



NORDREGIO
Nordic Centre for Spatial Development

Implementing the Concept of Smart Specialisation in the Nordic Countries

An Exploratory Desk Study

Maria Lindqvist, Lise Smed Olsen, Liisa Perjo och Haukur Claessen

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Nordic co-operation seeks to safeguard Nordic and regional interests and principles in the global community. Common Nordic values help the region solidify its position as one of the world's most innovative and competitive.

The Nordic Council

is a forum for co-operation between the Nordic parliaments and governments. The Council consists of 87 parliamentarians from the Nordic countries. The Nordic Council takes policy initiatives and monitors Nordic co-operation. Founded in 1952.

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is a forum of co-operation between the Nordic governments. The Nordic Council of Ministers implements Nordic co-operation. The prime ministers have the overall responsibility. Its activities are co-ordinated by the Nordic ministers for co-operation, the Nordic Committee for co-operation and portfolio ministers. Founded in 1971.

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Stockholm, Sweden, 2013

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Summary

The objective of this paper is to explore the impact and early implementation of the new concept of “smart specialisation” in regional policy in the Nordic countries. The study was commissioned by the Nordic Working Group on Third Generation Regional Policy, initiated by the Nordic Council of Ministers. The review is mainly based on a previous literature review and desk research, with a limited number of supplementary telephone interviews to identify the relevant actors and measures. The study also used empirical material developed in other Nordregio projects, for example on green growth and innovation and the role of higher education institutions in the Nordic countries.

In the aftermath of the latest economic crises, the concept of “smart specialisation” was presented to increase the efficiency of European investments in research, innovation and entrepreneurship. The objective was to ensure an effective use of public funds. Based on an understanding of regional strengths, regions were expected to concentrate their resources on a few key priorities rather than spreading their investments thinly across areas and business sectors. This required a well-developed regional governance process, based on broad stakeholder involvement. “Smart specialisation” strategies also implied collaboration between actors at the local, regional, national and global levels, as well as linkages between policy areas, sectors and disciplines.

The concept was developed by academic experts under the EU research and innovation policy framework. Since the potential and implications for introducing policies for “smart specialisation” are very different in different regions, the concept has successively been adapted to a more place-based, regional context. Since the development of Research and Innovation Strategies for Smart Specialisation (RIS3) is expected to be an ex-ante condition in the new Structural Funds 2014–2020 programme period, the concept has attracted a high level of attention in a short time span among the EU member states.

To support national and regional actors in the process of developing RIS3, the European Commission has established the S3 Platform in Seville, to provide various forms of support, including guidelines provid-

ing six practical steps for designing national or regional RIS3. In the study, the model has been applied to the Nordic countries, to assess the level of early implementation and possible synergies with established policy strategies and measures. The study does not, however, claim to provide a complete overview of the relevant policy measures.

The review indicates that the concept of “smart specialisation” is relatively new and the level of implementation at the national and regional levels in the Nordic countries is rather limited, even though the interest has increased, particularly among the actors responsible for the implementation of the new Cohesion Policy in the Nordic EU member states. However, there are variations, both within and between the Nordic countries. Finland seems to be coming closest to developing research and innovation strategies in line with “smart specialisation” and several regions are active on the S3 Platform. Sweden seems less willing to adopt the concept formally at the national level, but prefers to focus on smart growth. Still, the concept has received attention at both the national and the regional level. In Denmark, there seems to be some scepticism at the national as well as the regional level, and the non-member states, Iceland and Norway, have only started to approach the concept.

Even though the concept as such is new, many of the elements of the strategies for “smart specialisation” have already been implemented in the Nordic countries. This indicates that there is strong potential for Nordic regions, building on the existing strategies and policy delivery instruments. Still, there are some aspects included in the guidelines for the development of Research and Innovation Strategies for Smart Specialisation (RIS3) that may contribute to strengthening the regional development processes in the future.

One example concerns the regional capacity for the analysis of economic potential in relation to other regions, within or outside the country. Another example concerns the need to provide incentives for the increased involvement of small and medium-sized companies (SMEs), entrepreneurs and representatives of the general public (quadruple helix). There is also a need for improved dialogue between different levels

and for increased participation of SMEs in global value chains and EU research programmes, such as Horizon 2020.

Finally, it is stressed that the potential for addressing and exploiting “smart specialisation” is likely to

vary between different types of regions. The most important challenge seems to be the development of a well-functioning and inclusive regional governance process, to secure broad stakeholder involvement and long-term ownership of the strategies.

Introduction

Background

In the aftermath of the latest economic crises, the European focus on research, innovation and entrepreneurship has increased, in order to reduce unemployment and secure a continued high quality of life. Demographic challenges, climate changes and increased global competition are other drivers of this increased attention. As a result, the EU Commission has presented the strategy Europe 2020 for smart, sustainable and inclusive growth.

To achieve these goals, the need for “smart specialisation” strategies is presented in the flagship initiative *Innovation Union* and in the implementation of the Cohesion Policy through the new Structural Funds 2014–2020. In the new programme period, the development of *Research and Innovation Strategies for Smart Specialisation (RIS3)* is expected to be an ex-ante condition for all the EU member states. The conditionality will apply specifically to the thematic objectives concerning strengthening research, technology development and innovation (R&I target) and enhancing the access to and use of quality of ICT (ICT target).

Objective and method

The objective of this paper is to explore the impact and early implementation of the new concept of “smart specialisation” in regional policy in the Nordic countries. The hypothesis is that many Nordic regions are already implementing strategies associated with “smart specialisation”, although the concept as such has not been used before. However, challenges may still remain that have to be addressed for continued learning and the efficient implementation of “smart specialisation” strategies.

The study was commissioned by the Nordic Working Group on Third Generation Regional Policy, initiated by the Nordic Council of Ministers. The review is mainly based on a previous literature review and desk research, with a limited number of supplementary telephone interviews to identify the relevant actors and measures. The study has also used empirical material developed in other Nordregio projects, for example on

green growth and innovation and the role of higher education institutions in the Nordic countries.

The concept of “smart specialisation”

Some important aspects of the strategy *Europe 2020* for smart, sustainable and inclusive growth concern the need for increased integration between innovation policy and other policy areas, a broad definition of innovations, including research-based and academic studies as well as experience-based and social or service innovations, and the need for collaboration between different types of actors, industrial sectors and policy levels.

During the last decade, various collaborative concepts have been introduced, e.g. clusters, triple-helix collaboration, innovation systems and open innovation platforms. However, many of these have been criticised for resulting in imitations and overly fragmented or overlapping investments. As part of the preparation of the new Cohesion Policy for 2014–2020, “smart specialisation” strategies were introduced to reduce these problems.

Smart specialisation strategies can ensure a more effective use of public funds and can stimulate private investment. They can help regions to concentrate resources to a few key priorities rather than spreading investments thinly across areas and business sectors. They can also be a key element in developing multi-level governance for integrated innovation policies. Moreover they have to be closely linked with other policy domains and require an understanding of regional strengths relative to other regions and the possible gains for inter-regional and transnational cooperation.¹⁾

The concept of “smart specialisation” was developed in the EU research and innovation policy framework by

1) European Commission (2010)

the expert group Knowledge for Growth²⁾ and has rapidly been implemented in EU policy. Even the original inventors of the concept have expressed their surprise.³⁾

Smart specialisation is a policy concept that has enjoyed a short but very existing life! Elaborated by a group of academic “experts” in 2008, it very quickly made a significant impact on the policy audience, particularly in Europe. Such a success story in such a short period of time is a perfect example of “policy running ahead of theory”.

However, translating this initially sector-based, place-neutral concept into place-based policy measures requires adaptation to regional contexts.⁴⁾ Depending on the type of region, the potential and implications for introducing policies for “smart specialisation” are very different. Some of the success factors that have been identified in various studies and discussions are the following:

- Broad definitions of innovation, combining technology and research-based innovation with, for example, user-driven, social and service innovation
- Use regional resources, infrastructures and competences (regional embeddedness) to develop the potential for competitive advantages in relation to other regions and nations
- Cooperative governance, combining strategic leadership (top-down) for prioritisation and monitoring/evaluation based on analysis and facts, with dynamic entrepreneurial processes (bottom-up), based on broad stakeholder involvement
- Prevent lock-in effects by diversification and collaboration between industries, sectors, clusters and disciplines (related variety)

- Avoid fragmentation and develop a relevant size (critical mass) by cross-regional and global linkages (connectivity)
- Support dialogues between local, regional, national and transnational levels (multi-level governance)
- Communication

To support national and regional actors in the process of developing Research and Innovation Strategies for Smart Specialisation (RIS3), the European Commission has established the S3 Platform in Seville, to provide various forms of support, e.g. in terms of information, seminars, peer reviews and guidelines providing six practical steps for designing national or regional RIS3.⁵⁾

1. Analysis – of the national or regional context and potential, in relation to other nations and regions
2. Governance – set up an inclusive structure and incentives for securing broad stakeholder involvement
3. Vision – produce a shared vision among stakeholders
4. Prioritisation – select a limited number of priorities for regional development
5. Policy mix – combine a mixture of policy measures and support them with road maps or action plans to secure implementation
6. Evaluation and monitoring – develop systems for continuous and evidence-based monitoring of the process and follow up on results and effects, in order to learn and revise the policy mix

Each step is presented in greater detail and illustrated with examples from the Nordic countries in the chapter entitled “Implementing ‘smart specialisation’”.

2) Foray, D., David, P.A. & Hall, B. (2009)

3) Foray & Ortega-Argilés, R. (2011)

4) Foray, D., David, P.A. & Hall, B. (2011); McCann, P. & Ortega-Argilés, R. (2011); S3 Platform (2012)

5) S3Platform (2012)

National and regional approaches to “smart specialisation”

Denmark

National approach

“Smart specialisation” (in Danish: “Intelligent specialisering”) is a concept that is particularly relevant to the Danish Business Authority, under the auspices of the Ministry of Business and Growth, which is the managing authority for the EU Structural Funds in Denmark. Moreover, it is a concept that needs to be taken into consideration by the six Regional Growth Fora responsible for creating regional business development strategies; monitoring regional and local growth conditions; and deciding on the allocation of regional development funds, including the EU Structural Funds, for projects in the five administrative regions and in Bornholm.

Within the framework of IQ-Net, which is a network of regional and national partners across the EU whose aim is to improve the quality of Structural Funds programme management through the exchange of experience,⁶⁾ a study was carried out on the issue of innovation and “smart specialisation” in Denmark during spring 2012.⁷⁾ Two representatives from the Danish Business Authority and two representatives from the Office for Business, Competence and Technology in the North Denmark Region were interviewed for the IQ-Net study. Both national and regional actors express some concern relating to the concept of “smart specialisation”. They note that one reason why Denmark has been strong in times of economic crisis has been the fact that there is flexibility in development strategies and Structural Funds programmes with great emphasis on innovation and entrepreneurship but less on specific economic sectors. There is an overriding concern on the part of both national and regional actors that “smart specialisation” will involve a “picking the winners” approach and more earmarking of funds, as opposed to the wider approach of supporting framework

conditions for innovation and entrepreneurship.

Regional approach

According to the Business Development Act of 2005, each Growth Forum shall develop regional business development strategies that are in compliance with the emphasis on the OECD growth drivers, which include a focus on innovation. The national-level priorities are further ensured through partnership agreements between the Government and each of the Regional Growth Fora. The six Growth Fora each have a business development strategy, and in most cases an action plan that guides the implementation of the strategy and is renewed every second year. The Growth Fora have not developed regional innovation strategies. However, innovation is a significant objective of the business development strategies and of the ERDF spending in the current Operational Programme, and thereby the business development strategies may also be considered as regional innovation strategies.

As introduced above, at the regional level, as well as at the national level, there are some concerns about the concept of “smart specialisation”. The EU office of Region Zealand published an article on the subject, which questions the strategy of focusing on particular sectors: “It is not clear how it can be avoided that specialised strategies will entail too much of a negative impact on firms which are outside of the areas of specialisation.”⁸⁾ Thus, the potential disadvantage of firms that are not within the areas of specialisation is stressed. The article also underlines the significance of the presence of many SMEs as drivers of economic growth in a given region, and the inherent risk of regions depending on the presence of one or a few large companies.

6) IQ-Net (2012)

7) Hviid, J.H. & Halkier, H. (2012)

8) Raundahl, N. (2011)

Finland

In Finland, innovation policy has national and regional, as well as local, dimensions. Innovation is seen as a multi-faceted whole, and during the last years, social, user-based and user-driven innovation has become a more important issue. In Finland, there has been a strong focus on innovation and specialisation in regional policy. According to a study conducted in relation to the IQ-Net network, there is quite good awareness in Finland about the risks related to “smart specialisation” and to the importance of not cementing old leading industries but concentrating on identifying new areas. Creative industries, culture and renewable energy are seen as such new industries with possibilities.⁹⁾

According to the IQ-Net report, the European Regional Development Funds (ERDF) programmes of all the Finnish regions have innovation as one of their priorities, even though they may focus on different parts of the innovation system. Post-2013, the focus on research, development and innovation (R&D&I) is likely to continue and even greater emphasis is expected to be placed on innovation. A memo published in June 2012 describes the focus areas suggested by the Ministry of Employment and the Economy for the Structural Funds programme 2014–2020. Within the field of innovation, it is emphasised that regional innovation and competence structures will be strengthened and applied research and user-based innovation encouraged. Applied science and research are also seen as a way to develop new methods of cooperation between firms, higher education institutions and secondary education institutions. In addition to developing the industry, it is considered important to search for new innovative ways to increase the profitability of the public sector and, for example, to come up with new innovative products and services to face the demographic challenges.¹⁰⁾ A new programme on innovative cities will also commence in 2014, putting further emphasis on strong and internationally attractive innovation centres.¹¹⁾

National approach

On the national level in Finland, “smart specialisation” (in Finnish: “älykäs erikoistuminen”) is considered to be an important means of promoting regional develop-

ment and innovation in the country. According to the Ministry of Employment and the Economy, the role of regions has increased continuously and the ability of regions to develop their competences, to specialise and to network regionally, nationally and internationally is increasing in importance. Competitive and functional regional innovation environments, according to the ministry, are recognised by the viable cooperation between businesses, universities and research institutions and science parks.¹²⁾

The guidelines for Finnish regional innovation policy are laid down in the *Government Decision on National Regional Development*. According to the Ministry of Employment and the Economy, regional innovation policy has mainly been implemented through the Centre of Expertise programme (CoE), TEKES regional strategy and regional Centres for Economic Development, Transport and the Environment.¹³⁾ However, in 2012, the Ministry of Employment and the Economy outlined a system of so-called *growth agreements* between the state and the biggest city regions and also prepared a new cluster programme on *innovative cities*, starting in 2014. The aim of the two measures is to strengthen the role of the bigger city regions in innovation and to increase their international competitiveness. The aim is to create new innovation centres in cooperation between the state and the city regions. In some cases, smaller city regions can be involved in growth agreements via city networks but the main focus is on stronger city regions.¹⁴⁾

The new programme on innovative cities will partly replace the former CoE programme but the focus will shift towards bigger city regions, in order to respond to global challenges and competition by supporting and creating fewer and stronger innovation centres. It is stated that the programme will support the cities in their specialisation. The aim is to accumulate high competences in certain strategically chosen innovation themes and to support synergies between regional and national measures. The state and participating city regions should work together to create internationally competitive and attractive innovation projects. Also, cooperation between businesses and the public sector is emphasised. It is of special importance for the programme that the chosen cluster activities are based on market demand or demand based on big societal challenges.

9) IQ-Net (2012)

10) Ministry of Employment and the Economy (2012a)

11) Ministry of Employment and the Economy (2012h)

12) Ministry of Employment and the Economy (2012b)

13) Ministry of Employment and the Economy (2012c)

14) Ministry of Employment and the Economy (2012i)

The Finnish *Regional Development Strategy 2020*¹⁵⁾ and strategy document *Innovation Targets for 2012–2016*¹⁶⁾ both consider regional specialisation as an important means to promote regional development and innovation. The *Regional Development Strategy 2020* aims at Finland having its own specialised role in the global economy in 2020 based on regional competences and continuous development. In the *Innovation Targets 2012–2016* strategy, the Ministry of Employment and the Economy sets the creation of high-level innovation centres as one of its most significant goals. The aim is to create strong thematic and regional innovation concentrations. Other aims include deepening the cooperation between enterprises, educational institutions and research communities and directing EU Structural Funds programmes to support the *Europe 2020* strategy by emphasising cooperation and strengthening competence structures.

According to the Ministry of Employment and the Economy, the objectives of the EU *Innovation Union* initiative are well in line with the Finnish innovation policy and the new *Horizon 2020* programme of the European Union is seen as a good opportunity for increased internationalisation.

Regional approach

“Smart specialisation” or regional specialisation is included to varying extents in the strategies of the Finnish regions. Six Finnish NUTS 3 regions (Etelä-Pohjanmaa, Kainuu, Lappi, Päijät-Häme, Pohjanmaa and Satakunta) and two Finnish cities (Tampere and Oulu) have joined the EU initiative S3 Platform. Most other regions also have activities and goals related to “smart specialisation” themes, even when the concept is not explicitly used.

All the Finnish regions have already developed regional innovation or technology strategies. There are also various kinds of cross-regional strategies both on innovation in general and on development and innovation in specific sectors. The innovation strategies are drawn up by the regional councils at the regional level (NUTS 3) or in cooperation between regional councils to cover NUTS 2-level provinces. For example, the regional councils in the province of Eastern Finland have published a common programme on bioenergy

development. The contents of the innovation strategies vary, and according to the Research Institute of Finnish Economy, Finnish regions have been rather successful in identifying their cross-cutting competences. However, they have had difficulties in formulating their thematic business strategies. Some regions have strongly emphasised the need to “productise” new working methods in innovation systems, while others have been more dependent on more traditional business service concepts.¹⁷⁾

Related to “smart specialisation”, the Centre of Expertise programme has been of significant importance for the Finnish innovation system at the regional level. It has been implemented by regional Centres of Expertise throughout Finland and it has helped the centres to network and cooperate with other centres that belong to the same or different clusters within the programme. The projects implemented in the programme aimed at strengthening the competitiveness of the participating companies, strengthening and renewing the competence and knowhow in the region, creating new business activities and promoting the generation of new creative innovation environments.¹⁸⁾ According to the IQ-Net thematic checklist, it was largely accepted and seen as a norm to base regional innovation policy on clusters and the policy is commonly seen as functioning well.¹⁹⁾

In a proposition from a working group of the Ministry of Employment and the Economy, it is argued that the CoE programme has been more advantageous for smaller regions, whereas its significance for stronger regions and bigger cities has been decreasing since the 1990s. It has been decided that the CoE programme will not be continued post-2013. In the new *Innovative Cities* programme, smaller regions will be able to cooperate with the cities that participate in the programme, but they cannot become full members of the new clusters. This has caused some concern among smaller regions regarding their potential for future collaboration.²⁰⁾ Structural Funds will be used to promote networking between the innovations centres of the *Innovative Cities* programme and smaller regions in order to spread knowledge and develop innovation activities.²¹⁾

15) Ministry of Employment and the Economy (2010a)

16) Ministry of Employment and the Economy (2011)

17) Research Institute of the Finnish Economy (2009)

18) Ministry of Employment and the Economy (2012d)

19) IQ-Net (2012)

20) Olsen, L. S. (Ed.) (2012)

21) Ministry of Employment and the Economy (2012h)

Iceland

Iceland, with a total of fewer than 320,000 inhabitants, is smaller than many European NUTS 2 regions. The Icelandic governmental structure has only two official administration levels, the national (state) level and the local (municipal) level and the term “region” does not represent an official administrative level. Therefore, policy making for innovation and economic development is dominated by the national level.

The Icelandic policies on innovation share a focus on research-driven innovation and enhancing knowledge transfer from research to industry and society. The two main policy documents are *Iceland 2020* and *Building on Solid Foundations*, published by the Prime Minister’s Office²²⁾. In the aftermath of the latest economic and social crisis, smart R&D and innovation (RDI) are believed to be an important part of the process towards economic recovery and future economic development in Iceland. Icelandic policy makers have attempted to minimise the effects of the budget cuts (by on average 10–15%) in RDI and education/training. The competitive research funds were, for example, partly sheltered from cuts.

The concept of “smart specialisation” has not been formally introduced, but the *Iceland 2020* reform programme involves great emphasis on both smart growth and sustainable growth, including innovation, R&D and improved skill levels, as well as knowledge economy developments, SME and ICT utilisation. There is also great emphasis on clustering and utilising green energy for knowledge economy developments, for example data centres.²³⁾

National approach

The *Iceland 2020* reform programme heavily emphasises increasing the R&D and innovation sectors. The Science and Technological Policy Council (STPC), under the Office of the Prime Minister, is responsible for the design and coordination of research and technology policy in Iceland. The role of the STPC is to promote scientific research and research training and to encourage technological progress in Iceland. Innovation, funding of excellence and internationalisation are recognised as important challenges for RDI policy. The STPC has presented a new *Science and Technology Policy* for Iceland for 2010–2012. The main themes of the strategy are a focus on innovation and close industry support, creative industries and user-driven innova-

tion; more cooperation and synergy among the various universities, research institutions and other actors in the system; evaluation and quality control; international cooperation and participation in international programmes; and funding on the basis of excellence and thus competition.²⁴⁾ According to a recent report on Iceland from PRO INNO EUROPE, the SPTC has become more prescriptive in this strategy, compared with previous declarations and strategic position papers reflecting the empowerment of the Council as a policy-setting body.²⁵⁾

There is close collaboration between the STPC and the Icelandic Centre for Research (RANNÍS), part of the Ministry of Education, Science and Culture. RANNÍS assists in the development and implementation of science and technology policy in Iceland, by serving as a policy advisor. It supports research, research studies, technical development and innovation, administers competitive funds and strategic research programmes, coordinates and promotes Icelandic participation in collaborative international projects, monitors resources and performance in R&D and promotes public awareness of research and innovation in Iceland.

Innovation Centre Iceland (ICI) is the main public actor with regard to technology transfer and the provision of advisory services to industry. ICI works within diverse fields of research, such as nanotechnology, renewable energy and concrete rheology. The centre has set up a semi-independent unit, IMPRA, which operates an incubator and assists entrepreneurs in the start-up, growth and management of SMEs working on innovative business ideas. IMPRA also runs an Enterprise Europe Network office (EEN) to encourage cooperation between Icelandic and European companies. Another unit within ICI is the Iceland Living Lab (LL), with a focus on the process of innovation in close contact with users, industry, universities and manufacturers of products and services for the public and private sectors. The Living Lab, if well developed, is expected to shorten the development and testing of new ideas and to allow different parties to plug into the process.²⁶⁾

Even though the concept of “smart specialisation” has not been used, the *Science and Technology Policy* contains several of the elements of such a strategy. More evaluation is requested, greater focus will be put on competitive funding in order to increase excellence and fund only the best, and non-technological support and innovation are considered to be major steps ahead.

22) Norden (2012a)

23) Prime Ministers Office (2011)

24) Rannis (2012)

25) PRO INNO EUROPE (2011)

26) <http://www.een.is/um-een/>

Iceland has also introduced a tax reduction scheme for R&D projects in businesses and there is an increasing emphasis on clusters in promising sectors. One example is geothermal activity, in which Iceland has strong potential and a great deal of know-how. Finally, there is increasing awareness of the importance of the potential power of the Government as a purchaser of innovative solutions. Despite this, there are remaining challenges related to the need for prioritisation of innovation and the development of clear growth strategies based on innovation; mobilisation and concentration of sufficient critical mass (in terms of funding and governance power); and listening to and working closely with the many entrepreneurial and creative initiatives in “the field” in order to coordinate and facilitate new developments. There is an ongoing debate about the efficiency, the effectiveness and the socio-economic results of public funding for research and innovation, and discussions on how this funding could benefit Icelanders in their daily life have taken place in so-called “open forums”.

Regional approach

Regional growth agreements have been developed through a bottom-up approach between national government, businesses, local authorities, regional development agencies, universities and other interest groups. The growth agreements clearly reflect the Government’s emphasis with regard to industrial development, SME and innovation policy, as well as competitiveness policy at the regional level. Growth agreements have been introduced for seven rural districts outside the capital region. The main emphasis is on local economic development and innovation through a cluster methodology. This is the first (public) initiative for a cluster policy in Iceland, promoting the active participation of local SMEs, while also involving regional and external universities, research organisations and businesses in line with the triple-helix approach. There are eight *Regional Development Centres*, responsible for implementing the regional growth agreements, and the national coordination is administered by IMPRA.

In early 2010, national assemblies (*open forums*) with the participation of inhabitants, interest groups and representatives from the local municipalities were arranged in each of the eight regions. The meetings aimed at identifying potential opportunities in the fields of employment, education and public services in each region. The conclusions revealed that the eight regions had a lot more in common than they had differences. Most regions emphasised the uniqueness of their tourism services and the development of research and knowledge centres. These emphases also emerged in the regional growth agreements, in which the regional

proposals could be grouped under six main themes: tourism services related to nature and culture, health and well-being, “pure” food and water, finished food products, knowledge and research centres, and the use of renewable and eco-friendly energy (e.g. hydropower and geothermal energy).

The main strategic effort to stimulate cooperation between higher education institutions and the surrounding society at the regional level are the nine *Regional Research Centres* of the University of Iceland. The research centres are managed by the Institute of the University of Iceland’s Study Centres, a research and service institution that reports to the University Council. The institute is the focal point for the university’s cooperation with local authorities, institutions, businesses, associations and individuals in rural areas. The objectives of the institute are to provide facilities for research in rural areas, increase the access of the general public to education and strengthen the relationship between the University of Iceland and the business community.

Norway

As a non-EU member state, Norway does not formally have to relate to the ongoing European discussions concerning the implementation of “smart specialisation” strategies. Still, as a Nordic country with close collaboration with other EU member countries, the concept has attracted attention at the national as well as at the regional level.

Norway is a country with a tradition of strong regional policy, as the Government has clearly stated a desire to preserve the main settlement patterns in all the regions of the country. Regional responsibility for economic development and innovation has increased during the last decade. In 2003, the 19 regional county councils received responsibility for regional development funding and were required by the national authorities to present regional development plans and to establish regional partnerships. The role was further strengthened in 2010, when the regional county councils received a 49% share of Innovation Norway, the national authority for innovation and business development. Since 2002, legislation for higher education institutions has been encouraging the increased cooperation of universities and university colleges with society. This ambition has been supported by several cluster and collaborative programmes, run by national authorities and implemented by regional actors, and by the establishment of seven regional research funds in 2010.

National approach

At the national level, the Ministry of Education and Research (KD) and the Ministry of Local and Regional Development (KRD) have three national authorities that implement national policy concerning regional development, research and innovation. SIVA, the Industrial Development Corporation of Norway, is responsible for developing strong regional and local clusters through ownership of infrastructure, investments and knowledge networks, as well as incubators, science parks and innovation centres. The Research Council of Norway (RCN) has the responsibility for basic and applied research, including the responsibility for the Regional Research Funds (RRFs). The Council has representation in 13 regions, with relevant competences to provide information to regional clusters, business and research, in order to mobilise regional research and innovation. The RRFs were established in 2010 in order to stimulate innovation and business development by strengthening regional R&D and collaboration between business and higher education and research institutions. This was also expected to increase research quality and the development of competitive R&D environments at the regional level.

A large share of regional funding is channelled through Innovation Norway (IN), responsible for regional development and innovation, by stimulating entrepreneurship, business growth and internationalisation. IN has regional offices and about 30 foreign support offices around the world. It provides funding (e.g. loans, credit, R&D contracts and tax incentives for SME research collaboration, SkatteFUNN), business support (e.g. advisory services, mentor programmes and cluster development) and internationalisation support (e.g. advice, competence development and export support).

The three authorities manage a number of national programmes affecting regional innovation potential, such as VRI (*Virkemidler for regional FoU og innovasjon*) supporting research and innovation at the regional level, the Norwegian Centres of Expertise programme, concerned with establishing strong research environments, and the Arena programme, stimulating regional cluster development. All the programmes are co-funded by the ministries, but administered by national agencies and implemented at the regional level.

Regional approach

The regional level of responsibility for economic development and innovation in Norway is high. In response to the national requirements, regional county councils regularly present *regional development plans*, implemented through partnership collaboration between

stakeholders from different sectors. Further, many national programmes are implemented at the regional level. The specific regional boundaries vary between different programmes. For the implementation of the VRI programme, 15 so-called VRI regions covering all 19 counties (fylken) were developed. When the Regional Research Funds (RFFs) were initiated in 2010, it was decided that seven RFFs were to be administrated in collaboration with actors from two to four counties, based on regional R&D strategies.

In terms of “smart specialisation”, some regions have started to take initiatives to increase the knowledge about the concept. One example is the seminar *Achieving Smart Specialisation via Territorial Cooperation*, arranged by the South Norway European Office, and another the participation of representatives from Nordland Fylke in Nordic seminars arranged by Nordregio. There are, however, no Norwegian regions participating as members in the S3 Platform in Seville or in the OECD TIP project on “smart specialisation”.

Overall, this indicates that regional actors in Norway over the year have come to take increased responsibility for research and innovation. According to Inger Midtkandal from the Seville S3 Platform, the Norwegian experience of regional innovation and research initiatives, e.g. VRI, NCE, Arena and RFF, means that the Norwegian regions have come far compared with many other European regions in terms of regional partnerships, prioritisation of sectors, knowledge development and the implementation of various policy measures.²⁷⁾ As a result, stakeholder involvement has evolved and many components of “smart specialisation” seem to have been applied, even if the concept has not yet been formally adopted.

Sweden

In Sweden, “smart specialisation” (in Swedish: “Smart specialisering”) has started to receive increased attention, mainly in relation to the implementation of the *Europe 2020* strategy for smart, sustainable and inclusive growth. Since the concept may have an important role in future European Cohesion Policy, it has been addressed by both national authorities and regional stakeholders. However, even though the concept has not been applied before, many initiatives have been taken to support activities in line with the ambitions of the “smart specialisation” strategies.

During the last decades, innovation has increasingly entered the spotlight, as Swedish regional policy has

27) Interview and working documents from Inger Midtkandal, Seville S3 Platform and former VRI programme manager

shifted from regional redistribution to regional development and now to regional growth. National initiatives have been taken to encourage regional actors at the county level (NUTS 3) to develop regional innovation strategies and to create competitive platforms for competence development. All counties are also required to develop *regional development plans or strategies* (RUP/RUS) on a regular basis. Further, higher educational institutions have been encouraged to increase their collaboration with the surrounding society (the third mission) and eight regional innovation offices have been established. Over the last decade, there have also been several national programmes to stimulate economic growth through increased collaboration between public sectors, business and academia (triple helix). As a result, the responsibility for innovation is to an increasing extent decentralised to the regional level.

National approach

During 2009, national agencies and business organisations initiated *Innovation for Growth*, a process to mobilise national and regional actors and provide input to a future national innovation strategy. In 2010, Sweden adopted a national services innovation strategy, and in 2011, the Government initiated a broad process to develop a *Swedish innovation strategy*, led by the Swedish Ministry of Industry, Energy and Communication. During this process, the concept of “smart specialisation” was introduced at seminars and during dialogues with various stakeholders. The strategy was launched in October 2012, but “smart specialisation” was not formally introduced. Still, the strategy contains many of the elements of a “smart specialisation” strategy, including a broad definition of innovation, an analysis and prioritisation based on global challenges, and broad stakeholder involvement. Even though there is no formal decision as yet, it is likely that the expected ex-ante condition of the new Cohesion Policy 2014–2020 to develop *Research and Innovation Strategies for Smart Specialisation (RIS3)* will be implemented at a national, rather than a regional level. The main reasons for this are first, the relatively short time span for developing regional governance processes based on broad stakeholder involvement and second, an ambition to reduce the level of bureaucracy of the regions to fulfil any agreements made directly with the EU Commission.

The role of the Swedish Agency for Economic and Regional Growth (Tillväxtverket) is to strengthen regional development and facilitate enterprise and entrepreneurship throughout Sweden. Tillväxtverket is also

the managing authority for the *European Regional Development Funds* (ERDF), supported by eight regional offices. Since the implementation of RIS3 is likely to have an impact on the Regional Operational Programs (NUTS 2) in the new programme period 2014–2020, the agency has invited representatives from the EU Commission to present the concept at information meetings. There is also an explicit ambition to integrate the concept into the new national programme for *Regional Innovation and Clusters*. In November 2012, a call was made for regions to apply for funding for mobilising regional actors for the development and implementation of RIS3.

The mission of the Swedish Governmental Agency for Innovation Systems (VINNOVA) is to promote sustainable growth by improving the conditions for innovation, as well as funding needs-driven research. VINNOVA is for example managing programmes on strategic research and innovation agendas and challenge-driven innovation (e.g. health care, sustainable cities, innovation society and competitive production). VINNOVA has also addressed “smart specialisation”. At various seminars and conferences, the agency has presented an ongoing analysis project to map important research and technology-based sectors in Sweden. This *mapping* is expected to provide national and regional stakeholders with important analysis input for future prioritisations and the implementation of various policy measures. The concept is also closely related to the *VINNVÄXT* programme, for the development of regional innovation systems. In the new call for 2013, the relation to “smart specialisation” and regional innovation strategies is referred to explicitly.

Regional approach

All the Swedish regions at the county level (NUTS 3) are required to develop *regional development plans or strategies* (RUP/RUS). Most of these plans or strategies include activities concerning competence, entrepreneurship and innovation, but many also include prioritisations of economic sectors, clusters or innovation systems. The Swedish counties have also been encouraged to develop regional innovation strategies and several regions have initiated such processes. Today, the counties of Skåne, Västra Götaland, Gävleborg and Stockholm have launched their strategies, while others are in the process of developing or launching them, e.g. Östergötland and Örebro.

However, there is still some uncertainty regarding whether the eight NUTS 2 regions in Sweden will be requested to develop RIS3 as an input for the new Structural Funds programmes or not. In order to in-

crease their understanding of “smart specialisations” and the potential for including the concept in their regional innovation strategies or regional development programmes or strategies (RUP/RUS), the regional authorities of Västra Götaland, Skåne and Västerbotten are members of the EU initiative *S3 Platform* in Seville. Västra Götalandsregionen (VGR) is also participating in the OECD project *TIP Work on Smart Specialisation*, focusing on analysis and knowledge development to

support “smart specialisation”. Most Swedish regions have participated in a series of seminars on *smart regions*, arranged by Reglab. This is a collaborative initiative between regional and national authorities, with an ambition to stimulate knowledge development and the exchange of experience concerning regional development issues by arranging meetings and initiating joint analysis projects.

Implementing “smart specialisation”

In this section, the national and regional approaches to “smart specialisation” in the Nordic countries are analysed, using the six-step model for developing *Research and Innovation Strategies for Smart Specialisation (RIS3)*, presented by the Seville S3 Platform. The presentation does not claim to be complete, but is rather an illustration of ongoing activities in line with the new concept. For each of the six steps, some remaining challenges for Nordic actors are summarised.

Step 1 – Analysis of the regional context and potential for innovation

The first step in developing a *Research and Innovation Strategy for Smart Specialisation (RIS3)*, according to the S3 Platform guidelines, is to make a sound analysis of the regional economy, society and innovation structure. The analysis should include an assessment of regional assets, often based on a combination of SWOT analysis (strengths, weaknesses, opportunities and threats) and other tools, to identify the regional potential for economic differentiation and exploitation of related variety. The main idea is to apply a broad definition of innovation and build competitive advantages by combining unique assets and competences in an innovative way, often in the interception between existing clusters, sectors or disciplines. However, it is also important to analyse regional potential in relation to other regions – nationally as well as globally – and to map linkages and flows of goods, services and knowledge across the world. Finally, “smart specialisation” requires a dynamic entrepreneurial environment, involving entrepreneurs of various kinds, e.g. individuals, firms and other organisations, in the strategy design process.

Regional analysis

In most Nordic regions, there is well-developed experience to undertake regional SWOT analysis and other types of regional analysis as input for prioritisation and the development of strategic documents, such as regional development plans, business development plans

and regional innovation strategies.

During the last decade, various collaborative development plans or strategies have been developed in the Nordic countries. In Sweden, for example, the Government has required regional authorities at the county level (NUTS 3) to develop such strategies, e.g. the former regional growth agreements (RTA), regional growth programmes (RTP) and, most recently, regional development plans or strategies (RUP/RUS). To facilitate regional analysis and benchmarking across Swedish regions, the Swedish Agency for Economic and Regional Growth (Tillväxtverket) invested in the development of a regionalised database and prognosis systems (rAps), run by the National Bureau of Statistics.

The regional councils of each Finnish NUTS 3 region also conduct their own analysis in relation to their regional development strategies, plans and programmes. For example, SWOT analysis can be used in order to identify the main competence areas of the region. In order to draw up innovation strategies and development programmes for specific sectors, separate analyses are conducted. Also, the Centres for Economic Development, Transport and the Environment typically follow the development of the regions and publish various kinds of report related to, for example, the economic development in different sectors.

Another example of analysis measures is the regional foresights funded by the Norwegian VRI programme, supporting a regional participant-based process to understand future challenges and develop a regional agenda for R&D and innovation.

Analysis in collaboration

In Denmark, regions can find support in analysing their relative position compared with other regions in the country through their membership of REGLAB. This is Denmark’s largest network for organisations working in regional economic policy, with about 100 members counting Danish regions, municipalities, universities, colleges, business advice centres, regional innovation organisations, companies, etc. REGLAB was initiated in 2004 and is a non-profit, non-political association, which regularly hosts seminars, work-

shops and conferences with a focus on current topics, bringing together its different members. Another important task of the organisation is to carry out regional analyses, which most often concern good practice from Denmark and beyond and result in policy recommendations. The analyses are disseminated within and outside the REGLAB network. REGLAB's vision is as follows:

*REGLAB is an important knowledge bank for organisations working for regional economic development. REGLAB is aiming to influence the agenda in discussions on future regional economic development policy.*²⁸⁾

In relation to “smart specialisation”, many Swedish regions are participating in an ongoing seminar series on smart regions, arranged by the joint analysis platform REGLAB in Sweden. The platform was initiated in 2009 by national agencies and Swedish regions, with inspiration from Denmark.

There are also collaborations at the international level. Three Swedish regions, Skåne, Västra Götaland and Västerbotten, six Finnish regions, Kainuu, Päijät-Häme, Pohjanmaa, Satakunta, Lappi and Etelä-Pohjanmaa, and two Finnish cities, Tampere and Oulu, are members of the Seville S3 Platform and have taken part in various activities, such as seminars and peer reviews. The Swedish region of Västra Götaland and the Finnish region of North Karelia and the Finnish sub-region of Lahti are also participating in the OECD TIP project on “smart specialisation”.

National analysis support

At the national level, the Swedish agency VINNOVA has offered support for regional analysis and discussions, based on an ongoing mapping of Swedish innovation systems in a national and international context. So far, results have been presented for the life science and automotive sectors. These two projects have been run in close collaboration with regional partners in Västra Götaland, who argue that this has represented an important input to their analysis activities. During 2012, mappings will also be provided for the maritime sector, mining/mineral, chemistry and steel/metals. During 2013, analysis will be presented for pulp/paper and the energy sector.

In Finland, the strengths of regional innovation clusters in 2012 were analysed in a report published by the Ministry of Employment and the Economy. The report aims at making it easier to compare the profiles

of different innovation clusters as well as to develop a methodology for producing a more comparable picture of their competences. It has a special emphasis on new indicators, especially related to networking, internationalisation and human capital.²⁹⁾

Challenges: How can regional analysis be developed to provide better opportunities for cross-regional benchmarking and collaborations – nationally and globally?

Step 2 – Governance: ensuring participation and ownership

The second step in the process of developing RIS3 is to ensure broad stakeholder involvement and ownership of the strategy. According to the S3 guidelines, a wide view of innovation implies that stakeholders of different types and at different levels should participate in the strategy design process. This argues for development from the traditional so-called triple-helix collaboration (industry, academia/research and policy actors) to quadruple-helix participation, also including innovation users, consumers and non-profit organisations representing citizens and workers. However, there is still a need to moderate the process and to formalise the governance structure, for example in a steering group and thematic working groups.

Horizontal and vertical collaboration

In Sweden, there have been some national initiatives to stimulate horizontal and vertical collaboration on innovation between actors over the last decade. At the national level, the Government supported collaboration between the three national agencies VINNOVA and the former agencies Nutek (Agency for Economic and Regional Growth) and ISA (Invest in Sweden Agency) on cluster and innovations systems development in the joint Visanu programme, running from 2003 to 2005. In 2007, the national strategy for competitiveness, entrepreneurship and employment 2007–2013 was presented by the Swedish Government as a guideline for the regional development plans or strategies (RUP/RUS) and the regional Structural Funds programmes (ERDF and ESF). One ambition was to coordinate various policy areas and increase the cooperation between the local, the regional and the national level. For the next programme period, a new national strategy will be presented, in parallel with the new na-

28) <http://reglab.dk/english>

29) Ministry of Employment and the Economy (2012e)

tional innovation policy, developed in collaboration between national and regional stakeholders.

In Norway, three national agencies, NRC, Innovation Norway and SIVA, have for several years run two programmes, Arena and NCE, in collaboration.

Broad stakeholder involvement

In Norway, there is a strong tradition of collaboration for research and innovation. The Norwegian VRI programme was introduced in 2007, based on previous experience from other programmes, mainly MOBI (Mobilisation for R&D-Based Innovation) and VS2010 (Value Creation 2010). The VRI programme was launched during a period in which the Government was in the process of introducing administrative reform in Norway, giving the counties increased responsibility for R&D. It was an experimental programme focusing on collaboration and administrative forms, including new divisions of responsibilities between national and regional levels. Today, the regions provide regional strategic documents and research strategies in broad collaborative processes, with competence and support from the regional representation of national actors, e.g. Innovation Norway and NRC.

In Sweden, the triple-helix model of collaboration has been explicitly implemented since the establishment of VINNOVA in the early 2000s. Collaboration between actors from various sectors has been a pre-condition for funding from the national cluster and innovation systems programme. For designing and implementing the European Structural Funds 2007–2013, eight Swedish regions (NUTS 2) were formalised to develop operational programmes for the ERDF. These programmes were to be developed and implemented in regional partnerships, including actors from different sectors, e.g. business, public sector, universities and non-profit organisations.

Today, several Swedish regions have introduced a process of stakeholder involvement into their regular regional development activities. In Värmland, for example, there is a regular dialogue on regional development issues between representatives of public actors (Region Värmland and Länsstyrelsen), Karlstad University and prioritised cluster organisations. In Skåne, stakeholder involvement is illustrated by the establishment of FIRS (Research and Innovation Council of Skåne) and SIS (Sounding Board for Innovation in Skåne) as the owner of the recently developed international innovation strategy of Skåne.

The Regional Growth Fora in Denmark, which are in charge of developing regional business development strategies, have existed since 2007. Each of the

six Growth Fora has approximately 20 members representing the business community, knowledge and education institutions, business and labour organisations, municipalities and the region.

All Finnish regions are obliged to draw up long-term and medium-term development strategies, as well as short-term strategies for implementing the goals identified in the long- and medium-term strategies. The strategies and programmes are according to the regional development law to be prepared in cooperation with national authorities, municipalities and communities that participate in regional development.³⁰⁾ Interaction with different stakeholders is in most cases an important part of the process. For example, higher education institutes and municipalities participate in strategy development. For example, when the *Innovation Strategy 2009–2015* of Päijät-Häme region was drawn up, the work included representatives from Lahti Science and Business Park, the Regional Council of Päijät-Häme, LUT Lahti School of Innovation, Lahti University Consortium, Lahti School of Applied Sciences Innovation Centre and the Centre for Economic Development, Transport and the Environment of Päijät-Häme Region.³¹⁾

Finnish regions also use different ways to activate citizens to participate. One example is the Regional Council of Varsinais-Suomi, which initiated an online discussion and information forum when its latest regional development programme was set up. The Regional Council of Päijät-Häme has published a plan for online stakeholder involvement and evaluation of the strategy in which it states that four to five discussion events will be organised in the preparation stage and that during the actual strategy work representatives from Lahti Science Park, the municipalities, the Regional Councils of Häme and Uusimaa, higher education institutes in the region as well as other regional authorities will be participating.³²⁾

The ERDF and ESF operational programmes in Finland are coordinated at the NUTS 2 level, but administered by regional councils (NUTS 3) and Centres for Economic Development, Transport and the Environment. Regional councils co-ordinate their regional programmes so that they are in line with the NUTS 2-level programmes. In addition, each of the regional councils is obliged to set up a regional management committee that coordinates the strategic whole of all the different development strategies. The management

30) Laki alueiden kehittämisestä (2009)

31) Regional Council of Päijät-Häme (2012a)

32) Regional Council of Päijät-Häme (2012b)

committee must consist of representatives from the regional council and its member municipalities, national-level authorities and organisations relevant to regional development (such as labour unions, trade unions, other organisations representing civil society, environmental organisations and gender equality organisations).³³⁾ Post-2013, the role of the regional management committees in choosing suitable projects is expected to be strengthened.³⁴⁾

Challenges: What can regional actors undertake to secure a broad stakeholder involvement, involving for example civil society and SMEs? How can synergies between regions and between actors at different levels be supported?

Step 3 – Elaboration of an overall vision for the region

To have a clear vision, with the main goals of the regional development, which is shared by all the stakeholders, is important to secure stakeholder involvement. It is of great importance to communicate this vision, both during the RIS3 design process and during the implementation of the strategy. The vision becomes particularly important in guiding regional prioritisation, in the next step of the RIS3 model.

National visions

In Iceland, strategies for “smart specialisation” are to be implemented at the national, rather than at the regional level. The *Iceland 2020* policy statement, published by the Prime Minister’s Office, is a vision for the future, developed through dialogue and collaboration between hundreds of Icelanders throughout the country and in consultation with regional associations, local authorities, trade unions and economic interest groups. These meetings and projects were carried out under the umbrella of the initiative *Moving Iceland Forward*. The policy statement presents 30 actions and tasks that are designed to be the first steps towards reaching the goals of *Iceland 2020*. One of the most important tasks will be the investment plan for the development of infrastructure, employment, human resources and society. In relation to R&D and innovation, the policy document *Building on Solid Foundations*, published by the Science and Technology Policy Council (STPC), summarises an approach towards innova-

tion that is closely correlated with the expectations of “smart specialisation” strategies:

Increased support to research-driven innovation and interdisciplinary cooperation between the private and public sectors at national and international levels provides opportunities for increased value creation and sustainable prosperity.

According to the vision in the national *Finnish Regional Development Strategy*, Finnish regions will have specialised and the development gaps between regions will have decreased by 2020. The regional specialisation will have increased the critical mass of knowledge and competence in the regions and improved the ability of the regions to take part in significant networks. Different regions will have different specialised roles in the national economy and each region will follow development strategies and policies that take specific regional circumstances into consideration. In the *Regional Development Strategy 2020*, it is clearly stated that the regions’ ability to succeed is dependent on their ability to specialise, develop their core competences and specialist areas, and create strong and functioning networks between the core actors in the region. The success of the specialised regions is also dependent on the ability and willingness of the regions to become engaged in networks – both nationally and internationally.

The current national innovation strategy of Denmark, with the title *Strengthened Innovation in Firms*, addresses the objective that firms in Denmark will be among the most innovative in the world by 2020.³⁵⁾ The action plan *Innovation Denmark 2010–2013: Knowledge to Firms Creates Growth* encourages firms, especially SMEs, to increase their research and development efforts and become more focused on innovation.³⁶⁾ On 20 December 2012, the Government will launch a new national innovation strategy that intends to support better utilisation of sources for innovation, such as research-based knowledge and a well-educated workforce, to support the innovation potential of firms and public authorities. The overall vision of the innovation strategy is: “Denmark will be the country of solutions, where innovative solutions for major societal challenges will be turned into growth and employment.”³⁷⁾

The new *Swedish Innovation Strategy* presents a vision for Sweden, stressing the importance of involving innovative individuals, companies, public actors and

33) Laki alueiden kehittämisestä (2009)

34) Etelä-Savon ELY-keskus (2012)

35) Danish Government (2010)

36) Danish Council for Technology and Innovation (2010)

37) Ministry of Science, Innovation and Higher Education (2012)

regions, to solve global challenges, to create value, to increase competitiveness and to attract competence and partners from all around the world.

Regional vision

At the regional level, each regional council in Finland sets up its vision for more specific programmes and strategies related to themes such as innovation, competitiveness or specific economic sectors, e.g. bioenergy. The visions and strategies are drawn up by the regional councils but the aim is usually also to include higher education institutes and relevant firms. Sometimes specific strategies and programmes can also be drafted in cooperation with other NUTS 3 regions. For example, two regions in Eastern Finland (South Savo and North Savo) are currently undergoing the process of setting up a shared climate programme. All Eastern Finland regions also have a common bioenergy programme for which they have identified the strengths and potential of each region within the bioenergy sector.

In Sweden, most *regional development plans or strategies* (RUP/RUS) or innovation strategies developed by regional authorities contain a vision. The overarching vision of the *International Innovation Strategy for Skåne*, for example, is to be “Europe’s most innovative region in 2020” and the vision of the *Regional Development Program of Västra Götaland* is “Vision Västra Götaland – the good life”. To implement these visions, a number of different activities have been identified.

Challenges: How can a vision be specific and realistic enough to function as support for regional prioritisation?

Step 4 – Identification of priorities

An important aspect of RIS3 prioritisation is the efficient match between a top-down process of identification of broad objectives and a bottom-up process of broad participation and entrepreneurial dynamics in developing candidate niches for “smart specialisation”. The idea is to conduct a prioritisation of a limited number of realistic innovation and research priorities. The main argument is to avoid traditional criticism of fragmentation, duplication and under-critical investments in too many competing cluster, sectors or initiatives, resulting in too much competition between regions. Still, it is argued that prioritisation does not have to focus on specific economic sectors, but could also involve horizontal-type priorities, such as the diffusion

and application of key enabling technologies (KET) and social or organisational innovations.

International level

At the EU level, several initiatives have been taken to support research and innovation in prioritised sectors. One initiative is the European Institute of Innovation and Technology (EIT), established as a body of the European Union in March 2008. Its mission is to increase European sustainable growth and competitiveness by reinforcing the innovation capacity of the EU, by supporting the development of innovators and entrepreneurs. To do so, knowledge and innovation communities (KICs), which link higher education, research and business sectors to one another, have been established with a focus on the following priority topics with high societal impact: climate change mitigation (Climate-KIC), information and communication technologies (EIT ICT Labs) and sustainable energies (KIC InnoEnergy). Today, Swedish partners are active in two of those, and Finnish partners in one of them.

National level

At the national level, a number of initiatives have been taken to stimulate national research and innovation in specific sectors over the last decade. During the last years, there has been an increased focus on initiatives to address large societal problems. In Finland, the national level has prioritised 13 national competence clusters (e.g. in nanotechnology, clean tech, and tourism and experience), which have been implemented by 21 regional Centres of Expertise. From 2014, the focus will shift towards having fewer prioritised areas with stronger actors and better international competitiveness and a maximum of 12 propositions will be accepted for the programme. In Norway, Innovation Norway has prioritised the following sectors, based on an overall evaluation of societal need and challenges for the Norwegian business sector: health care, energy and environment, agriculture, seafood, the maritime sector, gas and oil, and tourism. The Norwegian Research Council runs seven so-called “large-scale programmes”, focusing on research to promote biotechnology (related to the implementation of the national strategy for biotechnology in the agricultural, marine, industrial and health sectors), aquaculture, nanotechnology and advanced material, climate change, utilisation of petroleum, clean energy systems and ICT.

As a consequence of the latest *Government Bill on Research and Innovation*,³⁸⁾ a new policy instrument,

38) Swedish Government (2012)

strategic innovation areas (SIO), will be launched in Sweden in 2013. The purpose is to stimulate long-term collaboration between research, business, public sector, civil society and other actors to address global challenges. There is also an increased focus on strategic research areas (SRA), to develop internationally competitive research in areas of strategic importance, particularly within life science, but also related to mining, forestry/biomass and sustainable development. SRA funding will be used to develop the existing research and to create new research environments. There is an explicit ambition to engage different types of actors and to ensure that the results have an impact on society. Also, the Swedish *National Innovation Strategy* from 2012 takes its starting point in global challenges, but focuses more on how to stimulate innovation (e.g. entrepreneurship, high-quality research and education, framework conditions and infrastructure for innovation) than on specific economic sectors.

Traditionally, Icelandic policy makers have not selected particular focus areas when trying to stimulate innovation. Over time, Icelandic innovation policies have become increasingly focused on research-driven innovation and cooperation between research institutions and businesses. According to the main policy documents, the *main growth sectors* in Iceland are likely to be linked to industry and primary production and services, including the high-tech and knowledge industry, innovative sectors and tourism. Still, soft approaches to innovation, including the health sector, are also gaining momentum. The report *The Strengthening of the Green Economy in Iceland*, published by the Parliament, also indicates a high level of prioritisation of the green economy. The Government of Iceland has approved an investment plan for 2013–15, which includes providing 25 million euros to implement the first phase of a 50-point proposal on strengthening the green economy. *Entrepreneurship* is another prioritisation that seems to have been gaining significant political focus in Iceland since the economic crisis in 2008. SMEs account for close to 45% of employment in Iceland and entrepreneurship is seen as a way to employ people who are entering the labour market or leaving construction and financial services due to restructuring of the labour market. The OECD has assessed the Icelandic regulatory framework and culture as one of the most conducive to entrepreneurship among all the OECD members.

In Denmark, both national and regional actors express concern over the concept of “smart specialisation” and the idea of prioritisation of specific sectors. Instead, Denmark has chosen to prioritise entrepreneurship in innovation policy, which is clearly stated both in the current national innovation strategy and in the action plan for its implementation. However, it is clear that the development of environmental technologies is a strong focus area at the national level, at which there are several funds that support innovation, R&D and demonstration projects in this area. Thus, there are three funds to support projects in the area of energy, six with an environmental focus and one with a focus on food.³⁹⁾ The ambition of Denmark to be a strong player in green growth was emphasised with the green growth strategy of the Danish Government, which entered into force in 2009.⁴⁰⁾

Regional level

In most Nordic countries, some regional prioritisations have been presented. In Sweden, the demand for prioritisation at the regional level has increased over the last decade, as it has become mandatory for co-funding from Swedish programmes for cluster and innovation systems to present regional prioritisation and anchoring in regional strategies or plans. In Norway, all seven research fund regions have developed research and innovation strategies, and for implementing the VRI programme, all collaborative projects focus on certain business sectors, anchored in regional strategy documents. These strategy documents are often in line with the national prioritisations of the national Soria Moria declaration: energy, environment, tourism maritime and marine sectors.

In Finland, the most important development areas of each region are identified in regional development strategies and programmes. Most regions have also been working with regional innovation strategies in which competence areas are identified. For example, the Regional Council of South Savo states in its *Innovation Strategy 2011–2015* that it will focus on technology-based innovation and service innovation, whereby bioenergy, environmental safety and digital archiving are identified as some of its central priority areas. The region of Päijät-Häme, which is a member of the Sevilla Platform, has been active in identifying its missions and innovation spearheads (e.g. environment/clean tech, design and practice-based innovation).

39) Ministry of Science, Innovation and Higher Education (2012)

40) Danish Government (2009)

Towards Smart Specialisation in Lahti

The sub-region of Lahti in Finland had been a declining region since the collapse of trade with the Soviet Union in the early 1990s, but by using a strategic approach much like “smart specialisation”, it has been able to create new prosperity. The region is the largest region in Finland without a university of its own. The level of education of its inhabitants has been low and the R&D input has been scarce. However, in the early 2000s, regional actors realised that the lack of a university was not necessarily a weakness. Instead, a new unique operational model was developed, based on network-like operational models of research transfer. The City of Lahti started collaboration with four universities in other regions, to create tailored university expertise, based on the needs of the region. Instead of traditional innovation from research, innovation in the Lahti area stems from interaction between companies and users. Environment/clean tech, design and practice-based innovation were chosen as the three specialisation

areas of the region in order to avoid scattered, inefficient activities.

With its focus on practice-based innovation, Lahti is now pioneering in developing modern innovation and can be considered as an interesting example of a region already working with “smart specialisation” before the term was introduced. Innovation activities have been based on practical solutions instead of the traditional method of basing them on universities and their research activities. The region has been able to import the needed competences and technologies to the region and thereby it has been successful in creating a sort of “technology bank”. The Lahti example shows that even a region with poor research and development resources can have a great deal of innovativeness. Today, the region of Päijät-Häme is amongst the most innovative regions in Finland.

Source: Harmaakorpi, V. & Tura, T. (2012), Towards Smart Specialisation – The Lahti Region, in *Nordregio News*, Issue no. 5, December 2012

Focusing on a limited number of prioritised areas is also common in the Danish regions, although they may not be restricted to selected economic sectors. The example of Bornholm is introduced below to elaborate on how the regional strategic focus has been developed since the initiation of the Regional Growth Forum. However, two of the focus areas involve business support and education, and they have a wider scope in

terms of the types of industries they may involve. This is in line with the statements of national and regional actors interviewed for the IQ-Net study, who regard the wider approach of supporting framework conditions for innovation and entrepreneurship as more appropriate than channelling regional development funds towards specific economic sectors.

Bornholm Growth Forum

Bornholm's Growth Forum issued its first regional development strategy for the period 2007–2010, and now there is a strategy for the period 2011–2014. Until now, similar to the other Growth Fora in the country, the emphasis has been placed on cluster development. Before the establishment of the Growth Forum with the local government reform in 2007, there was a temporary Growth Forum in Bornholm, as well as in the five NUTS 2 regions in Denmark. Bornholm's temporary Growth Forum was the first to introduce the idea of clusters in regional development policy on the island. The secretariat at the Regional Municipality of Bornholm started up cluster working groups in 2006, based on the most recent national analysis, which identified the economic sectors that experienced the most positive development. Since then a number of ERDF projects (and other EU funding sources) have been initiated to support these sectors.

The Business Development Strategy 2007–2010 had ten priority areas, but this turned out to be far

too ambitious so the number of priorities was cut back in order to focus the investments. The current Business Development Strategy 2011–2014, therefore, has four main priorities: Bornholm as a “business island”, as an “education island”, as a “green test island” and as an “experience island”. The title of the strategy, *Bright Green Island*, indicates the increasing focus on utilising the geographical specificities of the island, which makes it appropriate for testing green technologies. The decision of Bornholm's Growth Forum to reduce the number of focus areas in the business development strategy was influenced by the actors involved in the clusters on the island who were consulted in the process.

Source: ADE – Analysis for Economic Decisions (2012), *Study on the Relevance and the Effectiveness of ERDF and Cohesion Fund Support to Regions with Specific Geographical Features – Islands, Mountainous and Sparsely Populated Areas, Final Report Volume 2: The six Case Studies*, February 2012.

Although the Growth Forum of Bornholm has limited the number of focus areas in its business development strategy, it is notable that only the last two focus areas concerning the development of green technology and the experience economy involve specific economic sectors that are regarded as having a competitive advantage on the island.

Challenges: How can visions be used to facilitate prioritisation, while at the same time avoiding the risk of regional lock-in effects? Can the process be developed to avoid being hijacked by established sectors, actors or lobbying groups? How can regional actors stimulate cross-disciplinary and cross-regional collaborations?

Step 5 – Definition of a coherent policy mix, road maps and action plans

According to the RIS3 model, the strategy should be implemented through a road map, supported by an effective action plan, defining for example time frames, budgets and responsibilities. To implement the strategy, a broad range of different policy delivery instruments or horizontal approaches may be applied. In the guidelines from the S3 Platform, some examples of general policy delivery instruments are clusters, innovation-friendly business environments for SMEs, research infrastructures, centres of competence and science parks, university–enterprise collaboration, internationalisation, financial instruments and public procurement. There are also examples of more sector-specific or horizontal activities, related to the digital agenda, key enabling technologies (KET), cultural and creative industries, green growth and social innovation.

In most Nordic regions, regional development or innovation strategies and plans are presented regularly. However, to implement a strategy, it is important to

have an action plan, specifying actions, responsibilities, budgets and time frames. In Denmark, the Regional Growth Fora launch a new action plan every second year, which elaborates on the objectives of the prioritised area in the regional business development strategy and gives an indication of which actions should be supported during the two-year period in order to achieve the objectives.

In terms of the policy mix, the Nordic countries have for many years been experimenting with a broad range of policy instruments. Eric Arnold, founder of the consultancy group Technopolis, considers Sweden to be interesting as an “experimental laboratory for Science and Innovation Policy”. Over the last decade, many programmes supporting cluster and innovation systems initiatives have been instigated, and higher education institutions have been enforced to collaborate with the surrounding society to an increasing extent. Lately, there has also been increased interest in new types of policy measures, including for example social innovation and public procurement. The presentation below gives a non-exhaustive presentation of policy delivery instruments and activities that have been applied in a Nordic context.

Clusters and collaborative actions

In the Nordic countries, there is a strong tradition of implementing national programmes for stimulating collaboration between businesses, competence providers and the public sector at the regional level. In Norway, for example, regional research and innovation have been stimulated by several different programmes. One interesting example is *Virkemidler for regional FoU and Innovasjon (VRI)*. According to Professor Björn Asheim, one of the leading researchers on innovation systems, VRI is a unique bottom-up process, introducing a broadly defined innovation policy at the regional level five years before Finland, which is often considered a pioneer in innovation policy, began this at the national level.⁴¹⁾

41) Cited in Norges forskningsråd (2012)

The VRI programme

The programme was launched in 2007 by the Norwegian Research Council and is the Council's main support mechanism for research and innovation in Norway's regions. The primary goals for VRI are to encourage innovation, knowledge development and added value by mobilising research in business, increasing regional cooperation and strengthening research and development efforts within and for the regions. The programme has a time frame of ten years (2007–2017), but will be revised and developed throughout the programme period. Yearly national funding of around NOK 70 million was provided by four ministries during the period 2008–2010. Regional co-funding of 50% is required and businesses contribute at least 50% to specific business projects. Prioritisation within each VRI region is conducted by regional authorities, businesses, unions, and research and higher education institutions.

The VRI programme offers professional and financial support to long-term, research-based development processes in the regions and is designed to promote greater regional collaboration between trade and industry, R&D institutions and the government authorities. Three types of funding instruments are available: industry-driven innovation projects, cooperative activities between industry and R&D institutions and strategic research projects. The first type of project has a clear business focus and is often initiated across levels, organisations or disciplines. The concept of trust is of great importance. The second type of project aims at connecting business and research organisations, in order to

stimulate future research-based innovation projects. Specific activities may concern mobility schemes, competence brokering, action research in companies, networks, pre-project funding and regional forecasts to understand future challenges and develop a regional agenda for R&D and innovation. The third type focuses on regional knowledge development concerning future collaboration potential, e.g. mapping business needs or understanding the responsibilities and competences of the research and innovation support system.

There is an explicit ambition to establish close ties with other national and international network and innovation measures, such as the Arena programme, Norwegian Centres of Expertise (NCE) and the Regions of Knowledge initiative. Some of the activities include research, exchange of experience, learning and cooperation across scientific, professional and administrative boundaries. A follow-up of the first period of 2007–2010 indicates high potential to reach the goals and also strong ownership in many regions, providing better coordination of the regional support measures. Some projects focus on developing regional strengths, while others aim at developing weaker business sectors, but they need to be anchored in the strategy documents of regional authorities.

Source: Norwegian Research Council (2012), *Statusrapport VRI-programmet I perioden 2007–2010* and Norwegian Research Council (2012b), http://www.forskningsradet.no/prognnett-vri/Home_page/1224529235237and

In Norway, three national authorities, the Research Council of Norway, Innovation Norway and SIVA, have collaborated to develop and run two parallel cluster programmes during the last decade: the *Arena programme*, focusing on mobilisation and early phases of cluster development, and the programme *Norwegian Centres of Expertise* (NCE), aiming at developing international competitive collaborations. In Norway, industrial clusters

have relatively few links to the academic communities, which can partly be explained by geographic distance. In comparison with Swedish and Finnish cluster programmes, the Norwegian cluster programmes have emphasised the connection with university or research institutions to a lower extent. Instead, the focus has been on developing collaboration between participating companies.⁴²⁾

42) Jakobsen E.W. & Röttnes R. (2011)

Cluster programmes in Norway

The *Arena programme* was first established in 2002, based on a theoretical background of cluster development and previous regional pilot projects. The overall strategy is to provide “professional and financial support to multi-year development processes in regional business environments and clusters, based on collaboration between business and industry, R&D and the public sector”. The objective is to strengthen the clusters’ innovative ability through stronger and more dynamic interaction between the industry, R&D institutions, universities and the public sector. Support is provided over a period of three years. The interaction is to be long-term, goal-oriented and focused on innovative collaboration, international awareness, access to knowledge and new business. In total, 47 business environments in various regions and sectors have been supported over the years.

The programme *Norwegian Centres of Expertise (NCE)* was established in 2006, based on cluster theories and international inspiration, e.g. from the Swedish VINNVÄXT programme. The NCE programme aims at strengthening innovation capacity in clusters with high potential for growth and international competitiveness, by accelerating the ongoing development processes. After three national calls, the programme has selected twelve potential world-class cluster projects for technical and financial support for up to ten years, divided into three contract periods with intermediate assessments.

There has been a focus on learning and exchange of experience within the programmes, and both Arena and NCE have been subject to regular evaluations. Previously, there was a possibility for more ambitious Arena projects to apply for NCE status. Today, however, the NCE programme is closed to new entrants.

Source: Innovation Norway, http://ekstranett.innovasjon Norge.no/templates/Page_Meta_____56522.aspx and http://ekstranett.innovasjon Norge.no/templates/Page_Meta_____57487.aspx

In Sweden, several national programmes have been launched in order to support the development of cluster and innovation systems at the regional level. One of the first programmes was the VINNVÄXT programme, developed and implemented by VINNOVA.

VINNVÄXT

VINNVÄXT is a programme for regional growth through the development of dynamic innovation systems. The programme was first launched in 2001 as a competition between regions. Since then, VINNOVA has carried out three calls with twelve winners altogether. The aim is to promote sustainable growth by developing internationally competitive research and innovation environments in specific growth fields. The objective is that the winners will become internationally competitive in their respective fields within this period.

The winning regions receive funding of up to SEK 10 million per year for a period of 10 years. A prerequisite is active triple-helix participation, with actors from the private, public and research sectors and from the political sphere. VINNVÄXT also comprises a number of support activities, such as seminars, training/education, exchange of experience and the extension of knowledge/research.

The programme and the projects have been subject to systematic monitoring and evaluation, including peer reviews and participative research (följeforskning).

Source: VINNOVA, <http://www.vinnova.se/en/Our-activities/Individuals-and-Innovation-Milieus/VINNVAXT/>

The VINNVÄXT programme had a clear focus on research-based innovation systems, based on triple-helix collaboration. In 2003–2005, the *Swedish Programme for Clusters and Innovation System* (Visanu) was initiated and run in collaboration between three national agencies, focusing less on research and more on business involvement. A cluster programme for the period 2007–2012 was run by Tillväxtverket (former Nutek) and replaced in 2012 by a programme for *regional innovation systems and clusters*, running until 2019 with the aim of increasing innovation capabilities in the Swedish business sector through well-developed governance processes and cluster or innovation systems. All Swedish cluster programmes have been subject to regular and ongoing evaluations.

Cluster-based activities have also been very important in the Finnish innovation system. *The Centre of Expertise* programme (CoE) and the *Strategic Centres for Science, Technology and Innovation* have so far been the most central initiatives. The Strategic Centres for Science, Technology and Innovation provide research centres and companies utilising research data as a possibility to cooperate in a coordinated way. The centres follow research strategies drawn up by firms, universities and research units. The aim is that the centres are multidisciplinary. Within the Strategic Centre programme, clusters are related for example to energy and the environment, the built environment and health and welfare.⁴³⁾

43) Ministry of Employment and the Economy (2012e)

Centres of Expertise Programme

The Centre of Expertise programme (CoE) supports regional strengths and specialisation as well as promoting cooperation between the Centres of Expertise in different regions. There are 13 national competence clusters (e.g. in nanotechnology, clean tech, and tourism and experience) in the programme and they are implemented by 21 regional Centres of Expertise. The Centres initiate cooperation projects between the research sector, educational institutions and businesses and industry.⁴⁴⁾ Within the programme, green growth-related cluster activities are central, including for example clean tech and the forestry industry (including bioenergy).⁴⁵⁾

The number of companies involved in the CoE programme has been growing every year. According to a mid-term evaluation of the programme drawn up in 2009–2010, the cluster model has been a well-functioning way to promote the ambitions of the CoE programme. The cluster model has facilitated new synergies between regions and encouraged the regions to become more conscious of their strengths and roles in the national context.⁴⁶⁾

According to the mid-term evaluation, by 2010 not all the clusters had been successful and in many clusters the specialisation of the regions was unfinished. It was emphasised that the focus of the programme needs to be clarified and that the evaluation system of the programme needs to be further developed and standardised. It was further noted that the share of ERDF funding and the share of funding from TEKES had been growing while the share of the EU's Research and Innovation funding had been decreasing.⁴⁷⁾ The programme will end after 2013 and will be partly replaced by a new programme on innovative cities with an exclusive focus on bigger city regions.

Finnish innovation organisations also have the possibility to participate in a network linking Finnish innovation actors to international competence clusters. The *Fin-Node network* promotes cooperation between enterprises and other actors, as well as partnerships in the markets and innovation sectors most interesting to Finland. Fin-Node produces information on innovation phenomena and activities in the countries where it operates and informs Finnish innovation actors about international trends in order to facilitate their development. It aims at linking Finnish innovation to international innovation

networks.⁴⁸⁾

Clustering made slower progress in Iceland than in, for example, Sweden, Norway and Finland during the 1990s. One argument has been that an overrated currency (the Icelandic króna) before the financial crisis resulted in unfavourable conditions for high-tech and innovative SMEs aiming for exports. The first public cluster policy initiative in Iceland was introduced in combination with the regional growth agreements and administrated at a national level by IMPRA, a unit within the ICI. Collaboration and interaction, nationally and internationally, is also being encouraged by the STPC, in order to stimulate development towards open innovation and user-centred innovation. One example is the development of a so-called Living Lab by the Icelandic Centre for Innovation.

Higher education and universities

As the state is the main financer of the higher education institutions, “smart specialisation” is also related to the efforts towards specialisation of HEIs. Over the last decades, the expectations of higher education institutions and universities to extend outside the traditional roles of providing education and research, to take an active part in developing the surrounding society, have increased in the Nordic countries. Today, this collaborative mission (sometimes referred to as the third task or mission) is often regulated by law or by contracts with the state. In Finland and Sweden, for example, the amount and quality of collaboration is followed up on a regional basis. There is also an ongoing debate regarding whether the number of university colleges should be reduced in order to increase specialisation, create a critical mass in education and research, and improve the quality of the functions performed.⁴⁹⁾

At the moment, there is an ongoing higher education reform in Finland. The reform aims at having fewer universities and universities of applied sciences and each institute having a more specialised profile. It also aims at increasing the strategic cooperation between higher education institutes. National and international evaluations earlier showed that the quality of Finnish research did not develop as expected in the 2000s and that research is conducted in too many small units that do not form coherent entities. According to the evaluation, international cooperation within the fields of education and research has developed too slowly. The reform aims at strengthening both basic and applied research and utilising the potential of the R&D&I activities of higher education institutes in order for ex-

44) Ministry of Employment and the Economy (2012c)

45) Centre of Expertise programme (2012)

46) Ministry of Employment and the Economy (2010b)

47) Ministry of Employment and the Economy (2012h)

48) Ministry of Employment and the Economy (2012f)

49) Lindqvist M. et al. (2012a)

ample to diversify business structures and to develop new business sectors, such as renewable energies. Furthermore, the universities of applied sciences are expected to develop their R&D&I activities in order to be able to respond to the needs of the firms and service sector in each region.⁵⁰⁾

In Denmark, a reorganisation of the higher education system has already been implemented. In 2009, a strategy for the integration of entrepreneurship throughout the entire Danish education system was introduced by cooperation between the Ministry of

Children and Education, the Ministry of Science, Technology and Innovation, the Ministry of Culture and the Ministry of Economic and Business Affairs. As part of the strategy, investments were made to support entrepreneurship education in schools, youth education, higher education and research. The Danish entrepreneurship strategy is unique in terms of the amount of earmarked funding, the involvement of all levels of education and the integration of entrepreneurship into the strategies of education institutions.⁵¹⁾

Aalborg University's Division for Supporting Entrepreneurship

The Division for Supporting Entrepreneurship at AAU Innovation (SEA) is part of AAU Innovation, which facilitates knowledge collaboration between Aalborg University and businesses, organisations, public authorities and educational institutions. The SEA organises various courses on entrepreneurship for university lecturers, including methods of integrating entrepreneurship into teaching.

In connection with the financial crisis in 2009, in which two of the multinational corporations in the ICT industry closed in the North Denmark region, a "regional task force" was set up, and the SEA opened the university incubators for courses in business development for engineers who had business ideas. Approximately 25 persons participated in this activity. After the courses ended, a number of firms were established as spin-offs originating from the larger firms that had recently closed in the region, while other participants found new jobs.

"Solution Camps" is a popular initiative run by the

SEA. In Solution Camps, firms can suggest problems that they wish to solve. Up to 20 students are then involved during one day, during which they, in cooperation with creativity consultants from the SEA, work with this problem. This is a way to make firms aware of the knowledge they can utilise at the university.

The Workshop for Innovation and Entrepreneurship (WOFIE) is another SEA initiative that involves an interdisciplinary workshop targeted at master's students across all the faculties of the university. During the four-day workshop, the participants work with idea development, creativity, business development and risk taking. The goal of the WOFIE is to provide the students with the tools and abilities to work on and present one or more ideas that can lead to innovative concepts and strategies with business potential.

Source: Lindqvist M. et al. (2012b), *Strategies for Interaction and the Role of Higher Education Institutions in Regional Development in the Nordic Countries – Case Studies*, Nordregio Working Paper 2012: 3.

In Sweden, the concept of the knowledge triangle has been introduced by policy makers to stress the importance of increased interaction between education, research and innovation. To support the development of a well-functioning knowledge triangle, VINNOVA has introduced various measures, for example to increase mobility between university and industry, to stimulate partnerships between actors from different sectors and to support commercialisation.

In Iceland, nine regional research centres have been established by the University of Iceland, in order to stimulate cooperation between higher education institutions and the surrounding society at the regional level.

Regional Research Centres

The research centres are small, independent organisational units, managed by the Institute of University of Iceland Study Centres. They provide facilities for research in rural areas, to increase the general public's access to education and to strengthen the university's collaboration with local authorities, institutions, businesses, associations and individuals in rural areas. The research centres are located in areas with fewer than 5,000 inhabitants, and their focus varies with the regional context, but environmental and land usage research, marine research and tourism research dominate.

Source: Lindqvist M. et al. (2012b)

50) Ministry of Education and Culture (2011)

51) Melin, G. & Blomqvist, L. (2011)

SME support

R&D operations are complex and associated with major costs and risks. With inspiration from for example the USA and Finland, the Swedish Government assigned VINNOVA to implement a programme that will strengthen and stimulate *R&D in small and medium-sized companies* (SMEs). In 2005, VINNOVA launched the programme Forska&Väx (Research&Grow). For 2011, the programme had a budget of SEK 120 million SEK.⁵²⁾ Other activities to support R&D in SMEs are the programme VINN NU, a competition for new companies that base their operations on R&D results, and SMINT, i.e. funds for feasibility studies relating to international technological collaboration. In parallel, Tillväxtverket offers financial support for the development of new or existing products and services to SMEs. Administration, prioritisation and the recommendation of specific projects are handled through 15 regional partnerships, including SME support actors such as Almi Business Partners, Innovation Bridges, County Administrative Boards, industrial development centres, universities, incubators and regional or local authorities.

TEKES, the Finnish Funding Agency for Technology and Innovation, supports SMEs with innovation activities. The amount of funding that can be received from TEKES is dependent on the novelty value of the innovation as well as whether it is expected to take a long period of time before the product can reach the market. Innovations with higher novelty value and a longer time to market can receive more funding. TEKES also has specific funding for young innovative growth enterprises that are small, less than six years old and are striving well to enter international markets. TEKES is a national agency with technology experts working regionally in Centres for Economic Development, Transport and the Environment, which regional SMEs are likely to approach when they are interested in the possibilities TEKES is providing.⁵³⁾

In order to provide easy access to firms that are interested in learning about public innovation opportunities, a Danish portal (www.vaekstguiden.dk) was established in 2010. Moreover, a call centre has been established that is able to give advice to firms with regard to the innovation opportunities that match their individual needs.

Research funding

SkatteFUNN is a key measure to support the R&D ac-

tivities of the business community in Norway. The scheme was introduced in 2002 and is administered by the Norwegian Research Council, in cooperation with Innovation Norway and the Norwegian Tax Administration. Through this scheme, firms can receive up to 20% tax reduction to cover their costs for R&D activities. A requirement is that the projects target the development of new knowledge or competences that can lead to new or better goods, services or production processes.⁵⁴⁾ Another unique activity in terms of delegating responsibility for research funding to the regional level was the establishment of the Regional Research Funds in Norway in 2010.

Regional Research Funds in Norway

A new funding mechanism for regional research was implemented in Norway in 2010. A fund of EUR 0.8 billion was set aside for this purpose, resulting in annual interest of about EUR 28.1 million to be divided between 7 research regions. The main objectives of the funds are to strengthen research and improve regional innovation and development in all the Norwegian regions, to improve the research quality and competitiveness of R&D institutions, to organise arenas for sharing knowledge and experience and to establish cooperation with national and international programmes and activities.

Each fund has its own secretariat and board, prioritising and submitting applications to the Research Council of Norway. The Council reviews applications, but also provides the regions with various services, e.g. coordination of issues at the national level, arranging learning arenas for cooperation and access to a home page.

In response to criticism concerning the danger of regional lock-in and low research quality, a permanent (ongoing) evaluation of the process has also been initiated. According to the first report in 2012, the funds seem to have been relatively well established at the national and regional levels even after only 2 years. All 7 regions have developed regional research strategies, 500 applications have been submitted annually and new actors, particularly from the industry, seem to have been mobilised.

Source: Regional Research Fund (2012), http://www.regionaleforskningsfond.no/prognett-rff-hovedside/RFF_in_English/1253976860326, and NIFU (2012), *To år med regionale forskningsfond – Rapport från fölgeevalueringen*, Rapport 1/2012

The Icelandic Government implemented new legislation in 2011, providing indirect support to business R&D in the form of tax incentives and guarantees. A tax con-

52) <http://www.vinnova.se/en/Our-activities/Innovative-SMEs/ForskaVax/>

53) TEKES (2012)

54) SkatteFUNN (2012)

cession to individuals investing in innovation start-ups or operating small innovative firms was introduced, in combination with a tax reduction scheme for expenditure on innovation in R&D-active companies.⁵⁵⁾

Demand-side policies and social innovation

In Finland, social innovation has arisen as one of the spearheads of the national innovation policy. Additionally, user-based and user-driven innovations have become central during recent years.⁵⁶⁾ The development processes and effects of social innovations have also been analysed, for example in a project funded by SITRA Finnish Innovation Fund. Further, TEKES has a specific programme on innovation in social and health services through which firms, municipalities and hospital districts can be funded. Within the programme, seminars and workshops are arranged, social innovation in Finland is mapped and excursions in Finland and abroad are organised.

Taltioni

SITRA contributed to promoting a new self-care service innovation, "Taltioni", which is a database whereby users can save, collect, produce and share electronic information on their health and well-being in a secure way. The basic idea behind the project is that citizens are experts on their own health. The overall aim of the project is to promote the health and welfare of citizens, support the health-care sectors and facilitate the follow-up of patients after they have been taking part in health-care services.

Source: SITRA (2012)

Iceland is also becoming increasingly aware of the importance of demand-side policies. In the 2010–2012 strategy for RDI, the Science and Technology Policy Council emphasised the need to involve users in innovation processes. In this respect, Innovation Centre Iceland has developed a number of initiatives, like the Living Lab initiative.

55) Global Tax News (2011)

56) IQ-Net (2012)

SmartIES – Smart Individual Energy Savers

SmartIES is a new Nordic project financed by NordForsk focusing on Living Lab activities leading to knowledge on how to motivate energy savings in households. Innovation Centre Iceland has a role as project coordinator of the creation of a theoretical framework for Living Lab Cases and Living Lab Operations. The other partners are: the Centre for Distance-Spanning Technology at Luleå University, the Norwegian University of Science and Technology (NTNU) and the Wireless Trondheim Living Lab, A9 Consulting (A9C) and the Sunrise Valley Science and Technology Park (SVST).

The project aims to create a Nordic citizen innovator user pool for smart city evolution as well as an indicator framework for Living Lab operations showing proof of concept of the Living Lab approach and finally a best-practice transnational Smart City Living Lab Pilot founded on evidence-based methods and approaches for Living Lab activities.

Source: <http://projectsmarties.com/> and Norden (2012b), <http://www.nordforsk.org/en/programs/prosjekter/a-transnational-nordic-smart-city-living-lab-pilot>

In Iceland, innovation related to specific welfare issues is also becoming central and many SME are engaged in innovation within the health sector. This is reflected in Iceland's expenditures on R&D within business enterprises and organisations, of which about 25% was related to health in 2009. The innovation capacity in the public sector has also become an important political issue in Sweden. After an initial phase of analysis and programme development during 2007–2009, innovation in the health services sector has been promoted by the Government.

Swedish support to health services innovation

During 2009, a call for proposals to support innovation in health services was launched by VINNOVA, in collaboration with Almi Business Development, Innovation Bridge and the Sweden Association of Municipalities and Country Councils (SKL). As a result, innovation channels (Innovationslussar) to promote the commercialisation of ideas for the health services sector into innovations have started to develop in several regions, e.g. Stockholm, Västra Götaland, Skåne, Östergötland, Uppsala and Västerbotten/Norrbottn. In collaboration with Tillväxtverket and SKL, pre-studies for developing test beds within the health services sector have been funded in six regions: Västra Götaland, Uppsala, Skåne, Stockholm, Östergötland and Södermanland.

Source: <http://www.vinnova.se/en/Our-activities/Innovation-management/>

Public procurement

In 2009, the Finnish Government made a decision of principle concerning sustainable public procurement. It is stated in the decision that in 2015, all public procurement by the Finnish Central Government should be sustainable. The Government also recommends that by 2015, 50% of municipal-level procurement should take environmental aspects into consideration.⁵⁷⁾

In Sweden, VINNOVA launched an Innovation Procurement programme in 2011, aiming to increase and extend the development of innovation procurement in the public sector. Under the programme, VINNOVA will develop its own efforts as well as efforts in partnership with national and international actors. A first call for proposals under the Pre-commercial Procurement programme started in May 2011.⁵⁸⁾

Iceland has also explicitly announced the use of public procurement as a policy tool to stimulate innovation. There is a legal framework as well as discussions and concrete initiatives on innovative procurement. Green areas in particular are targeted. The aim is to increase green public procurement to 50% by 2015 and 80% by 2020, and an action plan will be developed to increase organic production to a level of 15% of the national agricultural production by 2020.

Challenges: How can the Nordic policy mix for supporting innovation be more connected outside the regions and nations, for example to European research programmes, such as *Horizon 2020*, or global value chains?

Step 6 – Integration of monitoring and evaluation mechanisms

Ongoing evaluation

In Norway, there is a long tradition of ongoing evaluation or participative research (in Norwegian: *følgeforskning* or *følgeevaluering*) in development processes and programmes. Over the last decade, several of the larger programmes for regional and business development have had external researchers or consultants following the processes, e.g. Arena, NCE and RRF.

With inspiration from Norway, Swedish authorities like VINNOVA and Nutek introduced the concept (in Swedish: *følgeforskning*) into the Swedish cluster and innovation systems programmes VINNVÄXT

and Visanu in the early 2000s. These initiatives later inspired the implementation of ongoing evaluation (*følgeforskning* or *lärande utvärdering*) of the Swedish Structural Funds programme in the programme period 2007–2013.⁵⁹⁾ To professionalise these ongoing evaluations, the national authorities responsible for implementing the European Social Funds (ESF Rådet) and the European Regional Funds (Tillväxtverket) developed and provided a university course for consultants and researchers working with this. In Sweden today, the concept is used as a method both for support and reflection in specific projects and programmes and as a tool for ongoing evaluation. These activities have created positive attention among evaluation experts at the European level.

External experts

External experts and peer reviews may have an important impact on strategic development. According to many Swedish regions, foreign evaluations or studies have acted as important input into their strategic development processes. In the region of Värmland, for example, an OECD university study and a peer review (PURE) had an important impact on the development of the role of Karlstad University. In Skåne, an OECD Territorial Review of Skåne and a number of peer reviews provided valuable input into the development of the international innovation strategy of Skåne. OECD Territorial Reviews were also of importance for the development processes in other regions, such as Småland and Västra Götaland. According to some of the regional actors, it is not only the content as such that may be unique, but the fact that information is provided by an external party makes it more legitimate than if it is provided by the regional actors themselves.

57) Finnish Government (2009)

58) <http://www.vinnova.se/en/Our-activities/Innovation-management/Innovation-procurement/>

59) Brulin & Svensson (2012)

Innovation databases

In Finland, the VTT Technical Research Centre maintains the *SFinno* database with longitudinal data on 4,500 product innovations in all business sectors. It includes data on, for example, commercialising firms, the characteristics of the innovations, innovation management, internationalisation, “life after” management, the role of public funding and public services as well as problems and challenges and impacts and benefits. The database includes innovations from the year 1945 and is founded mainly on literature-based research complemented by register data. Questionnaires for innovators are also used to obtain more detailed information on innovation processes. At the moment, the database is being developed further to include service innovations. It is stated that similar efforts are underway abroad as well, which could open up new possibilities⁶⁰.

Challenges: How can we improve evaluation by introducing more relevant indicators and more cost-efficient qualitative evaluations? How can ongoing evaluators and peer reviewers avoid being influenced too much by strong regional stakeholders? Is it possible to balance the need for close collaboration (to develop trust) and the need for distance (to remain objective)?

60) VTT, 2012

Concluding discussion

The review of the Nordic countries indicates that the concept of “smart specialisation” is relatively new and the level of implementation at the national and regional levels is, so far, rather limited. Still, the interest has increased, particularly among the regional and national actors responsible for implementation of the new Cohesion Policy in the Nordic EU member states.

In the analysis of national and regional approaches to “smart specialisation”, we have identified variations, both within and between the Nordic countries. In discussions with regional and national actors, there has been some criticism concerning the concept and its level of novelty. It is concluded that many of the elements of strategies for “smart specialisation” have already been implemented in the Nordic countries, even though the concept as such is new. This indicates that there is strong potential for Nordic regions, building on existing strategies and policy delivery instruments. Still, there are some aspects included in the guidelines for the development of *Research and Innovation Strategies for Smart Specialisation (RIS3)*, which may contribute to strengthening regional development processes in the future.

Variation in national approaches

During the last years, “smart specialisation” has received increased attention, mainly in relation to the implementation of the *Europe 2020* strategy for smart, sustainable and inclusive growth. As a consequence of this, the EU member states have become more involved in the discussions as part of the preparation for the future Structural Funds programmes. In Finland, there seems to be a trend towards increased concentration and specialisation of research and innovation activities, in line with “smart specialisation”, and several Finnish regions have become members of the S3 Platform to support the implementation of the concept. Sweden seems to be less willing to adopt the concept formally at the national level and to demand regions to develop RIS3, but for the last years the Government has supported the voluntary development of regional innovation strategies (RIS) at the county level (NUTS 3). Nevertheless, several Swedish regions have initiated processes in line with “smart specialisation” and some

have taken an active part in the S3 Platform. In Denmark, there seems to be some scepticism regarding the concept at the national as well as the regional level. The argument is that it is more efficient to support entrepreneurship and innovation in general than to concentrate on specific economic sectors. The non-member states, Iceland and Norway, have also started to approach the concept, even though it is not yet widespread.

Finland

With a strong focus on innovation, Finland is probably the Nordic country where aspects of “smart specialisation” have had the greatest impact on regional policy. Even if the concept as such has not always been used, the ability of regions to develop their competences, to specialise and to network regionally, nationally and internationally has been stressed. All Finnish regions have regional innovation or technology strategies, drawn up by the regional councils and supported by national initiatives. One example is the Centre of Expertise programme (CoE), encouraging regional strengths and specialisation, as well as cooperation between regions. During the ongoing project period, 21 regional Centres of Expertise were established to support and coordinate collaboration between 13 nationally prioritised competence clusters (e.g. nanotechnology, clean tech, and tourism and experience). However, post-2013, the CoE programme will be replaced by a new initiative, concentrating research and innovation investments in a network of innovative cities. As a result, several regions have started to explore the potential for “smart specialisation” as a means to become interesting partners for future collaboration. Today, 6 regions and 2 cities are part of the S3 platform in Seville.

Sweden

In Sweden, many aspects of “smart specialisation” have been implemented in regional policy, even though the concept has not been applied before. All NUTS 3 regions are required to develop regional development programmes or strategies, usually including questions of innovation and prioritisation of sectors or clusters.

The Swedish Government has also encouraged the development of regional innovation strategies and the national agencies have run several programmes for supporting innovative collaboration and cluster development. In the latest national innovation strategy and the Government's bill on research, there is a focus on strategic research and innovation areas related to societal challenges, particularly life science. No formal decision on the responsibility for the development of RIS3 had been taken by December 2012, but many Swedish regions are preparing for this. Three Swedish regions are members of the Seville S3 Platform, but many regions have participated in various activities to increase their understanding of the concept. To support them, the Agency for Economic and Regional Growth (Tillväxtverket) recently launched a call to mobilise regional actors in the development of RIS3 and the Agency for Innovation Systems (VINNOVA) is providing an analysis of the main economic sectors in Sweden.

Denmark

In Denmark, "smart specialisation" is a concept that is particularly relevant to the Danish Business Authority, which is the managing authority for the EU Structural Funds in Denmark, and the six Regional Growth Fora. The latter are responsible for creating regional business development strategies with a focus on innovation; monitoring regional and local growth conditions; and deciding on the allocation of regional development funds. However, the attitudes towards "smart specialisation" seem to be less positive. According to a recent study, both national and regional actors express concern that smart specialisation will involve a "picking the winners" approach and more earmarking of funds, as opposed to a wider approach of supporting the framework conditions for innovation and entrepreneurship. This indicates a rather narrow interpretation of the concept, excluding the ideas of horizontal prioritisation (for example on entrepreneurship). In the new Danish innovation strategy, there is an increased focus on the identification of innovative solutions to societal challenges.

Norway

Since Norway is not a member of the EU, there is no external pressure to develop national or regional strategies for "smart specialisation" and the concept is not yet on the national policy agenda. However, many of the elements of "smart specialisation" have been implemented, as the regional level plays a strong role in innovation and economic development. In terms of

prioritisation and stakeholder involvement, this has been supported by several national programmes during the last decade, e.g. cluster programmes, the VRI programme and the Regional Research Funds. All these programmes have an explicit ambition to support research, innovation and collaboration between different types of actors and there are also explicit expectations of universities and higher education institutions to promote transfer of knowledge (third mission), e.g. through councils for collaboration with business. The national agencies have also conducted some prioritisation related to important societal challenges for Norway. Today, there is a growing interest in "smart specialisation" among some regions.

Iceland

As a non-EU member state, Iceland has not yet applied the concept of "smart specialisation" to any great extent. The national focus is on innovation and any approach concerning "smart specialisation" is most likely to be implemented on the national level. Icelandic innovation policies have a traditional focus on research-driven innovation and enhancing knowledge transfer from research to industry and society. However, certain effort for stakeholder involvement and prioritisations in, for example, tourism related to nature and culture, health and well-being, pure food and water, finished food products and renewable and eco-friendly energy (hydropower, geothermal energy) have taken place.

Discussion of the concept

Regional specialisation as such is not a new concept. During the last decade, several concepts have been introduced to characterise collaboration between different stakeholders within specific competence areas, e.g. clusters, innovation systems and open innovation platforms. However, many of these have been criticised for resulting in imitations and overly fragmented or overlapping investments. To overcome the criticism, the concept of "smart specialisation" was introduced and a number of elements have been hypothesised to be critical for the successful implementation of strategies for "smart specialisation". These have been identified based on a combination of theory and practical experience, for example from the European RIS-RITTS programmes in 1994–2004. An important driver is that scarce resources after the economic crises will force European regions and countries to prioritise, in order to use their resources for research and innovation in a more efficient way.

During the last two years, "smart specialisation"

has been discussed in various fora. It has become clear that the concept has a strong policy appeal, but that it may be misleading in some cases. Since the potential for implementing strategies for “smart specialisation” is likely to vary between different types of regions, the interpretation of “smart” is also likely to vary. In smaller regions, it has been argued that a “smart specialisation” strategy may actually involve diversification, to reduce vulnerability and avoid regional lock-in effects. In larger regions, the challenge may be to develop a governance process and to identify the potential for synergies between clusters, sectors, industries and disciplines.

The review of the Nordic countries indicates that the level of formal implementation of “smart specialisation” is still limited. One argument is that it may be confusing to introduce a new policy concept in addition to smart growth, which is already part of the Europe 2020 strategy and is considered less controversial. Another argument is that the development of RIS3, using the six-step model, takes too much time to be integrated into the new Operational Programmes for the Structural Funds 2014–2020. A third argument is that many Nordic regions have already implemented many of the elements of “smart specialisation” in their strategies and policy measures.

Potential advantages of Nordic regions

Although the concept is new, many Nordic regions are doing well from a “smart specialisation” perspective. The concept seems to have had a greater impact in regions in Southern and Eastern Europe, where the level of innovation has traditionally been lower than in the north. The Nordic countries have often been used as “best practice” examples in studies on regional development and innovation. Over the last decade, there have been many programmes and initiatives for regional development and innovation, including components that may support the future implementation of RIS3.

Analysis of regional potential

In most Nordic regions, there are regional cluster strategies, innovation strategies or development programmes based on a thorough analysis of the regional potential, mainly *within* the regional contexts. Analyses are often based on traditional SWOT analysis (strengths, weaknesses, opportunities and threats), but several regions have also used external experts or peer

reviews in the process. It is argued that external input tends to have a greater impact on policy makers than analysis provided by the regional authorities themselves. To support regional stakeholders further, collaborative platforms for regional analysis have been established in both Sweden and Denmark, and some national agencies are providing various types of analysis. There is also a well-developed tradition of more qualitative evaluations, inspired by the Norwegian concept of “følgeforskning” or ongoing/learning evaluation.

Tradition of triple-helix collaboration

There is a strong tradition in the Nordic countries on collaboration between various stakeholders in the process of developing regional programmes or strategies. Many of the national initiatives even require collaborative actions, for example the Structural Funds programmes 2007–2013 (regional NUTS 2 partnerships), the Swedish VINNVÄXT programmes (triple-helix collaboration), the Danish Growth Fora and the Norwegian VRI programme and Regional Research Funds. In most cases, these collaborative activities combine the need for strategic leadership (governance) with stakeholder involvement, often from a triple-helix perspective.

Prioritisation of boundary-spanning collaboration

Over the last years, cross-sector and trans-disciplinary collaboration has been addressed, specifically in some of the national cluster and innovation programmes. In the latest innovation policy documents, for example, national innovation strategies and the Swedish bill of research, the Nordic countries address global challenges and societal problems as important priorities for future research and innovation. These are challenges that cannot be addressed by single actors, regions, sectors or disciplines, but require collaboration across competences and geographic distances, as well as between various levels. This type of collaboration may reduce the future risk of path dependence and regional lock-in effects.

A broadly defined concept of innovation

As indicated in the previous chapter, Nordic countries have introduced policy measures to support various types of innovation, including user-driven innovation, public sector innovation and green innovation. These issues have been addressed in national policy documents, as well as in regional action. One sector that has attracted a high level of attention during the last years

is health care. Many initiatives have been taken to support private as well as public innovation in the health care sector, for example specific incubators and clinical test facilities. Green growth and the development of sustainable cities are other areas of national interest. The importance of public procurement has been addressed as potential for public actors to support such a development.

Remaining challenges

In summary, the overall ambitions of “smart specialisation” are positive and many Nordic regions are doing well from a “smart specialisation” perspective. Still, there seems to be room for further implementation of some of the elements suggested to generate more efficient regional and national development and innovation strategies in the Nordic countries. One example

concerns the regional capacity for the analysis of economic potential in relation to *other regions*, within or outside the country. Another example concerns the need to provide incentives for increased involvement of small and medium-sized companies (SMEs), entrepreneurs and representatives of the general public (quadruple helix). There is also a need for improved dialogue between different levels and for increased participation of SMEs in global value chains and EU research programmes, such as *Horizon 2020*.

Finally, it is important to understand that the potential for addressing and exploiting “smart specialisation” is likely to vary between different types of regions. The most important challenge seems to be the development of a well-functioning and inclusive regional governance process, to secure broad stakeholder involvement and long-term ownership of the strategies.

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