REPORT ON

PROMOTIONAL ACTIONS AND INSTRUMENTS

Agency for Renewable Resources, University of Greifswald
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Executive Summary

This report explores how promotional communication between the bioeconomy-related stakeholders can foster the bioeconomy in Sweden, Denmark, Germany and Poland. The material was collected during the BioBIGG project and is part of the work package 6. The purpose of the report is to present promotional strategies, actions and instruments that will support the transition towards a bioeconomy in the SBA. Primarily, the project activities inform this report and a specific focus is put on the influence of networks on national and local authorities.

Firstly, the existing networks in the SBA and BSR are presented, followed by an analysis of how politics can be influenced in the four project partner countries. Based on the findings, the report suggests that the following communication ideas strengthen the bioeconomy: (1) Network formation is critical to share knowledge and foster cooperation between the different stakeholders. (2) Viewpoints should be effectively communicated to the relevant authorities. (3) Social media and the inclusion of customers prove to be effective ways to increase interest in bio-based products amongst society. (4) The ScanBalt Bioeconomy Working Group is an excellent tool to disseminate the project results.

Abbreviations

BCV	BioCon Valley® GmbH
BMBF	Federal Ministry of Education and Research
BMEL	Federal Ministry of Food and Agriculture
BSR	Baltic Sea Region
BSR S3	Baltic Sea Region Smart Specialization Strategy
FNR	Fachagentur Nachwachsende Rohstoffe e.V.
IHK MV	Chamber of Industry and Commerce Mecklenburg-Vorpommern
IMAG	Interministerial working group
MV	Mecklenburg-Vorpommern
NBÖ	National Bioeconomy Strategy (German: Nationale Bioökonomie-Strategie)
NBP	National Bioeconomy Panel
PA	Policy Area
RIS	Regional Innovation Strategy
SBA	South Baltic Area
SBR	South Baltic Region
SBBN	South Baltic Bioeconomy Network
SDGs	Sustainable Development Goals
WP	Work Package

Content

1. Introduction

The BioBIGG project:

- identified existing biomass resources and their value chains in the partner regions,
- analysed positive examples regarding cascading, use of waste (and left-overs and residues) and circularity,
- mapped material flows to identify innovation potentials,
- developed an online-survey and conducted interviews to see the SME's point of view, how willingly they would change their running systems and which barriers stand against the implementation of the sustainability concept; to show opportunities to improve the use of biomass and bring it to the market,
- prepared pre-feasibility-studies, innovation programs, business case models and implementation models to show opportunities of new or elongated value chains and evaluate the feasibility of the new concepts in terms of economic implementation and the transferability to other companies and regions,
- highlighted laws and other regulating framework conditions that influence the development of the bioeconomy.

In a next step, changes to a more sustainable bioeconomy have to be promoted. This can be realised best in a bioeconomy network with all BioBIGG partners and other South Baltic Area (SBA) stakeholders. In a workshop in 2019, all partners (together with external guests) discussed several possibilities how to establish a sustainable network that will exist after the project ends. With the ScanBalt network it was decided to connect to an existing organisation. ScanBalt is Northern Europe's leading accelerator for inter-regional cooperation regarding health in the Baltic Sea Region (BSR). A bioeconomy working group was founded by the BioBIGG project partners and other stakeholders.

This report presents some ideas collected during the BioBIGG project how promotional activities and communication between all the bioeconomy-related stakeholders could foster the bioeconomy in the SBA and the BSR in general. It presents proposals for promotional strategies, actions and instruments to overcome bioeconomy development barriers and further the transition towards bioeconomy in the SBA. It builds on assessments and input from project activities in the various WPs and shows information about networks and their influence on national and local authorities. Firstly, the networking and communication between bioeconomy stakeholders will be examined. Secondly, small case studies show how politics can be influenced in the four project partner countries. Lastly, some ideas about communication methods with the general public were collected, to promote sustainable bio-based products and, thus, the bioeconomy.

2. Networking

Networking and communication between bioeconomy stakeholders

Previous BioBIGG reports conclude that the bioeconomy has to be investigated individually in every region to find suitable solutions due to the many different conditions of every region. Regional networks are a suitable tool to foster regional development, since they can serve as exchange platforms and communication hubs for e.g. biomass logistics or finding cooperation partners.

Specialised workshops aid knowledge transfer while conferences have proved to be adequate networking opportunities. The ScanBalt network offers both specialised workshops and conferences, which are specifically catered to the needs of the different stakeholders. The concept of the bioeconomy is a relatively contested concept; hence networking and dialogue is key. It can be observed that biomass producers primarily focus on their primary business and do not have an interest in finding innovative alternative solutions to utilise their feedstock. A networking event would aid the company to gain new insights from other companies in order to use their by-products in a more efficient and circular way. Thereby, knowledge transfer from one company to another could result in the optimisation of by-products.

The knowledge transfer between companies is hindered by the lack of good trading platforms and specialised expert networks. Moreover, including non-commodity feedstock (e.g. residues from food production) would strengthen the bioeconomy. The main problem is that there is a demand for a consistent feedstock quality, which cannot be met due to a varying feedstock quality. SME struggle the most to partake in the bioeconomy, as they are less flexible due to a lack of informational infrastructure about regional biomass. A solution is to create logistics hubs with a vast network that access both local and regional side streams.

In a survey during the *ScanBalt Bioeconomy Group Kick-off Conference* the participants were asked why they want to be part of the Bioeconomy Working Group. The four most popular answers were: 'Finding project partners', 'Turning ideas into practice', 'Influence on politics' and 'Improvement of the environment/sustainability'.

Networking to form interest groups to influence policy making

To strengthen the bioeconomy in the South Baltic region, one has to take the laws and political incentives into account.

Some laws and regulations need to be adapted. Besides, various obstacles require complex solutions. Different actors have different self-interests (e.g.: nature conservation versus land use) and different ways of evaluating specific issues[1]. The BioBIGG report 6.2 'Regulatory frameworks and changes to support the transition to a cross-border sustainable bioeconomy' provides more detail for the partner countries regarding this issue.

Sweden, Denmark and Germany have many institutions and authorities working on distinct topics of the bioeconomy. In many cases, it is difficult to understand the different points of view due to a lack of communication between the different institutions. Conflicts of interests must be identified and politically evaluated.

Also in Poland, there is no specific authority dealing with the bioeconomy, as the relevant activities are carried out by at least four ministries, that is Ministry of Economic Development, Labour and Technology (which in our opinion eventually will take over the lead), Ministry of Climate and Environment, Ministry of Agriculture and Rural Development and Ministry of Development Funds and Regional Policy. Because various units coordinate most issues, it is difficult to take any action and to incorporate all the different stakeholder ideas at the national level. As the bioeconomy is such a broad concept, cooperation between entrepreneurs, scientists and governmental representatives is needed for a holistic understanding of the concept.

Therefore, it is crucial to form a group in which all conflicts of interest can be identified, discussed and taken into consideration when communicating with decision-makers.

[1] Please cite the reports as: Sartorius, V., Nitzschke, J., Cuypers, B., Behrens, M., Mittenzwei, M., Bochniak, R., Dąbrowski, P., Gołąbek, A., Mikielewicz, D., Nør Hansen, R., Kjær, T., Skøt, M. K., Dyreborg, A. M., Lund, J. and Prade, T. (2021). Regulatory frameworks and changes to support transition to a cross-border sustainable bioeconomy in the SBA. Report with recommendations and proposals on establishing an enabling framework to facilitate bioeconomy in the South Baltic Area (SBA).- BioBIGG

Possible solutions should be jointly explored, considering different points of view and create compromised cooperative positions together with the stakeholders.
Overall, there is a need for increased exchange between actors at various administrative levels (EU, federal, state) and stakeholders as well as experts in individual sectors of the bioeconomy and with experts in environmental protection and nature conservation. Four main stakeholder groups should always be considered:

1. producers, enterprises and industry;
2. universities, research organisations and the scientific community;
3. public administrations; and
4. civil society.

The following chapter will describe some examples with collected opinions and ideas from different stakeholders from BioBIGG report 6.2.
At the regional level, several networks and projects actively promote a shift towards sustainable and better use of biomass.

3. Existing Networks

Sweden

BioInnovation

Through the adaptation of the Swedish research and innovation strategy for a bio-based economy in 2012, the need for coordinating research and innovation measures in the field of bioeconomy became loud, resulting in close cooperation, a joint innovation platform named '*BioInnovation*' of Sweden's leading funding bodies for research and innovation: The *Swedish Energy Agency, Vinnova* and *Formas.*[2]

Collaborative group for circular and bio-based economy

The *Ministry of Enterprise and Innovation* appointed a group of 25 representatives from industry and academia focusing on sustainable production and supporting the transition to a circular bio-based economy by replacing fossil-based products with bio-based ones. Their work further focuses on wood-based housing, circularity and resource efficiency, innovative bio-based feedstock, biofuels, new materials, upscaling and commercialisation.[3]

TREESEARCH

The research platform TREESEARCH addresses topics related to new materials and chemicals made of wood. The forest-based sector is also addressed by the ERA-NET Cofund Action 'ForestValue-Innovating forest-based bioeconomy' supporting Europe in its change towards a resource-efficient and productive sector. The Swedish government is linking and supporting the forest's contribution to a sustainable growth within the entire country, established four more working groups, contributing to the job market, develop bioeconomy growth and pushing the potential of forest resources used for the production of bio-based products and energy sources.

[2] BioBIGG (2018): State of play for Bioeconomy in the South Baltic Area. https://issuu.com/biobigg/docs/d._3.1_state_of_play_for_bioeconomy_in_the_south_b
[3] Regeringskansliet, 2017. Lägesrapporter 1&2: Cirkulär och biobaserad ekonomi. Samverkansgrupp för cirkulär och biobaserad ekonomi, Ministry of Enterprise and Innovation Stockholm, Sweden.

Denmark

The National Bioeconomy Panel in Denmark (Nationale Bioøkonomiske panel)

The panel is an independent unit/network of appointed representatives from primarily industry and academia, supported by an inter-ministerial secretariat led by the Danish environmental protection agency (EPA). Recommendations are primarily disseminated from the panel to the inter-ministerial secretariat (but also to regions, municipalities and industry) with the purpose of mobilising public financial support to large-scale bio-based projects and R&D. The secretariat coordinates the further inclusion of relevant stakeholders in relation to the recommendations and facilitates knowledge sharing, through meetings, workshops and conferences.[4]

The NBP is focusing on in-depth development of new value-chains for bio-based building blocks. In other words, the focus of the panel lies with applied research (the development of pilot- and demonstration facilities), biorefining processes (mechanical, thermal, chemical, biological) industry stakeholders, product development, commercialization, and export.[5] This is also apparent in relation to proposed recommendations in 2019 on biopolymers for packaging, textiles, and products (with long life cycles)[6] and 2020 on proteins for consumption and fodder.[7] Furthermore, the recommendations also acknowledge the importance of resource effective utilization of input-materials for building blocks, both in relation to primary biomasses (intermediate crops etc.) and secondary biomasses (industrial bio-based residuals and bi-products, organic waste etc.).

Another newly formed industrial/academic network; the Partnership for sustainable biorefining (*Partnerskab for bæredygtig bioraffinering*) has also shown support to NBPs focus on development of protein value-chains from resource effective primary and secondary sources.[8] The network consists of several key stakeholders, such as Novozymes, Haldor Topsøe, Nordzucker and Shell.

INBIOM – Innovation network for bio-resources *(Innovationsnetværk for bioressourcer)*

INBIOM is one of 22 national innovation networks financed under the Ministry of Higher Education and Science. INBIOM supports and administrates four thematic sub-networks; Danish Biogas Network, Danish Insect Network, Danish Boiler Network and the Danish Bioenergy Group. The main purpose of the innovation network is to unite, and support, academia, industry and public authorities, involved in the transition towards a circular bioeconomy (within the mentioned thematic fields). Especially in relation to the creation of valuable bio-based material flows for existing and new value chains. Another key priority of the network is to improve the utilisation and nutrient recirculation in low value biomass and waste from industry, agriculture and communities.[9]

[4] Organisational structure of NBP; https://mst.dk/media/136869/kommissorium-for-det-nationale-biooekonomipanel.pdf (29.01.21)
[5] Interview with Morten Gylling and press release
[6] Recommendations on biopoymers; https://fvm.dk/fileadmin/user_upload/MFVM/Miljoe/Biooekonomi/baeredygtige_polymerer_FINAL-.pdf (29.01.21)
[7] Recommendations on Proteins; https://fvm.dk/fileadmin/user_upload/MFVM/Miljoe/Biooekonomi/Recommendations_from_the_National_Bioeconomy_Panel_Proteins_for_the_future__PDF_.pdf (29.01.21)
[8] Referendum on protein value chains; http://danskmiljoteknologi.dk/wp-content/uploads/pdf/notat-om-alternative-proteinerfinal.pdf (29.01.21)
[9] INBIOM homepage; https://en.inbiom.dk/forside (29.01.21)

Germany

The Federal Government intends to use the National Bioeconomy Strategy (NBÖ) adopted in January 2020 to create the conditions that will enable Germany to play a global pioneering role in the bioeconomy and to develop the technologies and jobs of tomorrow. The framework for this is provided by the Federal Government's "High-Tech Strategy 2025"[10] , the "National Research Strategy Bioeconomy 2030" (BMBF)[11] and the "Bioeconomy Policy Strategy" (BMEL)[12]. Actors from policy, research and industry are to be involved in developing the NBÖ and political activities are to be bundled in a coherent framework. Simultaneously, the Federal Government is committed to its global responsibility in the internationally networked bioeconomy that results from the implementation of the UN Sustainable Development Goals (SDGs)[13].

Interministerial working group on bioeconomy (IMAG)

The IMAG was established in 2013 by the Federal Government under the leadership of the BMEL to support the implementation of the National Policy Strategy Bioeconomy. The IMAG serves to exchange information and coordinate the federal government's departments' policies about the bioeconomy. Also, IMAG deals with interdisciplinary questions concerning the bioeconomy, such as the monitoring of the bioeconomy. The exchange between the federal ministries in the IMAG is also to be continued within the new bioeconomy strategy framework. It is then to be integrated into the coordination of the German government's social dialogue on the bioeconomy.[14]

A governance structure is currently being developed, coordinated in the interministerial working group on bioeconomy. This includes, for example, the establishment of a new national bioeconomy advisory committee (Bioeconomy Council; Bioökonomierat), the establishment of a new steering group and office, as well as questions regarding the thematic focus, the processing and presentation of various individual bioeconomy-relevant topics and the corresponding dialogue and discussion formats.

Competence Network Bioeconomy MV

This bioeconomy competence centre/network is just beginning to form. To bring together actors and funding along value chains, competencies will be bundled and central contacts for bioeconomy will be established. The aim is to create a competence network that will coordinate existing structures and jointly strengthen bioeconomy activities. [15] There will be a meeting at the end of February 2021 to form a board that will take the lead of the network's establishing process. This process is based on the 'Regional Innovation Strategy 2030 MV'.

Poland

Baltic Ecoenergetic Cluster

The Baltic Eco-Energy Cluster (BKEE) is a joint initiative of the Institute of Fluid-Flow Machinery of the Polish Academy of Sciences, the University of Warmia and Mazury, the Gdańsk University of

[10] BMBF (2018): Forschung und Innovation für die Menschen - Die Hightech-Strategie 2025

[11] BMBF (2010): Nationale Forschungsstrategie BioÖkonomie 2030 - Unser Weg zu einer bio-basierten Wirtschaft

[12] BMEL (2016): Fortschrittsbericht zur Nationalen Politikstrategie Bioökonomie

[13] Position Paper of the Strategic Group I „Life Science" (2020): Eckpunkte für eine Bioökonomie-Strategie 2030 in MV

[14] Answer from the Federal Government on the small question of the delegates Thomas L. Kemmerich, Michael Theurer, Grigorios Aggelidis, further delegates and the parliamentary group of the FDP - printed matter 19/7102 - Bioeconomy in Germany (2019); https://dip21.bundestag.de/dip21/btd/19/075/1907547.pdf

[15] Position Paper of the Strategic Group I „Life Science" (2020): Eckpunkte für eine Bioökonomie-Strategie 2030 in MV

Technology and the Koszalin University of Technology as well as Marshals and Local Governments of the Pomeranian and Warmia and Mazury Voivodeship, as well as business entities and associations based in these provinces. It covers northern Poland from Koszalin through the Pomeranian Voivodeship to the eastern ends of the Warmia and Mazury Voivodeship. Cluster activities are aimed at: reducing the share of fossil fuels as primary energy sources, stimulating the development of new technologies in the area of green energy and training specialists, supporting the production of equipment for bioenergetics, promoting and supporting energy-saving technologies, development of ecological awareness and professional activation of the population from rural areas, creating new biocomponents and biofuels, waste utilization in terms of energy and material applications, fostering the significant increase of biomass utilisation for energy purposes.[16]

Association Bioeconomy Cluster

The Association Bioeconomy Cluster was established in 2019 and is a voluntary, self-governing association of natural persons and enterprises, scientific and research institutions, and other organizations. The Association's foundation was the need to integrate and concentrate the scientific community and entrepreneurs operating in the field of bioeconomy, with particular emphasis on its cross-sectoral impact, including the basic pillars of cooperation, i.e. innovation education, entrepreneurship development and social communication. One of the activities was the promotion of activities in the field of National Smart Specializations (program consisting of determining economic priorities in the area of Research, Development and Innovation while focusing on investments in areas ensuring an increase in the added value of the economy and its competitiveness on foreign markets). The Association Bioeconomy Cluster is open to discussions and cooperation with other countries. Because the topic of the bioeconomy should be approached in a cross-sector and cross-regional way, the Cluster does not want to limit itself in its activities to only small groups of recipients but strives to create a bridge between business entities in Poland with European Union countries and eastern states and research units.[17]

4. Cross-border activities and networks

Nordic Council of Ministers

The Nordic Council of Ministers is the lead partner in the Policy Area Bioeconomy (PA Bioeconomy) in EU's strategy for the Baltic Sea Region and plays an active role in promoting sustainable bioeconomy in the Nordic and the Baltic Regions. This includes a Nordic Bioeconomy Strategy, several publications and international initiatives, such as the Baltic Sea Region Bioeconomy Council and the Nordic Bioeconomy Panel.[18]

Forum Ostsee MV

The forum is organized under the regime of the Ministry of the Interior and Europe M-V. It is a network of public authorities, local authorities, universities and research institutes, associations, companies and other institutions implementing or preparing activities in the Baltic Sea Region. Beneath others, Forum Ostsee works in the field of bioeconomy.[19]

[16] Baltic Eco-Energy Cluster. Index page. https://www.imp.gda.pl/bkee/, 27.5.2020
[17] STOWARZYSZENIE KLASTER BIOGOSPODARKI. Index page (January 2021). http://klasterbio.pl/
[18] The Nordic Council and the Nordic Council of Ministers. Bioeconomy in the Baltic Sea Region. https://www.norden.org/en/information/bioeconomy-baltic-sea-region, 09.10.2020
[19] Europaportal. Forum Ostsee Mecklenburg Vorpommern (20 August 2020). https://www.europa-mv.de/ostseekooperation/forum/

ScanBalt MTÜ Bioeconomy working group

The organisation is Northern Europe's leading accelerator for inter-regional cooperation, envisioning the region as a "global hotspot for health and bioeconomy". In the frame of the BioBIGG project, a working group "bioeconomy" could be established. All project partners had agreed in advance to join ScanBalt as a member to establish a transnational bio-economy network via their actors by harnessing the organization's competence and influence. At the conference on 21 October 2020, the working group's kick-off event has taken place and was presented by ScanBalt members, a representative of the Plant³ Alliance and FNR.

Working group bioeconomy

The Nordic Council of Ministers, as a coordinator of the policy area bio-economy in the EU Baltic Sea Strategy, runs a working group as a contact point and support function for stakeholders in this field. From Mecklenburg-Western Pomerania, WITENO GmbH, representing the ScanBalt network, participates in this committee to set their impulses for the actors in the Baltic Sea region and to take up suggestions for the implementation of relevant topics in Mecklenburg-Western Pomerania.[20]

The STRING network

A political cross-border partnership between Skåne, Sjaelland, Copenhagen and the capital region as well as Schleswig-Holstein and Hamburg. The strategy developed within this cluster is aimed at developing business models within five themes: 1) Green mobility, 2) Sustainable cities, 3) Energy efficiency in buildings, 4) Renewable energy and 5) Resource efficiency and waste management. Several of these themes are interlinked with the bio-based economy.[21]

In 2018 Sweden and Finland joined forces to develop the bioeconomy

A collaboration of the Swedish RISE and the Finnish VTT was agreed on to strengthen and expand in the areas of biorefining, including biomaterials and thermochemistry, circular bioeconomy and digital solutions. A joint story about the circular forest bioeconomy of the future should also be developed.[22]

Biobord Platform

After the RDI2Club-project came to an end (Rural RDI milieus in transition towards smart bioeconomy clusters and innovation ecosystems Biobord platform was originated as) in September 2020, the Biobord platform continues the network as an open virtual innovation hub for connecting bioeconomy developers.[23]

5. Cross-border Projects in the (South) Baltic Area

Projects like BioBIGG are obviously perfect boosters for research and innovation in the bioeconomy field. They should take part in international networks and conferences. Project results can be shared among the members to strengthen knowledge exchange. Networking events are a good opportunity for finding new project partners for organisations, research institutes and companies.

Following is a list of various examples of projects in the SBR and BSR. This list does not claim to be complete but the BioBIGG consortium considered those to be currently the most important ones.

[20] Landesregierung Mecklenburg-Vorpommern. (2018): Bericht der Landesregierung zur Zusammenarbeit in der Ostseeregion 2018. p. 50. https://service.mvnet.de/_php/download.php?datei_id=1619389,

[21] STRING network. Index page (July 2020) https://stringnetwork.org/

[22] Government Offices of Sweden. Sverige och Finland enade för en utvecklad bioekonomi (July 2020) https://www.regeringen.se/pressmeddelanden/2018/04/sverige-och-finland-enade-for-en-utvecklad-bioekonomi/

[23] Biobord. Index page (May 2020). https://biobord.eu/

BalticBiomass4Value

The BalticBiomass4Value project wants to increase the production of bioenergy in more environmentally sustainable and economically viable ways by utilizing new biomass sources (mainly biological waste) for energy production and possibilities to use bioenergy side streams for higher value bio-products.

SuMaNu

SuMaNu (Sustainable Manure and Nutrient Management for reducing nutrient loss in the Baltic Sea Region) is a platform project that analyses and synthesizes approaches to sustainable manure and nutrient management.[24]

Interreg V A Cooperation Program Mecklenburg-Vorpommern / Brandenburg / Poland under the "European Territorial Cooperation" goal of the European Regional Development Fund (ERDF)

The program in which funding for a joint Polish-German project assigned to one of the four priority axes can be obtained: Nature and Culture, Transport and Mobility, Education, Cross-border Cooperation. At least one partner from Poland and Germany is required, including at least one of the support areas (West Pomeranian Voivodeship, Mecklenburg, Brandenburg). One of the priority axes of the program: "Nature and Culture, Preservation and protection of the environment, and promotion (support) of resource efficiency" has a specific objective related to the maintenance and development of biodiversity and is closely related to the EU Strategy for the Baltic Sea region and activities such as sustainable development and bioeconomy.[25]

URBACT III

URBACT is the European Territorial Cooperation Program for Sustainable Urban Development. The program helps cities to develop practical, innovative, and sustainable methods that combine economic, social, and environmental dimensions. It enables them to share good practices and lessons learned with all professionals involved in urban policy in Europe.

URBACT is a program aimed at building ability through the exchange of experiences between European cities that need mainly integrated strategies and actions for sustainable development; support in the implementation of integrated urban strategies and activities; ensuring access to knowledge for practitioners and decision-makers at urban, national, regional and EU levels, and the ability to share knowledge to support sustainable urban development.[26]

WASTE MAN Integrated Sustainable Waste Management System (ISWMS)

The project's idea is to facilitate the transition of the waste management sector from linear to a circular economy by the implementation of Integrated Sustainable Waste Management System (ISWMS). The project includes 6 partners from 3 Member States: DK, PL, LT and 4 associated partners.

The main target groups are municipal stakeholders of the waste-services and companies, local politicians and authorities and the knowledge organisations directly involved in waste management as well as citizens, producers of goods and services, SMEs, housing associations, municipalities. Besides,

[24] SuMaNu. About the project (May 2020). https://balticsumanu.eu/about-the-project/

[25] Interreg V A. Index page (May 2020) https://interreg5a.info/pl/

[26] Ministry of Funds and Regional Policy. URBACT III Programme (May 2020) https://www.ewt.gov.pl/strony/o-programach/przeczytaj-o-programach/programy-europejskiej-wspolpracy-terytorialnej/urbact-iii/

a pilot investment will be implemented – a specialized container equipped with laboratory devices for waste testing and the Educational Path. [27]

Baltic Phytoremediation
Institutions participating in the project: Department of Process Engineering and Chemical Technology of the Gdańsk University of Technology, RISE (Sweden), Klaipeda University (Lithuania), Linnaeus University (Sweden), Research Institute Center (Lithuania), NSVA (Sweden), Utilization Plant in Gdańsk (Poland). The project's goal is to develop and implement phytoremediation to eliminate pollution from soils in the South Baltic Region.[28]

COASTAL Biogas - Cluster On Anaerobic digestion, environmental Services and NuTrients removal
Project partners: Faculty of Chemistry of the Gdańsk University of Technology, Rostock University (Germany), Baltic Energy Innovation Centre (Sweden), Lithuanian Energy Institute, Roskilde University (Denmark), Agency for Renewable Resources (Germany), Koszalin University of Technology (Poland). The main goal is to promote the use of the latest technologies of anaerobic digestion of agricultural waste and marine flora to reduce the number of nutrients in the Baltic Sea.[29]

BASE – Baltic Sea Biogas Alliance
Partners: Krinova Incubator & Science Park (Sweden), EU Office Skåne Nordost (Sweden), Vidzeme Planning Region (Latvia), Klaipeda University (Lithuania), Association of Polish Communes of Euroregion Baltic (Poland) and the Institute of Physics, National Academy of Sciences of Ukraine (Ukraine).The purpose of this project is to improve the biogas-related capacity and expertise of the participating organisations. The goal is also to establish a strong and competitive alliance.[30]

Complete project lists of the programs can be found here:

- Interreg Baltic Sea Region: Project Library – Interreg Baltic Sea Region 2014 - 2020 (interreg-baltic.eu)
- Interreg South Baltic: Database - Interreg South Baltic
- Horizon 2020: Horizon 2020 projects | Horizon 2020 (europa.eu)
- BBI JU: Projects | Bio-Based Industries - Public-Private Partnership (bbi-europe.eu)

6. Bioeconomy promotion

During interviews, conferences and workshops that were part of the BioBIGG project, communication with the public was raised. This chapter presents some ideas and recommendations that should be picked up during conferences and workshops of the networks, to be discussed and developed for individual situations.
There are - mostly uncoordinated - ongoing scientific and stakeholder debates about adequate sustainability criteria. Socio-economic aspects of sustainability are not well integrated (e.g. customers must be convinced, not forced, to buy sustainable products) and certification has the most significant potential to influence direct and local impacts.[31] The development of new sales models is observed, in

[27] WASTEMAN. Information about the WASTEMAN project (May 2020) https://www.imp.gda.pl/wasteman/EN/
[28] Interreg South Baltic. BAPR – Baltic Phytoremediation project (May 220) https://southbaltic.eu/-/bapr
[29] Interreg South Baltic. Coastal Biogas Programme (May 2020) https://southbaltic.eu/-/coastal-biogas
[30] https://www.krinova.se/en/project/base-baltic-sea-biogas-alliance/
[31] Van Dam, J.; Junginger, M.; Faaij, A.P.C.(2010): From the global efforts on certification of bioenergy towards an integrated approach based on sustainable land use planning. Renew. Sustain. Energy Rev. 2010, 4, 2445–2472

which the consumer works closely with the producer. There has been a shift in producer-to-consumer relations, both in producer-to-consumer marketing but also in production. Consumers demand retail companies to step up and influence the production process; for example, many consumers demand companies to use reusable packaging, which can be returned to the manufacturer to be refilled. As eco-conscious people like getting involved, this practice is a strong recommendation to promote bio-based products and packaging to consumers and therefore strengthen the bioeconomy.
Overall, a rethinking of consumerism has to occur, as over-consumption is environmentally and socially harmful. Hence consumers have to educate themselves and make conscious decisions on where they put their money. This might mean fewer options; however, making more sustainable choices will aid climate and environmental protection, consequently improving our quality of life for generations to come.

More ideas to pick up inside the networks, especially in workshops:

- Investors need comparable and holistic information regarding environmental risks and their impacts to assess their portfolios beyond carbon exposure.[32]
- Participative dialogue with the public can improve consumer behaviour increasing acceptance and maybe also changing attitudes towards the bioeconomy and bio-based business models.
- Increasing the collective responsibility of producers from the SBA to extend the lifetime of household devices.
- Bio-based business models should be firmly based on these principles: Cascading, use of residues and waste, and circular value chains.
- Insecurities inside sectors should be reduced and investments increased by transparent communication (precise information on feedstock availability whilst always keeping low the environmental impact).
- A great part of the population lacks interest in sustainable products, tendency decreasing in the BSR. That goes along with lacking pressure by the customers on the biomass producers that slows further development. Also the lack of knowledge on compounds of biomass and availability of feedstock contributes to this situation. Social media influences modern society. Companies and authorities should use this way to promote sustainable bio-based products.
- Since companies have noticed that enthusiastic key persons can lead the way to success, our recommendation is the establishment of funding possibilities for such persons.

7. Possibilities for exerting influence

The authorities listed above for each country have a more or less direct influence on various ministries since they work under or with them and carry out projects and provide funding in their interest. However, executive authorities often do have limited rights to develop or implement legislation. A continuous review of laws and activities is of main importance to identify possible problems and barriers or even changes. Therefore, the easiest way for networks and organisations would be to collect their project results and communicate them in a bundled way to the authority/ministry responsible for the respective law/directive. It is often very time-consuming to arrange a visit with people in charge of the authority. This needs to be changed by appointing a person to establish and guide the communication between the respective Ministry and the various networks and organisations. This calls for a constant exchange of information on the progress of implementation. In other words, a Plan-Do-Check-Act cycle might also be of great relevance for policies and regulations.

[32] European Parliament. Establishment of a framework to facilitate sustainable investment. http://www.europarl.europa.eu/doceo/document/TA-8-2019-0325_EN.html

Personal meetings have been neglected in the past year, due to the COV-19 pandemic. They are important to achieve a mutual understanding of needs and limitations, both for policy makers and stakeholders. Workshops and conferences are good opportunities to deepen this exchange and to provide more detailed background information. Joint coffee and lunch breaks offer space also for informal communication and can contribute to develop the relation and confidence between stakeholders and policy makers.
The influence of social networks has increased rapidly in recent years and is being used in all areas. The results of many projects are summarised in short videos, which can also be found on YouTube, LinkedIn, and the project websites. This trend should also be used to influence policies and to communicate problems regarding current laws and regulations.

8. Existing authorities and institutions related to the bioeconomy

To bring the bioeconomy in the South Baltic region on the right track, it should be considered that many laws and political framework conditions influence its development. To create a coherent framework, some laws and regulations need to be adapted. In addition, some barriers require complex solutions because different actors, all of whom want a more sustainable environment, have different target interests (e.g.: nature conservation versus land use).[1] Therefore, it is important not to act as an individual, but to work with an active network of stakeholders. That can be done by founding or joining an already existing bioeconomy network. All relevant conflicts of interest should be considered to identify the essential barriers and communicate them to the political actors. Together, possible solutions should be explored that consider the concerns of all interest groups in the form of a "best possible compromise".
BioBIGG's D3.1 report shows the overview of local legislations in every country. Out of the four countries considered in the report, only Germany and Sweden have national strategies dedicated to the bioeconomy and none of the regions presented in the report have dedicated strategies. Part of the BioBIGG project was assessing legal and administrative frameworks related to the bioeconomy in each of the partner countries (Sweden, Denmark, Germany and Poland). This is to be found in D6.2: Regulatory frameworks and changes to support the transition to a cross-border sustainable bioeconomy in the SBA. Thereby the benefits and barriers of various laws and regulations with relation to the bioeconomy were identified.
On a regional level, several networks and projects, as mentioned above, promote a transfer towards sustainable and better use of biomass. Hence, the following paragraphs give a short view on different institutions and authorities addressing financing, implementation of laws, the support and promotion of projects, and the competitiveness of companies and regions benefitting the regional bioeconomy.

Sweden

The *Swedish Board of Agriculture* is an administrative agency implementing agricultural EU regulations into national regulations. Furthermore, they are responsible for income support and farm support. The Swedish Environmental Protection Agency is a public agency carrying out assignments on behalf of the Swedish Government related to the environment in Sweden, the EU and internationally. Their work includes investment aid calls for local and regional measures that reduce carbon dioxide emissions and other gases affecting the climate (e.g. financial support of new biorefineries).
The *Swedish Food Agency* works towards the following goals: healthy dietary habits, safe foods and fair practices in the food trade using regulations, recommendations and communication. This includes recommendations and communication support to consumers in their everyday lives, such as shopping,

feeding their children, and cooking. Guiding consumers towards healthy dietary habits is a big challenge and a vital task for the Swedish Food Agency.
Another governmental agency, the *Swedish Agency for Economic and Regional Growth*, works closely with networks as they support and strengthen companies and regions' competitiveness in their approach of sustainable development.
The examples show that the Swedish government is closely linked to agencies working within different fields of the bioeconomy.
Due to EU regulations, Sweden as well as other EU countries can only use a maximum of 7% from food crops for biofuel production resulting in a significant restriction on choices of what can be planted on the available land. The concerned stakeholders, mainly farmers, should therefore contact the Swedish Board of Agriculture to work on a common solution acceptable for both sides.[1]

Denmark

Three authorities working within different fields of the bioeconomy have been assessed in Denmark. The Agency addresses environmental topics *for Environment* working closely with the *Ministry of Environment* aiming to simplify already existing as well as new legislations. The Agency is split into five centres: Centre for Rich Nature, Centre for Clean Water, Centre for Safe Chemistry, Centre for Green Production and Centre for Staff. [33,34] The *Agency for Agriculture* acts under the *Ministry of Food, Agriculture and Fishery,* drafting the majority of the laws and regulations leading the agricultural sector. The main part of its work focuses on examining the agricultural sector, organic farming and environmental affairs.[1]
In addition, the *Danish Energy Agency* is part of a ministry, the *Ministry of Climate, Energy and Utilities* to support and strengthen cooperation on green energy, energy technology development and eco-innovations.[35]
The Agencies work in close cooperation with the respective Ministries and thus have direct access to legislative stakeholders.
Denmark needs to amend the laws and frameworks as they are not adaptive towards new biological resources, resulting in unnecessary costs and administrative burdens for municipalities and biogas plants. The affected parties should list their criticism on the law, the current problems, and the necessary changes and pass them on in bundled form to the Danish Energy Agency and involve the *National Bioeconomy Panel.*[1]

Germany

In Germany, the bioeconomy is addressed by several state authorities and federal ministries, each focusing on different fields of the bioeconomy where there is an overlap of tasks and close cooperation is required.
The *Federal Ministry of Food and Agriculture*, Co-Publisher of the National Bioeconomy Strategy is responsible for data collection, networking, and utilisation of biomass and the support of bioenergy and bio-based products in the area of forestry, agriculture, food, feed, fishery and regional development. Furthermore, there are the *State Office and Ministry for Agriculture and Environment in MV* implementing federal and state legislations and EU regulations in agriculture and the environment at the regional level (Mecklenburg-Western Pomerania). The *State Forestry MV* is an institution under the public law where forest authority, services and operations are on one hand. Their work is regarding

[33] Kommissorium for Det Nationale Bioøkonomipanel, 2017, Miljø-og Fødevareministeriet
[34] The Danish Environmental Protection Agency. Bioøkonomisk Panel relanceres (January 2021). http://mst.dk/service/nyheder/nyhedsarkiv/2017/aug/biooekonomisk-panel-relanceres/
[35] The Danish Energy Agency. EUDP (January 2021). https://ens.dk/ansvarsomraader/forskning-udvikling/eudp

climate protection, economical use of a timer, renewable energies (wood, wind and solar energy) and environmental education in youth forest homes.
Finally, the State Office for Environment, Nature Conservation and Geology is developing basics for the planning and implementation of nationwide protection measures at the regional level (Mecklenburg-Western Pomerania).[1]
The Chamber of Industry and Commerce MV (IHK MV) is in direct contact with companies from various sectors and has both an advisory and a mediating function. In one way or another, laws always play a role, which often influences the bioeconomy. Therefore, the Chamber of Industry and Commerce presented the collected problems to the Ministry of Agriculture and Environment to be taken into account when amending the laws or that even the urgency of the problems will lead to a new edition of the laws.[1]

Poland

There are the Ministry of Climate, Ministry of Development, and the Ministry of Agricultural and rural Development on national level. The first mentioned works on sustainable development activities at the international level, implements tasks resulting from Poland's membership in the Organization for Economic Cooperation and Development, and raises ecological awareness. The second mentioned ministry cooperates with the Ministry of Energy to maintain the current level of use of agricultural raw materials for the production of biofuels. The *Ministry of Development* supports the implementation of tasks supporting the transformation towards a circular economy and a low-emission energy industry, including issues related to the ecological footprint and industry access to raw materials. The *Marshal's Offices* operate on a regional level defining the regional development strategy, conducting the regional development policy, including those connected with bioeconomy. Topics like ecological education, climate policy, international aspects of sustainable development, air protection, and the national energy and climate plan for 2021-2030 are part of their work.[1]
The Polish interview results revealed that the Waste Act needs to be amended as it there are no general procedures to follow to use waste raw materials in subsequent processes. This problem should be addressed by the *Ministry of Agriculture and Rural Development* as part of their work focuses on using agricultural raw materials for the production of biofuels and the promotion of agricultural biomass, which as well addresses a topic related to waste.

9. Conclusions

In conclusion, this report investigated how promotional communication between the bioeconomy-related stakeholders can foster the bioeconomy in Sweden, Denmark, Germany, and Poland. Findings from the BioBIGG project informed the different communication ideas explored throughout this report. Firstly, networks and networking were introduced, followed by listing already existing networks in Sweden, Denmark, Germany and Poland. Additionally, cross-border activities and cross-border projects were presented. Moreover, ways in which the bioeconomy can be promoted and influenced, including relevant institutions, were explored.

1. All the bioeconomy-related stakeholders should organise themselves in networks. These can be used for knowledge sharing, project or trading partner research, establish biomass trade hubs, etc.
2. The establishment of regional networks can serve to strengthen application-oriented research and, in particular, knowledge and technology transfer. They can act as control centres for concrete packages of measures and take over information transfer into society. They can perform the interdisciplinary coordination tasks and serve as a contact point, knowledge base, and nucleus to implement regional bioeconomic value chains.
3. In these regional and national networks, advisory opinions should be elaborated and presented to authorities to handle problems and barriers with practical discussions and compromises.
4. Regional and national networks do already exist or are currently being planned in Sweden, Denmark and Germany. In Poland, those are still missing, but many international projects are working towards strengthening the bioeconomy in the project-regions. International networks can also serve for internal exchange, however, they are less apt for contacting national authorities.
5. Project results may be forwarded to the ScanBalt Bioeconomy Working Group for dissemination purposes. Moreover, other groups/networks to assure the best possible knowledge exchange.
6. Social media and the inclusion of customers into product design decisions are very effective ways of getting the population more interested in bio-based products.