

# Sustainability Focus Area

## LAB International Week 2024

Annakaisa Elo - Chief Specialist – Material Cycles

# Agenda

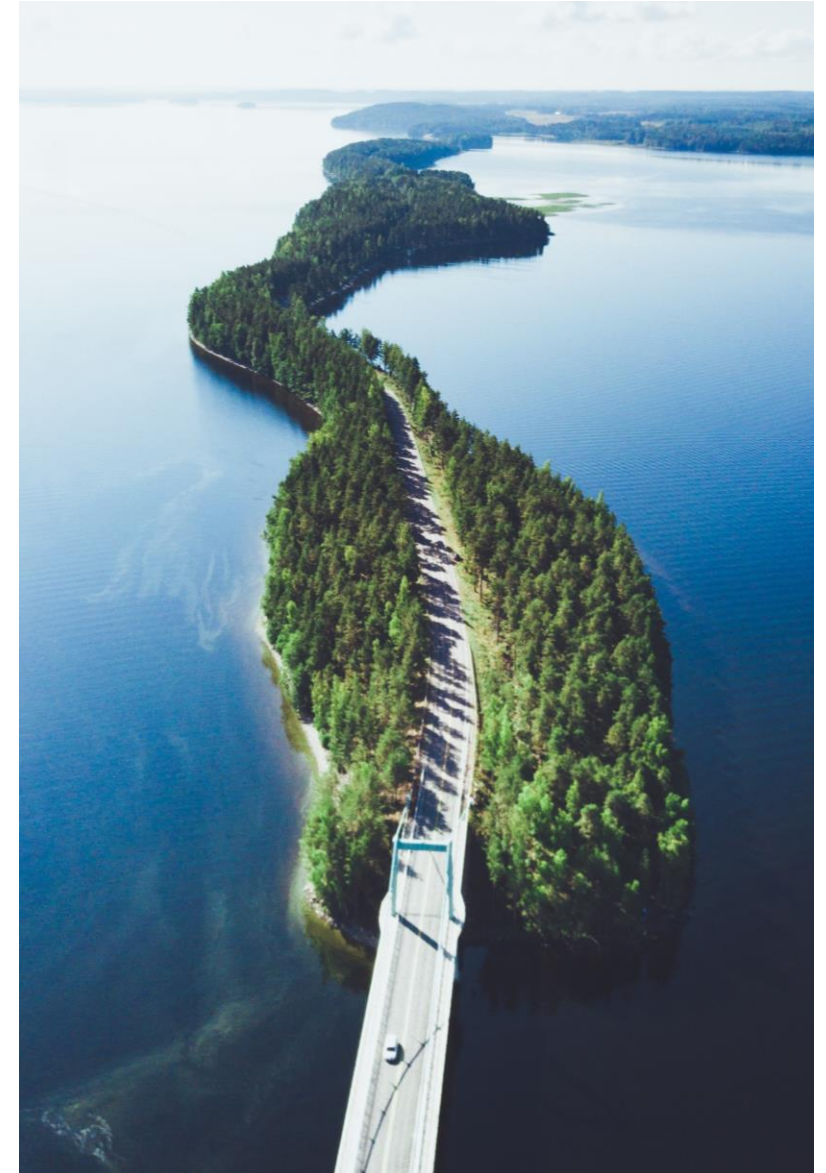
- 1 – Research themes
- 2 – People
- 3 - Projects

# 1 – Research themes

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# Our themes include:

- **Materials (Technical and Biobased cycles)**
  - Sustainable material cycles
  - Primary production
  - Techno-economic solutions based on the versatility and multifunctionality of materials
  - Technologies that have high added value in the field of circular economy. Our expertise areas are textiles, plastics and construction and demolition waste.
- **Urban**
  - Systemic change towards a sustainable society
  - Carbon-neutral built environment: digitalisation in the urban environment, sustainable energy solutions
- **Food**
  - We develop new products and processes in the bioenergy and food ecosystems for the resilience needs of our society.



# Research interests

- MATERIALS

- Nutrient recovery and recycling, circular fertilizers
- Carbon dioxide capture and utilization, BioCCU
- Boundaries for raw material utilization and the supply chain in the production of high value products (Sourcing, quantity, quality, systemics and scalability)
- Bio-based plastics
- Energy: biogas, pyrolysis
- Plastic and textile recycling, material recognition
- Laboratories supporting research: Circular economy lab, Analytics etc.

- URBAN

- ▶ Sustainable societies
- ▶ Digital green solutions
- ▶ Adapting to climate change
- ▶ Smart energy systems

- FOOD

- ▶ Implementation of regional food strategies
- ▶ Sustainable use of side streams from food value chain
- ▶ Plant based food products, especially oats
- ▶ Research around "Food Pilot Plant" facility

# 2 – People



**Jyrki Schroderus**  
RDI Director  
[jyrki.schroderus@lab.fi](mailto:jyrki.schroderus@lab.fi)

**Kirsti Cura**  
Chief Specialist in Materials  
[kirsti.cura@lab.fi](mailto:kirsti.cura@lab.fi)

**Susanna Vanhamäki**  
Chief Specialist in Urban  
[susanna.vanhamäki@lab.fi](mailto:susanna.vanhamäki@lab.fi)

**Sami Luste**  
Chief Specialist in Food  
[sami.luste@lab.fi](mailto:sami.luste@lab.fi)

**Annakaisa Elo**  
Chief Specialist in Biobased Cycles (Research team)  
[annakaisa.elo@lab.fi](mailto:annakaisa.elo@lab.fi)

**Ossi Martikka**  
Chief Specialist in Technical Cycles (Research team)  
[ossi.martikka@lab.fi](mailto:ossi.martikka@lab.fi)

**& RDI specialists & Lecturers**

# 3 – Projects



# Sustainability - Project overview

## Funding:

Horizon Europe: 3 ongoing projects

Interreg Europe: 2 ongoing projects

Erasmus+: 1 project

Life+: 1 project

Business Finland: 6 projects

ERDF: 11 ongoing projects

Academy of Finland STN: 1 project

& Other funding sources: 7 projects





# Waste4Soil

## Improving food systems sustainability and soil health with food processing residues

- › Because of the unsustainability of mineral fertilizers, Waste4Soil strives for a next-generation fertilisers, environmentally friendly, from European territories, and affordable to all.
- › It relies on four key innovative approach (IA):
  1. Knowledge sharing regarding waste at source and circularity,
  2. Innovative technologies,
  3. Social innovation and co-creation in food value chain, and
  4. Circular business models.



This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement No 101112708.

### PARTNERS:

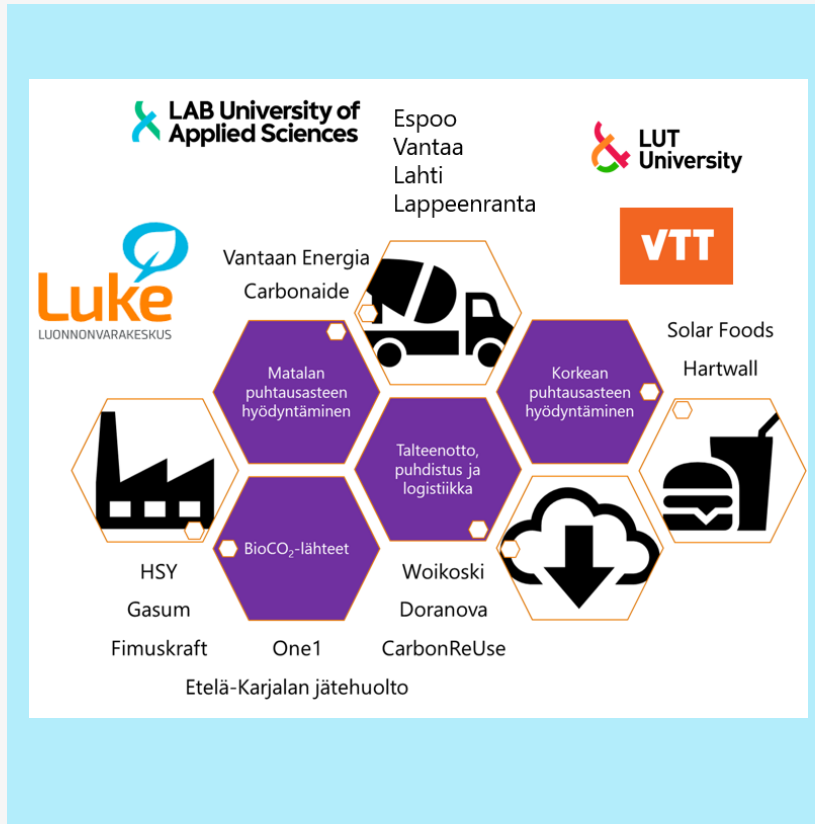
Centre for Research and Technology for Hellas CERTH, Kreikka (koordinaattori), Association Nationale des Industries Alimentaires, Ranska, Soilfood Oy, Suomi, Institute de Recerca i Tecnologia Agroalimentaries, Espanja, Universita Degli Studi di Parma, Italia, Assemblee des Regions Europeennes Fruitières Legumières et Horticoles, Ranska, Acondicionamiento Tarrasense, Asociacion, Espanja, SEDE Environment, Ranska, jR – BioPhosphate Ltd, Unkari, Instituto Tecnológico del Embalaje, Transporte y Logística, Espanja, Associazione Nazionale Cooperative Agroalimentari Per Lo Sviluppo Rurale e Costiero, Italia, Wings ICT Solutions Information & Communication Technologies iKE, Kreikka, Wageningen University, Hollanti, Conferazione Generale dell Agricoltura Italia, Biomasa Peninsular S.A., Espanja, Instytut Uprawy Nawożenia i Gleboznawstwa, Państwowy Instytut Badawczy, Ponia, Cluster Vicoekonomias kai Perivalontos Dyktis Makedonias, Kreikka, Anonymi Etairia Diacheirisis Aporrismaton per Dyktis Makedonias, Kreikka, Koto Proizvodno in Trgovsko Podjetje Doo, Slovenia, Gesco Società Cooperativa Agricola, Italia, Univerza di Ljubljani, Slovenia, Bay Zoltan Alkalmazott Kutatasi Kozhasznu Nonprofit Kft., Unkari, Savonia University of Applied Sciences, Suomi, Agencia Estatal Consejo Superior de Investigaciones Cientificas, Espanja, Znanstveno-Raziskovalno Sredice Koper, Slovenia, Euroquality SARL, Ranska, FiBL Research Institute of Organic Agriculture, Sveits (litännäspartner)

### BUDGET:

LAB 349 890 €  
Tot. 6 999 461 €

### DURATION:

6/2023–12/2026



## “HIILIKETJU” - Value chain opportunities in urban carbon cycle

- › Establishing **new bioCO<sub>2</sub>-based value chains** together with cities and companies (BioCCU)
- › Investigating utilization opportunities of both purity levels of **CO<sub>2</sub>: industrial (10 – 95 vol.%)** and **food grade (99.9 vol.%)**
- › The project investigates **boundary conditions of the business models**

**BUSINESS  
FINLAND**

**PARTNERS:**

Natural Resources Institute Finland - LUKE, Technical Research Centre of Finland - VTT, LAB University of Applied Sciences, LUT University

**BUDGET:**

LAB 655 000€  
Total. 3 050 000€

**DURATION:**

6/2023–5/2025



**BUSINESS  
FINLAND**



## BioCarbon Value

- › Preparing for **new era of bioeconomy** centered around agricultural biomass and creating value for unutilized agricultural side streams
- › Replacing fossil-based carbon in high-value applications such as battery carbons
- › BioCarbonValue engages **whole value chain** including leading companies that can make change from feedstock sourcing to end user of high value carbons

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**PARTNERS:**

VTT Technical Research Centre of Finland,  
LAB University of Applied Sciences, Fortum,  
Sumitomo SHI FW, Neova, Premix, PUHI, Carboflex,  
Carbo Culture, Fift Innovation, City of Heinola

**BUDGET:**

1 200 000 €

**DURATION:**

6/2020–5/2022

# Food Pilot Plant

## Development- and Testing Environment for plant- based food products

Lappeenranta-Lahti University of Technology (LUT) and LAB University of Applied Sciences support the product development and research efforts of the Grain Cluster companies.

- Currently, companies and higher education institutions are working together to prepare a joint testing and product development environment for the food industry.
- LUT University has also strengthened its research into separation technology; there are now five professorships in separation technology and research teams associated with them in Lahti.

- LAB University of Applied Sciences is building a new pilot-scale operating environment for the development and testing of plant-based products
- Operating Environment is abt. 600 m<sup>2</sup> and its location is in Lahti
- Development project is implemented in cooperation with the Päijät-Häme Grain Cluster
- The new operating environment will be ready in the summer 2023 and Commercial Services will start at the beginning of 2024
- Development Project of Operating Environment is financed by European Regional Development Fund



Photo: Viking Malt



| [plastlife.fi](https://plastlife.fi) | [#plastlife](https://twitter.com/plastlife) |

# PlastLIFE

- › Developing a Finnish plastics roadmap
- › The goal is a sustainable circular economy of plastics in Finland by 2035.
- › Develop methods to reduce the environmental harm caused by plastics, littering and unnecessary consumption.
- › Enhancing the recycling of plastic waste, replacing fossil raw materials and to utilize recycled plastics.
- › Develop analytics and risk assessment of harmful substances contained in plastic waste.
- › LAB is involved in the project to create a plastic cluster in Päijät-Häme and South Karelia as well as training packages and to conduct recyclability studies for the project.

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**PARTNERS:**

Finnish Environment Institute - SYKE, Aalto University, City of Helsinki, Jyväskylä University, Karelia University of Applied Sciences, Kuljetusliike Vaahterinen Ltd, Lappi University, Natural Resources Institute Finland – LUKE, LUT University, Muovipoli Ltd, Orthex Finland Ab, Keep the Archipelago Tidy Association, Plastone Ltd, Finnish Biocycle and Biogas Association, Turku University, Ministry of the Environment

**BUDGET:**

LAB 350 000€

**DURATION:**

1/2023–12/2029



# SIIRTYMÄ

## Transition to carbon-neutral ecosystems of renewable energy and resource efficiency

- › Promote the interoperability of renewable energy production units, energy transformations and energy storage facilities in Päijät-Häme.
- › Build and model ecosystems of wind and solar energy, energy storage and biogas cycles.
- › Communicate the results of the project and expand the network of energy cooperation.



Leverage from  
the EU  
2014–2020



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### PARTNERS:

LAB University of Applied Sciences, LUT  
University

### BUDGET:

LAB 294 000 €  
Total 563 000€

### DURATION:

10/2022–12/2024



# MURCS 1.5

## Master in Urban Climate & Sustainability 1.5

- › 2-year international Erasmus Mundus master programme in cooperation with three universities: Glasgow Caledonian University, LAB University of Applied Sciences, University of Huelva ja Dresden University of Applied Sciences
- › Integration of thematic knowledge on three subject-specific streams (Planning, Management and Science) into coherent curriculum produces professionals and leaders who are able to manage urban climate change in sustainable way
- › Students and teachers are financially encouraged for mobility and implementation of studies should take place at least in two countries



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**PARTNERS:**

Glasgow Caledonian University, LAB University of Applied Sciences, University of Huelva, Dresden University of Applied Sciences

**BUDGET:**

LAB 425 000 €  
Tot. 696 000 €

**PROJECT PERIOD:**

10/2020–9/2026






# CITISYSTEM

## Supporting cities in sustainable biobased systemic change

- › Capacity building, knowledge and good practices exchange to develop policies supporting cities in sustainable biobased systemic change
- › Supports the utilization, circulation, and recovery of biobased resources in materials, nutrient and energy loops
- › e.g., separate biowaste collection and processing, as well as the most effective utilisation and valorization of biowaste, biomass

 @CITISYSTEMeu



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### PARTNERS:

LAB University of Applied Sciences, City of Lahti, Technical University of Košice, BSC, Business support centre L.t.d., Kranj, City of Mechelen, Regional Development Fund of Central Macedonia, CERCA Institute-Catalan Research Centres Institute

### BUDGET:

LAB 336 000 €  
Tot. 1 476 000 €

### DURATION:

1.3.2023 - 28.2.2027



## Sustainable Horizons

- › Integrating discovery-based research on sustainability in university studies
- › Improving universities links with surrounding ecosystems and actors: pilots in all countries
- › Developing institutional change and internal procedures, exchanging and adopting best practices
- › Developing Sustainable Campus activities



Funded by  
the European Union

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#### PARTNERS:

University of Algarve (Portugal), University of Huelva (Spain), Banat's University of Agricultural sciences and veterinary medicine, Timisoara (Romania), LAB University of Applied Sciences, Ludwigshafen University of business and society an Applied Sciences (Germany), Tomas Bata University in Zlin (Czech Republic)

#### BUDGET:

LAB 281 000 €  
Tot. 2 326 000 €

#### PROJECT PERIOD:

1.9.2022-31.8.2024

The logo for 'NET ZERO CITIES' is displayed on a white square background. The word 'NET' is in a bold, dark blue font. 'ZERO' is in a similar font, but the 'O' is replaced by a circular graphic with a rainbow color gradient. 'CITIES' is in the same bold, dark blue font as 'NET'.

## Systemic change towards sustainable commuting in Lahti

- › Improving sustainable commuting in 8 in workplaces (big and small companies, public actors, university campus)
- › Background research about possibilities to improve sustainable commuting
- › Mapping the initial situation and planning actions to support sustainable commuting
- › Interventions at the workplaces (improved facilities, incentives, etc.)
- › Implementation on wider scale in the City of Lahti and sharing experiences in Net Zero Cities network



Funded by  
the European Union

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**PARTNERS:**

City of Lahti (lead), LAB, LUT University, Wellbeing services county of Päijät-Häme

**BUDGET:**

LAB 350 000 €  
Tot. 1 000 000 €

**PROJECT PERIOD:**

1.6.2023-31.5.2025

**Thank you!**