



SCALE UP
community-driven

bioeconomy development

WS4 Training Programme Protocol

Proceedings of the training sessions in WS4 – Session #1
07 September 23



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Aim of the event

On 7th September 2023, the first training session of the SCALE-UP training programme took place. The session began with introductions to the SCALE-UP project and an overview of selected biomass streams in the 6 project regions. A presentation was made on the development of local biomass supply systems. The event featured breakout group discussions that were focused on the challenges and the current state of biomass logistics and infrastructure in each focal region. Key topics of discussion included regional biomass resources, their current use and ownership, as well as barriers and potential solutions for mobilization, upgrading, and storage of biomass resources. Following the breakout sessions, each group reported back on their key outcomes and questions. The session concluded with a discussion of next steps and the distribution of a survey to gather participant feedback on the event. In total, around 50 participants (details of the participants) joined the session.

Starting the training session & presentations

Opening the session and warm-up

Magnus Matison (BFR) opened the session and welcomed the participants. A short introduction to the training session was given and the next speakers were introduced.

Presentation of the project and training programme

Holger Gerdes and Zoritzia Kiresiewa (ECO) gave a short introduction to the SCALE-UP project. Additionally, they presented the dates and topics of the following training sessions within workstream 4.

Presentation of the biomass streams from previous project activities

Frans Feil (BTG) then presented the biomass streams of the SCALE-UP regions. Frans explained the types of biomass streams being studied, whether they are the primary product or by-products. In the case of by-products, he clarified whether they become available at the factory or in the field. Additionally, for each of the biomass streams, the desired end-products were explained shortly. Finally, some final considerations were given, including constraints in feedstock availability and environmental constraints.

Presentation on how to develop a biomass supply system

Magnus Matison (BFR) began the presentation on how to develop a biomass supply system. He referred to the main characteristics of biomass streams and the challenges related to their collection and processing. Then he discussed the value development of bioproducts, the impact of production on by-product availability and other factors affecting the biomass potential.

In terms of logistics, important factors such as bulk density, transport, loading/unloading and communication were covered. He emphasized the importance of multi-actor partnerships, which are also essential for optimizing value by obtaining multiple products from biomass feedstock, often referred to as the biorefinery approach. For example, various products can be derived from wood, including timber, pulp and paper, as well as high-value chemicals extracted from residues. This approach could also be applied to other organic feedstocks.

To match supply and demand a logistic solution could be found in the establishment of a so-called "Bio-hub". In this place feedstocks in various shapes and sizes can be collected from multiple sources and directed towards various processing routes.

The participants were then given three topics from this presentation, to be discussed in the regional break-out sessions, namely:

1. Regional biomass resources,
2. Upgrading and storage of biomass (including "Bio-hubs"),
3. Multi-actor partnerships.

FRENCH ATLANTIC ARC, FRANCE

a) Presentation of concept board and participants

- 8 participants took place in the regional breakout, of French-speaking region

b) Challenges identified

- **Regional biomass resources: volumes and spatial distribution, seasonality**
Technical and economic potential:

The Atlantic Arc is a very large French region, but there are delays between the different administrative regions that make up the region, with the north being more developed in terms of fibre plants.

Professional rules for the use of materials in the building industry should be promoted locally. Industrial projects such as a bamboo fibre valorization and processing plant in the north should be duplicated in the other regions of the Atlantic Arc.

- **Storage: for a regular supply to processors, Availability of biomass**

How long to store straw: availability in relation to requirements?

What is the cost of storage? the price of gate and field-gate without including the price of storage. For bamboo, for example, few quantities are required, local storage like wood. Buffer stock is required.

- **Constraints and mobilisation of biomass**

There is competition from other insulation materials, and biomass processing techniques need to be improved for miscanthus. There is competition from other insulation materials, and biomass processing techniques need to be improved for miscanthus, for example.

c) Ways to overcome barriers – Conclusions/learnings:

- Regular exchanges between stakeholders in each region of the Atlantic Arc will make it possible to envisage harmonious development based on the experience of each, the duplication of models or industrial pilots of transformation.
- We need a better understanding of the needs of building professionals to anticipate the production and storage of biomass.
- Technical solutions need to be tested to improve production and primary processing by farmers.
- Include discussions with participants and how they would tackle the problem; also include points from main room discussions or get input from expert.

AUSTRIA AND GERMANY

1) Presentation of concept board and participants

8 participants took part in the regional break out session of German speaking regions.

2) Challenges identified

The following challenges were identified:

- Discrepancy in biomass between actual quality and how they should be applied
- Some of the waste already has to be bought in at a high price, so it is difficult to create value.
- Lack of information: Chemical properties of different categories of waste are different and should be labelled to ensure seamless processing.
- The storability of biogenic waste is usually short. Material flows from the food and agricultural industries are usually difficult and can only be stored for a short time. Rapid processing is very interesting.
- Foodstuffs are not homogenous and packaging is a major obstacle.

3) Ways to overcome barriers – Conclusions/learnings

- Waste gets value: Disposers should take responsibility and recognise the value. This can close gaps and stimulate the circular economy.
- Bilateral agreements between producer and processing: short reaction times, agile and innovative work.
- Networking of all stakeholders is important to drive innovation in bioeconomy.
- Region as initiator: Clear, regional goals must be set politically.

ANDALUSIA, SPAIN

1) Presentation of concept board and participants

The breakout session was focused on clarifying the state-of-the-art biomass logistics and infrastructure in the Andalusia region. It was divided into four main points:

- Regional biomass resources: volumes and spatial distribution, seasonality;
- Current use and ownership of the biomass;
- Barriers and solutions for biomass mobilization;
- Upgrading and storage of biomass.

First, an introduction of the local context for each point was presented by moderators (Rafael Castillo) and speakers (Carmen Ronchel and Marina Barquero, from CTA). After, an open discussion was carried out with very high-quality contributions from participants, mainly from academia (University of Cordoba) and the private sector (DCOOP and NATAC).

2) Challenges identified:

As has been commented before, the session was split into four different points:

a) Regional biomass resources: volumes and spatial distribution, seasonality:

Climate change transforms drought into a very recurring natural phenomenon in Andalusia and therefore, water scarcity directly affects biomass production. In particular, private sector companies showed their concern about the modification of the feedstock rates (olive fruit, olive leaves, olive pulp, skin or stones, etc.). Additionally, they identified the intensive crop as a new emerging problem

for the control of biomass resources. On the other hand, the whole value chain remarked the seasonality of biomass from the olive. These feedstocks are available only three months per year (March, August, and September).

b) Current use and ownership of the biomass:

Stakeholders commented on the high dependency of the main products in most of the actual valorization process. They concluded it is crucial to find more added-value by-products to mitigate that dependency. Since we have several new innovative processes for obtaining bio-based products, there exist several legislative gaps between local, regional, and European policies. End-users commented that depending on the final use of the biomass feedstock (e.g, alperujo) it must be considered as a by-product or as waste. It involves several administration processes within an uncertain environmentally increasing associated cost. Finally, stakeholders from the academia sector explained a long list of potential innovative uses of biomass, but they concluded that nowadays all of those processes have a very low economic profile and companies refuse to adopt them.

c) Barriers and solutions for biomass mobilization:

The main barriers identified by companies are related to the low added value per product unit. That means they need to mobilize large amounts of biomass to get environmental and economic profiles with the main feedstocks: alpechin and the ones encompass olives (olive stones and olive shells). However, before mobilizing the biomass, it is necessary to get it. Biomass logistic operators explained that it is necessary to create and develop a set of awareness-raising activities for the primary producers since mostly they do not know they can obtain economic profiles with waste and, in the case of olive crops, primary producers directly burn the biomass without any purpose.

d) Upgrading and storage of biomass:

Unfortunately, we did not have time to discuss this very interesting topic.

3) Ways to overcome barriers – Conclusions/learnings

A set of very innovative solutions was proposed for each discussion point:

a) Regional biomass resources: volumes and spatial distribution, seasonality:

The most accepted solution for biomass resources was to create a digital hub in order to improve biomass availability and information accessibility. Creation of new multi-stakeholder partnerships for better control of biomass availability was also suggested. Regarding the problems associated to the seasonality of the biomass from olives, cooperative members proposed mixing biomass from different crops with the feedstocks from olives.

b) Current use and ownership of the biomass:

Due to the several legal barriers, Andalusian stakeholders agreed it is necessary to develop new governance models involving the entire value chain and consider the most recent innovative bio-based solutions. Academia actors boosted the private sector to increase their R&D investment in new and more profitable valorization technologies bridging the gap between the academia and the market by supporting the scaling-up processes.

c) Barriers and solutions for biomass mobilization:

The private sector explained that it is necessary to secondary processes with very high added value to complement the actual main validation products since most of them present a very low economic profile. They boosted the sector to the partnerships to increase their minor by-products research with a high added value per product unit, reducing the logistic cost by the way. Another proposed solution was to reinforce the public administration and primary producers' relationship in order to link the awareness raising with the social, environmental and economic benefits that both of them could obtain by the use their biomass for valorization process. Finally, due to large volumes of biomass produced during the season, all the stakeholders involved in the valorization processes agreed about the benefits of the use of mobile pilots' plants for biomass treatment. Those in-situ plants must involve the use of renewable energy, closing a very innovative and sustainable circle.

d) Upgrading and storage of biomass:

Unfortunately, we did not have time to discuss this very interesting topic.

STRUMICA, NORTH MACEDONIA

1) Presentation of concept board and participants

The number of participants from North Macedonia was ten covering different sectors including public authorities, academia, business and innovation sector and NGOs. However, the industry and primary producers as sectors were not represented.

2) Challenges identified

During the breakout session, the following challenges were identified:

- Lack of awareness about different possibilities and low levels of promotion and information for bioeconomy
- Insufficient number of onsite trainings for primary producers
- Reluctance of stakeholders to work jointly and low level of motivation
- Need for adequate education and improvements in the programmes
- Need for secondary bio-based products as alternatives for styrofoam and plastics
- Need for better land management
- Expensive machinery
- Illegal landfills and open waste-burning
- No storage for agricultural residues (ends up in landfills)

3) Ways to overcome barriers – Conclusions/learnings

To overcome the barriers and challenges identified during the discussion, some of the following recommendations and good practice were proposed:

- Established agreement between the largest vegetable processing company and biogas plant for handling over the residues. This example should be as guidance for other companies to start such cooperations.

- Regional landfill which will enhance the waste management on regional level.
- Better utilization of the existing financial support measures in order to improve the machinery and tools for agricultural activities.

MAZOVIA, POLAND

2) Challenges identified and 3) Ways to overcome barriers – Conclusions/learnings

- 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.
- Creating a system for collecting and storing biomass from small producers to ensure a constant stream of biomass for the end users. Such a system could be created on the basis of biohub.
- 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.
- Developing a settlement and payment model for small producers.

NORTHERN SWEDEN

1) Presentation of concept board and participants

6 participants including regional bioeconomy experts and companies.

2) Challenges identified

- The competition for raw material
- "The Green Transition" (all black coal shall turn green). This industrial revolution in northern Sweden means that we are concerned about labour, electricity supply, and raw materials. But it is also a driving force for the bioeconomy.
- The big Forest companies are not interested in sharing material and ideas. The existing forest industry strives for control over the price level of the assortment they currently trade with. The control of raw material flows hinders development as the large cash flows are now in the core business.
- It can be a challenge for those who want to buy a specific product such as birch bark as the primary producer does not sell the product.
- If new assortments are introduced, that can change the price of existing assortments.
- A new product will be excess heat that can change the market

3) Ways to overcome barriers – Conclusions/learnings

- The business models for the supply chain for logging residues need to be developed - Logging Residue Business
- We need a multi-actor partnership and to develop long-term planning
- Umeå Energi (a regional energy company that develops and provides sustainable solutions for energy and communication services) are building a circular area - an industrial Ecopark, 600m² (BioHub) - the cascade principle
- We need to improve our contact with Forest owners and discuss the supply of logging residue
- We need to encourage strong players to ask for new assortments, for example, logging residue in order for a new assortment to emerge
- Identify future oriented actors

Challenge: Bring in new forest ranges, e.g., grot, to be able to raise the value of residual products

Discussion around obstacles

- If new ranges are introduced, they may lead to price changes on existing ranges.
- Long-term planning is needed
- The existing forest industry strives for control over the price level of the assortment they currently trade with.
- It can be a challenge for those who want to buy a specific product such as birch bark as the primary producer did not sell the products
- But it's just attached to another item and then ends up with the person who bought the stem.
- The control of raw material flows hinders development as the large cash flows are now in the core business.
- More difficult to find available raw materials as primary producer organizations have their own supply and do not release the products on the market.
- We need strong players who ask for new assortments that, for example, for a new assortment to emerge.

International break-out room

An international break-out room assembled a number of bioeconomy stakeholders not originating from one of the six SCALE-UP regions. Represented regions included Bavaria and Brandenburg in Germany and the Eastern part of the Netherlands. The participants exchanged views on three topics, namely 1) the availability of regional biomass resources, 2) potentials and limitations of “biohubs”, and 3) the relevance of multi-actor partnerships.

As for the **regional context and the availability of biomass**, it was stated that in the case of the Bioenergy Cluster Eastern Netherlands, there is a discrepancy between the quality of the available biomass on the one hand, and application potentials on the other hand. Also, the seasonality of the biomass supply is a challenging issue; large-scale biomass production/conversion facilities need a large and constant supply of biomass, originating from the entire region (economies of scale). Looking at the situation in Bavaria, it was pointed out that biomass side streams are often handled in an “informal” way, which means that potential buyers and sellers often don’t get together – a matchmaker / platform that could fulfill this function is currently missing. However, two companies maintain private “resource databases”, which they use to buy and sell biomass in the regions.

In this context, the **concept of a biohub** was regarded promising, as it could help to bring biomass providers and potential users together and to enhance the flow of information among relevant actors. Ideally, a public authority would support or oversee setting up and steering such a regional biohub. The case of the Bioenergy Cluster Eastern Netherlands could serve as a good practice example in this context. With a view on the Brandenburg area in Germany, it was held that local (waste) disposal contractors could be relevant actors for setting up regional biohubs.

Regarding **regional multi-actor partnerships**, their importance with regard to the establishment of a flourishing bio-based sector was recognized by all participants. As shown by the example of the

Bioenergy Cluster Eastern Netherlands, a regional government deciding to promote a certain development (e.g. renewable energies) may prove as an efficient facilitator that succeeds in bringing relevant actors (industry, academia) to the table. While some of the companies that engage in such a multi-actor partnership might be competitors, the benefits of working together seem to outweigh the risks of sharing (potentially) sensitive information.

Cross-regional conclusions/learnings

Discussions in the breakout rooms underlined the need to develop and improve solutions for effective biomass logistics. High dependency on the main products was considered problematic. As purchasing power often is low, more ways to create added value in the biomass streams should be included. Seasonality of biomass was highlighted as a main barrier and the lack of storage facilities. Bio Hubs were suggested as an attractive solution. Better information between stakeholders along the whole value chain can contribute to better understanding of the challenges each stakeholder is facing. More involvement of primary producers was suggested. Improved multi-actor partnerships to develop long-term planning of biomass mobilization and logistics was suggested. Some regions considered legislation on a regional, national and EU level as a barrier for biomass mobilisation and suggested improved dialogue with policy makers. Overall, the session has contributed to awareness raising among stakeholders and inspired for more multi actor actions to tackle and overcome barriers along the whole value chain.

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, 17 participants responded to the survey, of which 3 participants were from Spain, 1 from North Macedonia, 2 from Austria/Germany, 5 from Poland, 4 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 17 participants, 12 gave the quality of the session a 4 (excellent), while the remaining 5 participants responded with a 3.



Figure 1, Participants' rating quality training session 1

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 during the breakout session.

Next, the participants were asked what could have gone better. Here, the use of other (non-wood) examples was mentioned, as well as the need for more time during the breakout session and to have had an exchange of contacts. Additionally, the participants mentioned that the PowerPoints could have been presented separately by the presenters, and that an interactive bulletin board would have

been helpful in the breakout session. Also, one of the participants (Sweden) mentioned that the real-time translation was not working great.

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 17 participants, 14 gave this a score of 4 (easily), and the other three participants a score of 3.

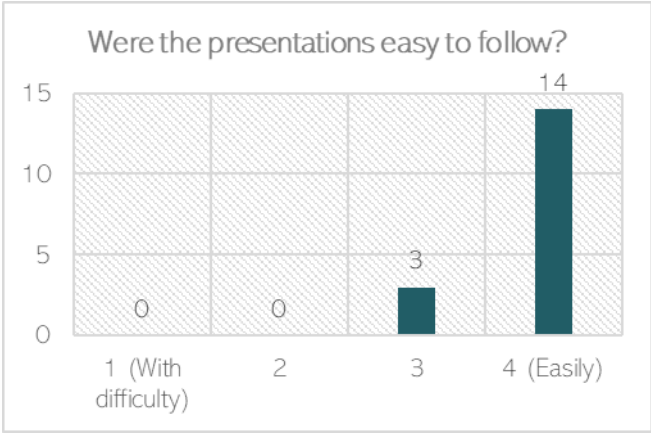


Figure 2, Participants' rating difficulty following presentation

In the next question, the participants were asked which topics they found most interesting. To this, multiple participants mentioned that they really liked the discussions in the breakout rooms and Magnus' presentation. More specifically on the topics of technical solutions, logistics, the Swedish experience, biohubs, collection and logistics of residues, organizing and systemizing knowledge, and improving logistical issues in the field.

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 most participants worked in research (6 out of the 17), followed by agriculture (5), and forestry (3). Additionally, a person from construction, public administration and the structuring of sectors joined.

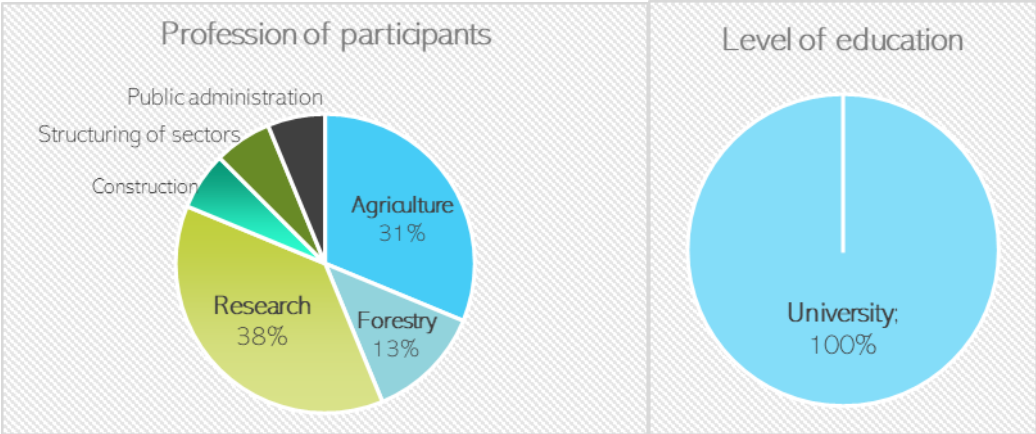


Figure 3, Participants' field of profession and level of education

Participants:

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

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