SCALE UP
community-driven
bioeconomy development

WS1 Training Programme Protocol

Proceedings of the training sessions in WS1: Improved Nutrient Recycling in the Bioeconomy

Session #1
12 March 2024

INTRODUCTION AND MAIN RECYCLING ROUTES: COMPOSTING AND DIGESTION

The first training session from the Workstream 1 "Improved Nutrient Recycling in the Bioeconomy" took place on March 12th, 2024, from 9:30 am to 12:00 pm CET. It focused on the significance of composting and digestion as primary recycling routes. Presenters included Dr. Stefanie Siebert from the European Compost Network, who discussed the importance of biowaste for the Bioeconomy and EU policy initiatives. She also highlighted the use of composting and digestate in the EU agricultural sector, addressing product regulation and market perspectives. Prof. Tomasz Skalski from Ambioteco presented on smart innovations in composting, showcasing advancements in the field. The session concluded with breakout discussions led by regional facilitators, followed by feedback and conclusions on key outcomes and challenges in the composting and digestion.

BREAK-OUT ROOMS

1. Composting and digestion play an important role in the recycling of nutrients. What is your experience with these two recycling routes?

INTERNATIONAL

All participants had a strong connection with composting. One had worked himself in a composting firm and was now using his expertise in the anaerobic digestion sector. Two are fully employed by a biowaste composting firm. Another, also from the Dutch BEON-platform, is providing air cleaning systems for composting plants.

SPAIN

José Luis García, a speaker at the Andalusian regional session and a PhD graduate from the University of Cadiz, discussed his experience using organic by-products from table olive processing for composting and as fertilizer, resulting in sustainable olive farming.

He also highlighted his experience with anaerobic co-digestion using Alperujo and bovine manure, indicating the reaction and the resulting methane production. The process of Anaerobic Co-Digestion results in the production of Biomethane and Digestate, which leads to the stabilization and reduction of biodegradable organic matter. Additionally, Biogas is produced, allowing for self-sufficiency energy, and Digestate is obtained with improved agronomic properties.

During the presentation, another speaker shared their experience using effluents and olive residues to produce high-quality agricultural fertilizer. The field phase of this project involves:

- Gathering phase, where the compost pile is assembled.

- Digestion phase, which is the development of the composting process;
- Maturation phase, where the composted material is separated into two fractions: maturation and refinement.
- Testing phase with organic effluent compost.

NORTH MACEDONIA

Composting and anaerobic digestion are acknowledged as vital processes for nutrient recycling, but they encounter challenges. Companies in various regions, such as Strumica, Skopje, and Kavadarci, are engaged in developing compost using different methods. However, issues regarding quality, as observed in Strumica due to poor fabrication, highlight the necessity for improved infrastructure. While promise is shown by national-level anaerobic digestion projects for electricity production, implementation at the municipal level, particularly in Strumica, is found to be lagging behind. Overall, there is a recognized need for better coordination and investment to maximize the benefits of these recycling routes for sustainable nutrient management.

POLAND

In the Mazovia region, where apple orchards are common, it is possible to see the positive impact of composting and digestion on nutrient recycling. Composting has been proven to be an effective way of managing orchard waste and creating soil amendments rich in nutrients, enhancing the health of the apple trees. Moreover, digestion processes have been valuable in converting organic residues into biogas, providing a sustainable energy source for our agricultural practices. Both methods have reduced waste and have promoted a circular economy in the Mazovia region.

However, one of the issues with biogas plants is that they tend to produce strong odours, which can be quite bothersome for the local population. Therefore, it is necessary to find solutions to eliminate the smell.

SWEDEN

Together with partners in Finland we have taken on the challenge of developing composting in a cold climate. We have tested a method to optimize the composting processes. The composting process has been made more efficient in such a way that the temperature measurement usually goes much faster when measuring with the online temperature device than measuring the temperature by hand. By being able to follow temperature drops and rises, among other things, the mixture of materials has been able to be adjusted to reach optimal temperatures.

2. What did you learn from the presentations and what do you see as the best options to promote composting and digestion in your region or country?

INTERNATIONAL

All were stressing the needs for proper regulations – and enforcement by the authorities - to ensure biowaste is treated properly, compost products reach quality, enjoy user confidence, and

find their way to the agricultural market. Finances remain difficult. Gate tariffs are under pressure and although compost prices have increased, this does not fully compensate the higher processing costs. The sector does expect some increase in sales volumes, but not much.

SPAIN

The most effective methods for promoting composting and digestion in the Andalusian region are:

- Collaboration between olive mills to enhance profitability and viability of operations.
- Enhancement of composting techniques to enable the return of nutrients to the soil.
- To view it as a new income formula and therefore continue composting agricultural waste.

NORTH MACEDONIA

The presentations highlighted valuable practices and advice that participants found promising for their own regions. Replicating successful models and advancing composting and digestion locally emerged as key points. Promoting awareness through educational programs, fostering partnerships among stakeholders, and offering incentives like subsidies can accelerate progress in these sustainable practices.

POLAND

The presentations provided valuable insights into the importance of biowaste and intelligent innovations in composting and digestion. Collaboration is crucial to promoting these practices in the Mazovia region. Some ideas mentioned by the participants include conducting odour reduction benchmark studies, measuring odour intensity during composting, and exploring what happens to odour when composting/digestion is not performed under controlled process conditions, and discarded organic waste decomposes in an uncontrolled manner. Educational programs could be established for local farmers in the region, sharing success stories and providing incentives for adopting composting and digestion methods. It is also important to engage local communities, along with local authorities in aligning policies with EU initiatives to create a supportive environment for sustainable nutrient recycling in Mazovia and Poland. Also state level financial support for local district heating networks, using heat from CHP units in anaerobic digestion plants should be taken into consideration, as real benefits for local communities (cheap heat) could provide additional support, necessary for public acceptance.

SWEDEN

It is important to be aware of EU directives to drive the development in our region.

3. Recycling of nutrients requires the cooperation of many players. The recycling chain is important. What could the role of the regional platforms? How can they stimulate composting or digestion of bio residues?

INTERNATIONAL

General recommendation is that platforms keep exchanging information on composting and promote the value of the products to the market.

SPAIN

Firstly, a legislative framework must be established to ensure the cost-effective implementation of composting and digestion. To achieve this, cooperation is needed to identify the needs and barriers different actors face when implementing composting or digestion. Once the regulatory framework is established, financial or technical support is required to ensure the success of the supply chain.

NORTH MACEDONIA

Regional platforms play a crucial role in coordinating efforts for nutrient recycling. They can stimulate composting and digestion of residues through targeted initiatives. In educational programs and workshops, farmers learn about the benefits of composting and digestion. They gain insights into techniques and best practices, motivating them to adopt these methods. Moreover, regional platforms work to improve access to composting machines and tools. Through rental programs or subsidies, farmers can afford essential equipment, facilitating their engagement in composting. By spearheading these efforts, regional platforms effectively promote nutrient recycling, fostering sustainability in agricultural practices.

POLAND

Encouraging cooperation between stakeholders in the Mazovia region can be facilitated by regional platforms. Some ideas that were discussed during the breakout session include:

I. **Educational workshops and training programs** can be organized by regional platforms to educate farmers, waste management professionals, and local communities about the advantages of composting and digestion. These sessions can cover the technical aspects of the processes, the environmental benefits, and the economic advantages. By providing hands-on training and sharing success stories, these platforms can motivate individuals to adopt these practices.

II. **Policy advocacy and incentives** are crucial for promoting sustainable waste management practices such as composting and digestion initiatives. Regional platforms can play an active role in engaging policymakers to develop regulations and incentives that support such initiatives. These policies may include promoting the use of compost in agriculture, offering tax incentives to businesses that adopt sustainable waste management practices, or providing subsidies for equipment related to composting and

digestion. By influencing policy at the regional level, these platforms can help create a more favourable environment for sustainable waste management practices.

III. **Collaborative research and innovation initiatives** focused on composting and digestion technologies can be facilitated through regional platforms. This can be achieved by bringing together researchers, businesses, and agricultural experts to develop new and improved methods for bio-residue management. In addition, these platforms can support pilot projects and demonstrations to showcase the viability and effectiveness of these technologies. This collaborative approach can help build confidence in composting and digestion practices, and encourage their widespread adoption in the region.

SWEDEN

We will share the valuable information from this session with our partners in Sweden, Finland and Norway.

Cross-regional conclusions/learnings

The recommendation from the regions vary to some extend, but the main conclusions that concern all are:

- **Importance of Collaboration:** Across all regions, collaboration emerged as vital for the success of composting and digestion initiatives. Collaborative efforts between stakeholders, including farmers, waste management professionals, and regional platforms, are essential for promoting these practices effectively.
- **Need for Regulatory Frameworks**: Establishing legislative frameworks is crucial to ensure the cost-effective implementation of composting and digestion. Regulations help identify needs and barriers faced by different actors and provide support for the entire supply chain.
- **Educational Programs and Awareness**: Educational programs and workshops play a significant role in promoting composting and digestion practices. These initiatives not only educate stakeholders about the technical aspects but also highlight the environmental and economic benefits, motivating adoption.
- **Regional Platforms as Catalysts:** Regional platforms serve as catalysts for coordinating efforts, providing access to resources, and advocating for policy changes. They play a crucial role in facilitating cooperation between stakeholders, fostering sustainability in agricultural practices.
- **Innovation and Research**: Collaborative research and innovation initiatives are essential for developing new and improved composting and digestion technologies. By supporting pilot projects and demonstrations, regional platforms can build confidence in these practices and encourage their widespread adoption.

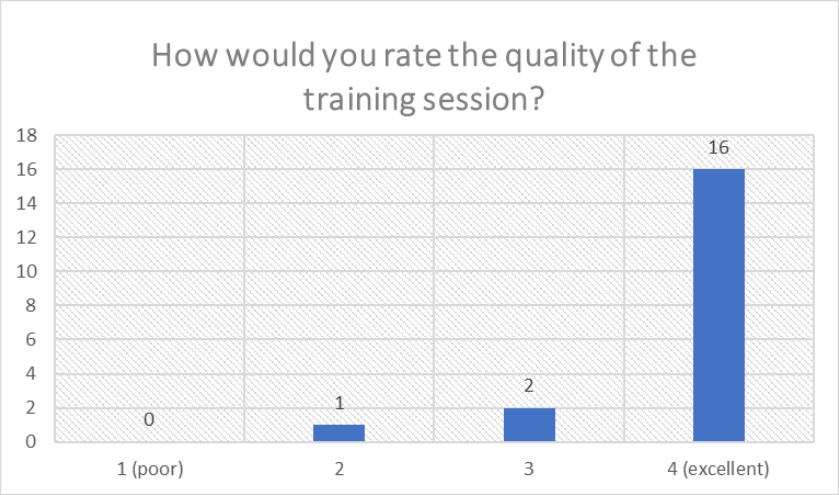
Overall, the exchange of information and best practices among regions emphasizes the importance of a coordinated approach, regulatory support, and continuous innovation in promoting sustainable nutrient recycling through composting and digestion.

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, 19 participants responded to the survey, of which 6 from Spain, 5 from Poland, 5 from Macedonia and one from Austria. Additionally, 2 participants from the Netherlands answered the English survey. This gave the following results:

1.1 Quality

The participants were asked to rate the quality of the training session on a scale from 1 (poor) to 4 (excellent). 16 out of 19 participants answered this question with a 4, meaning they found the training session to be of excellent quality. 2 participants answered this question with a 3; and 1 participant with a score of 2.

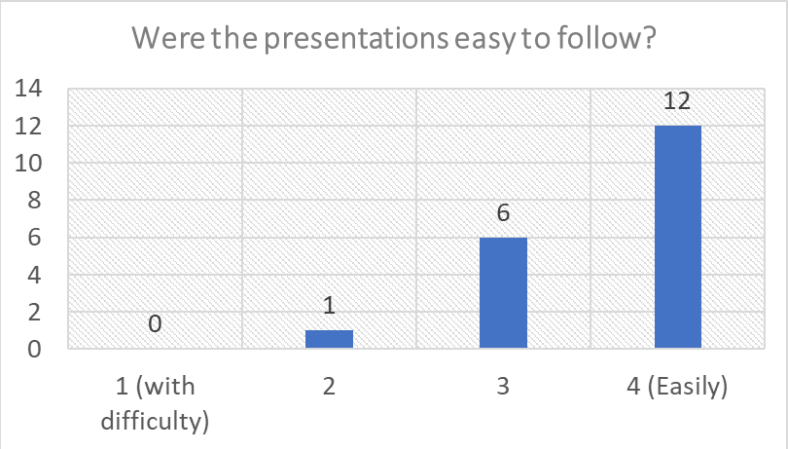


The participants were then asked what went well during the session. The participants answered that they liked the presentations and the contents, the selection of speakers, the breakout rooms, the large international crowd and the organization. One participant mentioned that the translation worked well.

Next, the participants were asked what could have gone better. The internet connection of the first speaker was mentioned, as well as the quality of sound. The time management of the session was also mentioned, as the first presentation could have been a bit shorter/more concise, the participants would have liked more time for the breakout sessions and for the second speaker. One participant mentioned that the speakers could have talked a bit slower. Finally, the answer to the post-treatment of digestate question was mentioned.

1.2 Understandability

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 19 responses, 12 were a score of 4 (easily), 6 people gave it a score of 3 and 1 person a score of 2.



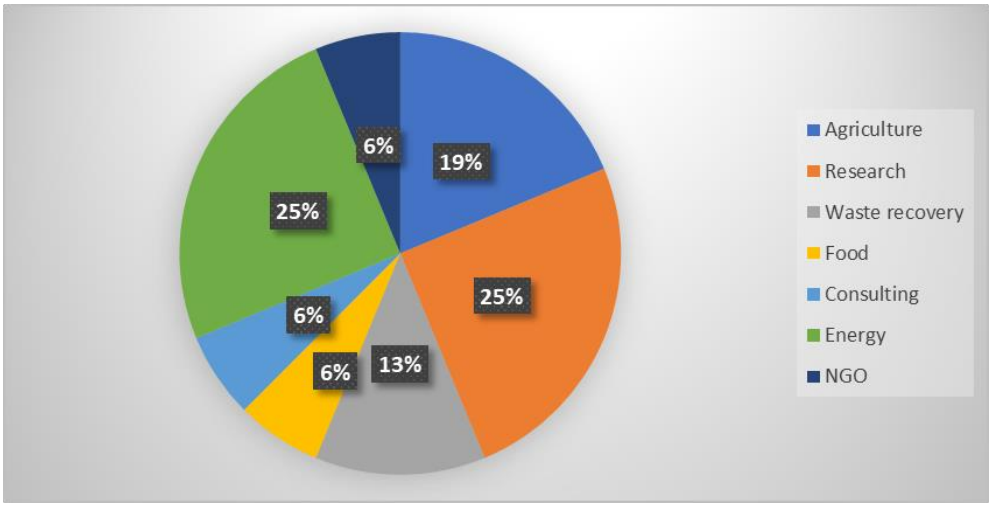
1.3 Topics

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

- Hurdles to be able to (re)use nutrients
- EU policy
- Composting (issues)
- Smart innovations in composting
- Presentation ECN
- Classification of different agronomic products
- Carbon content in the soil

1.4 Field of occupation

The survey concluded with an optional question regarding the participant's field of occupation. The participants came from different areas; 4 from research, 4 from energy, 3 from agriculture, 2 from waste recovery, and one from food, consulting, and an NGO.



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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