for coordination of stakeholders, however there is lack of IT knowledge and experience with digital tools shown through the experience of agricultural cooperatives.

3) Quality control of biomass supply – Suitable solution for your region

Quality control is crucial for successful biomass supply. The stakeholders listed several factors that should be controlled in the composting process such as moisture content, nutrition (carbon: nitrogen ratio of the material). Digital tools and platforms and a collaboration with local representatives of relevant institution (e.g. Ministry of agriculture) can be used to map the stakeholders that can offer agriculture residues suitable for composting.

MAZOVIA, POLAND:

Summary of the discussion

During the discussion, challenges were defined from the end user's point of view:

Challenge 1. Ensuring the appropriate quality of biomass. When planning to use apple biomass for food production, care should be taken to ensure the safety of the raw material. Plant protection products are used in apple production, and therefore biomass used for food production must be checked whether sanitary standards have been exceeded. Creating a control system that would cover small producers requires the involvement of, for example, a research institute with appropriate equipment and staff.

Challenge 2. Creating a system for collecting and storing biomass from small producers to ensure a constant stream of biomass for the end user. Such a system could be created on the basis of biohub.

Challenge 3. Providing new technologies for new applications of apple biomass. The means of production currently used by producers are not suitable for changing the production model. The challenge is acquiring technology, such as providing new skills for employees.

Challenge 4. Developing a settlement and payment model for small producers

NORTHERN SWEDEN

Representatives from two start-ups and one energy plant participated together with representatives from BioFuel Region.

1) Long term (+10 years) and continuous infeed of biomass 24/7

Both start-ups stressed the challenge they are facing to access large amounts of biomass that fulfill their specific quality requirements. These assortments are already used mainly for combustion and to replace the energy plants need to mobilize new biomass assortments like logging residues.

2) Payment and quality control of biomass supply – Suitable solution for your region

This is already established and authorized in our region. Payment is carried out for every MWh delivered. For this, you need scaling and authorized sampling of moisture content. Quality control of ash and contaminations is also important. For new end users' other quality parameters like alkaline content will have to be controlled. A fruitful discussion took place about the possibility for the two start-ups to establish cooperation and production near the energy plants' open bio hub. Potential synergies were discussed and the discussion about potential business partnerships continued after the breakout session.

Cross-regional conclusions/learnings

All regions highlighted the importance of a quality control system. Different quality parameters were considered important in different regional biomass value chain. In the end it will be end users' specific quality requirement that will determine what is considered as good or acceptable quality. This can vary between different end users. Suitable payment methods were not well developed in the regions, and discussion should be continued with primary producers and end users to find suitable solutions. The most important challenge for end users is to secure a long term and continuous (all the year around) infeed of biomass. To solve this challenge several regions pointed out decentralised upgrading and storage of different biomass assortments in Bio Hubs as an attractive solution. New business models like joint venture were also suggested. In the end, long term delivery contracts between primary producers and end users must be secured for investments to take place. The session has raised awareness of the challenges that end users are facing and suggested actions to solve some of the challenges. Work will continue within the SCALE-UP regional platforms.

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, 14 participants responded to the survey, of which 3 participants were from Spain, 2 from North Macedonia, 2 from Austria/Germany, 4 from Poland, 1 from France, and 2 participants from Sweden. The survey gave the following results:

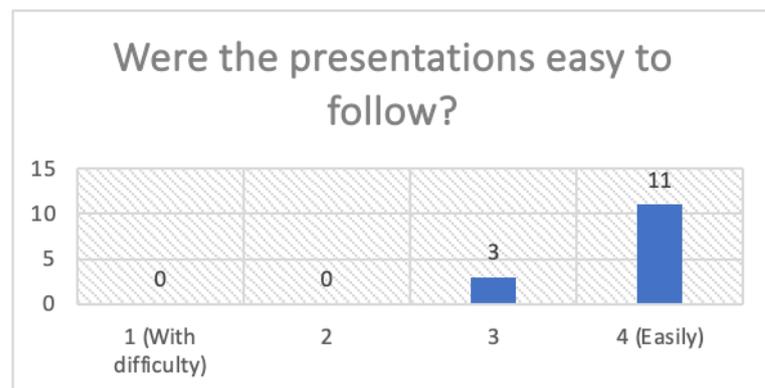
The participants were asked to rate the quality of the training session on a scale from 1 (poor) to 4 (excellent). Out of the 14 participants, 10 gave the quality of the session a 4 (excellent), while the remaining 4 participants responded with a 3.



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

Next, the participants were asked what could have gone better. Here the entry into the breakout session was mentioned, as well as the quality of the subtitles, more presentation, and more visual material and more time for breakout rooms. The first presentation was the same as last time, but I understand the point if there were new participants.

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 14 participants, 11 gave this a score of 3 (easily), and the other three participants a score of 3.



This second session the participants were asked to compare this one to the first session. The quality was similar to the first one and one participant stated that this was even better as we had more actors who could collaborate in the future.

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

- Quality control
- Recycling tree pruning olive trees
- Olives and breakout rooms
- All topics that were tackled
- Valorization of waste biomass through examples
- Innovative solutions
- Transport logistics and biomass conservation
- The practical side of a biomass-based business
- Pilot financing
- The digital innovation hubs

- Andalusia session, presentation of biocomposites from Andaltec, biocarbon from Norway, presentation of the biomass resources of each of the regions
- Hear real cases from Sweden and Spain how to work and create new products out of biomass and solve the problems that exist with biomass logistics.
- Co-location of new industries already in planning mode

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 8 participants graduated from university and 2 filled in Vocational education. For the field of occupation, the participants came from different areas; agriculture (2), Energy (2), Food (2), NGO (1), Cluster (1), Engineering and consulting (1), Research (1) and Forestry (1).

Cover page photos © BFR, CTA, UNIMOS, franceagritwittos.com, and pixabay.com