FOREST-BASED BIOMASS FOR ENERGY

INNOVATIVE APPROACHES AND ADVANCED SOLUTIONS

Useful cases, initiatives, best practices and projects for Ukrainian stakeholders from all around Europe

TRICOLOR

June 2022

Introduction

Despite the urgency of climate change and the rapid fall in the price of renewable energy sources, the world still relies on nearly 80% of its energy from fossil fuels. Accelerating the shift away from fossil fuels will have considerable environmental and economic benefits, yet progress is much slower than we need.

The problem of fossil fuel dependence has also been heightened by the 2022 Ukraine crisis and the desire of Europe to reduce its dependence on Russian oil and gas.

In May 2022, more than 500 companies from the bioenergy value chain called on the European Commission in an open letter to use bioenergy as part of the energy mix to end the energy dependence on Russian fossil fuels (bioenergyeurope.org). The letter highlights that “bioenergy is readily available and can be deployed quickly, often at a low cost. For example, in district heating, switching from fossil fuels to biomass and waste has reduced costs and emissions in many countries. For residential and commercial buildings, pellet, briquettes, or wood chip heating offers a clean and efficient alternative to gas and oil.”

Alike in Europe, in Ukraine, there is a lot of unused potential along with the pressure from the society to get less dependent on fossil fuels and to put more focus on the forest-based biomass for energy.

In this publication, we have collected 18 useful cases, initiatives, best practices, and projects from 14 European countries that might serve as examples and inspire Ukrainian organizations and companies to change and improve.

We genuinely believe that mobilization of wood, improving logistics, and digital solutions presented in this publication will help to address the challenges we face nowadays and mobilize unused wood resources.

Lesya Loyko,
FORZA NGO
Ukraine

Göran Gustavsson,
Energikontor Sydost,
Sweden

This publication is produced in the frameworks of project **Tricolor: a tripartite collaboration for increased use of biomass for sustainable heat or electricity production.**

Through the exchange of experience, the project strengthens existing and supports establishment of new networks for a sustainable utilization of forest-based biomass in Sweden, Estonia and Ukraine.

Financial support is provided by the Swedish Insistute Baltic Sea Cooperation Programme.

Tricolor is a trilateral project between partners:
- Energikontor Sydost (Regional Energy Agency for Southest Sweden) energikontorsydost.se
- NGO Agency for sustainable development of the Carpathian region FORZA forza.org.ua
- Tartu Regional Energy Agency TREA (Estonia) trea.ee

Funded with support from Swedish Insistute Baltic Sea Cooperation Programme. (roject number 02577/2019)

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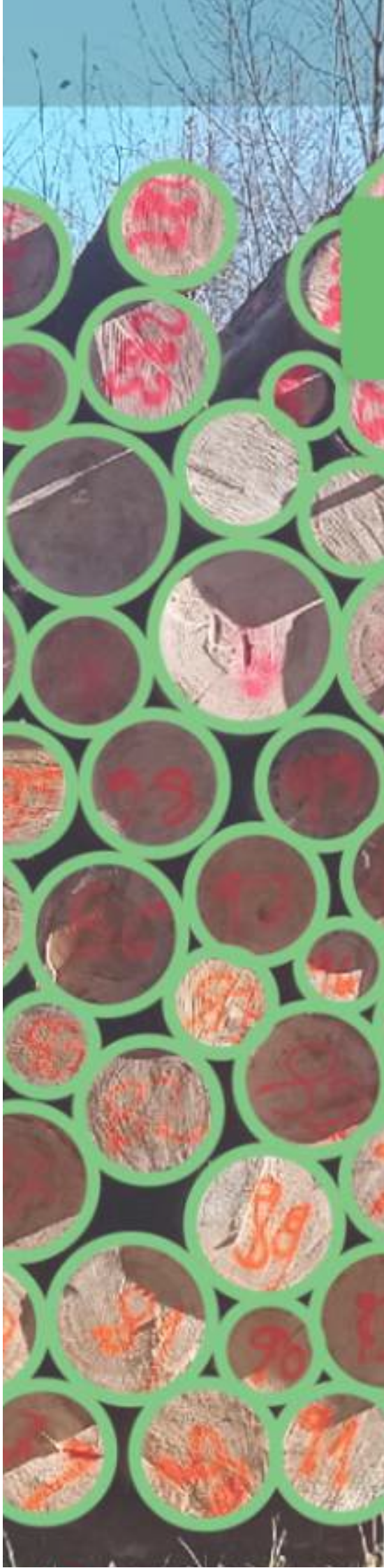

CARBON, AQUA, FIRE & ECO-RESILIENCE DECISION SUPPORT SYSTEM

C.A.F.E.

C.A.F.E. (Carbon, Aqua, Fire & Eco-resilience) is a Decision Support System for a multiple-criteria forest management.

resilientforest.eu/wp-content/uploads/2020/05/DSS-TOOL-.pdf

C.A.F.E. is a tool that combines eco-hydrologic dynamic simulation with many-criteria optimization, where the user can carry out forest management according to more than one product at the same time, and choose the relevance of each objective/product.

COMPANY | OWNER CONTACT

Technical University of Valencia, **SPAIN**

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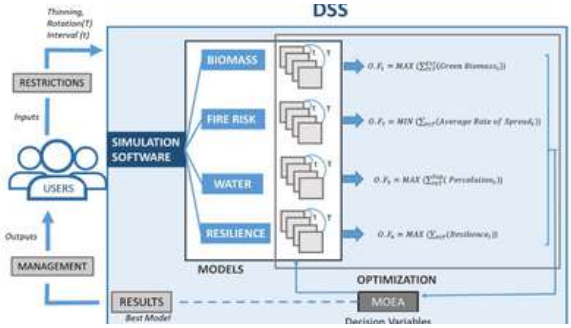
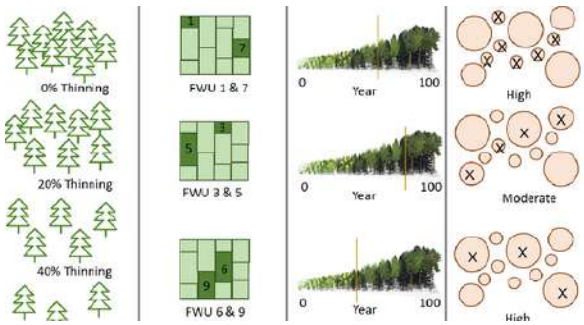
iiama.upv.es/iiama/en/technology-transfer/software/cafe-i.html

This software is capable of working under different climatic regions thanks to the previous calibration of the eco-hydrological simulation.



This tool determines the optimum silvicultural activities to manage multiple products, goods and services such as biomass production, CO2 sequestration, fire risk, water provisioning, climatic resilience or biodiversity, which are simultaneously quantified in time and space for a selected solution. Main advantages include:

- Changing the mono-objective approach in order to include a group of ecosystem goods and services.
- Improving the economic performance of low productive areas by quantifying and valorising other resources that could be remunerated attending to the environmental value.
- Holistic optimization of multiple goods and services out of forest management.
- Adequacy to the specific characteristics of each site.
- Multi-scalar results (plot, forest working unit, catchment, etc.)



TRICOLOR Tripartite collaboration for increased use of biomass for sustainable heat or electricity production

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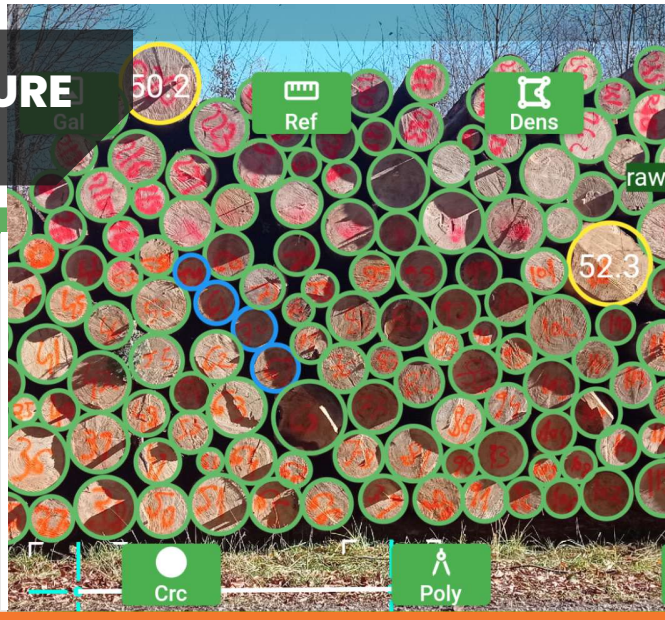
WOOD WATCHER – MEASURE VOLUME OF WOODPILES



Wood Watcher offers a complete digital solution to measure wood piles and wood transports using an Android phone, iPhone or iPad.

woodwatcher.app

COMPANY | OWNER CONTACT

Wood Watcher, **ROMANIA**

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woodwatcher.app

Wood Watcher is an application offering a quick and easy roundwood measurement solution that helps companies reduce time, costs, and risks.

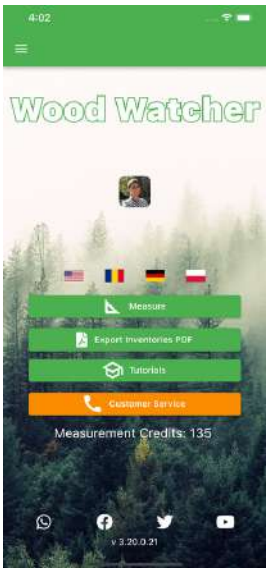
Main benefit: Manual wood volume measuring is labour-intensive and time-consuming, however, volumes can be easily measured digitally in minutes on a smartphone using Wood Watcher.

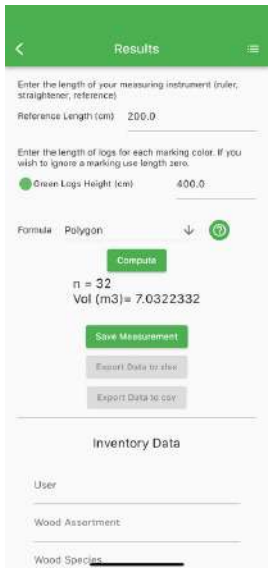
Using AI technology, it makes calculations so that your business figures are accurate and transparent, thus avoiding human error. Also, the inventory is done in real time. Having clear statistics regarding the amount of wood used and the amount your company needs, the logistical part of the operations is being naturally optimized.

Take a photo of a wood pile or timber transport with your smartphone or tablet.

Receive an instant report with: the number of logs, the precise volume, the individual diameters, the pile density, the pile height, the unique digital fingerprint QR code.

Add transport ID, transport source and destination, tree species, and GPS coordinates. Upload and store data in the cloud, synchronize it across all devices, and make it accessible to the whole company. Generate and use reports in commercial relations. Your forestry management system is in professional engineers' hands.





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BIOMASS TRADING CENTRES CALCULATION TOOL

Calculation tool for the establishment and operation of biomass trading centers

play.google.com/store/apps/details?id=brazole.com.biores&hl=uk&gl=US

bioresproject.eu

COMPANY | OWNER CONTACT

GIZ Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH, **GERMANY**

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Biomass Logistic and Trade Centres (BLTCs) are local or regional centres with optimised logistics and trading organization, where different woody bioenergy products (or heat) are marketed at standardised quality focusing on the domestic market uptake.

It's an innovative business model competitively operating as an intermediator to organise local woody bioenergy value chains between local biomass suppliers and customers of different scale from private households up to deliveries to heat and power plants. BioRES supported setting-up such BLTCs in Bulgaria, Croatia and Serbia.

Starting point are web-based marketing and sales platform with limited physical infrastructure. This can be successively extended into a BLTC with its own production, storage and logistics facilities when the local market reaches critical volumes allowing for the amortization of investments.

BioRES mobile app was developed upon request of partners to calculate basic costs and quantities on the field. Technically, the app works on every android-based devices. For operations, users do not need internet connections, so BioRES app can be used on remote places and on the fields with no internet access.

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MILJÖTEKNIK

ORGANIC RANKINE CYCLE FOR HEAT AND POWER PRODUCTION

The technology makes it possible to extract electrical energy from heating plants without having access to superheated steam

ronneby.se/sidowebbplatser/miljoteknik.html

COMPANY | OWNER CONTACT

The Energy Agency for Southeast Sweden, SWEDEN

Göran Gustavsson

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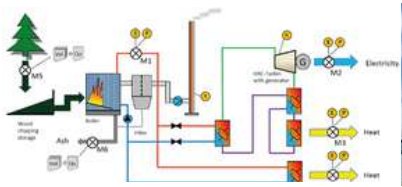
energikontorsydost.se

- **Effect**: 45 kW electricity
- **Operating hours**/year: 4000 h
- **Electricity production**/year: approx. 260MWh
- **Investment cost:** approx. € 120 000
- **Feed-stock:** wood chips, forest residue, bark
- **Moisture** in feed-stock: 35-50 %
- **Model:** Againity AT50
- **Dimensions:** 2,5 x 1,14 x 2 meters
- **Pay-back period**: approximately ten years

Ronneby Miljö & Teknik AB (Ronneby Environment & Technology AB) is a municipal company wholly-owned by the municipality of Ronneby. They manage power, heat, water, sewage, sanitation, fiber optic networks and broadband.



In the small community of Bräkne-Hoby, an ORC (Organic Rankine Cycle) has been installed in the previously existing biofuel boiler supplying heat for the district heating network and a wood dryer. The ORC unit produces heat through a heat exchanger and electricity via a turbine.

Prganic Rankine cycle operates with an organic working fluid of a lower evaporation temperature compared to a conventional steam process, but without the risk of moisture vapor and corrosion and erosion in the turbine or expander.

Internal working medium needs a heat source over 90' connected to the evaporator. After passing through the turbine, the organic working medium is cooled down in the condenser connected to either a district heating network, air cooling system or other cooling water.

Due to the use of an organic medium with a higher density than water vapor in the turbine loop, a turbine more compact than a conventional steam cycle can be used.

The technology facilitates upgrading a plant to a combined heat and power plant if there is an exisiting heating plant with a hot water or steam boiler. When you produce your own electricity this way you reduce your energy bills and contribute to a greener and more weather-independent energy system.

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Swedish Institute

energikontor sydost

FORZA

Tartu Regioni Energiaagentuur

GREN CHP PLANT IN TARTU, ESTONIA

Cogeneration plant which generates electricity and heat at the same time, using local biomass resources

gren.ee

COMPANY | OWNER CONTACT

GREN Energy company, **ESTONIA**

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gren.ee

Tartu Power Station is a cogeneration plant which generates electricity and heat at the same time. The electricity produced is transmitted to the electricity grid and sold on the power market of Nord Pool AS, while heat is directed to Tartu's district heating network.

In energy production, the type of fuel used is very important. Tartu Power Station only uses local fuels: 80% renewable biomass - woodchips and 20% peat (which is not a renewable energy, but is local).

Using local fuels improves the local living conditions and economy and provides employment. Using renewable energy is environmentally friendly and reduces exhaust gas emissions. The CO2 emissions from burning woodchips and timber industry waste, for example, can be written off, as the CO2 released when burning biofuels is reabsorbed by plants through photosynthesis, which means the greenhouse effect does not increase.

The energy efficiency of cogeneration comes from the fact that a certain amount of fuel simultaneously produces both electricity and heat. Producing the same amount of heat and electricity in separate stations would require 40% more fuel.

The job of today's energy companies is to offer customers products they need, based on smart solutions, while using all the energy produced in the process without wasting it.

The heat capacity of Tartu Power Station is 50 MW and the power capacity is 25 MW.

Tartu's district heating network is one of a kind in Estonia: although the majority of the heat is produced at Tartu Power Station using biofuels, Fortum Tartu has also launched an open district heating project with the printing company Kroonpress: extra heat generated in the printer's production process which is not used by Kroonpress is directed to Tartu's district heating network.

This network also receives extra heat from district cooling – the heat returned from district cooling consumers is directed via a heat pump to the district heating network to heat buildings and water.

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SAVING ENERGY WITH CONDENSING ECONOMIZER IN BORYSPIL, UKRAINE

Utilizer of smoke gases (economizer) is a heat exchanger that further enhances the capacity of the boiler at 10-25% with the same fuel consumption.

kge.bio

COMPANY | OWNER CONTACT

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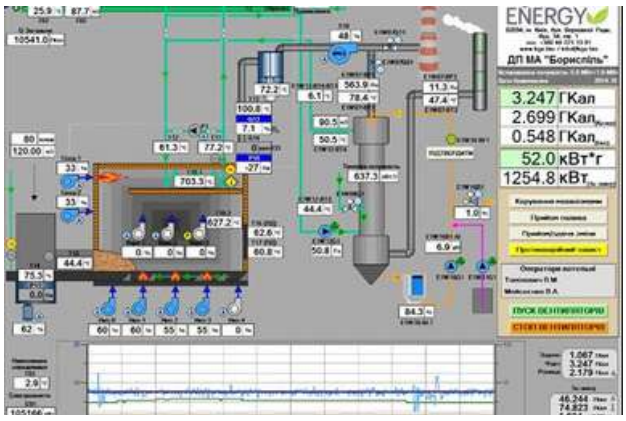
In 2016 at Boryspil airport, Kyiv, Ukraine, UABIO member Kyiv Green Energy company opened the first in Ukraine economizer after the wood-fired boiler of 5 MW capacity.

The economizer is a heat exchanger that further enhances the capacity of the boiler at 10-25% with the same fuel consumption.

The economizer is a heat exchanger that further enhances the capacity of the boiler at 10-25% with the same fuel consumption. The high-performance indicators of the economizer are achieved due to the fact that high moisture content wood is combusted in the biofuel boilers, and a large portion of the combustion heat is used to evaporate moisture from the fuel. In the condensing economizer, contrary to the boiler, this heat is recovered and reused.

The water-heating boiler house is equipped by 5 MW biofuel boiler manufactured by INKA Corporation (Kharkiv) and 1 MW economizer for deep cooling of flue gases of the Enerstena companies group (Lithuania).

The economizer brings free additional heat and the removal of solid particles from the flue gas.



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ENERGY WOOD CHARACTERISTIC DATA CALCULATION




The easy-to-use calculation tool enables quick conversion between standard volume and weight prices.

klimaaktiv.at/erneuerbare/energieholz/werkzeuge-und-hilfsmittel/kenndatenkalkulation.html

COMPANY | OWNER CONTACT

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ienergieholz@energyagency.at

klimaaktiv.at/erneuerbare/energieholz/werkzeuge-und-hilfsmittel/kenndatenkalkulation.html

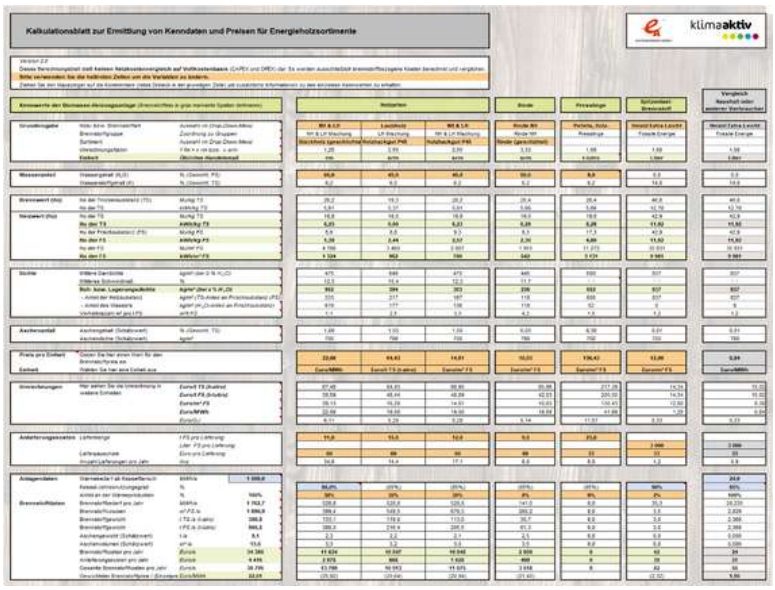
The easy-to-use calculation tool enables quick conversion between standard volume and weight prices. By entering a few factors, the essential characteristics can be quickly determined for different types of energy wood and the assortments compared with each other.

Based on specific characteristics, the weight and volume related energy contents and assortment prices are calculated and compared with each other.

For biomass plants, it is additionally possible to calculate the annual fuel requirements by weight and volume, to compare different energy wood assortments and to calculate the annual fuel costs.

Energy wood characteristic data calculation can:

- convert units: from volume to weight to energy content
- carry out price comparisons
- compare different types of wood
- compare wood assortments with different water contents
- calculate the wood requirement and the fuel costs for a boiler/heating plant and to choose fuels in any ratio
- compare wood assortments with fossil fuels and enter your own parameters
- take important characteristic values of various tree species and types of wood from data sheets


Kalkulationsblatt zur Ermittlung von Kenndaten und Preisen für Energieholzsortimente

klimaaktiv

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LARGEST BIOMASS BOILER HOUSE IN WESTERN UKRAINE

The facility of the Rivneteploenergo was launched after the modernization on February 23, 2022 with the aim of abandoning imported gas.

rivneteploenergo.com

COMPANY | OWNER CONTACT

Bioenergy Association of Ukraine UABIO, UKRAINE

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uabio.org

- Capacity of 20 MW.
- Heats 12 budget buildings and 91 apartment buildings. The boiler house provides almost a third of the city's needs.
- Saves 10 million m3 of gas.
- Uses local fuel — wood chips.
- Was built with private funds (credit).
- Investor Ukrteplo group, UABIO member

The facility of the LLC Rivneteploenergo was launched after the modernization on February 23, 2022 with the aim of abandoning imported gas.

Currently, there are 29 boiler houses in Rivne. Five of them run on solid biofuels. TIn total, Rivneteploenergo serves more than 800 apartment buildings and more than 130 social buildings (hospitals, schools, kindergartens).

The city is implementing a green transition plan in the all-region. The most powerful solid fuel generation in the western region of Ukraine is planned by officials to create — to re-equip up to 70% of boiler houses in 3-4 years.

All boiler houses are planned to be re-equipped to biomass within 5-10 years. The difficulties are in the organization of logistics, the creation of biofuel warehouses, and the fact that these boilers are too small. In 5-6 years, 90-95% of re-equipment is real, according to Rivneteploenergo.

Further modernization will reduce the price of heat supply by one and a half times.

An energy willow will be planted near the regional center — about two million trees. It is guaranteed enough fuel. Biomass will be used as a basic raw material in energy consumption, and gas — as a backup option in peak situations.

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GIEŁDA BIOMASY

Biomass marketplace where you can place bids for purchase or sale of broadly understood biomass as well as products and services in the renewable energy sector

rebiomasa.pl/gielda-biomasy

COMPANY | OWNER CONTACT

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ebiomasa.pl/gielda-biomasy

Giełda biomasy is a biomass marketplace where you can place bids for purchase or sale of broadly understood biomass as well as products and services in the renewable energy sector.

IIn addition to biomass marketplace, the platform includes:

- catalogue of companies operating in renewable energy field including biomass producers and traders as well as machinery and service providers
- news on bioenergy, renewable energy sources and forestry
- discussion forum on related topics

It is a complete source of information on biomass availability, and technologies, services and stakeholders in renewable energy market.

It promote the usage of biomass as well as other renewable energy solutions contributes to reduced reliance on fossil fuels and overall carbon footprint.

Registration is required.

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BALTPOOL BIOMASS EXCHANGE

INTERNATIONAL BIOMASS EXCHANGE

Biomass marketplace where you can place bids for purchase or sale of broadly understood biomass as well as products and services in the renewable energy sector

baltpool.eu

COMPANY | OWNER CONTACT

BALTPOOL UAB, **LITHUANIA**

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baltpool.eu

Baltpool International Biomass Exchange is a rapidly growing online trading platform, where buyers and sellers meet to trade in biomass products under standardized rules. Baltpool currently operates in Lithuania, Latvia, Estonia, Poland, Denmark and Sweden.

Baltpool is part of Lithuania's state-owned EPSO-G energy transmission and exchange group. All of biomass exchange operations are licensed and supervised by Lithuania's national energy regulatory council.

Since 2016, all biomass for energy production has been purchased on the biofuel exchange, which is regulated by law, but with permission to buy biomass outside it, if the price of fuel is lower than on the exchange.

Baltpool currently has 251 companies producing and supplying biofuels and more than 100 buyers of biofuels. More than 90% of all suppliers on the biomass exchange are Lithuanian companies.

One of the most popular types of biomass sold on the exchange is wood chips. Competition between heat producers is organized through monthly auctions for the sale of heat, also organized at Baltpool. The exchange also operates in other countries.

BALT POOL International Biomass Exchange

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DARTMOOR WOOD-FUEL CO-OPERATIVE

Sustainable and environmentally friendly supply of biomass in the area is within 40 miles of the Dartmoor region.

dartmoorwoodfuel.co.uk

COMPANY | OWNER CONTACT

Dartmoor Wood-Fuel Co-Operative,
UNITED KINGDOM

Alastair Mumford

info@dartmoorwoodfuel.co.uk

dartmoorwoodfuel.co.uk

Dartmoor Wood-Fuel Co-operative was set up in 2009 by a group of like-minded residents, each of whom shared a common interest in the environment and reducing the carbon footprint of their lifestyles on Dartmoor.

Initially it supplied six boilers from a variety of businesses including a hotel, a tourist attraction and local farms.

DWC provides knowledge, contractor, machinery and storage facilities to its members.
The cooperative aims to:

- encourage local boiler installations and woodland owners to collaborate
- reduce carbon emissions by using sustainably managed woodlands and improving their bio-diversity and
- develop public awareness of renewable energy and encourage eco-tourism around Dartmoor. Members forward pay for 2 years of fuel based on £50 per kW.

Over the period this investment is paid back through the supply of biomass.

DWC now has 30 members, all with boilers and has just turned a profit with a turnover of £300,000. Members are home owners, schools and elderly care facilities. They're storing 7,500 m3 of wood chip and 2,000 tonnes of timber.

DWC had grants from European Regional Development Fund and Rural Development Programme for England and Forestry Commission.

A board provides overall management and direction with a team of five people managing it on a day to day basis. DWC then uses three sub-contractors to produce the biomass.

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ASH AS CONSTRUCTION MATERIAL IN FOREST ROAD MAINTENANCE

Ashes can be used in a road building among gravel

apio.fi/briefly-in-english

COMPANY | OWNER CONTACT

Tapio Oy, **FINLAND**

Samuli Joensuu

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tapio.fi/projektit/arvo-tuhka-hanke-tuhkan-maarakentamisen-uudet-arvoketjut

The ashes can be used in a road building among gravel. The use of ash from neighboring heat plants reduces the use of natural aggregates. The use of ash in the construction of the road has been limited, as it is currently subject to environmental permits.

In the forest and energy industries, burning wood produces a lot of ash, which is placed in landfills. The forest industry alone generates more than 300 000 tonnes of exploeable ash every year.

The increase in wood energy increases the amount of ash even further. Current measures to benefit from the use of ash do not correspond to the principles of sustainable consumption and production. It would be essential to influence the legislation in order to ease the utilization of ash. It is important to perform carrying capacity measurements and research and test different mixtures of gravel and ash. The environmental issues need to be surveyed.

In Finland there are 135 000 km of forest roads where maintenance is necessary for wood procurement. According to the National Forest Programme 2015, forest car roads should be upgraded to 4 000 km annually. In the construction of roads, cost-effectiveness is most essential. The biggest challenge in most cases is the availability of affordable gravel or crushing near the forest road project. Utilization of ash as material for road construction and maintenance has produced excellent results in terms of both the technical suitability and the environmental impact.

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At the website you can find full reports, but also such useful tools, like Crushed ashed calculator - to calculates the ash and crushed stone masses in tons of the crushed ash overlay required for the construction or renovation of a forest road.

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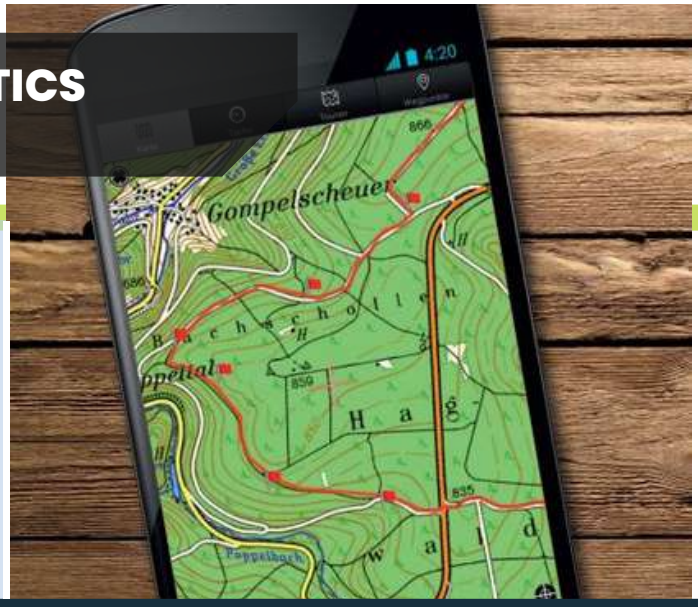
WASP | WOOD LOGISTICS PLATFORM



Modular timber and biomass logistics platform

wasp-logistik.de

COMPANY | OWNER CONTACT

WASP-Logistik GmbH, **GERMANY**

Florian Lange, Ursula Fendel

info@wasp-logistik.de

wasp-logistik.de/englisch.html

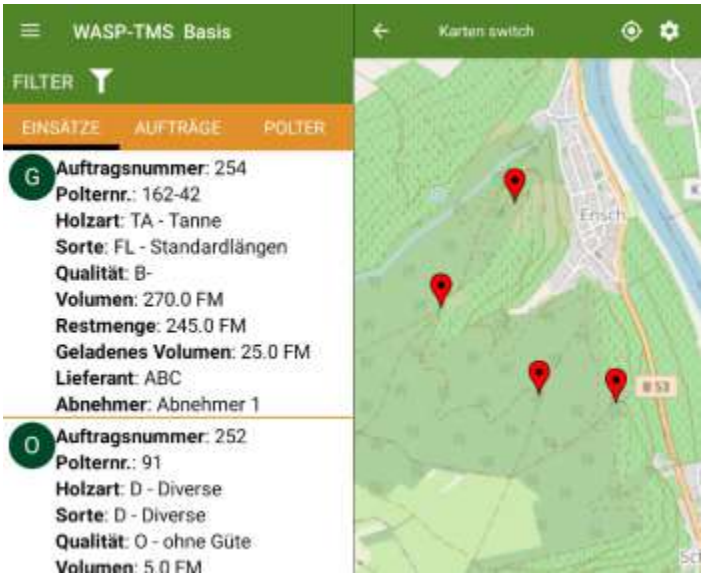
The forestry and timber industry is one of the key industries. The market potential of timber resources increases due to its quality being a renewable and sustainable raw material. There is a large potential for cost reduction by optimising the logistics from forest to factory (wood logistics).

The aim of WASP is to integrate software solutions that are already established on the market as well as the integration of newly developed logistics modules into this internet based platform. The applications used in the forest and timber industry will be interlinked across companies and continuous information flow will be secured along the logistics chain from forest to industry.

WASP supports the continuous control and optimization of logistics processes.

A continuous flow of information is created on the basis of a bundle of existing information. Therefore, operational processes of roundwood and wood chip transports will be improved, empty runs measurably reduced, routes optimised and costs minimised.

WASP uses the existing technical possibilities to optimise logistics, as RFID, mobile data capture and cloud computing. ELDAT standard (EDI of timber data in Germany) is defined as an interface format.
That makes operation of timber removal easy and efficient for companies that transport timber and their clients (forest owners, forest industry and energy suppliers).



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ENON ENERGY COOPERATIVE

Produce district heating energy
by providing woodchips for the three heat production/distribution plants

enonenergia.fi

COMPANY | OWNER CONTACT

Eno Energy Cooperative, **FINLAND**

Tanja Kähkönen

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www.enonenergia.fi

Eno Energy Cooperative is a community-based enterprise in North Karelia, Finland. It was established in 1999 by 12 local forest owners. At that time, there was no proper market for energy wood and the cooperative created that for Eno district, so the initiative was well-received.

Today the co-operative is owned by 54 local forest owners and the aim is to generate heating energy by providing wood chips for 3 district heating plants. Members provide about 20-30% of energy wood, the rest is acquired from different suppliers nearby, e.g. from the fellings of forests owned by the city of Joensuu. The raw materials used are small diameter trees by manual felling (15%), by multi-tree processing (70%) and logging residues (15%) from clear cut areas.

Local approach is central in terms of operation, its members, energy wood procurement and other related services. Municipality building and private customers have saved without taxes about 2 mio € during 15 years compared to light fuel oil.

Besides affordable price of heat, local benefits include net carbon dioxide emissions being reduced because imported oil is replaced by renewable forest chips (5 million kg annually) and local networks are created. The actions employ between 7-10 persons/year.

The cooperative produces 15,500 MWh energy annually which corresponds to the energy consumption of c. 800 detached houses.

Due to concrete benefits to locals, inclusion of residents and openness of the operations, Eno cooperative has become a good example of successful and environment-friendly solution that supports the transition towards oil-free and low-carbon region.

Funded with support from Swedish Insistute Baltic Sea Cooperation Programme. (roject number 02577/2019)

IT FOR II – PORTALE LEGNO VENETO

Online marketing platform for local/regional wood supply chain.

portalelegnoveneto.it

COMPANY | OWNER CONTACT

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Portale Legno Veneto is an online marketing platform for local/regional wood supply chain.

The demand meets the offer in a digital platform where the public forest owners can put on auction their properties for forest enterprise. The platform also has a section where forest enterprise can show and promote themselves, offer roundwood, fire wood and their timber products as well as setting up ads for products their looking for.

The platform also collect all the information about the regional auctions in order to provide useful data on the forest products sector.

Funded with support from Swedish Insistute Baltic Sea Cooperation Programme. (roject number 02577/2019)

FIREWOOD DISTRICT HEATING COMMUNITY NETWORK IN LUCINGES

Replacement of oil and old boilers by wood, a modern wood boiler and a new district heating network

forestener.fr

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Annemasse-les-Voirons agglomeration aims to reduce GHG emissions by 75% per inhabitant by 2050. Composed of 120 municipalities, representing about 400,000 inhabitants. The municipality of Lucinges, part of the agglomeration, has decided to install a firewood district heating network allowing to supply six communal buildings, 57 collective housing units, five single-family homes and the two businesses with renewable heat and to replace the aging oil-fired boilers.

12
wood boiler rooms

8000
MWh/year

40miles
max supply radius

2700
tonnes of chips consumed / year

The municipality of Lucinges delegated the production, distribution and sale of heating for a period of 20 years. The municipality requested the project to be financed with at least 40% of local funds but is also shareholder of ForestEner at 4% of the capital.

The company ForestEner was selected for the design, implementation and financing of the project. The wood used to run the boiler room comes exclusively from a short circuit (less than 30 km).

Citizen funds were raised by Énergie Partagée (founding member and shareholder of ForestEner). Besides being shareholders, citizens can get involved in the governance of the project via Énergie Partagéeand or can send a representative to the general assemblies of ForestEner. The inhabitants are also involved in the operation of the boilers, managing the ashes (which are even used to make artisanal soap), and thus allowing to decrease the operating cost of the wood boilers on the long run.

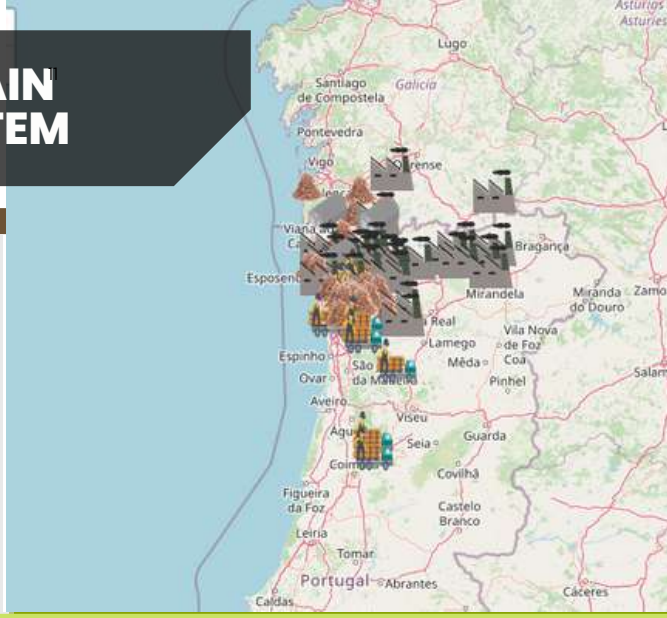
Results are:

- installed two wood boilers of 150 and 330 kW;
- 185 000€ of Shared Energy citizen funds invested on the 1 050 000 € total budget
- Production of 1 100 MWh / year (the consumption of 110 households)
- 50 aging oil-fired boilers replaced by the heating network.

TRICOLOR Tripartite collaboration for increased use of biomass for sustainable heat or electricity production

Funded with support from Swedish Insistute Baltic Sea Cooperation Programme. (roject number 02577/2019)

FOREST SUPPLY CHAIN OPTIMIZATION SYSTEM



Forscope is a prototype of an advanced planning system for forest biomass supply chain.

forscope.inesctec.pt

The Forscope is a prototype of an advanced planning system for forest biomass supply chain.

COMPANY | OWNER CONTACT

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It works as a digital marketplace for forest biomass, providing information on supply and demand for forest biomass for various types of users, biomass producers, biomass consumers, and logistical suppliers of processing and transportation.

It also allows the planning of the supply chain, i.e. it sequences the forest biomass splitting operations according to the available equipment leet and their productivity, in order to minimize logistics costs and meet the supply contracts of the biomass plants.

It can also provide the optimal transport routes and cost estimates with processing equipment, with transport equipment, thus allowing the management of an operations plan that can be monthly but also a daily management of operations.

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ADVANCED LOGISTICS APPLIED TO THE BIOMASS SECTOR

LOGISTICIPLUS

High efficiency along the woodchips supply chain thanks to continuous measurement of fuel consumption and productivity

logisticiplus.it

LogistiCIPlus concerns the improvement of the efficiency of the energy balance and the containment of climate-altering gas emissions in the production of energy from woody biofuels derived from forest biomass, through the containment of energy inputs from traditional fuels in the transformation and transport processes of biomass and biofuels, as well as with the introduction of innovative technologies and methods of production, management, traceability and marketing.

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Strengthening wood biofuel producers from an economic, organizational, qualitative and environmental point of view is of considerable importance in order to increase the professionalism of the supply chain and ensure maximum traceability of products and transparency towards consumers.

The project provides for the adoption of a tool to support the traceability and assessment of the environmental sustainability of woody biofuels based on the ISO 17225 and UNI EN 15234 certification scheme as well as on the specifications relating to the different types of solid biofuel (in particular ISO 17225-4 and UNI EN 15234-4 for wood chips).

The project supports companies involved in obtaining a certification capable of guaranteeing traceability, environmental and qualitative sustainability for the biofuels produced through tools to support the management of raw material logistics to produce wood chips, handling and treatment of the finished product.

The goal is to lay the concrete foundations for improving efficiency in the organization of biomass collection and transformation sites and consequently significantly reduce CO2 emissions produced during obtaining the raw material, handling, processing and marketing of woody biofuels.

Funded with support from Swedish Insistute Baltic Sea Cooperation Programme. (roject number 02577/2019)

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