



RDI2CluB:
Rural RDI milieus in transition towards smart bioeconomy clusters and innovation ecosystems

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Regional Bioeconomy Profiles

Report on the development process and main findings of the Regional Bioeconomy Profiles for RDI2CluB partner regions.

Regional Council of Central Finland
Hannu Koponen

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SUMMARY

Bioeconomy happens on a regional level. On EU and national level, we have an increased demand on sustainable biobased solutions (EU bioeconomy strategy 2012, update 2018). Simultaneously, Baltic Sea Region has high potential for bioeconomy. This has been identified on national bioeconomy strategies of various BSR states. In order to fulfill these expectations, we need more comprehensive understanding on regional bioeconomies, their strengths and weaknesses. In order to promote the trans-regional cooperation, a comprehensive and comparable approach to bioeconomy is required.

The work in RDI2CluB on bioeconomy profiles relies on the existing work conducted in BERST project (BioEconomy Regional Strategy Toolkit, FP 7 2013-2015). In RDI2CluB, the existing BERST tool was further developed to map the strengths and weaknesses of the regions' bioeconomy. After this we integrated our tool to existing EU wide tools; eye@Ris3 and S3 platform tool for benchmarking regional structures. This procedure enabled us to go further in benchmarking the best bioeconomy regions.

As an outcome from this process, regional bioeconomy profiles were created for participating regions. These were further developed by the regional experts to ensure contextual understanding in interpretation of the results. Regional statistics on bioeconomy are now available on NUTS 3 level (Estonia, Finland, Latvia, Norway) and on NUTS 2 level (Poland). Users of the tool can compare the corresponding region to national level average, or selected benchmarking region.

These bioeconomy profiles revealed not only the potential of the regional bioeconomies, but also an urgency to further develop bioeconomy related statistics. We need reliable and comparable data on bioeconomy on regional level for evidence-based strategic planning.

Though bioeconomy has different strengths region per region based on the raw material availability, the history of the region, and presence of the R&D&I, similar features were found. RDI2CluB regions are all sparsely populated, meaning that the availability of skilled labor force must be considered when further developing regional bioeconomy. Another drastic feature is the establishment and presence of R&D&I network, with close connection to existing business on the region.

Presence of the bioeconomy strategy and strong political commitment on bioeconomy development is an essential part of the regional development. This requires also a support from the national and EU level. National bioeconomy strategies should reflect the regional strengths and potential.

Regional bioeconomy profiles can be found from the rdi2club.eu website.

1. Process Description

Bioeconomy profiles (GoA 2.1) are a base for the future work in the project. Bioeconomy profiles will provide information for regional level actions and trans-regional joint action plans (GoA 2.2). The work was conducted on RDI2CluB project milestones 1-2 (10/17-9/18).

After the tendering process for external expertise, the regional level data collection was conducted. The data collection was organized via the regional partners (Central Finland (PP2), Hedmark County Council (PP5), Świętokrzyskie Voivodeship (PP8) and Foundation for Education and Social Dialogue PRO CIVIS (PP9), Vidzeme Planning Region (PP11), and Stockholm Environment Institute Tallinn Center (PP12). Data was collected, not only from the regions involved on RDI2CluB, but also from other NUTS 2 and 3 regions from corresponding countries.

- FI NUTS 3 (19 areas)
- NO NUTS 3 (19 areas)
- PL NUTS 2 (16 areas)
- EE NUTS 3 (5 areas)
- LV NUTS 3 (6 areas)

Statistical data was organized using the same methodology as used in BERST-process.

Bioeconomy key sectors were summed up into following categories:

- Biomass availability
- Infrastructure
- Land use
- Quality of the workforce
- Demographics
- Cluster size
- Employment structure
- Innovation

After the regional data collection was completed, external expert created regional profiles based on this data. The core of these regional profiles is the Bioeconomy readiness wheels (Figure 1) and detailed comparison of the bioeconomy sectorial employment and economic variables from regional to national averages. These regional profiles were evaluated by the regions and regions contributed to the profile development by providing information on regional recommendations for further development of the bioeconomy.



Figure 1. Bioeconomy readiness wheel (Left: Vidzeme, Latvia; Right: Hedmark, Norway)

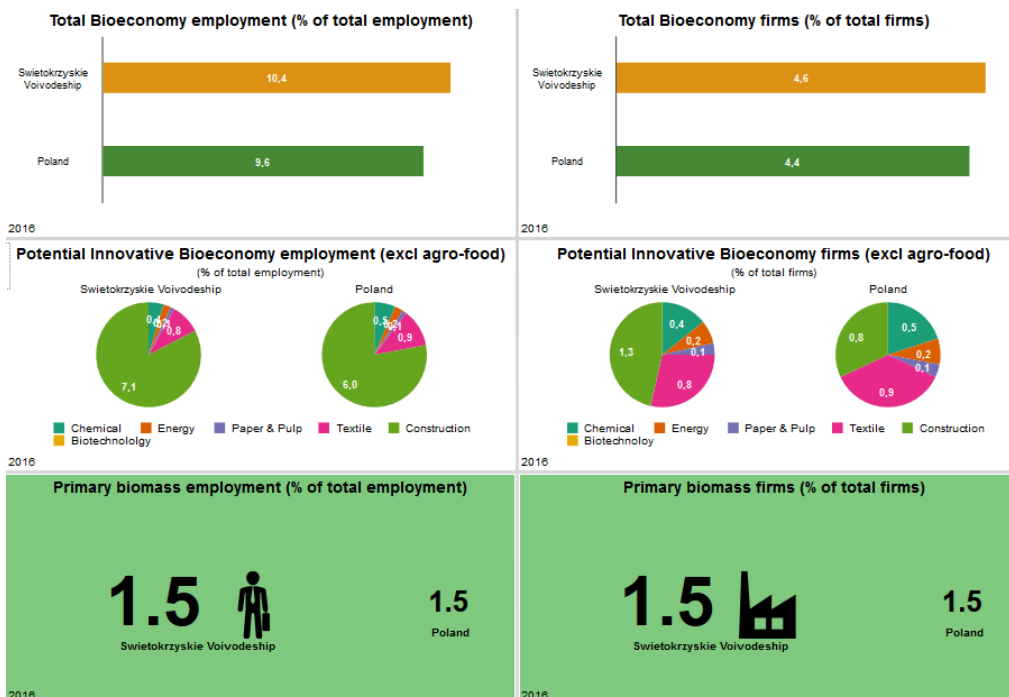


Figure 2. Example of employment of bioeconomy sectors (Świętokrzyskie Voivodeship, Poland).

2. Regional Dialogue

Regions organized stakeholder workshops to study their results in more detailed. Based on these regional analyses, the regional expertise was included into the profiles. This included especially dialogue in recommendations for the further development of the bioeconomy. These discussion forums served also as a base for GoA 2.2., Joint action plan development of corresponding regions.

Regional workshops concluded, that these kinds of regional profiles could serve as a good tool for a region to show their potential in bioeconomy for outsiders. In addition, internal discussion on regional bioeconomy performance is useful. The bioeconomy development should be based on the strengths and potential, and for this purpose bioeconomy profiles can offer a solution. However, data interpretation must happen on regional level. The bioeconomy profile and the comparison to other regions could act as a base for regional development in bioeconomy.

Here are some examples (direct comments) from the regional dialogue workshops:

- Bioeconomy regional profiles are useful for branding the region
- The level of the data is very general; it does not show the real potential but more a state-of-the art. E.g. in agriculture not only the volume, but the crop type defines the value.
- Various sectors relevant for the regions are missing, since no data available; Nature tourisms, recreation and non-wood products (berries etc.). Bioeconomy service sector is completely missing from this analysis. It is very likely that especially this sector will boost in BSR region in the future.
- Bioeconomy profile can help identification of regional importance of the bioeconomy. It is a good tool when arguing for the development of a regional bioeconomy.

Based on the regional profiles, each region conducted a **SWOT analysis** on bioeconomy possibilities. This work was conducted during the transnational workshop in Estonia (June 2018). The purpose of this exercise was to reveal the possible similarities on regions' bioeconomy development. Based on these regional remarks, each region started to further develop their regional Joint Action Plans (JAPs). Regional SWOT analysis were collected together to show the similarities in bioeconomy development in RDI2CluB regions (Table 1).

Table 1. Common features in RDI2CluB regional bioeconomy development

Strengths	Weaknesses
<ul style="list-style-type: none"> - Existing high activity in bioeconomy; wood, agriculture etc., serves as a good base to start further development. - New potential sectors, especially construction sector. - Good quality of the biomass. 	<ul style="list-style-type: none"> - Low activity in novel sectors and/or traditional mind-set in development. - R&D&I – low innovation activity and/or low level of transformation of innovations to business. - Low attractiveness of the region to new branches of bioeconomy.
Opportunities	Threats
<ul style="list-style-type: none"> - R&D possibilities to create innovative firms - Various biobased resources; lakes, food sector, nature services. - Circular economy in bioeconomy. - Collaboration and cooperation between research institutes and with the business. 	<ul style="list-style-type: none"> - Decreasing population-> lack of (qualified) workforce. - Lack of political commitment on national and/or regional level endangers further development of bioeconomy.

3. Benchmarking

Benchmarking the interesting regions is one of the main uses of the regional bioeconomy profile tool. For that purpose, the regions performed an exercise, where they compared their own region to another region with the tool. The partners in regional authority role conducted this work on behalf of the regional triple helix team. Regions did comparison to more advanced region (Biobased Delta), and then to another RDI2CluB region.

Biomass availability plays an important role. In RDI2CluB regions, biomass is available (wood and/or agro), but in many cases the higher-level processing is missing. The bioeconomy development of the RDI2CluB regions is connected to the biomass available in the region. Also, the regions have a historical “backpack”, the processing has a long history. In some cases, this dates back centuries, and the updating of the processes end products has not been a necessity yet. In Biobased Delta, the development is more influenced by the “bio-boom”, the alternative renewable raw materials are replacing the old fossil-based industry. The raw materials in Biobased delta are imported from abroad (or from other regions), and the bioeconomy is higher level processing of selected raw materials.

Biomass production per land area used and **biomass value** should be increased. Biobased Delta has higher value crops and higher productivity. RDI2CluB regions are located on more northern latitudes, meaning that the productivity may not reach such high yields as in the Netherlands. In the Netherlands, where the availability of the land is an issue, unlike in RDI2CluB regions, the development has been more favorable towards new technological applications. There is a potential for utilizing novel technologies in primary production on RDI2CluB regions.

Most of the regions highlighted the **bio-chemistry and biotechnology** as areas to be developed. The firms in these sectors in RDI2CluB regions are relatively small. This of course shows the potential to grow in these sectors, but the growth requires knowledge, investments and innovations. In bioeconomy, the long-term commitment on development is a necessity. “We need to continue working to enforce the R&D employment and Finance” as stated in RDI2CluB internal benchmarking. When replacing a fossil-based product, or a process, with a biobased one, high-level R&D is required to make the new biobased product as good quality as the replaced product had. Biobased Delta has actively searched for companies to establish in the area and is very actively utilizing funding from different sources to increase the area's key players' knowledge. Networking with the leaders in bioeconomy, and building cooperation is a key lesson on this topic for the RDI2CluB regions.

Skilled labor was highlighted. “Education level and population growth parameters are two significant weaknesses in connection to availability of qualified or able to learn workforce at the present and in forthcoming decades”. This has quite an important link to higher added value processing. Without high level R&D, there is no new innovations. Majority of the RDI2CluB regions have declining population growth. This is a challenge, especially since the aging of the population means less skilled labor force in the regions. How to increase the knowledge, when the skilled people are moving away? The present skills of the employees, and the future skills that are required, are essential to identify. This is not only for the companies' point of view, but also for the educational institute's point of view. Training the skilled labor force will result in a higher employment rate and thus is beneficial for the region's economy. RDI2CluB regions have multiple solutions for this; universities of applied sciences and other organizations on applied science in bioeconomy can create a platform for bio-focused R&D. Networking and mutual learning between the regions with similar challenges can build the capacity to increase the knowledge, and as it best, also offers new business opportunities between the regions.

Regions in RDI2CluB project have agreed to create a **joint innovation hub**. This answers to especially the recognized need to support innovations in SMEs. Though the regions are different, they can help each other by connecting regional innovators and innovation incubators in bioeconomy. Lesson learnt from Biobased Delta is the cooperation. In RDI2CluB case, the trans-regional cooperation among the various stakeholders enables the further increase of bioeconomy innovations and the access to markets.

4. Self-evaluation of the Regions

Regional Bioeconomy Profiles were seen as a useful tool for describing regional bioeconomy. Comparison to national level showed the strengths of a region, but also requires further analysis. Due to the national level comparison, the sectors, that are specific to a region and do not have such importance on national level, seem to dominate the tables and figures of a region even when it has very minor impact on regions bioeconomy. This is the reason why the interpretation of a profile must be done with solid knowledge on regions realities. Local level knowledge is also a key to successful transformation of the bioeconomy regional profile findings into concrete actions.

The recommendations were described as "generic". However, simultaneously the need for future orientation was raised up. In general, a lack of timelines in specific bioeconomy sector was a weak point of a regional profile. On the other hand, the follow-up discussions and workshops, provided important information from the stakeholders on this. Regional profiles are a start-point of regional level discussions with the stakeholders. The collection of the data was seen beneficiary for a region. The tables and figures of the regional bioeconomy profile were seen informative and easy-to-digest.

Data gathering and reliability of the data was a challenge. Country level data estimates on regional level do not provide precise enough information. We need regional level data gathering. Lack of biobased economic data on certain specific sectors, like construction or chemical industry makes it hard to estimate the importance of these sectors on overall bioeconomy. In case of innovation potential, the overall activity on R&D (personnel, turnover, companies) does give an idea on total innovation activity but may not reflect that on bioeconomies point of view.

Regions define their bioeconomies in different ways, and this can create challenges on trans-regional dialogue. This is also true inside the regions. When discussing bioeconomy, we need to first have a common understanding on the terminology.

All the regions saw bioeconomy profile as prominent way for a dialogue between different stakeholders. A triple-helix partnership of the project partners on regional level enables deeper dialogue. Regional dialogue workshops were seen as good forum for further discussions in preparation of the Joint Action Plans, and other bioeconomy related regional cooperation models.

Concluding Remarks

The conclusions of Regional Bioeconomy Profiles development process can be summarized to the following points.

1. Regional Bioeconomy Profiles are useful for regional developers, when they further develop their regional bioeconomy strategies.
2. Bioeconomy is defined differently region per region. This creates challenges on regional and trans-regional dialogue and data comparison.
3. Bioeconomy statistics need to be further developed on regional and national level. Especially on sectors, where fossil- and biobased economies are parallel, e.g. in energy and building sector, the opportunities to identify biobased jobs and added value should be further developed.
4. Sectorial approach is working well when dealing raw materials, land use and other traditional regional parameters. When dealing the level of innovations, research and development, we need to create more detailed analysis based on the regional level expertise.
5. Bioeconomy profiles act as a start point for regional bioeconomy strategy work. For this purpose, we also need long time datasets, to understand the regional trends in bioeconomy.

On EU Bioeconomy strategy update (10/20018), the importance of regional and national level bioeconomy strategies was highlighted. There is an increasing interest to create a database of indicators for national and regional bioeconomy monitoring. Joint Research Centre (JRC) has these kinds of activities, simultaneously with various national and transnational projects (e.g. Swedish regions activity in bioeconomy statistics collection, Biomonitor, MontBioeco, Boost4Bio etc.) A base of a strategy is the understanding of the current status of a bioeconomy. Also, a clear result from this work is, that we need not only national level data, but also regional level datasets in bioeconomy. Bioeconomy is very much linked to regional development, especially via S3 strategies.

Further work is required especially on statistical tools; current NACE coding system does not support the identification of bioeconomy activities. The most problematic sectors include building, chemical industry and energy. These three sectors are also the most crucial ones in transition to fossil-free era – so it is of uttermost importance to develop national and regional data to show the growth of bioeconomy in these sectors.

References:

EU Bioeconomy strategy:

<https://ec.europa.eu/research/bioeconomy/index.cfm?pg=policy&lib=strategy>

BERST project: www.berst.eu