

ACCELERATING PRODUCTION OF FOREST BIOENERGY IN THE BALTIC SEA REGION - *BALTIC FORBIO* INTERNATIONAL PROJECT

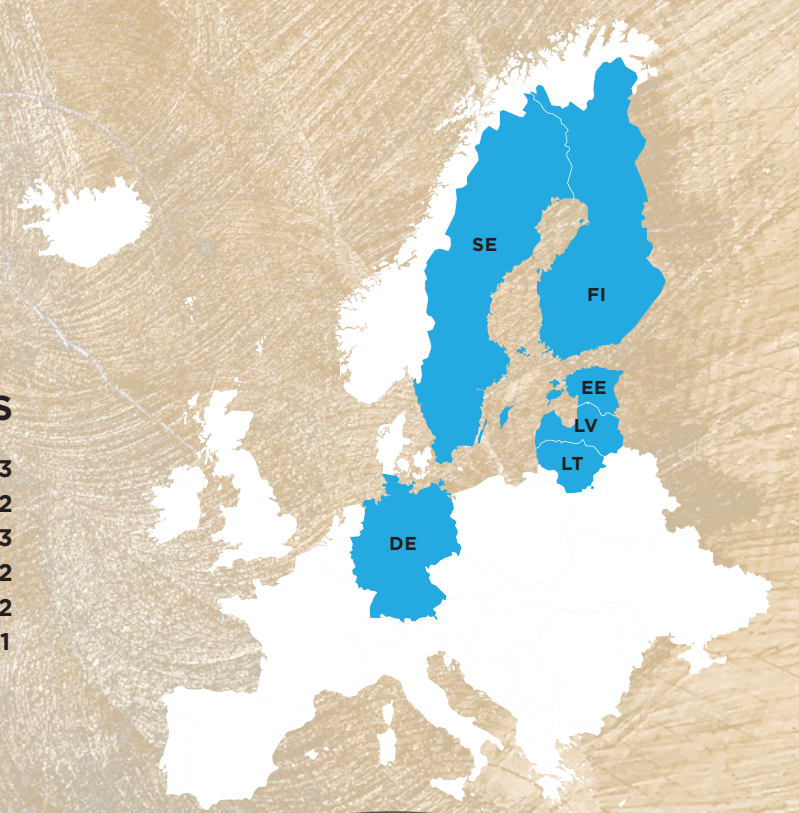
2017.-2021.

Interreg Baltic Sea Region Transnational
cooperation project *Baltic ForBio*, project No. #R058



PARTNERS

Sweden	3
Finland	2
Germany	3
Estonia	2
Latvia	2
Lithuania	1



2017.

2018.

2019.

2020.

2021.

The duration of this project is from May 2017 to March 2021.

In the Baltic Sea region, **ENERGY WOOD** is a very **IMPORTANT SOURCE OF RENEWABLE ENERGY**, as in each of the project countries the forest occupies large enough area of the country's territory. One of the stages of the forest management cycle is harvesting, after which various felling **RESIDUES REMAIN** in the forest, which can later then be used as fuel wood for **ENERGY PRODUCTION**. One of the most common materials obtained from the processing of felling residues is **WOOD CHIPS**, which are in stable demand, since they are used in general use and industrial boiler houses, as well as in cogeneration plants. Every year new boiler houses are built or the existing ones are converted so that it could be possible to use environmentally friendly products for energy production.



During this project, useful educational and training materials have been developed that will not lose their relevance over time. They are intended for private forest owners, societies, associations, forestry companies and also for the people employed in the forest sector.

You can read more about the project here: [Baltic ForBio | Externwebben \(slu.se\)](https://www.balticforbio.eu)

It is funded by the support of the EU *Interreg Baltic Sea Region* programme. The project involved **13 PARTNERS FROM 6 MEMBER STATES (SWEDEN, FINLAND, GERMANY, ESTONIA, LATVIA AND LITHUANIA)**. The project aims to increase the production of renewable energy, improve the institutional capacity of public authorities and relevant organisations, and promote the use of logging residues.

There is a stable and growing demand for energy wood both in the local and export markets, and in Latvia where the gradual transition from the use of fossil resources to the use of wood resources is taking place in energy production, the **WOOD FROM THE FORESTS OF LOCAL FOREST OWNERS** is used, thus promoting national economic development.



WP 2 - COST-EFFECTIVE AND SUSTAINABLE HARVEST METHODS

This work part consists
of four different activities and tasks.

- 1 The aim of **THE FIRST ACTIVITY** is to increase the awareness of the involved partners about the bioenergy market and the policies affecting it. Therefore, this information is an important compilation that allows for a better understanding of the positive aspects and challenges in each of the Member States, thus contributing to the implementation of the most appropriate business model in the Baltic Sea Region.
- 2 As a result of **THE SECOND ACTIVITY**, a handbook “Cost-Effective and Sustainable Harvest Methods” has been developed by the common efforts of all the project partner countries in order to create a broader global perspective. The content of the handbook is quite extensive. The Latvian State Forest Research Institute (LSFRI) “Silava” has compiled basic information about Latvia, as for example – the technological and economic aspects of forest energy production, energy wood production during the thinning process



of young stands and other themes that are included in the handbook. Research into the technological solution to produce energy wood as efficiently as possible is also an important contribution. An important conclusion is that the use of small-scale machines (*Vimek 404 harvester*) significantly increases the profitability of commercial thinning by sawing smaller trees, without adversely affecting the productivity and costs in the most

[Link to the guide -
Baltic for Bio, WP2's outcomes | Externwebben \(slu.se\)](#)
(Available in English,
Estonian, Latvian, Lithuanian,
German and Russian)

common group of felling - commercial thinning. In its turn, The Forest Advisory Service Centre (FASC) of the Latvian Rural Advisory and Training Centre (LRAT) created a questionnaire for logging companies and removers of overgrowth in order to understand the services of preparing and delivering of energy wood for private forest owners. With these outcomes, the challenges and negative aspects that could hinder the development of this sector can be understood, but at the same time the opportunities to improve the situation could be distinguished.



3 **THE THIRD ACTIVITY** has resulted in the development of a free training programme **“ENERGY WOOD HARVEST IN THE FOREST MANAGEMENT PROCESS”**. Training is an important and effective way to communicate information in the shortest possible time. Until now, training in the field of energy wood has been very general or is no longer organized in the partner Member States. Therefore, when carrying out the research/compilation of information on the existing training opportunities for forest owners and those employed in forestry a clear vision emerged regarding of how the training programme should look like to ensure its effectiveness.

The aim of the training is to provide a broader insight into the role and potential of energy wood and

to educate forest owners, entrepreneurs and those involved in the forestry sector on the use of felling residues and small wood in energy production.

THE PROGRAMME CONSISTS OF THEORETICAL AND PRACTICAL PARTS.

The theoretical material is available in the distance learning environment, where the participants can acquire this part in a way that suits them best. The **E-LEARNING PLATFORM** has a distance learning course management system based on the Moodle CRM, which includes the presentations developed within the framework of the project, video materials, audio files and various additional informative materials, which make the learning process more versatile. **IN ADDITION**, a user authorization **PLUGIN** has been created **TO BE LINKED TO LATVIJA.LV** authorization.



In order to make sure that the participant has mastered the basics, **A TEST** has been created **TO CHECK THE ACQUIRED KNOWLEDGE**. This training programme also includes a practical section, which will be organised for one day together with knowledgeable forestry specialists. Basically, the classes will take place in the forest, where the availability of energy wood resources during the thinning of young stands, intermediate felling and final felling operations will be assessed. Also, the site views of the prepared logging residues, measuring of small-sized trees and shrubs at roadside landings, as well as the municipal boiler houses will also be included. The programme differs slightly depending on the target audience, since we have prepared one programme for **PRIVATE FOREST OWNERS** and another one for **THE COMPANIES** involved in the sector.



Link to the course
**“Energy wood harvest in the forest
management process”:**
LRATC Distance learning



Latvian



English

4 **THE FOURTH ACTIVITY** includes **THE SELECTION OF DEMONSTRATION SITES**, in which the thinning of young stands or commercial thinning has been carried out, and the resulting material (or part of it) has been forwarded for energy production - **FUEL CHIPS AND FIREWOOD**. In these objects it was necessary to determine the parameters of the forest stand before and after the economic activity. It was also necessary to assess whether the soil and remaining trees have been damaged. Information about the use of forest machine units and their location was also recorded. The Ltd. Forest Advisory Service Centre selected 6 sites in privately owned forests in the territory of Latvia, while the LSF1 “Silava” selected 16 sites that will be possible to visit within the framework of the practical section of the training programme.



WP 3 - DEVELOPMENT AND TESTING OF THE SUPPORT TOOLS FOR DECISION MAKING

It is important for forest owners to know the value of their forest property or a specific forest stand intended for felling, therefore **A NEW VERSION OF THE COMPUTER PROGRAMME “MEŽVĒRTE”** was developed within the *Baltic ForBio* project which is used to assess the expected estimated volume of assortments in a forest stand. The principle of the programme is the same as before, but an additional section has been created for the calculation of the expected volume of wood biomass from logging residues (branches and the top), which can then be processed into fuel chips, thus giving the owner an idea not only of the volume of the expected wood assortment, but also on the volume of wood biomass and the expected income from the felling site. **A NEW FUNCTION** has also been added to the computer programme “Mežvērte”, which, when working with shp files, provides an opportunity to quickly and easily create



sketches of the felling area and mark **THE LOCATIONS OF NATURAL VALUES** in the felling area **TO BE PRESERVED** during logging and felling residue removal. The information in the sketch gives the forest owner or logger an idea of the bird nests, ecological trees, groups of ecological trees or any other values to be preserved in the planned felling area and their exact location there.



In this work package, in order to ensure the efficient operation of “Mežvērte”, **PRICE MONITORING AND A METHODOLOGY** for determining the most current prices in Latvia’s market for roundwood, harvesting and forest chips **HAVE BEEN DEVELOPED**, thus renewing the prices at which forestry consultants carry out the forest stand assessment process on a monthly basis and predicting the most accurate income after logging. Until now, the Ltd. Forest Advisory Service Centre had determined the price update according to a different method, in which, for example, the prices of forest chips were not taken into account. With the improvements of “Mežvērte”, a new price monitoring was required.

More information about the computer programme “Mežvērte” is available on the e-learning platform **TĀLMĀCĪBA.LLKC.LV** under the training course “Energy wood harvest in the forest management process”, where one can find the informative material about innovative computer programmes for energy wood calculation.

The specialists of the Ltd. Forest Advisory Service Centre have been provided with the developed computer programmes, and subsequent assessments of felling areas are issued to forest owners, including there the volume and price of potentially harvested wood biomass.

A new version of the computer **PROGRAMME “MEŽA EKSPERTS”** was also developed which is used for data processing and modelling in order to support strategic decision-making in forest management planning. The principle of the programme has been maintained as it was before, but an **ADDITIONAL SECTION HAS BEEN CREATED** in which **THE EXPECTED VOLUME OF WOOD BIOMASS FROM LOGGING RESIDUES** (branches and top part) is calculated. The criteria for calculating wood biomass are based on technological, biodiversity and soil fertility aspects. When entering data about a forest stand in the computer programme, the expected volume of wood biomass is calculated for a certain rotation cycle, which is divided into periods, and the duration of one period is 5 years.



WP 4 - GIS PLATFORM AND DATABASE DEVELOPMENT

The Forest energy Atlas was designed to provide **SPATIALLY ACCURATE CALCULATIONS OF A FOREST BIOMASS POTENTIAL** for further use by district heating and energy production companies, municipalities, forest sector entrepreneurs and forest owners. In 2019, the Ltd. Forest Advisory Service Centre in cooperation with the Faculty of Forestry of Latvia University of Life Sciences and Technologies performed calculations of the volume of potentially obtainable

energy wood from the data available in the State Forest Register at the forest stand level. The data obtained from the calculations allow the users of *the Forest energy Atlas* to find out **THE POTENTIALLY OBTAINABLE VOLUME OF ENERGY WOOD** for five assortments (small-sized trees from thinning young stands, firewood and felling residues from commercial thinnings and final felling, which distinguishes between selected felling and clear felling) in the period from



Link to Forest energy Atlas - forest-energy-atlas.luke.fi
(Available in English, Estonian, Finnish,
Latvian, Lithuanian, in Swedish)

2019 to 2054. In the GIS system it is possible to view the volume of potentially obtainable energy wood for a country, municipalities or a freely marked territory, thus allowing the energy wood consumer to plan the optimal location for the development of his or her business. More information about the Forest energy Atlas is available on the **E-LEARNING PLATFORM TALMACIBA.LLKC.LV** under the training course "Energy wood harvest in the forest management process", where you will find informative material about the GIS system, as well as a video tutorial for working with *the Forest energy Atlas*.



WP 5 G.A. 5.1 - BOILER HOUSE BUSINESS MODELS IN RURAL AREAS

As a result of the first activity of this work part, the guidelines for **THE DEVELOPMENT AND ADAPTATION OF SMALL-SCALE BOILER HOUSE BUSINESS MODELS** in rural areas have been created. Latvia's contribution to that is a reflection of the situation on the aspects of related policies and regulations as well as a study of government concepts to be taken into account when processing energy wood for energy production, the number of general purpose and company boiler houses and cogeneration plants using wood biomass as a raw material. This made it possible to compare the situation with other Member States and draw conclusions on the trends in energy use and untapped potential.

LATVIA'S ENERGY BALANCE, comparison of data by years, data analysis and conclusions have also been prepared, as well as future challenges envisaged for the creation and development of new heating systems. Each project country has submitted this type of report, which makes it possible to understand the current opportunities and search for new solutions to use wood biomass even more efficiently in boiler houses and cogeneration plants.

Link to reports -
[Wood Fuel User Manual - TREA English](#)
(Available in English)



INTERVIEWS were conducted with small-scale boiler house operators. After that, **THE RESULTS** of the interviews **WERE ANALYZED AND SUMMARIZED**. Through the interviews the major current and future challenges, market, regulatory and financing limitations were identified and the factors hindering success and development were analyzed.



Participation in the international *Baltic ForBio* project for the Ltd. Forest Advisory Service Centre made a significant contribution to the development of knowledge and exchange of experience with forestry companies in the Baltic Sea region. The acquired knowledge and tools developed within the project framework will help in the further work both in Latvia by providing advice and consultations to private forest owners on efficient and climate-mitigating forest management, and further developing international cooperation with forest consulting companies in the Baltic and Scandinavian countries. Participation in international projects is especially useful for developing focused and narrowly specialized knowledge, as in the *Baltic ForBio* project on the use of felling residues and small wood for energy production from private forests.

Baltic ForBio project managers in Latvia express their gratitude to the State Forest Service, Forest and Wood Products Research and Development Institute, as well as Latvia University of Life Sciences and Technologies, especially to the information system programmer Salvīšs Dagišs, for the cooperation in the project.



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Ltd. Forest Advisory Service Centre
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