



Welcome to North Karelia and City of Joensuu

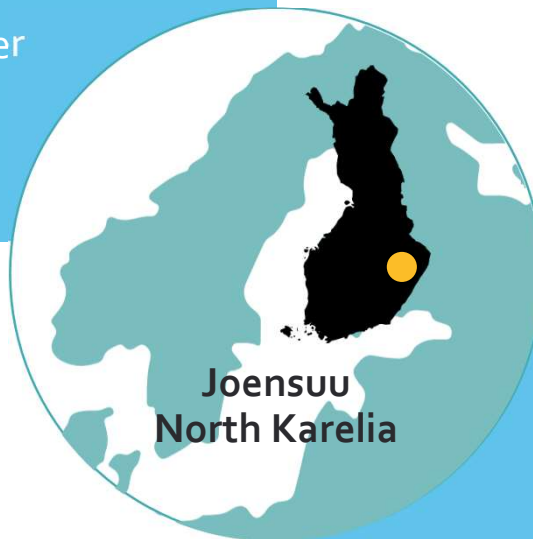
Joensuu 27.6.2023

Timo Tahvanainen Regional Council of North Karelia



World-leading Forest Innovation Ecosystem

- 600 experts
- 500 companies
- 6 000 jobs
- > 2 B euros cluster turnover
- UNITE Flagship (Academy of Finland)



Joensuu
North Karelia

One of Europe's Leading Micro and Nano Photonics Ecosystems

- 300 experts
- 50 years of university research
- **Photonics Center** infrastructure with equipment, professionals, and facilities
- PREIN Flagship (Academy of Finland)

Advanced Metal and Plastics Manufacturing Ecosystem in Finland

- 250 companies
- 6 000 jobs
- **Over 1,2 B euros** export-driven turnover



ICT Hub

- 100 companies
- > 1 000 jobs
- Strong educational environment
- Unique ICT study path



Sustainably managed forest resources



- 89% / 1,6 Mill ha forestry land
- Annual growth 9,3 Mm³, harvesting 5,3 Mm³
- High degree of processing
- Partners, experts, networks and workforce

World-class concentration of forest research and education



World-leading digital forestry business



Forest knowledge

- 600 experts
- 500 companies
- 6 000 jobs
- 2 B euros cluster turnover





Regional Council of
NORTH KARELIA

Regional Council of North Karelia

Who are we?

- > The Regional Council of North Karelia is regional, politically guided, municipal coalition for the development and interest supervision in the region
- > We are responsible for regional planning and general coordination of regional development programs related to national and EU structural funds.
- > In charge of international activities of the region in its fields of activities.

Our objectives in EXPRESS project

- > The project aims to increase energy self-sufficiency and the share of renewable energy in energy production in the North Karelia region.
- > The project supports the goals of the North Karelia Climate and Energy Program 2030 to achieve 80% energy self-sufficiency and renewable energy use by 2030.
- > In North Karelia, the knowledge gained in the project will be utilized in the preparation of the next regional strategic program for 2026-2029.

Overseeing the interests of

PEOPLE
162 540 inhabitants
8,64 / km²



MUNICIPALITIES
made up of 13 municipalities
22,903 km² (of which 82% land)

ORGANIZATIONS



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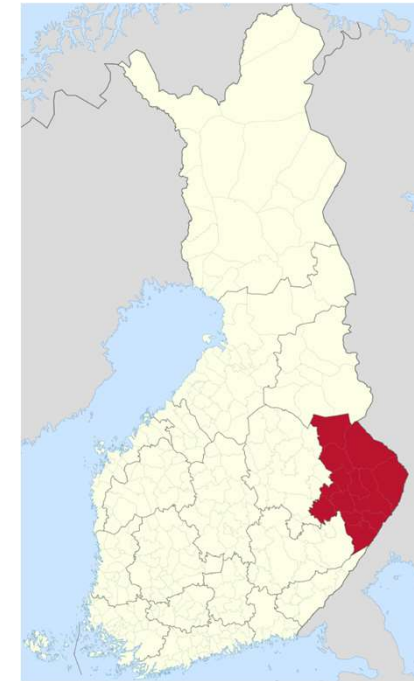
EXPRESS 2023-2027

European regions promoting renewable energy self-sufficiency

Timo Tahvanainen

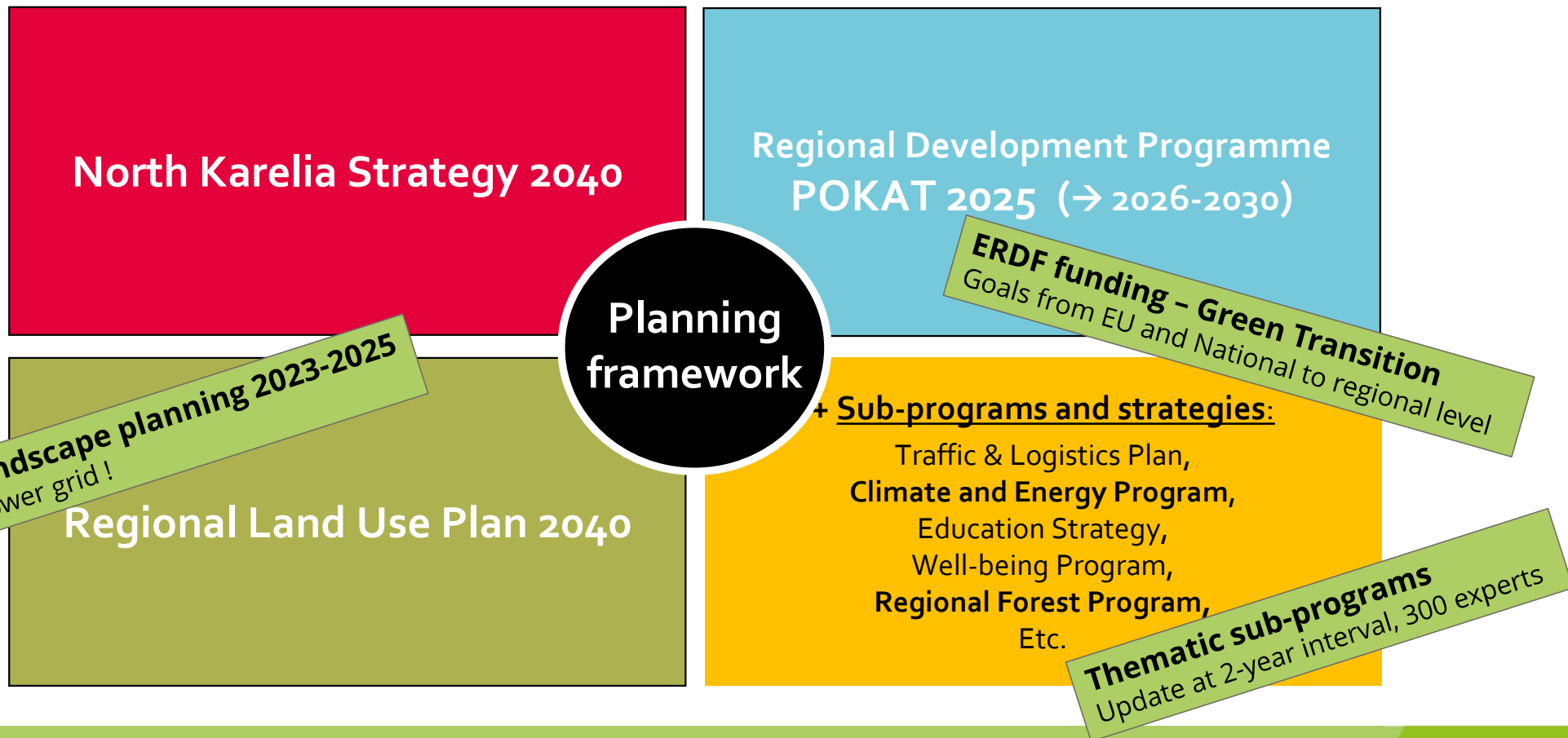
Regional Council of North Karelia

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27.06.2023 | EXPRESS Thematic Workshop / Joensuu

EXPRESS – linkage to regional development system



Pohjois-Karjala

- POKAT 2026-2030 Program preparation

Bioenergy – electricity, heat & traffic

Bioenergy 2.0

- Side product of biorefining (eg. biocoal production)
- Increasingly efficient use and processing of biomasses (eg. fresh chip concept and new biomass sources)
- Hybrid systems and administrative innovations (incl. energy communities, heat entrepreneurship and industrial symbiosis)
- Bio-based traffic fuels and e-fuels

→ From bioenergy towards hydrogen economy?

- Wind and solar power
- Heat as a side product, heat pumps and energy efficiency – cascading use of biomasses for materials etc. value-add products
- Bio-based CO₂ → raw material for green hydro-carbons

Energy self-sufficiency and share of renewable energy in 2030

80%



Main challenges?

Fuel availability challenge in district heating

- Simultaneous substitution of energy peat and stopping the import of Russian wood chips and electricity
- Competing new uses for low-quality timber and wood residuals (positive and negative impacts)

Utilization of hydrogen economy investment boom, strongly linked to wind power investments

- Radar problem (inter-regional)
- Grid problem (inter-regional)
- Gaining investments on hydrogen production and further processing to basic chemicals
- Timeline for real investments?

Green fuels for traffic and moving machines

- Dependent on National decisions and guidelines
- Agriculture as a sectoral challenge

Balancing power demand and supply



Power grid - capacity & landscape effects?



Traffic fuels - role of biogas?



Current energy balance - forecasted trends

Primary energy consumption - North-Karelia (GWh)

Source	2008	2010	2012	2014	2016	2018	2020	%
Wood	4 915	5 948	5 780	6 140	5 723	5 955	5 722	51,7 %
Heat pumps	80	127	190	211	232	260	351	3,2 %
Other renewables	60	132	18	13	19	21	33	0,3 %
Renewable electricity ¹	1 210	1 211	1 533	1 352	1 471	1 471	1 457	13,2 %
Non-renewable electricity ²	645	1 422	1 134	1 536	1 512	1 345	992	9,0 %
Traffic fuels ³	1 366	1 336	1 328	1 281	1 328	1 353	1 329	12,0 %
Energy peat	691	558	479	509	612	515	344	3,1 %
Heating oil	682	738	587	566	505	428	449	4,1 %
Oil, machinery	397	365	338	407	418	441	396	3,6 %
Other non-renewables	0	6	2	0	0	0	0	0,0 %
TOTAL	10 046	11 843	11 389	12 015	11 820	11 789	11 073	100,0 %
Share of renewables	62,6 %	63,3 %	67,0 %	65,8 %	63,9 %	67,0 %	71,0 %	

Energy self-sufficiency:

66,0 %

- 1) Includes regional hydro and imported renewable electricity
- 2) Includes imported non-renewable electricity
- 3) Includes also blended bio component

NOTE:

Update of the regional energy balance using 2022 statistics was ordered together with neighboring Eastern Finland regions.

- Available during 2nd semester
- Basis for new energy goals and actions

CO₂ emission development 2007-2021

(affected by corona recession)

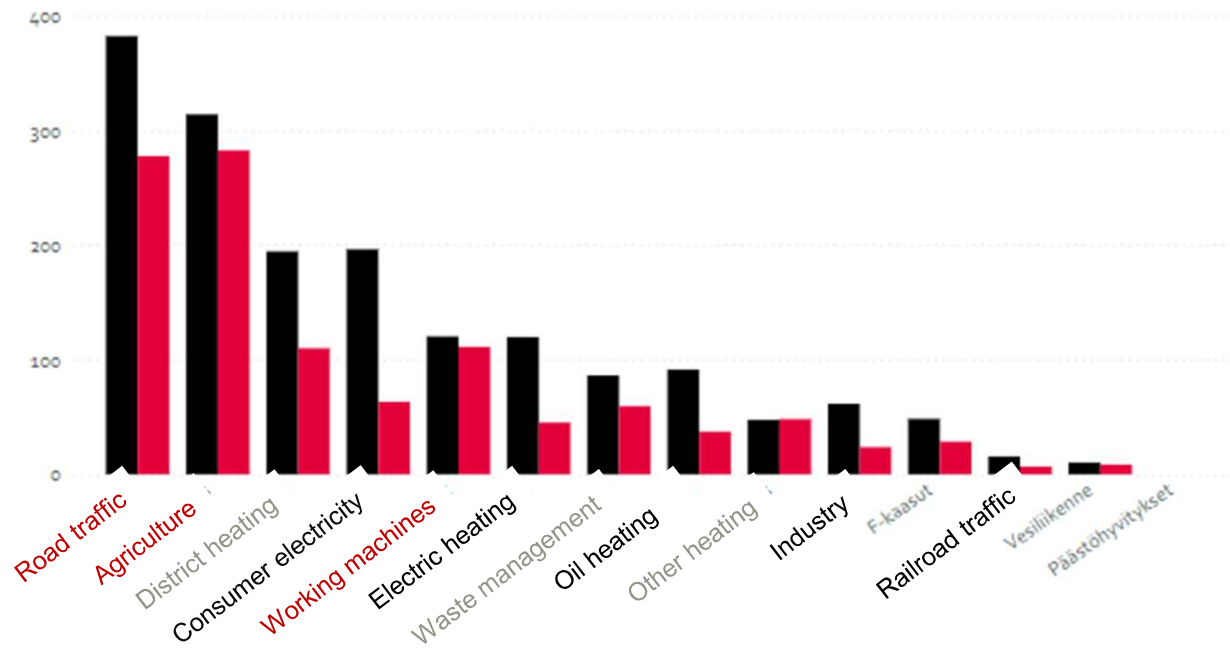


Päästöjen määrä Pohjois-Karjalassa 2021

Kehitys päästölähteittäin

Päästöt ktCO₂e vuosina 2007 ja 2021

Vuosi ● 2007 ● 2021



Top 5 reducers

CO2 source	Change 2007-2021 %
Consumer electricity	67,8 %
Electric heating	-62,3 %
Industry	-61,6 %
Oil heating	-59,3 %
Railroad traffic	-57,1 %

Good practices / North Karelia (draft list)

Industrial symbiosis for circular economy – CASE Biotie

- CHP plant and district heat network as a platform for new hydrogen economy investments
- On-going process – major development factor in North Karelia Green Transition
- Industrial wind and solar power, grid demand, military radar challenge, investments in hydrogen + value-add chemical industry production

Heat entrepreneurship

- Finnish success story, CASE Eno Energy Cooperative – new trends in business like solar hybrids

Clean and energy-efficient use of wood in domestic heating

- Important time demand response factor balancing peak electricity demand in cold winters periods
- Remarkable energy self-sufficiency option and tool against energy poverty especially in rural areas
- Good quality (dry) fuel as a key: development of chopped fire wood markets and jobs in professional fuel wood suppliers
- Technology / standards: Industrial heating stoves for high-efficiency, clean combustion - new catalysator technologies for dense population areas

Energy Communities

- New concept based on new EU legislation: something we want to test, develop and learn during the project

Joint piloting?

Biochar production – value-add products based on wood residues and low-quality timber

- Wide scale of end-products offering environmental benefits and option for carbon storing

Fresh wood chip concept for bioenergy

- New concept using energy wood without typical one year storing and drying process
- In combination with new heat recovery technology and fluegas cleaning + new boiler designs, boosted by the EU Medium Combustion Plant Directive
- Pros and cons will be studied in starting LUKE research project

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EXPRESS

Thank You!

The project EXPRESS is implemented in the framework of the Interreg Europe programme and co-financed by the European Union.

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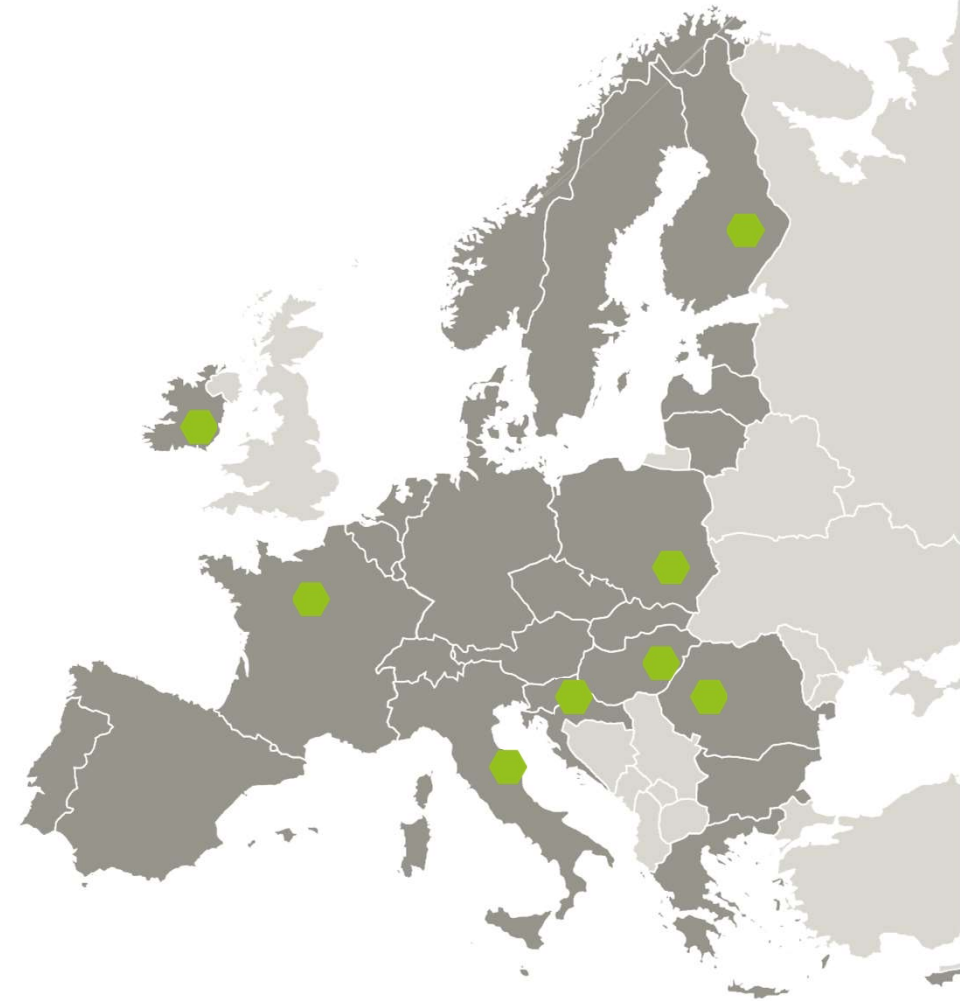
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Appendix

*Details on Regional
Development System and
Goals and
Core Competences in
North Karelia*

Regional Strategic Programme POKAT 2025

- POKAT 2025 sets out the region's common view on what is important and worth developing in North Karelia. It has been drawn up together with regional stakeholders and approved by the Assembly of the Regional Council of North Karelia.
- It aims to promote the wellbeing of residents and the competitiveness of businesses in North Karelia.
- It reacts to the changing operational environment.
- A well-functioning economic life, growth of businesses and internationalisation are at the centre of development.



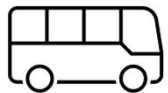
POKAT 2025 focus areas 1/2

Growing competitiveness and strengths of the region

- *Forest bioeconomy*
- *Stone processing and mining*
- *Technology industry*
- *Agriculture and food production*
- *Tourism*
- *Creative fields*

POKAT 2025 focus areas 2/2

***Accessibility –
a functioning
transport
system***



Accessibility

***Skilled life –
education and
competence***

- *Education*
- *Culture*



Skilled life

***Climate
resilience and
biodiversity***



**Climate and
nature**

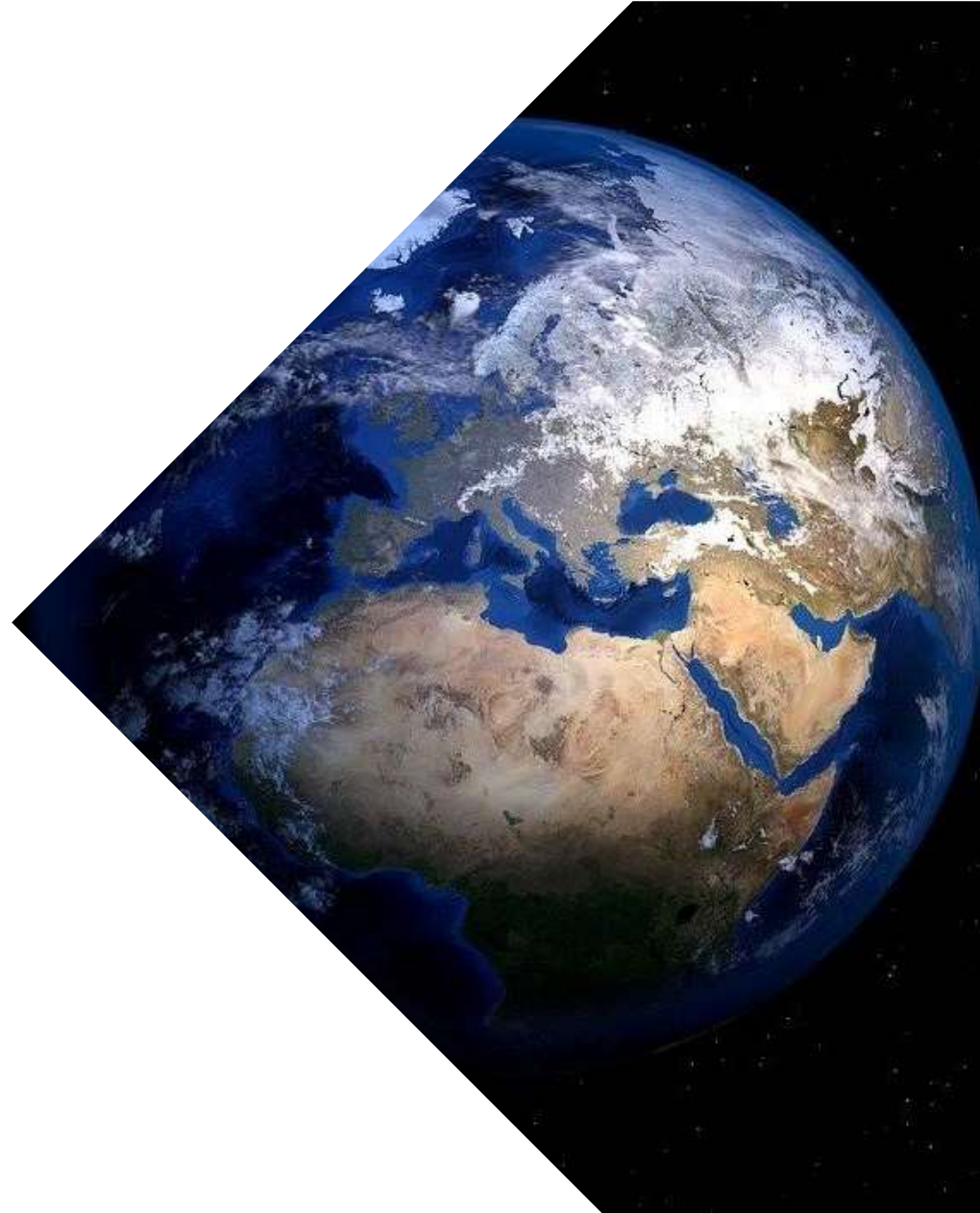
***Wellbeing –
healthy,
thriving and
inclusive
residents***



Wellbeing

Overarching themes

- *Digitalisation*
- *Sustainability*
- *Internationality*



Three Pillars of Smart Specialisation

- Clean Solutions and Green Transition
- Renewing Industry and Emerging Technologies
- Innovative and Sustainable Services



Priority areas of the Clean Solutions and Green Transition Pillar



New bio-based high added value products

- New uses and end products of wood raw material and other renewable raw materials and their side streams
- Further processing of biomass

Sustainable low-carbon housing solutions

- Wood construction and the utilisation of renewable materials
- Sustainable urban development
- Life cycle solutions in housing

Natural resources and related value creation

- Natural products, clean raw materials and their further processing
- Digital forest services

Multidisciplinary solutions for green energy

- New energy production solutions
- Emission management
- Carbon capture and further use

POKAT 2025 targets 1/2



We aim to improve employment by enhancing job creation.



We promote the lifelong inclusion of all residents and prevent marginalisation of any groups of people.



We support the region's diversified industrial structure and make full use of the potential and strengths of different parts of the region.



We aim at climate resilience, act resource-wisely and support the green transition.



We support the restructuring process of health and social services to ensure the wellbeing of people in North Karelia.



We promote biodiversity and work actively to stop nature's decline. We take principles of sustainability into account in all our development activities.

POKAT 2025 targets 2/2



We enhance continuous learning to ensure availability of skilled labour.



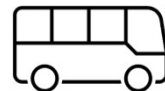
We support the transformation of service structures to meet the demand and we improve the accessibility of services by using digital technologies.



We enable multi-local living by improving telecommunication connections and digital services.



We ensure a good accessibility of North Karelia by strengthening several modes of transport.



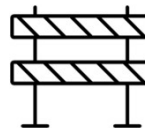
We develop a well-functioning transport system that supports the regional economic life and meets the transport needs of all people in a sustainable manner, regardless of their residency.



We strengthen the regional culture as part of the region's ability to attract and retain talent.



We support modern networking and international connections and adopt an open and co-operative way of working.



We pay attention to the special features associated to our geographic location, for example our proximity to Russia.