51 best practices of bioenergy use and energy efficiency in Finland and France

2022

ebook

Thermopolis Ltd
Finnish Forest Centre
Dinan Agglomeration
SCIC Pays de Rance
Park Naturel regional des Boucles de la Seine Normande
LAG Aisapari
Leader Seine Normande

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The European Agricultural Fund for Rural Development: Europe investing in rural areas

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Parc naturel régional des Boucles de la Seine Normande

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FRANSU is knowledge exchange project between Finnish and French partners.

The aim of the project is to increase the international cooperation.

This booklet contains good practices of bioenergy use and knowledge exchange between the areas of LAG Aisapari, Finland and Bretagne and Normandy in France.

The project partners share the information of the best practices of bioenergy use, forest resource information databases collection methods, energy efficiency and sustainable development ideas for both areas regional development actors and enterprises.

Project partners Finland

Thermopolis Ltd is a non-profit company with the goal of promoting the use of renewable sources of energy, energy efficiency and sustainable development in South Ostrobothnia.

Thermopolis

Finnish Forest Centre is a state-funded organisation covering the whole country. We are tasked with promoting forestry and related livelihoods, advising landowners on how to care for and benefit from their forests and the ecosystems therein, collecting and sharing data related to Finland's forests and enforcing forestry legislation.

Metsäkeskus
Forest Centre

Project partners France

Dinan Agglomeration is an administration grouping 64 municipalities in the Brittany region on a territory of 95500 hectares and 98000 inhabitants. Dinan Agglomeration is a territory of resources, water resources, but also in deposits in energy fields tomorrow.an Air Territorial Energy Climate Plan under construction.

SCIC Pays de Rance is a cooperative community-oriented enterprise that shares most aspects of Social and Solidarity based Economy (ESS) and whose activity is centered on valorizing and promoting local renewable wood resources. Its working range covers Le Pays de Rance, including Le Pays de Dinan et le Pays de St Malo.

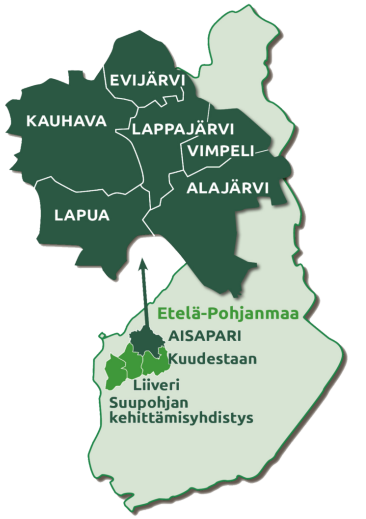
Park Naturel regional des Boucles de la Seine Normande is a Regional Natural Park located in Normandy, between Le Havre and Rouen. It covers 90 000 hectares and there are 77 towns and 100 000 inhabitants. This protected area was create in 1974 to preserve landscapes, biodiversity particlary waste lands, and heritages. Working about agricultural and forestry sectors, the Park supports the territory and his actors setting up of a legal, financial and functional structure allowing the valorization of wood with preserve and restore hedgerows frame aim.

Project funders

FRANSU

LAG Aisapari helps applicants with their applications and organises events in cooperation with other local actors. The operational area of Leader Aisapari consists of six municipalities: Alajärvi, Evijärvi, Kauhava, Lappajärvi, Lapua and Vimpeli.

LEADER Aisapari



Leader Seine Normande is a Local Action Group (LAG) located in France (Normandy) presents in 179 municipalities and for 160 000 inhabitants. This LAG finances innovative and experimental projects in rural areas and supports project leaders in their approach. Leader seine Normande also works in cooperation with French and European partners.

LEADER Seine Normande

The European Agricultural Fund for Rural Development is a fund to support rural development in Europe. The objective of the Fund is sustainable growth, development of livelihoods and improving the quality of life in rural areas.

The European Agricultural Fund for Rural Development: Europe investing in rural areas

Best practices in Finland, LAG Aisapari area

In Finland there are 54 Leader groups, 4 of them are in Southern Ostrobothnia. One of them is Leader Aisapari.

Best practices

Bioenergy use

The LAG Aisapari municipalities have district heating companies which produces heat for many public properties, but also for private companies and private houses. The district heating is usually produced by separate district heating companies. Over the coming years, the use of peat will be abandoned in Finland, due to which energy will be increasingly produced by wood, i.e. chips. There are also biogas plants in the LAG Aisapari area and its immediate surroundings and one solution to the increase in energy independence in the area is biogas plants.

Energy efficiency

From this ebook you can find energy efficiency examples, especially of energy efficiency solutions made by municipalities, which bring annual energy savings and, by extension, emission reductions and financial savings.

Sustainable development and wood products

Finland will continue to use more and more wood to produce heating energy in addition to various hybrid solutions. The forest resources in South Ostrobothnia have been clarified in the Forest Centre survey. Municipalities in the area are conducting climate action in all sectors to reduce greenhouse gas emissions and improve energy efficiency.

Fuel distribution and forest energy balance of district heating plants in South-Ostrobothnia

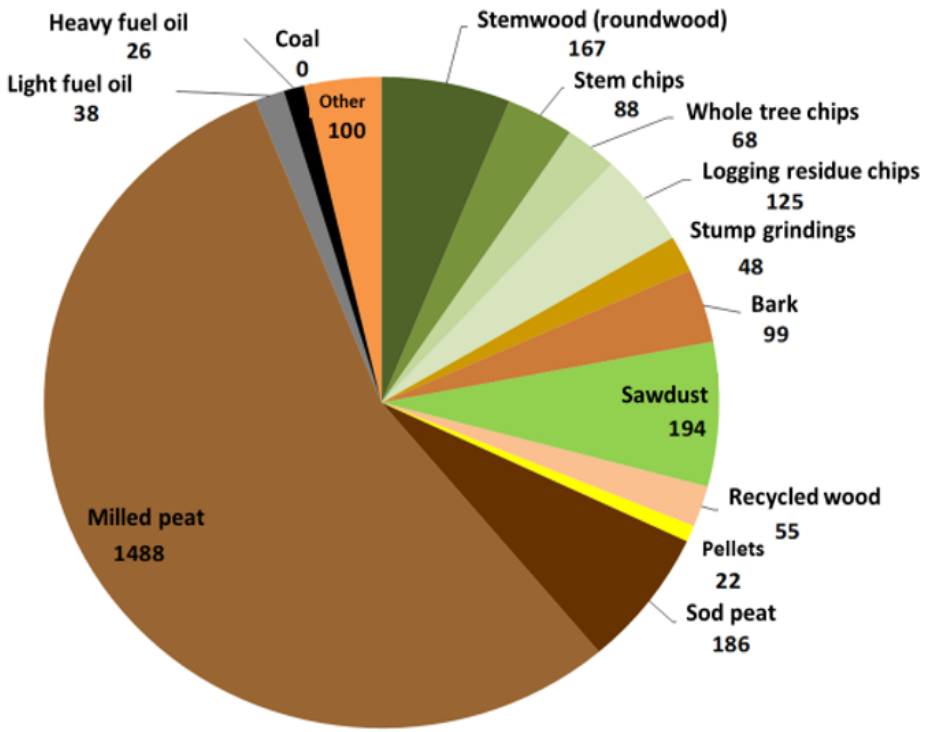


Figure: Quantities of fuels used by disctrict heating plants (GWh) in South-Ostrobothnia in 2019, in total 2 704 GWh. (Finnish Forest Centre)

- The results are based on a survey done by the project Maaseudun muuttuva energiantuotanto (Changes in energy production in the countryside)
- Peat accounts for 62% (1 674 GWh) of the fuel distribution of district heating plants.

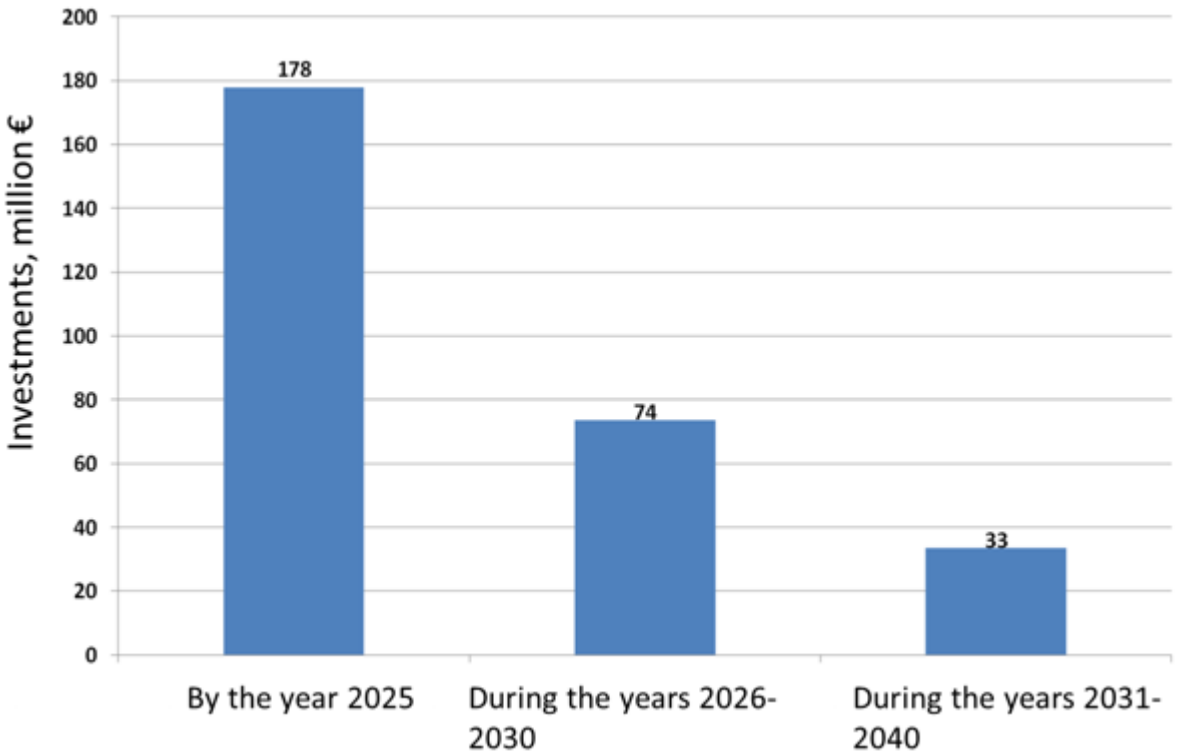


Table: Investment needs of district heating plants (million €) in 2021 - 2040, in total € 285 million €(Finnish Forest Centre)

- Some district heating plants are technically built on milled peat and would require significant investments if they would be converted to alternative fuels.
- According to the survey, there are plans to e.g. invest in an electric boiler, flue gas scrubbers and heat recovery system.
- The rapid increase in the use of wood for combustion may affect the price of wood and the increasing use of imported wood.
- Heating plants are hoping for direct support for investments when converting peat plants to replacement fuels and energy saving investments, e.g.. flue gas scrubbers.

- According to district heating plants, energy wood harvested from young forests includes both small-sized trees and stem wood that meets the dimension requirements of the pulpwood.

- Total unused woodenergy potential in the region is approximately 1 635 GWh/year.

- Almost 80% of the unused wood energy potential consists of pulpwood potential and the rest is logging residues and stumps.

- The current use of pulpwood in the forest industry is used in the calculations. Future investments in the forest industry may increase the industrial use of pulpwood, which will reduce the calculated pulpwood potential accordingly.

Wood energy potential, usage and balance in South-Ostrobothnia			
Roundwood assortments	**Potential (GWh/year)**	**Usage (GWh/year)**	**Balance (GWh/year)**
Small-sized trees	540	540	**0**
Pulpwood (incl. wood consumed by industry)	3 900	2 612	**1 288**
Logging residues (spruce dominated forests)	220	125	**95**
Stumps (spruce dominated forests)	300	48	**252**
Total	**4 960**	**3 325**	**1 635**

Source: Finnish Forest Centre

Kauhavan Kaukolämpö Ltd - Ylihärmä district heating plant

99 % of the energy from woody biomass.

- Industrial by-products, recycled wood, wood chips), 1 % from oil.
- The company has tested burning of green/fresh wood, but it has only a minor role. It has been cost-effective only for hardwood.

Kauhavan Kaukolämpö Ltd has approximately 500 active customers.

- Approx. 50 % of the customers are private houses, but they use less than 10 % of the energy produced.

The company has 4 district heating plants

- Total capacity of production plants is 50 MW, and they have 66 km of networks.

Kauhavan Kaukolämpö Ltd website

Ylihärmä district heating plant is built in 2013. The capacity of the plant is 3 MW.

86,3 % of the fuels used are from woody biomasses (wood chips, also fresh wood). Heat recovery of the plant is 12,5 %. CO2 emissions/sold energy are 4,1 g/kWh (average in Finland is 149 g/kWh). Customers are mostly industry and public buildings.

Source: Kauhavan Kaukolämpö Ltd

Multifunctional school in Kauhava

New school for children

This multifunctional school was built in 2018–2019, and opened in 2020.

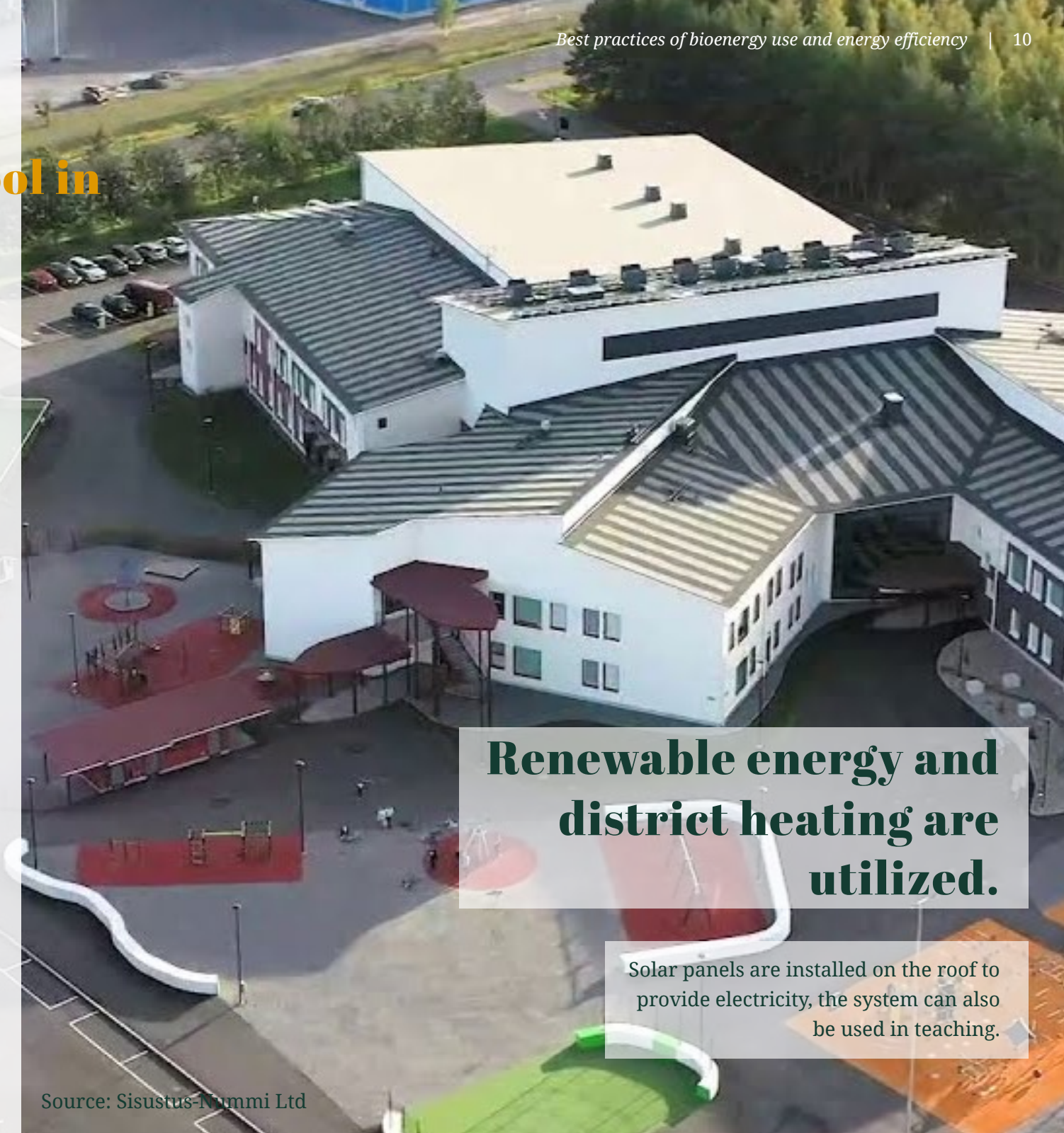
Electric vehicles becomes more common

The school has also charging points for electric vehicles.

Variable class rooms

The school was designed for 750 students and smaller classes in the future.

Ecophon - An article of Kauhava School Centre



Renewable energy and district heating are utilized.

Solar panels are installed on the roof to provide electricity, the system can also be used in teaching.

Source: Sisustus-Nummi Ltd

Lapua Energy Ltd CHP Plant

Energy production

Lapua Energy Ltd has approximately 700 active customers. Total capacity of production plants is 50 MW, and they have 75 km of networks.

Energy sources

Earlier the company used peat as their fuel. During 2021 Lapua Energy Ltd stopped useing peat and replaced it with wood chips.

The plant

The main plant is located near the Lapua city centre. The company also have two smaller and independent regional heating plants in the village areas, and also these plants use wood chips as their fuel.

Lapua Energy Ltd website - in Finnish

Lapuan Energy Ltd produces heat and electricity from renewable energy sources from the year 2021.

Source: Lapua Energy Ltd

Lapua city: geothermal cooling

Lapua has made investments to geothermal cooling systems over the past few years.

- in health center buildings, upper secondary school and Alanurmo school.

- Previously there was no cooling at all.
- The first investment was made in the CONCERTO SOLUTION project (FP7) in the years 2009-2014.

Discover shallow geothermal - The Heat Under Your Feet

The technology of shallow geothermal systems

Source: Lapua Upper Secondary School website

Lapua city: Alanurmo school

Alanurmo school is built in 2013.

Annual energy consumption:

- 350 MWh heating and
- 270 MWh electricity per year

Heating energy sources:

- district heating (small village plant)
- Annual solar energy production about 30 MWh
- Annual geothermal cooling production 12 MWh and
- Annual geothermal preheating 23 MWh

Green Flag school tells about students sustainability education.

Learn more about Green Flag:

Green Flag website

Source: Motiva

Outdoor swimming pools in Finland

Contributing factors for heat demand

- The bottom color of the pool
- Location of the pool
- Material
- Insulation
- Cover for the night

Household outdoor swimming pools

Household outdoor swimming pools can be warmed by geothermal - and solar heat.

Public outdoor swimming pools

In Finland public outdoor swimming pools are mostly heated up by disctrict heating.

For example Allas Sea Pool in Helsinki, where outdoor swimming pools are in use all year around. These pools are heated with renewable district heating powered by biogas.

Allas Sea Pool website

Allas Sea Pool in a nutshell

Example: EpopPark in Lapua uses district heating for heating the pool, produced by renewable energy.

Source: Motiva/EpopPark

Lapua city FEG skills project in schools

The aim

The aim of the project is to highlight the energy resources and its consumption, climate change and sustainable development in various subjects in basic education.

Start

The project was developed and piloted in 2018 - 2019 by four elementary schools from Lapua, Finland.

Funding and development

FEG Skills is funded by and developed in co-operation with Finnish National Agency for Education. For the time being it's only available in Finnish, but we are certainly interested in translating FEG Skills into multilingual versions in the future.

- FEG skills website
- WWF article about Energy Genius of the Year 2019

FEG Skills is an abbreviation for Future Energy Skills and Gamification.

FEG Skills is an undertaking focused on sustainability of our scarce resources and preserving healthy living conditions for future generations here on Earth.

Source: FEG skills Facebook

Heat recovery renovations with high efficiency

Renovations made energy savings possible.

Renovations have been made
in many municipal buildings in the past years.

The heat of the exhaust air is recovered and transferred to the heating of the supply air.

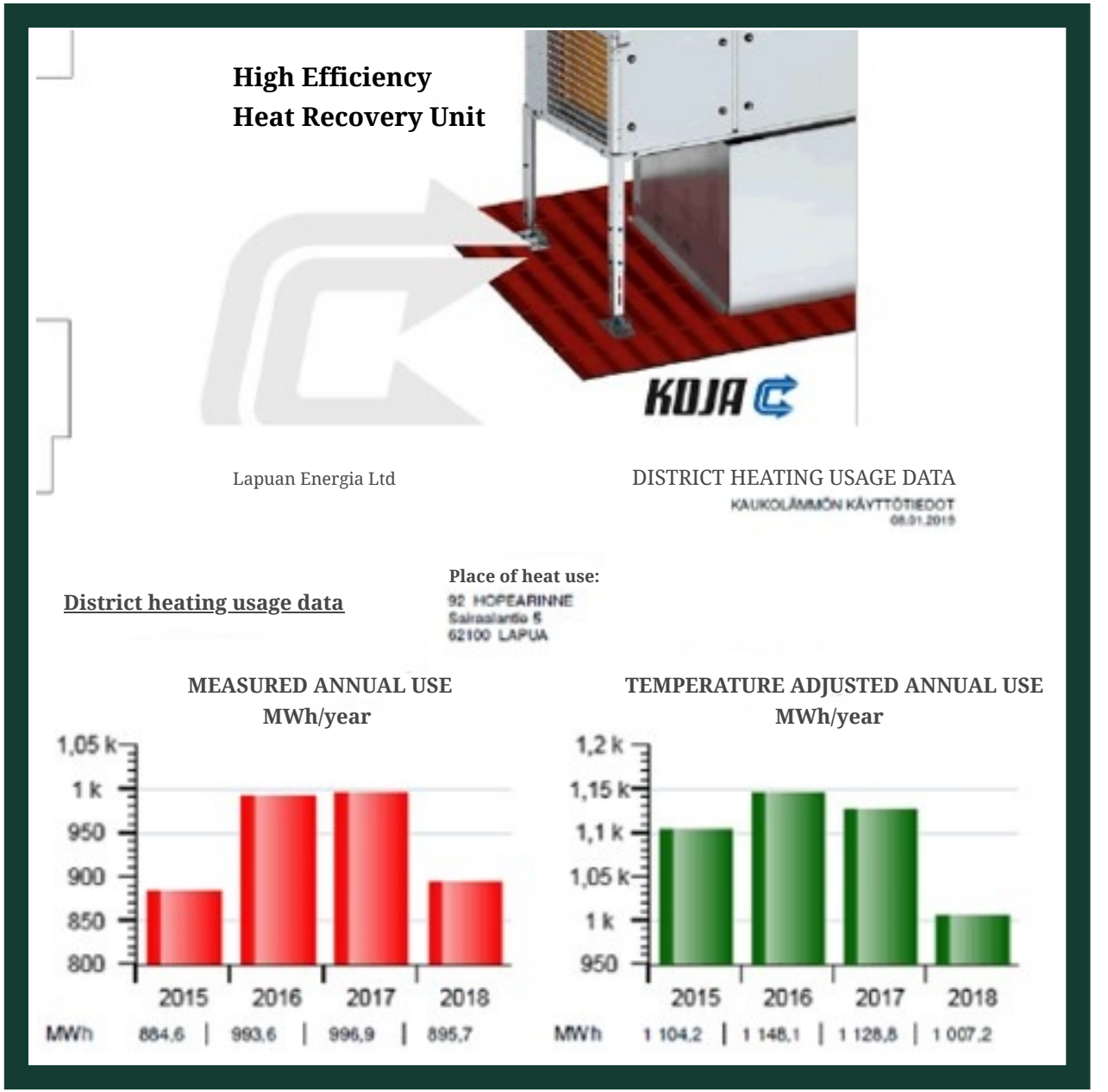
One good examble is Lapua city rest home Hopearinne:

- 15 exhaust fans recovered with 4 air conditioning hardware with high efficiency heat recovery systems.
- Annual energy savings are:
  - 240 MWh in heating
  - 9 MWh in electricity.

Project Solution Concerto was a project, which aimed at influencing the challenges and needs of sustainable development in Europe.

Read more about it:

Project Solution Concerto website



Lapua city gardening

Source: Lapua Facebook/Kestävät website

Lapua city gardening effort invests in improving biodiversity in built-up areas:

- Meadow grassland
- Utilising grazing
- Utilising manewood in the construction and meadows of children's play areas
- Reuse of play equipment parts in other structures
- Sand for reuse
- Composting of biowaste in gardening
- Prevent invasive alien species.

Lapua city has a tourist garden called Jokilaakso. Jokilaakso is a Finnish word and it means river valley.

In the tourist garden there are thousands of different plants, which are suitable for the area. Some of the plants are more traditional garden plants but there's also rare and new plants.

There's also a useful plant sample ground, which is one of the biggest in Finland.

The tourist garden Jokilaakso website - in Finnish

The tourist garden Jokilaakso, Lapua

CLT (Cross Laminated Timber) manufacturing in the near-by area

Hoisko CLT

Hoisko CLT manufactures and processes massive wood construction products made of cross-laminated timber (CLT). Hoisko CLT has a factory in Alajärvi.

Suitability and tailoring

Cross-laminated timber (CLT) is suitable for internal and external walls and for ceilings and roofs. The final products can be tailored according to the customers needs.

CLT Plant

CLT Plant Ltd in Kauhajoki are also manufacturing CLT boards.
CLT structures are planned and formulated in advance, so the assembly can be done quickly and easily.

- CLT Plant Ltd website - in Finnish
- HOISKO CLT production website
- HOISKO CLT production
- Your CLT building partner - HOISKO - CLT-rakentamisen kumppani

CLT solid wood board products have excellent fire safety characteristics, short set-up time, easy to assemble and high level of prefabrication, sustainable construction method with positive CO2 balance.
The carbon footprint of CLT is small because wood binds carbon dioxide as it grows and acts as a carbon storage.
Also producing wood as a building material takes less energy than other materials. The amount of wasted wood is minimal.

From CLT boards can be built e.g residential buildings, public spaces, plants, apartment buildings, farm buildings, properties and balconies - all without plastic.

CLT solid wood board products are manufactured by gluing boards/battens crosswise in several layers.

Source: Hoisko CLT

Biogas plant in Vimpeli: Hietakorpi

Farm owners are more and more interested in increasing self-sufficiency of the farm with respect to electricity and heat.

- This biogas plant operates in connection with the organic dairy farm.
- The open doors of the biogas plant were in November 2018.
- Raw materials for biogas production are cow manure and inedible feed.
- Becauce of the biogas plant annual savings are about
  - 25 000 € in electricity
  - 10 000 € in heating.

Virtuaalibussimatka Hietakorven tila virtual bus tour

Biokaasulaitos Hietakorpi ay, Vimpeli - Avoimet ovet 1.11.2018

Source: Envitecpolis Ltd/Demeca Ltd Facebook

Afforestation

Obligations of forest owners

The Finnish Forest Act obligates forest owners to regenerate their forest after a final felling.

In terms of sustainable forestry, the forest regeneration process should be initiated as quickly as possible. The regeneration may be implemented by artificial (planting, sowing) or natural regeneration.

Suitable areas for afforestation

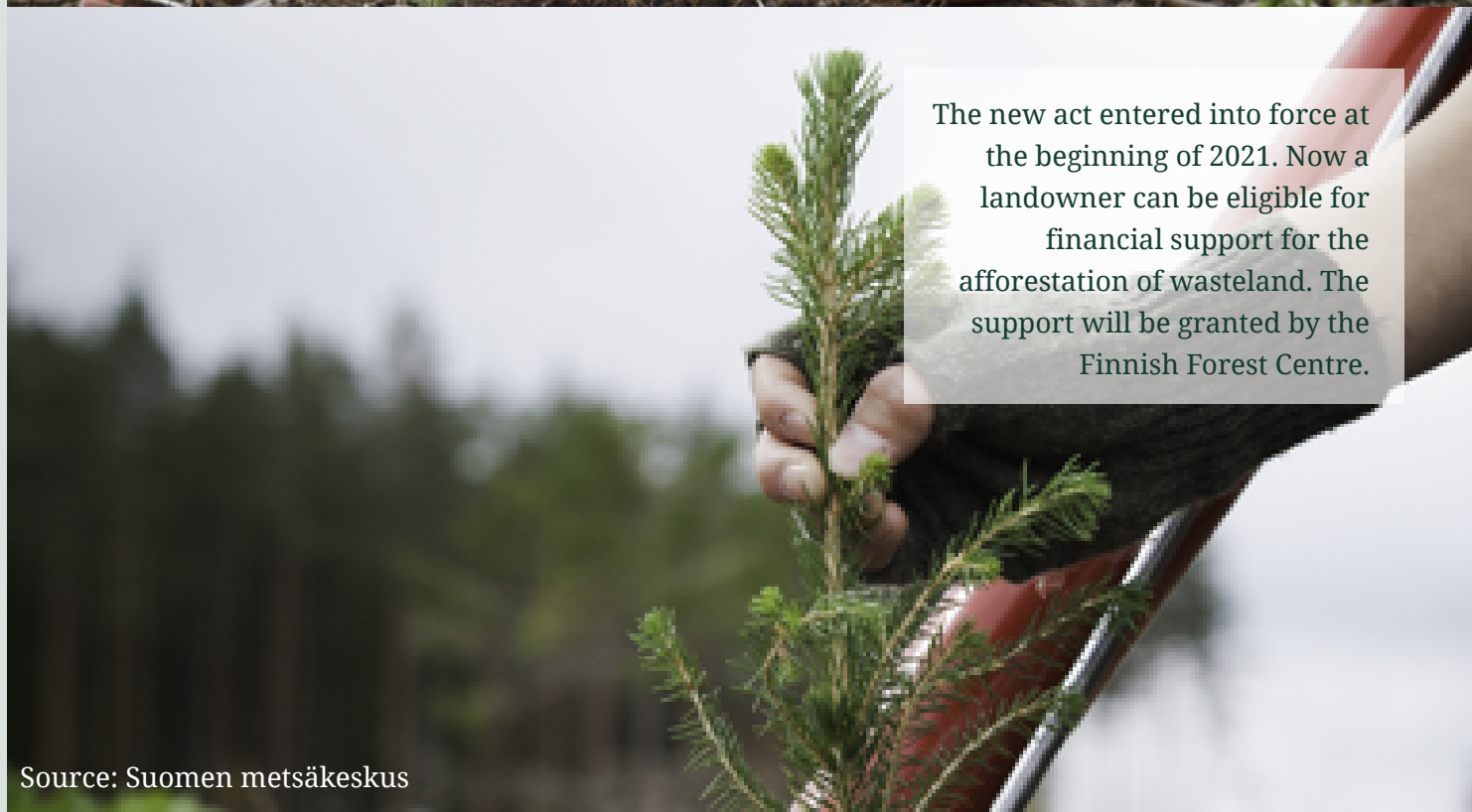
Areas considered suitable for afforestation are arable parcels excluded from agricultural use and former peat production areas.

The measure is not intended for the afforestation of agricultural lands used for cultivation. Afforestation of meadows, pastures and clearings that are important in terms of their environmental and nature value is also not eligible.

The Finnish Forest Centre - Afforestation support

An article of New observation station at a former peat extraction area

Finland's forest area can be also increased through afforestation. The aim is to increase and strengthen forest carbon sink.



The new act entered into force at the beginning of 2021. Now a landowner can be eligible for financial support for the afforestation of wasteland. The support will be granted by the Finnish Forest Centre.

Source: Suomen metsäkeskus

eServices for forest owners and service providers

- Encourages the users to carry out silvicultural work.
- Shows the possibilities of each forest estate: properties of trees, soil and nature; what to plant, cut or protect.
- Forest owners can share information with service providers.
- Finnish Forest Centre collects and maintains data of forest resources covering the private forests.
- The collection method is based on remote sensing. Data is updated according to forest owners´and service providers´notificatons.

Forest information presented in Metsaan.fi service

- Soil and forest site
- Growing stock
- Treatment proposals for a five-year period
- Environmental values (habitats of special importance)
- Latest maps and aerial photographs

eService Metsään.fi

To whom?

- Forest owners and forest service providers

What information?

- Maps and aerial photographs
- Natural values
- Silvicultural work and fellings.

What are the benefits?

- Easy to use and to network.
- Forest information in one place.
- Same information for all parties.

Who provides?

- Provided by the Finnish Forest Centre and funded by the Finnish Ministry of Agriculture and Forestry.

metsakeskus.fi

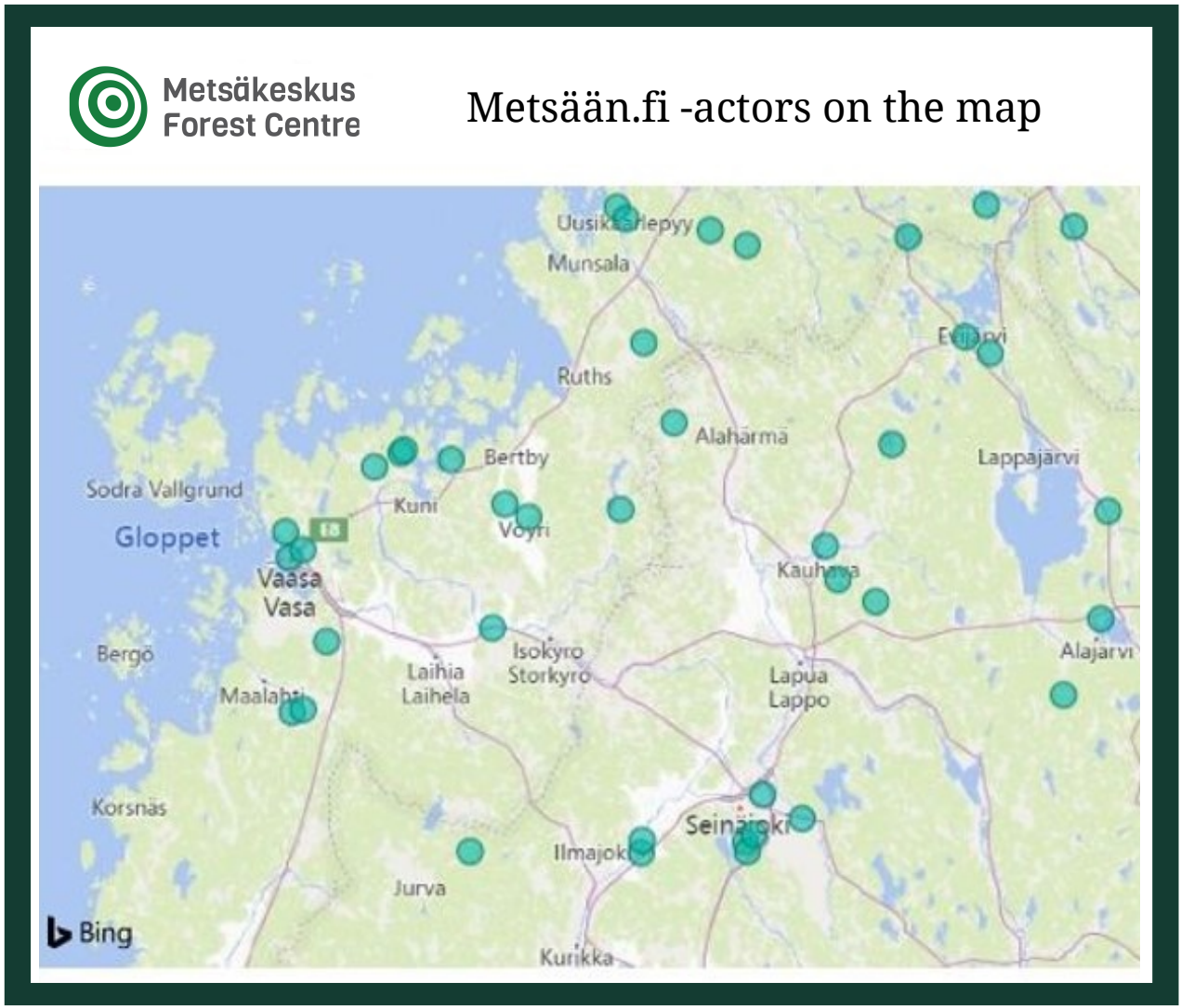
Digital services – spatial data applications

Network of timber and energy wood terminals and areas used as buffer storage

- Locations of existing and potential terminals are published in a spatial data application.
- If a operator needs a terminal or storage for energy wood, this application can be used to find the nearest location and more information of the location (owner etc.).
- Can be utilized in the operational activities of forestry and, for example, in land use planning and zoning.
- Finnish Forest Centre acts as the service administrator.

Application of the Forestry operators

- The spatial data application can be used to find forestry companies and entrepreneurs and other service providers.
- In order to find a service/operator the user can use the application to choose the area, the municipality and the industry of which the information is wanted.
- The location of the operator on the map as well as information about the services provided by the operator are available.
- The service is free of charge and open to all operators.



Metsään.fi - website - in Finnish

CLT School in municipality of Kuortane (near LAG Aisapari area)

Source: Kuortane website/Alvarin uusi alakoulu Facebook

Kuortane is a municipality with 3546 inhabitants. The municipality of Kuortane wants to procure products and building materials from nearby areas to reduce transport emissions and to increase the vitality of the area.

Utilisation of wood

Authorized want to utilize Finnish wood production in building the school.

Variability and renewable energy

The school has variable class rooms. They have also invested in PV system with 100 panels.

Olympic training center

Olympic training center in Kuortane has also CLT gymnastics arena.

Olympic training center in Kuortane – carbon neutral at 2030

This project is one of the biggest geothermal energy projects in Finland.

- Partly photovoltaic geothermal energy
- Almost self-sufficient at summertime
- 2618 PV panels produces 15 % of total energy
- 104 geothermal wells
- Led lightning
- Annual energy consumption is about 5 500 MWh, heated space 375 000 m3
- 15 years pay back time, after that the annual savings are 200 000 €. Now annual energy savings are 70 000 €.
- Carbon dioxide emissions reduced:
  - Photovoltaic system and led lightning reduces 200 tons
  - Geothermal energy reduces 1300 tons
- About 2 million investment

Kuortane olympic training center website

Kuortane olympic training center

Check out a video about the stand gymnastics hall Lem-Kem Arena.

- Building material CLT, led lightning, PV panels etc.

Olympic Training Center Kuortane, Lem-Kem Arena - partly in Finnish

Source: Maaseudun tulevaisuus

Biogas plant in Jepua

Operation in the biogas plant started in 2013.

The company produces energy from agricultural and food industry by-products. The biogas plant doesn't process municipal wastewater.

The biogas plant receives approx. 130 000 tons of raw material/year. Annual production is 30 GWh.

Jepuan biokaasu Ltd offers these products and services:

- Transport biogas
  - costs 1,40 €/kg, which means approx. 0,93 €/litre.
- Industrial biogas
  - biogas can replace fossil fuels.
  - vision for the future is to reprocess biomethane into liquid form (LBG).
- Fertilizer production
  - nitrogen and phosphorus are in soluble form.

Virtuaalibussimatka Jepuan Biokaasu virtual bus tour

Since the plant's operations began, monitoring of the state of the environment is regular. Also the company constantly wants to minimize adverse environmental impacts.

Source: Jepuan Biokaasu Ltd

Jepuan Biokaasu Ltd is focused on nutrient recycling and renewable energy.

Indoor swimming pool in Kurikka (not in the Aisapari region but in South Ostrobothnia)

An exhaust air heat pump was installed in the swimming hall to reduce energy consumption.

The exhaust air heat pump removes moisture from the air and recovers heat. The recovered energy is utilized in the post-heating of the supply air and any excess energy is transferred to the pool process.

The energy efficiency of the building improved and the moisture stress on the ventilation unit and pool area decreased.

With the new system, in the monitoring period 22.10.-10.11.2020, 25,41 MWh of energy had been recovered. Electricity consumption was 7,326 MWh and the COP value 4,5 during the monitoring period. Annual energy savings were about 700 MWh.

Kurikka city is committed to an energy efficiency agreement.

The aim is to reduce energy consumption by up to 10,5 % (compared to 2015 levels) in the follow-up period 2014–2025. The exhaust air heat pump system was introduced on 22.10.2020.

Case Kurikka city

KEINO Competence Centre website

Source: Kurikka website/Ilkka-Pohjalainen

Photovoltaic plant in Ilmajoki (near LAG Aisapari)

Lähdesmäki Ltd was established in 1972. Their primary field of business is furniture retail.

- The company has two branches in Ilmajoki and Vaasa. Their main branch is in Ilmajoki.
- The main branch has floor space over 5000 m² and there is direct electric heating.
- Annual energy consumption is almost 500 MWh.
- Indoor and outdoor lightning have been changed into led lightning.
- In 2018 the company installed 120 PV panels. Now they have 240 PV panels. The nominal peak output is almost 67 kW.
- In 2020 until the end of August their cross output was about 50 MW and almost 14 MW of that was overproduction.

Source: Virtual bus tour Youtube video

Virtuaalibussimatka Lähdesmäki Oy virtual bus tour

Manufacturing industry in energy sector

Finland is well known for its educational and technological competence. There are many companies who are operating globally in manufacturing industry in energy sector.

Here is a few example of these companies:

Veljekset Ala-Talkkari Ltd:
Biomass heating devices and environmental machines.

Valmet Plc:
E.g pulp, board and paper, tissue, energy.

Oilon Group Ltd:
Environmental technology with a special emphasis on product research and development work.

KPA Unicon Group Ltd:
Deliver energy solutions, e.g Bio & Waste, Liquid & Gaseous, Unicon Heat Recovery.

Hydroll Ltd:
High-quality piston accumulators.

TP Silva Ltd (Palax):
Firewood processors.

Good practice - LAG aisapari project

Source: Leader Aisapari

Leader Aisapari has been working on sustainable development projects during 2014-2020

- Energy efficiency renovations for 33 shared facilities.
  -A total of more than 600 000€ funding has been granted to the assembly room projects.

- What have been done?
  -Purchase of air source heat pumps
  -Updating the heating systems
  -Renovations for better thermal insulation
  -Energy saving changes for lightning and water supply

- In addition to village houses and youth clubs, other traditional buildings and meeting and leisure facilities for organisations have also undergone energy renovation.

Leader Aisapari website

The Kestävät municipalities project

"Kestävät" is a Finnish word and it means sustainability and endurance.

There are four municipalities in this project; Lapua, Kuortane, Alavus and Kurikka. All of them are located in South Ostrobothnia, Finland. These municipalities want to respond to the challenges posed by climate change and they joined forces because "there's power in cooperation".

"The municipalities have drawn up a joint sub-regional climate strategy, which is now being implemented in various ways."

E.g all of these municipalities have their own Energy Saving Teams. These teams have prepared sustainable development programs for the activities of the municipality. Energy Saving Teams monitor the implementation of programs and also update these programs as required.

Source: Kestävät kunnat website

LEARN MORE

HECSO - The heat entrepreneurship cluster of South Ostrobothnia

This development project assembled the heat entrepreneurship knowledge cluster of South Ostrobothnia.

- The knowledge cluster has been made to utilise, in many different ways, the companies located in the region, other actors in the region and the internationalisation of the whole province.
- A principal component of internationalisation is the knowledge cluster's training package on heat entrepreneurship, which is on offer to interested foreign target groups. Vocational Adult Education Sedu is responsible for the training.

More information from here:

HECSO website

Lämpöyrittäjyys Suomessa - Heat entrepreneurship in Finland

Source: HECSO website

Forestry training in the region (in South Ostrobothnia) Sedu

Sedu - Vocational Education and Training Institute

Vocational education and training in 32 vocational upper secondary qualifications in several locations around the region.

- For example, study programmes in agriculture and forestry, mechanical engineering and production technology, wood and construction.

In addition, Sedu organises education and training for further vocational qualifications and specialist vocational qualifications.

- For example: programme options for professionals: bioenergy and heat entrepreneurship training, update your foresty skills, automation and precision in agriculture.

Sedu website

Sedu - Forestry, Ähtäri

Sedu - Forestry training

Source: Sedu website

Agricultural, Natural and Environmental training in the region (in South Ostrobothnia)

Jami

Jami - Järviseutu Vocational Institute

- Operating in South Ostrobothnia in several location and offering 16 vocational qualification study programmes.

- Jami website

- Jami - #porttimaaseudulle - kohti unelmien ammattia - towards the profession of dreams - in Finnish

- Many of the study programmes are also available for adults. The multiform education aimed for adults includes maximum of one week per month of contact learning. In addition, the study programme contains distance learning and on-the-job training. They also organize supplementary and further education, and apprenticeship training.
  - Examples of degrees available: Entrepreneur in Nature-Based Services, Rural Entrepreneur, Environmental Operative

Source: Jami website

Project example: Maaseudun muuttuva energiantuotanto (Changing energy production in the countryside)

A joint development project of Finnish Forest Centre and Jyväskylä University of Applied Sciences during 1.10.2020 - 31.12.200

Photos: Jussi Laurila, Suomen metsäkeskus

- The aim is to promote the use of renewable energy and entrepreunership in the project area (in South Ostrobothnia). The main goal is to increase the sustainable use of forest energy in the area. The use of forest energy must be increased, e.g., due to the reduction targets for the use of peat in energy production. The aim is also to increase the utilization rate of agricultural by-products in energy production.

- The measures aim to mitigate climate change, reduce the use of fossil fuels and promote the transition to a carbon-neutral society. The project also promotes the regional economy and networking between entrepreuners. The main target group of the project is primary producers in agriculture and forestry, as well as entrepreuners in the heat, machinery and energy sectors.

- Examples of the measures:
  - To secure the supply of energy wood in rural areas by developing procurement logistics and demonstrating alternative harvesting methods and technology.
  - To investigate the possibilities to burn by products of grain drying
  - To investigate the possibilities for burning horse dry manure.

Euroopan maaseudun kehittämisen maatalousrahasto: Eurooppa investoi maaseutualueisiin

Maaseudun muuttuva energiantuotanto - In Finnish

Best practices in France, Bretagne and Normandy

Seine Normande

Park Naturel regional des Boucles de la Seine Normande is a Regional Natural Park located in Normandy, between Le Havre and Rouen. It covers 90 000 hectares and there are 77 towns and 100 000 inhabitants. This protected area was create in 1974 to preserve landscapes, biodiversity particlary waste lands, and heritages. Working about agricultural and forestry sectors, the Park supports the territory and his actors setting up of a legal, financial and functional structure allowing the valorization of wood with preserve and restore hedgerows frame aim.

Leader Seine Normande is a Local Action Group (LAG) located in France (Normandy) presents in 179 municipalities and for 160 000 inhabitants. This LAG finances innovative and experimental projects in rural areas and supports project leaders in their approach. Leader seine Normande also works in cooperation with French and European partners.

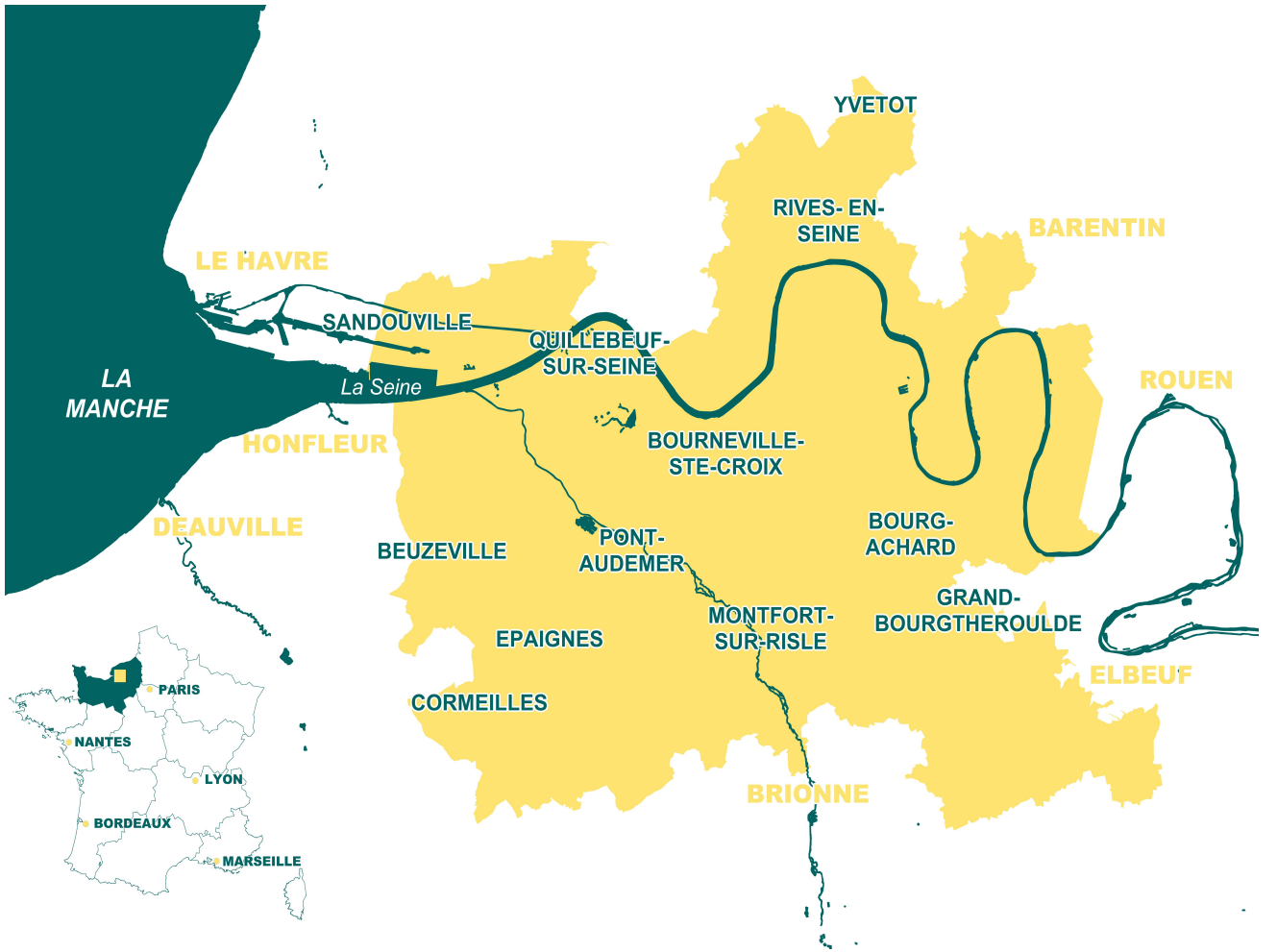


Figure 1. Seine Normande location

Dinan Agglomeration

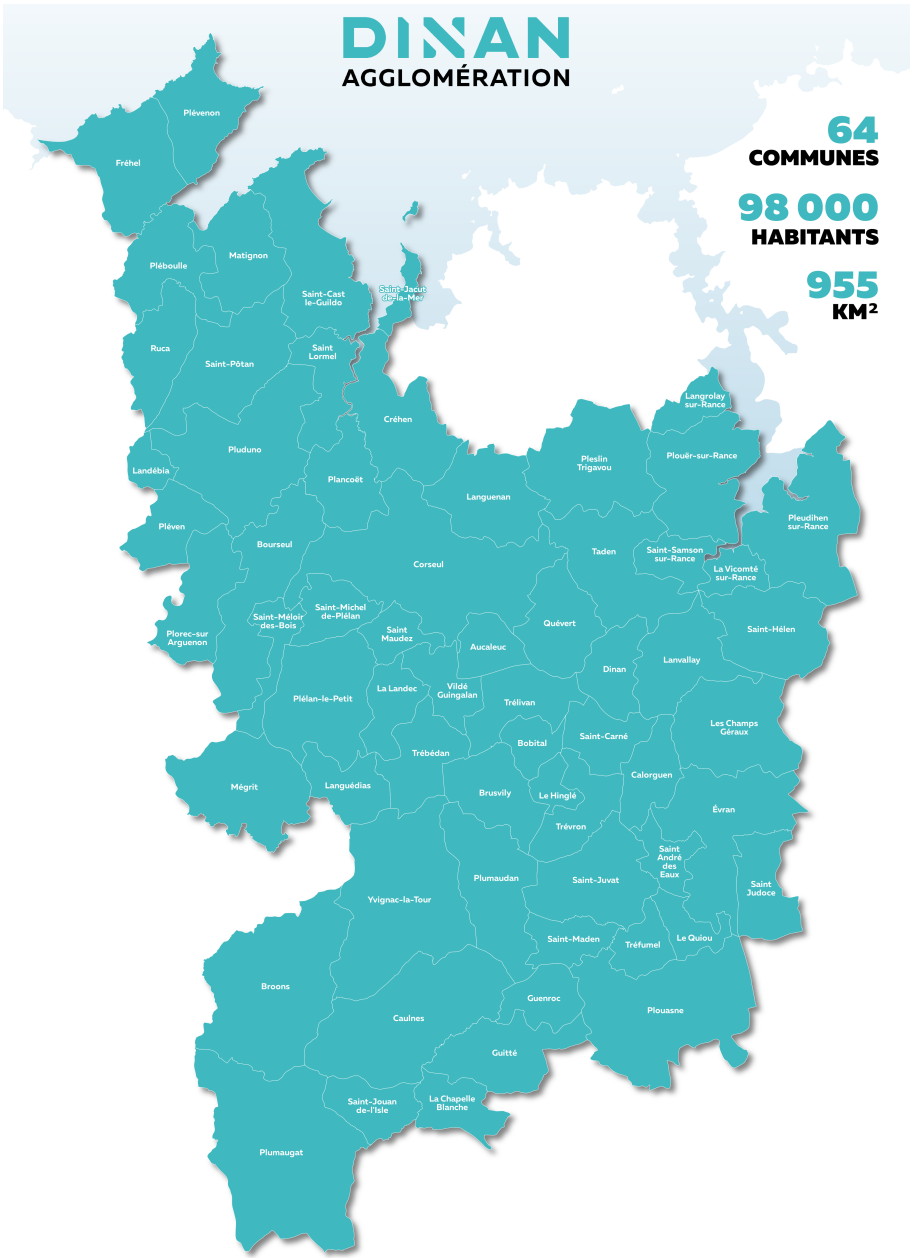


Figure 1. Map of DA territory

Dinan agglomeration is an adminstration grouping 64 municipalities in the Brittany region on a territory of 95 500 hectares and 98 000 inhabitants. It is also a territory of resources, water resources, but also in deposits in energy fields tomorrow.

Dinan Agglomeration is a territory of resources, water resources, but also in deposits in energy fields tomorrow.

Air Territorial Energy Climate Plant under construction

Dinan Agglomeration adminstrates the local Leader-programme of European Agricultural Fund for Rural Development. Working method Community Led Local Development (CLLD)
Total funding for 2014-2020: 1 740 829€
FRANSU is a project funded in the Leader 2014-2020 programme of DA

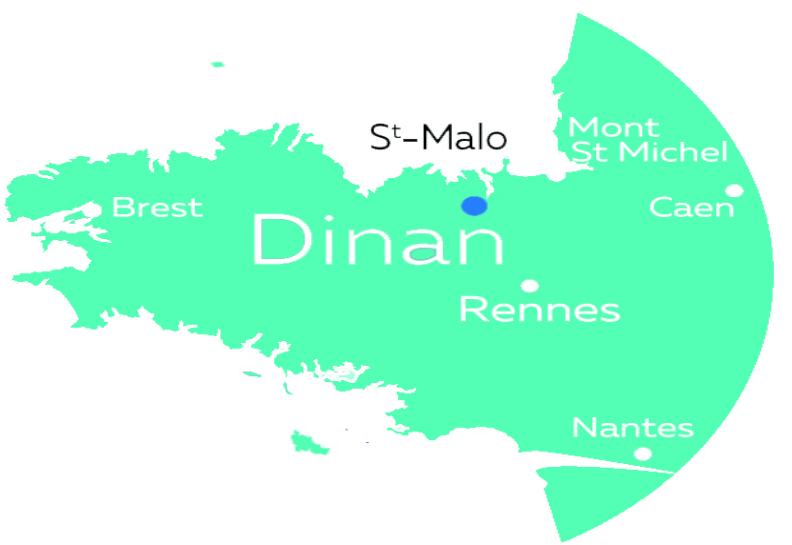


Figure 2. Map of Brittany locating Dinan

Solar power plant on the ground in Ruca

Taking place in a public former Ruca landfill site rehabilitated in 2010, the solar power project initiated in 2020, will be comssioned in the october 2022

-Landowner of site: Public intercommunal household waste recycling Syndicate KERVAL

-Projec support: Energy mixed economy company of Cotes d' Armor region (SEM ENERGIES 22)

SEM ENERGIES 22, through the associaton of local actors and banks, will promote the emergence of energy projects in Cotes d'Armor.

-Construction & operation society: INITIATIVIES & ENERGIES LOCALES (IEL group)

Kerval gave to SEM Energies 22 a manadate to carry out this project from 2020. IEL group was selected as part of a call for tenders launched by SEM Energies 22.

Technical details and figures

- Project site area: 5,5 ha
- Number of solar panels: 9 800
- Installed power : 4 MW
- Annual prodcution : 4,5 GWh

Economic details

- Investment 4 000K€ (2,5% is reserved for a crowfunding for citizens and communities).
- Annual fiscal economic benefits for public authorities: 15K€

Figure 1. Location of the project

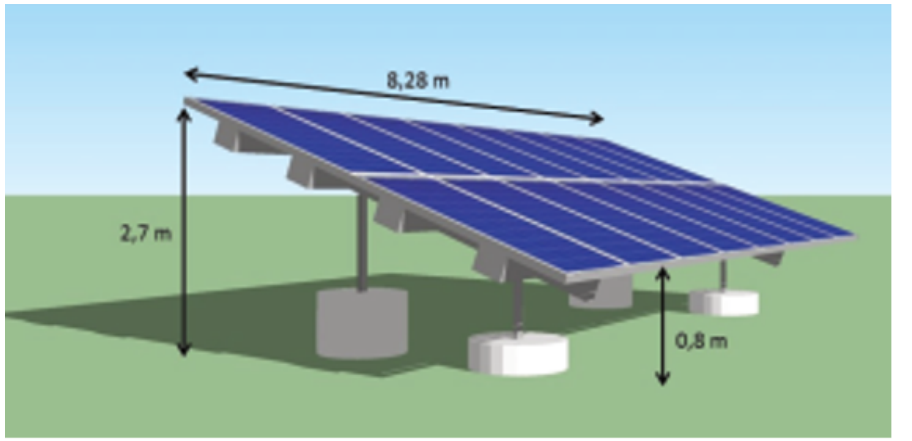


Figure 2. 3D Representation of a photovoltaic panel table weighted by hybrid piles

Taden municipality - Creation of a wood boiler room and a technical network

Source: Dinan Agglomeration

Characteristics of the installation:

- Cost: €400,734 including VAT
- 2 boilers of 120 kW
- 3,000 litre buffer tank
- Temperature regime 85/65 °C
- Automatic feeding by 2 screws
- Metering of consumption by building
- Length of the network: 154 ml
- Network density: 1.2 MWh/ml
- Wood consumption: 68 Tons - 225 m3
- Production: 195 MWh - 17 toe
- Ash production: 1,600 litres
- Decentralised back-up consumption: 22 MWh
- Wood moisture content: M30
- Pellet size: P45A
- Silo volume - 90m3 - 50m3 useful

Schedule:

- **November 2015:** Carrying out a pre-feasibility study by the shared energy advisory service.
- **August 2016:** Carrying out a feasibility study by the Graine d'Habitat consultancy firm.
- **December 2017:** Launch of the recruitment of the project management team.
- **December 2018:** Launch of the public market.
- **November 2019:** Inauguration of the boiler room.

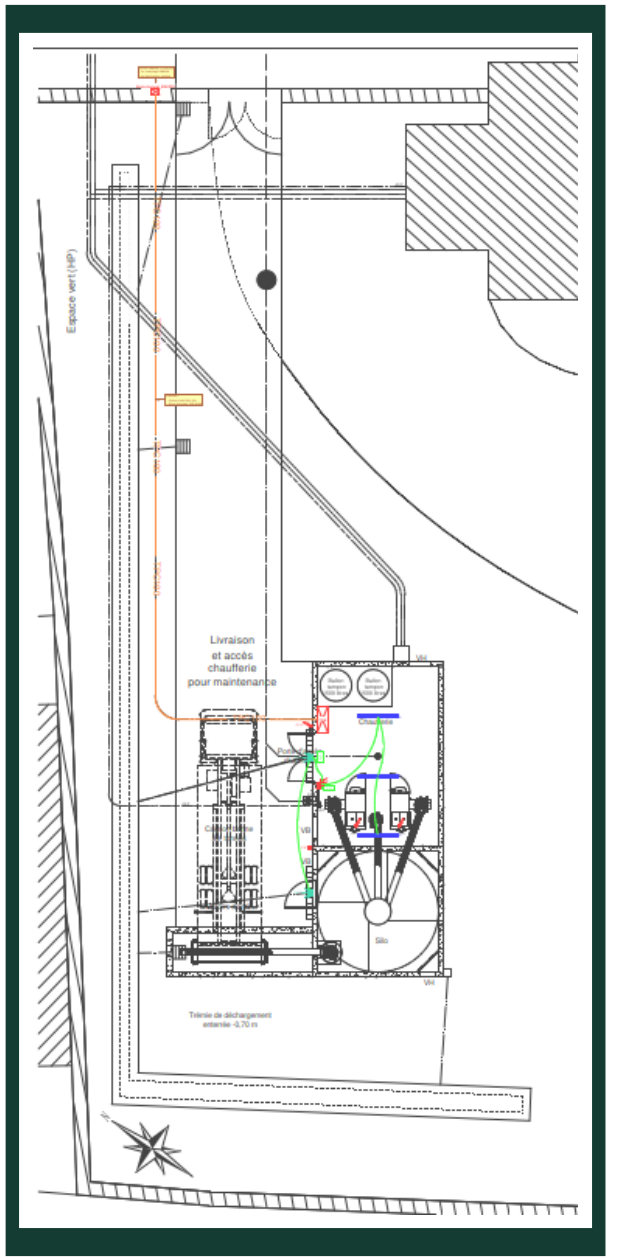
Evran municipality - Creation of a wood boiler room and a technical network

Characteristics of the installation:

- Cost: €500 000 including VAT
- 2 boilers of 90 kW
- 3,000 litre buffer tank
- Temperature regime 85/65 °C
- Automatic feeding by 2 screws
- Metering of consumption by building
- Length of the network: 145 ml
- Network density: 1.48 MWh/ml
- Wood consumption: 71 Tons - 284 m3
- Production: 263 MWh - 17 toe
- Ash production: 1,600 litres
- Decentralised back-up consumption: 22 MWh
- Wood moisture content: M30
- Pellet size: P45A
- Silo volume - 90m3 - 50m3 useful

Schedule:

- **November 2015:** Carrying out a pre-feasibility study by the shared energy advisory service.
- **August 2016:** Carrying out a feasibility study by the Graine d'Habitat consultancy firm.
- **December 2017:** Launch of the recruitment of the project management team.
- **December 2018:** Launch of the public market.
- **2019**: Pre-feasibility study by the Dinan Agglomeration energy advisor.
- **2020:** Feasibility study by Exoceth concultancy firm.
- **2021:** Finalization and preparation by Armor Ingénierie.
- **April & May 2022:** set up of the underground heat network.
- **May to September 2022:** Works & set-up for the boiler (building and equipment).
- **October 2022:** Start-up.



Source: Dinan Agglomeration

Dinan Agglomeration - Inter-communal swimming pool of Broons and wood boiler

Source: Dinan Agglomeration

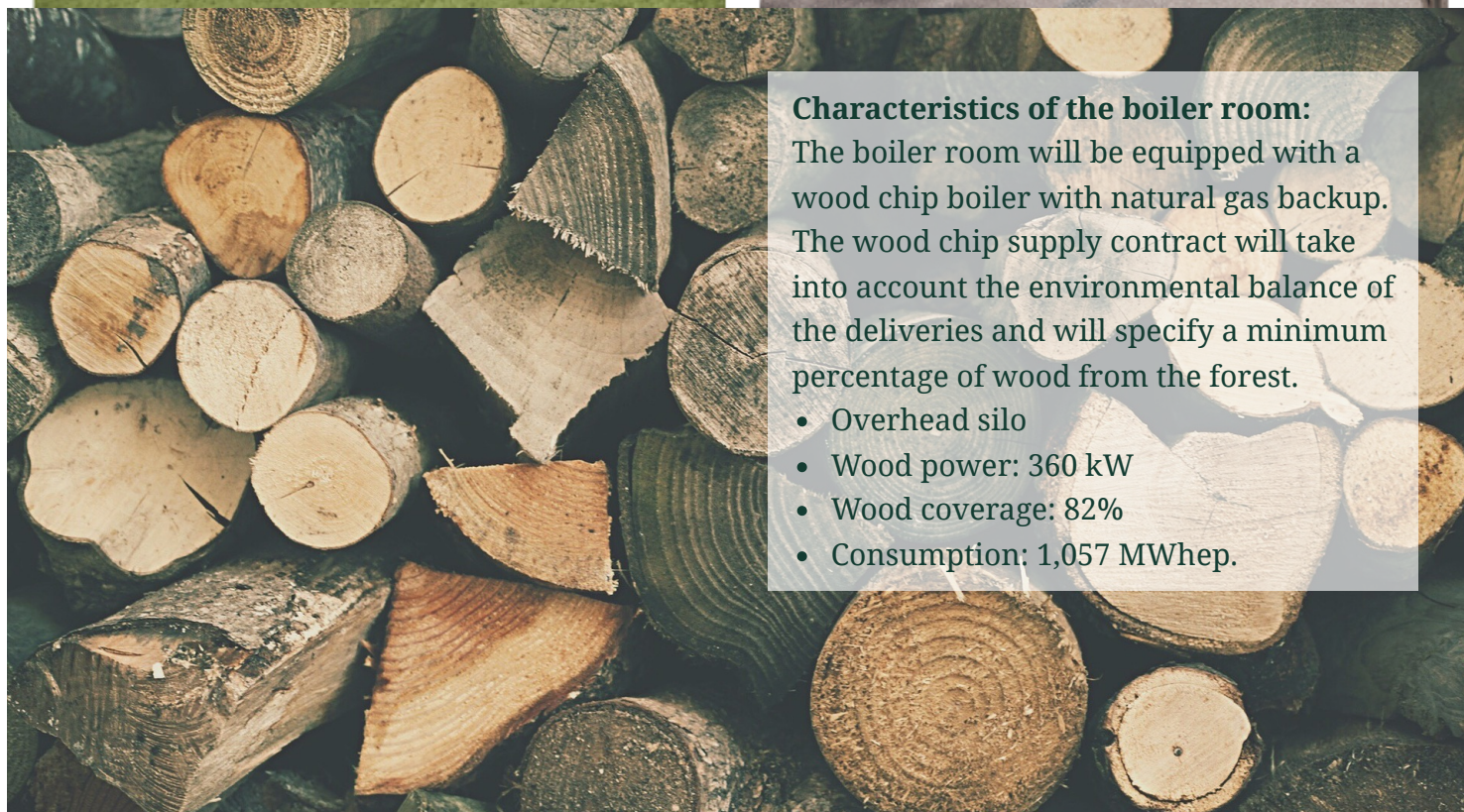
A landscape and environmental quality renovation!

Programme for the new swimming pool:

- Reconstruction of an outdoor pool of 25 m x 10 m with a minimum depth of 1.30 m, installation of a stainless steel lining.
- Proposal of technical solutions that save water and energy, alternative rainwater management, Life Cycle Analysis approach.
- Use of bio-sourced materials.
- Heating by a wood chip boiler room.

Schedule:

- **December 2010:** Diagnosis of technical installations, Design office Ethis.
- **July 2020:** Creation of a programme for the use of the pool over 12 months.
- **February 2021:** Validation by the community bureau of a wood-fired heating system.
- **2nd half of 2023:** Inauguration of the pool.



Characteristics of the boiler room:
The boiler room will be equipped with a wood chip boiler with natural gas backup. The wood chip supply contract will take into account the environmental balance of the deliveries and will specify a minimum percentage of wood from the forest.

- Overhead silo
- Wood power: 360 kW
- Wood coverage: 82%
- Consumption: 1,057 MWhep.

Establishment and role of hedges, hedge label

A hedgerow cannot fulfil its functions without a certain amount of space and careful maintenance. The connectivity of a hedge, its width, its diversity and its management are the guarantors of a healthy and functional hedge network.

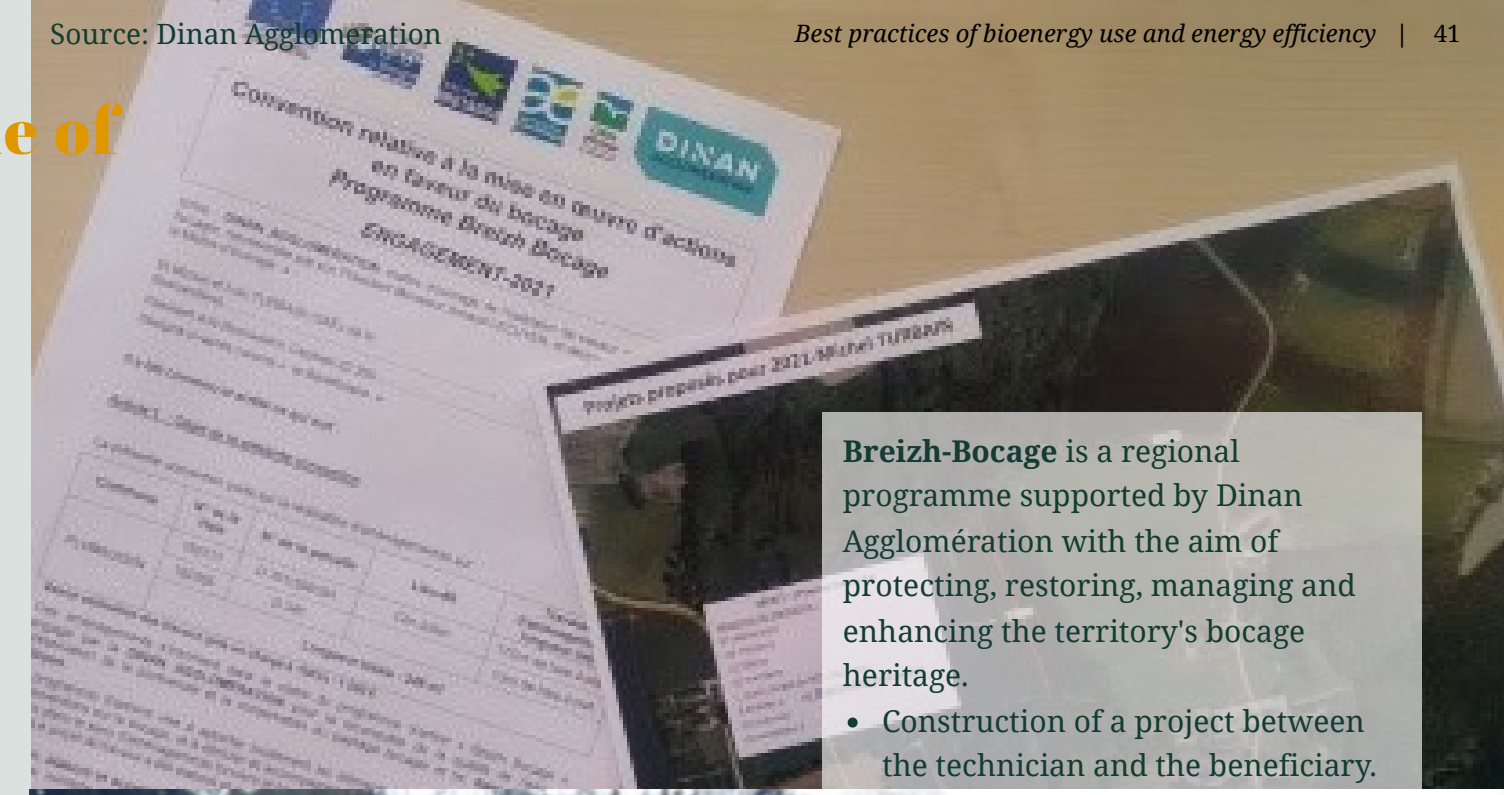
Multiple services provided by the hedge:

- Hosting a rich biodiversity that is essential to the environment.
- Purifies the air and captures carbon.
- Limits soil erosion and fixes elements.
- Provides a living environment and fruit production.
- Protects animals, crops and people.
- Holds and filters water.
- Produces wood and fodder for animals.

To go further: creation of a hedge label to recognise the sustainable management of hedges.

Label Haie

Source: Dinan Agglomeration



Breizh-Bocage is a regional programme supported by Dinan Agglomération with the aim of protecting, restoring, managing and enhancing the territory's bocage heritage.

- Construction of a project between the technician and the beneficiary.
- Commitment of the beneficiary and the financiers over 30 years.
- Work carried out by local companies.
- Local species planted
- Financing: Europe, Region, Department and DA (100 % covered).

Crédit : T. Guéhenneuc

Bretagne Pellets granulation unit in Mauron (Morbihan)

- **1** - Storage of round wood (mainly related products) which will be used to make pellets on a large outdoor area (3 ha). The supply is carried out by the sawyers of the sector who provide a little bit of chips and sawdust (20% of the needs), but mainly small round unsawable softwoods.
- **2** - The pieces are passed through the debarking line to obtain a very low mineral content in the pellet (NF, Din+ and EN+ certification).
- **3** - The bark is then used as fuel for drying the raw material. They are supplemented by hardwood chips for a total of 25,000 tonnes of wood fuel per year. The wood pieces are then sent to a wet hammer mill and then to the dryer. Then it is refined and stored in a silo. Finally, the dry material is distributed by a mixer to presses and then cooled (from 90°C to 30°C). The pellets then go to the bagging unit.

Source: Dinan Agglomeration

Natural Gas Vehicule (NGV) filling station in Quévert

Project owner: Energy mixed economy company of Cotes d´Armor region (SEM ENERGIES 22)

National objective in 2030 through multi-annual energy programming, objective of 3% of heavy goods vehicles running on NGV and 20% of NGV is from bioNGV

Based in the economic eco-park site in Dinan Agglomeration´ s territory, in the immediate vicinity of a busy road, this NGV station contributes to linking the whole of Brittany region.

Station power supply and type of gas: Public gas network, compressed natural gas (CNG)
Origin of the gas: mainly natural gas and bioCNG, biogas from local methanizers with guarantee of origin in the future

Advantages for the territory:

- An outlet outisde the heating period for biogas from methanizers
- A less carbon-intensive & less impact on air quality mobility solution for local economic players and public services

Comissioning date : september 2022

Technical details and figures

- 2 compressors (1 principal and one backup) of 600 Nm3/h each one
- Flow rate: 4 charge pumps
- Tank capacity: 4000l of compressed gas at 250bar

Economic details

- Investment 1 390K€
- Public financial support: For investment 250K€ from European FEDER funds, for private companies vehicle fleet conversion: 200K€ (10K€ max/vehcile) from Ecological Transition National Agency (ADEME)

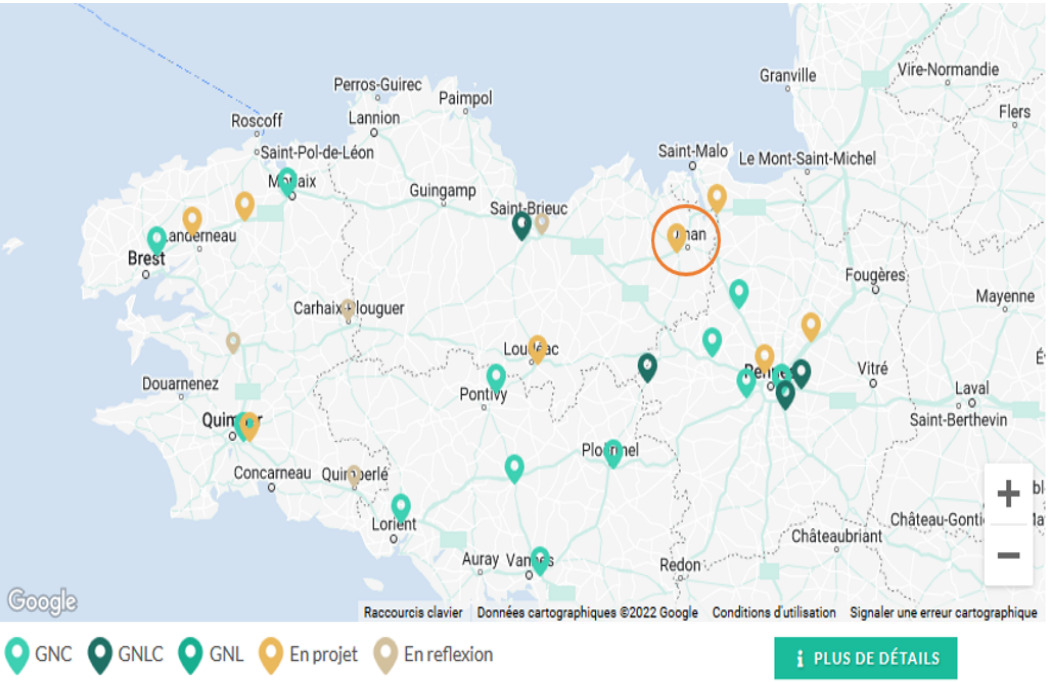


Figure 1. GNV filling stations in french britany region & location of the project

Figure 2. Picture of NGV filling station

SDE 35 (educational programme)

The educational project was launched by SCIC EnR and 'Des Idées Plein La Terre'. The project was targeted for 4th and 5th graders (Primary schools) and it included 5 animation periods. The Scic EnR is well anchored on its territory. However, there is a constant need to sensitize a larger public to ecology through animations.

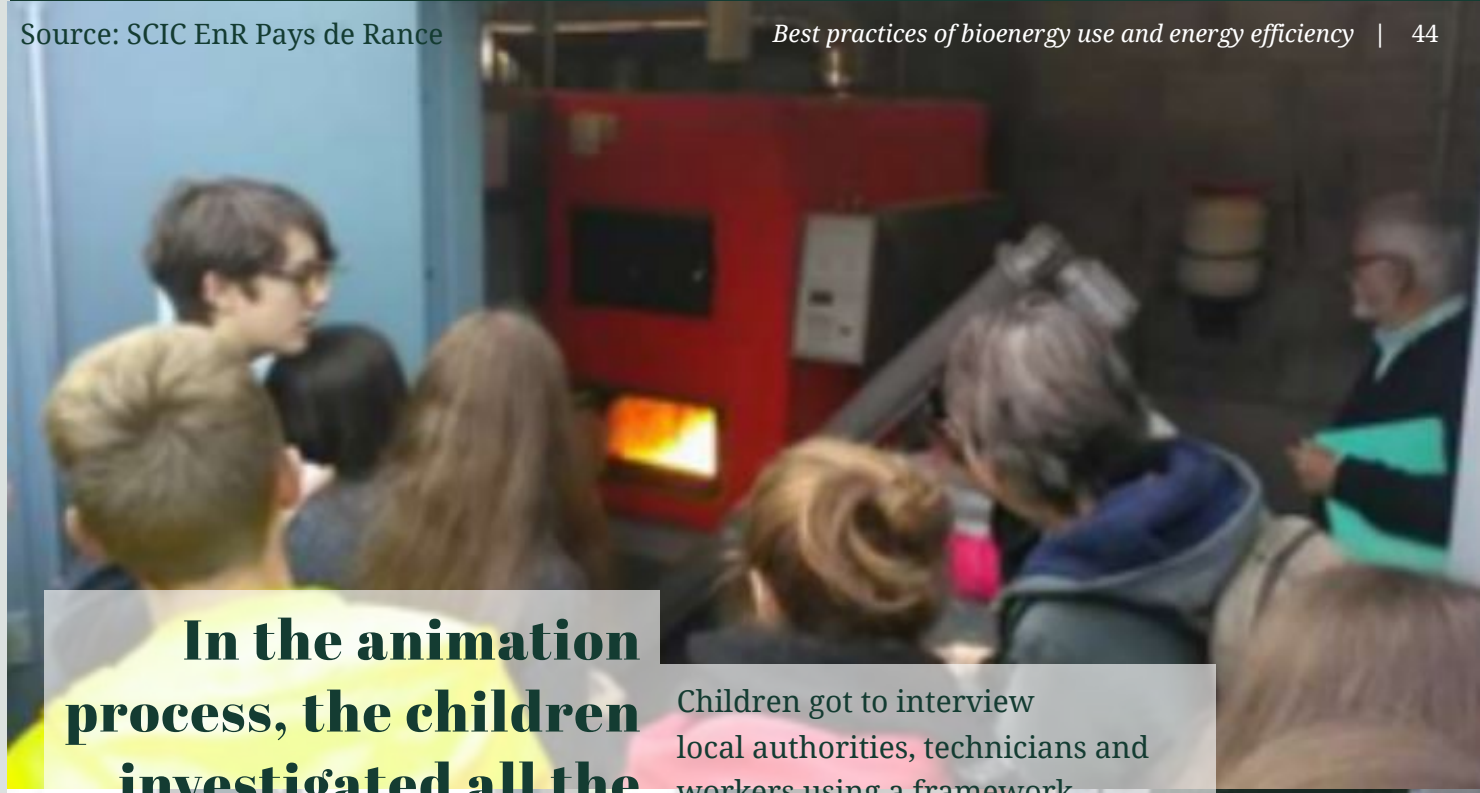
The aim of the project

SDE 35 is a pedagogical project to help understand the global notion of renewable energy, and more particularly, the wood-energy sector. It's important to try to make children realize that us humans are a part of the nature. SCIS EnR pledge to educate younger generations to the energy transition, and to develop their critical thinking and their curiosity to make them better actors on their everyday environment.

The ways to educate

Drawings and studies have been used as educational methods. Students have had the opportunity to question their practices and habits, and to develop ideas about various forms of energy and ideas that promote local renewable energies.

Source: SCIC EnR Pays de Rance



In the animation process, the children investigated all the different rooms and their villages.

Children got to interview local authorities, technicians and workers using a framework elaborated in class and centered on energy and its local use.

SCIC EnR Pays De Rance - EDUCATIONAL PROJECT

Presentation of the SCIC EnR cooperative

The Pays de Dinan is a community of 80 cities and villages. From 2006 to 2008, a group of citizens within le Pays de Dinan reflected on the opportunity to produce local renewable energies. There was organized le Conseil de Développement, where local actors could think together.

Local renewable energies

One important question was how to produce energy based on the local renewable energies such as biomass, sun and wind. Later on even tidal movement might step into the picture.

The life cycle of a tree

Also the wood rose up in discussions. Wood was little known local resource so it was little exploited. Wood as an energy emerged as a local abundant resource that ought to be promoted with a structure that could unite various actors of the wood sector. In 2008 under the legal SCIC-SARL structure the Life cycle of a tree (Wood-energy cycle), from plantation to valorisation, was made. Later on a plan how to diversify wood was made also.

SCIC EnR - example of cooperative

The SCIC was launched in 2008. It is an enterprise working as a cooperative with common interest.

SCIS was created as a SARL, the only legal status that allows public and private structures to manage a society together; all participants buy shares to abound the capital, under the rule 1 share (or any number of shares) provides one vote only. Hence, a collective reflexion lead to the creation of a cooperative with 100+ share-holders and 15 employees today.

Source: SCIC EnR Pays de Rance

Presentation of “what is a SCIC?”

SCIS means Société Coopérative d’Interêt Collectif or Cooperative Company.
SCIC was legally introduced on July, 2001.
The notion of common interest is SCIS's main characteristic.

SCIC is the French model for multi-status stake-holders cooperative. The aim of SCIC is not to divide profit among share-holders but to give benefit to the community.

SCIC is recorded on the official Record of Businesses and it's under
to the business tax system. As a cooperative company, every 5 years the status and state of the SCIC must be revisited, according to the evolution of its accounts and results.

SCIS acts in a specific territory, within a specific professional branch and aims at a specific public. Associates of SCIC can be communities, individuals, legal entities or persons, businesses, whether with legal or private status on a common project.

You can learn more of some other SCIS from:

- Prix de l'Impact Local : SCIC EnR Pays de Rance - Video in English
- What is a cooperative society of collective interest?
- Participation in European projects for local development - In French
- SCIC ECLIS - in French
- SCIC Enercoop - in French

Drying of wood energy/wood logs in parallel with a methanisation unit

The SCIC valorises the tree found locally through selling logs, wood-energy pellets and chips. The main idea in this project was to pool the use of a biogas plant (methanizer) to dry the logs and chips that the SCIC EnR Pays de Rance sells.

The aim of the project

The aim of the project was to strength the partnership between the SCIC EnR Pays de Rance and the share-holder farmer (breeds cows to produce organic milk), and to reveal the social, economical and environmental gains that the pooling will bring.

The dryer

The biogas unit is coupled to the dryer. This dryer is available most of the year and thus ensure the local wood is top quality.

The progression of the project

On winter 2019/2020 wood energy drying in drying silos were made. On winter 2020/2021 it was the time to purchase of a combination of processing and drying of logs in silos. Implementation of economical, social and environmental indicators for heat pooling, and hiring of an employee is scheduled to be done in 2021.

The SCIC EnR serves 1500 customers with heating wood, i.e 3000 cords.

Half of the production came from the Trémereuc platform and the other half came from a supplier near Chateauroux, over 400 km away. The plan was to increase the local production in order to reach a complete local production. The Scic can now claim it sells 100% local wood-energy.

Pooling the use of biomass plant to dry logs and chips

Source: SCIC EnR Pays de Rance

The SCIC headquarters - wood and straw building

Source: SCIC EnR Pays de Rance

The SCIC headquarters, a wood and straw building for energy efficiency, is made with short-circuit wood and straw supply.

This building is meant to be the showroom of the SCIC's activities; partners and customers can find there all useful information about the entreprise:

- transformation of wood to be sold as wood-energy (logs, chips, pellets).
- storage of wood chips to be sold to communities as well as individuals.
- bocage hedges plantation, maintenance know-how.
- storage of mulching.
- sensitisation about the wetlands and other natural environments.
- a true concrete example of how local collective energy works.
- tree care, pruning, trimming and felling techniques; know how and training.

The premises are also a space of valorisation and demonstration of SCIS's competences for their professional partners (e.g producers and contractors) and they facilitate the development of projects such as FRANSU and other partnerships.

The building of the SCIC Energies Renouvelables en Pays de Rance

The SCIC - Cooperation with land owners

Since 2010, the SCIC has planted somewhere between 60 and 80 km of hedges to rebuild the bocage throughout its territory, in Brittany.

Management plans

Rebuilding the bocage proposes land owners (farmers, communities and individuals) management plans for the replantation and maintenance of the bocage, in order to better know and assess the distribution and current state of existing hedges, land owners biodiversity, and their potential in terms of wood-energy production.

Production

Land owners are enabled to schedule their maintenance operations within 20 years, chose either autonomy (use their own production to feed their boiler) or the services of the SCIC to sell their extra production, or co-supplying larger structures (boiler or heat networks) public or private.

Planting hedges - in French

Source: SCIC EnR Pays de Rance

For the past 12 years, SCIC have been working with SCIC EnR farmer-members.

The SCIC helps maintain the balance between offer and demand for local wood-energy, as well as control costs of this energy while it ensures the sustainability of the resource, aging or recent replanting.

Pôle Cristal

Pôle Cristal is a innovation and testing center and it's specialized in refrigeration and thermal engineering. This center is made up of companies, technicians, engineers, and (PhD) doctors. Pôle Cristal is located in Brittany, France.

Pôle Cristal

Pôle Cristal helps and accompanies designers and engineers with their projects, from scratch to production, at every step from design, testing, on site testing, production of systems, solutions, products through a range of services. This structure helps industrials, manufacturers as well as service providers and retailers manage their development strategies

Activities

- Research contracts
- Technical services
- Animation, innovation consulting.

Technology expertise

- Refrigeration
- Heat pumps
- Air treatment and air conditioner
- Exchangers thermal
- Storage thermics
- Aeraulics.

Pôle Cristal uses this expertise in the fields of construction, food, and industry.

Pôle Cristal Dinan
Centre technique Froid et Génie Climatique

Pôle Cristal has the development tools and a laboratory fully equipped in metrology for performance tests and analysis.

The center has technical means such as design and simulation tools, climate cells (positive, negative and ambient), water loops and DHW test benches and prototyping tools.

Pôle Cristal website - in French

Entreprise Norman

Norman packaging

- Founded in 1908 in Dinan, the Norman family firm is part of the Norman limited Group of Jersey which dates back to 1840. Offers a range of packagings suitable for every product.
- Crates, wooden crates, round baskets, wooden boxes, trays and other wooden containers, Norman has over 50 references to receive your products from whatever nature.
- Rubustness of the package and therefore preservation of the products contained, hydrometic qualities of the material (abosrption, moisture restitution) and therefore conservation of foodstuffs: fresh products prefer wood, wether fruit and vegetables or sea products.
- Far from being only limited to only food packaging, Norman´s products are also used for the contents of the most unusual.

Norman emballages

Source: Norman Emballages

Halle de Vatteville

Vatteville-la-Rue village offers good hiking trail opportunities. La Halle is a beautiful place for hikers and it's made out of local wood. The hall is built in front of the village grocery-store and bar.

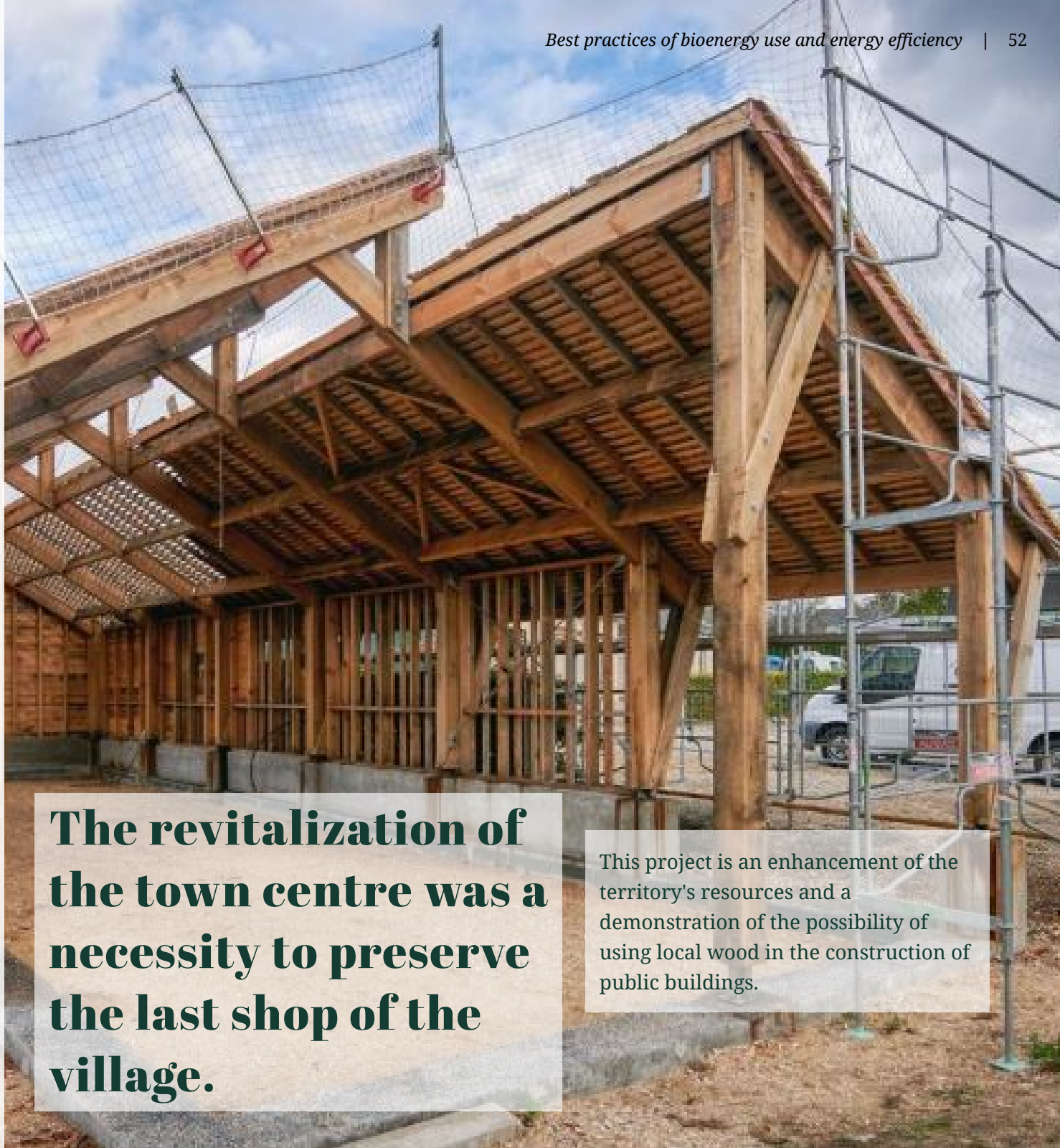
The aim of the project

The aim of the project is to demonstrate the possibility of using local resources in timber construction and to encourage green tourism.

Utilization of local wood in construction

Timber constructions are rarely made from local wood because nowadays the use of local wood is complicated. From an economic point of view, using local wood for construction is an important objective and wood is a carbon storage. In this project the trees used for construction were chosen with the carpenter. On the construction site the first tree was laid in September 2020.

Source: PNR des Boucles de la Seine Normande



The revitalization of the town centre was a necessity to preserve the last shop of the village.

This project is an enhancement of the territory's resources and a demonstration of the possibility of using local wood in the construction of public buildings.

Boiler room and extension of the Park's house

The Maison du Parc is an old farm from the 19th century made up of 7 buildings, it accommodates the employees of the Natural Regional Parc of "Boucles de la Seine Normande".

- In this context, the work on the Park's house is intended to be exemplary, in particular on the creation of an extension. This extension will allow the creation of two modular rooms for a total area of 90m². It is made with bio-based materials, the framework and the cladding of the facade will be wooden and local and the walls wil be made of hemp concrete.

- The innovation and the use of bio-based materials do not stop there, since a wood-fired boiler room was installed during the work. It will be used to supply all the buildings with heating. This wood will come from the local sector and will make it possible to add value to the bocage wood.

- Since 2020 thermal and functional rehabilitation works as well as an extension in local eco-materials are underway.

Source: Pnr - BSN

This project has been designed to be as exemplary as possible. Indeed, the Park aims to implement an innovative planning and economic, social and cultural development policy that respects the environment and heritage.

Sawmill LEFEBVRE

Source: Lefebvre sawmill website

Development of a construction system with local hardwood

- Sawmill specializated in beech transformation, a local specy which compose a majority of territorys forest using principaly for joinery.
- LEFEBVRE has developed a construction system using beech in a glued-laminated system. This process enables to use and value scond quality wood pieces.
- First seven-storey building will be construct at Rouen in the Flaubert Eco-district with this construction system.

Groupe LEFEBVRE - In French

Bonding technology for structural use - In French

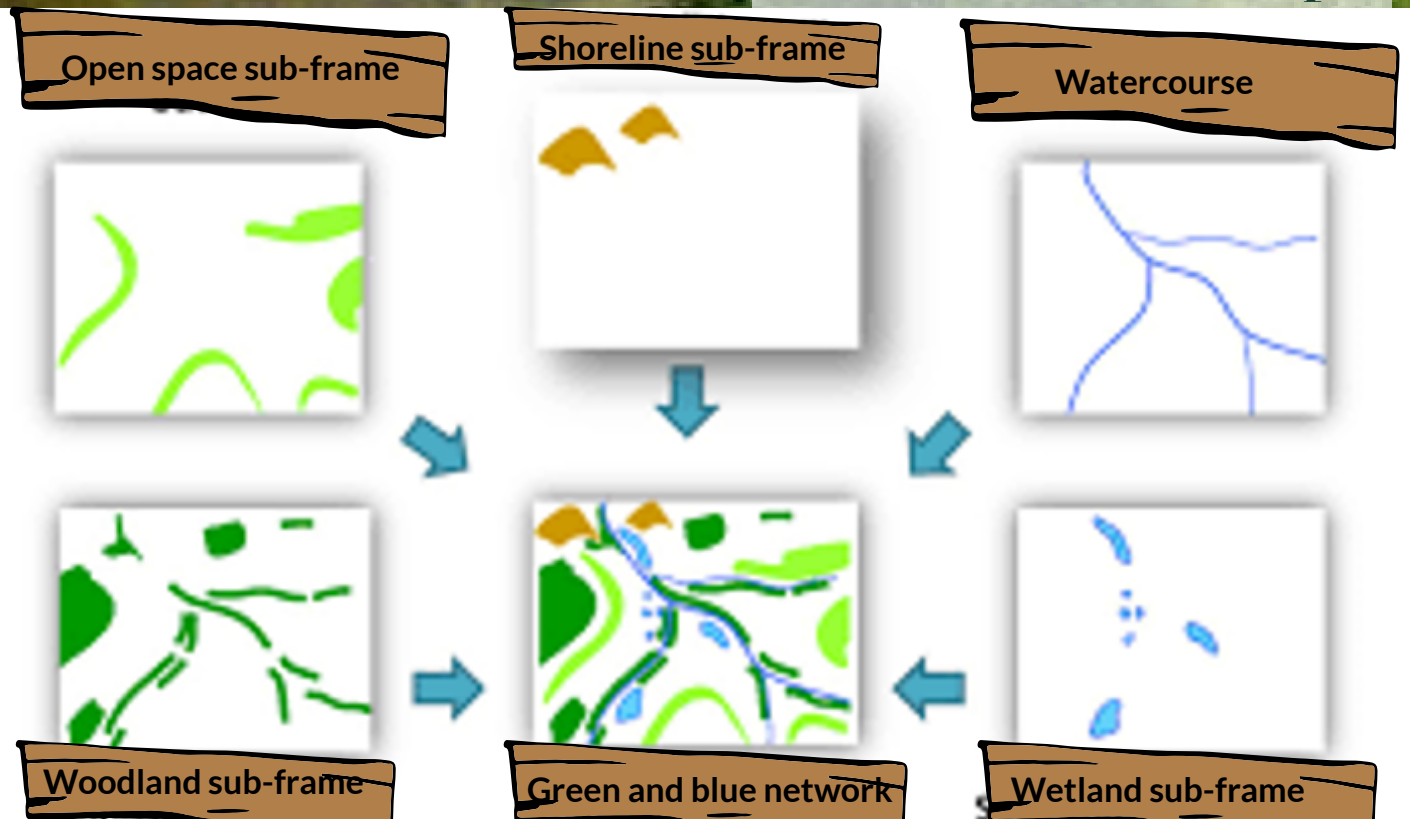
Green and blue frame, ecological continuity, mesh of hedges

This green and blue frame was composed of biodiversity reservoir and corridors between this. This frame should favorise migration and deplacement of species. Green and blue frame was integrated to territory amenagement plan with an action programme to restore discontinities which can be caused by artificiliazation of area, transport infrastructure or agricultural practices.

For forest ecosystem, target is to preserve reservoir in a well-preserved state with diversity of species and forestry good practices. Plantation and preservation of hedgerows permit to conserve and restore ecological corridors to species mobility.

Source: PNR des Boucles de la Seine Normande

In France, preservation and restoration of ordinary biodiversity pass by « green and blue frame » concept.

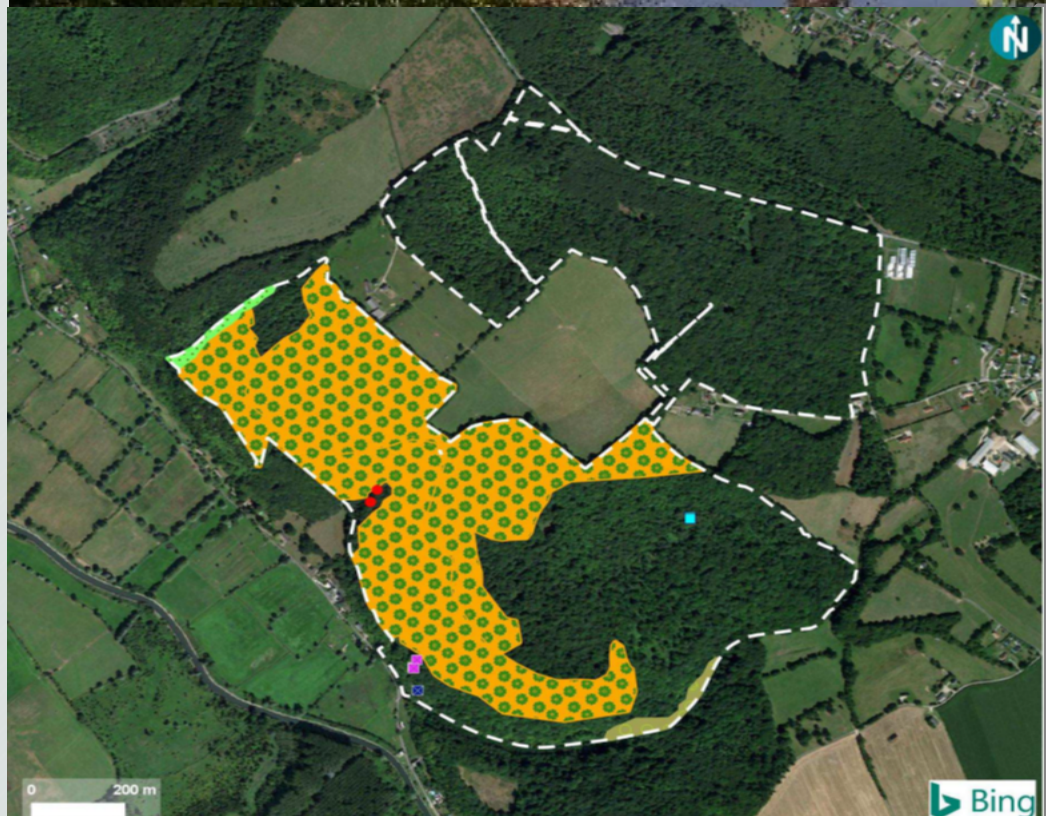


Biodiversity in forest

Biodiversity in private forest is very unknown. Forest management plan are center in programmation of cutting wood operation and forest's works.

- Natural Regional Park has realised a study of forest biodiversity with forest owners of the territory.

- Naturalists inventories was made in forest and results of inventories was diffused to forest owners to include their in forest management plan and if necessary realised works to preserve or restore natural habitats.



Caption

-Owners parcels

Heritage flora

-Ashy sparrow

-Digitale jaune

-Garance voyageuse

-Iris fétide

Invasive Flora

-Robinier faux-acacia

Habitat of community interest

-Perennial Mercurial Grassland

-Aspen grove with Doradilla scolopendre

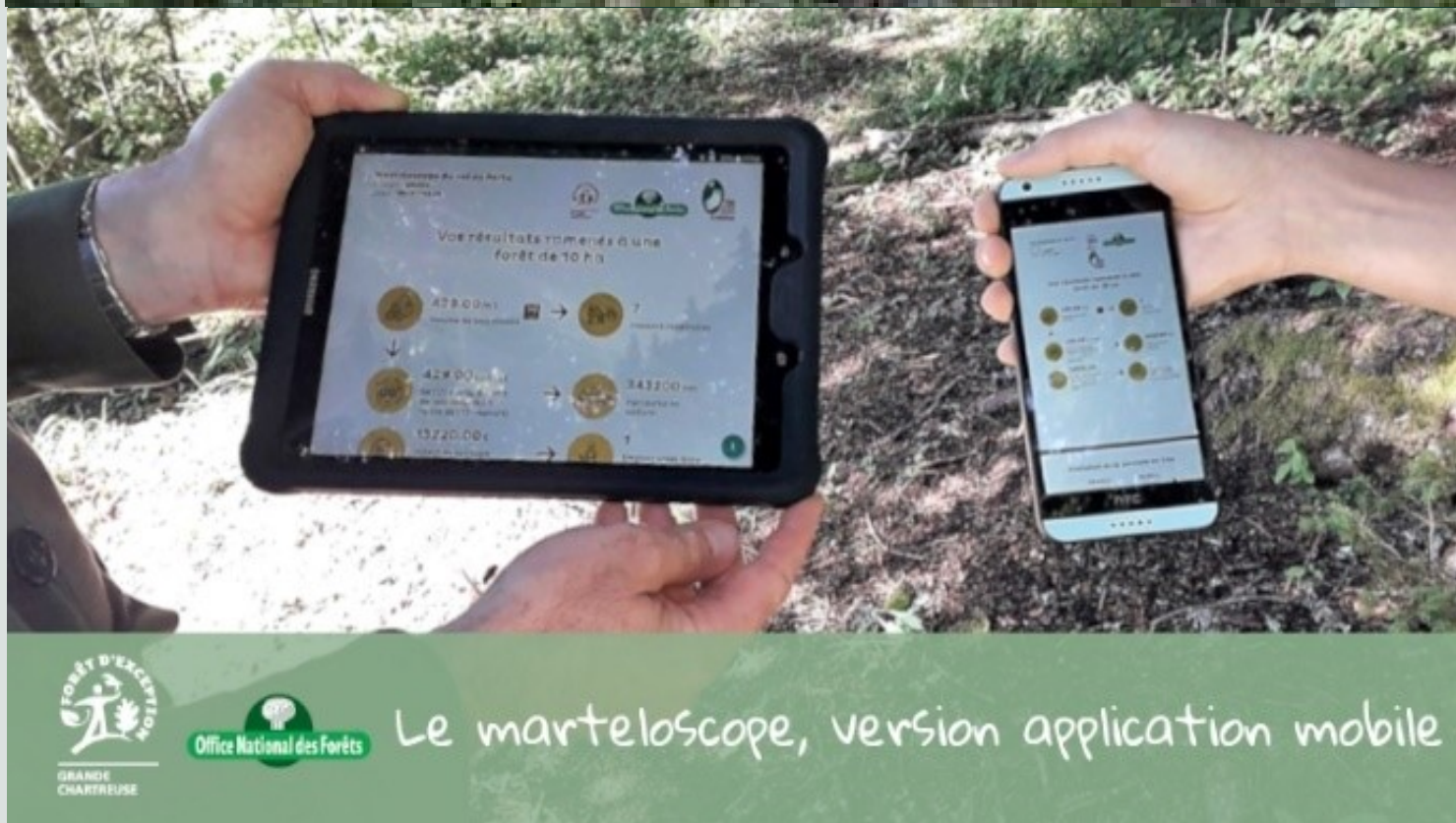
-Atlantic acidiphilic beech-oak stands

Source: PNR des Boucles de la Seine Normande

Marteloscope

Marteloscope is a educational device in forest with a digital application.

Source: Furet Company / Parc naturel regional du Pilat



- Participants realize a marking trees practice in this forest parcel. The results of all participant simulations permet to discuss about forestry, choice of trees who will be exploite, biodiversity preservation, wood products value.

- Regional Natural Park works actually with National Forest Office (ONF) in marteloscope installation in a beech parcel of Brotonne forest.

Martelloscope of the pilat - PDF - In French

Furet Company - Martelloscope - In French

Intergenerational restaurant at Flancourt Crescy en Roumois

Flancourt is a rural village of 1486 inhabitants.

The municipilaty in the process of building an intergenerational restaurant. This restaurant will be the canteen for the children of the village and will be able to produce 500 meals a daywith a majority of local products. It will also serve as a restaurant for the elderly. The goal is to create more links between children and the elderly.

The building will have strong thermal insulation and photovoltaic panels will be installed on the roof. In addition, rainwater will be collected to water the vegetable garden and green spaces.

Source: PNR des Boucles de la Seine Normande

Renovation of the presbytery at Conteville

Conteville is a rural village of about 1000 inhabitants, located next to Honfleur.

The presbytery was built in 1778 and renovated 240 years later by municipality. The presbytery became the town hall.

This place was designed to be a real service center for the inhabitants, so there is a digital space dedicated to supporting citinzens in their andminstrative procedures and a multi activity room (music rehearsals, exhibitons, association meetings..). The municipality took advantage of the work to install a wood pellet boiler to heat this building.

Source: PNR des Boucles de la Seine Normande

Manufacture of wood pellets (AsWood – Gastebois)

Gastebois - SEFOB sawmill is specialize in softwood transformation with a majority supply from Normandy and borders areas.

Previously consider like a waste, related products of sawing are now price in wood energy. A part of this wood is use to dry sawing products and in 2006, they create Aswood society who make wood pellets with this related products.

Source: AsWood - Gastebois

Aswood - sawdust refining - In French

Gastebois - French softwood sawing and machining - In French

Use of chipped wood for breeding litter + mulching of plantations

Cattle breeders of Natural Park Territory

- Practicing extensive grasing in wasting area which does not have many cereal crops to produce mulch to breeding litter.
- However, there are many trees on the farm that are valuable for felling. The use of these allows growers to be independent in terms of breeding stock.
- The farm also uses wood chips to cover the soil to protect plantations of hedge bushes, which will produce wood chips for heating and other uses in a few years.

Civam - chipped wood litter PDF - In French

Source: Photos (bois-energie-du-maine.com / collectifiboisbocage35.com / pays-de-la-loire.chambres-agriculture.fr)

FRANSU Cooperation by travelling

FRANSU project arranges excursion trips between France and Finland during the year 2022. The aim of these excursion trips is to increase the information exchange between different kinds of actors in both countries.

MORE INFORMATION FROM:

- Thermopolis Ltd website
- Finnish Forest Centre website - in Finnish
- the SCIC Pays de Range website - Projet FRANSU- in French