Ongoing RDI-activities in bioeconomy Kainuu region

East and North Finland in now member of Vanguard initiative bio-economy pilot

East & North
FINLAND

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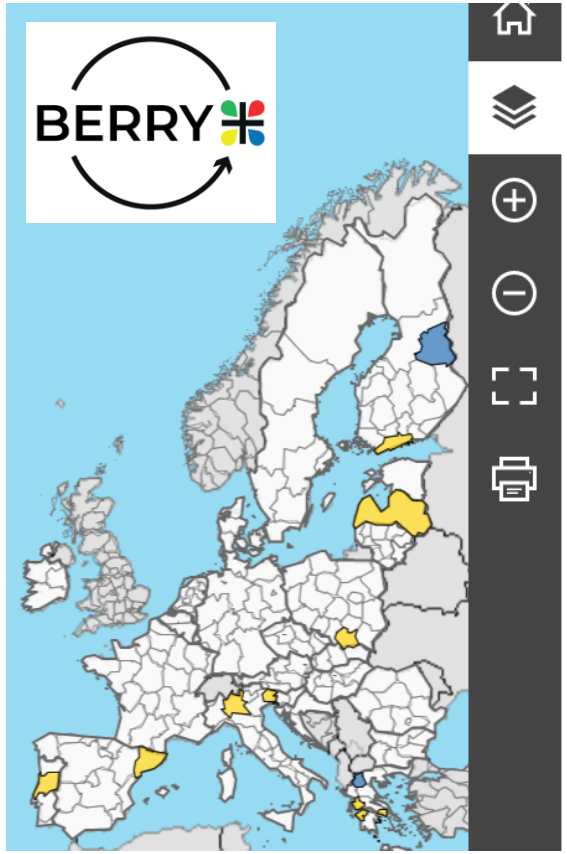
Bio-economy in Kainuu

Bio-economy is the largest private-sector industry in Kainuu in terms of turnover and human resources. #wood construction, #local energy and #Measurement technology and automation.

- Kainuu has forestry land 1.93 million hectares, 95 percent of the land area, includes protected areas. 74.5 % of forestry land is used for wood production. The growth of the forest is 7.34 million cubic meters per year in forest and heath land
- Bio-economy is strongly in Kainuu RIS3 strategy
- The sawmills operating in the area have invested significantly in increasing capacity, and production will almost double in a couple of years
- Region has strong measurement technology&automation industry providing solutions to bio-economy sector.
- Aim is to develop more value added products, Promote the implementation of new investments related to the bio-economy industry in the region and promote industrial wood construction in Eastern Finland

BERRY+

- BERRY+ is an S3 industrial modernization partnership
- Establish an interregional cluster among the partner regions, emphasizing excellence-based processing of renewable natural resources & their side streams for high added value applications and ensuring access to market, through value chain collaborations
- Kainuu is the one of the leading regions



Berry +

Leading regions

Kainuu, Finland (FI)

Western Macedonia, Greece (EL)

Participating regions

Attica, Greece (EL)

Catalonia, Spain (ES)

Centro, Portugal (PT)

Friuli-Venezia Giulia, Italy (IT)

Helsinki-Uusimaa, Finland (FI)

Latvia (LV)

Lombardy, Italy (IT)

Malopolska, Poland (PL)

Western Greece, Greece (EL)

KAINUUN LIITTO

CEMIS – Centre for Measurement and Information Systems

CEMIS

KAMK • University of Applied Sciences

UNIVERSITY OF OULU

UNIVERSITY OF JYVÄSKYLÄ

VTT

CSC
ICT Solutions for Brilliant Minds

UNIVERSITY OF OULU

Unit of Measurement Technology in Kajaani University of Oulu

Mittaustekniikan yksikkö Oulun yliopisto

MITY

Dr. Jarkko Räty, Research manager
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MITY- Applied science to practice

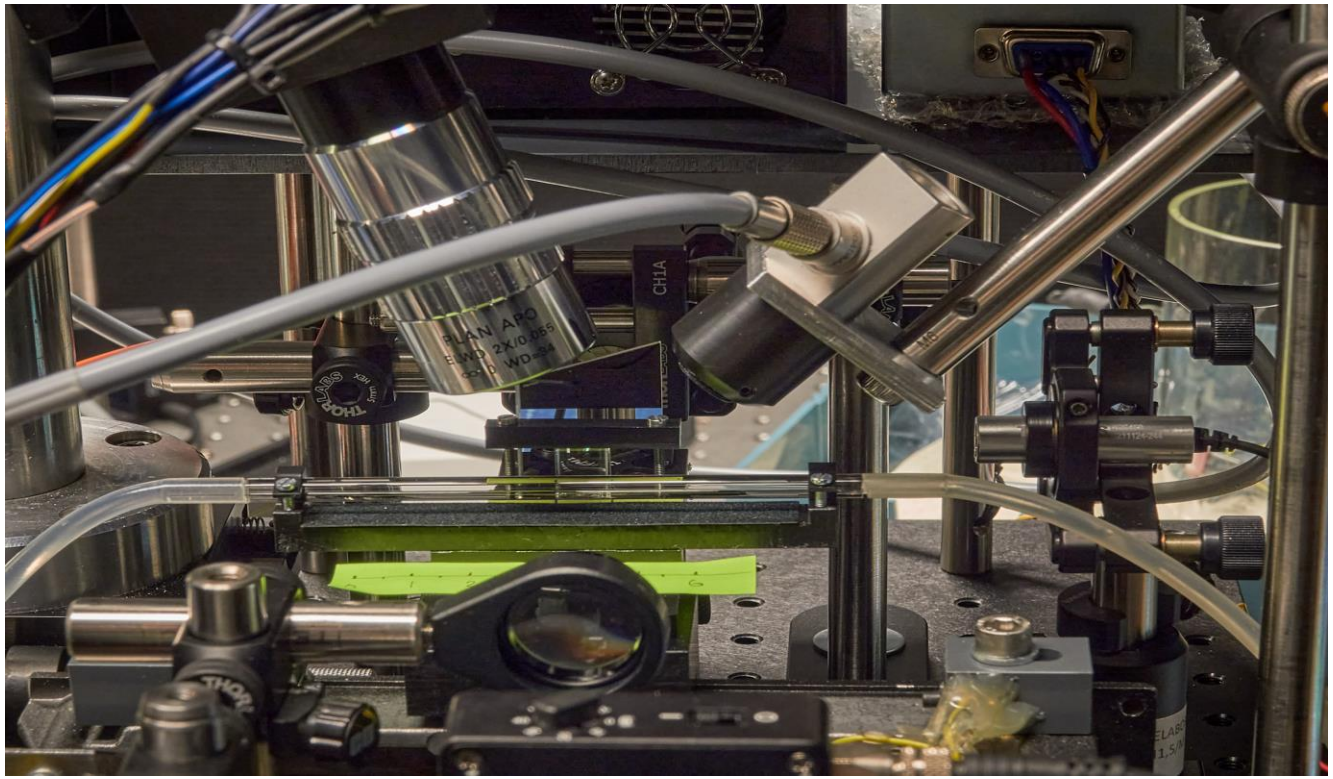
Agile project organization with strong link to industry

- Applied research unit; chemistry, physics, engineering, biology, biochemistry, technology development, piloting

- Applications:
  - **Cleantech** (Mining, Industry, Water)
  - **Bioeconomy, Forest and wood industry, side-streams**

  - Health and wellbeing, nutrition
  - Medical technology

- Green transition
- Energy efficiency
- Circular economy
- Business orientation
- Measurement techn.
- Digitalization & IoT



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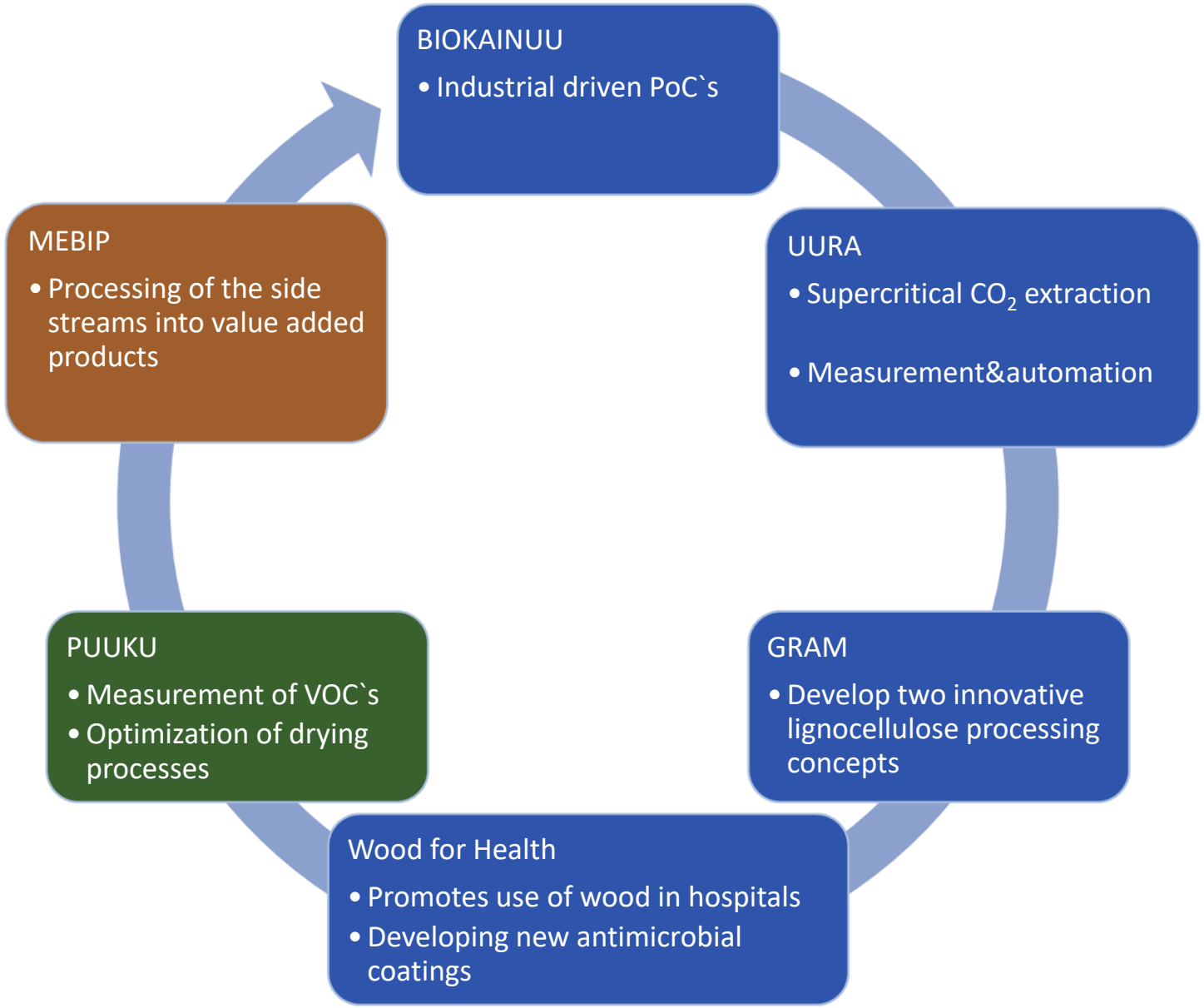
Forest bioeconomy



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Green adaptable method for refining lignocellulosic materials to high-value components GRAM

EXPANDFIBRE

Project aims to further develop two innovative lignocellulose processing concepts

- **White lignin and white cellulose fractions** can be separated from any lignocellulose raw materials with non-toxic, inexpensive chemicals at low temperatures and short reaction times
- **The modification of technical lignin grades** in terms of solubility, purity, reactivity, and color will increase valorisation opportunities of them.

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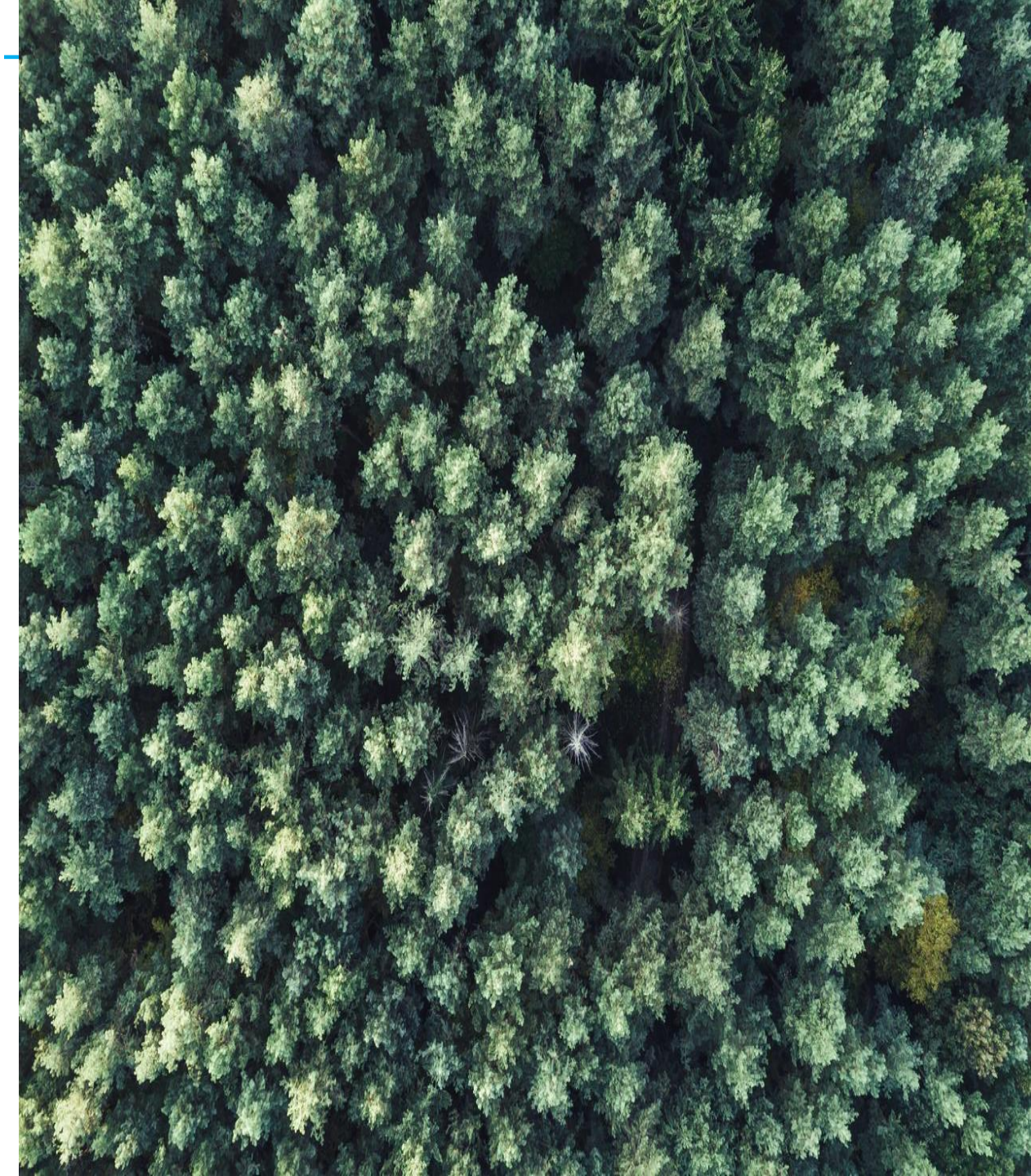
Åbo Akademi University

BUSINESS FINLAND



Co-funded by the European Union

AWE- Arctic Water Excellence

Industrial water processing & measurements

Arctic Water Excellence

SAVONIA AMMATTIKORKEAKOULU

KAMK • University of Applied Sciences

LUT University

XAMK

OULUN YLIOPISTO

VTT

GTK

THL TERVEYDEN JA HYVINVOINNIN LAITOS

MIKSEI MIKKELI

Cluster Management Excellence BRONZE

EUROPEAN CLUSTER COLLABORATION PLATFORM

Etelä-Savon maakuntaliitto

KAINUUN LIITTO

Vipuvoimaa EU:lta 2014–2020

Euroopan unioni

Pohjois-Savon liitto tukee maakunnan menestystä

POHJOIS-POHJANMAA COUNCIL OF OULU REGION

CEMIS Centre for Measurement and Information Systems

KUOPIO WATER CLUSTER

New and digital solutions for solving the challenges of Kainuu region bioeconomy, circular economy and measurement technology - UURA

- The UURA project is part of the CEMIS development program 2022–2024. It focuses on solving the challenges identified in the regional business life.
- The one goal of the project is to improve the operating conditions of the bio-economy sector in Kainuu and enable new investments. For the needs of the bioeconomy, the project develops a high-quality supercritical extraction service with the help of reliable chemical analyses, and further develops an industrially scalable extraction process.
- Project also develops new measurements towards pulp and paper industry needs and thus collaborating with local companies

Co-funded by the European Union

OULUN YLIOPISTO

KAMK - University of Applied Sciences

VTT

KAINUUN LIITTO

Research for collecting setup development and utilization potential of VOCs during the drying of wood material – PUUKU

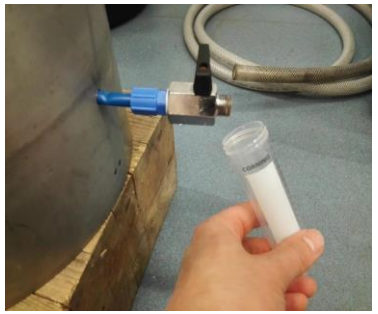
- Project duration 1.1.2024 – 31.12.2025
- Project budget: 398 000 eur for University of Oulu
- Funding: ERDF 80%, University of Oulu 12,5%, three saw mills 7,5%

- **Goals:**
- To study removing and collecting of VOCs during kiln drying of wood material
- Three key themes of study:
  - reduction of air emissions
  - potential of commercial utilization of VOCs
  - Modelling and optimization of kiln drying process, in particular for energy consumption
- To study valuable wood based VOCs and separating methods for them
- To study potential value chain for valuable wood based VOCs
- The first research year will be spent in laboratory, the second one in saw mill environment

OULUN YLIOPISTO

Elinkeino-, liikenne- ja ympäristökeskus

Co-funded by the European Union



More information: petri.osterberg@oulu.fi

Some other research projects

Co-funded by the European Union

- **ITÄPUU** - Eastern Finland wood product cluster, In the project, the cooperation and networking of wood industry operators is strengthened to promote industrial wood construction in Eastern Finland.
- **BIOKAINUU** - marketing of the continuous learning modules for local citizens and 5 industrial driven PoC`s related to forest bioeconomy sector
- **MEBIP** - Processing of the side streams of forest bioeconomy into value added products 2024-2025, Innovative New Processes For The Separation Of Valuable Compounds From Industrial Side Streams
- **ATP** - Continuous ATP-based microbial level determination for the process industry, The focus of the project is to develop a scalable, continuous measurement concept for process microbial levels for industry
- **ERA-NET Cofund Action - ForestValue** – Innovating forest-based bioeconomy, promotes increased innovation and competitiveness of the forest-based sector in Europe and support its transformation from a resource-intensive to a knowledge-intensive, productive, resource-efficient and resilient sector
- **Ecosystem of Natural Product Field for Eastern Finland** - A multiregional ERDF project, MITY is the Lead Partner, bringing together all RDI-players in the Eastern Finland and responds also to urgent research needs of the companies
- **SustainIT** - Releasing the potential of ICT for sustainable milk and beef cattle value chains,
- **An ERA-Net ICT Agrifood program**, mapping of available animal health data in 4 European countries and research how to use the data to benefit sustainable agrifood value chains

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KAMK RDI thematics related to circular economies and waste management

- **KAMK has a strong role in practical RDI and real life piloting**

→ We want to make a concrete change from lab work into field piloting and actual investments

- **Water and waste water**
  - Sewage sludge management (biogas): REMAC, Kaasua Kuhmoon, KAMBIO, Solutions4Farming
  - Runoff water management, waterbody management : PeatStop, REMMI, KIRKU, HUDA, URBREATH
- **Industrial side stream valorisation (adsorbents), Industrial water management**
  - Puhdas AU, WaterPro, AWE, Sustainable Nutrients
- **Sustainable waste management:**
  - Collection, recycling: SUSWAM, NOWA, THREADS
  - Demolition material management: PUMA
  - Waste logistics management: HUDA
- **Sustainable city infra**
  - RAVE, low-carbon district heat production, positive climate activities at tech sector,

Co-funded by the European Union

Local energy concepts + waste management

- **Local biogas production concepts**
  - Biogas plant for waste water sludges at Puolanka
  - New tech demonstrations
    - Reference projects: REMAC (Karelia CBC), Kaasua Kuhmoon (Maaseuturahasto), KAMKBIO (AKKE)
- **Energy efficiency & cutting CO2 footprint**
  - Low-carbon district heating (EAKR), energy-effiency for buildings RAVE (EAKR), CO2 footprint minimization Pihi (EAKR), data center waste heat HUKKIS (EAKR)
- **Waste management & new tech solutions**
  - SUSWAM (KareliaCBC), HUDA (EAKR), PUMA (EAKR,), NOWA
  - Regional use cases for waste valorisation, Nordic country collaboration for waste management issues