Bio-based strategies and roadmaps for enhanced rural and regional development in the EU

Summary report on small-scale bio-based business models and their market potentials

July 2021

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Based on the work of the Task Forces of OIP Covasna, OIP Strumica, OIP Kurzeme & Vidzeme, OIP Polish Lagoons and OIP Stara Zagora

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EXECUTIVE SUMMARY

This deliverable report describes the work carried out under Task 5.3 of the BE-Rural project, *Developing business models and analysing market potentials.* The task was conceived and executed as a capacity-building exercise in which the facilitators of BE-Rural's Open Innovation Platforms (OIPs) worked together with bioeconomy entrepreneurs and other regional stakeholders to conceive suitable, locally-adapted business models and explore their market potential. The results provide initial building blocks for the OIPs and their stakeholder groups to develop bio-based strategies and roadmaps based on the identified needs and market characteristics of their regions.

The first chapter of this document introduces the bioeconomy as a promising approach to generate new jobs and economic growth by uncovering new bio-based business models on the basis of regionally available resources. It then provides a broad overview of the elements that make up the EU framework to support the bioeconomy transition. An outline of the methodological approach used for the market assessment and business model design follows. The chapter closes with a list of the bio-based products and services that were evaluated and some initial background information on why they were selected.

The second chapter compiles synthesis reports for each bio-based product or service extracted from the full assessments that were carried out in each of the five OIP regions. Each synthesis introduces the bio-based product or service that was evaluated; describes its value proposition; names the owner of the business idea and the individuals who were involved in the assessment; provides a brief overview of the results of the market assessment activities; illustrates the business model with a business model canvas; and outlines relevant considerations for the future development of each enterprise (opportunities and threats).

The third chapter presents the results of a process of discussion and reflection that aimed to evaluate the procedure followed, identify positive experiences, areas of opportunity, and the factors that played a role in each outcome. It is intended as a summary of lessons learned for OIP facilitators and others who might want to continue exploring business ideas within their region using the BE-Rural approach.

The last chapter provides some overall conclusions, pointing to the wide variety of business ideas that emerged from the five regions; recognising that the EU framework in place provides a good foundation, but that more dedicated connections within country networks are necessary to effectively uncover opportunities and drive collaboration based on concrete ideas. It points to the potential of small-scale bioeconomy businesses to evolve into strong regional networks connecting new and redesigned value chains and increasing the well-being of rural communities.

The detailed, confidential assessments of the individual business ideas on which this summary report is based, are available in a separate document, for which access is restricted to the *BE-Rural Task Forces on Market Assessment and Business Model Design*, the wider BE-Rural Consortium, and the Commission Services.

Table of contents

Figures

Tables

Abbreviations

BIA	Bulgarian Industrial Association
CoR	Committee of the Regions
EC	European Commission
EU	European Union
EGD	European Green Deal
GHG	Greenhouse Gas
IPE	Institute for Economic Forecasting
MAF+	Market Assessment Framework
NGO	Non-Governmental Organisation
NMFRI	National Marine Fisheries Research Institute
OIP	Open Innovation Platforms
SDEWES	International Centre for Sustainable Development of Energy, Water and Environment Systems
SDG	Sustainable Development Goals
SILAVA	The Latvian State Forest Research Institute
WP	Work Package

1 Introduction

1.1 A promising perspective

The bioeconomy is an appealing approach for policy making as it holds the promise to uncover new bio-based business models on the basis of regionally available resources, to generate new jobs and economic growth. At the same time it has the potential to contribute to climate and environmental protection through the efficient and environmentally friendly use of resources. According to the European Commission, the bioeconomy can act as a catalyst for systemic change, tackling economic, environmental and social aspects at once (EC 2020).

According to estimates from Ronzon et al. (2020), in 2017 the bioeconomy was contributing 4.7% of the EU-27 GDP and 8.9% of the EU-27 labour force, with prospects for further growth. Job creation in the bioeconomy is expected to be particularly high in coastal and rural areas, as participating in a local bioeconomy can help primary (biomass) producers diversify their activities and create more added value that remains in their regions (EC 2018a).

Arranged properly, the bioeconomy has the potential to contribute to the achievement of the Sustainable Development Goals (SDGs) and other EU sustainability-related policies. For instance, it is seen as key in the transition from fossil resources towards renewable, bio-based resources, e.g. in industrial production. This is expected to play an important role in reducing green-house gas (GHG) emissions and thus to contribute to climate change mitigation (Spatial Foresight et al. 2017). Moreover, the bioeconomy plays an important role in the transition towards a circular economy. At its core, the bioeconomy implies a set of changes in all economic sectors that involve the production, processing, use and end-of-life processes of biomass. Associated with this is an increase in the re-use, cascading use and recycling of biomass and waste streams, which is enabled through social and technological innovations (Spatial Foresight et al. 2017). In this sense, a circular bioeconomy has the potential to contribute to all dimensions and objectives of the newly launched European Green Deal (EGD). This is reflected by the inclusion of the bioeconomy among the proposed actions for the European Climate Pact which is part of the EGD:

> *"European funds, including for rural development, will help rural areas to harness opportunities in the circular and bio-economy. The Commission will reflect this in its long-term vision for rural areas. It will pay particular attention to the role of outermost regions in the European Green Deal, taking into account their vulnerability to climate change and natural disasters and their unique assets: biodiversity and renewable energy sources (EC 2019, p. 23)".*

The European Commission also foresees that the bioeconomy will play an integral role in spurring the EU-recovery from the COVID-19 crisis, for instance by improving resilience and competitiveness, providing long-term systemic solutions, and ensuring a just transition (EC 2020). On the other hand, the COVID-19 pandemic offers an opportunity to trigger systemic change on many levels, including one towards a sustainable and circular bioeconomy. However, for this potential to materialize, existing contradictory policy goals, e.g. in terms of long term investments, need to be better understood and addressed (BE-Rural 2020).

1.2 Elements of the EU framework to support the bioeconomy transition

At EU level, the bioeconomy is governed by the EU Bioeconomy Strategy and its associated Action Plan, which were updated in 2018 and have among their top priorities the development of new business models, not least to bring the economic benefits of the bioeconomy to rural regions. The following passages from the strategy reflect this clearly (EC 2018a)

> *"For the bio-based sector to deliver its benefits across regions and actor groups, and to ensure a balanced distribution of its benefits, different technologies and business models need to be developed, offering a portfolio of options (EC 2018, p.46)".*

> *"To achieve a wide deployment of sustainable bio-based value chains, it is necessary to develop in parallel business models that can be replicated and adapted to a variety of locations and contexts, with lower levels of investment, risk and technical sophistication, which can be plugged into established food and bio-based value chains or to stimulate new alternatives, taking advantage of the benefits of the particular location (resource availability, socio-economic factors, etc.). A wider range of actors need to get involved, including farmers and forest owners (alone or in association), small businesses, etc (EC 2018, p. 58)".*

To this respect, *regions* are considered by the European Committee of the Regions (CoR) to be the most appropriate territorial level at which to implement bioeconomy strategies (CoR 2019). Hence, the CoR encouraged all European regions to either adopt bioeconomy action plans by late 2024, or to at least include a dedicated chapter on this in their global development strategies (CoR 2019). Furthermore, the EU 2020 Strategy and EU Cohesion Policy 2014-2020 encouraged national and regional authorities to develop Research and Innovation Strategies for Smart Specialisation (RIS3). The majority of regions that have developed such strategies so far have incorporated bioeconomy-related aspects in them, making RIS3 a potentially suitable mechanism to develop the bioeconomy in the absence of dedicated strategies (Spatial foresight et al. 2017).

Next to the potential to revitalize rural economies by creating new jobs and generating more added value in these regions (EC 2018a), the transition towards a circular bioeconomy also generates expectations in terms of research and innovation (R&I), for instance in emerging fields such as biotechnology (Spatial Foresight et al. 2017). The growing strategic relevance of bioeconomy R&I for the EU is reflected by the gradual increase in its share of the European research programme funding: while the FP7 programme (2007 – 2013) contemplated EUR 1.9 billion funding for bioeconomy topics, its successor Horizon 2020 (2014 – 2020) more than doubled the sum, with EUR 4.52 billion (EC 2017). The most recent programme, Horizon Europe (2021 – 2027), has a proposed budget of EUR 10 billion for food and natural resources, including the bioeconomy (EC 2018b). In this context, Horizon Europe's destination "Circular economy and bioeconomy sectors" under cluster six "Food, Bioeconomy, Natural Resources, Agriculture and Environment" has a clear focus on small-scale business model development of both technological and non-technological nature.

However, in addition to supporting policies and R&I programmes, the successful transition to a bioeconomy requires closer consideration of the financial feasibility and market readiness of entrepreneurial endeavours that develop bio-based products and services (Reim et al. 2019). To this respect, business development methodologies are useful to help social and technological innovators to reflect on their business models and redefine key aspects such as value proposition, creation, delivery, and capture in order to improve their economic feasibility (Reim et al. 2019).

1.3 BE-Rural's approach for designing small-scale bio-based business models and exploring their market potential

The BE-Rural Open Innovation Platforms (OIPs) bring a diverse range of regional stakeholders together to discuss, plan and ultimately take part in the bioeconomy. This wide representation and mix of perspectives can make the OIPs relevant sources of market intelligence and feedback that can effectively help bioeconomy entrepreneurs to develop more user-centric products and services and bring them to market (Anzaldúa et al., 2020). The methodology prepared for this task and the process followed for its implementation was designed to promote open innovation and generate instances of collaboration on concrete business ideas that the OIP members deem relevant and adaptable to the context of their region. The core element of this is the *Task Force on Market Assessment and Business Model Design.* This is a group of individuals from the OIP that are invited to take part in the exploratory assessment of a business idea by contributing their specialized knowledge of the region, their professional experience, access to specific data, information and contacts, etc. Underpinned by this collective knowledge, the bioeconomy entrepreneurs who have come forward with their bio-based business ideas get the opportunity to incorporate expert insights into their market analysis and business model design activities. The assessment is executed following an agile approach in which the Task Force meets at regular intervals to examine different elements of the business strategy and to develop them iteratively and incrementally.

The methodological framework used by the Task Force is structured as a collaboration system consisting of seven market analysis and business development exercises (for additional detail refer to Anzaldúa et al., 2020). These are designed to be completed by non-specialists in these topics with guidance from supporting partners from BE-Rural. Each exercise supports Task Force members on the path towards evolving an identified gap in the market into a bio-based business. Succinct text explains each exercise's purpose, provides step-by-step instructions, and features relevant examples. The assessment uses previous outputs of the BE-Rural project as impulse for the Task Force members to reflect on the external conditions that influence their region's market. It then helps define and prioritize market segments, and supports in estimating their size and drawing projections for the future. After this first stage, which represents the market assessment, the framework shifts to business model design activities. Here, it deals with identifying the relative strengths and weaknesses of the bio-based product or service and its provider, and consolidating the information gathered into a Business Model Canvas. Due to their format, the exercises help the Task Force to produce practical outputs that can feed directly into a business plan, marketing, and strategic planning documents. At the same time, there is a conscious intention to build the Task Force's capacity by getting members who are not acquainted with marketing and business concepts to learn about them through practice.

1.4 Overview of the inception phase at each of the OIPs and the bio-based products and services explored

The following bio-based products and services were evaluated in each OIP using the approach described above:

- **The Task Force from OIP Covasna in Romania assessed a consultancy service based on the concept of Sustainable Energy Communities.** Sustainable Energy Communities are groups of stakeholders, private and public entities on local or micro-regional level who are engaged to develop and contribute to a biomass value chain with the goal of ensuring the local energy supply from local renewable and sustainable resources. In the context of the bioeconomy strategy or roadmap that the OIP facilitators will develop for their region in the next phase of the BE-Rural project, they considered this service a relevant initiative to explore as the concept behind it involves engaging multiple stakeholders from communes in Covasna around bioenergy, the main field of interest for bioeconomy entrepreneurs of the region. The OIP facilitator saw potential in this to gain a much deeper insight into the local dynamics and priorities, and to use the lessons of the assessment as a building block for their own work on the regional strategy or roadmap development. Concretely, this will inform the design of the measures to be incorporated in the regional strategy or roadmap. It will also help lay guidelines on involving local actors in the establishment of bio-based value chains for renewable energies in rural areas. The group was also interested in finding and developing instances of cooperation between entrepreneurs in the field of bioresources for renewable energies; in building capacities to provide technical support in exploring business opportunities in the circular economy and energy sector; and in training and informing members of regional clusters on identifying and accessing support and funding programs. In preparation for the market assessment and business model design exercises, the Romanian OIP facilitators updated their information on the current biomass supply and potential as well as on the needs and wants of regional stakeholders. They collected information about the amount of biomass potentially available as an alternative feedstock and about the formats in which biomass is or could be supplied. They confirmed that while a small number of biomass plants are concentrated in the area where the biomass resource is mainly located, there are still unused biomass feedstocks available. In addition, there is a biomass and waste logistics centre working with biomass feedstocks in the region, but more than 50 km far away from potential biorefineries or bio-based industries. This led the facilitators to seek businesses and entrepreneurs involved in finding ways to incorporate the available biomass into new- or updated value chains, ultimately liaising with Biomass NRG Consulting SRL.

- **The Task Force from OIP Strumica, North Macedonia evaluated a mycelium-based packaging and insulation material**. This is a biodegradable substitute to expanded polystyrene that is sourced from agricultural and forestry residues. It has applications in the

packaging, construction and fabrication industry. In the context of the bioeconomy strategy or roadmap that the OIP facilitators will develop for their region in the next phase of the BE-Rural project, they considered this bio-based enterprise a relevant initiative to explore as it would be a first instance to promote joint work of the stakeholders with bio-innovators to conceive suitable, locally-adapted business models. Further, it would generate insights on regional and local bio-based economies, the contextual background and the specific information on biomass potentials, market needs and local conditions with view of easing the uptake of bio-based solutions. It would also endow the facilitators with new skills and knowledge on providing support to innovation within the local reality. Finally, it would lay out building blocks for local municipalities and authorities to develop their bio-based roadmap. Concretely, the Task Force sought to explore the key concepts of circularity, the sustainability of the biomass supply, the optimization of value creation (cascade use of biomass), and the integration of new agricultural and industrial value chains. The group was also interested the aspects of business sector development; R&I capacities and activities; use of diverse EU, national and regional funding streams; synergies with other policy fields related to rural and regional development (S3); education/information in relation to sustainability; international collaboration and sharing of good practices among regions. In preparation for the market assessment and business model design exercises, the OIP facilitators updated their insights on the current biomass supply and potential as well as on the needs and wants of regional stakeholders via an online survey which was responded by a small number (<15) of stakeholders from the region belonging to academia, business and the public administration. The results of the survey confirmed the facilitators' expectations, indicating that currently important biomass streams in the region stem from agricultural/agri-food waste (different streams), forest biomass (wood and by-products from wood processing, e.g. saw dust), and root vegetables. As to stakeholder needs, the survey results pointed to 1) taking advantage of locally available resources that are currently unused; 2) diversification of the regional/local economy; and 3) reduction of plastic littering. The biggest opportunities for biomass use that were identified included anaerobic biodigestion for biogas production (bio-energy); pellets and woodchips (bioenergy); and production of renewable biocomposites (e.g. for manufacturing plant pots, construction boards and ornamental vases) from mycelium (fungus) growing in agroforestry residues. This led the OIP facilitators to BioPAT and SOMA, two collaborating start-up companies developing new designs, technologies and biotic materials aimed at reducing pollution, enabling sustainable industry and boosting circular economy.

- **The Task Force from OIP Vidzeme and Kurzeme in Latvia explored a bio-based product named Wood Wool**. This is a purely natural upholstery product elaborated in an eco-friendly manner. It has applications as building and decoration material. Further, an extension of the business model is being considered, using the farm where production takes place as an eco-tourism location. In the context of the bioeconomy strategy or roadmap that the OIP facilitators will develop for their region in the next phase of the BE-Rural project, they considered this bio-based enterprise a relevant initiative to explore as it could provide a concrete example of the valorisation of otherwise unused biomass as alternative resource in products that could drive small-scale business development in rural areas. Concretely, the Task Force sought to explore the possibility of transforming waste material into simple products and developing a small-scale business in a rural area to commercialize them without incurring in large investments. The group was also interested in understanding the level of complexity of setting up such a business in the region and in getting an indication of its potential profitability. Lastly, there was interest in generating and showcasing a positive example of how it is possible to set up small businesses in Latvia's rural area exploiting raw materials that are easily available and free. In preparation for the market assessment and business model design exercises, the OIP facilitators had to update their insights on the current biomass supply and potential as well as on the needs and wants of regional stakeholders. For this, the Latvian OIP facilitator carried out a small number (<15) of individual interviews in the region and consulted statistical reports. Interviewees belonged to the stakeholder groups of academia and business. The preparatory activity confirmed the facilitators' previous knowledge that biomass in the region is mostly used in boiler houses and cogeneration stations, and that there is a need for freely available, cheap and predictable biomass. A new insight that was attained was that after pre-commercial

thinning, parts of unused tree trunks can be employed as input for production of textiles. This led the facilitators to Mr. Ritvars Tocs, a craftsman who produces fabric from tree fibers. Mr. Tocs has experience in tourism but no previous training on business development.

- **The Task Force from OIP Polish Lagoons explored a concept of "slow tourism" underpinned by low-value fish species in the rural areas of the Szczecin and Vistula Lagoons.** Rather than exploring a single small-scale business model in isolation, the task force took a wider perspective to examine the incipient value chain that supplies low-value fish stocks (e.g. bream, roach, perch and herring) to an also budding segment of the tourism sector in the lagoons: "slow tourism". This led the facilitators to Mrs. Adriana Kutelska and Mr. Piotr Kutelski, founders of the Ptaszarnia Guesthouse; and Mr. Jerzy Bogusz, owner of the Nad Zalewem Restaurant. These are two small existing businesses that have these low-value fish on regular offer in the Szczecin Lagoon and the Vistula Lagoon, respectively. The purpose of following this adapted approach was to gather insights for formulating a branding and promotion concept for the regions that is underpinned by short but strong value chains for the exploitation of fish stocks that are currently seen by local fishers as by-catch and are thus rarely used or treated as waste. The task force used their knowledge of the region and their local contacts to inform their market assessment.

- **The Task Force from OIP Stara Zagora in Bulgaria explored a cold-pressed grape seed oil.** This is a high quality natural product that could be produced at low cost in the region and commercialized both there and in the rest of the country to establish short value chains and replace imported counterparts that are used as inputs to the production of cosmetics manufacturers. The OIP facilitators came in contact with the owner of the business idea, Mr. Ivan Georgiev, an Agricultural Machinery Engineer who lives and works in Bulgaria, in the Stara Zagora region. The task force sought to evaluate this as a viable option to exploit residues from the production of Bulgarian wine, which has gained popularity in recent years. Interest has been already expressed by several stakeholders, including a winery and several cosmetics manufacturers established in the region.

The following chapter provides a brief synthesis of the assessment results for each of the bio-based products and services described above.

2 Bio-based business models explored in the BE-Rural OIPs

2.1 Sustainable Energy Communities from Covasna, RO

2.1.1 Bio-based service and value proposition

The analysed business idea is a consultancy service specialising in the design and establishment of "Sustainable Energy Communities" in rural areas. Sustainable Energy Communities are groups of stakeholders, private and public entities on local or micro-regional level who are engaged to develop and contribute to biomass value chains with the goal to ensure the local energy supply from local renewable and sustainable energy resources. This involves a variety of value propositions which are differentiated on the basis of the market segments targeted. The most important ones considered in the assessment are:

- Developing the concept of sustainable energy (rural) communities by setting up a participatory approach involving local stakeholders and (re)designing the value chain for the production and local use of renewable energies in rural areas
- Providing technical support (e.g. from idea creation to technical design and planning, including business plans and development actions) for companies in exploring business opportunities in the circular bioeconomy and energy sector
- Providing training and information to cluster members (e.g. private companies, R&D institutions and authorities) on the identification and access to support and funding. These can be for example from national, international and EU funding programmes such as AFM (Funds for Environment in Romania), POIM (Large Infrastructure Operational Program), PNDL (National Plan for Local Developments in Romania), Innovation Norway, Horizon 2020/Europe, Interreg Danube Transnational Programme, Urban Innovation Action, among others)
- Developing cooperation between local key stakeholders in the fields of bioresources and renewable energies. These include for instance collaborative projects among local public authorities, enterprises and NGOs for the establishment of local bio-based supply chain, biomass-based energy supply, local renewable-energy based district heating system, etc.

2.1.2 Stakeholders involved in the assessment

Task force:

The MAF+ exercises for the OIP Covasna in Romania were carried out by the task force composed by a total of six persons which included team members of the business idea owner (Biomass NRG Consulting Srl) and the OIP facilitators (IPE), as well as a representative of the Romanian Green Energy Innovative Biomass Cluster, based in Covasna. The whole process also included an active involvement of the BE-Rural project team's task lead Ecologic Institute.

Business idea owner:

Biomass NRG Consulting
S U C C E S S

GREEN ENERGY
Romanian Innovative Biomass
CLUSTER

Biomass NRG Consulting Srl is an integral consultancy and service provider company based in Covasna County Romania. It is focused on energy production from biomass and social and technology

innovation with focus on rural and less developed regions in Romania. Among its most important services are the development and elaboration of bioenergy strategies and the development of energy self-sufficient communities, e.g. for municipal governments. The company is composed by a small team of young and motivated professionals with ample experience in the equipment related to bioenergy and its installation, as well as on project development that goes hand I hand with key stakeholders at local level. Biomass NRG is a member of the Green Energy Innovative Biomass Cluster.

Team:

Tihamer Sebestyen is Ph.D. Researcher in field of renewable and sustainable energy resource-based local and rural developments. He is the owner of Biomass NRG Consulting Ltd established in 2011 and leads a young professional team who is engaged in sustainable developments of rural areas with alternative methods.

Vasilica Racariu is a geographer graduated from the Alexandru Ioan Cuza University of Iași and a partner of the Green Energy Cluster from Covasna. Her basic training is in the field of environmental science, geomatics and preliminary problems in the study of groundwater quality (from wells). Her current work centres on sustainable development and consolidation of a Romanian village through the creation of a value chain for local and renewable thermal energy from wood biomass, including waste.

2.1.3 Results of the market assessment and business model design process

The market overview

Biomass NRG operates at the moment mainly in Covasna County and neighbouring regions and its business model is adapted in first line to the particular conditions that are found there.

Romania does not have a bioeconomy strategy nor a specific regional bio-based industry strategy. However, many national policies are focused on bioeconomy-related issues and are underpinned by EU level policies, which is channelling public spending in these bioeconomy-related sectors (e.g. via subsidy programmes). For instance, Romania's Law no. 220/2008 on the Promotion of Renewable Energy Sources, the national transposition of the EU Renewable Energy Directive, supports renewable energy sources (e.g. biogas) through a mandatory quota system based on green certificates. Under this mechanism, a defined percentage (quota) of the entire gross electricity consumption has to come from energy sources that qualify for these green certificates, which are eligible for public subsidies (Investromania 2016). Therefore, projects that apply for public subsidies are more likely to receive them if they include, at least partially, bioeconomy-related topics such as bioenergy production and utilisation of local bioresources.

At regional level, the Regional Smart Specialization Strategy (RIS3) of the Central Region and the 2010 Master Plan for Biomass, as well as other policies in preparation, have links to the bioeconomy in general and bioenergy specifically. In this context, public funding of related activities is likely in the coming years.

According to a previous assessment of the macro environment of BE-Rural OIPs (see Anzaldúa et al. 2019) bioenergy is currently the most promising bioeconomy sector for the future in Covasna County, particularly from waste generated by the wood processing industry and private households.

Moreover, Covasna County features a unique bottom-up initiative to promote bioenergy called "1 village 1 MW". This is aimed at implementing small-scale bioenergy projects, initially to supply local public buildings but with prospects of expanding to supply private businesses and households. The project has been launched by the Green Energy Innovative Biomass Cluster in 2012 as a means to reduce local energy spending and decrease dependence on imported fossil fuels, while addressing environmental issues related to their combustion. In this context, various municipalities have already submitted project proposals and implemented bioenergy investments in their area, making this sector-led initiative one of the most successful development approaches in the region.

Biomass NRG has been involved in development on Energy Efficiency Action Programme in Ghelinta Municipality, as well as on the development of local bioenergy strategies and other project developments for rural development programs. These activities offered the unique opportunity for advising further municipalities, households and companies in developing sustainable energy communities focused on the utilization of local biomass, particularly waste. During the development processes the company gained not only up-to-date details on specific technologies but also social skills on how to establish and develop working groups, team building skills, delivered engagement events with key influencers and developed trust-based strategical action plans with local decision makers. Therefore, among the market segments potentially suitable for the type of services that Biomass NRG offers are local and regional authorities and institutions, private households, as well as companies in the agricultural, energy, forestry and related industrial sectors.

The identified market segments have been further analysed and prioritized to sort out which of these can be considered *target groups* following five criteria:

- Their needs and willingness to act upon them
- The capacity of the offered service to satisfy these needs
- The access to/ease of communication with the market segment
- The existence of competitors addressing the identified needs
- Substantiality and potential profitability of the market segment

Due to the very broad nature of the service provided, many of the identified market segments were considered in the assessment as potential target groups. However, when considering future perspectives in terms of market growth rate, penetration, and profitability, certain groups appeared comparatively more attractive. For instance, in terms of needs and willingness to act upon them, local authorities are encouraged by the regional authorities to manage the waste which results from cutting off branches. Moreover, investing in the utilization of these residues for energy production also offers the potential to cover the cleaning of river beds, roadsides and green spaces. To this respect, it is foreseeable that the authorities could make an investment to replace their current heating systems with one based on this biomass in the form of wood chips. On the other hand, for households there is also a need to find alternative uses for domestic wood residues, as Romanian law prohibits the burning of waste in the open field. Nevertheless, while using this waste could also be economically beneficial for this market segment, in the short term it is still not likely that it will be willing to spend money on advice or technologies to valorise this waste. Therefore, the decision was made to pursue a phased strategy focusing efforts on the most immediately relevant segment (i.e. local authorities) during the first three years and then re-evaluating and following on the rest (e.g. regional authorities, private households, farmers and companies from forest-based industries). Through this, it was possible to narrow down priorities for the development of the business model canvas. Nonetheless, as the different target groups' needs and required services differ significantly, in turn demanding differentiated strategies, a business model canvas was developed for each of the top priority segments. These are presented below.

Business model canvas

In the case of Biomass NRG Consulting, the business model canvas was used to visually represent the company's current and future business model by summarizing its most essential components discussed throughout the MAF+ exercises. The business model canvas captured the key elements of the business plan whilst highlighting the links between components. Since the company had not developed yet such a map about its customer segments, the relationships between the stakeholders and business components, the MAF+ exercises were perceived as a training which supported and encouraged the company for further development. By completing the business model canvas, the Biomass NRG team managed to clarify gaps in the core business approach and get additional clarity to the process of business development.

Table 1 Business model canvas for target group local authorities, Biomass NRG, Romania

<table>
<tr><th>7) Key Partners</th><th>6) Key Activities</th><th>2) Value Propositions</th><th>4) Customer Relationships</th><th>1) Customer Segments</th></tr>
<tr>
<td rowspan="2">Local authorities
Green Energy Cluster
Media Ministry of Environment, Waters and Forests (MEWF)
Local Action Group (LAG)
Regional Development Agencies (RDA)
Ministry of Agriculture and Rural Development (MARD)</td>
<td>Regular meetings.
Promote spring cleaning as a community action.
Attract sponsors for events.
Organizing online or physical events with local authorities, MEWF, MARD and RDA to debate.</td>
<td rowspan="2">We have an integrated and innovative approach to sustainable and renewable energy sources.
We offer you the easiest alternative to collect the branches, in order to not burn or deposit them illegally.
With us, you have the best reason to clean the roadside, because it adds value to your heating solutions.
You can resolve an environmental problem in your commune, and also obtain a cheap resource of thermal energy for heating the city hall and schools.
You can be a national example of sustainable development and have the ministry recognition for that.*</td>
<td>Direct sale of consulting services
Meeting once a month, maybe on monthly council meeting to establish the next steps to be followed.
Keeping close relationship with the mayor by inviting him or the councelers to events on the sustainable development of rural communities.</td>
<td rowspan="2">1. Local Authorities</td>
</tr>
<tr>
<td>5) Key Resources:
Building
Human resources
Social media
Grants from LAG, MEWF, MARD and RDA.</td>
<td>3) Channels
Social media pages of our company and our customers.
Articles in the local newspaper.
Advertising on online meetings.
Sending emails with our offers.
Established meetings 1:1, in person.</td>
</tr>
<tr><th colspan="3">8) Cost Structure</th><th colspan="2">9) Revenue Streams</th></tr>
<tr>
<td colspan="3">Fixed :
Salary for employees
Bills on energy
Advertising
Variable:
Training courses
Transport</td>
<td colspan="2">Commission from projects
Being involved in local events where we have presentation of our activity</td>
</tr>
</table>

Table 2 Business model canvas for target group private households, Biomass NRG, Romania

<table>
<tr><th>7) Key Partners</th><th>6) Key Activities</th><th>2) Value Propositions</th><th>4) Customer Relationships</th><th>1) Customer Segments</th></tr>
<tr>
<td rowspan="2">Local authorities
Green Energy Cluster
Media
Ministry of Environment, Waters and Forests (MEWF)
Local Action Group (LAG)
Regional Development Agencies (RDA)
Ministry of Agriculture and Rural Development (MARD)
Active citizens.</td>
<td>Regular meetings.
Promote spring cleaning as a community action.
Attract sponsors for events.
Organizing online or physical events with local active citizens.</td>
<td rowspan="2">We offer you the easiest alternative to collect the branches, in order to not burn or deposit them illegally.
You can resolve an environmental problem in your commune, and also obtain a cheap resource of thermal energy for heating your house.
You can have a product like wood chips obtained in your household and used as soil fertilizer, decoration and against weeds invading the lawn.
In the spring season, there is no need for you to burn the branches, you can either chop them or give them to a collector (local authorities or a firm).</td>
<td>Direct sale of consulting services
Keeping close relationship with the inhabitants.</td>
<td rowspan="2">2. Private households</td>
</tr>
<tr>
<td>5) Key Resources:
Building
Human resources
Social media
Formal partnerships with local NGOs.</td>
<td>3) Channels
Social media pages of our company and our customers.
Articles in the local newspaper.
Advertising on online meetings.
Local events.
Online meetings.</td>
</tr>
<tr><th colspan="3">8) Cost Structure</th><th colspan="2">9) Revenue Streams</th></tr>
<tr>
<td colspan="3">Fixed :
Salary for employees
Bills on energy
Advertising
Variable:
Training courses
Transport</td>
<td colspan="2">Commission from projects
Being involved in local events where we have presentation of our activity</td>
</tr>
</table>

2.1.4 Relevant considerations for the future

Related to external factors, the type of services that Biomass NRG is and will be offering are expected to be positively affected for instance through further policy developments at EU level. Among relevant policies that could create more favourable conditions for the business idea are the EU Renewable Energy Directive or the Energy Union Strategy, which has recently become the key policy instrument for achieving the energy transformation and climate neutrality goals set by the European Green Deal. These policies address on one hand the substitution of fossil fuels with renewable energy sources such as biomass. On the other hand the Energy Union also has an explicit goal to diversify Europe's energy sources to make a better, more efficient use of the energy produced within the EU. The activities of Biomass NRG harmonize very well with these policy objectives and future funding streams related to these, including national public funding programmes (e.g. PNRR, PNDL 3) and international funding programmes (e.g. POR, Horizon Europe, Interreg Danube, Innovation Norway, Urban Innovation Action, LIFE). This could mean potential opportunities for the development of bioenergy projects in rural areas.

Moreover, the large biomass availability in the Covasna County, including large quantities of waste from agriculture, forestry and related processing industries create a favourable outlook for self-sufficient, renewable bioenergy projects in the region. This is an advantage that could be effectively tapped with the support of EU mechanisms, potentially increasing the demand for Biomass NRG's services. However, there appears to be still a quite low awareness in a large proportion of the Romanian communes about the potential of developing a local, bio-based energy supply. This represents a threat particularly regarding the target group of households, which could valorize their bio-waste, but are not necessarily willing to pay for the required technologies or technical advice for doing so.

Furthermore, public funding from Romania's national and regional governments is very relevant for financing many of the projects where Biomass NRG's services could be incorporated. Hence, a further threat identified has been the fact that applying for such funding is often linked to bureaucratic difficulties, unclear legislation and unclear guidelines in national funding schemes, which decrease the potential for successful project submissions.

Overall, Biomass NRG is committed to bringing innovation to rural communities, a value proposition that has so-far been well received by local public authorities (three completed projects, six projects in development process while three additional projects under contracting phase), which will constitute the initial focus of further activities. Nonetheless, depending on the developments in terms of public support (both EU and national) of energy transition and self-sufficient energy supply in rural areas, the services could be further expanded to cater private clients. These could be for technical advice for instance households or local companies to collect separately their bio-waste and convert into energy, and through that approach to mitigate their own energy expenses and increase the local energy self-sufficiency.

2.2 Mycelium-based Packaging and Insulation Material from Strumica, MK

2.2.1 Bio-based product and value proposition

BioPAT offers an innovative and sustainable product that utilises the resources from the Strumica region. The product has applications in multiple sectors such as food & beverage, gastronomy and construction. Some of the benefits of this mycelium-based material include that it is biodegradable, flame resistant, lightweight and shock absorbent, durable and flexible. The production process generates no wastewater and uses significantly less energy than traditional solutions. The product is highly suitable for wineries commercialising luxury wine lines who are interested to reduce their plastic packaging and want to raise awareness on the importance of biodegradable materials.

Figure 1 Examples of packaging applications using mycelium-based material. Source: BioPAT

2.2.2 Stakeholders involved in the assessment

Task force:

The assessment exercises for the OIP Strumica in North Macedonia were carried out by a task force composed by six persons which included team members of the business idea owner (BioPAT) and the OIP facilitators (SDEWES). The process was supported by the BE-Rural project team's task lead Ecologic Institute, who provided guidance, reviewed the results of the exercises and provided feedback along the way.

Business idea owner:

The business idea belongs to a collaboration between BioPAT and SOMA labs, two start-up companies from North Macedonia and Serbia, respectively. BioPAT owns a franchise from SOMA labs and works to unlock natural properties of microorganisms and fungi in order to develop practical uses to help achieve the vision of healthy people in a healthy environment. The team is composed of passionate forward-looking individuals united around the ideals of environmental and personal health. BioPAT and SOMA both believe in a sustainable and green future, powered by biotechnology. They are developing new designs, technologies and biotic materials, aimed at reducing pollution, enabling sustainable industry and boosting circular economy. They are also involved in the production of health and wellness supplements using environmentally friendly processes.

Team:

BioPAT specializes in sustainable promotional activities and packaging designs and solutions. They have close collaboration with a large network of scientific consultants from fields of biotechnology, biochemistry and molecular biology, as well as national and international institutions in the bio-based sector. BioPAT has all the expertise necessary for successful project implementation, including experience and knowledge in management, technology, manufacturing, microbiology, product development, finance and commercialization.

Nikola Stanojevic has graduated from the Faculty of Molecular Biology and Genetics, University of Belgrade. His field of interest is circular economy, eco-design, development and manufacture of innovative sustainable bio-based materials.

Aleksandar Chebotarev is an experienced energy manager with a demonstrated history of working in the renewables and environment industry. Skilled in Renewable Energy, Electrical Engineering, Event Management, Energy Efficiency and Microsoft Office. Strong operations professional with a Master of Science (MSc) focused in Renewable Energy from Faculty of Electrical Engineering and Information Technology FEIT - Skopje.

2.2.3 Results of the market assessment and business model design process

The market overview

BioPAT is exploring the national market for biodegradable packaging materials in North Macedonia. After considering and evaluating 11 different market segments of interest (including the retail sector, the gastronomy sector, the manufacturing industry, and the construction sector), the entrepreneurs and the members of the Task Force selected the Food and Beverage Industry in the country as the most promising segment. The groups foresees that this segment will have a pressing need to replace traditional packaging materials with biodegradable alternatives in the near future. The mycelium-based packaging material is relatively new and unknown at the national level. This product at first might be more expensive than its traditional counterparts, but it will help position clients as innovative and eco-friendly in a market which is increasingly demanding environmentally sustainable solutions. It is expected that in most cases the current facilities of the target industry can be adjusted to adopt the new packaging materials with relative ease and without requiring large investments. Through the research they conducted as part of the assessment, the Task Force has identified over 30 active companies from the sector in North Macedonia that could become potential clients. Based on their calculations, which assume a moderate willingness to adopt the new product, they expect a decent market share could be attained in the first year of operation, generating enough revenue to sustain the start-up. In terms of growth projections, the global market for biodegradable packaging solutions is expected to grow at a CAGR of 5.3%, propelled by increased consumer awareness driving interest and demand for recyclable and sustainable materials and a shift away from plastic counterparts (REF). For the North Macedonian case, the Task Force expects a growth rate of 6%.

Neither the country of North Macedonia nor the Strumica region have published bioeconomy strategies. However, the current political priorities are closely aligned with the concept of bioeconomy, as is reflected by the National Strategy for Agriculture and Rural Development for the Period 2018-2022 and the Macedonian Nationally Determined Contribution (NDC) for the UNFCCC. Further, there is strong political will for EU integration and an ongoing process of structural reforms aimed at adopting EU policies, standards and best practices - including those related to bioeconomy (Anzaldúa et al. 2020). So far no legal constraints for the production of the mycelium-based packaging and insulation material have been identified by the Task Force members.

The main economic activity in the Strumica region is agriculture, with animal husbandry, viticulture, vegetable and fruit cultivation, livestock breeding and forestry industries being important bioeconomy sectors in the region. There are around 900 business entities related to the bioeconomy and rural development operating here. There is great potential for value creation in the region, which lies in the valorization of agricultural residues and forest biomass. Feedstock availability is not sufficient for large-scale applications, but given the low competition for residues as inputs to production processes, small-scale bio-based operations can be sourced locally (Anzaldúa et al. 2020). BioPAT would use local agricultural residues combined with mycelium for the production of the bio-based materials.

Table 3 Business model canvas for Mycelium-based Packaging and Insulation Material

<table>
<tr><th>7) Key Partners</th><th>6) Key Activities</th><th>2) Value Propositions</th><th>4) Customer Relationships</th><th>1) Customer Segments</th></tr>
<tr><td rowspan="2">• Forestry and agriculture residues suppliers
• Wineries
• Stores</td><td>• Securing local feedstock
• Successful production
• Raising awareness
• Acceptance from the market</td><td rowspan="2">We provide innovative, biodegrable, sustainable, flame resistant, lightweight and shock absorbent, durable and flexible product, while the production process generates no wastewater and uses lot less energy than traditional solutions.</td><td>• Traditional sales operations
• Phone/Email/social media interaction
• Personalized support offered</td><td rowspan="2">1. Food and drink industry
2. Local authorities
3. Forestry
4. Building sector</td></tr>
<tr><td>5) Key Resources:
• Financial
• Human
• Intellectual</td><td>3) Channels
• Direct communication with customers and promotion in market/flayers
• Websites and social media</td></tr>
<tr><th colspan="3">8) Cost Structure</th><th colspan="2">9) Revenue Streams</th></tr>
<tr><td colspan="3">Fixed costs:
• Equipment/production
Variable costs:
• Feedstock, license, trainings, workforce</td><td colspan="2">• Fund for Innovation and Technology Development
• Local or national subsidies
• Interested business sector</td></tr>
</table>

2.2.4 Relevant considerations for the future

After consulting the previous outputs of the BE-Rural project most relevant to this task i.e. the handbook on regional and local bio-based economies (Colmorgen et al., 2020), the report on the macro-environment surrounding BE-Rural's Open Innovation Platforms (Anzaldúa et al., 2019), and the report on the bioeconomy potential of the OIP regions (Khawaja et al., 2019)., the entrepreneur and the Task Force conducted an extended SWOT Analysis to examine the internal and external factors influencing the competitiveness of BioPAT and its new product.

Regarding potential opportunities for the future, the group is expecting an increase in the awareness of farmers and forest keepers about the need to valorise their residues. While traditionally the awareness of these groups on the issue of creating value from residues has been low, recent and ongoing undertakings (including the events and communication campaigns organised by SDEWES as part of the BE-Rural project) are drawing attention and are expected to shift the consciousness of the region in the future. This is an important aspect for BioPAT as it will depend on these regional suppliers to secure its production as it becomes established and starts to grow. On the demand side, the group expects increasing interest of food and beverage companies in maintaining their brand image by incorporating environmentally-friendly, yet cost-competitive materials into their processes. Further, working with high-end, high exposure food and beverage producers and retailers gives BioPAT an opportunity to increase its own visibility, coattailing on the marketing of its own customers and benefiting from cross-promotion. Lastly, in terms of potential pathways for product diversification, the entrepreneurs sees potential underpinned by R&D efforts to improve the physical properties of the material which would allow for a wider range of applications (e.g. building insulation).

As regards potential threats, the Task Force identified the issue of uncertainty in securing feedstock with the required properties for production. While the awareness and willingness of farmers and foresters to valorise their residues may increase in the future, the process requires feedstock with a specific set of characteristics to yield consistent output of mycelium-based material of the desired quality. Addressing this would probably require establishing closer collaboration with a group of suppliers as well as training and a quality control scheme of certain level. Another threat is that competitors (i.e. producers of traditional packaging materials) also decide to engage in the Macedonian market for biodegradables and that due to them having more established processes, assets and/or competences are able to offer more affordable options and thus seize a strong market position. BioPAT has a potential advantage of being locally based and having access to the regional suppliers, but realising that advantage will require the start-up to strike a balance between the speed at which it gains new clients and its capacity to cover their demand.

Overall, by setting up a solid team, using the results of the BE-Rural assessment as building blocks for a sound market entry strategy, and securing the necessary initial investment, the innovative and potentially expandable solution offered by BioPAT could encounter a promising future.

2.3 Wood Wool from Vidzeme, LV

2.3.1 Bio-based product and value proposition

The business idea for the OIP Vidzeme in Latvia is a wood wool produced from laying trees. After forest tending, because of the small tree dimensions and high costs associated with collecting these trees, large amounts of tree trunks are left on the ground. The same happens after windfalls, when some trees, especially old ones, are knocked down. Since extracting and transporting individual tree trunks out of the forest is not economically viable, they are left unused. However, they have potential to be incorporated as raw material for fabrics that can be produced from tree parts (i.e. the material between the tree bark and the timber). This tree part is manually collected in spring (trees should lay on ground one winter, where temperature and moisture fluctuations are required) and manually washed to obtain fiber. The fiber can then be woven into fabric. Other tree parts are left in the forest to support biodiversity. The value proposition tied to the business idea is a purely natural upholstery product,

made in an eco-friendly manner. The product can be used in the building sector as an alternative upholstery material, while the farm where production occurs could offer potential to the tourism sector.

Figure 2 Various wood wool fiber preparations. Source: SILAVA

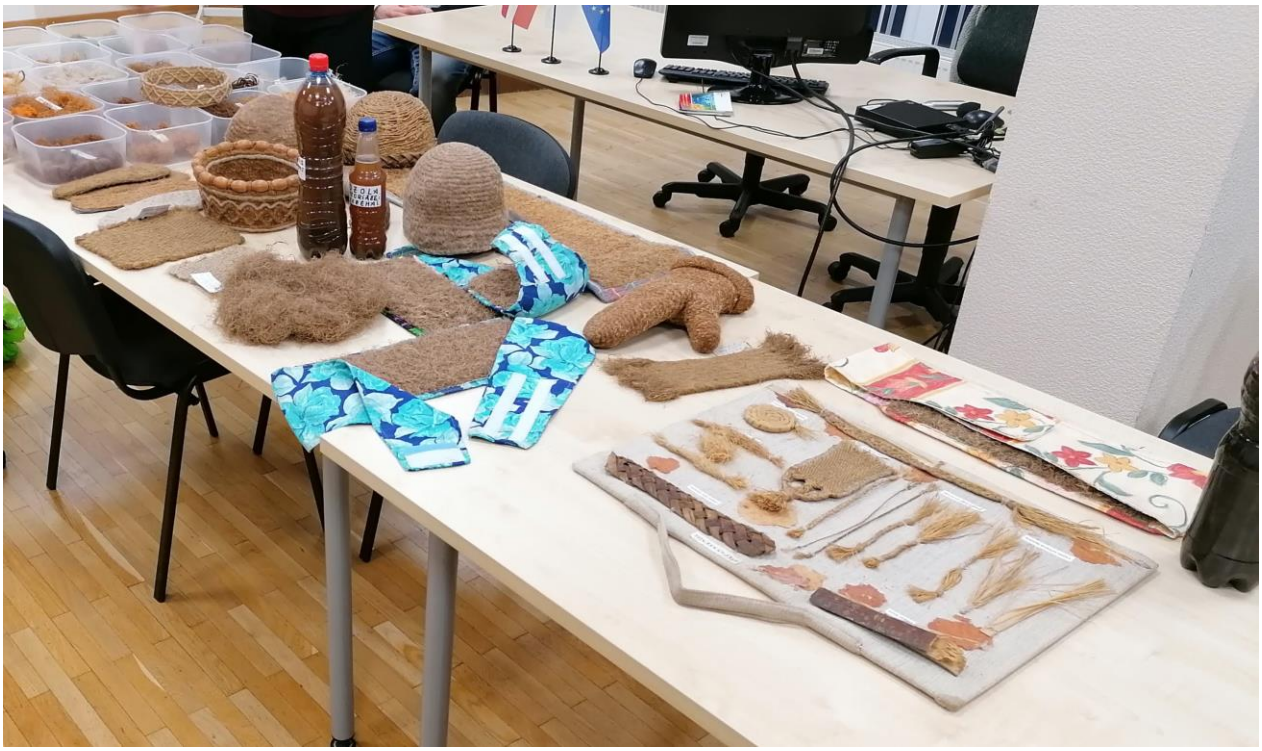

Figure 3 Samples of textile products created with Wood Wool. Source: SILAVA

2.3.2 Stakeholders involved in the assessment

Task force:

The MAF+ exercises for the OIP Vidzeme in Latvia were carried out by the task force composed by a total of five persons which included the business idea owner (Ritvars Tocs) and the OIP facilitators (SILAVA). The whole process also actively involved BE-Rural project team's task lead Ecologic Institute.

Business idea owner:

The business idea owner is craftsman Ritvars Tocs, who lives and works in Latvia, in the Vidzeme planning region.

Team:

Mr. Tocs is currently the sole entrepreneur for Wood Wool. He has revealed ancient Baltic skills - to obtain wool from nettles, thistles, fir trees, reeds, willows, maples, apples, mountain ash, aspen, oak, and other trees and plants. He has developed different product concepts from wood wool in the workshop - small canvases, hats, wrist and back healing bandages, gloves, leg felt, wreaths, etc. Ritvars's business scope is obtaining, processing, and transforming wood wool into fiber or other raw materials for further use in clothing and building interior materials. He has prepared his farm to make it possible for visitors to see how wood wool is made and what type of products could be made using this kind of fiber. The craftsman is also knowledgeable about the healing properties of wool and is ready to tell anyone in detail about it.

2.3.3 Results of the market assessment and business model design process

The market overview

In 2017, the Latvian government published a dedicated national bioeconomy strategy, making it the first one to do so in the EU-13. The main goals of the Latvian Bioeconomy Strategy 2030 are:

- Advancement and retention of employment in the bioeconomy sectors
- Increasing the value added of bioeconomy products to at least EUR 3.8 billion

- Increasing the value of bioeconomy product exports to at least EUR 9 billion

Furthermore, the Smart Specialisation Strategy of Latvia contains guidelines for the development of forestry and related sectors 2015-2020 which promotes and supports technological progress specialization areas including sustainable wood production in changing climate conditions, the full use of biomass for chemical processing and energy, and high value-added wood niche products

At the regional level, in Vidzeme there is a dedicated bioeconomy action plan, which provides support to innovators working with value-added wood products. In light of the positive political developments at the national and regional level with respect to the development of the bioeconomy, the wood wool product fits into societal trends towards eco-friendly products. Though there may be some advantage to it being a new product that is not yet widely used, this also comes with an inherent risk that it will remain a niche product with no stable user base.

The relevant *market segments* for the wood wool product include: the building sector, the tourism sector and the textile industry. These market segments can then be further analysed and prioritized in order to determine which can be considered *target groups* following five criteria:

- Their needs and willingness to act upon them
- The capacity of the offered service to satisfy these needs
- The access to/ease of communication with the market segment
- The existence of competitors addressing these identified needs
- Substantiality and potential profitability of the market segment

According to the assessment, the building and tourism sectors are the target groups for the product. The building sector is one that is willing to move towards the use of more natural materials. Specifically, the wood wool may be attractive as an upholstery material, and could be sold to building companies, carpenters, shops, and distributors. This use of wood wool was a common approach in the past, but there are currently no similar products in the market. Additionally, there is a potential market related to the tourism sector. Countryside tourism is popular in Latvia, and customers may be interested to visit the farm to learn about the production process and other uses for the wood bark.

Table 4 Business model canvas for Wood Wool

<table>
<tr><th>7) Key Partners</th><th>6) Key Activities</th><th>2) Value Propositions</th><th>4) Customer Relationships</th><th>1) Customer Segments</th></tr>
<tr><td rowspan="2">1. Private communication
2. Building companies
3. Private carpenters</td><td>• Manufacturing:
○ Trees are obtained from the forest
○ Obtain wood fiber from the inner side oft he barks
○ Bark washing, fermentation, storage and packing
○ Wood wools are processed into wool
• Transport/ product distribution
• Personnel advice and consultation about product
• Feedback Collection</td><td rowspan="2">A purely natural upholstery product, made in eco-friendly manner. Could be used in building and decoration</td><td>Personal communication</td><td rowspan="2">3. Building sector</td></tr>
<tr><td>5) Key Resources:
• Tree bark (raw material)
• Water
• Tools (specific and customized)
• Storage tanks
• Product packaging materials
• Workers
• Distribution channels</td><td>3) Channels
• Offsite lectures and workshops to building companies
• Word to mouth communication
• Articles in specific newspapers
• Private excursions in farm
• Product demonstration to building companies and individual carpenters</td></tr>
<tr><th colspan="3">8) Cost Structure</th><th colspan="2">9) Revenue Streams</th></tr>
<tr><td colspan="3">Fixed costs: Product storage costs, equipment maintenance
Variable costs: Raw material (mostly free), raw material transport, labour (rate per product unit), packing, delivering, communication</td><td colspan="2">• Selling to building companies
• Selling to private carpenters
• Selling to small shops or individual distrubutors
• Selling in online shops</td></tr>
</table>

As mentioned, the key target group for the wood wool product is the building sector, which is likely to be receptive to the value proposition, as it is a sector that is willing to move towards the use of new, sustainable, and natural materials. In order to develop customer relationships with the building sector and potential users of the wood wool, a variety of channels will be pursued. It will be important to engage in personal communication with potential customers through engagements like regular offsite lectures and workshops, as well as word of mouth exchanges. Visits to the farm where the wood wool is produced, including product demonstrations, can also offer valuable personal interaction with building companies and carpenters, for example, as well as the opportunity to offer physical and tactile interactions with the product. The tourism sector can provide important support here in marketing these visits and demonstrations. Furthermore, an important way to reach the building sector is through industry journals, newspapers, and at building exhibitions.

Developing the wood wool product relies primarily on the use of tree bark as the raw material input, which is generally a residue of forestry processes. Wood fiber is collected from the inner side of bark, which is washed, fermented, and then stored and packaged. As such, the production process also requires water, specific tools, storage tanks, and packaging materials. Finally, labour is necessary in order to facilitate the transport and distribution of the product. Other key activities in the process involve the collection of feedback and advice on the product.

In terms of financials, the fixed costs are limited to the storage costs for the product, as well as the costs of equipment maintenance. Variable costs include the tree bark, which is mostly free since it is essentially a waste product of the forestry industry, the transportation costs for the raw material, labour, packaging, distribution, and communication. Revenue is expected through the sale of the wood wool product. It can be sold to building companies, private carpenters, small shops or distributors, as well as online shops. There is an additional potential revenue stream that can be achieved through tourism at the farm where the wood wool is produced. Considering all of these potential sources of product sales, there is potential for the costs to be covered by the revenue.

2.3.4 Relevant considerations for the future

The wood wool product in question is already in a position to benefit from a favourable political climate in Latvia, both nationally and regionally. Both the Latvian Bioeconomy Strategy 2030 and the Action Plan for Development of a Knowledge-Driven Bioeconomy Innovation Ecosystem in Vidzeme Region can provide support to businesses working in the bioeconomy sector. The region's economic focus on primary resource sectors such as forestry should encourage building ties between businesses and other relevant institutions in the bioeconomy value chain.

In Latvia, there is a recognised potential for by-products of forest management such as young forest strand thinning and short rotation coppice, and the region has enough feedstock from forest management to support a self-sufficient small-scale bio-based industry. Furthermore, there is existing infrastructure for biomass transportation, and Vidzeme possesses a qualified workforce to implemented and manage bio-based installations. There is, however, a lack of infrastructure to handle and pre-treat biomass. This would require additional investment. Additionally, there is a lack of a stable and steady market for biomass resources, which is another area requiring attention.

While it is difficult to predict the specific market growth rate for wood wool as it is a new product, the market for biomass materials is projected to increase both locally and globally, with the export of such products critical to balanced development in Latvia. However, there is also the potential that the new wood wool product will not be successful with consumers for a range of reasons, including conceptually as well as physically. There are also concerns about the durability of the product.

In sum, the wood wool products offer an important value proposition to the region of Vidzeme, and Latvia more generally. With a supportive political framework already in place, and much of the technological and logistical infrastructure already exiting, there is potential for the product to scale successfully. However, the wood wool is still a niche product with small scale production and a small customer base, so it will be important to explore further potential product uses, as there is a risk the consumer base will not be responsive.

2.4 Slow tourism concept underpinned by low-value fish species from Szczecin Lagoon and Vistula Lagoon, PL

2.4.1 Bio-based service and value proposition

Given the own nature of the two Polish lagoon regions, the structure of their economy, their challenges and the vision of the OIP facilitator to address them, this case took a distinct shape compared to the others described in this document. Here, rather than exploring a single small-scale business model in isolation, the task force took a wider perspective to examine the incipient value chain that supplies low-value fish stocks (e.g. bream, roach, perch and herring) to an also budding segment of the tourism sector in the lagoons: “slow tourism”. This was done by assessing two small existing businesses that have these low-value fish on regular offer: a guesthouse in the Szczecin Lagoon and a restaurant in the Vistula Lagoon. The purpose of following this adapted approach was to gather insights for formulating a branding and promotion concept for the regions that is underpinned by short but strong value chains for the exploitation of fish stocks that are currently seen by local fishers as by-catch and are thus rarely used or treated as waste.

Case 1: Guesthouse „Ptaszarnia” in Karsibór

Place: Świnoujście - Karsibór, Poland.

Sector: Hospitality (under the concept of slow tourism)

Category: Private sector

Ptaszarnia is a small guesthouse in the rural, lagoon side of Świnoujście on Karsibór Island. The guesthouse specializes in serving customers looking for peace and quiet, family atmosphere and closeness to nature. In the season, the offer includes a minimum 7-day stay with meals adapted to the requirements of customers (e.g. gluten-free, vegan, vegetarian diet). Low-value fish species are a regular part of the all-day board, which is included in the price of the stay. In particular, dishes of perch, bream and roach are offered.

For the guesthouse owners, including low-value fish species in their menu is a way to distinguish their business and to emphasize the uniqueness of their offer and the diversity of the region. They use a “virtual larder”[1] to show customers what they have on offer on a rotating basis. This virtual pantry is a way to promote and cross-sell a compound service of accommodation and catering.

Figure 4 Low-value fish on offer in Ptaszarnia. Source: http://ptaszarnia.pl/

Case 2: Restaurant Nad Zalewem in Stara Pasłęka

Place: Stara Pasłęka, Poland.

Sector: Gastronomy

[1] See http://ptaszarnia.pl/nasze-atrakcje/ptaskowa-spizarnia/

Category: Private sector

Located on the coast of the Vistula Lagoon near the mouth of the Pasłęka River, Nad Zalewem is a small catering facility offering mainly local sea fish. The restaurant opened on 1 June 2014 and its construction was financed by the European Fisheries Fund. The facility is owned by a local fisherman and the source of supply is the family's own catch and that of other local fishermen. The main competitive factor and differentiator of this restaurant is the local product. Low-value fish species are on offer as fried fish dishes for consumption at the restaurant or for take away. Pickled fish packaged in jars are also offered and provide a means to promote the restaurant, the region and these fish species. Due to low customer interest and lack of familiarity, sales of low-value fish species generate only a small amount (approximately 5%) of the restaurant's turnover.

Figure 5 Jar of pickled fish on offer at Nad Zalewem. Source: Adam Mytlewski

2.4.2 Stakeholders involved in the assessment

Task force:

In the case of the Polish Lagoons, the MAF+ exercises were carried out by the task force which was composed by Mr. Adam Mytlewski and Mr. Marcin Rakowski from NMFRI, facilitators of the Polish OIP. They consulted and collaborated closely with the owners of the two businesses to gather the necessary information for the market assessment and describe the business models of each enterprise. Further information was gathered through interviews with Fishery Local Action Groups (FLAGs) stakeholders involved in the project. The whole process also actively supported by the task lead Ecologic Institute.

Business idea owners:

Mrs. Adriana Kutelska and Mr. Piotr Kutelski are founders of the Ptaszarnia Guesthouse. Mr. Jerzy Bogusz is the owner of the Nad Zalewem Restaurant.

Team:

Ptaszarnia

Adriana Kutelska and Piotr Kutelski are founders of this facility. She used to hold a management position in an international corporation and he is an experienced Chef. In 2010 they built a guesthouse and opened their business. She is responsible for guest experience and facility operations, he is responsible for catering. They cooperate with some fishermen and neighbors for good quality local products and in high season (summer) offer temporary work for locals (1-2 persons). The emphasis on environmental friendly business and local bioresources use in catering make their offer special. They are pioneers of slow food and gastronomy tourism in the Szczecin Lagoon area.

Nad Zalewem

Mr. Jerzy Bogusz is an active fisherman who decided to diversify his sources of income by opening a fried fish bar near the harbor in Stara Pasłęka. Staff from the FLAG office there developed the idea and were the main source of financial support to start the business. They adviced Mr. Bogusz to submit a proposal for financial support and invest in larger scale. He applied for financial support from the

Operational Program for Fishery and invest in small restaurant instead of planned bar. Together with his wife were focused on serving commercially known fishes, but offer as well less known species, which starts to be very popular. Success of the investment allows them hire 3 employees and starts to manufacture marinated fishes in the jar, which are recognition mark of the business. Mr Bogusz would like to enlarge his restaurants, and expand fish supply for other fishers in the area.

2.4.3 Results of the market assessment and business model design process

The market overview

The two businesses presented operate in regions attractive for tourists. However, the tourism profile of areas within these regions vary significantly. The coastal part of the regions (e.g. Świnoujście, Krynica Morska) is mass tourism oriented, mainly in the summer season. It has highly developed touristic infrastructure (accommodation) and a large selection of restaurants. Tourists travel here looking for lively experiences, numerous attractions and well-developed entertainment services. Cultural activities (learning about the culture and history of the region) are less sought after here. Alternatively, the rural areas such as the southern coast of the Vistula Lagoon and almost the entire Zalew Szczeciński are better suited for “slow tourism” concepts. The infrastructure here is less developed and tourists who visit the region seek for closer contact to nature and to experience the regional culture (e.g. via its cuisine).

Market supply of low-value fish species

To frame the assessment, the task force defined their market of interest as the sum of transactions of low-value fish in the Polish Lagoons regions. The Vistula Lagoon and the Szczecin Lagoon are areas where numerous small fishing entities operate. The fish are caught in small boats (up to 12 m) with the use of passive gear (set nets). Fishing entities are small family businesses.

Due to the limited resources and landings of low-value fish, the task force considers there are no possibilities to create a mass product that meets the needs of tourists coming to seaside areas or sold throughout Poland. Hence, the identified alternative is to develop the offer in specific areas of the regions which are characterized by a lower tourism intensity and to tourists engaging in “slow tourism”.

Table 5 Volumes of low-value fish species in the Polish Lagoons in 2018-2019. Source: NMFRI

Species	Szczecin Lagoon (t)		Vistula Lagoon (t)	
	2018	2019	2018	2019
Bream	558,1	717,5	318,4	596,4
Roach	732,0	713,8	48,4	139,7
Perch	463,8	702,8	40,4	102,6
Other low-value species*	141,8	86,6	57,1	101,8
Total	**1 895,7**	**2 220,6**	**464,3**	**940,4**

*crucian carp, white bream, punch, tench, asp, whitefish, smelt, burbot, vimba, ruffe, goby, other

Tourism figures in the regions

The analysed voivodeships, of which the Baltic lagoon areas are a part, are the regions with the highest density of accommodation in Poland, which is mainly due to the developed accommodation base of large tourist centers/cities and coastal towns. West Pomeranian and Pomeranian Voivodeships have the largest accommodation resources, offering tourists 145.4 thousand and 119.5 thousand beds respectively in 2019, with seasonal accommodation predominating in these voivodeships. The West Pomeranian Voivodeship had the highest number of holiday resorts and tourist cottage complexes in 2019 (32.3% and 25.4% of facilities of this type in the country, respectively). In the Warmian-Masurian voivodeship, accommodation infrastructure is less developed (and more fragmented) and is not seen

through the prism of official statistics because Statistics Poland only examines enterprises employing more than 10 people.

The occupancy rate in objects with 10 or more beds was in Poland 2019. 40.6% (in 2018 - 40.1%) and was highest in West Pomeranian Voivodeship - 51.5%. It was 45% in Pomeranian Viovodeship and 38.6% in Warmian-Masurian Voivodeship. In facilities with less than 10 beds, the occupancy rate was about 18% and was slightly higher than the year before.

In 2019, Polish residents made a total of 75.1 million trips with at least one overnight stay (one person could make several trips) - 4.2% more than in 2018. Domestic trips predominated by far, with 59.8 million (3.7% more than in 2018), of which 34.5 million (2.8% more than in 2018) were short-term trips (2-4 days) and 25.3 million (5.1% more than in 2018) were long-term trips, i.e. lasting 5 days or more. The number of foreign trips by Polish residents amounted to 15.3 million (6.2% more than in 2018) and were mostly trips for 5 days or longer - 12.4 million (5.5% more than in 2018). International trips of 2 to 4 days were 2.9 million (9.5% more than in 2018). In 2019, according to the Department of Tourism of the Ministry of Development, Poland was visited by 3.0% more foreigners and by 7.8% more foreign tourists than in 2018. The total value of domestic travel growth (3.7%) can be used as a potential growth rate for tourism in Poland.

The main destinations of Polish tourists during domestic short-term trips were cities (62.8%), rural areas (24.8%) and mountains (11.0%). In case of long-term trips cities were also the most popular destination (48.2%), followed by seaside (30.5%) and rural areas (22.3%).

The available statistics do not allow disaggregation of tourist traffic figures for the Vistula Lagoon and the Szczecin Lagoon, so the study covered the three voivodeships in which these regions are located (Pomeranian, Warmian-Masurian and West Pomeranian voivodeships).

The number of visits to the analyzed voivodeships in 2019 varied and ranged from 2.7 to 6.8 million. Traditionally, the most visited due to attractions in the summer season are coastal areas and attractively located towns (e.g. Gdańsk, or in the lagoon regions Świnoujście, Międzyzdroje, Krynica Morska). Both seasonally (summer season) and geographically – tourist traffic concentrates in a few localities with well-developed tourist infrastructure.

West Pomeranian Voivodeship is one of the most attractive tourist regions in Poland. This is confirmed by statistical data on tourist traffic and accommodation facilities. According to the Statistics Poland "Tourism 2019" report, the Western Pomeranian Voivodeship had the highest number of overnight stays in Poland in 2019 (16.1 million overnight stays, almost one million more than in 2018 - 15.15 million overnight stays, 2017 - 14.06 million, 2016 - 13.12 million). The average growth was thus in the range of 7-8%. In the West Pomeranian Voivodeship in 2019, the number of tourists using accommodation was almost twice as high as the number of residents - there were 189 tourists per 100 residents. Slightly lower statistics were found in Pomeranian Voivodeship (about 90% of the value of West Pomeranian Voivodeship) and the growth rate was similar i.e. 7%.

In the Warmian-Masurian Voivodeship, tourist traffic in the form of overnight stays provided was about 40% lower than in the West Pomeranian Voivodeship (although the dynamics were similar). The number of domestic tourists, measured by the number of overnight stays in the Warmian-Masurian Voivodeship, was 1,377 thousand in 2019. There were 2,784 thousand domestic tourists to Warmian-Masurian voivodeship in 2019. This result places the voivodeship in 8th place in the country. The share of tourists visiting Warmian-Masurian Voivodeship was 5.57% in the number of domestic tourists 17 traveling in Poland. It can be concluded that tourists coming to the Warmian-Masurian voivodship used a different type of accommodation than the facilities included in the survey of Statistics Poland. To a large extent, they used accommodation in small facilities, i.e. on yachts or in cottages, which are not included in the statistics of Statistics Poland. Hence, the analysis of actual tourism in the analyzed regions is difficult due to the lack of knowledge about the small entities.

In 2020, due to the Covid-19 pandemic, there was a decrease in overnight stays provided by tourist accommodation objects to 9,947,125 (down 38.1%) and a significant decrease to 2,035,648 nights provided to foreign tourists (down 49.6%). However, it can be expected that in 2021 the parameters of tourist traffic will return to the level of 2019.

It can be said that the analyzed voivodeships are among the most popular travel destinations and tourist traffic shows growth trends of 4-5% per year (except during the pandemic period). However, the

areas are diverse in their profile, as previously mentioned. The great diversity of tourist traffic relates both to seasonality and significant concentration of tourist services in a few localities, usually coastal ones. Such dynamics create impulse for better allocation of tourism through promotion of less intensive forms of recreation and more contact with nature and culture of the regions. The challenge, seen here as a market opportunity, is to reallocate part of this traffic and/or attract new visitors by promoting less popular destinations in the regions. The intention is to do this by rebranding the lagoon regions using the low-value fish species as icons of local culture, tradition and cuisine.

Table 6 Business model canvas for Ptaszarnia Guesthouse, Poland

<table>
<tr><th>7) Key Partners</th><th>6) Key Activities</th><th>2) Value Propositions</th><th>4) Customer Relationships</th><th>1) Customer Segments</th></tr>
<tr><td rowspan="3">• Local fishermen</td><td>• Operation of the guesthouse
• Organization of low-value fish processing and dish preparation
• Acquisition of recipes for the preparation of the products, (through interviews mainly with older residents of the area)</td><td rowspan="3">• A customized service for travelers looking for peace and quiet, family atmosphere and closeness to nature.
• A minimum 7-day stay with meals adapted to the requirements of customers (e.g. gluten-free, vegan, vegetarian diet, etc.).
• Low-value fish species (perch, bream and roach) as regular part of the all-day board, which is included in the price of the stay.</td><td>• Initial interaction (for information and reservations) via the internet
• Direct contact at the guesthouse
• Repeat visits and longer-standing relationships are sought through follow-up interaction with customers via the internet</td><td rowspan="3">1. Tourists visiting the region - Couples aged 40-60 with higher education, with a stable financial situation, resting without children. These people are looking for tranquility, regional specificity, good family service and tasty and traditional food.</td></tr>
<tr><th>5) Key Resources:</th><th>3) Channels</th></tr>
<tr><td>• Location and facilities
• Access to low-value fish species(supply)
• Human resources needed to process the fish</td><td>• Website, social media, and direct contact by owners
• "Virtual pantry" emphasizing home-cooked meals to customers (including low-value fish dishes)</td></tr>
<tr><th colspan="3">8) Cost Structure</th><th colspan="2">9) Revenue Streams</th></tr>
<tr><td colspan="3">• Labor cost
• Equipment and materials
• Fish and other ingredients (cost of fish, vegetables, vinegar, etc.),
• Utilities (electricity, water, heating)
• Other costs</td><td colspan="2">• Revenue generated by on-site sales to the following customer groups:
- tourists coming for a weekly stay from Poland: 80%,
- tourists coming for a weekly stay from abroad (mostly from Germany): 10%,
- short-stay tourists: 10%</td></tr>
</table>

Table 7 Business model canvas for Nad Zalewem Restaurant, Poland

<table>
<tr><th>7) Key Partners</th><th>6) Key Activities</th><th>2) Value Propositions</th><th>4) Customer Relationships</th><th>1) Customer Segments</th></tr>
<tr><td rowspan="3">• n/a</td><td>• Operation of the restaurant (primary activity)
• Processing of low-value fish and packaging into jars for retail (secondary activity)
• Acquisition of recipes for the preparation of the fish dishes and products.</td><td rowspan="3">• A fresh culinary offer based on fish caught locally by the restaurant owners
• Unique fish products that are associated with the region and its diversity.
• The opportunity to consume on the spot, matching product and place.
• A chance to take home the culinary memories of the places they visit</td><td>• Ad-hoc based on the direct contact at the restaurant (no active follow-ups)</td><td rowspan="3">1. Tourists visiting the region (mainly families with children arriving by car and cyclists)
2. Local population</td></tr>
<tr><th>5) Key Resources:</th><th>3) Channels</th></tr>
<tr><td>• Location and facilities
• Access to low-value fish species(supply)
• Human resources needed to process the fish</td><td>• Direct contact at the restaurant</td></tr>
<tr><th colspan="3">8) Cost Structure</th><th colspan="2">9) Revenue Streams</th></tr>
<tr><td colspan="3">• Labor costs
• Equipment and materials
• Fish and other ingredients (cost of fish, vegetables, vinegar, etc.),
• Utilities (electricity, water, heating)
• Other costs</td><td colspan="2">• One-day tourists from Poland: 80%,
• Cyclists and sailors: 5%,
• Local population: 10%
• International tourists (Russia): 5%</td></tr>
</table>

2.4.4 Relevant considerations for the future

Along the discussions of the task force and the interviews with the regional stakeholders, foreseeable developments that could strengthen the two businesses examined emerged that are mostly consistent. For both the guesthouse and the restaurant, a key opportunity identified was a seemingly increasing interest of tourists for regional products. Positioned and communicated more strongly, the current offer of both businesses could benefit from this trend. A second common opportunity is the growing demand among their visitors for healthy food. Given that both businesses focus on fresh and traceable ingredients as well as carefully elaborated dishes (in the case of Ptaszarnia that are adapted to the specific needs and desires of the customer), this development could further strengthen their future position in the market. Beyond this, the owner of Nad Zalewem sees increasing tourist traffic in the region as a very likely development that can have a significantly positive impact on the business.

Similarly as for the opportunities, both Ptaszarnia and Nad Zalewem observe a common threat in the growing costs of labor in their areas. This represents not only the prospect of lower margins but could also strain the operations or eventually result in the interruption of secondary activities (e.g. the production and packaging of pickled fish). Both businesses also see demographic processes (e.g. aging of the population) as a threat that, while having a moderate level of impact on their businesses, is likely or very likely to happen. The owners of Ptaszarnia also see danger of restrictions on fishing caused by deteriorated conditions of the environment. While the perceived probability of such a development is moderate, the impact level on the business would be very high. Nad Zalewem see stricter sanitary requirements for fish processing as something they will have to account for in the future and that would reasonably impact their operation.

Overall, the entrepreneurs see value in the OIP facilitator's idea of rebranding the Polish Lagoon regions based on the traditional consumption of low-value fish species and consider this could bring new opportunities and prosperity to their areas.

2.5 Cold-pressed Grape Seed Oil from Stara Zagora, BG

2.5.1 Bio-based solution and value proposition

The business idea explored for the OIP Stara Zagora is the production of cold-pressed oil extracted from one of the main by-products of regional wine production: grape seeds. In the region, wineries very rarely exploit seeds after grape pressing. Appropriate drying and subsequent processing of this "waste" in an oil mill can yield a rich oil with valuable characteristics for different use cases. Several businesses established in the region (e.g. cosmetics production, retail and gastronomy) currently import this high-end natural product, and so local production would reduce its distribution costs and carbon footprint and could thus make it competitive from a pricing and environmental perspective. The oil-cake that remains after pressing the seeds can be used as animal feed.

The value proposition tied to this business idea is a high quality, locally-produced and price competitive grape seed oil for health, wellness and culinary applications for the cosmetic and gastronomy industries operating in the region.

2.5.2 Stakeholders involved in the assessment

Task force:

The MAF+ exercises for the OIP Stara Zagora in Bulgaria were carried out by the task force composed by a total of four persons which included the business idea owner (Mr. Ivan Georgiev) and the OIP facilitators (BIA). The whole process also actively involved BE-Rural project team's task lead Ecologic Institute.

Business idea owner:

The author of the idea for the production of cold pressed grape seed oil in the region is Mr. Ivan Georgiev, an Agricultural Machinery Engineer who lives and works in Bulgaria, in the Stara Zagora region.

Team:

Mr. Georgiev has been working for more than 30 years in the field of production and processing of agricultural products as a chief engineer and farm manager. He has experience as a technologist in a company that processes sunflower and extracts sunflower oil. In recent years, he has also worked as a consultant for a wine production company, where together with the management he has to solve the problem of waste from wine production. One of the ideas and opportunities that the company's management sees is to find processing capacity to produce cold-pressed grape seed oil from wine production waste, which Mr. Georgiev, given his experience and qualifications, considers very feasible.

Mr. Georgiev's idea was evaluated jointly with a team of the Bulgarian Industrial Association consisting of three experts: Iliana Pavlova, an economist with more than 20 years of experience in waste management and environment; Ludmila Metzova - chemical engineer, with more than 25 years of experience in project development and management, Martin Stoyanov - economist, with more than 15 years of experience in communication. Each stage of the business model development was coordinated with experts from the Thracian University and the regional chamber of commerce.

2.5.3 Results of the market assessment and business model design process

The market overview

Grape production is considered one of the most important agro-economic activities in the world. In 2019, 178 thousand tons of grapes were produced in Bulgaria, of which 71 thousand tons in the Southeastern Statistical Region, where the region of Stara Zagora is located (Ministry of Agriculture, Food and Forestry, Production of Wine Grapes and Wine, 2019). Grape seeds are waste from wineries and have often been considered important agricultural and industrial residues with potential to be processed and reincorporated in pharmaceutical, gastronomy and cosmetic applications.

Grape seed oil is produced in many countries around the world such as Italy, Spain, Chile, USA, Australia and France. Analysts predict a 5% growth rate in world grape seed oil production over the next 5-7 years (Business Wire, 2021; Data Bridge, 2021). The method of extraction depends on the characteristics of the raw material. The traditional way is cold pressing of whole seeds in a continuous hydraulic press or ground and heated seeds in a screw press. Extraction through cold pressing is a light process that allows to obtain good quality oil. While data on the world production of grape seed oil is limited, specialized sources refer to production in Italy, France and Spain reaching 42,000 tons (De Haro, J.C. et al., 2018). Bulgaria mainly uses oil imported from these three countries.

Grape seed oil is widely used in the cosmetics industry for the development of preparations against various skin imperfections and for hair treatment. In gastronomy, its light taste and content of polyunsaturated fats, OMEGA-6 fatty acids, vitamin E, and phenolic compounds provide a healthy alternative to other commercial products for preparation of dishes and dressings. The assessment conducted by the Bulgarian task force explored the regional market for high quality cold pressed grape seed oil. In a first stage, the team identified six different market segments of potential interest (including the gastronomy sector, the retail sector, the pharmaceutical industry and the cosmetics industry). Further analysis on the basis of market needs, priorities, competition and other criteria showed the cosmetics industry to carry the most potential as main target group for the business idea.

The cosmetics industry in Bulgaria uses large quantities of high quality grape seed oil as intermediate input for production. According to the National Statistical Institute, there are 68 companies in the country that produce cosmetic products. Large manufacturers work mainly for their own brands of Western European retail chains. Given that the internal production of grape seed oil in the country is limited and carried out only by small companies that target direct retail sales and often cannot secure consistency and quality requirements, cosmetics manufacturers established in the country resort mainly to imports. This results in higher prices and longer lead times. According to the task force, the shorter distribution channels and the fact that Bulgaria has the lowest labor cost in the EU would make

it possible to offer a regionally-sourced product that is competitive in price while still being up to par with its imported counterparts in terms of quality and quantity (including reliability of production and delivery).

The Stara Zagora region is well known abroad for its cosmetics industry, given that it produces the highest quality and most famous rose oil. This makes the region well suited as a beachhead market, as industry contacts and communication channels are already available and visibility could be achieved rapidly. However, the entrepreneur has set goals to cover not only the needs of cosmetics manufacturers based in the region, but also to replace the imports of others in the rest of the country with his product. The task force has provided access to the Association of the Cosmetic and Perfume Industry in Bulgaria and relevant manufacturers have been identified. So far there are good prospects that two to three of them (some of which have production facilities within or in close proximity to the Stara Zagora region and rely increasingly on natural extracts for their products) would be willing to replace their imported grape seed oil with a locally produced one in the short term. A plan for offering them the product has been elaborated.

Table 8 Business model canvas for Cold-pressed Grape Seed Oil (early business phase and including all segments explored in the assessment), Bulgaria

<table>
<tr><th>7) Key Partners</th><th>6) Key Activities</th><th>2) Value Propositions</th><th>4) Customer Relationships</th><th>1) Customer Segments</th></tr>
<tr><td rowspan="2">• Cosmetic companies – for determination of admixtures, examination of the composition; building a quality management system
• National Retailers , incl. online stores – package size, labeling, advertising;
• Wineries in the region of Stara Zagora – ensuring the quantities of raw materials for production;
• Machine suppliers
• Advertising agencies</td><td>• Production planning, execution and quality control;
• Introduction and execution of a quality management system;
• Development and adjustment of pricing strategy;
• Effective dialogue with wine producers from the region to increase the volume and quality of raw materials;
• Continuous direct connection with customers (CRM);
• Assistance to customers in developing local new products</td><td rowspan="2">Cold pressed grape seed oil is:
Health / Wellness proposition
• Rich in linolenic acid - used for chronic skin problems;
• Nourishes hair follicles and stimulates hair growth;
• Delays skin aging, absorbs easily and is used in various massage techniques
Healthy eating
• It is rich in OMEGA-6 fatty acids, vitamin E, phenolic com-pounds
• Environment friendly (reuse of grapes plus reuses of oil-cake)
• The product will be produced from wine production residues. The waste from the production (oil-cake) can be used for animal feed</td><td>• Direct contacts with cosmetic manufacturers, health food stores, mineral baths in the region, massage studios, major restaurants.
• Creating a customer base with potential customers for each of the target groups. Develop a special approach for each of them.
• Maintaining close personalized relationships with customers</td><td rowspan="2">1. Cosmetic industry - Bulgarian manufacturers of hair and skin products
2. Retail - shops for natural products, healthy eating, incl. online
3. Gastronomy (restaurants)
4. Pharmaceutical Industry
5. Massage Studios, Spa Complexes,</td></tr>
<tr><td>5) Key Resources:
• Availability of local base - premises for equipment and offices</td><td>3) Channels
• Direct contact with customers.
• Preparation of a detailed information brochure with a description of the product's qualities.
• Presentation of the product to the Association of the Cosmetic and Perfume Industry and participation in their forums.
• Conducting a regular dialogue with customers</td></tr>
<tr><td colspan="3">8) Cost Structure</td><td colspan="2">9) Revenue Streams</td></tr>
</table>

Fixed costs • Equipment – the projections are within two years to recover the cost of equipment and start operating at a profit Variable costs • Electricity, labor costs, raw material, packaging, overheads	• Revenues from sales to cosmetic companies (large quantity bulk sales) • Revenues from sales to retailers (smaller quantities at a premium) • Revenues from the sale of oil-cake

As previously mentioned, the main target group for the cold-pressed grape seed oil is the cosmetics industry in the Stara Zagora region (Phase I) and at the national level (Phase II). Given a combination of factors – grape seed oil is already a preferred ingredient in a number of cosmetic products; representatives of the cosmetics industry have shown interest in the use of locally produced grape seed oil; the price of the offered product would be much lower than that for its imported counterpart; and the entrepreneur has very good technical expertise and knowledge of the process, as well as previous professional collaboration with wineries – prospects within this target group are promising for the first year of business operation (planned 2022) and breakeven through commercial agreements with them is expected in the second year.

While these initial phases of development place large importance on the cosmetics industry, the business model canvas above reflects the wider results of the assessment carried out by the task force, which considered retail shops, the gastronomy sector, the pharmaceutical industry and massage studios/spas. This wide array of potential target segments reflects the diversity of applications for the product and the resulting value propositions. The focus on the cosmetics industry will allow for a more specialized offer and value proposition and with it a more effective communication strategy. The latter will be based on direct communication targeted initially at contacts that have already been established (in part through the collaboration within the task force) and presentations to the Association of the Cosmetic and Perfume Industry. A strong Customer Relationship Management system is deemed crucial for after sales retention of the clients and expansion of the commercial agreements in the future.

The key activities, resources and partners listed here reflect a very initial stage of the business, where piloting and first production runs would strongly depend on partnerships and access to spare production capacity of non-proprietary facilities. This helps keep fixed costs low and would hopefully allow for a stepwise growth as the business gains traction in the market and explores other customer groups.

2.5.4 Relevant considerations for the future

The task force combined previous outputs of the BE-Rural project (on macro-environmental conditions and bioeconomy potential of the Stara Zagora region) with the results of their market assessment to pin point the main factors that could influence the successful commercialization of the cold-pressed grape seed oil in the coming years. The opportunities perceived originate mostly from the expected demand from cosmetics manufacturers, which is seen with optimism by the group. External threats appear to be linked mainly to securing a steady supply of raw material for oil production.

The group considers that given the expected growth rates of global production over the following 5-7 years and the growing use of grape seed oil for multiple applications, prospects for a high quality regional product that is much more affordable than its imported competitors are promising. According to the task force, Bulgarian wines are increasingly popular both on the local and international market. From the perspective of raw material availability, they see this as an opportunity for parallel expansion. At the same time, the task force is conscious of the risk of fluctuations in the supply of grape seeds caused by reductions in grape harvests and interventions from the EU to stabilize the market. In the past, the latter have come in the form of compensation payments for farmers that harvest grapes before ripening, effectively destroying the wine grape crop. This is an external factor upon which the entrepreneur has virtually no control and instead a high vulnerability. One potential way to reduce the impact of such developments are yield and efficiency gains that are feasible through the improvement of extraction methods. These are planned to be executed with the support of qualified specialists who are already in the entrepreneur's network. The operator intends to optimize oil yield using sorted seed lots by grape type. The large extent of the oil content of the seeds depends on the grape variety and it is possible for winemakers to sell the meal according to their production to the individual batches.

The second threat identified is the latent competitive rivalry in the region. Several sunflower oil producers operate currently in Stara Zagora, and given that they could use their existing equipment to produce grape seed oil, their barriers to entry (at least from a technological perspective) would be rather low. The foreseeable options here are attain a strong market position swiftly with the grape seed oil as flagship product and seek competitive expansion through the use of the equipment (installed capacity) for the production of other cold pressed vegetable oils (i.e. the inverse of the identified threat), or to explore potential partnerships or joint ventures with one of them. As mentioned previously, the latter option would in any case reasonable as a way to reduce the necessary investments and risks during the early stages of the business (pilots and first production runs).

3 Reflections on the process and lessons learned

This chapter presents the results of a process of discussion and reflection on Task 5.3 and a subsequent survey to gather anonymous feedback from representatives of the OIPs (two OIPs did not provide responses). The aim was to evaluate the procedure followed to identify positive experiences, areas of opportunity, and the factors that played a role in each outcome. The purpose of this exercise is to leave a synthesis of lessons learned for OIP facilitators and others who might want to continue exploring business ideas within their region using the BE-Rural Task 5.3 approach.

The first aspect considered was whether the work in the business model design and market assessments brought the consortium closer to achieve the project's overall objectives. The group felt confident as regards the mobilization and engagement of regional stakeholders; the building of capacity among regional stakeholders; the support to modest and moderate innovator countries in the development of regional bioeconomy strategies and roadmaps; and the exploration of small-scale business models and their market potentials. OIP facilitators who responded the anonymous survey mentioned that they gained a good deal of additional knowledge on bio-based alternatives to existing products and services as well as on tools for business development. Overall, they came out with a better understanding of their regions and the business ideas that are emerging from them. Some also mentioned having gained an expanded network that could be valuable for their future work. All OIPs identified entrepreneurs with interesting ideas for bio-based products and services for which better informed business models were elaborated and market potential was evaluated. The work within the Task Forces engaged bioeconomy entrepreneurs in direct collaboration with other stakeholders and experts from their region, and in most cases endowed them with new or enhanced abilities to work more strategically in the future perspectives of their bioeconomy business idea. At the same time, expectations regarding a broad involvement of regional stakeholders (beyond BE-Rural partners), with dedicated interventions structured along the assessment timeline, were not met. While several stakeholders pledged their engagement at the start of the activities, the process did not seem to elicit commitment afterwards. Some survey respondents associated this to the restrictions to physical gatherings caused by the Covid-19 pandemic. Either way, this resulted in a missed opportunity as Task Forces were not as diversely constituted as originally planned. Survey respondents recognized this and appear willing to pursue this broader participatory approach in the future to bring together stakeholders with different backgrounds and enhance the assessment.

It was discussed that the process of identification and selection of business ideas at the OIPs could have been more transparent. By design, this was to be informed by the surveys/interviews carried out by the OIP facilitators at the start of the task. However, in most cases it was unclear to what extent this points of information were actually incorporated in the final decisions. For future instances, it would be advisable to establish a more robust reporting process to document the decisions. Nonetheless, while it took some effort at the start, interesting business ideas were ultimately identified, all of which were related to their regions' features and relevant in practice. The inertia in the beginning could probably have been overcome more easily if the task had started earlier on with the building of a long list of business ideas and the entrepreneurs behind them. The list could have then been explored together with a larger group of stakeholders to decide which one to follow-up on while raising expectation and generating some buy-in into the process. Notwithstanding, in most of the cases, the entrepreneurs were highly committed and motivated, and open to follow the project's approach. The process led to good conversations within the Task Forces and generated new and/or deeper insights than what the group started with.

The group pointed to an apparent lack of motivation from some OIP facilitators towards the task. Some identified causes were the lack of up front clarity on what the benefits of the task would be; an insufficient conviction that the methodology and the process could yield useful results; the impossibility for task force members to meet physically due to Covid-19 restrictions; and the fact that these activities overlapped in time with many other tasks, overburdening the partners' capacities.

As regards the methodological framework used (the MAF+), with the exception of one survey respondent who judged it as moderately suitable, the group deemed it very suitable for the type of innovations being explored, well-structured and workable with stakeholders and innovators who do not have a business background. The two-day online training on the methodology was deemed as very useful and the process given to all OIP facilitators before the start of the assessments was deemed as

simple, helpful and very well structured. The fact that one of the OIP facilitators decided to work independently (primarily to avoid language barrier issues) and managed to provide a very good first draft of the assessment confirms this.

4 Conclusions

The task from which this report stems entailed the training of OIP facilitators to carry out a set of collaborative market assessment and business model design activities following a common but flexible methodological approach. It required the facilitators to identify bioeconomy entrepreneurs in their OIP regions by effectively communicating about the BE-Rural project and this task specifically using their networks. It also compelled them to set up a *Task Force on Market Assessment and Business Model Design,* involving various stakeholders from the region in the regular exchange and collaboration with the entrepreneurs. This was the basis of the assessment of regional markets and the exploration of possible business models for the bio-based products and services examined.

Among many things, the task has shown that while there are common points and broad similarities between the rural regions of the BE-Rural OIPs, a wide array of ideas for bio-based businesses has emerged. From the largely technological, to the more artisanal, from the consultancy-service oriented to the wider ranging, integrated concepts for providing impulse to entire regions. It is clear that the business models illustrated in this document require fine-tuning and further elaboration. The ideas explored vary in their level of innovation, as they reflect and resemble the capacities and necessities of the regional market and structures. However, the efforts spent by all the individuals involved in this task has started to reveal possible pathways for concrete ideas. If they succeed, these could indeed become examples of businesses that impulse their regional economy in a context of openness, transparency, inclusiveness and sustainability.

This work has also served to illustrate that while EU policy like the Bioeconomy Strategy and the RIS3 initiatives provide a strong framework to impulse positive change and regional development, more dedicated connections within country networks are necessary to effectively uncover opportunities and drive collaboration between stakeholders. Small-scale businesses, while often might not be overwhelmingly lucrative, do have the potential to lift the well-being of regional communities while having better chances to manage and limit their environmental impacts. They have the potential to develop regional partnerships and collaborative approaches based on the links that emerge between one or multiple value chains. These bio-based value chains may be entirely new or redesigned versions of existing ones.

The authors hope that the capacity-building concept that lies at the origin of this work has generated conditions and opened new spaces for collaboration in the OIP regions, and that these will continue to operate, expand and evolve beyond the BE-Rural project’s lifetime.

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