DECEMBER 2021 | ISSUE NO. 6

BALTICBIOMASS4VALUE

6th Newsletter of the BalticBiomass4Value Project

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PROJECT NEWS & ACTIVITIES

WELCOME TO THE 6TH BALTICBIOMASS4 VALUE NEWSLETTER

Dear Readers,

welcome to the sixth and final BalticBiomass4Value Project Newsletter. BalticBiomass4Value is a project implemented under the framework of the Interreg Baltic Sea Region Programme, financed by the European Regional Development Fund (ERDF), the European Neighbourhood Instrument (ENI) and Norwegian national funding.

This newsletter presents the project activities and achievements of the last couple of months. As this is the final issue, the overall project outcomes will be summarised.

We hope you have enjoyed reading our newsletter! We wish you a happy holiday season and a fantastic start to 2022. Please stay in touch by visiting our project website.

On behalf of the BalticBiomass4Value project,
Lena Huck
(Communication Manager, Agency for Renewable Resources - FNR)

Presenting the BalticBiomass4Value Interactive Online Portal

The BalticBiomass4Value is proud to announce the release of a new Interactive Online Portal (e-tool).

In essence, the Interactive Online Portal is a database providing collected and processed bioeconomy data relevant for public authorities and business enterprises in the Baltic Sea Region. Information that was collected during the project (good practice examples, statistical indicators and special calculators) is made available in an accessible way. The aim of the portal is to improve knowledge and technology transfer services in eight countries (Germany, Poland, Sweden, Lithuania, Estonia, Latvia, Russia and Norway) and disseminate the project outputs.

Features of the Interactive Online Portal:

- Catalogue of good practice bioeconomy business models
- Database of statistical indicators, including several calculators for biological waste potential and bioenergy demand modelling
- Business planning tool
- Catalogue of measures to promote the circular bioeconomy at the local and regional level

The Interactive Online Portal can be found on the BalticBiomass4Value website (https://balticbiomass4value.eu/e-tools/) and is available in English, German, Swedish, Norwegian, Polish, Latvian, Estonian, Lithuanian and Russian.

We have prepared a presentation explaining all the relevant features of the Interactive Online Portal.

The new BalticBiomass4Value homepage

Transnational Hybrid Conference

On 20-21 October, the BalticBiomass4Value project held its Transnational Hybrid Conference. The physical and virtual conference was hosted by the University of Warmia and Mazury in Olsztyn.

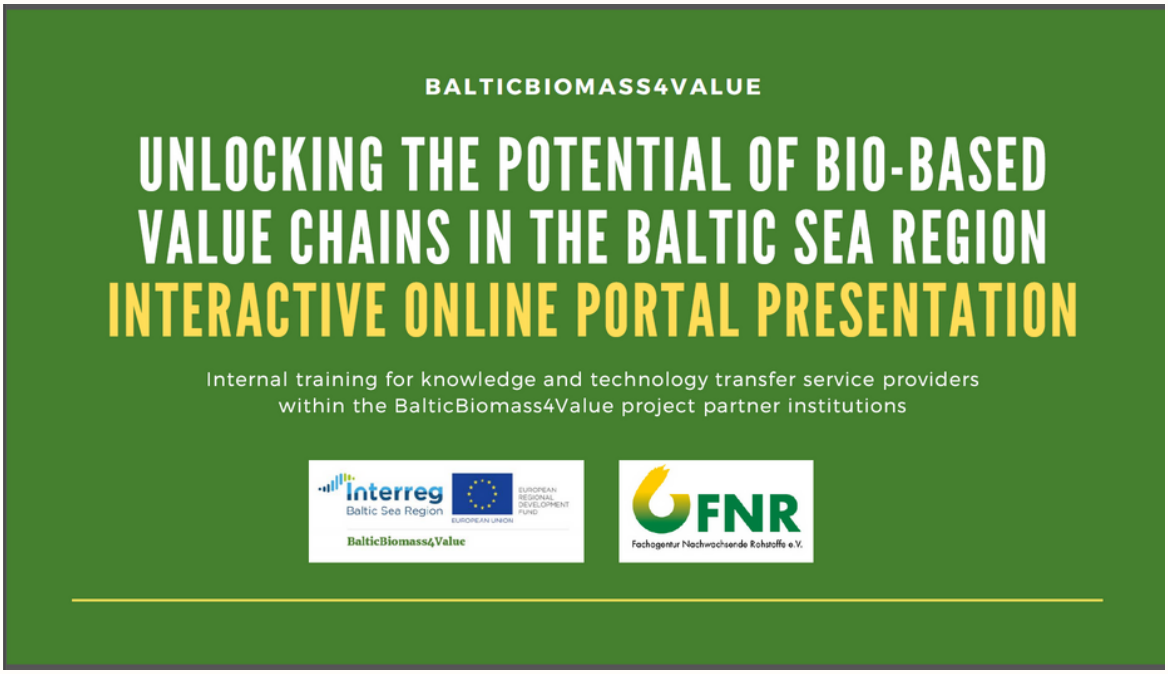
The conference was divided into three sessions: (1) identifying and assessing market opportunities, biomass potential, technologies and business models for circular bioeconomy development; (2) preparing guidelines for circular bioeconomy development support at local level and promoting them among public authorities and (3) improving circular bioeconomy innovation support services and initiating pilot business projects.

You can read the full event summary here.

Internal Trainings for Knowledge and Technology Transfer Service Providers

On 20 October 2021, as a side session of the Transnational Hybrid Conference, the Agency for Renewable Resources (FNR) held an internal training aimed at knowledge and technology transfer service providers. During the training the demo version of the BalticBiomass4Value Interactive Online Portal was presented. Participants had the opportunity to gain insights into the Interactive Online Portal and discuss the relevance of e-tools for knowledge and technology transfer. All the different functions of the Interactive Online Portal were outlined and participants shared their experiences, as well as providing feedback on how the e-tool could be improved.

Additional to the combined training hosted by FNR, the project partners presented the Interactive Online Portal at their institutions. Thereby, the competences of existing knowledge and technology transfer service providers were improved and circular bioeconomy innovations in the Baltic Sea Region were promoted.



Experience Exchange and Networking Event

On 9-10 November 2021, the BalticBiomass4Value project held the Experience Exchange and Networking Event "Perspectives and Challenges of Local Authorities and Municipal Waste Management Enterprises for Bio-Waste Management". The event was hosted by Vidzeme Planning Region, Halmstad University and 3N Kompetenzzentrum e.V.. Mr. Frans Debets, an expert in urban environment and climate issues moderated the event.

The first day of the event aimed at municipal and state-owned companies relevant to the value chain of bio-waste management. Experts of different fields gave presentations, covering various aspects of bio-waste management. Prof. Dr. Daniel Pleissner, Leuphana University of Lüneburg-Institute of Sustainable and Environmental Chemistry (Germany), discussed future perspectives and challenges of bio-waste management, followed by his presentation on innovative bio-waste management and utilisation technologies. Dr. Miguel Angel Suarez Valdes, Project manager at HOOP Project, CETENMA (Spain), gave an overview of the HOOP Project, which supports cities and regions in developing large-scale urban circular bioeconomy initiatives, with a focus on urban bio-waste effective management. Mr. Hans-Peter Erhar, Sales manager at BEKON GmbH (Germany), presented technologies and practices used for biogas production and composting of bio-waste from households.

The event's second day aimed at local, regional, and national authorities and administrations interested in bio-waste management. Prof. Marie Mattson, Rydberg Laboratory for Applied Sciences, Halmstad University (Sweden), illustrated the relevance of biogas, arguing that it is a good environmental option for treating bio-waste. Dr. Rūta Bendere, Member of the Latvian Waste Management Association board (Latvia), discussed life cycle thinking and assessments for waste management at the municipal and institutional level. Ms. Elvira Laneborg, who is an Ecological sustainability development officer for the City Hall of the municipality of Kalmar (Sweden), provided valuable insights into local strategies and action plans for effective bio-waste management and utilisation.

At the end of each day, participants were introduced to the good practice implementation guidelines for circular bioeconomy development at the municipal and company level developed during the BalticBiomass4Value project. Dr. Aleksejs Nipers, Lead researcher, and Dr. Arnis Lenerts, docent and researcher at Latvia University of Life Sciences and Technologies presented the good practice implementation guidelines. Additionally, Ms. Virginija Kargyte, Project Manager of BalticBiomass4Value, showed the results of the project.

In total 71 participants from eight countries took part in the event, representing municipal enterprises, national, regional and local authorities, universities, and research institutes.

The event was the final large-scale activity organised within the BalticBiomass4Value project, which will end in December 2021.

Unlocking the Potential of Bio-based Value Chains in the Baltic Sea Region

How large can the eco-energy potential of solid biomass be in the smallest administrative units in Poland?

Paweł Dudziec, Mariusz Jerzy Stolarski, Michał Krzyżaniak and Ewelina Olba-Zięty

Department of Genetics, Plant Breeding and Bioresource Engineering, Faculty of Agriculture and Forestry, Centre for Bioeconomy and Renewable Energies, University of Warmia and Mazury in Olsztyn, Plac Łódzki 3,10-724 Olsztyn, Poland. Correspondence: mariusz.stolarski@uwm.edu.pl.

1. Introduction

Solid biomass is the dominant RES in Poland and it accounted for 65.6% of the total in 2019. Solid biomass is the leader in heat generation from RES in Poland (90.1% in 2019), and it also accounted for 25.1% of electricity generation in 2018, with only wind energy having a larger share. Local generation and distribution of energy increases the system reliability and reduces the distribution-related loss, which is the case with the centralisation of energy sources. Therefore, a single region should be regarded as a not-fully-used energy system with respect to the RES resources present in it. Such activities are in line with the concept of sustainable development and circular economy because seeking local and renewable energy sources guarantees their development, which is important in view of the crisis resulting from the exhaustion of conventional energy sources. The territory of Poland is divided into regions, with the administrative division being the most common manifestation of regionalisation. Poland is divided into 16 voivodships, 314 districts and 2,477 communes as the smallest administrative units. Considerable parts of rural areas contain potential sources of solid biomass which can play a special role in the local energy system, especially since the average commune size is 12,500 ha. This study aimed to determine the solid biomass resources and the energy potential in one of the Polish communes. This analysis should be used as the basis for changes in the local strategies of regional development, raising social awareness of the potential and local use of RES in rural areas.

2. Materials and methods

The commune of Goworowo covers an area of 21,909 ha in 2020. Administratively, it is part of the Mazowieckie Voivodship and is situated in the north-east of the voivodship, in the southern part of the Ostrołęcki District. The methodological work was started by determining the environmental and natural conditions in the commune with respect to the solid biomass acquisition potential. The materials that were originally accumulated were used to identify the most significant and usable sources within the administrative unit under study. Data were gathered using mainly the official, up-to-date administrative databases. The next stage involved the determination of the solid biomass amount from various sources based on the processed data and its energy potential. The specific local conditions in the commune were considered when the solid biomass resources in it were determined.

3. Results and discussion

The total energy potential of solid biomass resources in the commune of Goworowo amount to 97,672 GJ y^{-1} (Table). The amounts of individual types of solid biomass and their potential varied significantly, which resulted from the local conditions. The solid biomass resources in the commune were equivalent to 4,192 Mg of hard coal (the most commonly used heat source in the commune), assuming its calorific value of 23.3 GJ Mg^{-1} (for eco-pea coal).

This shows that the solid biomass potential in the commune of Goworowo is high. Surplus straw accounted for the greatest part and wood from roadside maintenance accounted for the smallest part of the energy potential in the commune. Our study not included solid biomass residues from wood industry facilities, because there are no such facilities in the commune.

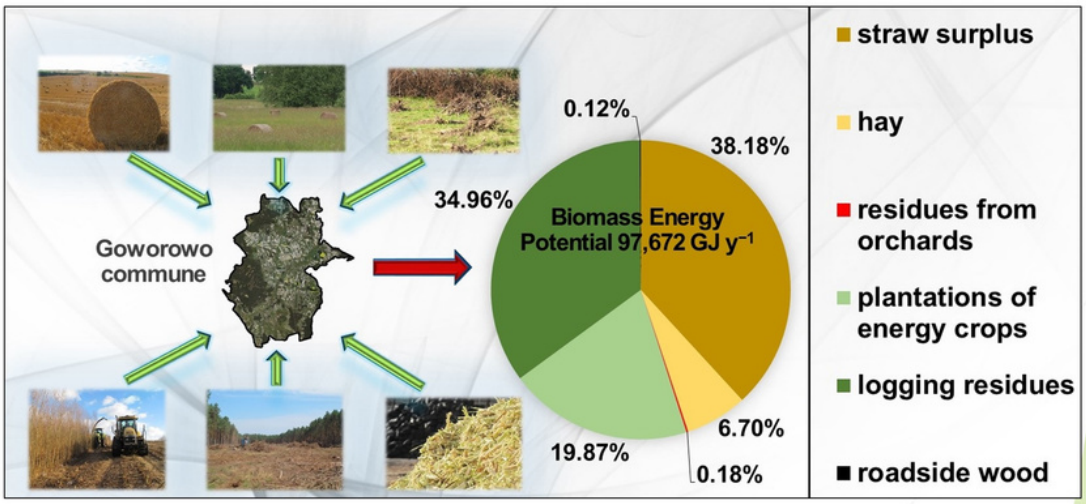
Table. The amount and energy potential of each solid biomass type

Solid biomass	Amount (Mg y^{-1})	Theoretical energy potential (GJ y^{-1})
straw surplus	2,663	37,288
residue from orchards	23	180
hay	475	6,543
plantations of energy crops	1,985	19,404
logging residue	4,553[a]	34,144
roadside wood	14	113
biodegradable waste	709[b]	-
landfilled sludge	10[c, b]	-
Total	-	97,672

[a] m^3 y^{-1},
[b] not taken into account in the determination of the total potential (GJ y^{-1}),
[c] expressed per dry weight.

4. Conclusions

Firstly, the smallest administrative unit in Poland – a rural commune – has solid biomass resources with considerable energy for use which can (and should) be of great importance in satisfying the energy needs, especially as fuel in local boilers and for individual recipients. Secondly, it was demonstrated that by obtaining biomass, the commune could be a place where energy sources are diversified and where links are created between the economy and ecology. Thirdly, research should be continued to determine the technical potential of biomass resources and a connection between local development and the local community welfare. Rural areas, such as the commune of Goworowo, with the agriculture and forestry sector in its area, could soon play a major role in the production and use of solid biomass. Moreover, local communities and fragmented farms, which do not develop on an industrial scale, will be provided with a host of opportunities. Local communities must be given information on the resources in their area and about their value. They must be informed about effective technologies of their use and a cost-effective logistics and management system.



Reference: Stolarski, M.J.; Dudziec, P.; Krzyżaniak, M.; Olba-Zięty, E. Solid Biomass Energy Potential as a Development Opportunity for Rural Communities. Energies 2021, 14, 3398. https://doi.org/10.3390/en14123398

Acknowledgments: We would like to thank the staff of the Goworowo Municipal Office for providing the necessary information for the preparation of manuscript.

Funding: The results presented in this paper were obtained as part of a comprehensive study financed by the University of Warmia and Mazury in Olsztyn, Faculty of Agriculture and Forestry, Department of Genetics, Plant Breeding and Bioresource Engineering (grant No. 30.610.007-110) and has been co-financed by the Interreg Baltic Sea Region Programme 2014–2020 co-funded by the European Regional Development Fund under the project "Unlocking the Potential of Bio-based Value Chains in the Baltic Sea Region" (BalticBiomass4Value-BB4V), No. #R095 and co-financed from the funds of the Ministry of Science and Higher Education under the program "PMW" in the years 2019–2021; No. 5047/INTERREG BSR/2019/2.

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BalticBiomass4Value: Project Outcomes

BalticBiomass4Value is coming to an end

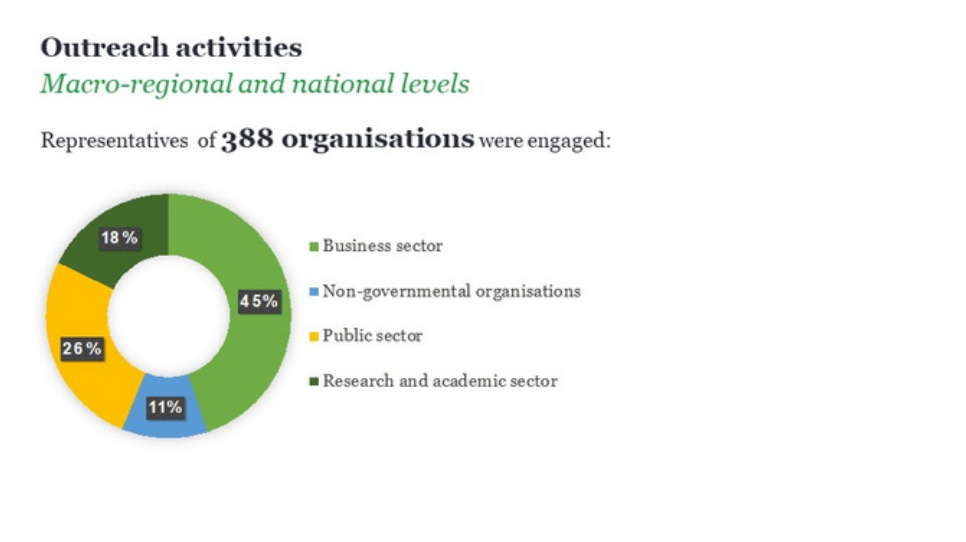
The BalticBiomass4Value project will end on 31 December 2021. The following section provides a detailed summary of all the different activities that were completed during the project.

All the activities are part of specific work packages (WP), with different project partners contributing to each WP. The main project outcomes are listed below.

Main project outcomes:

- Analysis of market outlook and future viability of different bioenergy products and value chains in the Baltic Sea Region energy system (full report available)
- Mapping of biomass value chains for improved sustainable energy use in the Baltic Sea Region (full report available)
- Preparation of good practice business models and example small and medium scale pilot business projects for sustainable bioenergy and side bio-products production in the Baltic Sea Region (full report available)
- Analysis of regional/local support systems for circular bioeconomy development and preparation of good practice implementation guidelines for public authorities (full report available)
- Interactive Online Portal (e-tool)
- Outreach events organised in every project partner country
- Information of the project activities were disseminated and communicated via the BalticBiomass4Value newsletter, Linkedin, Facebook and the project website

You can find the overview of all the project outcomes here.



WP1: Project management and administration

As the Lead Partner, Vytautas Magnus Veritas University (VMU) is responsible for the project coordination. The Agency for Renewable Resources (FNR) is responsible for communication and dissemination.

Project Coordinator
Virginija Kargyte
Vytautas Magnus Veritas University (VMU)
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and

Communication Manager
Lena Huck
Agency for Renewable Resources (FNR)
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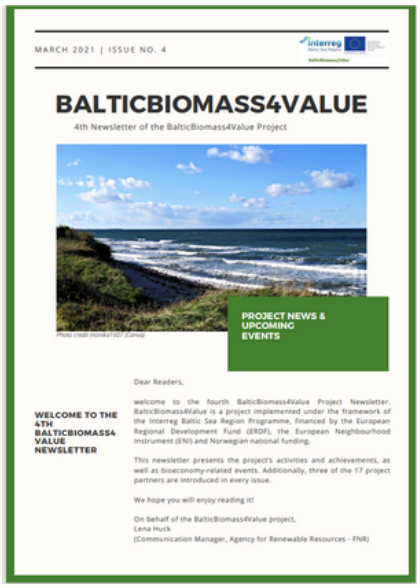
Below you can find a few examples of all the outreach activities:

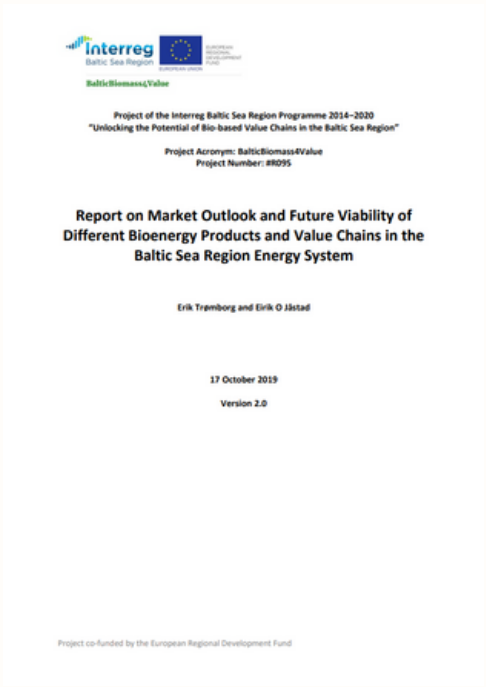
- 6 newsletter have been published (including this issue)
- Linkedin and Facebook was used to disseminate information about events, published reports and other project activities
- A total of 40 articles were published on the BalticBiomass4Value website
- Communication experts met monthly to discuss dissemination and to implement the Communication Strategy of the BalticBiomass4Value project (virtual meetings)

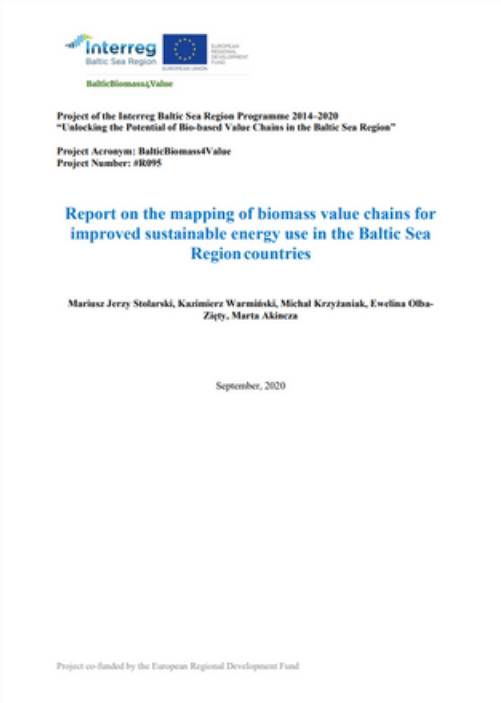


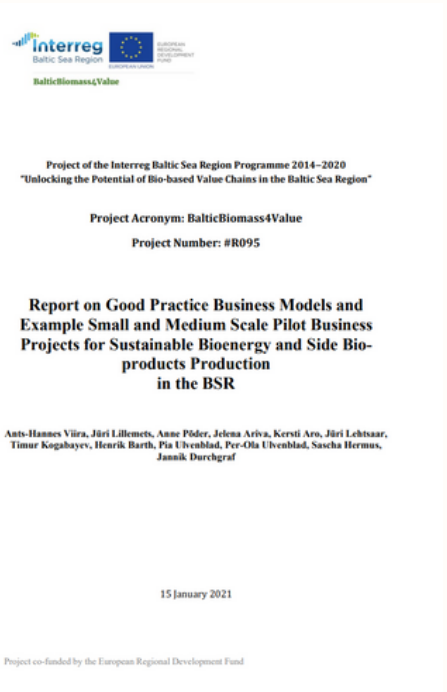
Left image: example of a social media post. Right image: 4th Newsletter

WP2: Identifying and assessing market opportunities, biomass potential, technologies and business models for circular bioeconomy development

As part of WP2, three reports were published. The reports are summarised on the next few pages.







Images 1-3: Reports published as part of WP2

A2.1: Analysis of market outlook and future viability of different bioenergy products and value chains in the Baltic Sea Region energy system

As part of the 2.1 activity, a report (link) on market outlook and future viability of different bioenergy products was produced by Norwegian Institute of Bioeconomy Research (NIBIO).

Activity Leader:
Birger Vennesland
Norwegian Institute of Bioeconomy Research (NIBIO)
birger.vennesland@nibio.no

The report describes the development of bioenergy in the Baltic Sea Region, barriers and drivers for increased bioenergy use and analyses future biomass use. The analysis of biomass use in heat and power plants is based on the energy system model Balmorel that covers the North European power and heat market. To assess the use of biomass in heating and the main opportunities to increase the use of biomass for heating in the Baltic region, a survey among the project partners was carried out. Initiatives for production of advanced biofuels were also mapped in the study.

The share of renewables in the gross final energy consumption has increased steadily in the Baltic region over the last decade. The use of biomass has increased by close to 40%. Solid biofuels constitute 2/3 of the biomass use, but the production of biogas has increased more than 200% and is currently about 15% of the bioenergy consumption in the region.

The use of biomass in the energy sector is expected to increase due to the reduced use of fossil fuels. Increased use of biomass in district heating and biofuels for transport represents important opportunities for growing use of bioenergy in the Baltic Sea Region. The utilisation of biomass and wood chips is increasing with growing carbon prices. Most of the biomass is used if the carbon price is high in 2030, while the lowest amount of biomass is used if the carbon price is low in 2040.

The most dominant biomass used for production of heat and electricity in the Baltic Sea Region is wood chips used for district heating. The level of consumed wood chips is heavily dependent on the carbon price. The usage of biogas increases both with year and carbon price. Pyrolysis oil is only used as a peak load for heat production in 2020. Biogas is increasingly used when the carbon price increases. Initiatives to produce second generation biofuels for transport from lingo-cellulotic feedstock is likely to increase the use of biomass in the transport sector.

Consumption of biomass in the industry sector represents the largest uncertainty in future biomass demand. In the metallurgical industry carbon also represent important opportunities for increased biomass use. Targeted incentives are required to ensure economic sustainability for increased use of biomass in the energy sector in the Baltic Sea Region. Increased costs for emission of carbon from fossil fuels imply increased use of biomass, especially in district heating and represent thus a low hanging fruit for reduced greenhouse gas emissions in many countries. Carbon costs, regulations, incentives and knowledge are needed for increased biomass use in the region. Biofuels for transport will continue to be based on agricultural products the next decade, but establishment of second generation biofuel plants is likely to gradually influence the biofuel market.

A2.2: Mapping of biomass value chains for improved sustainable energy use in the Baltic Sea Region

As part of the 2.2 activity, a report (link) on biomass value chains for sustainable energy use was produced by University of Warmia and Mazury in Olsztyn (UWM).

Activity leader:
Mariusz Jerzy Stolarski
University of Warmia and Mazury in Olsztyn (UWM)
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In the 2.2 report, biomass potential and bioenergy technologies in the Baltic Sea Region countries were defined. It was found that Baltic Sea Region (BSR) countries were characterised by a high share of woodlands and agricultural land. They produced large amount of wood and agricultural biomass, particularly Germany and Poland. BSR countries had a high share of pellets production in the EU. Denmark by far used the largest amounts of pellets for energy production. Germany is the leader among the BSR countries in terms of the amount of bioenergy produced in each sector and it has the largest number of biogas plants and experience in this sector. Estonia has the largest share of biomass in the total of residential heat production. Latvia and Finland have the highest share of biomass in the gross inland energy consumption. Sweden and Lithuania have the highest rates of total biomass in the total derived heat production. Poland ranks second in terms of the number of biogas plants, biofuel installed capacity and primary production and the number of pellet plants. Norway has the largest share of renewable waste in gross electricity generation from biomass.

Additional to the report, two articles were published in international journals with an impact factor:

1.Stolarski M.J., Warmiński K., Krzyżaniak M., Olba–Zięty E., Akincza M. 2020. Bioenergy technologies and biomass potential vary in northern European countries. Renewable and Sustainable Energy Reviews, 133, 110238, https://doi.org/10.1016/j.rser.2020.110238 (IF: 12.110).

2.Stolarski M.J., Dudziec P., Krzyżaniak M., Olba-Zięty E. 2021. Solid biomass energy potential as a development opportunity for rural communities. Energies, 14, 3398. https://doi.org/10.3390/en14123398. (IF: 3.004).

A2.3: Preparation of good practice business models and example small and medium scale pilot business projects for sustainable bioenergy and side bio-products production in the Baltic Sea Region

As part of the 2.3 activity, a report (link) on good practice business models was produced by Estonian University of Life Sciences (EMU).

Activity leader:
Ants-Hannes Viira
Estonian University of Life Sciences (EMU)
Ants-Hannes.Viira@emu.ee

Collecting 59 cases of real-life enterprises enabled the Estonian University of Life Sciences (EMU) to develop 12 clusters of bioeconomy enterprises and describe their underlying business models. The 20 business case narratives help to understand the motivation of the entrepreneurs, as well as enabling factors and barriers in developing business in the bioeconomy. We learned that the businesses and business models in the bioeconomy are very diverse, require high entrepreneurial abilities and also collaboration with biomass producers, local communities and authorities, research and development organisations and other businesses in the international value chains. Each of the business models has the potential to open up new ideas and discussions among the entrepreneurs, regional organisations and at the governmental level. All these finding were presented in the 2.3 report.

In cooperation with the Estonian Chamber of Agriculture and Commerce, Estonian Ministry of Rural Affairs, and Estonian University of Life Sciences a seminar on biogas production in agriculture was organised in early 2020. The BalticBiomass4Value project helped to raise interest and awareness in this topic, which was follow-up in various discussions and seminars. The project allowed us to better understand the interests of Estonian agricultural and food producers – what are the main bio-based resources produced as a by-product, what bio-based resources are they interested in utilising and adding value, are these resources currently being utilised etc. This allowed a targeted approach on the business consultation-matchmaking meetings.

As a result, a number of farmers have become more deeply interested in biogas production and valorisation of the side streams. The BalticBiomass4Value project has also created a network of experts and colleagues who can reach out to each other and answer the questions of practitioners.

WP3: Preparing guidelines for circular bioeconomy development support at local level and promoting them among public authorities

A3.1: Analysis of regional/local support systems for circular bioeconomy development and preparation of good practice implementation guidelines for public authorities.

Activity leader:
Arnis Lenerts
Latvia University of Life Sciences and Technologies (LLU)
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As part of the 3.1 activities, Latvian University of Life Sciences (LLU) developed a training program for regional/local public authorities on circular bioeconomy development and its support systems. Additionally, guidelines for circular bioeconomy development were developed.

The the report is available here.

A3.2: Cross-border learning and promotion of good practice implementation guidelines for circular bioeconomy development at local level among public authorities.

Activity leader:
Irīna Kulitāne
Vidzeme Planning Region
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As part of the 3.2 activities, Vidzeme Planning Region coordinated the organisation of the transnational events and local trainings.

Transnational Events:

The combined event organised by Halmstad University, 3N Kompetenzzentrum and Vidzeme Planning Region took place on 9-10 November 2021 (event summary). A joint event with the "BIS - Baltic Industrial Symbiosis" project took place on 26 May 2021 (event summary).

The Russian event took place on 8-9 July 2021(event summary).

Local Trainings:

Vytautas Magnus University (VMU), Latvia University of Life Sciences and Technologies (LLU), Estonian University of Life Sciences (EMU), 3N Kompetenzzentrum, University of Warmia and Mazury in Olsztyn (UWM), Halmstad University, and Norwegian Institute of Bioeconomy Research (NIBIO) organised 1-day trainings on circular bioeconomy development and its support systems to regional / local public authorities in their countries. (Link to event page)

WP4: Improving circular bioeconomy innovation support services and initiating pilot business projects

A4.1: Improving competences of existing knowledge and technology transfer service providers and organising outreach activities to promote circular bioeconomy innovations in the Baltic Sea Region

Activity leader:
Lena Huck
Agency for Renewable Resources (FNR)
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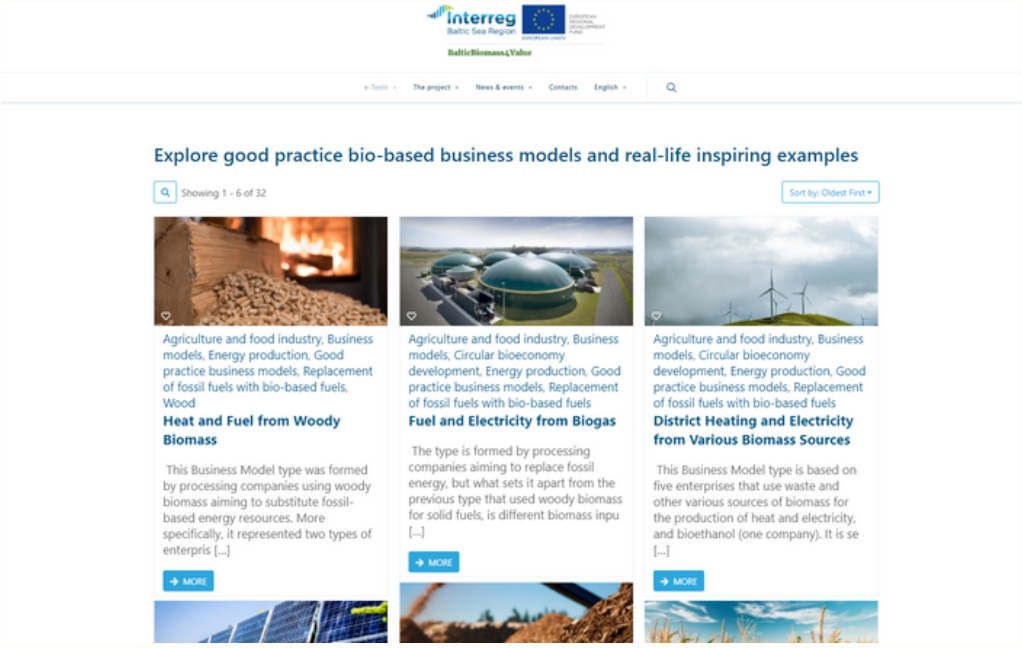
Within A4.1, the Agency for Renewable Resources (FNR) was responsible for coordinating the development of the Interactive Online Portal (e-tool). Additionally, trainings for knowledge and technology transfer service providers within the project partnership were organised. FNR hosted a combined training on 20 October 2021, coupled with individual training sessions by the project partners. The Interactive Online Portal was presented during the trainings.

Outcomes of A4.1

- The interactive online portal (e-tool) was developed and published on the BalticBiomass4Value website. Find out more information on page 2.
- The internal training for knowledge and technology service providers was held on 20th October 2021, you can read the event summary on page 4.



Example of Interactive Online Portal (Business models)

A4.2: Organisation of consultations for potential pilot business projects in the Baltic Sea Region

Activity leader:
Sascha Hermus
3N Kompetenzzentrum e.V. (3N)
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In A4.2 consultations and match-making events were organised.

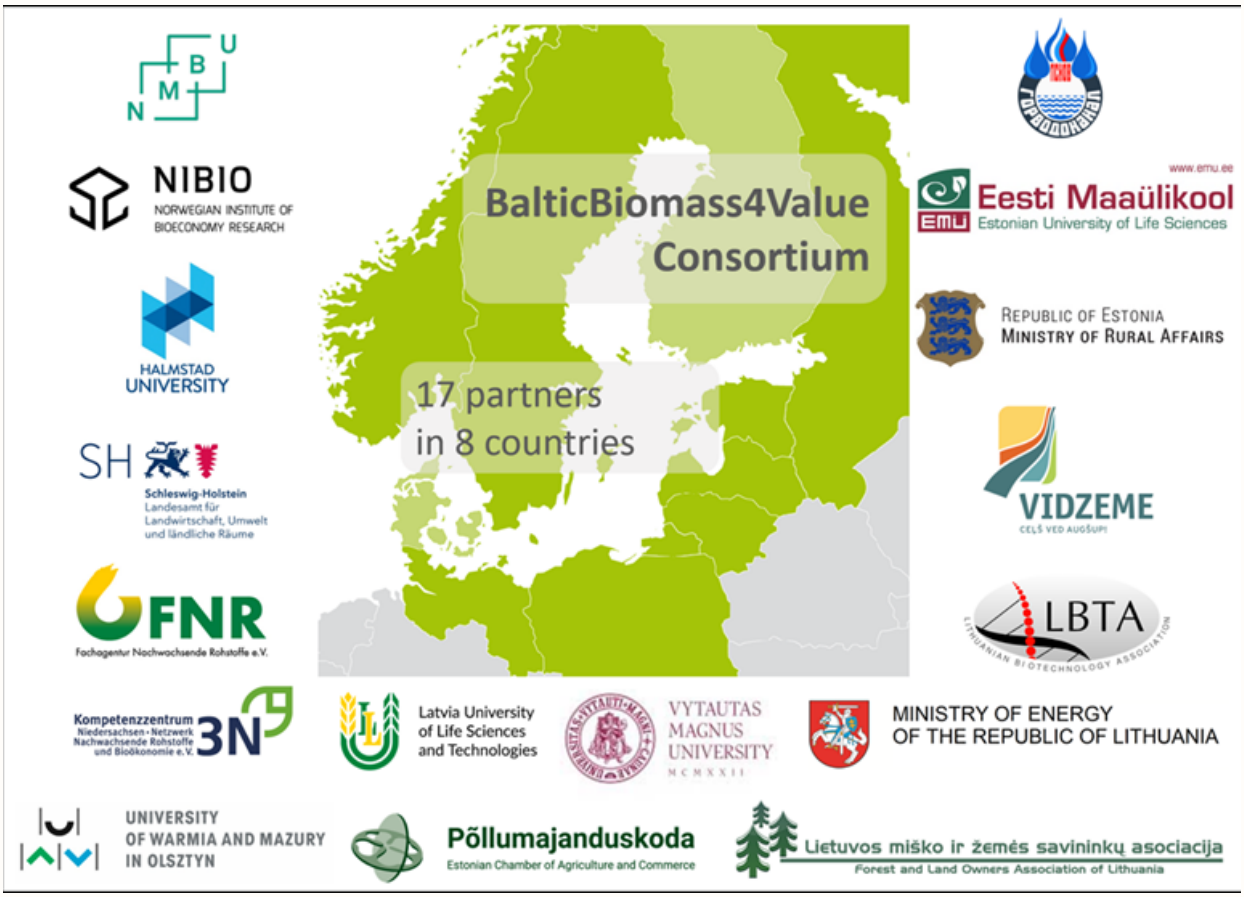
Potential partners for consultations and match-making events were identified using a questionnaire that included all relevant questions for companies working in the field of bioeconomy. The questionnaire was evaluated and the companies were categorised according to their strengths, weaknesses, expertise and needs. Following, match-making events were conducted (partly online, partly in presence) to bring the companies together. The areas of interest ranged from renewable energy (biogas and photovoltaic) to sustainable product production.

In Germany and Estonia the focus was on biogas and biomethane production. During the match-making topics such as the close collaboration of farmers and the utilisation of by-products as input substrates for the biogas plant were discussed. In Poland the discussions focused more on alternative packing material and biopolymers, as well as fertilisers derived from organic matter. The Lithuanian events focused on aquaculture and fish production.

The events are completed in Germany, Estonia, Lithuania and Poland and the events are still ongoing in Latvia, Sweden and Norway.

Read more about the business consultations here.


WISHING EVERYONE A HAPPY HOLIDAY SEASON
The BalticBiomass4Value Team



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Duration: January 2019 – December 2021. Total budget: EUR 2.79 million European Regional Development Fund: EUR 1.86 million ENI/Russian National Fund: EUR 0.09 million Norwegian Funding: EUR 0.19 million