

Design of bio-industrial symbiosis with green bio-masses - Latvia

This brief is a part of the Blue Green Bio Lab Tool Kit, that represents the findings in the Blue Green Bio Lab project. The project targets the urgent challenges of reducing nutrients to waters of the Baltic Sea Region, limiting greenhouse gas emissions, and enhancing European self-supply with food, feed, and energy. Together, aquaculture, agriculture and industry can provide solutions to these challenges through industrial symbiosis based on the sustainable exploitation of local blue and green biomasses initially grown and/or harvested with the objective to produce positive ecosystem services. The Blue Green Bio Lab project is co-financed by Inter-Reg Baltic Sea Region with partners in Denmark, Latvia, and Sweden.

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This brief contains the findings from the Latvian workshop on designing of bio-industrial symbioses on green biomasses as part of the Blue Green Bio Lab Project. The purpose of the workshop was to identify challenges and barriers and how to move forward. The workshop was held by Zemgale Planning Region and Latvian Institute of Aquatic Ecology in April 2023.

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Resumé

The seminar of representatives of interested institutions organized by the Latvian partners of the project- Zemgale Planning Region (ZPR) was held on April 27, 2023 in Jelgava with 21 participants representing local municipalities, academics, farmers, small and medium enterprises and non-governmental organizations.

It was decided to follow the general design proposed by the project. The Zemgale region in Latvia is

well known as an agricultural and energy development area. Cereals are the main agro crops grown here, forestry and timber industry are also developed. The region does not have direct access to external waters, that is, an outlet to the Baltic Sea or the Gulf of Riga, which determines that the use of marine plant or animal biomass cannot be counted on. In the Zemgale region, there are quite a lot of lowlands, wetlands, meadows and inland waters, where there is a good potential for grass or reeds extraction, further processing and energy producing. At the time however, these potentials are not developed.

Before the seminar, the region's situation in the field of extraction, processing and use of green biomasses was identified. In this process a wide range of representatives were involved - from scientists and regional development planners to local government specialists and rural entrepreneurs. As an introduction, the types of biomasses included in the biomass briefs were presented and the options to include those into bio-industrial symbioses.

The workshop began with a speech by the executive director of Zemgale Planning Region. Afterward followed the presentation by project partner Latvian Institute of Aquatic Ecology on several possible biomass types for creation of bio-industrial symbioses. Later the floor was given to two enterprises. The first was "Mežacīruļi"

drawing the experience on biomass extraction and use for energy production purposes as well as “EGG ENERGY” on energy processing for energy production. The presentation was by the professor of Latvia University of Life Sciences and Technologies and focused on the opportunities on biomass processing and use from industrial hemp and oriental galega.

During the group discussion part of the seminar, participants talked about possible bio-industrial collaborations in the Zemgale region, about existing and necessary production facilities, biomass processing capacities, various possibilities of additional use of wild and cultivated plants, as well as the flow of resources in our region. Furthermore, a SWOT analysis was carried out regarding business cooperation potential and determined the priority of challenges and their solutions.

Thus, the workshop was the first step for participants’ understanding of the seriousness of the issue. It was also an encouragement to the project team to continue communicating about the involvement of various players in the Zemgale region and the creation of a mutual basis for bio-industrial symbiosis.

Mapping of the bio-industrial symbioses

It was not possible to map any bio-industrial symbioses due to missing value chains in Zemgale region. The tendency for biomass use in the region expressed by participants was mostly towards energy (biogas) production, as experience exists in the region. The following section therefore tackles some of the issues related to energy production.

(See also the 3D model diagram at the end of this brief.)

Choice of biomass

All groups choose to focus on green biomass types with the emphasis on extraction and pro-

cessing. The groups had different approaches and considerations, but the following topics were discussed:

- Nature restoration
- Production/cultivation
- New products
- New market opportunities

Nature restoration

Residues from agricultural crops, grasslands, bushes have great volumes of green biomass in the Zemgale region. The gathering of green biomasses frequently is considered a great way to clear the agricultural areas from the residues and also fight invasive alien plant species, one of the main reasons for soil degradation and reduction of biodiversity nowadays. By regular grass cutting there is no option for the seeds of invasive plant species to ripen and spread the plant further.

Production / Cultivation

Specific production of green biomass is still in question. Zemgale is a region of extensive agricultural production, so there is more likely an option to use the leftovers from the crops, vegetables and other agricultural production as well as timber. The biomass from grasslands is used for the livestock mostly, but part of that could be used also for energy production.

New products

During the workshop some participants discussed the usage of straw, reeds and hemp in the production of construction materials. Hemp also has an option to be used in the production of the food products, such as oil, seed mix and butter. Still, all new options and products have a theoretical potential at this point, given the lack of established value chains.

Marketing opportunities

The idea of bio-industrial symbiosis is quite new in the region, and it was obvious that it is a topic that should be communicated more extensively and explained more between the stakeholders.

Strengths

During the groups' presentation of their work, they discuss the strengths of their chosen symbiosis. Many of these strengths have been mentioned above in the review of symbiosis possibilities. In general, these ideas about circular bio-industrial symbiosis are considered to have a great potential in building cooperative networks and value chain creation. Less evaluated but still relevant were the opportunities in new financing programs, regarding development logistics and development of the new technologies.

Barriers

Most barriers for green biomass use for energy production purposes involve the provision of certain volumes of gathered biomass that could be delivered to the energy producers. Businesses are willing to receive regular supplies of biomass. To some extent that is possible, but considering the seasonal changes and the biomass destinations the situation may be different and unpredictable. The stakeholders pointed out the threats starting from the uncoordinated actions in the energy sector, current political situation and existing unpredictable situation in energy and economics sectors.

Addressing barriers with potential for greatest positive impact

There is a need for wider awareness of the many ideas for biomass usage (beyond only energy) and a greater linkage with the improvement of ecological quality and climate impact through the development of circular bio-industrial symbiosis.

Prioritization of Efforts

The workshop concluded with a prioritization of the barriers that need to be addressed to have the greatest positive impact. This prioritization, referred to as a "temperature measurement" in the workshop, involves equipping all participants with two stickers that they could place on notes

containing different challenges. The stickers were then counted once everyone has placed them.

The temperature measurement revealed that the most important barriers/obstacles to be addressed, in prioritized order, are as follows – with the top two being clear "winners":

- How do we communicate across different sectors?
- Lack of communication and involvement among stakeholders
- Where and which activities should be chosen (to intervene effectively)?

Other barriers and obstacles mentioned in groups' presentations include:

- Communication.

Next steps

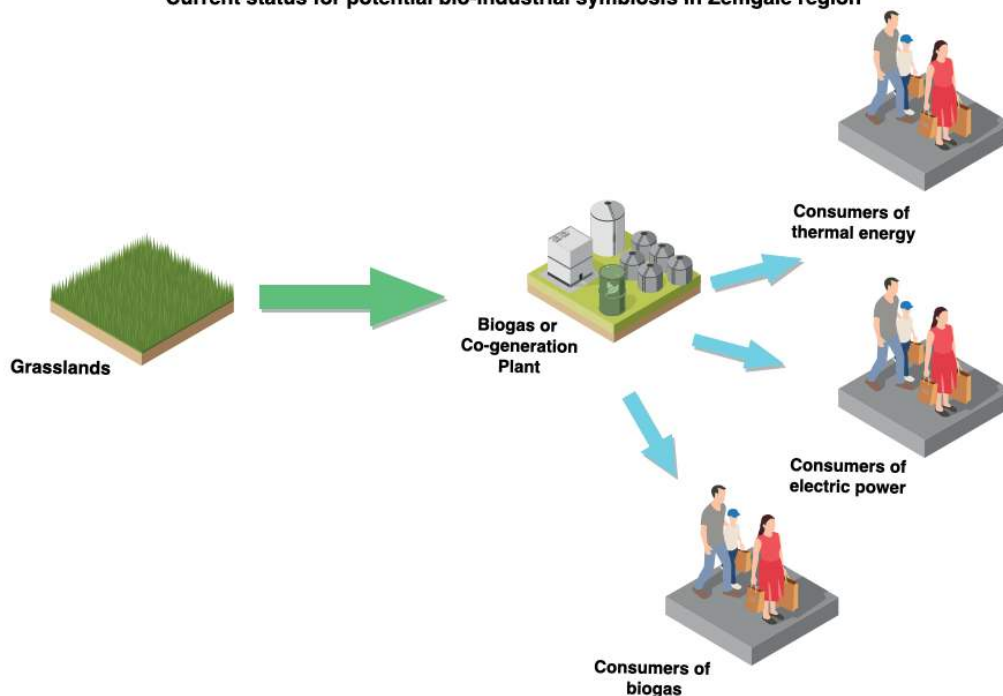
The groups of participants had the opportunity to share their suggestions on how we best can move forward in creating future bio-industrial symbiosis in the biomass sector. The proposed suggestions are as follows:

- The need for awareness campaigns on the use of biomass in energy production;
- Developing a master plan that ensures a political framework, a democratic process, the ability to seek funding for the value chains of biomass harvesting, logistics and use in the energy creation.

Reflections / learning

- it was a good opportunity to hear the views of the participant and to be able to see the strengths and the weaknesses of the current situation from their point of view.
- In the areas of the river protection line it is not allowed to gather the reeds.

Current status for potential bio-industrial symbiosis in Zemgale region



RESOURCES

In Zemgale there is a possibility to use existing resources of biomass as initial feedstock for bioindustrial purposes, grass is considered as most promising. For successful implementation of this approach, a cooperation between municipalities, state and private property owners is needed. Also, the availability and abundance of respective type of resource should be assessed before initiating further use.

USE OF RESOURCES

The most possible current possibility for use of biomass is feedstock for biogas and/or co-generation plant. This option is in line with Energy Action Plan 2018-2025 of Zemgale Planning region. Action Plan also foresees locations of energy facilities to have appropriate regional coverage.

END USERS

Type and distribution of the produced energy will be decided by direct involvement of local inhabitants, mostly via community councils. Community council is a non-governmental body directly representing interests and concerns of local citizens.

Diagram of possibilities for bio-industrial symbiosis based on knowledge developed in the Blue Green Bio Lab workshop in Zemgale Planning Region, Latvia.

Project facts

The Blue-Green Biolab project is co-financed by Interreg Baltic Sea Region.

Total budget: 499,399.60 Euro.

Project period: October 2022 - March 2024.

Homepage: <https://interreg-baltic.eu/project/blue-green-bio-lab/>

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