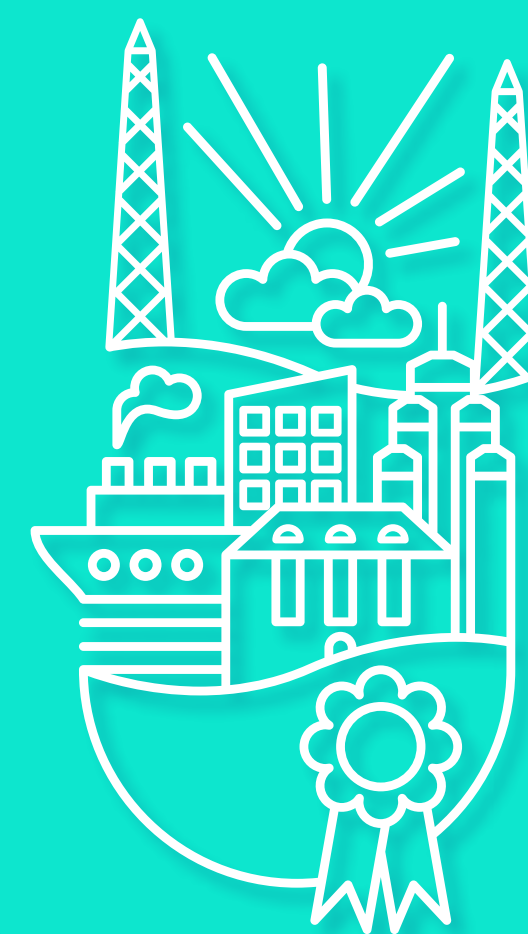
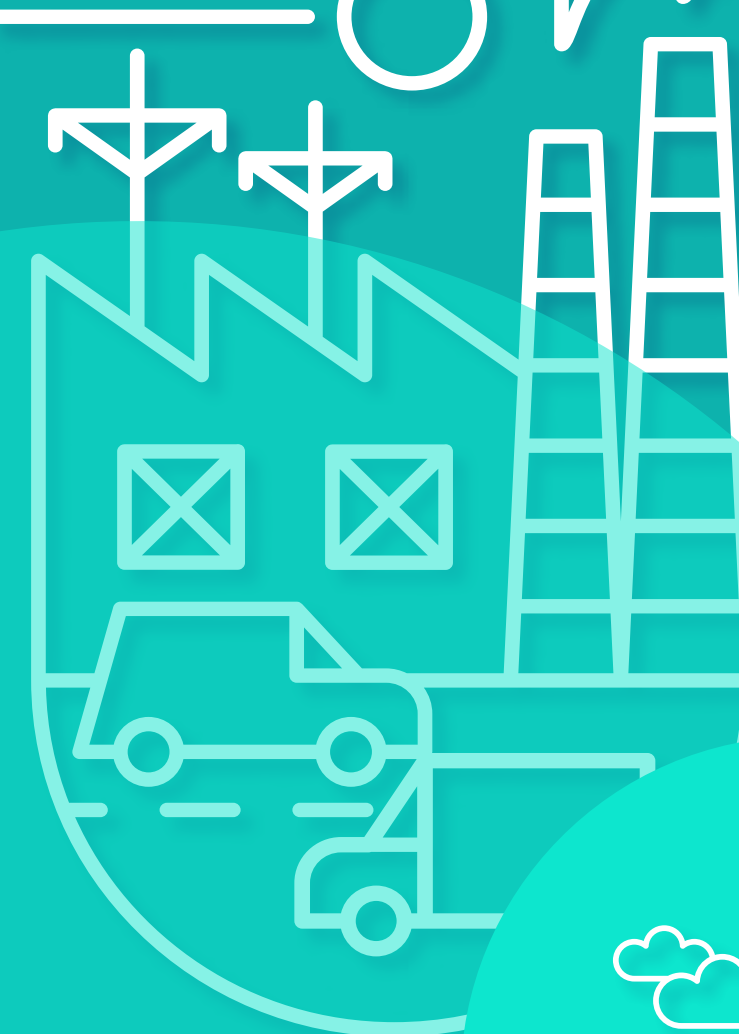


Leverage from  
the EU  
2014–2020



# Päijät-Häme Roadmap towards Circular Economy

ENTER »



# Päijät-Häme Roadmap Towards Circular Economy

The Päijät-Häme Regional Circular Economy Strategy, ie. The Circular Economy Roadmap, was published for the first time in 2017. It was compiled in collaboration with stakeholders in the region. The roadmap defines the objectives and actions for achieving a circular economy in the Päijät-Häme region.

The roadmap was supplemented in 2019 with the Päijät-Häme Bio-based Circular Economy Action Plan. The vision of the Päijät-Häme regional circular economy is “a success that

*will not waste resources in 2030*”, to which the actions listed in the roadmap will lead if implemented.

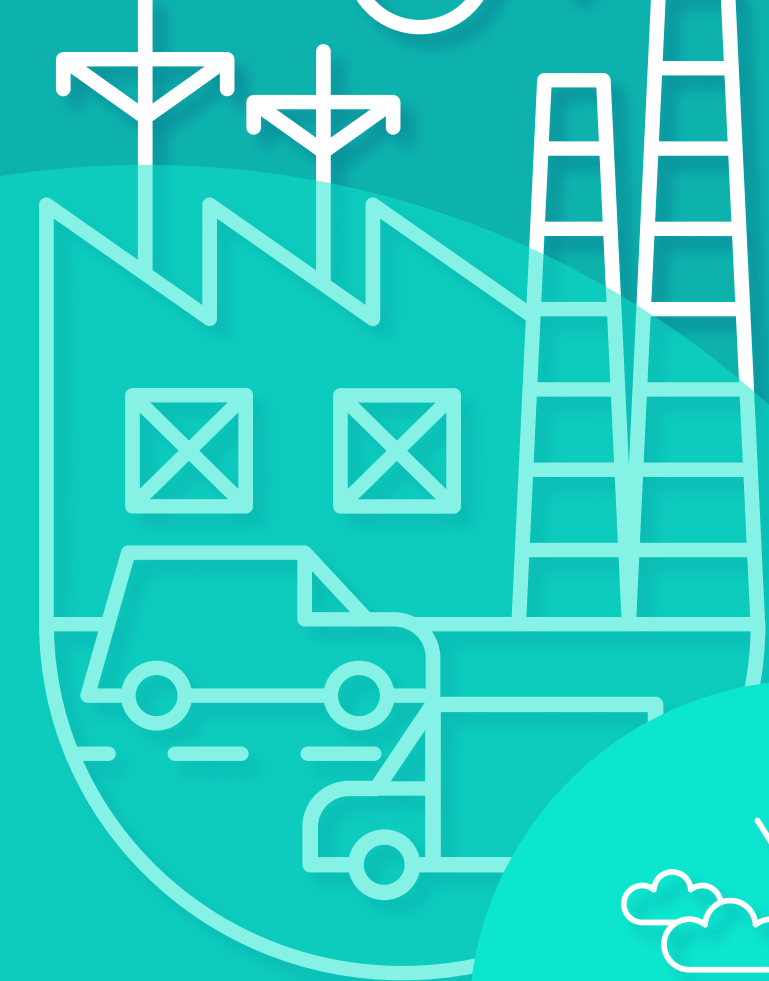
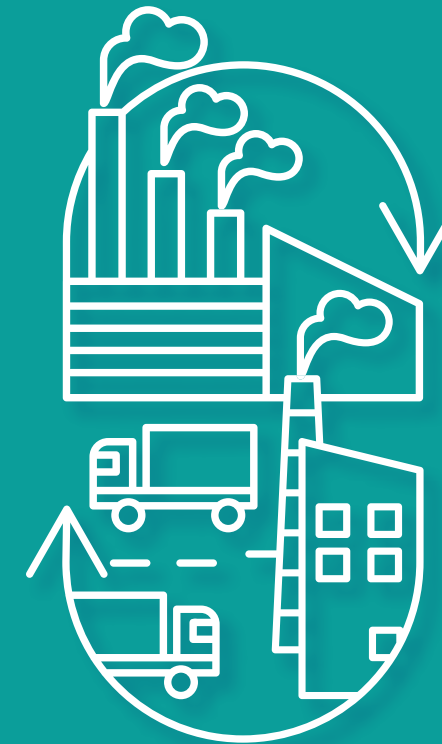
In the roadmap, the measures are divided into five themes: **closed material loops, energy, bio circular economy, new consumption models** and **innovative solutions**. The following is a thematic presentation of planned activities and the good practices achieved.

ROADMAP »

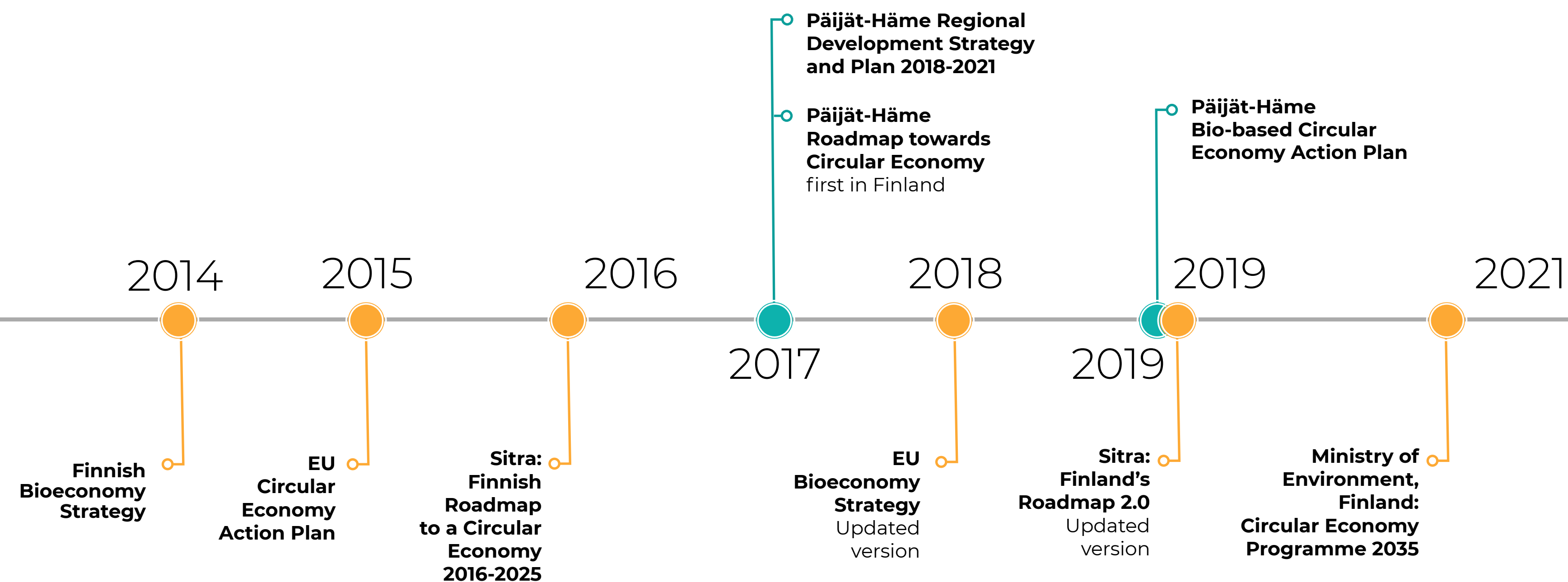
TIMELINE »

NETWORK »

COORDINATION »





# Timeline for Circular Economy



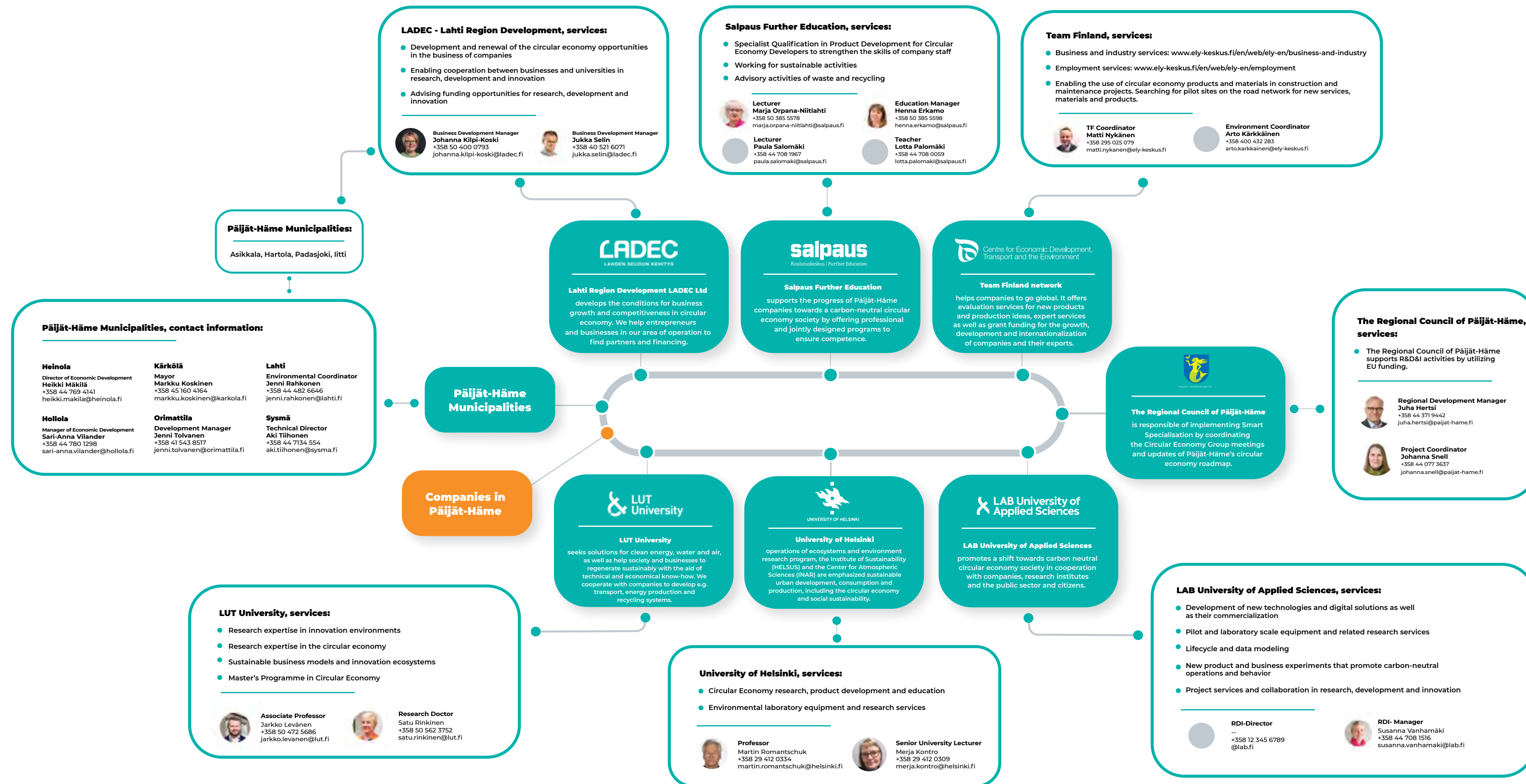
« RETURN

ROADMAP »

 = Regional level     = National/EU level



# Network of Circular Economy Stakeholders in Päijät-Häme



« RETURN

ROADMAP »



# Coordination of the Circular Economy Roadmap

The implementation of the circular economy roadmap is monitored and guided by the Regional Council of Päijät-Häme. The council convenes the Päijät-Häme Circular Economy Cooperation Group with experts from universities, development organizations, municipalities and companies in the region.

The cooperation group monitors the progress of the roadmap activities and is responsible for updating the roadmap. The group shares information on ongoing and planned circular economy actions and projects.

## Responsible persons in the Regional Council:

### Juha Hertsu

Regional Development Manager  
+358 44 3719 442, juha.hertsu@paijat-hame.fi

### Johanna Snell

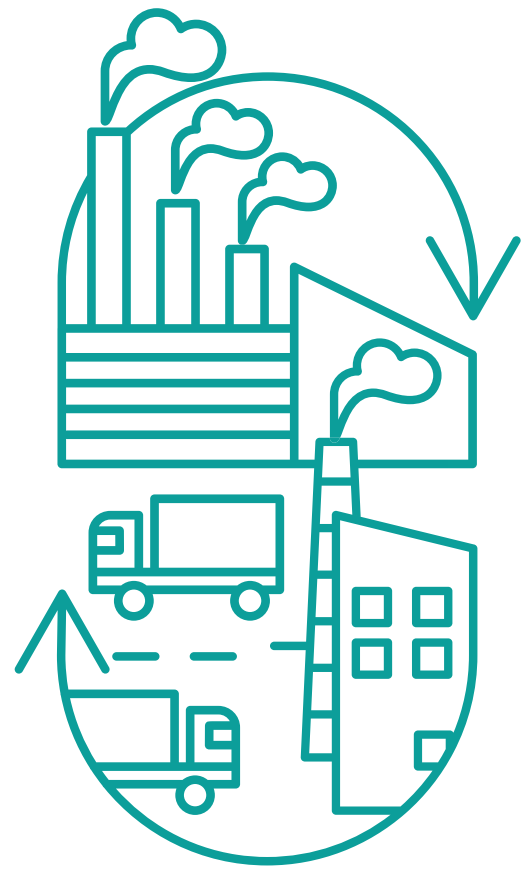
Project Coordinator  
+358 44 077 3637, johanna.snell@paijat-hame.fi

The regional development of the circular economy is implemented through many projects that receive funding from various channels. The project will serve as an inspiration and initiator for the new business of many companies when collaborating with research and development organizations. Significant sources of funding include **The European Regional Development Fund, the Rural Fund of Mainland Finland** and **Business Finland's** innovation and internationalization funding.

**Interreg programs** enable Europe-wide project cooperation. Exchanging experiences and views and networking in different industries strengthens Päijät-Häme's RDI expertise. Many Finnish practices achieved in the circular economy are models in other regions in Europe.

[« RETURN](#)[ROADMAP »](#)

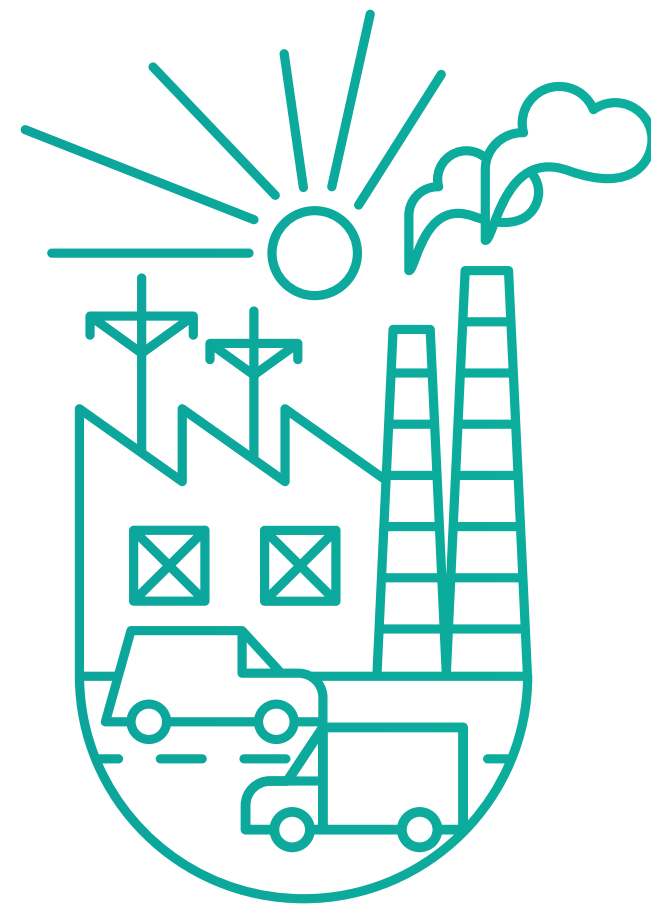
# Themes and Goals



## Closed Material Loops

Päijät-Häme region has many closed streams of technical materials and added value has been produced for wider streams.

[READ MORE »](#)



## Energy

Päijät-Häme is nearly self-sufficient in energy production.

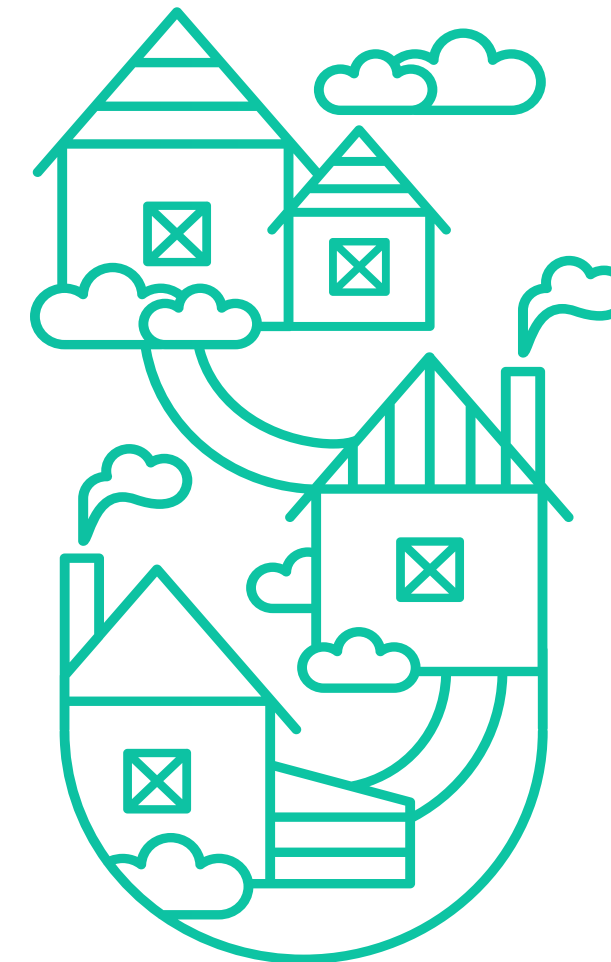
[READ MORE »](#)



## Bio Circular Economy

The bio circular economy is a significant part of Päijät-Häme's business.

[READ MORE »](#)



## New Consumption Models

New consumption models and changes in ownership are developing new business opportunities in Päijät-Häme.

[READ MORE »](#)



## Innovative Solutions

Päijät-Häme is an open-minded region with numerous international references for piloting new solutions and incentives.

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# Closed Material Loops

Closing material cycles is an essential part of the circular economy. The goal is to have the longest possible life cycle of products and materials and to minimize waste. This promotes the reuse of waste and by-products as a material in closed loops instead of incineration and landfill.

The use of municipal, construction and demolition waste, as well as plastics and soil, should be directed more towards reused and recycled materials rather than the use of virgin raw materials. In Päijät-Häme, only 1% of municipal waste ends up in landfills, but the challenge is still to increase recycling compared to energy utilization.

REGIONAL ACTIVITIES

GOOD PRACTICES

« RETURN





Closed Material Loops

# Good Practices

- » Tarpaper Recycling Finland
- » Muovipoli & New Plastics Center NPC
- » Salpamaa
- » Material Efficiency Audit for Companies
- » Laboratories for Sustainable Material Cycles
  - » Textile Recognition and Sorting Unit
  - » Construction and Demolition Waste Sorting
  - » Devices for Plastic Washing and Recycling
  - » Pyrolysis Equipments
  - » Furniture Laboratory

« RETURN



Closed Material Loops

Regional Activities

Action	Timetable	Operatives	Influence
Digital platforms are being developed to increase the efficiency of transportation and recycling of by-products of companies. In addition, digital information management and new business related to textile recycling will be promoted.	Continuous	LAB University of Applied Sciences	●
Together with the City of Lahti, the digitization and opening of information of the city's subsidiaries will be promoted.	Continuous	LAB, City of Lahti, ITKO- project	●
The company-oriented plastics competence network New Plastics Center NPC promotes e.g. biomaterial innovations, product development and the cooperation needed to develop and introduce new materials.	Continuous	LAB, Muovipoli Ltd, Finnish Plastics Industries Federation, RAMPO-project	●
The national co-operation network Telaketju develops business models for disable textiles based on the circular economy. LAB studies the mechanical identification of textiles and activates companies in the region to join the textile recycling ecosystem and develops an application for managing and utilizing the life cycle information of textiles.	Continuous	LAB, Finix-project	●
The carbon footprint of soil-based construction is reduced by using suitable waste, such as fly ash, in road construction. Use will be piloted on rural forest and private roads as well as municipal road structures.	2018-2020	LAB, Arvo-Tuhka -project	●
The material efficiency of companies in the region is promoted e.g. developing a new evaluation method for SMEs in cooperation with the national coordinator Motiva. The method has been piloted in companies in the region and it is intended to scale nationally.	2018-2020	LAB, SMARTTA -project	●
RDI activities support the introduction of new energy and circular economy solutions. LAB University of Applied Sciences develops business-oriented operating environments for energy and circular economy in LahtiCampus, including campus energy control system, digestion and gasification laboratory equipment, plastics and textile recycling devices.	Continuous	LAB University of Applied Sciences	●●
The library of recycled materials is used to increase information about materials in product design, to promote industrial symbioses and to help circulation of materials.	Continuous	LAB, Muovipoli Ltd.	●
New business is growing around 3D printing, enabling the use of various recycled materials as a raw material for printing. LAB University of Applied Sciences has a 3D robotic printer that can print large pieces (dimensions over 1m x 1m x 1m).	2021-2022	LAB, Muovin tarina -project	●
The Lahti Urban Environment Circular Economy Development Program was completed in 2020 and the Lahti Circular Economy Roadmap will be prepared during 2021.	2020-2021	City of Lahti	●
Public procurement is developed that the procurement regards ecological aspects and cost of the product throughout its life cycle. Sharing and sustainable services are also options.	Continuous	Municipalities	●
The utilization of recycled materials will be added as criteria to the public procurement of Päijät-Häme municipalities. Offers that make intelligent use of recycled materials have an advantage over others. Procurement practices will be reviewed immediately.	Continuous	Municipalities	●

« RETURN

Influence: ● Low ●● Moderate ●●● High



## Closed Material Loops

# Tarpaper Recycling Ltd

From  
roof  
to road

The Finnish cleantech company **Tarpaper Recycling Finland Oy** specializes in the recycling of roofing felt and demolition bitumen. It started operations in Kujala, Lahti, in 2015.

The recycling plant processes demolition bitumen and surplus materials from roofing felt factories. Crush made from recycled raw materials is delivered to the asphalt industry. The company is the only one of its kind in Finland.

A crush can replace about half of the virgin bitumen needed for asphalt and can be used to reduce CO2 emissions by 60 kg per tonne of asphalt produced.



Click to watch  
(in Finnish)

« RETURN



Tarpaper Recycling  
Sapelikatu 7,  
15160 Lahti, FIN



**Tarpaper homepage (FIN)**



**Closed Material Loops**

# Muovipoli Oy & New Plastics Center NPC

Plastics  
expert  
supporting  
the needs of  
the sector

**Muovipoli Ltd** was founded in 1998 to develop the Finnish plastics industry. Its owners include universities, the Finnish Plastics Industries Federation, a wide range of plastics companies, cities and development and education organizations.

Muovipoli is specialized in testing and development services of plastics and plastic products.

In 2019, Muovipoli launched the **New Plastics Center NPC**, a company-oriented plastics competence network, in co-operation with the Finnish Plastics Industries Federation. NPC's goal is to promote biomaterial innovations and product development in Finland based on the EU's new plastic strategy and to strengthen the co-operation and networking needed for the development and introduction of new materials.

« RETURN



Muovipoli Oy  
Niemenkatu 73,  
15140 Lahti, FIN



**Muovipoli homepage (ENG)**  
**New Plastics Center homepage (FIN)**





## Closed Material Loops

# Salpamaa

Soil and  
stone  
materials  
for reuse

**Salpamaa Ltd** is a company founded at the beginning of 2021 to process soil and inorganic by-products produced by industry. It is a subsidiary of the waste management company Salpakierä Ltd.

Salpamaa receives a variety of soil and stone materials, such as clean surplus land, contaminated land, asphalt, concrete, brick, sanitary ware and ash. The soil is recycled as a secondary raw material or for use in construction.

The majority of customers are private construction companies in the region.

The focus of the company's operations will be on promoting the utilization of surplus land instead of landfilling and the treatment of polluted soil.

« RETURN



Salpamaa  
Sapelikatu 7,  
15160 Lahti, FIN



**Salpamaa homepage (FIN)**







European Union  
European Regional  
Development Fund

## Closed Material Loops

# Material Efficiency Audit for Companies

Material  
efficiency  
increases  
productivity  
and compe-  
titiveness

The cost of a company's material loss is up to 25 times the cost of waste.

Material efficiency improves a company's competitiveness, reduces costs and enhances carbon neutral action.

**Material Efficiency Audit** is a practical tool for evaluating the company's operations and managing material flows. The audit identifies steps in the production where the use of

materials, the amount of waste generated and environmental impacts can be reduced. Besides, recommendations can be made for the recovery of the loss.

The Material Efficiency Audit provides valuable information for the company's development activities.



« RETURN



LAB University of Applied Sciences  
Mukkulankatu 19,  
15210 Lahti, FIN



**Motiva – Material Efficiency Audit Tools  
for Companies (ENG)**



## Closed Material Loops

# Laboratories for Sustainable Material Cycles

Versatile  
equipment  
allows  
materials  
to be  
tested

LAB University of Applied Sciences generates commercial testing and expert services for companies. LAB and LUT University are building comprehensive operating environments on the Lahti Campus to promote the circular economy, where testing under different standards can be performed.

There is a testing laboratory for furniture and wood products, a plastic washing and recycling line, and textile identification and sorting equipment.

Also, LUT universities have received funding for the construction of a circular economy laboratory, which

will include pyrolysis, pelleting and magnetic separation equipment for the treatment of construction and demolition waste.

### Available services for companies:

- Furniture Testing
- Product Testing
- Wood Products
- Textile and Fibre Testing
- Material Studies
- Machining (metal and plastic)
- Quality inspection, Quality control and reclamation studies
- Conformity statements
- Life Cycle Analysis
- Carbon Footprint

- » **Textile Recognition and Sorting Unit**
- » **CDW Sorting**
- » **Plastic Washing and Recycling Unit**

- » **Pyrolysis Equipment**
- » **Furniture Laboratory**

« RETURN



LAB University of Applied Sciences  
Mukkulankatu 19,  
15210 Lahti





Closed Material Loops

# Textile Recognition and Sorting Unit

By sorting  
high quality  
recycled  
textile  
fibres

The recognition of textile fibres has been developed at Lahti University of Applied Sciences since 2016 when a pilot-scale **textile fibre recognition and sorting equipment** was designed and built for research and development purposes. The equipment can be used to identify the most common fibres and their mixtures of consumer and business textile products.

Separate collection of end-of-life textiles is likely to begin in Finland at the beginning of 2023. End-of-life textiles must be able to be

identified and sorted according to its composition in order to recyclers to have access to high quality and uniform recycled fibre fractions.

LAB acts as an expert in textile fibre recognition in several national projects. Besides, it offers textile fibre recognition and sorting services to both end-of-life textile collectors and sorters and companies that use recycled textiles.





## Closed Material Loops

# Construction and Demolition Waste (CDW) Sorting

By sorting  
construction  
and  
demolition  
waste  
for reuse

In 2021, LAB University of Applied Sciences is establishing a new operating environment for testing, piloting, and demonstrating a circular economy.

As part of this new environment, LAB is investing in a magnetic separator and a pelleting machine to **study and promote recycling and material reuse of CDW** in collaboration with local companies.

The European Commission has set a 70 % recycling target for construction and demolition waste (CDW). The potential for recycling and re-using CDW is high although some CDW fractions are challenging to recycle in required volumes. The material from the sorting of CDW waste contains organic matter such as plastic, fibres and wood.





## Closed Material Loops

# Devices for Plastic Washing and Recycling

The plastic unit explores the utilization of plastics

Kiemura-pilot is a **plastic washing and recycling unit**, which includes washing and drying equipment and an extruder. The separation takes place with a hydro cyclone which is efficient and accurate with pure materials. Further processing is done with a twin-screw extruder.

The unit is used for testing the suitability of different plastic fractions and their mixtures, for instance, making of recycled plastic granulates.

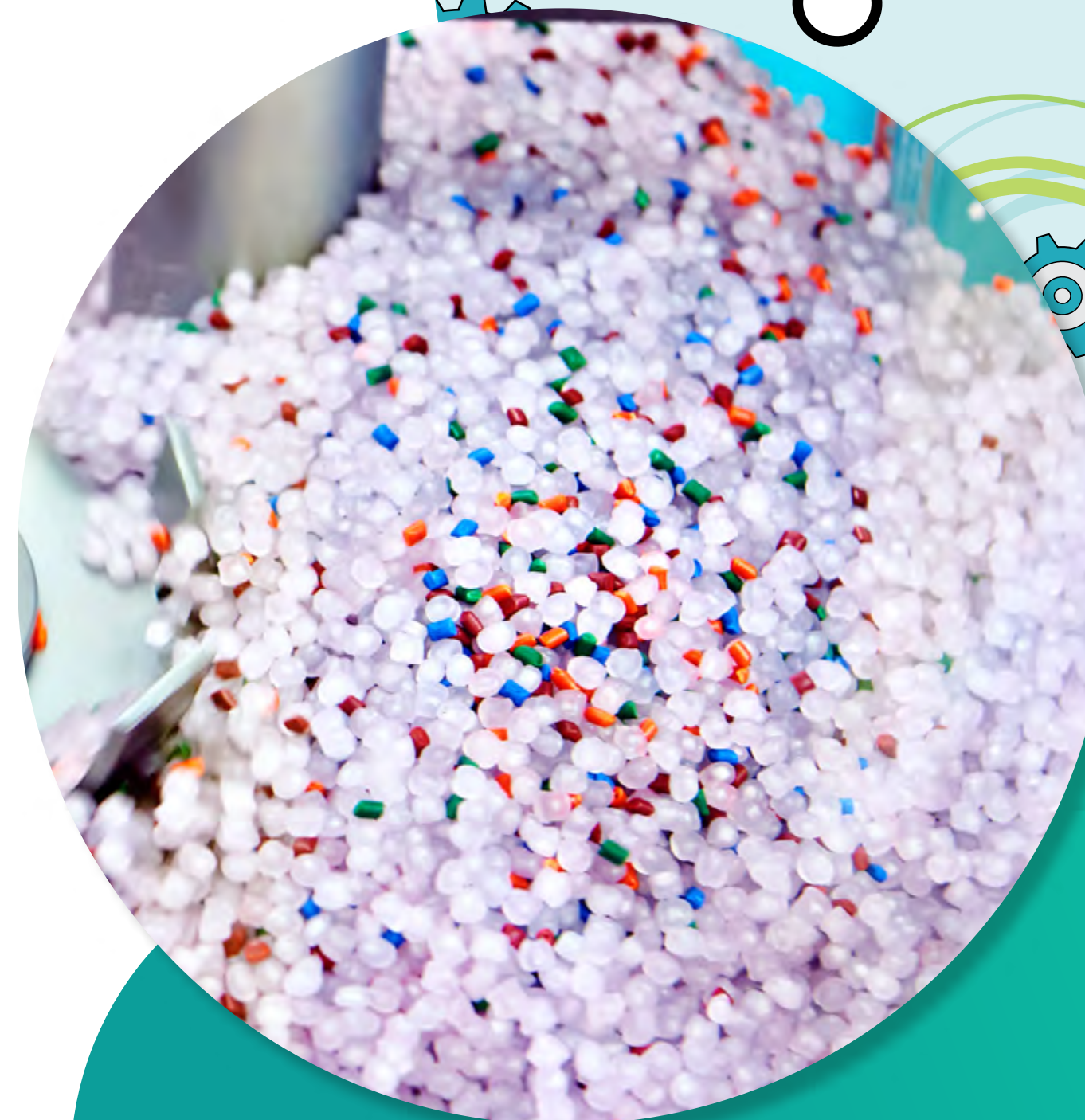
The unit allows the washing and separation of materials slightly

larger than the laboratory scale. It is originally designed to be transferable and can be placed in a 20-foot sea container.

The unit can be utilized in various development projects of companies and cooperation with research institutes and universities.



Click to watch





## Closed Material Loops

# Pyrolysis Equipments

Services for  
utilization  
of material  
components

In EKI-project will be established an operating environment for energy and circular economy (EKI) at LAB University of Applied Sciences. In the future, this will provide companies testing and expert services as well as the opportunity to pilot pyrolysis processes.

Pyrolysis equipment is used to study the pyrolysis of various materials such as biomass, wood, plastics, textiles and the end products generated in the process, as well as their utilization possibilities.

Dry distillation, or pyrolysis, is a thermochemical reaction in which a material is heated in an environment from which oxygen has been removed or replaced with an inert gas. In the reaction, smaller molecules are degraded from large complex molecules. The main products of the reaction are e.g. biochar, pyrolysis oil and -gas.





**Closed Material Loops**

# Furniture Laboratory

Independent  
service for  
furniture  
testing

**The furniture laboratory**

operating at LAB University of Applied Sciences is the cornerstone of LAB's testing and expert services. Nowadays commercial services have been expanded to include wood and materials technology.

Founded in 1993, the furniture laboratory is currently the only independent furniture testing laboratory in Finland.

The laboratory has a wide customer base, and in addition to standard furniture testing, the laboratory carries out various product

development and safety tests for manufacturers, importers and designers. Official reports and statements for authorities are made.

The laboratory is in Kemesta's national "Furniture" standardization committee and participates in the activities of CEN and ISO technical committees.



« RETURN



LAB University of Applied Sciences  
Mukkulankatu 19,  
15210 Lahti



**Furniture Laboratory  
brochure (ENG)**

# Energy

The use of renewable energy and increasing energy efficiency, as well as local energy solutions, are part of the circular economy.

In Päijät-Häme, a major change was made in energy production in 2019, when the use of coal was switched to renewable energy sources in the district heating production of the heating company Lahti Energia. Almost all municipalities in Päijät-Häme are involved in the Municipal Energy Efficiency Agreement, and renewable energy in municipal

properties is mainly in use. The goal of the Low Carbon Construction Development Center of the City of Lahti is to find new ways to reduce construction emissions and increase the use of circular economy solutions.

Traffic emissions are reduced by e.g. flexible mobility services, lower-emission vehicles and the infrastructure that supports them. Shared cars, combined mobility applications and other services are part of sustainable mobility.

REGIONAL ACTIVITIES

GOOD PRACTICES

« RETURN



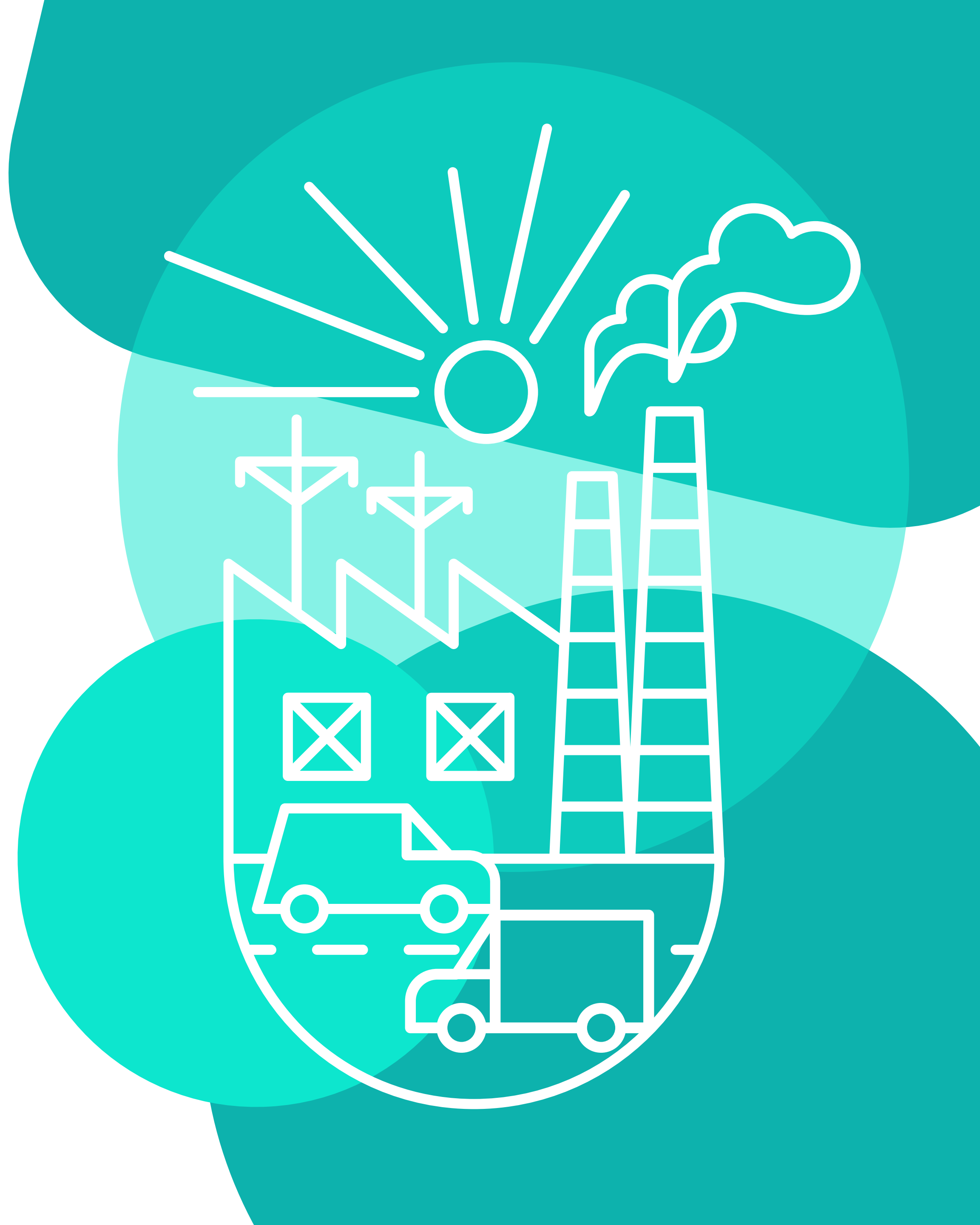


**Energy**

# Good Practices










- » **Personal Carbon Trading**
- » **Lahti Energia Bio Heatplant**
- » **Aquifer Thermal Energy**
- » **Geothermal Energy**
- » **Solar Energy**
- » **Electric Cars**

« RETURN



Energy

# Regional Activities

Action	Timetable	Operatives	Influence
Implementation of <b>Energy Efficiency Agreements</b> in eight municipalities.	2017–2025	Municipalities	
Clarifying the number of oil-heated properties and informing about the possibilities and subsidies of renewable energy sources.	2020–2021	Asikkala, Heinola, Lahti, Padasjoki, Päijät-Häme Rescue Services, Päijät-Häme Regional Council, Sustainable alternatives to oil heating -project	
Investigating the <b>reduction of energy consumption</b> and climate emissions in renovation construction.	2018–2021	City of Lahti, Lahden Talot – Rental Housing Company, CANEMURE-project	
Implementing an energy turn towards <b>renewable energy sources</b> , e.g. Lahti Energia's bioheat plant.	Continuous	Energy companies, municipalities	
<b>Development of energy ecosystems</b> based on agriculture and decentralized energy production using renewable energy.	Continuous	Municipalities, universities, farms, companies	
<b>Promoting renewable energy and energy efficiency</b> in companies through international cooperation.	2019–2023	RESINDUSTRY- ja SME-POWER-projects	
Implementation of <b>Conditions and Development of Low-emission Transport</b> in Päijät-Häme – program.	Continuous	Päijät-Häme Regional Council, municipalities, Transport system-ryhmä	
Construction of <b>infrastructure for alternative propulsion of transport:</b> Construction of charging stations for public and private electric cars (in Lahti, the goal is 40 charging stations in 2021).	Continuous	Energy companies, municipalities, companies, housing associations	
<b>Sharing cars and the emissions trading</b> incentive will be in use in City of Lahti in 2021-2030. Personal carbon trading has been piloted in traffic as part of the CitiCAP project. In the spring of 2020, the city will pilot the PiggyBaggy app, which enables joint business trips. MaaS (Mobility as a Service) piloting will start in 2021.	Continuous	City of Lahti, companies, universities	



## Energy

# Personal Carbon Trading

Application  
promotes  
towards  
sustainable  
urban  
mobility

Approximately 32% of total CO<sub>2</sub> emissions are contributed by the traffic sector within the city area of Lahti.

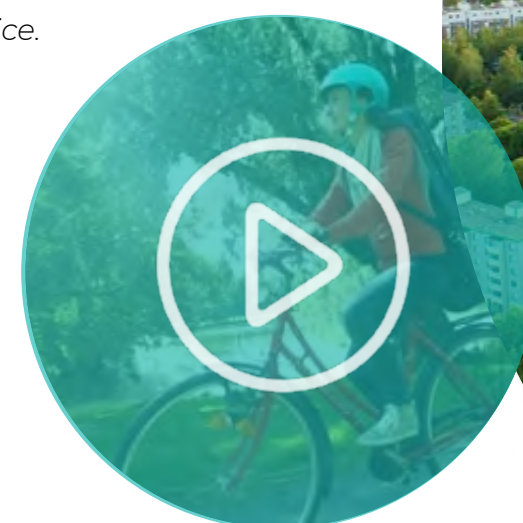
**The CitiCAP project (Citizens' cap-and-trade co-created)** aims to change the attitude and behaviour of citizens towards mobility to encourage the switch from private car use to sustainable mobility.

The project includes the development and introduction of a new mobile application based on a transport mode detection solution to monitor individual emissions and to calculate the personal mobility

carbon footprint. Through this application, citizens can receive benefits, such as bus tickets, in exchange for sustainable mobility choices. The application can be downloaded from Play Store and App Store.

The project will also include the construction of a smart bicycle route that highlights the importance of safe cycling infrastructure.

*Interreg Europe-good practice.*



Click to watch





## Energy

# Lahti Energia Bioheat Plant

District  
heating  
production  
from  
renewable  
sources

**Lahti Energia Company's Kymijärvi III Heat Plant** was built to replace the old coal-powered Kymijärvi I plant. Kymijärvi III enables the city of Lahti to completely reject coal in its energy production, which significantly reduces emissions in the area.

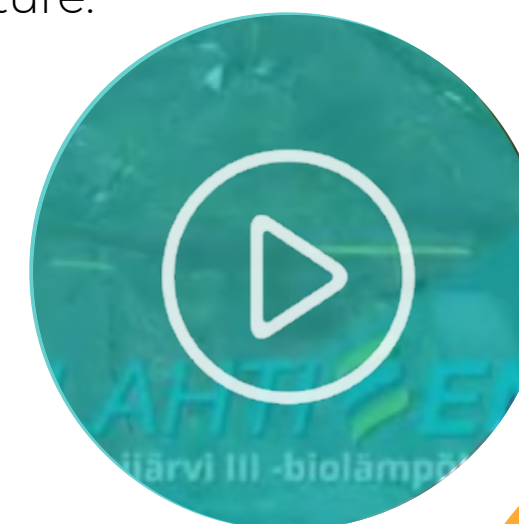
The new plant burns forestry residues and energy wood from forest management acquired from private forest owners, and other biomass, producing entirely renewable energy.

Heating power of the plant is 180 MW and is enough to cover most of the Lahti area district heating

demand. Lahti Energia's carbon dioxide emissions will be reduced by up to 600 000 tonnes per year. The plant's ash is to be recycled back to the forests for fertilizer.

The plant's steam boiler is designed so that it can be retrofitted with a turbine for electricity production, thus the plant can easily be converted to combined heat and power plant in the future.

*Interreg Europe  
Good Practice.*



Click to Watch





## Energy

# Aquifer Thermal Energy

Ground-  
water  
energy  
used in  
heating  
with heat  
pumps

In Lahti is located an area called **Askonalue**. There lies a large old industrial building called Upontalo. Vision for the area is a concentration of housing, work and leisure services, where resource efficiency and the circular economy have already been taken into account at the planning stage.

Upontalo is heated by a system that is still very rare in Finland: it is heated with energy taken from groundwater. With the use of heat pumps, the energy stored in groundwater is moved

to the building's central heating. The constant temperature of groundwater allows for high efficiency even in the extremes of winter.

The water supply of the Upontalo system is 1000 cubic meters per day and the monthly heating capacity is about 160 megawatt hours. The 300 kW system is small compared to the megawatts of heating potential stored in the aquifers of Lahti Area because the area is located on a huge gravel mattress.



« RETURN



**Askonalue**  
Askonkatu 9,  
15101 Lahti, FIN



**Askonalue homepage (FIN)**  
**Päijät-Hämeen alueen  
pohjavesienergiapotentiaali (FIN)**



## Energy

# Geothermal Energy

## Geothermal heating of factory using heat pumps

**Halton Marine**'s factory in Lahti has moved from previous natural gas system to a system of ground heat pumps. At the same time, they have replaced the old cooling system, as a heat pump is just a cooling system in reverse, thus by using reversible heat pumps savings are made on investing in two separate systems.

The geothermal heat pump system consists of 22 heat wells, 310 to 330 meters deep, drilled into the land surrounding the plant. The ground

stays at a steady temperature all year round allowing for heat to be captured in winter and transferred by the heat pump into the heating system.

By decoupling from natural gas use the factory has reduced emissions by 90 % and heating costs by 35 %. Additionally, the increased cooling capacity has allocated to factory's workspaces on hot summer days, that allows employee comfort and improving productivity.

*Interreg Europe-ohjelman hyvä käytännö.*





## Energy

# Solar Energy

### Solar power- plants for shopping malls

Electricity produced by **solar panels** is of interest to both companies and households as an inexhaustible form of renewable energy.

Several retail chains in Päijät-Häme have installed solar power plants on their roofs to generate electricity. In stores, solar energy is utilized e.g. in lighting, ventilation and refrigeration equipment. Especially in grocery stores, the need for cooling increases summertime, when the temperature rises. At the

same time, electricity production is also high when the sun shines more. Grocery stores are well suited for solar power plants due to the high demand for electrical power for cooling.

Retail chains have set carbon neutrality targets for the next few years, which will be achieved through various energy efficiency measures and the use of renewable energy.

*Interreg Europe Good Practice*





Energy

# Electric Cars

Compre-  
hensive  
charging  
network  
for electric  
cars

In Finland, traffic causes significant emissions when it relies heavily on private cars. Thus, new mobility solutions are being sought in **low-emission electric cars**, for which a comprehensive charging network will be built nationwide.

In 2021, the goal is to have 40 public charging stations for electric cars in Lahti. Charging points can be found e.g. at gas stations, shopping malls and individual companies. Later, charging points will also be built in collective buildings.

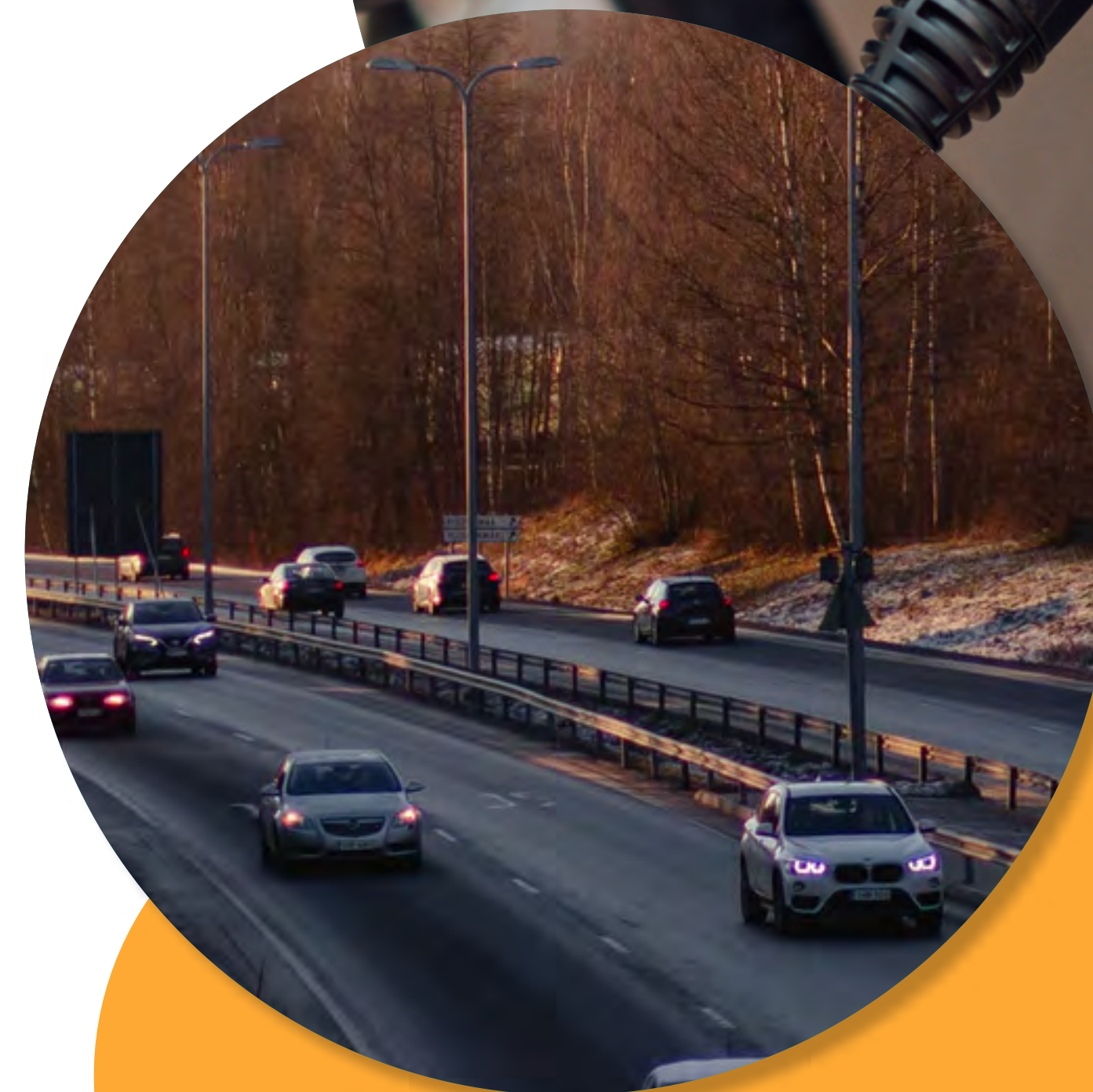
In Lahti, company **Kempower Ltd** manufactures fast charging solutions that are suitable for different types of electric vehicles. They can be scaled from needs of passenger traffic to public transportation and heavy-duty vehicles.

Kempower is part of **Kemppi Group** with 70 years of experience in manufacturing power supplies in Finland.

« RETURN



[Kempower homepage \(ENG\)](#)  
[Charging Stations on the map \(FIN\)](#)





# Bio Circular Economy

Traditionally, the bioeconomy has been a significant industry in Päijät-Häme, especially in the forestry and food sectors. The bioeconomy uses renewable resources sustainably to produce food, energy, nutrients, materials and services.

The Regional Council of Päijät-Häme and its stakeholders have drawn up the Päijät-Häme Bio-based Circular Economy Action Plan, which sets concrete goals for promoting the bio circular economy in the coming years. The implementation of the action plan is underway through several actors and projects.

REGIONAL ACTIVITIES

GOOD PRACTICES

« RETURN





**Bio Circular Economy**

# Good Practices

- » **Labio & Gasum**
- » **Hartwall & ST1**
- » **Fazer Xylitol Manufacture Plant**
- » **Versowood**
- » **Päijät-Häme Grain Cluster**
- » **BioHub Heinola**
- » **Putretti®-fertilizer**

« RETURN





Bio Circular Economy

# Regional Activities

Action	Timetable	Operatives	Influence
The Regional Council and its stakeholders have drawn up <b>an action plan for the Päijät-Häme bio-based circular economy</b> , which sets concrete goals for promoting the bio circular economy.	2019	Päijät-Häme Regional Council	<div></div>
<b>The Bio-based Circular Economy Action Plan is implemented in BIOSYKLI -Circular Bioeconomy in Päijät-Häme Region project.</b> The project focuses on four topics: 1) developing effective biowaste collection, 2) exploiting organic waste as a raw material for biodegradable products, 3) developing use of biobased plastics, and 4) developing carbon dioxide cycles and promoting the use of biogenic carbon dioxide.	2019-2022	LAB University of Applied Sciences, LUT University, Helsinki University, Finnish Plastics Association, Salpakierro- Regional Waste Management Company, LADEC – Lahti Region Development	<div></div>
<b>The use of biochar is promoted in improving soil quality and carbon sequestration.</b> New business models are created around recycled fertilizers (Putretti fertilizer) and commercialized them for export markets.	Continuous	Universities, companies, municipalities, HIME-project	<div></div>
<b>Nutrients that have already been discharged into waters are recovered</b> from sediments and, for example, by increasing the use of low-value fish.	Continuous		
<b>New innovations are being created in the area, e. g. through the development and research of wood-based materials.</b> In the Heinola area, a diverse biovillage complex is being developed, which studies e.g. utilization of straw as a high value-added product.	Continuous	Universities, municipalities, companies, City of Heinola, Green Growth Biovillage-project	<div></div>
<b>Priority will be given to utilization of raw wood other purposes than energy use.</b> To encourage wood construction, a regional promotion program will be drawn up. The different components of the biological by-products are utilized as accurately as possible for different products.	Continuous		

Influence:  Low  Moderate  High



## Bio Circular Economy

# Labio & Gasum

Production  
of biogas  
and  
fertilizer  
from  
biowaste  
streams

**LABIO Ltd** biogas and composting plant produces biogas and fertilizer from municipal and industrial biowaste, sludge from wastewater treatment plants and other biodegradable materials.

Biogas generated in the dry digesters is transported through the pipeline to nearby energy company **Gasum Ltd** for upgrading and distribution in the gas network. The digestate is processed with other biowastes in the composting facility to produce compost and other growing

solutions used in cultivation and gardening. Heat energy from the composting process is used to heat the biogas facility.

LABIO Ltd, the largest biogas production and refining plant in Finland, is part of the industrial symbiosis in Kujala Waste Treatment Centre in Lahti. LABIO processes annually 80 000 tons of waste, producing 50 GWh biogas and 20 000 tons of compost. The composting plant has operated since 2005 and the biogas plant since 2014.

*Interreg Europe Good Practice*





## Bio Circular Economy

# Hartwall & ST1

Bioethanol  
from  
by-products  
of the  
food  
industry

**The energy company ST1's** production plant Etanolix utilizes bio-based process residues originating mainly from **beverage manufacture of Hartwall**. In addition, waste material is transported from several local industries using grain, such as bakeries, grain mills and breweries. From these by-products, ST1 produces bioethanol, which is later mixed with petrol to gain bio-based fuel for vehicles. The resulting fuel has 80 % bioethanol concentration.

The waste material originating from Hartwall consists of production's

residue yeast and beverages, which cover 30–40 % of the total material needed for bioethanol production. The left-over yeast is still further used as livestock feed.

The location of ST1 plant right next to the Hartwall's factory enables transferring yeast through pipes between two plants. The ST1's Etanolix plant is operated since 2010 and it can produce annually one million litres of bioethanol.

*Interreg Europe  
Good Practice.*



Click to watch

« RETURN



**Hartwall**  
Kasaajankatu 13,  
15520 Lahti, FIN



**Hartwall homepage (ENG)**  
**ST1 homepage (ENG)**

**Biofuel production from food industry residues - RESINDUSTRY good practice**





Bio Circular Economy

# Fazer Xylitol Manufacture plant

Xylitol and  
energy  
from  
oat mill  
sidestreams

A Finnish food company **Fazer** has initiated a production line utilizing the sidestreams of its oat mill. The process uses new, patented technology to produce xylitol from oat hulls, generated large amounts in the milling process.

The plant will be the world's first xylitol factory acquiring its raw material from the company's own processes.

The new **xylitol manufacture plant** is located next to the oat mill, which minimizes the need for transport. Rest of the material will be used as fuel in energy

production in a new bio-energy-plant located same site.

Xylitol can be used in various products: as chewing gum ingredient or sweetener but also in cosmetics and pharmaceutical industry.

Construction of the factory is nearly completed, and production is planned to begin in 2021. The value of the investment is 40 M Euros, and it generates 30 new jobs.



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**Fazer**  
Kasakkamäentie 3,  
15100 Lahti, FIN



**Fazer Xylitol (ENG)**



Bio Circular Economy

# Versowood Group

Utilization  
of wood  
up to  
the last  
sawdust

**Versowood Group** is Finland's largest family-owned mechanical wood processing company headquartered in Heinola.

Versowood is an important regional employer, generator of export revenue and has a large tax footprint. Company's turnover is about 400 M € and it employs almost 800 people in 12 units. The company buys annually 3.5 million m<sup>3</sup> raw wood from Finnish forests, and it complies with PEFC forest certification in wood procurement.

Versowood utilizes wood resource-wisely up to the last wood chip. In

addition to sawn timber products, it manufactures various further processed wood products such as strength graded, finger-jointed and painted wood products, glulam, wooden bridges, telephone and electric poles, pallets, sawdust littering and various bioenergy by-products.

In wood products, carbon dioxide is stored throughout the product's life cycle.



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**Versowood Oy**  
Sahatie 1,  
19110 Vierumäki, FIN



**Versowood homepage (ENG)**  
**Carbon dioxide animation**



Bio Circular Economy

# Päijät-Häme Grain Cluster

Co-  
operation  
model  
between  
farmers and  
companies

The food industry, especially the grain sector, is important for the Päijät-Häme region. **The Päijät-Häme Grain Cluster** is a cooperation network of the local grain value chain. The cooperation model was founded in 2003 to promote networking between businesses and farmers, support cooperation and raise the profile of the food sector.

Grain processing is traditional but at the same time a modern branch of the food industry, which invests significantly in research and development.

The Cluster involves a total of 14 companies, two advisory organisations and about 1000 farmers. It brings together all actors in the region, from grain producers to industry and retail, both large international to small craft companies, e.g. mills, breweries, a malt producer and bakeries.

The Cluster has two separate chains: a bread chain and a beer and beverage chain. Both chains involve total of 2,200 employees in the processing and marketing sectors.

« RETURN



The Grain Cluster homepage (FIN)





## Bio Circular Economy

# BioHub Heinola

A new  
concept for  
the regional  
development  
of the bio  
and circular  
economy

The City of Heinola is extensively developing new business for the bio- and circular economy innovation chain. A new type of cooperation with Heinola and LAB University of Applied Sciences raises regional development agreements to a new level. Cooperation with research, public authorities and local businesses will be more straightforward, and there will be benefits for both parties in exploiting each other's networks.

**The BIOHUB** package includes several projects such as the **Green Growth Biovillage** and **Extra-CT**.

The Biovillage project investigates how straw-based bioprocessing can be made profitable in Päijät-Häme region and it develops the supply chain and process. The main objective of the Extra-CT project is to create conditions for the development of a low-carbon business based on hot water extraction in the Heinola region.

Besides, new projects are being prepared in cooperation with companies in the region.





## Bio Circular Economy

# Putretti® - Fertilizer

Increasing  
forest  
growth  
with  
recycled  
fertilizer

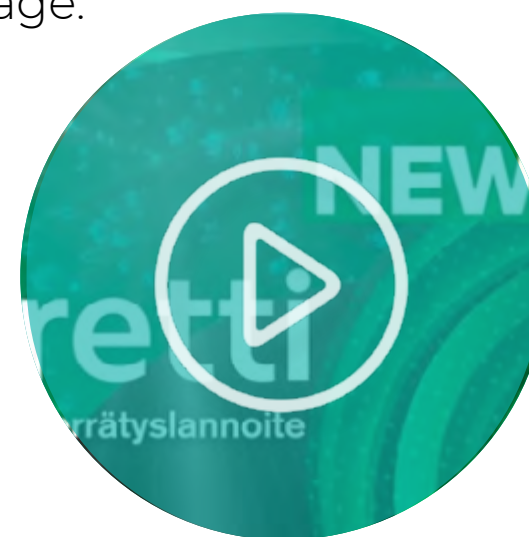
In Päijät-Häme has been developed from local by-products **an organic recycled fertilizer** called **Putretti®** that is suitable for forest fertilization.

Putretti®'s production process, product development and commercialization have been carried out by LADEC - Lahti Region Development Ltd and LUKE - Natural Resources Institute Finland under the leadership of Aalto University.

Putretti® utilizes the nutrients and trace elements of compost and wood ash. By fertilizing forests, nutrients are returned to the cycle to increase forest growth and carbon

sequestration. The production of Putretti® consumes significantly less energy than the production of artificial fertilizers. According to preliminary calculations, its climate impact is only about 11 % of artificial fertilizers.

Recycled fertilizer Putretti® responds to global megatrends resource deficiency (especially phosphorus), climate change and the strengthening of carbon sinks and storage.



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« RETURN



LADEC  
Niemenkatu 73,  
15140 Lahti, FIN





# New Consumption Models

In Päijät-Häme, new types of sharing economy services are being developed as part of the circular economy. Instead of buying products, these services support sharing, reuse, repair and rental of goods. Businesses and residents in the region benefit from new commercial opportunities as well as new types of products, services and operation models.

REGIONAL ACTIVITIES

GOOD PRACTICES

« RETURN





New Consumption Models

# Good Practices

- » Anttilanmäki-Kittelä Citizen Community
- » Municipal and City Bikes
- » Urban Farming
- » Borrowing of Goods
- » Sharing Services for Urban Premises
- » Painovoima Association

« RETURN





## New Consumption Models

# Regional Activities

Action	Timetable	Operatives	Influence
<b>Development of new material- and energy-efficient housing and mobility solutions</b> for everyday life and promote the participation of residents in the sharing economy.	Continuous	Universities, municipalities, companies, associations, CECI-, ASKEL- ja KESTI-projects	●
<b>New solutions are being invented for urban farming.</b> Urban plantations are established in parks and other green areas. Schools are encouraged to farm e.g. in collaboration with nursing homes.	Continuous	Municipalities, associations, companies	●
<b>Shared services will be strengthened for premises, goods and transport.</b> The city of Lahti is developing a unified reservation and rental service for premises and equipment.	Continuous	Municipalities, companies	●
<b>A rental system for city and municipal bicycles will be formed.</b> In Lahti, the goal is to make bicycles available in 2021.	Continuous	Municipalities, associations, companies	●

Influence: ● Low ●● Moderate ●●● High

« RETURN



## New Consumption Models

# Anttilanmäki-Kittelä Citizen Community

A step  
towards  
sustainable  
housing

The Anttilanmäki-Kittelä Citizen Community in Lahti has nurtured and developed its traditional environment and organized various cooperation, excursions and gatherings for residents since 1957.

The Askel project (2020-2021) coordinated by LAB University of Applied Sciences facilitates the development of three eco-efficient services. The aim is to improve SME's capabilities to produce circular and sharing economy-based services in reforming markets, which will help consumers move towards low-carbon housing and consumption.

The services to be developed are a community platform through which residents' and association's equipment, facilities and know-how can be borrowed; vegetable bag service, where the market trader delivers the ordered products from nearby producers with recipes and a service for monitoring home consumption and conditions, for example concerning water, electricity and indoor air quality.

*Interreg Europe  
Good Practice.*



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Anttilanmäki  
15100 Lahti,  
FINLAND



**Citizen Community's homepage (FIN)**  
**ASKEL- project (FIN)**

**Developing sustainable housing services - CECI  
good practice (ENG)**



## New Consumption Models

# Municipal and City Bikes

Sustainable  
mobility is  
promoted  
by shared  
bikes

In cooperation with the Maalle-  
muuttajat 2030 -project and the  
municipality of Hollola, **a municipal  
bicycle experiment** was launched,  
in which used, refurbished bicycles  
can be borrowed free of charge for  
one day.

In the summer of 2020 bicycles were  
available in the municipal centre  
and farm shop. In the future, the  
bicycle experiment is to be extended  
to new areas, and the aim is to make  
it an entrepreneur-driven activity.

Municipal bikes serve residents  
as well as tourists, and in the first  
year, they made both business  
and leisure trips. The feedback

received has been positive and most  
customers were willing to pay for  
the use of the bikes.

One kind of **city bike system**  
is being prepared in Lahti, where  
users can borrow and return bikes  
at purpose-built city bike stations.  
Operation is planned to start for  
2021.

*Interreg Europe Good Practice.*



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## New Consumption Models

# Urban Farming

Local  
food  
farming  
in the  
community

Urban farming and community food production are good examples of sharing economy models.

**The Kotiniemi Allotment Garden Association** was founded in 1984. The association has leased land from the City of Lahti where they have 85 cottages with gardening plots and areas for common use. Cottages can be bought by Lahti residents who do not have their cottage elsewhere.

Allotment gardening is a community-based association activity characterized by jointly agreed policies and rules. The gardeners have to pay a small membership fee.

**Lahden palstaviljely** leases farmland owned by the city to the residents. A plot can be rented at a time for one growing season. The individual size of a plot typically suits the needs of a family for non-commercial gardening or growing food plants.

The starting time varies from year to year depending on the soil preparation activities. Rules have been drawn up for plot gardening.



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**Kotiniemen Allotment Garden**  
Ryytimaanraitti,  
15230 Lahti, FIN





Euroopan maaseudun  
kehittämisen maatalousrahasto:  
Eurooppa investoi maaseutualueisiin



European Union  
European Regional  
Development Fund

## New Consumption Models

# Borrowing of Goods

Borrow  
a drilling  
machine  
or a steam  
cleaner  
with the  
library card

In the summer of 2020, loaning service of goods was opened in connection with the Asikkala library. Residents were given ideas on what items they would borrow and based on the wishes, the goods were collected as a donation to the library.

The goods lending office is freely available to all residents with the library card.

The operation was planned from the beginning so that it would become a permanent operation for the

Asikkala Library. If necessary, the goods will be repair or the selection will be updated with new donations.

A lending service based on a sharing economy helps reduce greenhouse gas emissions and increases opportunities for hobbies and domestic work among residents.

*Interreg Europe Good Practice.*



« RETURN



**Asikkala Library**  
Asikkalantie 21,  
17200 Vääksy, FIN



**Sharing economy library in the rural area  
of Päijät-Häme - CECI good practice (ENG)**



## New Consumption Models

# Sharing Services for Urban Premises

Operating  
facilities  
for more  
efficient  
use

**The city of Lahti** offers meeting, event and exhibition space, facilities for creative activities and entertainment, as well as for sports. More information about the premises to be rented and the contact persons are compiled on the city's website.

**The city of Heinola** has a free community workspace called Spotti where you can work remotely and have meetings. Well-equipped meeting and group work facilities have the latest digital technology and free online services.

The space is used by 80-120 people per week: entrepreneurs in customer meetings and remote workers during the day, also cottagers in summer. In the evenings, the space is used by associations and sports clubs.

Spotti facilities can be rented through the city's electronic booking service.

« RETURN



**SPOTTI**  
Wanha Lehtitalo, 2<sup>nd</sup> floor  
Lampikatu 8 C,  
18100 Heinola, FIN



**Tilavuokraus, Lahti (FIN)**  
**Spotti, Heinola (FIN)**







PÄIJÄT - HÄMEEN LIITTO

## New Consumption Models

# Painovoima Association

A new kind of  
co-operation  
in the Center  
for Circular  
Economy  
of Creative  
Industries

**Painovoima** is an association and community of creative workers in Lahti. Painovoima aims to promote employment in the arts and culture sector, maintain traditional art workshops and methods in a vibrant urban environment, and act as an intermediary between companies, associations, educational institutions and municipal organizations.

**The Circcu - circular economy and city centre** is located in an old ski factory. Circcu is a unique entity, which combines e.g. the showroom of the local energy cluster, university

research and student work, a brand store for circular economy products, co-working facilities for creative industries and unique space for urban events. It is a smelter of creative industries that comprehensively promotes and utilizes the circular economy.



« RETURN



Sammonkatu 8H,  
B-rappu, 5<sup>th</sup> floor  
15140 Lahti, FIN



**Painovoima (FIN)**





# Innovative Solutions

The circular economy in Päijät-Häme is based on strong expertise in environmental technology and cleantech. Päijät-Häme has several internationally interesting circular economy examples, which are especially related to material and energy efficiency as well as bio circular economy solutions. Business in these sectors supports sustainable growth and has significant export potential.

The City of Lahti is the European Green Capital in 2021, which will bring a lot of national and international visibility.

REGIONAL ACTIVITIES

GOOD PRACTICES

« RETURN





**Innovative Solutions**

# Good Practices

- » **Lahti Green City 2021**
- » **Laboratories for Sustainable Material Cycles**
- » **Carbon Neutral Päijät-Häme**
- » **Kujala Industrial Symbioses**
- » **BioHub Heinola**

« RETURN





Innovative Solutions

# Regional Activities

Action	Timetable	Operatives	Influence
<b>The City of Lahti will be European Green Capital in 2021.</b> The year will include both local and international events, as well as numerous projects to raise new environmental solutions.	2021	City of Lahti, partners	●
<b>Existing circular economy references are being publicized.</b> Sites of international interest include the Asko and Kujala regions. Päijät-Häme's strong Grain Cluster is also a pioneer of industrial symbioses.			
<b>The business of SMEs will be strengthened by developing resource efficiency and industrial symbioses.</b> Possible future references are, e.g. the Henna area in Orimattila and various enterprises in the Lahti region. The goal is to build more closed material loop plants in the future.			
<b>A recycling park will be built in Päijät-Häme region to promote the region's circular economy and industrial symbioses.</b> Activities focus in particular on the material reuse of different kind of soils, as well as construction and demolition waste.		Municipalities, companies	●●
<b>Education related to the circular economy</b> is developed nationally together with university consortia and Sitra for primary schools and upper secondary levels, as well as for public sector and company personnel.	Continuous	Universities, schools, municipalities, Sitra, companies	●
In municipalities <b>climate partnership activities are developed</b> with companies through student cooperation.	Continuous	Municipalities, LAB University of Applied Sciences, Päijät-Häme Regional Council	●
<b>Region of Päijät-Häme is a part of Hinku-network</b> (Towards Carbon Neutral Municipalities and Regions). Members of network are committed to reduce greenhouse gas emissions by 80 percent by 2030.The circular economy is one way to reduce these emissions.	2019-2030	Municipalities, Päijät-Häme Regional Council	●

Influence:    ● Low    ●● Moderate    ●●● High





Innovative Solutions

# Lahti Green City

Lahti -  
European  
Green  
Capital  
2021

The European Commission has awarded Lahti the **European Green Capital Award (EGCA) 2021** as the first city in Finland. This is a recognition of the long-term environmental work of Lahti as the leading environmental city in Finland.

In Lahti, there is taken bold environmental actions every day. Lahti is a pioneer of climate work: the use of coal was abandoned in 2019, and the city will become a carbon-neutral by 2025 as the first large city in Finland. Lahti has developed circular economy expertise into a growth-oriented

business, and up to 99% of municipal waste is recovered as energy or material. The city is also the first in the world to test personal mobility emissions trading by citizens.



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« RETURN



Green Lahti (ENG)



## Innovative Solutions

# Carbon Neutral Päijät-Häme

Emission  
Reduction  
Target:  
-80% CO<sub>2</sub>

Region of Päijät-Häme aims for carbon neutrality in 2030 and is committed to an 80 % reduction in greenhouse gas emissions from 2007 levels by 2030. Päijät-Häme is a part of **Hinku-network** coordinated by the Finnish Environment Institute (Towards Carbon Neutral Municipalities and Regions) and all municipalities in the region are committed to achieving the goal.

The Regional Council of Päijät-Häme, municipalities, universities and other experts have compiled a climate roadmap for the region,

which determines more detailed sector-specific objectives and aims towards carbon neutrality. The operation is coordinated by the regional climate group.

The roadmap will be updated yearly. Future aims will also include clarifying the region's carbon balance and improving preparedness for climate change.



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## Innovative Solutions

# Kujala Industrial Symbioses

Finland's  
most  
significant  
circular  
economy  
industrial  
park

**Salpakierto Ltd** and **Kujala Waste Centre** in Lahti are the core of the Kujala industrial symbioses. The company provides waste management for 10 nearby municipalities and offers seven waste reception stations for residents. Salpakierto serves over 200 000 residents and 13 000 companies. Due to a sophisticated at-source sorting system, only one percent of the total municipal waste is landfilled.

Long-term cooperation between municipalities and neighbouring companies has enabled the development of a functional symbiosis. Several companies working in recycling and material recovery can benefit from each others' expertise in Kujala area. One's residues are another's raw materials. Different residues are processed into e.g. biogas, fuel, fertilizers, asphalt and energy.





## Innovative Solutions

# BioHub Heinola

A new  
concept for  
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