

Västernorrland's Regional Innovation Strategy for Smart Specialisation



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SUMMARY

Västernorrland's Regional Innovation Strategy for Smart Specialisation (RIS3) is a growth strategy that complements and clarifies Västernorrland's regional development strategy in the field of innovation.

Smart specialisation is to be seen as a tool and a process and to support the implementation of the 2021-2027 structural fund period, as required by the EU. The strategy provides us in Västernorrland with a basis for how we can jointly take on challenges to meet the future in a knowledge-driven manner. The strategy identifies the region's different areas of strength and development, which increases the opportunities for collaboration with actors in neighbouring regions, nationally and internationally, who have similar and/or complementary areas of strength.

Regional innovation for sustainable development and growth is a process of continuous capacity building in terms of structures, competences and skills in priority areas.

The Regional Innovation Strategy is therefore based on continuous updating and monitoring through the EU's conditional six-step process for smart specialisation. For Västernorrland, smart specialisation as a concept also means the start of a new joint process-based approach and learning.

The strategy is a tool in the toolbox to stimulate diversification and increased sectoral breadth of the region's existing areas of strength. This is to identify and support the development of existing and new sustainable and knowledge-driven areas of strength. The aim is that these areas of strength, through cross-fertilisation, can be used as levers to boost innovation. This will enable us to find more applications, areas of use and markets to meet challenges, broaden the labour market and strengthen competitiveness.

Västernorrland's innovation strategy for smart specialisation will contribute to meeting challenges, taking advantage of opportunities and driving development based on the 2030 Agenda and for the transition to sustainable development.

Västernorrland's identified areas of strength and development are:

Areas of strength:

- Forest-based bioeconomy
- Advanced manufacturing, in metal, machinery and vehicle
- GovTech
- Renewable energy - power generation, solar, wind, hydro and bio energy
- Development and control of complex production and operational systems

Areas of development:

- Autonomous mobility
- FoodTech
- Crisis and rescue
- Smart caring - crisis care, safety and security

Follow the work on Region Västernorrland's website: www.rvn.se/smartspecialisering

INTRODUCTION

Research and innovation are crucial for regional innovation efforts and for achieving sustainable regional growth and development in Västernorrland. Competitive innovation efforts and the pursuit of knowledge-driven growth create synergies that also strengthen general economic development. Västernorrland's regional innovation strategy for smart specialisation is linked to and based on the regional development strategy, which sets out the long-term priorities for how we create sustainable growth and development in Västernorrland.

Västernorrland share different societal and industrial challenges, with Europe and the rest of the world. These range from managing transition in a competitive way to create a more sustainable, secure, and resource-efficient society and industry by addressing various social and demographic challenges. We can meet this challenge by being proactive in promoting sustainable regional development in all sectors. This includes digital transformation, business development and service innovation, as well as efforts to increase the circular economy.

The European Commission's conditions¹ on smart specialisation are that regions need to focus on areas of strength

where they are most competitive and have the potential to become leaders in their field. Smart specialisation underpins the EU's common innovation and research policy and parts of the European cohesion policy.

The Smart Specialisation Strategy does not aim to pursue greater specialisation of the regional economy, but to keep it in mind when formulating development policy. The aim is that these areas of strength, through cross-fertilisation, can be used as levers to boost innovation. Through this cross-fertilisation, find more applications, areas of use and markets which can develop new knowledge-driven areas of strength to meet challenges, broaden the labour market and strengthen competitiveness.



The work of the Västernorrland Regional Innovation Strategy (RIS3) for Smart Specialisation is to set the long-term priorities for sustainable growth and development. Growth is sustainable when we can meet our current needs - economically, environmentally and socially - while providing the conditions for future generations to meet their needs. Among other things, the national strategy Circular Economy - Strategy for the Transformation of Sweden is the guide and direction for what needs to be done to transition to circular production, consumption and business models, as well as non-toxic and circular material cycles. The vision is a society where resources are used efficiently in non-toxic circular flows and replace virgin materials.

¹ <https://eur-lex.europa.eu/legal-content/SV/TXT/PDF/?uri=CELEX:32013R1303&from=EN>

It is crucial in smaller and sparsely populated regions such as Västernorrland that the innovation and research stimulate diversification, a broadening of the business sector, based on the identified areas of strength. One part of this development work is to make better use of our sparsely populated area as appealing access to large areas of land, natural resources and the offer of a sustainable living environment. In Västernorrland, we need to broaden our industry structure, as we are specialised and profiled in technology and manufacturing which has also resulted in a gender-segregated labour market

and a difference in income levels. We also need to make better use of the opportunities offered by digitalisation.

The challenge in Västernorrland is to build on existing areas of strength and to use competence, know-how and skills to develop and transform more industries into new areas of strength for the future. Therefore, in Västernorrland's Regional Innovation Strategy for Smart Specialisation (RIS3), we also highlight strengths which not only create the conditions for today's areas of strength, but also enable for future ones.

Knowledge-driven growth, renewal and diversity

Västernorrland's Regional Innovation Strategy for Smart Specialisation (RIS3) is a tool to ensure continuous investment in knowledge-driven growth, renewal and diversity in Västernorrland. In addition to close collaboration between companies, universities and colleges, research environments, public administration and civil society, implementation also requires that we attract broader funding for the work than is currently the case. By that, Västernorrlands areas of strength can continue to contribute in order to national and international competitiveness. The strategy identifies today's areas of strength and gives us direction for how we in the Västernorrland can jointly take on challenges in research and innovation to meet the challenges of the future.

The strategy will support the coordination of research and regional development efforts in the upcoming structural funds' period. By identifying areas of strength and development, we can increase the opportunities for functional collaboration with neighbouring regions and regions with similar and/or

complementary strengths in order to jointly attract national and international development capital. This is particularly true for Jämtland Härjedalen, which is part of the same programme area (NUTS2 area) as Västernorrland.

Smart specialisation has been initiated by the EU as a systematic process to jointly identify and strategically focus on knowledge-driven and competitive areas of strength. The focus of smart specialisation is both new and existing areas that provide competitive advantages for innovation, diversification and growth. This includes, for example, established and emerging sectors, technologies or intersections between sectors that build competitiveness.



SMART SPECIALISATION IN VÄSTERNORRLAND

Smart specialisation is a growth strategy to dynamically promote development activities of related areas of strength and a strong broadened sustainable innovative business structure based on Västernorrland's conditions.

Strategy development

Region Västernorrland is the organisation responsible for regional development. This role includes coordinating the development, implementation and follow-up of the regional innovation strategy for smart specialisation. The strategy has been developed in dialogue with the regions entities, based on quantitative and qualitative analyses of the county's strengths². In addition to the analysis of business strengths, these have been related to the knowledge-generating environments in the region, with a focus on Mid Sweden University, RISE and other environments for research and innovation development. The knowledge bases describe the process and deepen the knowledge of existing and potential areas of strength. In addition to the strategy, we have gained new knowledge about the Västernorrlands business sector and the regional strengths and challenges in research and innovation during the work process. Knowledge that, properly managed, will be able to stimulate increased competitiveness in existing and newly developed areas of strength.

The innovation strategy has been developed by identifying and prioritising areas with potential for knowledge-driven growth. This includes areas where the region already is strong as well as new areas. Smart specialisation is a six-step process-based approach, based on a thorough analysis consisting of quantitative analysis and qualitative entrepreneurial process and dialogue. It is an approach initiated by the EU Platform for Smart Specialisation:

- Analysis of the region's strengths, assets, European and international competitiveness and links with others markets.
- Alignment and participation. Market and customer perspectives. In addition to the triple helix, society and customers should be involved, through direct influence and participation or indirectly through representation by stakeholder organisations.
- Frame an overall vision for the region.
- Identification of priority areas and niches for the future.

- Implementation plans. The strategy is implemented through action plans where it is important to provide space for experimentation.
- Plan for learning and monitoring the objectives of the strategy.

In addition to Region Västernorrland, the participating actors in the process and the development of the strategy are: Härnösand, Kramfors, Sollefteå, Sundsvall, Timrå, Ånge and Örnsköldsvik municipalities, the Swedish Association of Local Authorities, the Västernorrland County Administrative Board, the Swedish Agency for Regional Growth and other relevant authorities, Mid Sweden University, other colleges and universities, research institutes, innovation and business promotion actors, business, civil society and others who work strategically for sustainable development and growth in Västernorrland.

The regional innovation strategy is linked to the vision and priorities of the regional development strategy: One Västernorrland - energy, vitality and natural power.

Together for people's and companies' growing power, in a healthy living environment for future generations.



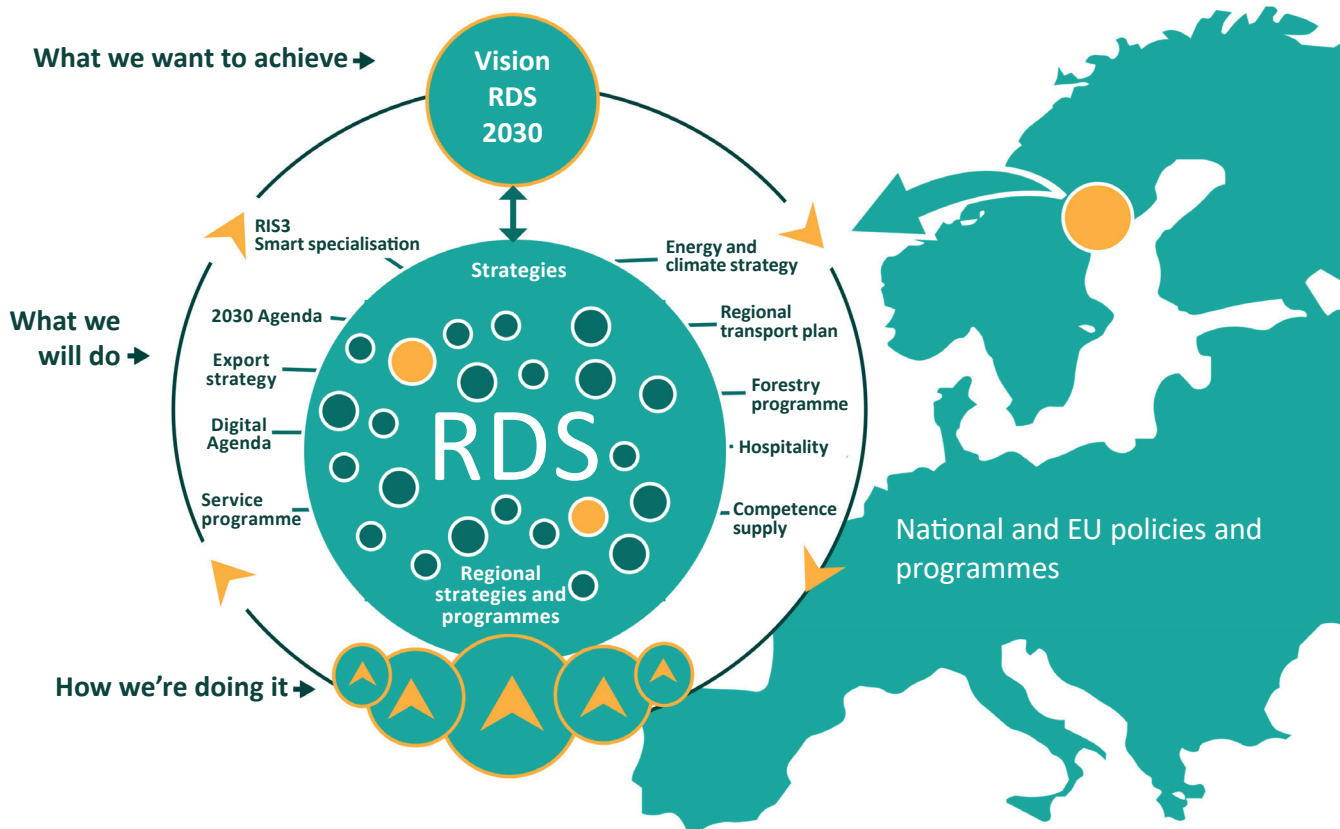
The work process for Västernorrland's innovation strategy for smart specialisation is divided into six steps.

² Information, reports and documents are published at www.rvn.se/smartspecialisering

Västernorrland's smart specialisation efforts should be seen as an integrated part of the work for sustainable regional growth. It will contribute to increased added value, employment, more knowledge-intensive and high-tech companies, new specialisations and diversification (broadening) and transformation based on our areas of strength.

To succeed in this, cooperation and joint efforts are needed in areas of strength and development that have been identified

and prioritised, where we in the Västernorrland have unique or particularly favourable conditions or common challenges. The innovation strategy will lay the foundation for continued renewal work and, in the long term, lead to strengthened innovative capacity, entrepreneurship and business growth. Therefore, those involved in the development are also crucial to the implementation of the innovation strategy, together with a range of national and international actors and funders.

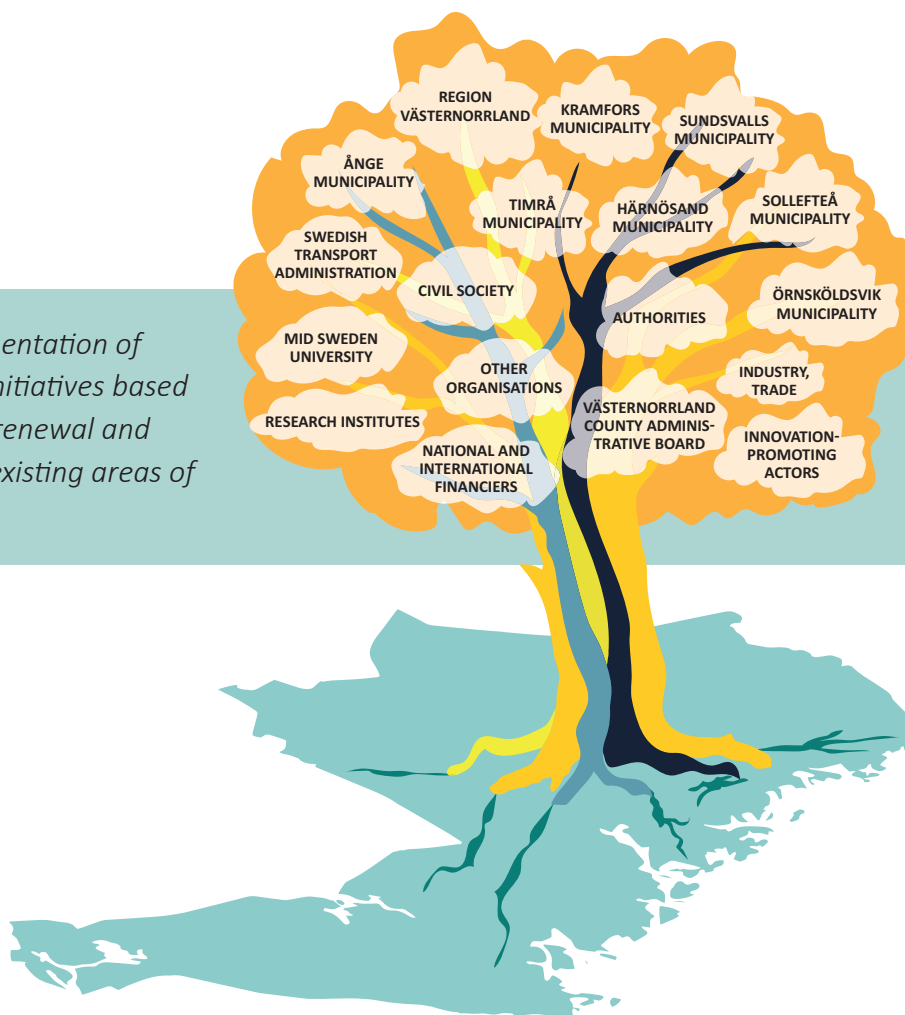


Multi-level governance. Examples of regional strategies and programmes guiding Västernorrland's innovation and growth work. In addition, there are strategies and programmes at both national and EU level that guide and enable regional development. For example, the EU's Digital Strategy, Horizon Europe and The Green Deal, Europe's growth strategy for growth that gives more than it takes.

Fact box:

Västernorrland's regional innovation strategy for smart specialisation is linked to the regional development strategy, which sets out the long-term priorities for how we create sustainable growth and development in Västernorrland. The regional development strategy is part of the implementation of the national strategy for sustainable regional growth, the EU cohesion policy, and the 2030 Agenda. It is our unifying link at regional level for municipal strategies, plans and programmes. Together with other linked mandatory plans and programmes, it guides the use of regional growth funds (allocation 1:1). It also guides the preparation and implementation of programmes for EU cohesion policy funds such as the Regional Fund, Social Fund, Interreg programmes and Rural Development programmes. Implementation is also facilitated by other funding tools at the national and EU level, as well as various types of co-financing.

The strategy is a tool for the implementation of sustainable development and new initiatives based on clear knowledge-driven growth, renewal and diversity in Västernorrland, both in existing areas of strength and new areas.



Achievement of objectives

The innovation strategy contributes to achieving the objectives of the Västernorrland Regional Development Strategy (RDS)



By 2030,
Västernorrland's position has been strengthened nationally and globally



In 2030,
Västernorrland is the place people choose to live in and visit



In 2030,
Västernorrland is the place companies and organisations choose to grow in

In the RDS, the following priorities are primarily relevant to the innovation strategy:

- Developed areas of strength according to the regional smart specialisation policy.
- Universities, colleges and research institutes are engines of innovation and development.
- More new and growing sustainable enterprises and more entrepreneurial residents.
- An expanded and coherent financing, enterprise and innovation support system.

VÄSTERNORRLAND'S WORK PROCESS

The process and criteria developed at the EU level have been used as a framework for the development of the Innovation Strategy. They have been adapted to the regional conditions of Västernorrland and other sparsely populated northern regions.

Region Västernorrland has been responsible for producing analyses and conducting dialogues and workshops with the aim of identifying and describing the region's areas of strength in business, research and the public sector. Community stakeholders and businesses have been offered the opportunity to provide input and participate, directly and indirectly, throughout the process.

Priorities and analysis in the assessment of areas of strength

Throughout the work, boundaries have been identified between Västernorrland's various specialisations, which has meant that some have been merged into common thematic areas of strength. The areas of strength and development identified and outlined in the strategy have proven to be interconnected from a number of strategic perspectives. Several of the areas of strength overlap, and the horizontal approach is viable in all areas. The overlaps provide opportunities for continued development at the intersections between different areas of strength.

Quantitative analyses have been carried out by analysing in several steps the industry structure and location quotient of the regional labour market compared to the Swedish average in order to identify the Västernorrland's degree of specialisation. This has been done by analysing:

- Area of strength, actors, institutions and networks between the actors.
- Level of education in general and in different sectors and gender equality.
- Relationships between the various sectors through embeddedness, so-called "skill-relatedness", has been analysed. The analyses have measured the extent to which the labour force switches jobs between industries. This shows how different sectors are clustered from a competence perspective.

³ According to the Agency of Growth Analysis, Sweden is divided into functional analysis regions consisting of one or more municipalities. The division is based on commuting to work across municipal boundaries and describes a functional division of the labour market.

- Västernorrland consists of four local labour markets, FA regions³, and these have been analysed.
- The area's potential and innovative power through scientific, knowledge production and technological development based on entrepreneurial spirit and experimentation.

Fact box:

- **Smart specialisation:** A process and approach, based on analysis and dialogue, to strengthen the competitiveness of regions. Based on identifying, prioritising and promoting knowledge-driven innovation in areas with potential for growth in existing and new areas of strength, building on the region's strengths and future strengths, competitive advantages and opportunities for excellence. Diversification from existing areas of strength.
- **Specialisation:** Sub-sectors, leading and trendsetting industries or knowledge areas that have some form of specialisation in quantitative indicators or focus area prioritised by the public sector.
- **Area of strength:** A combination of at least two specialisations between which there are opportunities for synergies. For example, a combination of a specialisation in the business sector and one or more areas of knowledge that can be applied in that area and that also exhibit specialisation.
- **Developmental area:** An area that is deemed capable of meeting the requirements to become an area of strength.

Analysis and reporting for - Västernorrland's 2030 Innovation Strategy for Smart Specialisation:⁴

- *Västernorrland's areas of strength - Detailed study of the functional labour markets in Örnsköldsvik, Sollefteå, Kramfors and Sundsvall. CERUM Report No 53/2019. Z.Elekes, R.Eriksson.*
- *Västernorrland's areas of strength - Detailed study of the forestry, automotive, ICT, banking/insurance and technical consultancy industries from a skills perspective. CERUM Report No 52/2019. Z.Elekes, R.Eriksson.*
- *Västernorrland's areas of strength - An overview of the business community's areas of strength and relationships to each other from a competence perspective. CERUM Report No 51/2019. Z.Elekes, R.Eriksson.*
- *The forest as a resource in region Västernorrland -Business analysis 2002-2015. CERUM Report No 48/2019. E.A Korang, R.Eriksson.*
- *Does Västernorrland have a digital competence shortage? An analysis of the digital occupational structure in the county. CERUM Report No 56/2019. R.Eriksson, E.Hane-Weijman.*
- *Mapping and analysis of areas of strength in Västernorrland. Oxford Research 2018.*
- *Northern Sparsely Populated Areas, OECD Territorial Reviews.*
- *The knowledge base for Västernorrland's regional development strategy has also been used in the work.*

Västernorrland's business structure needs to be broadened

Västernorrland has a highly profiled business community dominated by many small, a limited number of medium-sized and a few global enterprises. The SMEs have different conditions and needs for support in the renewal work, not least in innovation, but also in terms of general business initiatives. This ranges from the development of sustainable business models for transformation, digitalisation and increased innovative capacity.

Strengthening the business structure in Västernorrland requires an industry structure that is both broad and leading. Increased investment is needed in a sustainable, equal and balanced business environment. Otherwise, our business structure and our knowledge-driven areas of strength risk perpetuating traditional gender-segregated structures.

In its report "OECD Territorial Reviews of Northern Sparsely Populated Areas"⁵, the OECD has identified common challenges and opportunities for countries and regions in Northern Europe in initiating and stimulating sustainable knowledge-driven investment, innovation and growth. This also involves identifying the needs of more sparsely populated areas, such as Västernorrland, where companies are often heavily dependent on external markets, but are at a competitive disadvantage due to long distances.

Promoting business is about development efforts that strengthen companies and linking companies through functional clusters as well as networks to increase economic growth, employment and productivity. A competitive and diversified economy also requires other enabling investments, such as systematic investment in physical and digital infrastructure, competence supply, skills development and lifelong learning.

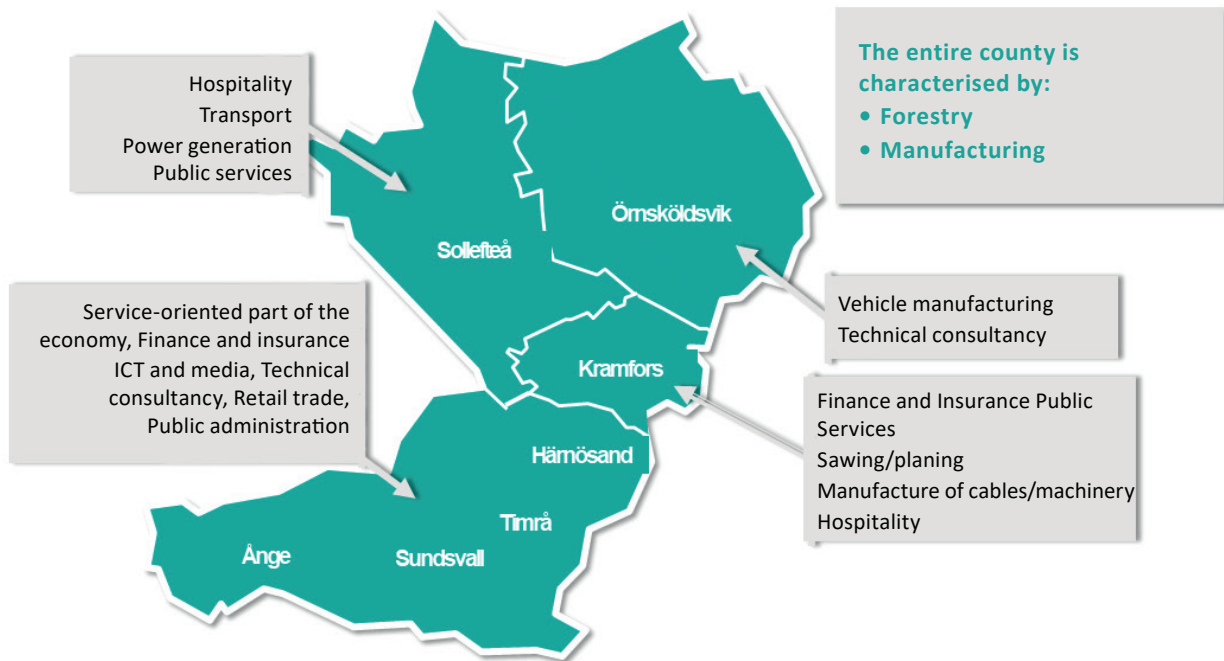
Businesses also need to be able to respond to the structural changes and transformation processes in society by drawing on the knowledge and experience of neighbouring areas. By identifying synergies and enabling cross-border cooperation, Västernorrland's businesses and organisations can strengthen their development and competitiveness.



⁴ Reports and analyses are written in Swedish.

⁵ OECD territorial assessments. Northern Sparsely Populated Areas <https://www.oecd.org/publications/oecd-territorial-reviews-the-northern-sparsely-populated-areas-9789264268234-en.htm>

Local industry concentrations



Västernorrland consists of four functional labour market regions, FA regions, with some local industry specialisations. Only forestry and mechanical manufacturing are found throughout the county.

Specialisation			Number of people employed	
Line of business	Employed %	Rank	Employed %	Line of business
Manufacturing military vehicles	0.72%	1	5.51%	Public administration
Other transport manufacturing	0.27%	2	5.39%	Public health
Maritime transport, goods shipping	0.18%	3	5.04%	Primary education
Pulp, paper	2.73%	4	4.80%	Elderly care
Other, metal	0.61%	5	2.73%	Manufacture pulp, paper
Telecommunications, wired telecommunications	1.28%	6	2.69%	Open social services, elderly
Forestry services	0.16%	7	2.42%	Preschool
Basic chemicals	0.74%	8	2.25%	Retail
Insurance	1.67%	9	2.06%	Electricity, plumbing, installation
Forest management	0.95%	10	2.03%	Road, transport
Sawmilling, planing of wood	0.85%	11	2.03%	Technical consultancy, construction and civil engineering
Compulsory social security activities	1,16%	13	1,93%	Secondary education
Logging	0.39%	14	1.67%	Insurance
Construction	0.28%	15	1.59%	Computer consultancy
Total	12.22%		44.1%	

The Västernorrlands 15 most specialised industries (left) and the 15 largest industries (right) ranked from 1 (top) to 15 (CERUM).

The economic structure of Västernorrland is undergoing a transformation from an industrial to an increasingly service producing region. At the same time, Västernorrland's industries are each relatively small, with the county's 15 most concentrated industries together accounting for only about 12 per cent of the county's total employment.

The balance between a traditional business sector and a growing public sector has left the county's labour market divided. There are large intra-regional differences, as can be seen in the illustration on page 11, across the regions geographical concentration in different industries. Business structures are changing at an accelerated pace across the world, including through technological development and digitalisation. Today, sustainable production processes, products and services are in demand both in the private business sector and in public services. This affects Västernorrland in terms of employment, competence requirements and business structure.

There is a challenge when stagnating and growing industries in many cases aren't located in the same geographical locations. Dependence on certain industries and companies also differs between the various parts of the region. The shift to skilled private services is most evident in the larger towns of Sundsvall, Härnösand and Örnsköldsvik - while manufacturing still dominates throughout the region and especially in its smaller municipalities. The public service sector is to a large extent driven by demographic trends, with a greater proportion of elderly persons in need of care and support.

Regional structure

Västernorrland is a highly specialised region in a few areas. This is a strong point, but at the same time it means increased sensitivity to economic fluctuations. To increase future competitiveness, Västernorrland needs an innovation strategy that contributes to the diversification and new value chains of the region's areas of strength and labour market. This can be achieved through cross-fertilisation between knowledge-intensive prioritised areas of strength and development and related areas. Västernorrland generally has a low proportion of people with at least three years of post-secondary education, a low proportion of people who have changed employers in the last three years, whilst the employment rate among people born abroad is low. The labour market is also highly gender-segregated, which means that companies and the public sector have difficulty finding the right skills.

Västernorrland is a large and sparse region with four functional labour market regions. The sparse geography means that functional interaction with surrounding regions and internationally is important for the region's development. The region's labour markets are concentrated in different sectors and

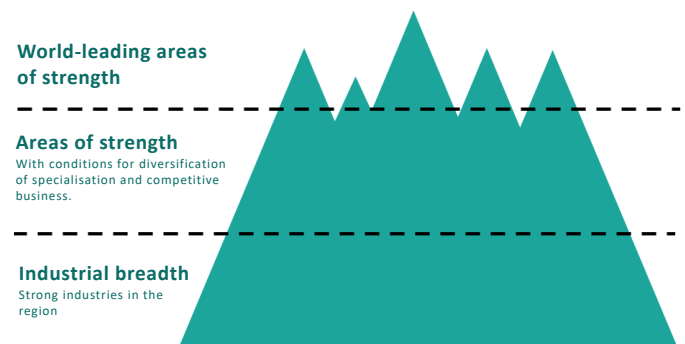
As women are more likely than men to work in the public sector, they are increasingly concentrated in this part of the labour market. This results in greater matching problems. It becomes more difficult to find suitable jobs in their place of residence. This increases the need to ensure functional mobility and commuting by all modes of transport in order to link our labour market regions.

We can see that the development of the areas of strength in smart specialisation is based on traditional industries that are being transformed, resulting in new knowledge and skills. Not least in the forestry sector, but also in knowledge areas that have previously been prioritised in regional growth work, such as information and archive science, ICT, defence and security issues and developed business models originating, e.g., in banking, pensions and insurance.

By using the competences and capacities available in identified areas of strength, Västernorrland will be able to further develop and strengthen currently identified areas of development and ensure that we identify and provide opportunities for the development of new areas of strength.

Therefore, continued knowledge-driven business development in all sectors is essential for increased added value, improved economic performance and increased employment. This can provide potential for transformation and development in, e.g., the regions green industries and hospitality sector.

dominated by micro, small and medium-sized enterprises and a few large companies and organisations, which is important to consider within the implementation of the strategy.



Knowledge-driven growth through smart specialisation involves diversification, broadening, based on Västernorrland's areas of strength. An area of strength consists of a combination of at least two specialisations between which there are opportunities for synergies. Through knowledge-driven growth and cross-fertilisation, industries can gradually develop into world-leading areas.

It is therefore crucial for regional competitiveness to build on Västernorrland's existing strengths, while enabling competitive advantage through broadening into related activities - areas of strength "we almost have" - and continuing to promote and prioritise investment through related activities.

Regions as Västernorrland, that are in industrial transition and rapid technological development often show a decline in established job profiles. This is due to transformation in traditional industries and competence shortages in areas related to future technologies. This poses a number of regional challenges and bottlenecks to sustainable regional development:

- Competence supply needs and labour shortages. Need to support regional structural transformation through competence supply. Västernorrland has competence supply needs in all areas due to an ageing population and urbanisation.
- Structural change in the business sector may create a geographical imbalance in localities with an unfavourable demographic structure and stagnating business activity. The region is dominated by micro-enterprises, large enterprises and public agencies and has a small share of medium-sized enterprises. Västernorrland's business structure has low regional downstream processing and needs more development of value chains. Structural change has redistributive effects in the geographical area, as stagnating and growing industries are in many cases not located in the same places. Dependence on different industries varies between growing and stagnating parts in the region. Transformation also has clear demographic effects, with a significantly higher proportion of the elderly population in the smaller towns.
- Balancing the Västernorrland's high degree of specialisation with renewal. Broadening the Västernorrlands areas of strength through increased diversification in related, ancillary industries and know-how between areas of strength. This will be done by both maintaining existing specialisations and finding new specialisations that build on the region's existing resources. Gradual innovation in existing areas of strength can reinforce lock-in effects and hamper the region's development. It is important to take into account that the local specialisations define the region's labour market and business environment. Each labour market has different competence resources and conditions for future specialisation. It is within the functional labour market that the local competence structure is reproduced, as it enables job changes without necessarily having to change place of residence.
- Matching problems. The public service sector is to a large extent driven by demographic trends, with a greater proportion of elderly persons in need of care and support. This leads to greater matching problems in the labour market, which in turn increases the need to commute, as it becomes more difficult to find suitable jobs in one's place of residence. This means that commuter areas around the larger towns is increasing and the need for functional regions is growing.
- Considering the size and geography of the Västernorrland which consists of four functional labour markets, sparse geography and in some parts low critical mass.
- Need for capacity building and higher rates of transition, transformation. Lack of proximity to dynamic environments and education and research centres in the Västernorrland functional labour regions. Capacity is lower due to long physical distances between companies, academic institutions and markets.
- Gender-segregated labour market and disparity in income levels. Efforts need to be taken to change this, to increase diversity and gender equality in different parts of the labour market.
- Transport infrastructure bottlenecks and broadband. Achieving larger functional regions with favourable conditions for growth requires a functioning infrastructure.
- Capital and internationalisation. Increase the access of SMEs to capital and markets and interaction with actors outside the region, nationally and internationally.

Strengths and assets of the region

Västernorrland has a nature-based economy that is dependent on exports. Businesses' access to international markets is therefore crucial. Large investments in the region's process industry strengthen the productivity and competitiveness of companies and testify to their confidence in the future, while at the same time reducing the need for labour in these companies.

Västernorrland has a clear profile in industrial process and production linked to the forest-based bioeconomy, metal and mechanical manufacturing, materials engineering and the power generation and renewable energy sectors. It is home to high-tech companies established at the leading edge of the supply, service and support value chain sectors. The labour market regions are small and fragmented, which means that localities need to be progressively linked together so that they can become larger and more cohesive. Interregional cooperation is high, especially along the northern coast. It is characterised by both informal and formalised cooperation in various forms, such as the Umeå and Sundsvall regions,

where municipalities in the north and south work together for regional development.

In order to maintain and increase regional competitiveness in the context of both knowledge-driven growth and general business development, Västernorrland needs:

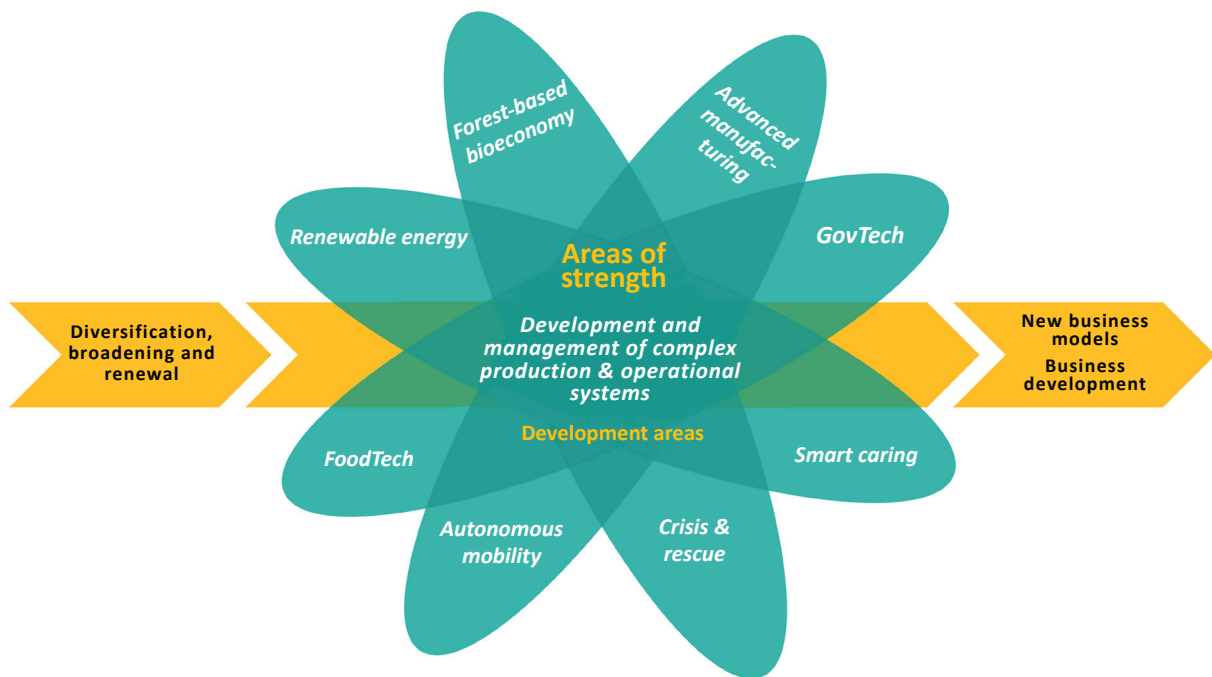
- revitalisation of traditional sectors through higher value-added activities and new market niches.
- exploiting new forms of innovation, such as open and user-led innovation, social innovation and service innovation.
- development of new economic activities through radical technological change and ground-breaking innovations
- diversification of existing areas of strength into related areas.
- modernisation through embracing and disseminating new technologies.

Västernorrland's priority areas of strength and development

	Criteria →	Educational level higher than the national average (excl. metropolitan regions)	Innovation, Patent/Trademark	Entrepreneurial dynamics	Internationalisation	Regional organisation <i>Support actors, clusters, research environments</i>
Areas of strength	FOREST-BASED BIOECONOMY	Yes	Yes	Yes	Yes	Yes
	ADVANCED MANUFACTURING <i>Metal, machinery and vehicles</i>	Yes	Yes	Yes	Yes	Yes
	RENEWABLE ENERGY <i>Solar, wind, water and bioenergy</i>	Partly	Yes	Partly	Yes	Yes
	GOVTECH	Yes	Partly	Yes	Yes	Yes
	DEVELOPMENT & MANAGEMENT OF COMPLEX PRODUCTION & OPERATIONAL SYSTEMS	Yes	Yes	Yes	Yes	Yes
Development areas	AUTONOMOUS MOBILITY	Yes	Partly	Partly	Partly	Partly
	FOODTECH	No	Partly	Partly	Partly	Partly
	CRISIS EMERGENCY AND RESCUE	Partly	Partly	Partly	Yes	Partly
	SMART CARING <i>Care, Safety, Security</i>	Partly	Partly	Partly	No	Partly

PRIORITISED AREAS OF STRENGTH

and future development areas



The illustration shows Västernorrland's nine identified thematic areas of strength and development.

The areas of strength are renewable energy, forest-based bioeconomy, advanced specialised metal, machinery and vehicle manufacturing, GovTech and the development and management of complex production and operational systems. Development areas are autonomous mobility, FoodTech, emergency and rescue and smart caring. Västernorrland's regional innovation strategy for smart specialisation will stimulate the region's competitiveness, diversification and renewal as well as new business models.

Västernorrland's areas of strength for smart specialisation are divided into horizontal and thematic areas. In addition, there are strong knowledge and discipline areas in the region that support these areas of strength and a number of development areas that have the potential to develop into the region's future areas of strength.

Västernorrland's areas of strength and development are to varying degrees embedded in each other via knowledge or value chains. The innovation strategy will help to increase investment and initiatives in areas that can be related to priority areas of strength and development. It is crucial for Västernorrland's future competitiveness that continued investment in a broad, diversified business sector be made possible - with the aim of tapping into complementary areas of strength and development.

The criteria for smart specialisation include employment and education levels higher than the national average (excluding metropolitan regions), innovative strength in terms of patents and trademarks, entrepreneurial dynamics (which includes new as well as existing companies and organisations, employment rates, internationalisation including exports, international ownership and relations), interaction in international research and development (R&D) and regional organisation in terms of research environments, cluster organisations and regional support actors.

Thematic areas of strength

Forest-based bioeconomy

The digitalisation of the newspaper industry and other media, combined with the shift to fossil-free products, means that the forest industry is undergoing change and transition to an increased focus on circular bioeconomy and recycling. In this transition, Västernorrland is, in terms of industrial applications and research in the biorefinery area, among the leading suppliers in the world of advanced services and technologies. In particular when it comes to sustainable processing of biomass into a range of new bio-based products such as food, feed, bioenergy, green chemicals, cellulosic fibres, nanocellulose, textiles, residual waste and renewable raw materials.

The region's forest-based bioeconomy with forestry, wood, paper, pulp, chemicals and residual waste management and recovery is a strong system driver. At the same time, forests as a natural resource are an important base for other industries and social and health values. This means that in Västernorrland there is a whole system of actors in the supply chain that support other sectors. The entire area shows high employment and has a large systemic impact as well as relatively high levels of education compared to the rest of the country with a large presence of international cooperations.

The forest-based bioeconomy is a mature area characterised by large scale and investment in streamlining and automation to maintain a high degree of competitiveness and continuous adaptation to market conditions. For example, there has been a move in recent years away from printing paper towards various types of packaging products and bio-fuels. At the same time, there is an evolutionary trend in the field towards value-creating and sustainable circular business models, driven by increasing societal needs for transformation. This includes sustainable forest management, awareness of forests as a resource in climate adaptation, focus on new product development and better use of the whole raw material and recovery of residues.

Västernorrland has achieved a leading position in this area in both industrial applications and research. This is based on a long tradition of expertise and world-class research in the entire value chain of the forest-based bioeconomy as well as resources for scale-up and demonstration. The established forest industry is surrounded by technology consultants, waste and recycling companies and the manufacturing industry, among others, which are also part of other areas of strength in the Västernorrland ecosystem for developing, scaling up and delivering new technologies to the industry - which is in demand internationally. Knowledge and research in industrial information technology, digital systems and services and

applied digitalisation available in the region are also increasingly relevant to development.

The research area spans broad areas of the forest-based bioeconomy, materials, chemistry and processes, with established R&D environments and test beds with high capacity in the biorefinery field. Within the area, RISE Processum brings together a broad cluster of companies established through the VINNVÄXT [Winning Growth] initiative "The Biorefinery of the Future". Research and development in the region is done in close collaboration with world-leading manufacturing and service companies in the private sector, the RISE research institute, Mid Sweden University, Swedish University of Agricultural Sciences, Umeå University, the Forestry Research Institute of Sweden and other international R&D actors. The high innovative power along the entire value chain ranges from forestry and advanced forest chemistry to the manufacture of entire wood and process industry factories.

The area is characterised by a high degree of internationalisation, due to the export business of the forest industry and the establishment of large companies in the region.

In parallel with the focus on rationalisation and increased competitiveness in mature segments, there is a strong interest in the development of new products from under-utilised raw material and process streams. These can be, e.g., energy carriers, materials, chemicals or nutrients and have applications in new sectors such as chemistry, materials, textiles, electronics, construction and wood products or agriculture and food. The development work focuses on knowledge from different fields in chemical engineering, biotechnology, materials engineering, energy and environmental engineering, industrial information technology and digital services. This is driven both by the need for increased resource efficiency and the demand for new renewable products, recycling and more efficient use of resources.

CHALLENGE. The area of strength is bifurcated, with large disparities in employment, educational and wage levels and gender in a traditionally male-dominated area. Embeddedness in the rest of the region's economy is weak, both in terms of how the area of strength is linked in terms of competence and how the labour force moves between



different sectors. The area of strength also needs to stimulate increased entrepreneurship in SMEs, innovation, service and product development, regional processing and spin-offs that contribute to continued high levels of appeal and employment, which is important for the competitiveness of the region.

Advanced manufacturing, within metal, machinery and vehicle

The industrial development with efficiency and automation has accelerated and changed the structure of the region's industries. Although some of this type of production has moved abroad, this is one of the region's areas of strength, with a high capacity for innovation, internationalisation and strong exports. It is a mature area in transformation where many smaller companies with high material and specialist skills are developing products and services in a competitive market.

In Västernorrland, we are recognised for our expertise and knowledge in the development, application and custom manufacturing of complete products and systems with high material and quality requirements for operating in demanding environments when it comes to advanced custom metal, machinery and vehicle manufacturing. This ranges from turnkey suppliers of machinery, engines and vehicles to electronics and hydraulic drive systems with associated applications and the development of control and monitoring systems in industrial information technology.

Materials engineering expertise is linked to the manufacture of products in materials such as titanium, carbon steel, aluminium and stainless materials and alloys for demanding environments. The custom-made products are mainly supplied to the defence, offshore, mining, sugar, process and chemical industries. The area is also partly integrated as a supplier in the value chain in the areas of strength of the forest-based bioeconomy and the development and control of complex systems linked to the Internet of Things.

There is a system of different actors in the supply chain, contributing specialist expertise targeted at each sub-sector in the area of metals, machinery and vehicles. The whole area shows

high employment compared to the rest of Sweden, with many smaller companies and some large companies with a high export and system impact. The machinery and vehicle manufacturing area has higher levels of education and wages relative to the rest of the country. Again, the area is traditionally male-dominated. This area shows higher embeddedness than the forest-based bioeconomy. In this area, the business sector is more interlinked in terms of competence, as the labour force is more likely to move between different industries. This is partly due to the fact that there are more production sites in the area and that they are suppliers in regional, national and international value chains.

CHALLENGE. Maintaining and developing the competences in the area and creating the conditions for continued development in areas of strength, as well as in a diversified business sector.

GovTech

GovTech concerns the development of the public sector and new digital welfare services for employees and citizens. The field is rapidly developing globally. The region has a strong position in public sector digitalisation, both in government administration, municipal development and collaboration with private companies. Public administration and public services are one of the sectors that employs the most people in Västernorrland. Several large government agencies' administrative and development operations are located in the region. The area employs around 16% of the workforce. In 2020, there were 22 public agencies established in Västernorrland, including the DIGG agency [Agency for Digital government], which has the principal national responsibility for strengthening the digitalisation of the public sector. Strategic and operational collaboration has been established through a network of agencies coordinated by the County Administrative Board. In addition to innovation and business development, the area also connects to social innovation and entrepreneurship.

In the municipal sector, all the region's municipalities, as well as Hudiksvall, Nordanstig and Umeå, are collaborating on the development of joint e-services. The services produced are used by municipalities all over the country. Alongside this work, there are many private consultancies and IT companies combining cross-sectoral knowledge of the region's basic industries with the development of public sector services and management.

CHALLENGE. Transition to new business models, increased digitalisation and accessibility, as well as secure information management.



Renewable energy - Solar, wind, hydro and bioenergy power generation

The renewable energy field is an area of strength based on Västernorrland's rich natural resources. The four major rivers that flow through Västernorrland produce large amounts of electricity from hydropower, contributing to the country's total energy production from renewable sources.

Västernorrland is one of the leading regions in Sweden in the production of renewable electricity with the presence of large international corporations. In addition to multinational power companies, there are a number of local electricity grid and electricity/heat production companies owned by public or private operators. Linked to this is a regional system of consultants, technology providers and companies developing new technologies in the field of renewable energy.

In terms of renewable electricity production, the region is one of the country's largest producers, accounting for almost 20% of Swedish hydroelectricity, with more than a third of the electricity exported. It is a mature and efficient area of strength in transition. The combination of the region's specialised skills in environmental, energy technology and power generation makes it an expansive area. Employment in the area is higher than in the rest of the country.

The field of hydropower and forest raw materials is closely linked to the area of strength of the forest-based bioeconomy. There is a high level of expertise and potential to continue building even stronger knowledge areas around solar, wind, hydro and bioenergy, as well as the adaptation of electricity systems and energy storage.

With almost 90% (1.7 million hectares) of forest land being productive, Västernorrland is one of Sweden's largest forested regions. These natural resources and the large raw material potential for biofuels provide national and international competitiveness in both the forest-based bioeconomy and renewable energy strengths. This means that Västernorrland is also contributing to a shift to energy production based on local forest raw materials and renewable sources, replacing goods with a high climate impact.

The changes in the electricity sector, the strong expansion of wind power and the development of solar energy mean an increased need for development of the electricity system in the form of new control capabilities, storage and balancing functions where consumers and producers interact. The transition to renewable electricity systems poses capacity and power challenges throughout the country. As a major producer of hydro and wind power, the region has a strong electricity grid, which provides competitive advantages for electricity-intensive production environments and businesses in the region. In order to increase transmission capacity in the transmission grids, major investments are planned for Västernorrland in Svenska Kraftnät [the Swedish electricity transmission company] system development plan. Together with renewable energy storage, this is a major challenge and development potential with value for the whole country.

Within the area there are regional innovation and export platforms and internationally recognised and niche research actors contributing to developments in green technology, power electronics, clean energy and sustainable solutions.

CHALLENGE. Taking advantage of Västernorrland's potential for innovation and development in the field and meeting the need for new skills arising in the field of renewable energy.

Horizontal area of strength

Development and management of complex production and operational systems

Västernorrland has a clear profile in the industrial services sector, with more people employed in this area than in the rest of the Sweden. The industry's concentration on core businesses has driven the development of outsourcing and the establishment of a new strong development-driven service sector. This is particularly the case in the region's areas of strength related to technical consultancy, engineering and business development.

Västernorrland is the site of leading companies in the development and management of complex production envi-

ronments, systems integration and operational systems. It has developed into a horizontal area of strength. Originated from Västernorrland's long tradition of process innovation (products, processes and services) in the forest-based bioeconomy, metal and mechanical manufacturing and power generation, and resulting in spin-offs and start-ups.

The area is characterised by a combination of strong industry expertise in all the areas of strength in Västernorrland. This is particularly true in the entire value chains of the areas of strength related to technology and industrial information technology, production, operations, processes, services and business development. This expertise is also used in business development and public sector services.

It is the site of systems integrators, top application devel-

opment companies and world-class research. Today, this is a well-developed, strong, independent world-leading knowledge-intensive exporting services sector with expertise across the value chain. This from a feasibility study for the development, design and planning of complete process and production lines to commissioning and maintenance. This includes integration, process optimisation and digital information management, organisational, operational and business models.

The area of strength is strongly embedded in the business structure, primarily in the strongest systemic areas of the forest-based bioeconomy, advanced manufacturing and renewable energy. There are both world-leading companies and

a supply chain of actors in the area, linking Västernorrland's various strengths, sectors and industries. This deep expertise means that the actors in the area are major boundary spanners and enablers within and between Västernorrland's existing areas of strength and potential development areas. The area spans a wide range of fields such as energy and environmental technology, industrial information technology, digital services, business development, chemical technology, quality engineering, biotechnology and materials engineering.

CHALLENGE. Primarily the competence supply and the exploitation of the development potential of the area of strength for more of Västernorrland's areas of strength and development.

Development areas

Development areas which have the potential to become areas of strength in Västernorrland.

Autonomous mobility

The area of autonomous mobility is a rapidly developing field that is undergoing technological leaps in terms of green transformation, efficiency, electrification and digitalisation.

Västernorrland is home to world-leading, international industry involved in everything from the development to the production and control of mobile and autonomous vehicles on land, water and in the air. The industry, with production of advanced customised electric wheelchairs, serial production of aluminium boats, off-road and military vehicles and special vessels, has a high capacity for innovation, a high degree of internationalisation and strong exports. This is thanks to a combination of materials and specialist skills, embedded services and technologies linked to industrial information technology.

In terms of employment, the field is the most specialised in the region compared to the rest of the country. It is dominated by a few actors with subcontractors in technical consultancy and manufacturing industry suppliers with high material and quality performance. This has also been recognised by a number of national and international companies and research actors who are now strengthening their presence in Västernorrland.

Örnsköldsvik Airport is home to the Swedish Civil Aviation Administration's LFV Aviation Research Centre (LARC) test arena. The airport is remotely controlled from the RTC Sundsvall air traffic control centre at Midlanda airport, which offers remote control to smaller municipal airports. LARC is an international test and demonstration centre for remote con-

trol and autonomous development in and around airports. The arena is a real test bed for development, testing and demonstration for aviation industry actors as well as stakeholders from industry, academia, government and regions. It encompasses developments in industry and societal functions linked to aviation such as electric aircraft, drones, different types of vehicle movements with high safety requirements such as airport surveillance, autonomous snow clearing, grass mowing and friction measurement. Initiatives on test and demonstration environments are also underway in the area of future shipping and sustainable marine technologies.

CHALLENGE. The field is characterised by major transition and innovation and the need to take advantage of the opportunities of technological advances in the field. One challenge in the area is to highlight the conditions for testing and scaling up that exist in Västernorrland, and to strengthen relations with other areas of strength and development.

FoodTech

The level of food self-sufficiency in Västernorrland and in Sweden needs to be increased and new production technologies need to be developed. At the same time, the demand for new, sustainable and healthy food products is increasing. To meet these needs, food producers and the systems around them are working to become more sustainable. The field offers opportunities for growth, job creation, research and development. FoodTech is Västernorrland's answer to the challenge of future sustainable food production. The region has a number of small production facilities, which provide opportunities for the development of small-scale food production.

In Västernorrland, primarily small-scale food production and the production of beverages are carried out.

Västernorrland is also home to the world's largest scaled-up closed-cycle management and cultivation system for tomato and fish production. Based in Härnösand, the county's FoodTech initiative is pursued with the vision of creating a national centre for research, development and innovation in circular and sustainable primary production for food and production areas for closed-cycle cultivation by 2025.

Research projects and feasibility studies related to challenge-driven innovation are also being conducted in the area of FoodTech, including the development of circular and sustainable fish feed from proteins derived from forest raw material and next-generation feed for fish cycles.

The region's industrial base in forestry also contributes to the development of the FoodTech area and to the emergence of future sustainable food production and a strengthened hospitality industry. The area also has the potential to address social challenges in climate and health through innovative solutions.

CHALLENGE. The field is currently under development and is characterised by small scale approach - a critical mass with more actors is crucial for future development.

Crisis and rescue

The region is home to a number of agencies and organisations working in the field of public protection, Crisis and rescue preparedness, civil defence and rescue. Based on increased uncertainty in the world around us, both in terms of climate change, pandemics and the balance of military power and terrorism, there is both a need and the potential to further develop the area based in Västernorrland. The field is well in line with an increased national focus on defence, civil defence and other types of preparedness issues. Research, development, training and operational development are also carried out in the field with test beds, training sites and drill areas set up for these purposes by the Swedish Civil Contingencies Agency (MSB), among others. What is unique to Västernorrland is the possibility of live and simulated drills in real and varied environments over large areas in coastal and forest environments

as well as in industrial and small buildings. These range from natural environments for landslide and avalanche events, search and rescue, complex risk environments, simulation of forest fires and natural disasters to military training grounds.

The field has been identified as important for the Västernorrland for a number of years and is an area of expertise both nationally and internationally, with e.g. the Swedish International Development Cooperation Agency and the Folke Bernadotte Academy. A long tradition of industrial production and a large military presence have contributed to the establishment of companies in the field of crisis and rescue and preparedness in the county in order to benefit from the synergies described above. Västernorrland also has highly specialised companies producing vehicles for the Swedish Armed Forces, the Coastguard and others. The area employs relatively few people, but at the same time accounts for a high proportion of the country's employment in this field.

The proximity to research centres at both universities and research institutes further strengthens the area, which is also a basis for continued government establishment in the area. With established test activities in the autonomous mobility development area, collaboration developed with industries to prevent/deter industrial emissions and a strong link to the GovTech area to heighten information security, the field has great potential to become an area of strength in Västernorrland, with national and international relevance.

CHALLENGE. Success in this area requires well-developed forms of collaboration and additional joint research and development projects, not least in the area of crisis and rescue systems and total defence.

Smart caring - care, safety, security

Smart caring is about promoting tomorrow's well-being in terms of care, safety, security and good and equal health at all stages of life. The demographics of the county, with both older and younger populations in urban and rural areas, pose challenges for society to respond to the needs that arise.



This field provides most of the employment in Västernorrland and there is a great need for preventive, health-promoting and rehabilitative activities, health and care innovations. These can be driven by new technologies, medical research and paradigm-creating innovations. There is a shortage of both labour and competence, whilst the needs of the target groups are increasing. The area is fraught with challenges, not least from a demographic perspective where fiscal power is declining in several of the regions municipalities while demand for welfare services is increasing.

Preventive activities and services related to various forms of safety and security functions as well as care, self-care and lifestyle changes are examples of measures that include more alternative actors in addition to traditional organisations.

There are a number of established companies in the region, as well as a number of different initiatives that have launched value-creating and future-focused efforts to develop new approaches, user-driven development, regulations and collaborative platforms, services and tools. Municipalities, regions and government agencies play an active and important role in promoting developments in this area, which is also linked to e-health.

Areas of competence and disciplines within identified areas of strength

Smart specialisation is based on key enabling technologies, such as nanotechnology, Internet of Things, industrial data, advanced manufacturing, advanced materials, robotics, 3D printing and artificial intelligence.

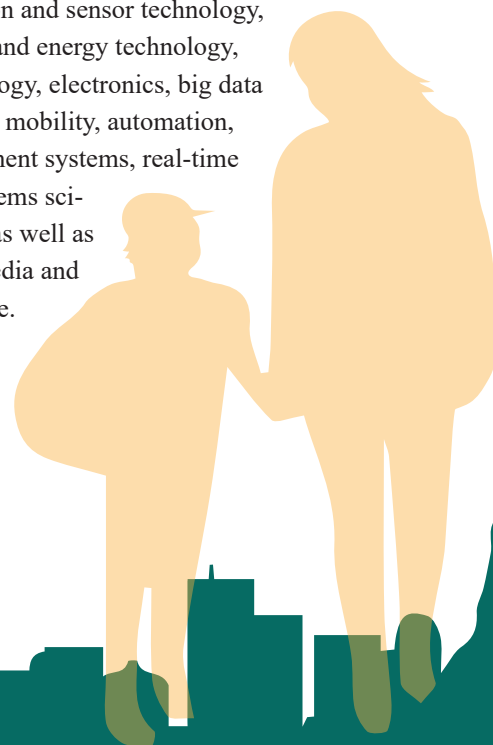
In developing the strategy, we have identified process and operational development, as well as the development of new business models, as strong disciplinary, technological and competence areas that cut across several priority areas of strength. Advanced technologies offer the opportunity to increase the region's competitiveness and the development of future products and services.

In Västernorrland, these key technologies and areas also link to the county's expertise in biotechnology, chemical

For example, pilots for testing, developing and introducing new technologies, work processes and health information support in primary care are being carried out in this area. There are laboratory facilities for user-driven development with service design as a method and approach to meet the challenges and needs for development and transformation that the health sector is facing. For example, through the Health test bed, Region Västernorrland offers companies and entrepreneurs access to parts of the health care system for the development and validation of health promotion and disease prevention solutions. Region Västernorrland is part of the joint platform Forum Norr for research support infrastructure in the four northern counties.

CHALLENGE. Demand for welfare services is increasing. Innovative solutions in Smart caring are a prerequisite for creating safety and ensuring future well-being. Platforms are needed to bring together different skills and perspectives that challenge existing structures to meet a number of priority societal challenges.

technology, materials engineering, industrial information technology, information and sensor technology, electrification, power and energy technology, environmental technology, electronics, big data and real-time analysis, mobility, automation, industrial and government systems, real-time analysis, data and systems science, archive science as well as quality technology, media and communication science.



THE REGIONAL INNOVATION SYSTEM

Innovation and research actors, clusters and networks

It is important to connect and link up with expertise that complements Västernorrland, regardless of where it is located geographically. In addition to strengthening the regional innovation system, it is important to identify needs and, in each area of strength, increase collaboration with actors outside the region, nationally and internationally for development in the work on smart specialisation.

The region's innovation system consists of a number of county-wide innovation support actors, which have both complementary roles and catchment areas. Some overlap exists in terms of general advice to entrepreneurs, innovators and start-ups; a challenge that is recognised as a priority in the regional development strategy, One Västernorrland - energy, vitality and natural power.

Innovation support refers to those actors in the community that provide support at some point in the process from idea to market - and that do not constitute traditional business start-up consultancy services. These include the regional incubator BizMaker, which operates in all municipalities of the region. Mid Sweden University with Miun Innovation, Almi Mitt, the research institute RISE, innovation council, Coompanion Västernorrland, the Västernorrland Association of Local Authorities, Region Västernorrland, the county's municipalities and the Västernorrland County Administrative Board. In several cases, these actors have offices in and links to more than one location in the region and neighbouring counties, primarily Jämtland Härjedalen and Västerbotten.

Several of them also participate in border-region, national and international structures and networks that contribute in various ways to both strengthening and developing Västernorrland. As an example, the innovation office Miun innovation of the Mid Sweden University is part of the innovation office Fyrklöver [Four-leaf clover], which is a network-based cooperation, with joint innovation support activities and development focusing on innovation and growth issues. In addition to Mid Sweden University, the cooperation also includes Karlstad University, Linnaeus University and Örebro University.

Research areas

Västernorrland has a long tradition and great expertise in the field of materials and processes with outstanding research in industry, RISE and Mid Sweden University. Mid Sweden University has several centres, including the Fibre Science and Communication Network (FSCN), Sensible Things that Communicate (STC), Sports Tech Research Centre and ETOUR in sports technology, hospitality and experience industry, Centre for Research on Economic Relations (CER), Risk and Crisis Centre, DEMICOM with focus on democracy and communication in the digital society and Forum for Digitalisation (FODI).

On the knowledge-producing side, in addition to the Mid Sweden University regional institutions, there is Umeå University, which has one of its campuses in Örnsköldsvik, as well as established research and integrated collaboration with RISE, the Research Institutes of Sweden, which is a strong research partner and innovation support actor in the county. The establishment of RISE in Västernorrland means increased support and access for the regional business community to the rest of the research institute's expertise and test beds in the rest of the country. The facility is part of the Bioeconomy and Health Division and offers a unique test and demonstration environment in the county, with infrastructure for scaling up to pilot facilities and industrial-scale demonstrations. The enhanced operations, which include Processum and MoRe Research in Örnsköldsvik, have further strengthened a long-standing research and innovation community in the county and the regional innovation platform for biorefinery development established through the Vinnväxt initiative - the Biorefinery of the Future.

RISE has also established itself in Sundsvall, in the biorefinery field as well as in the digital systems division and the area of applied digitalisation combining technology and organisation with a focus on electronics, information and communication technology as well as software development, mobility, systems analysis and interaction design. Other actors with



strong links to the region's activities include the Swedish University of Agricultural Sciences, Skogforsk, Chalmers and Luleå University of Technology.

Clusters and networks

There are two types of clusters: Institutional Innovative Systems (IRIS), which have been created institutionally, i.e. initiated by society, and Entrepreneurial Innovative Systems, (ERIS), which are built on solid existing companies in a region and that society supports the initiatives of the companies and enables them to further develop. These have different approaches and differ from each other, particularly in terms of regional development. The IRIS model is based on predefined strong industries, whereas the ERIS model focuses more on processes of support and development. The different types partially capture different actors and different phases of dynamic processes. In other words, relying solely on one or the other model runs the risk of not fully utilising the innovative potential of the other.

In addition to RISE Processum and its associated clusters, there are a number of other actors in Västernorrland's networks, innovation and cluster initiatives. They bring together strong functional geographically unrestricted networks and clusters in their fields locally, regionally, nationally and internationally, such as Bron Innovation, ITH Institute of Technology and Hydraulics, North Sweden Cleantech, Swedish Civil Aviation Authority's Aviation Research Centre - LARC, High Coast Destinations Development. The incubator eXpression, Fibre Optic Valley (fibre optics and sensor systems) located outside the county, are also described by regional actors as important actors. Other networks that bring together business actors include industry groups in the county, such as the High Coast Industry Group, Örnsköldsvik Industry Group, High Coast Tourism, the Swedish Federation of Business Owners, the Chamber of Commerce, Destination Sundsvall, Leader Höga Kusten, Leader Mittland Plus, and the Federation of Swedish Farmers, among others.

In Västernorrland, there is also a municipal innovation centre in Sundsvall, Innovationsslussen, which grew out of a national Vinnova [Swedish government research and development state funding agency] programme aimed at municipalities. The establishment of public innovation centres is a trend that can be found, e.g., in the Swedish Companies Registration Office and Region Västernorrland. New knowledge and insights are created through cross-border collaborations between academia, the public sector and business community, with great potential for innovation by addressing a range of societal challenges, including new partners and social entrepreneurship.

Funding

Ensuring access to funding through private and public venture, equity and loan capital is a prerequisite for increased sustainable growth and investment in the region. In the implementation of the smart specialisation strategy, external funding should first of all be increased to Västernorrland County through external capital, global and European funds and programmes such as Interreg programmes, COSME, Horizon Europe, Baltic Sea programme. Increased funding from national agencies such as the Swedish Energy Agency, the KK Foundation, the Swedish Agency for Economic Growth,

Vinnova and various foundations such as the Promobilia Foundation, the Kempe Foundation and the Kamprad Family Foundation, among others, for research in the Norrland region is important if Västernorrland's areas of strength are to contribute to national and international competitiveness. With this focused shift in external funding, the investments in a broad and diversified business community can continue to be made through 1:1 funds (state regional development funds), the Regional Fund (ERDF) and to a certain extent the Social Fund (ESF+) and other structural fund programmes, together with co-financing from municipalities, the region and other financiers.

Enhanced funding should also be sought under the JTF, Just Transition Fund⁷, and the Green Deal Västernorrland's areas of strength are at the forefront of the transformation to a clean, circular economy and contribution to a carbon-neutral Europe in 2050. The Green Deal covers all sectors of the economy, and in particular transport, energy, agriculture, buildings and such industries as steel, cement, ICT, biorefinery, textiles and chemicals.

⁷ When the strategy was adopted, the opportunities for the forestry sector and biorefinery to seek enhanced funding under the JTF, Just Transition Fund, were still being discussed.



IMPLEMENTATION

Follow-up, evaluation & learning

Västernorrland's regional innovation strategy for smart specialisation has been adopted as policy by Region Västernorrland after consideration by the Regional cooperation Council. The strategy sets the framework for regional innovation work and enables priorities for public investments that promote national and international collaboration and for regional development and competitiveness in innovation, research and education. The strategy is implemented according to the six-step model for smart specialisation. Implementation should therefore be seen as an ongoing development process to develop, concretise and complement the identified areas of strength and development for smart specialisation. The six-step model also ensures follow-up, evaluation and learning and helps to improve and clarify actions for continued development in the different areas. The approach will also contribute to the necessary flexibility in the implementation of individual actions and activities, irrespective of who or what the responsible actors are, as a work and action plan. If strategic decisions are required, matters are referred to the Regional cooperation Council.

From an overall perspective, regional innovation work is also pursued as a priority in the Västernorrlands regional development strategy. In addition, the innovation strategy for smart specialisation will also be monitored with specific indicators.



The work process for Västernorrland's innovation strategy for smart specialisation is divided into six steps.

Indicators

Identified and prioritised actions will be monitored via defined indicators.

In the process of smart specialisation, regional innovation and research, various indicators will be used for continuous monitoring and evaluation. The aim is to measure short- and long-term development in order to create sustainable growth and competitiveness in accordance with the regional development strategy.

The continuous monitoring through analysis and evaluation will support the prioritisation of actions, revision and updating of the strategy.

Sub-objective Indicators:

- Increased employment and wage growth.
- Reduction in income disparities.
- Reduced gender segregation and increased gender equality in the labour market.
- Increased sectoral breadth/new knowledge areas through related diversification.
- Increased number of new firms and survival. Per year and survival 3/6 years.
- Increased investment in R&D in SMEs.
- Increased number of innovative environments/meeting venues/networks for innovation processes.
- Increased level of internationalisation among SMEs.
- Increased number of institutional clusters (IRIS).
- Increased number of entrepreneurial clusters (ERIS).
- Number of collaborative projects in the areas of strength.
- Percentage of project collaborations in the areas of strength with national and international partners.
- Number of participating actors from industry, academia and research institutes, private and public sectors and civil society in project collaborations.
- Share of private/public co-financing in development and innovation projects.
- Number of experimental projects is increasing.

Further information on smart specialisation

What is a smart specialisation strategy and what is it used for?

Smart specialisation was initiated by the EU as a systematic process to jointly identify and strategically focus on knowledge-driven and competitive areas of strength with potential for growth based on skills and business strengths. The focus of smart specialisation is both new and existing areas that provide competitive advantages for innovation, diversification and growth. This includes, for example, established and emerging sectors, technologies or intersections between sectors that build competitiveness.

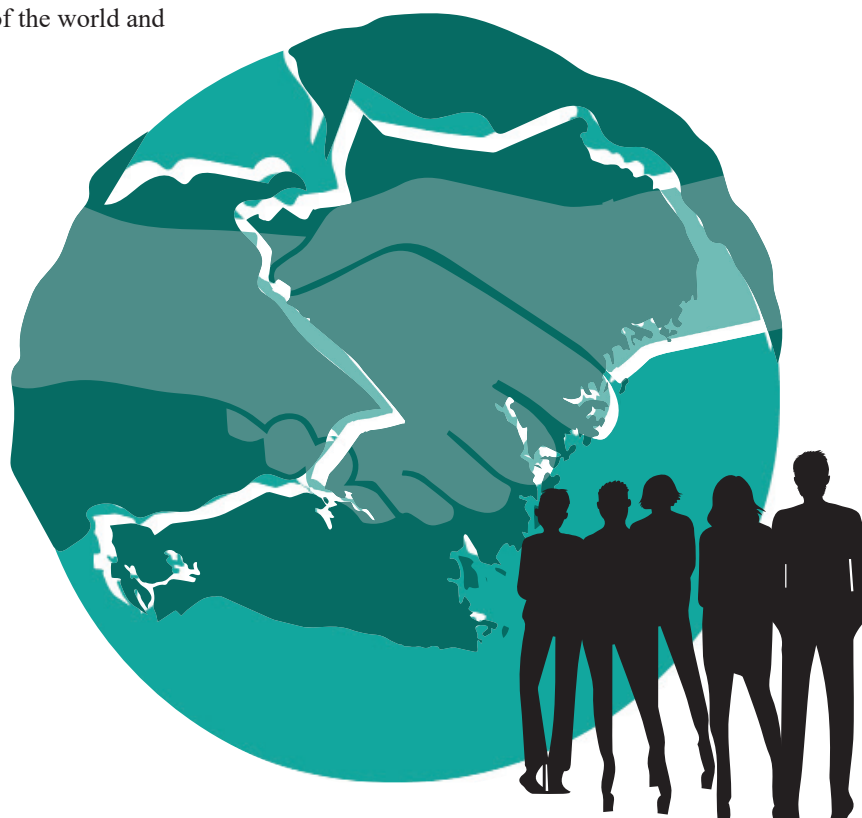
Smart specialisation is a way to create competitive advantages for individual European regions and for Europe as a whole. It is based on growth based on knowledge and innovation in:

- Sustainable growth that promotes a resource-efficient green and competitive economy.
- Inclusive growth that promotes high employment and economic, social and territorial cohesion.

Smart specialisation is a key requirement of EU cohesion policy and the European Commission is monitoring how Sweden and the Swedish regions are working on smart specialisation. Smart specialisation identifies the relative strengths of the region and places them in relation to the rest of the world and prevailing trends.

Specialisation as a measure indicates how concentrated the economy is in certain areas compared to a reference distribution. Smart specialisation builds on the latter meaning of specialisation by emphasising the importance of having an accurate picture of regional specialisation. Areas of strength are a combination of at least two specialisations.

- Smart specialisation strategies do not aim to pursue greater specialisation of the regional economy but the existing specialisation should be kept in mind when formulating development policies.
- Smart specialisation is about promoting innovation and diversity.
- It does not necessarily imply further refinement of the underlying economy. The specialisation in smart specialisation targets the strategic priorities on which public funds should be concentrated, not the existing business sector structure.
- The areas that are of importance are those with strong roots and systemic impact in the regional economy. The fact that a niche in the business sector is high-tech or particularly successful does not necessarily mean that it is important.



The aim is to contribute, within the framework of priority areas of strength and development, to increased competitiveness of existing and future companies, organisations and strengthened regional innovation environments. The strategy will enable initiatives that provide increased growth and employment, increased added value, more knowledge-intensive companies and increased external funding for innovation that contributes to the transition to sustainable development and continued diversification (broadened competitiveness) of Västernorrland's regional economy.

Based on the draft regulations presented for EU cohesion policy after 2020, we can see that stricter requirements will be directed at Member States with respect to smart specialisation, based on regional and national areas of strength.

Smart specialisation has been initiated by the EU as a systematic process to jointly identify and strategically focus on knowledge-driven and competitive areas of strength. The focus of smart specialisation is both new and existing areas that provide competitive advantages for innovation, diversification and growth. This includes, for example, established and emerging sectors, technologies or intersections between sectors that build competitiveness.

Smart specialisation as a method and process

Smart specialisation is an approach based on thorough analysis and dialogue. The strategy will be a tool to guide the prioritisation of specific initiatives that stimulate development, renewal in innovation and knowledge-intensive industries.

In other words, the regional innovation strategy for smart specialisation identifies common long-term priority areas of strength and development but does not aim to pursue greater specialisation of the regional economy. It addresses complex development challenges by adapting policies to the regional context.

Smart specialisation is a growth strategy to dynamically promote the development activities of related areas of strength and the broadening of a strong sustainable innovative business structure based on Västernorrland's conditions.

Smart specialisation strategies will also contribute to a more efficient use of European structural and investment funds through synergies between different programmes at EU, national and regional level, to increase public and private investment.

Smart specialisation will support the creation of knowledge-based jobs and growth not only in leading research and innovation areas but also in less developed regions and rural areas. This requires smart, strategic choices and evidence-based policy decisions. A regional smart specialisation strategy must be based on the region's conditions from a bottom-up perspective on a region's assets, its challenges, competitive advantages and development potential in order to strengthen the development of regional competitiveness. Smart specialisation involves ensuring that the mix of policy interventions, i.e. the combination of policy measures available in a given regional environment, such as grants, loans and other support, effectively leads to the overall policy objectives, helps businesses and leverages private investments.

The EU requires Member States and regions to have smart specialisation which:

- Is based on a SWOT or similar analysis to focus resources on a limited set of research and innovation priorities,
- describes measures to stimulate private investment in research, technology and development.
- includes a monitoring and review system,
- ensures that a Member State has adopted a framework outlining available budgetary resources for research and innovation, and a Member State has adopted a multi-annual plan for budgeting and prioritising investments linked to EU priorities (European Strategy Forum for Research Infrastructures, ESFRI).

APPENDIX

Definitions

Bioeconomics: A bio-based economy involves a transition from an economy largely based on fossil raw materials to a more resource-efficient economy based on renewable raw materials produced through the sustainable use of ecosystem services from land and water. (Formas [Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning] 2012)

Circular bioeconomy: is based on the sustainable production and use of biomass to enable increased use in a range of social sectors. Reuse, remanufacturing and recycling contribute to the long-term use of materials and other resources. The aim is to reduce the climate impact and the use of fossil raw materials. The bio-economy also includes increasing the added value of biomass, while minimising energy consumption and recovering nutrients and energy from the end and by-products.

Biorefinery: Sustainable processing of biomass into a range of bio-based products such as food, feed, chemicals, materials and bioenergy (biofuels, power, heat).

Circular economy: The national strategy, Circular Economy - Strategy for the Transition in Sweden, <https://www.regeringen.se/regeringens-politik/regeringens-arbete-med-omställning-till-cirkular-ekonomi/> outlines the direction of the work that needs to be done to transition to circular production, consumption and business models, as well as non-toxic and circular material cycles. The vision is "A society where resources are used efficiently in non-toxic circular flows, replacing virgin materials" and the overall objectives are "The transition to a circular economy will contribute to achieving the environmental and climate goals, as well as the global goals of the 2030 Agenda".

Subsector: Thematically cohesive group of activities within a sector. Industries and niches or research fields and areas of knowledge are sub-sectors of business and research and education respectively.

Entrepreneurial dynamics: Number of new enterprises.

Entrepreneurship: Favourable conditions for equity investment, investor angels and venture capitalists. Business environment favourable to the creation of new SMEs. The existence of policies and instruments to promote the commercialisation of the output of innovation; the existence of specific measures to support young innovative enterprises and the appreciation of regional inventions.

Research environments: Starting research environments and centres.

Research profiles: Strategic research areas.

Innovations: The creation or introduction of new or improved solutions that respond to the needs and demands of everyday life and the world around us, such as goods, services, organisational practices, technological solutions or the development of design, business and organisational models.

Internationalisation: Qualitative assessment of the internationalisation of sectors and areas of strength, including export statistics.

Clusters: Clusters are made up of a number of different actors interacting with each other, where the core of the clusters is made up of companies and that it is part of a system that supports and interacts with the clusters. The aim of clusters is to create favourable conditions for growth and innovation. Innovative communities can lead to the emergence of clusters. The actors can be both complementary and/or in competition with each other. There are two types of cluster initiatives: Institutional Innovative Systems (IRIS), which are institutionally created, i.e. initiated by society, based on what it considers to be important areas for the region and where it believes there is potential for growth. Entrepreneurial Innovative Systems, ERIS, which are based on strong existing businesses in a region and on society supporting initiatives

from the businesses and enabling their further development. These have completely different approaches and differ from each other, particularly in terms of regional development. The IRIS model is based on predefined strong industries, whereas the ERIS model focuses more on processes of support and development. However, the different types of approaches involve somewhat different actors and different phases of innovative processes. Relying solely on one or the other model therefore entails the risk that the innovative potential of a nation or a region is not fully utilised.

Niche: Refers to the market. A market niche is a part of the user or consumer market that can be served by specific products or services. It is usually defined in terms of the profile of potential customers and their needs. Meeting these needs is the goal of the business to identify/occupy the corresponding niche.

Policy mix and framework conditions: Collaboration between local, regional, national and EU level in relevant policies, coordination of all relevant policies within the region; alignment between policies managing the supply and demand (uptake of innovations).

Related variation: The economy is renewed through knowledge sharing between related activities.

SME: Terms used to describe micro, small and medium-sized enterprises. The EU definition assumes that micro enterprises have fewer than 10 employees, small enterprises have 10-49 employees and medium-sized enterprises have 50-249 employees. https://ec.europa.eu/growth/smes/sme-definition_en

Specialisation: A sub-sector that exhibits some form of specialisation. It may be an industry or a field of knowledge that exhibits specialisation in quantitative indicators, or a distinctive area of focus that is prioritised by the public sector.

location quotient of employees. Leading industries and peaks in leading industries.

Area of strength: A combination of at least two specialisations between which there are opportunities for synergies. For example, a combination of a specialisation in business and one or more areas of knowledge that can be applied in that area and that also exhibits specialisation.



