

Smart specialisation drives innovation and know-how



Foreword

The strategy for smart specialisation in North Karelia is part of the Regional Strategic programme. The strategy sets a common goal the region's innovation-driven growth, skills and job creation. Technological change, sustainable clean solutions and innovative services have been identified as global drivers of change in which North Karelia already has international competitiveness. Further long term development within these themes will strengthen the region's chances of succeeding in the international operating environment.

The new programming period for EU's regional and structural policy emphasizes the importance of smart specialisation. Smart specialisation is a prerequisite for the use of funds and directs resources to selected themes. At the same time, the emphasis is put on the cooperation and various partnerships that we need to develop especially for international activities and to exploit direct EU funding.

The strategy for smart specialisation in North Karelia has been prepared in cooperation with key players in the region. The drafting process has involved e.g. educational and research organizations in the region, business development agencies, North Karelia Chamber of Commerce and the ELY Center. The interaction with all partners has been excellent which provides a good starting point for implementing the strategy.

Growing vitality and the region's strengths

Sustainable, smart and international North Karelia – North Karelia's Smart Specialisation Strategy

The definition of smart specialisation

Smart specialisation is a European innovation policy concept. It states that regions must identify their own areas of strength and competence and target future resources and investments in these areas. Smart Specialisation aims at improving the competitiveness of business life, utilising expertise and top research, and transferring it to new commercial products and services. The key aspects are internationality, partnerships and networks, and their transformation into growth, business and new jobs in the regional economy. The strategy seeks a vision for the future, but also concrete steps that can be taken to develop innovation activities in the region in the long term.

North Karelia is a strong multidisciplinary region of education that has international top research and recognised expertise in many fields. The industries in the region are diverse, and a few successful export companies have created significant clusters and value chains around them.

The majority of the companies are micro-enterprises which poses a challenge to growth and innovation-driven activities. Companies' RDI investments are relatively low in the national comparison. However, the support structures for business activities are strong throughout the region, and as the role of municipalities in industrial policy has become stronger, even more has been invested in these structures. Identifying the innovation needs of companies and solutions to them are one of the starting points for smart specialisation. Cooperation is based on the different parties' mutual trust and willingness to work together - both of which are at a good level in the region.

Starting points and objectives for smart specialisation

North Karelia's Smart Specialisation Strategy is based on the national RDI roadmap, according to which Finland should seize the opportunities brought about by global challenges such as climate change and sustainable development and offer solutions to them. New ideas, knowledge and technologies are

the most important sources of growth and productivity. The roadmap identifies three interconnected strategic development targets: competence, a new partnership model, and an innovative public sector. Achieving these goals is only possible through a shared vision and missions, more ambitious RDI activities, and investments in both the public and private sectors.

In North Karelia, smart specialisation aims at solutions and investments that support business growth and innovation activities in key business sectors and related value networks. The region strives towards carbon neutrality; it aims to become a pioneer in the green transition from the perspective of RDI activities and business growth. Innovation activities respond to the challenges posed by climate change but at the same time, they aim to create products that meet market demand. This requires long-term cooperation between the private sector and public actors as well as the strong promotion of entrepreneurship in the higher education sector and elsewhere.

The objective is to integrate the RDI activities of higher education institutions and research institutes more efficiently into the growth and development of top fields and related networks. It should also be ensured that expertise is competitive and that top experts can be employed in companies in the region. The objective is to give space to RDI activities that are a part of national and international networks, cross sector boundaries, and carry out new experiments. The focus is on creating an open atmosphere that enables reforms and innovations. RDI competence is made visible and communicated effectively to different stakeholders.

Smart Specialisation Objectives in North Karelia

Business growth in top fields and related value networks, as well as solutions and investments supporting innovation activities

Carbon neutrality and the pioneering nature of the green transition from the perspective of RDI and business growth

Competence development and promotion of entrepreneurship based on new innovations

Networking research and business nationally and internationally

Integrating the RDI activities of higher education institutions and research institutes more efficiently into the growth and development of top fields and related networks

Accelerating RDI activities and new experiments across industry boundaries

Creating a positive atmosphere open to reforms and innovation

Making RDI competence visible and making communication more efficient for different stakeholders



Vision for smart specialisation by 2025

North Karelia's vision of smart specialisation is *"reforming, sustainable, international North Karelia"*.

We see and boldly seize the opportunities offered by societal phenomena and global changes. We are openly seeking growth, partners and opportunities for new business. We operate in international networks and we are proud advocates of our experts. We believe that knowledge, innovation and entrepreneurship will continue to work. We are moving towards our objectives together through good co-operation.



Descriptions of the key areas of smart specialisation

Renewing Industry and Emerging Technologies

European industrial production is undergoing a major transformation. The need to reform and maintain competitiveness as well as to respond to low-carbon goals has brought industry to face major changes. Operators need to have the ability to apply innovations, adopt digital solutions and business models as well as respond to rapidly changing market needs. Developing, introducing and exporting sustainable solutions will increase self-sufficiency and create new jobs.

The reform of industry plays a key role in supporting industries towards climate sustainability. The European industrial strategy explicitly emphasises the role of SMEs in the innovation networks of industry's digital green transition and the better use of the capacity of SMEs. The transition requires both investments and funding. The region's objective must be to achieve a competitive advantage and to safeguard the operating conditions.

The Renewing Industry and Emerging Technologies pillar supports the industry's transition into low-carbon production through digitalisation, circular economy, and new solutions and technologies. North Karelia, naturally, has a lot of export-driven business and evidence of international capabilities, but also new development potential that supports innovation-driven renewal. The Renewing Industry and Emerging Technologies pillar consists of the region's strong industrial expertise at company level, top expertise in research and education organisations, and co-operation between them. The region has several international companies whose products have a global market and strong growth expectations. Digital solutions and smart manufacturing support the transition towards stronger competitiveness and energy and material efficiency in the economic sector. Key companies have the ability to act as drivers of value networks and create scalable solutions for e.g. machine and equipment manufacturing and component production. The region's strong ICT competence supports the change and offers innovative solutions and tools for developing service business.

It is possible for the region to develop in business related to low-emission production and material-efficient processes. They utilise circular economy solutions and industrial symbioses, among other things.

With regard to circular economy, even on an international scale North Karelia has particularly strong expertise in mineral processing related to the transformation of the mining industry towards the utilisation of secondary raw materials and resource efficiency. The expertise of the GTK Outokumpu unit is reflected not only in companies in the sector but also in many different value chains in industry, which are focused on creating new types of sustainable business. Promoting these requires network-like models of cooperation that challenge traditional operating methods. A good example is battery value chains in which battery minerals are refined from raw materials into chemicals, materials and modules for batteries which can be recycled and partially reprocessed into production in addition to primary materials.

The photonics ecosystem and competence in the region is internationally unique. Photonics applications and components manufactured in the region can be utilised directly in industry and in consumer-level electronic products. As enabling technologies, AR/VR and 3D printing intersect in many sectors and offer countless application opportunities. The Photonics Institute, University of Eastern Finland, Karelia University of Applied Sciences and the new Photonics Center create a framework for the education of experts in the field, start up entrepreneurship and the production of service packages. They have world-class equipment and research infrastructure, which companies as well as researchers can utilise in pilot and trial phases. The University of Eastern Finland coordinates the Academy of Finland's photonics flagship project. All these factors increase the region's appeal for companies in the sector and increase the opportunities to operate in international innovation networks.

Priority areas of the Renewing Industry and Emerging Technologies Pillar

Scalable industrial solutions for global markets	Intelligent manufacturing and ICT solutions	Low-emission production and material-efficient processes	Top technologies and photonics applications
Manufacture of machinery, equipment and components for international markets, scalable products and service packages	Intelligent manufacturing expertise and production technology in industry, automation and digital solutions, ICT competence	Circular economy solutions and industrial symbioses, mineral processing and utilisation of secondary raw materials, materials analytics	Optics applications and components for consumer electronics and industry, precision technology, AR/VR technologies, 3D printing

Clean Solutions and Green Transition

The green transition supports the structural economic change and a carbon-neutral welfare society. The effective implementation of the green transition requires that innovation policy measures are directed towards developing and producing technical solutions that mitigate climate change and increase resource efficiency. The aim is to accelerate solutions that significantly reduce emissions. The national objective is to make Finland the world's leading country in the hydrogen and circular economy, high added value bio-products and emission-free energy systems and other climate and environmental solutions. In addition, efforts are being made to improve energy efficiency and speed up the transition to fossil-free transport and heating.

Finland's goal is to be carbon neutral by 2035; North Karelia's ambitious goal is to be climate-sustainable in 2030. These objectives, combined with the implementation of the EU's Green Deal, guide the economic sector and companies towards low-carbon, clean solutions.

The Clean Solutions and Green Transition pillar consists of an extensive package related to the global social transformation that offers the region new business opportunities. The aim is to mobilise as many green transition investments as possible and create comprehensive market solutions in a demand-driven manner. Many solutions require multidisciplinary research

and expertise from educational and research institutions to support them. The ability to apply and transfer research data towards business goals and profitable business activities is crucial.

SMEs need support from an innovation ecosystem related to the green transition which consists of cooperation between the driver companies, research institutes, educational organisations and social, commercial and consumer organisations. An example of this type of activity is the regional network of experts in forest bioeconomy, in which researchers and companies operate in a close partnership to solve various development challenges.

In new bio-based products, the region utilises abundant and high-quality forest and wood resources in particular. In the further processing of biomass, the aim is to create high added value products in which the raw material becomes e.g. textile fibre or biocomposite. Based on the region's strong forest expertise and research data, RDI activities should be further accelerated, and the strong international networks in the sector should also be utilised. Sustainable utilisation of natural resources, for example in clean natural products and their further processing, has significant potential. Another good example is different digital services related to forests that collect, process and apply data related to forest resources in a new way. They have significant export potential as long as competence can be productised and refined into services.

The region has good resources to produce solutions and service packages related to sustainable living that take low-carbon aspects into account. The network of actors around the wood construction industry combines expertise at the company level as well as research infrastructures and testing environments of educational organisations. The region has significant reference sites for wood construction which serve as a showroom for the innovativeness of the sector. Sustainable, low-carbon housing combines sustainable urban development, public procurements and life cycle solutions in housing. In extensive changes, cooperation between the private and public sectors is important for the development of wood construction and for increasing business activity in the sector.

Climate change mitigation requires major changes in energy-intensive and emission-intensive industries and society by creating a present and future need to reform energy production to create less emissions and be more energy-efficient. The transformation of energy production and mobility requires multidisciplinary solutions for green energy. These solutions can be created through emission management and clean energy solutions, among others. The region has expertise in such areas as green chemistry and catalysts. Green chemistry aims to develop and make compounds as environmentally friendly and energy-efficient as possible, avoiding toxic and other harmful raw materials. This competence can be applied when developing, designing and manufacturing new, more efficient purification catalysts.

Priority areas of the Clean Solutions and Green Transition Pillar

New bio-based high added value products	Sustainable, low-carbon housing solutions	Natural resources and related value creation	Multidisciplinary solutions for green energy
New uses and end products of wood raw material and other renewable raw materials and their side streams, further processing of biomass	Wood construction and the utilisation of renewable materials, sustainable urban development, life cycle solutions in housing	Natural products, clean raw materials and their further processing, digital forest services	New energy production solutions, emission management, carbon capture and further use





Innovative and Sustainable Services

The economic structure is becoming more and more dominated by services. This is a development trend that progresses despite economic fluctuations. Over 60 per cent of the value added produced by the private sector comes from services. The increase in services in the economy will continue everywhere in the world. As a result of the market transformation, demand is increasing for high-quality, competitive and sustainably produced services. The importance of service export in the Finnish economy has grown steadily. In 2019, service export accounted for 32% of total export.

The change in private consumption behaviour is reflected in sustainable, responsibly produced services. The productisation of services and making purchasing them easy, especially through digital channels, is a prerequisite for the growth of service business.

In services targeted at private consumers, the strengths of the region lie in tourism, events and experiences produced through creative sectors, culture or sports and service packages placed on the market. Many different events are organised in North Karelia, the most well-known of them being sports and music competitions and festivals. Creative industries, culture and events have a significant impact on increased supply and demand in tourism. By improving productisation and marketing, it would be possible to create experiences and tourism products that are even more appealing.

In tourism services, the boundaries of the regions do not matter: customers search for and combine interesting destinations and services. In order to develop, the tourism sector needs investments and related service innovations. The trend

in tourism is all about increasingly high-quality experiences which are also produced sustainably. The region's strengths include tourism products based on clean nature, and developing responsible tourism can naturally be combined with existing strengths. International growth in the sector requires investments in communications, marketing and sales. Digital platforms and visibility in the right channels are prerequisites for successful sales. International networks and cooperation, for example in the Lakeland area and with Russian Karelia, are important development channels.

The region has good opportunities to provide multidisciplinary welfare services related to health and well-being. The expertise and technological innovations from different fields are widely utilised in these services. The public sector must anticipate growth opportunities and provide a good operating environment for various trials and the development of services.

The transformation of work is a global trend which refers to a change in education, brought about by rapid technological change and the idea of continuous learning. North Karelia is a strong region of education that provides degree programmes at all levels. The proportion of students in the population is one of the highest in comparison between regions. The competence of educational organisations and Finland's international reputation as a model country for high-quality education should be fully utilised. In the future, education and learning services will be offered increasingly through digital platforms in a way that does not rely on a specific time or place. Teaching technology applications and related services create new business opportunities that are based on combining pedagogical and technological competence. The initiatives in international education exports must be further developed.

Priority areas of the Innovative and Sustainable Services Pillar

Responsible tourist destinations and services

Products based on creative industries, culture and physical activity

Multidisciplinary welfare services

Learning and education services

Attractive tourist destinations and high-quality service packages, productisation and digital technology

Event and experience production, new business models and service design

Co-operation between the public sector and private sector, utilisation of different sectors in welfare services

Competence packaging and digital solutions, education export, advanced teaching technologies

Implementation of and monitoring of smart specialisation

In the implementation of the strategy, cooperation between different actors and the added value gained through it for the region play a key role. Strong international networks and partnerships are needed, as well as activities at a national level. North Karelia participates in the European Commission's Smart Specialisation Partnership Platforms (s3) which create networks around a specific theme, such as the mining industry or photonics. In Finland, the regions of Eastern and Northern Finland cooperate in the so-called Industrial Transition (ELMO) and develop joint models and knowledge transfer for innovation work in all regions.

The direct RDI investments and development measures of companies will be allocated public resources from the Innovation and Skills in Finland 2021–2027 regional and structural policy programme. The precondition for using the funds is that business funding supports the implementation of smart specialisation. The funding is guided by the company funding strategy for Eastern Finland, the implementation of which is the responsibility of the Centre for Economic Development, Transport and the Environment in Southern Savo. Monitoring

and impact assessment of the use of business funding and regional development aid are done by the regional Maakunnan yhteistyöryhmä (MYR) co-operation group, among other actors. Monitoring is carried out in themes in accordance with the three pillars of smart specialisation. The implementation of the strategy will be supported more by synergic funding, which will produce impacts more efficiently and quickly.

The implementation of the strategy requires competitiveness of the innovation environments and RDI infrastructure of higher education institutions and research institutes, as well as the possibility of supporting development work with companies. At the same time, the transfer of the latest knowledge and competence from educational institutions to companies and vice versa must be strengthened. Networking is supported by ecosystem agreements concluded by the state and university cities, in which Joensuu is involved. Sustainable urban development resources are allocated to the implementation of ecosystem agreements from the structural programme.

The Regional Council is responsible for monitoring and coordinating the strategy for smart specialisation. A POKAT group (North Karelia group) will be formed to support the implemen-

tation. Its tasks will include monitoring changes in the innovation field nationally and internationally, identifying functional innovation work models and communicating information to stakeholders. A situational overview analysis of innovation activities will be carried out periodically to support the steering of strategy work, based on information collected from companies and development organisations. Every year, a regional forum for smart growth will be organised, which will bring together a wide range of actors involved in the activities. At the national level, the Regional Councils will form a joint network of colleagues, in which the Ministry of Economic Affairs and Employment is also involved.

Easily available indicators and information will be used as strategy monitoring indicators.

- development of company turnover
- number of growth companies
- R&D investments in companies and the public sector
- patent applications and number of patents granted
- change in value added
- amount of RDI funding available for the region through Horizon Europe

More information

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