The status, characteristics and potential of **SMART SPECIALISATION** in Nordic Regions

By Mari Wøien, Iryna Kristensen and Jukka Teräs

NORDREGIO REPORT 2019:3

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*Prepared on behalf of the Nordic Thematic Group for Innovative and Resilient Regions 2017–2020,
under the Nordic Council of Ministers Committee of Civil Servants for Regional Affairs.*

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Stockholm, Sweden, 2019

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List of Abbreviations

AIKO (Finland)	Alueelliset innovaatiot ja kokeilut (Regional innovations and experiments)
EDP	Entrepreneurial discovery process
ELY-Centre	Finnish Centre for Economic Development, Transport and the Environment
ERDF	European Regional Development Fund
EU	European Union
FD (Norway)	Finansdepartementet (Ministry of Finance)
KMD (Norway)	Kommunal- og Modernisering Departmentet (Ministry of Local Government and Modernisation)
RCN	Research Council of Norway
R&D(&I)	Research and Development (and Innovation)
RIS3	Research and Innovation Strategies for Smart Specialisation
S3	Smart Specialisation Strategy
SMEs	(Micro) Small and Medium-sized Enterprises

Foreword

This report arose from research undertaken by Nordregio on behalf of the Nordic Thematic Group for Innovative and Resilient Regions 2017–2020¹ under the Nordic Council of Ministers' Committee of Civil Servants for Regional Affairs. The work programme for the Nordic Thematic Group for Innovative and Resilient Regions 2017–2020 listed three themes that create a foundation to understand the factors that support the creation of innovative and resilient regions across the Nordic countries. These prioritised themes were resilience, smart specialisation (S3) and digitalisation. The three themes are closely interlinked from a regional development perspective; therefore, their complementarities are considered throughout the entire implementation process.

This report explores the concept of smart specialisation in the Nordic context and offers an analysis of the added value of smart specialisation as a tool for regional growth in this region. The in-depth study on smart specialisation was carried out in the period from 2017 to 2018 and drew on the insights and experiences of regional stakeholders and relevant national actors. The thematic group and its secretariat are grateful for the time and effort spent by these regional and national actors in providing relevant information and enabling the empirical research for this in-depth study.

Smart specialisation is gaining momentum in Europe due to an ex ante conditionality for the European Regional Development Fund (ERDF). The Nordic Region is well-suited to spearheading the assessment of the concept's added value. Given the relatively strong regions and similar institu-

tions across regions, the Nordic countries provide a comparative perspective of the possible methods of applying smart specialisation, both in the region itself and in Europe more widely. The report highlights the enabling and impeding factors and offers policy recommendations for working with smart specialisation in future. Thus, it aims to provide a solid background and policy recommendations for deliberation in the process of developing a smart specialisation strategy.

The close collaboration between the Nordic Thematic Group for Innovative and Resilient Regions and Nordregio was crucial for the creation and development of this report in terms of the valuable discussions, support and guidance provided in this working relationship. The editors would like to express their gratitude to the thematic group for creating a supportive and stimulating milieu in the final months leading up to the publication of this report. The report has also benefitted from the editorial and administrative tasks undertaken by Mari Wøien and Jukka Teräs at Nordregio.

Finally, this study is valuable from the viewpoint of Nordic ministries and institutions in developing their innovation and research and development (R&D) policy work. It contributes to the framework for the adaptation of smart specialisation in the Nordic Region.

Mr. Mikko Huuskonen

Chair of the Nordic Thematic Group for Innovative and Resilient Regions 2017–2018

¹ More information on the Nordic Thematic Group for Innovative and Resilient Regions 2017–2020 is available on Nordregio's [website](#).

Executive summary

The overall objective of the current smart specialisation study (undertaken during 2017–2018) is to create an understanding of how the different Nordic regions adapt to the smart specialisation policy concept (referred to as S3) and to analyse the added value of its implementation in the Nordic context. The study is part of the work programme for the Nordic Thematic Group for Innovative and Resilient Regions 2017–2020 set by the Nordic Council of Ministers.

This report attempts to create a foundation for understanding the added value of smart specialisation in the Nordic context. It focuses on the cohesiveness and complementarity between the different tiers of government, paying particular attention to the dialogue between the national and regional levels to identify factors that enable or impede the implementation of smart specialisation. The report also addresses the role of smart specialisation in realising the green economy and looks at regional commonalities in the pursuit of identifying a Nordic model of smart specialisation. Although there might not be a clear-cut vision of such a model, common themes can be identified that enables the implementation of smart specialisation, such as similar approaches to regional governance and socio-political factors.

The acceptance and implementation levels of smart specialisation differ markedly between the Nordic countries. The European Union (EU) member states, Sweden, Finland and Denmark, are required to draw up innovation strategies in line with the smart specialisation discourse because it is an *ex ante* conditionality for receiving Structural Funds from the European Regional Development Fund (ERDF). To date, the Faroe Islands and Greenland have not adopted smart specialisation, but the Finnish province of Åland has included smart specialisation as part of its innovation strategy for 2014–2025. Denmark, as an EU member state, has developed a policy framework that consists of a number of national strategies related to innovation, but regarding the full utilisation of the smart specialisation concept it remains somewhat reluctant. Sweden has created a multilevel S3 framework, consisting of several strategies for

research and innovation (R&I), whereas Finland remains largely regional in its approach. It is interesting to note that, in Norway, which is not a member of the EU, regions are increasingly considering smart specialisation as a potential approach to regional growth and innovation. Moreover, in 2018, the Norwegian Ministry of Local Government and Modernisation published a handbook (*Veileder*) to smart specialisation at the regional level. Looking across the ocean to Iceland, smart specialisation has not been formally adopted as a concept. However, as its innovation policies are modelled on those of the EU, it is likely that similarities will be observed in its upcoming innovation policies.

In those regions in which smart specialisation has not yet been adopted, it is still possible to detect *de facto* smart specialisation. This refers to initiatives that clearly carry resemblances to smart specialisation (Teräs et al., 2018). Thus, the one of the aims of this report is to further analyse the status, potential and the characteristics of smart specialisation also beyond the EU's regional boundaries, whilst considering the nature of smart specialisation in EU member states.

Empirical research

The case study areas in this report were selected to ensure that territorial diversity in the Nordic Region was represented. They cover urban and capital regions as well as rural regions, the Arctic and islands; they also cover a variety of typologies, with the aim of uncovering and analysing transnational and transregional similarities and differences. Thus, they provide a pan-Nordic perspective on benchmarks for the design and implementation of smart specialisation.

The Finnish region **Kymenlaakso** has begun to integrate smart specialisation successfully into its regional strategy. Enhancing its vision for regional development, Kymenlaakso has traced and defined its regional domains, creating a foundation for long-term prosperity. In addition, the definition of these domains creates a sense of urgency by bringing clear priorities into the regional agenda and facilitating the allocation of available regional resources. Creating clear prioritisations and spear-

heads in the regional S3 strategy (known as Kym-RIS) enhances the region's chances of success when participating in tendering processes for regional funds.

Despite not having adopted an S3 strategy, the **Stockholm** region remains the innovation leader of the EU. Arguably, the implementation structure of smart specialisation in Stockholm challenged its development, as the political ownership to the process was largely missing. For this reason, the development of S3 policies have been largely person-dependent and vulnerable to change. Although the region has developed an overarching innovation strategy, the strategy remains general, with only loose connections to the S3 concept. As a capital region, Stockholm has a wide variety of actors, and the absence of a strong history of cluster politics may have affected its ability to mobilise these actors for smart specialisation. With this in mind, it may be worth questioning whether smart specialisation is better suited for mid-sized regions with e.g. a historically strong industrial sector, creating clear and obvious prioritisations based on existing strengths and knowledge networks. The case of Stockholm may thus indicate that there is an 'optimal size' for the implementation of smart specialisation.

The Central Denmark Region, **Midtjylland**, takes a pragmatic approach towards smart specialisation as it has largely regarded the concept as a means to secure ERDF funding to boost regional competitiveness. Thus, the practical application of S3 is limited to dialogue forums and partnerships and it carries little substantive meaning for the regional innovation stakeholders. However, the S3 proxy structure adopted appears to be substantial and the current approach to regional innovation in the Midtjylland region suggests that a 'de facto smart specialisation strategy' has been implemented.

The Norwegian region of **Nordland** was the first region to consider the concept of S3 as part of its innovation and research and development (R&D) strategy, after a thorough review of the concept's potential for regional growth. However, the challenges regarding multilevel governance structures between the regional and the national levels may cause additional complexity in the future. The Planning and Building Act and the integration of S3 objectives may assist in further structuring the strategical work. The Nordland case also demonstrates the importance of clear

ownership and leadership for enabling and capitalising on smart specialisation, enhancing the dissemination of knowledge of the concept and its consequent utilisation.

Like Norway, **Iceland** is a non-EU member and it is therefore not required to implement smart specialisation in its regional innovation and R&D policies. Moreover, Iceland does not have the regional governmental structure that is seen in the Nordic Region at large. Smart specialisation is not included in its national innovation policies, but the upsurge of a smart specialisation discourse, and the fact that Iceland's approach to innovation is often reminiscent of the EU's approach, may indicate that smart specialisation will form part of Iceland's future innovation policies. Like Denmark's Midtjylland region, similarities to the S3 concept are detectable in Iceland's policies.

Åland is not part of the EU Smart Specialisation Platform but has nevertheless developed an innovation strategy based on the concept for receiving ERDF funding. Additionally, the smart specialisation concept is firmly rooted in Åland's approach to sustainable development and influences its skills policies and education planning. Thus, the take on smart specialisation in Åland is largely practical in its orientation. Over time, Åland's smart specialisation attempts may be challenged by its limited volume in R&I.

Key findings

To some extent, the implementation of and approaches to S3 are cast differently across the Nordic Region. Regardless of this, there are underlying similarities between the region's countries—they are characterised by their relatively strong economic positions, high levels of trust and natural resource dependency—that may enable, buttress and deepen S3 strategies. For example, regional S3 policies targeting the bioeconomy may increase the competitive edge of natural resource-dependent regions, levelling the playing field and reducing the traditional urban–rural dichotomy. Considering the case studies analysed for this report, it is clear that the more rural regions, with stronger industrial sectors and greater reliance on natural resources, are actively using S3 to increase their competitive advantage. By comparison, the metropolitan and urban areas are displaying some lack of enthusiasm for the concept, owing to their already high levels of innovative performance and the overall nature and

number of companies present in the region. However, some of these regions do display traces of de facto smart specialisation, due to the scholarly focus of their universities and research institutes. This divide also raises the question of optimal size, noted above in relation to Stockholm: that is, regional size may be relevant in terms of available actors and the economic structure for enacting an S3 strategy.

When examining the operationalisation of smart specialisation, it is evident that the regional administrations play a significant role, although commitment to the implementation and the subsequent performance of the concept varies across the EU and the Nordic Region. Thus, the methodology and strategies connected to its implementation are decisive for the uptake of S3. In exploring smart specialisation and the relative policy and regional context in the Nordic Region, there are evident signs of what this report has referred to as de facto smart specialisation, that is, regions are working in line with the S3 concept, despite not having formally adopted its methods and processes. In this report, the case studies indicated that the ways in which the Nordic innovation systems and markets are organised are reminiscent of, and largely compatible with, the theoretical foundations of smart specialisation.

Devising a smart specialisation strategy requires a combination of harmonised actions and actors. A clear regional ownership and leadership,

with the right set of capabilities for bringing about the strategy in a sound manner, is necessary, but only in combination with the engagement of actors across pre-identified areas of regional strength. Furthermore, based on the case studies, it seems evident that a strengthened connection between the different levels—businesses, regional actors and national authorities—may be an advantage in constructing a strong regional economy. Trans-regional and transnational knowledge sharing, enabled by common platforms—such as the EU's S3 Platform in Seville, Spain, which provides support to the design and implementation of S3—remains important in devising best practice examples and providing methodological inspiration.

Despite being a relatively new concept, S3 has made its way into the fabric of various Nordic regions. The concept has been adapted in local and regional contexts, and similarities are detectable across the macro-region, implying the existence of a Nordic model of S3. Arguably, the nature of the context within which the Nordic innovation systems are situated have aided and incentivised the implementation S3 strategy processes. The existing innovation systems facilitates the adoption of the S3-logic, and their absorption capacities makes for an easy adoption of the policy tool regardless of the country's EU-membership status or ex ante conditionalities. The Nordic region may play an active role in creating benchmarks for the implementation of S3 elsewhere in the future.

Introduction

Background of the study

Smart specialisation was first introduced by the European Union (EU) in 2010 as a bottom-up policy for regional innovation to help bridge the growing gap between Europe and the United States, Japan and other emerging global competitors (European Commission 2010a; Foray and van Ark, 2007; Teräs and Mäenpää, 2016). The smart specialisation concept and its sub-concepts of 'entrepreneurial discovery processes' (EDP) and 'domains' assist in promoting strategic innovation policies from an entrepreneurial perspective. Lending this lens to the overall strategic implementation of smart specialisation (S3), this bottom-up approach may identify and address new and emerging innovation paradigms that break with a region's dominant or traditional areas of economic strength (Teräs and Mäenpää, 2016).

Thus, drafting research and innovation strategies for smart specialisation (RIS3) became an ex ante condition for accessing the EU Structural Funds for the 2014–2020 programme period. This implies that for the first time, territorial cohesion—the fundamental goal of European regional policy—is *"welded" with the objectives of competitiveness and innovation* (Bellini, 2015: 23). While a large body of literature deals with the theoretical underpinnings of the smart specialisation concept (Foray et al., 2011, 2013; McCann et al., 2011, 2013; Morgan, 2013, 2015; Foray, 2015), understanding its potential to address growth challenges that different European regions face is still largely missing (Capello and Kroll, 2016). For the sake of the nature of this report, we will be referring to 'S3' rather than 'RIS3'.

It is evident that the relatively early adoption of smart specialisation and its influence on the overall strategy process, which were features of the Nordic development of smart specialisation, may be favourable factors in implementation, which should be taken into account in future policies and strategies in Europe (Kroll, 2015; Teräs and Mäenpää, 2018). However, there is currently no systematic overview of how the Nordic regions adapt and implement the concept of smart spe-

cialisation to their regional innovation strategies. There is also no overview of the differences between the concept of smart specialisation and the regional innovation strategies. What emerges is a clear learning gap in the Nordic context that is worthy of further exploration.

An evaluation of the impact of smart specialisation programmes and strategies is rather challenging, given the early stage of their implementation. Often, the evaluation is limited to collecting feedback and reflections from the actors and participants involved in the respective smart specialisation programmes and projects. This study comes at a critical moment, as there is a need to meet the growing demand of policy makers for assistance in assessing S3 developments, as well as to provide them with the most recent data on smart specialisation.

This report aims to evaluate and analyse the present status of smart specialisation in the Nordic Region. Given that smart specialisation is part of an ex ante conditionality for EU member states, it is particularly interesting to consider the smart specialisation rationale, challenges and opportunities facing the regions that remain outside the EU and are thus not directly affected by the conditionality. This report provides an in-depth analysis of five different regions in the Nordic partnership: the Finnish region Kymenlaakso; Stockholm, Sweden; the Central Denmark Region, Midtjylland; Nordland in Norway; Iceland; and Åland.

It is important to note that the empirical research for the case studies reflects the stakeholder perceptions of S3 and does not seek to generalise the empirical findings beyond the analyses of the commonalities identified throughout this process.

Aim and scope

The overall objective of this S3 2017–2018 study is to **create an understanding of how the different Nordic regions adapt to the S3 policy concept and to analyse the added value of its implementation in the Nordic context**. Four research questions (RQs), defined below, assist in reaching this objective:

RQ (1) How do the national and regional governmental levels support S3 processes and which tools are in place for this purpose?

RQ (2) What are the enabling and impeding factors influencing the adoption of S3 elements at the regional level?

RQ (3) To what extent does the S3 approach aid the understanding of the relevant processes in regional innovation systems and the stimulation of necessary synergetic co-operation within them?

RQ (4) As a place-based approach, how does S3 contribute to driving the green growth agenda in the Nordic context?

The relation between regional smart specialisation strategies and national policies, as well as funding priorities, are crucial issues for the analyses. With a focus on the cohesiveness and complementarity between different tiers of government and the dialogue between regional and national levels vis-à-vis regional smart specialisation, such analyses may provide significant insights.

The project also considers the different geographical scales of S3. This includes the highly relevant but not yet sufficiently analysed aspect of transnational and transregional collaboration, and a benchmarking of smart specialisation design and its implementation in and from a pan-Nordic perspective.

From a policy perspective, it is important to consider how the public authorities can initiate interregional learning processes for S3 and EDP in a feasible manner. Furthermore, it is worth mentioning the green transition, as it plays an important part in the future of the Nordic economies. Given the abundance of natural resources available to the Nordic countries, the bioeconomy is particularly relevant. Finally, the project will contribute to the sharing of experiences and knowledge at the Nordic level regarding the design and implementation of smart specialisation strategies and their outcomes in relation to the organisation of regional–national governance structures, the methodology employed by the regions for iden-

tifying regional strengths and weaknesses, and finally, the level of stakeholder involvement in S3 processes.

Structure of the report

This report is structured in the following manner. First, in **Chapter 1**, the report introduces the conceptual framework. The purpose of the knowledge overview is to introduce the key concepts and provide an overview of national and regional policy support related to S3 processes. **Chapter 2** provides an overview of smart specialisation policies in the Nordic Region. The reception of smart specialisation differs between the Nordic countries and is not uniformly applied. This chapter provides the contextual background for the empirical research conducted for this report. Chapter 1 and Chapter 2 build on the foundations provided for this report in Kristensen, Teräs, and Wøien's Discussion paper: *'The potential for Smart Specialisation for enhancing innovation and resilience in Nordic regions'*, which was prepared for the Nordic Thematic Group for Innovative and Resilient Regions and published in January 2018 (Kristensen et al, 2018). **Chapter 3** lays out the methodology applied when conducting the empirical research and considers the desktop material studied and analysed for this report. The section refers to existing approaches to understanding S3 from a policy perspective and provides a rationale for the case study selection. **Chapter 4** presents the empirical research undertaken using case studies. The case study interviews were undertaken during the second half of 2018. The section takes a closer look at the six Nordic regions examined and their conceptualisations and approaches to smart specialisation. **Chapter 5** places the empirical findings from the case study research into a cross-case analysis. The cohesiveness, complementarities and dialogue between the different tiers of government and regional actors are examined from a comparative perspective. **Chapter 6** concludes by providing a thorough overview of the main findings pertaining to the research questions, followed by a series of policy recommendations for regional and national authorities and other interested parties.

1. Conceptual framework

The purpose of the knowledge overview is to introduce the key concepts and provide an overview of national and regional policy support related to S3 processes. Regional economic development and growth are increasingly centred around the production and utilisation of knowledge, and the successful translation of knowledge into innovative products and processes is headlining policy objectives. This section will consider this paradigm shift in innovation policy design, followed by an exploration of new designs as it appears in smart specialisation strategies. Key concepts such as entrepreneurial discovery processes and domains will be studied.

The paradigm shift in innovation policy design

Over the past decade, innovation and knowledge-based economic development have become a headline for policy makers emphasising the strategic importance of building a strong knowledge base for the economy. In this discourse, knowledge is regarded as an asset that can appear in two forms: as an input (competence) and an output (innovation) in the production process (Lundvall, 2003). The question of how knowledge is produced, mediated and used has become a prominent issue in policies for growth and regional development.

Existing disparities in growth patterns across regions precondition individual and context-specific policy approaches. Terms such as 'radical innovation', 'fast movers' and 'competitive entry' reflect positively the imperatives of EU policies. However, they do not add much to regions that are not front-runners in any specific industry. The success of innovative communities depends on their ability to combine and share both knowledge and skills, as well as different policy approaches.

Often, a prevailing justification for the existence of an innovation policy is the risk of market failure, owing to the existence of knowledge externalities, information asymmetries and capital market imperfections. Any deviations from these established 'neutral points' in innovation policy would stir up debates around issues of wrong choices, such as the creation of market distortions by 'picking winners', a process which likens sectoral

strategies or specialisations to 'the magical chaos of the blind watchmaker' (Foray et al., 2011: 3). However, the paradigm shifts in European innovation policy that have developed over the last few years have increasingly emphasised the role of the co-ordinating agents involved in the innovation process. Additionally, the demand-side measures of innovation policy have significantly enhanced the importance of competition-friendly sectoral policy, and highlighted the relevance of the regional dimension by placing stronger emphasis on the knowledge assets required for long-term economic growth (Foray et al, 2011; OECD, 2011).

A number of theoretical concepts exist to explain the policy processes for constructing regional advantage, thereby highlighting the role of regions in these developments. These theories include i) *learning regions*, where interactive learning plays a key role in regional networks (e.g., Asheim, 2011); ii) *innovative milieu*, where emphasis is placed on regional institutional endowment and knowledge interexchange (e.g., Fromhold-Eisebith, 2004), and iii) *clusters*, where industrial value chains with the spatial perspective of proximity are the main focus (e.g., Asheim, Smith and Oughton, 2011). However, the conventional methods of implementing regional innovation policies have been challenged, as they continue to focus strongly on research and development (R&D) processes, whereas these are such spatially concentrated processes that the policy efforts end up favouring only a small number of regions (Boschma, 2008; Asheim, Boschma and Cooke, 2011). Many policy makers tend to fall for the fallacy of 'imitating success stories' and subsequently fail, while the presence of knowledge asymmetries and important region-specific assets remain unexplored. Asheim et al. state that '*innovation is about [the] creation of new products and processes, but to be effective it must draw on the capabilities of regions*' (2011: 882), thus emphasising the necessity of recognising differences and capitalising on regional advantages.

There has been a rapid increase in the volume of investments in knowledge-intensive activities, as a regional policy tool for realising the potential for knowledge spillovers in innovation-related ac-

tivities. However, long-term sustainable economic outcomes will depend particularly on an expansion of those domains where innovation can generate complementarities between sectors, thereby creating *'future domestic capability and interregional comparative advantage'* (Foray et al, 2011: 4). Boschma (2008) argues that neither specialisation within specific economic sectors nor a diversity of sectors promotes innovation processes in their own right, instead emphasising the need for *'regional specialisation in related variety'* (2008: 8). This line of reasoning echoes Schumpeterian views of 'new combinations', or a cross-fertilisation of existing factors, generated by a multifaceted set of structures in a different way (Lundvall, 1992: 8). In this context, the development of potential application areas is highly contingent on the ability of the region to use existing capabilities in a way that will influence regional economic growth.

Towards smart specialisation

The origins of the concept

Past efforts at selective public intervention to ensure a favourable environment for innovation and growth have failed. This is because policies of 'picking the winner' fail to optimise the existing innovation potential and take advantage of the knowledge-based resources, be it a 'leading' or a 'following' region. One way to overcome these challenges is to generate and empower distinctive regional assets and competencies based on a region's unique economic structures and knowledge bases, consciously adapting to the regional context.

Originally, the idea of smart specialisation was introduced by a group of economists with expertise in growth and innovation (the K4G expert team), with the aim of understanding Europe's weak performance in the development and commercialisation processes of technological developments (McCann and Ortega-Argilés, 2016) and to address the fragmentation of European innovation policies and explore alternatives. The role of entrepreneurship was considered vital as *'innovations ... can be successfully nurtured, disseminated and taken up within the wider EU economy'* (McCann and Ortega-Argilés, 2016: 538). Later, Foray et al. (2009) further refined the concept of smart specialisation by defining it as *'an entrepreneurial process of discovery ... a learning process to discover the research and innovation domains in which a region can hope to excel'* (2009: 2).

The launch of the Barca Report in 2009 marked a 'spatial turn' of innovation strategies (Teräs et al., 2015), bringing to the fore the notion of place-based development as 'the new paradigm for the operationalisation of EU policies at the regional level' (Dubois, Kristensen and Teräs 2017). Table 1 below presents some of the key features that distinguish smart specialisation from a cluster-based approach (author's elaboration, based on Foray, David and Hall, 2009, 2011; McCann and Ortega-Argilés, 2011; Ketels et al, 2013; Bellini, 2015):

The term '**specialisation**' has remained rather vague in the context of regional policy making. Bellini (2015) states that *'smart specialisation is an invitation not to specialise [the] economy, but the policies and their objectives'* and that it is a

Table 1: Distinguishing cluster-based approaches from smart specialisation strategies

Elements of comparison	Cluster-based approach	Smart specialisation strategy
Unit for specialisation	Broader set of economic sectors	Specific innovation-intensive domain or niche of economy
Approach	Enhancing external effects through shared infrastructure and input markets	Facilitating knowledge spillovers between knowledge domains
Types of linkages in focus	Linkages between knowledge domains	Groups of companies in related industries
Function	Element of innovation ecosystem	Wider policy aiming at transforming ecosystems
Expected outcome	Enhance the performance of a group of related industries	Structural transformation of an economy around new knowledge-based activity domains

Smart specialisation:

A strategic approach to enhance economic transformation by directing knowledge investments into activities with the highest potential to generate spillover effects on regional growth.

'well-targeted diversification, based on 'related varieties', i.e., a reduction of sectoral specialisation' (2015:24). Furthermore, it should be noted that for rural and peripheral regions it may be necessary to consider the benefits of *smart diversification* rather than smart specialisation (see e.g. Asheim et al., 2017). McCann and Ortega-Argilés (2016) state that policy results stimulated by smart specialisation approaches have never been about sectoral specialisation, but rather about '*carefully choosing priorities which are best suited to moving the region from its current development trajectory to a stronger trajectory via the enhancement of the local entrepreneurial climate*' (2016: 542). In other words, smart specialisation is not a structure but a transformative activity that aims at addressing unique capabilities, capacities and infrastructure specific to a technology or sector (Foray, 2017 at the 12th Regional Innovation Policy Conference (RIP) 2017).

Entrepreneurial discovery process— The 'smart' core of S3

S3 corresponds to a new *policy prioritisation logic* (McCann and Ortega-Argilés, 2013) grounded in EDP. In a nutshell, whereas smart specialisation refers to the policy process, entrepreneurial discovery describes the functional processes enabling it (see Figure 1). Entrepreneurial discovery refers to the processes of promoting specialised diversification initiatives across related sectors, referred to as *domains*, in regional economies (Foray et al., 2011; Asheim and Grillitsch, 2015). The reference to '**entrepreneurial**' reflects the importance of recombining the existing entrepreneurial knowledge scattered across the regional innovation system (Foray et al., 2011; McCann and Ortega-Argilés, 2013; Boschma, 2014), while the use of '**discovery**' highlights the non-deterministic, interactive process of identifying novel applications from regional entrepreneurs, which is the opposite approach to that of 'picking the winner' adopted in previous generations of R&I policies. Foray (2015) defines

an entrepreneurial discovery as '*a new area of structural change that opens up, into which a whole segment of an industry can move to explore it and generate numerous innovations*' (2015: 24).

Figure 1: Entrepreneurial discovery process (EDP)
Source: Dubois, Kristensen and Teräs, 2017

Instead of promoting individual innovations, the entrepreneurial search process stimulates a demand-driven 'innovation discovery' (Rodrik, 2004; Asheim and Grillitsch, 2015), which leads to a structural transformation of the regional economy. As a policy process, therefore, S3 may foster a heuristic approach aimed at gradually improving the capacity of regions to source and use knowledge more effectively as a key driver of economic growth and societal change. Thus, bringing the S3 argument into the regional development context directs attention to regional capacity building, the potential of exploiting related variety and the importance of interregional and intraregional connectivity between different organisations (McCann and Ortega-Argilés, 2013).

EDP constitute the 'smart' core of S3, underlining the vertical or 'specialisation' logic of resource allocation. The entrepreneurial knowledge, which is needed for 'domain' discovery, rarely arises from a single organisation or individual. Therefore, smart specialisation can only be achieved through new collaborative behaviour between entrepreneurs. This loosely encompasses all relevant stakeholders, including individual entrepreneurs, companies, universities, technology transfer offices and regional

Entrepreneurial discovery:

a process of engaging various actors (i.e., organisations and agencies) in an experimentation process to explore alternatives for sustaining the competitive advantage of regions.

development agencies that have the capacity to contribute to the discovery of new domains (Foray and Goenaga, 2013). To give a new perspective to the topic of RIS implementation, scholars have advocated a more pragmatic approach that puts entrepreneurs in a position *'to discover the domains of R&D and innovation in which a region is likely to excel given its existing capabilities and productive assets'* (Foray et al., 2011:7). Thus, in S3 thinking, entrepreneurial discovery is conceived as an iterative, cyclical process involving multiple streams of knowledge exchanges and shaping a joint knowledge base within a specialised area (or domain) that can aid the generation of new knowledge *'about the future economic value of a possible direction of change'* (Foray, 2015: 24).

Domains as transformative activities

The main place-focused dimension of S3 is the emergence of one or more domains within the regional economy that are cross-sectoral and of local delineations. From this perspective, regional innovation cannot be attributed to a specific sector or locality of a region but arises from new forms of cognitive connectivity.

Foray defines a domain as the level at which S3 priorities are identified, assessed and supported, neither too high (an entire sector), nor too low (an individual firm) (2015: 41). Thus, a domain corresponds to a mid-level economic unit that stretches across several sectors or activities (without covering them entirely), thereby offering greater learning possibilities and opportunities for knowledge spillovers (McCann and Ortega-Argilés, 2013). The promotion of new domains rather than entire

sectors in S3 aims to *'realise the potential for scale, scope and spillovers in knowledge production and use'*, and to *'develop distinctive and original areas of specialisation for the future'* (Morgan, 2013: 104). This is arguably much less intuitive than promoting entire industries or individual champions.

The emergence of domains necessitates the creation of new functional linkages across firms, sectors and localities within the regional economy. As pointed out above, Boschma (2008) argues that neither specialisation within specific economic sectors nor a diversity of sectors promotes innovation processes in their own right and that, instead, the main focus should be on solutions that seek specialisation through regional cross-sectoral links or *'related variety'*. In a way, this relates more to the idea of smart diversification than to smart specialisation (Asheim and Grillitsch, 2015; Cooke, 2016).

Building transformative activity (i.e., selecting priorities or building domains) means addressing specific capabilities, capacities and infrastructure specific to a technology or sector (see Figure 2). Identifying a region's strong sectors and the mapping of possible domains may open up room for alternative projects and generate new areas of knowledge in the region. However, it is important to restate that the determination of strong sectors in a region and the subsequent act of building domains for structural transformation does not equate to a narrow or exclusive regional approach to growth. Rather, it encourages a strategic view on how to consolidate efforts to find new areas of possibilities.

According to Foray, transformative activity is *'neither an individual project nor a sector as a whole, but a collection of existing innovation capacities and actions oriented towards a certain structural change (e.g., transition, diversification or modernisation of regional economy)'* (at RIP 2017). This implies that there is no one-size-fits-all regional recipe, and that each transformative activity always involves some level of uncertainty and risk.

Although smart specialisation is gaining momentum in the European policy debate, a few potential dilemmas seem to persist regarding its implementation. Below are some of the main factors/risks impeding S3 implementation, as identified by Capello and Kroll (2016):

Domain:

refers to a transformative activity that stems from existing economic structures and causes structural transformation.

Figure 2: Development of transformative activity (selecting priority areas). Source: Foray, 2017 (RIP conference 2017) + authors' interpretation.

- The implementation process can be hampered by a lack of local preconditions for innovation, especially in more peripheral regions.
- Regions often find it difficult to diversify around local historical specialisation patterns.
- Difficulties in policy prioritisation may exist. Some regions tend to replicate policies at the local level with the ambition to be strategic in relation to the national and international levels.
- The repositioning of peripheral regions in international value chains is often beyond the control of regional policy makers (due to the strong dependence of many regions on large multinational enterprises).
- There is a risk that 'discovery' processes become predominantly driven by the public sector, and hence, there is a lack of application-oriented strategies because of the weak absorptive capacity and creativity of small and medium-sized enterprises (SMEs). This section will give an overview of the current European policy context for smart specialisation. It will also provide a policy review of the five Nordic countries, as well as a shorter summary of the three territories (Faroe Islands, Greenland and Åland).

2. Policy review

This section is based on desktop research and covers the Nordic Region more broadly than the proceeding case studies. For a compilation of national S3 approaches in the Nordic region, please consult Table 6 in Annex 1.

European level: S3 as ERDF conditionality

The European Commission manages its Cohesion Policy through the European Regional Development Fund (ERDF), through which EUR 277 billion is allocated to regional development for the period 2014–2020 (European Commission, 2017). The overall aim of the Cohesion Policy is to reduce regional differences and ensure growth across Europe. The ERDF operates under the EU policy *Europe 2020: A Strategy for Smart, Sustainable and Inclusive Growth (2014–2020)*. This means that the funding mechanism follows the priorities of R&I, information and communications technology (ICT), small and medium-sized technology developments, as well as advocating for a low-carbon economy.

Development of a smart specialisation strategy is a precondition for regions to receive funding from the EU Structural Funds. As the Structural Funds are considered a crucial tool for European regions to overcome economic crises and downturns, this precondition links smart specialisation strategies to the concept of resilience. In this way, the European Commission directs regions to design their place-based R&I strategies in an inclusive way, with smart specialisation as a guiding approach. The requirement does not mean that a stand-alone S3 strategy is necessary to achieve EU funding, but such a strategy must be in place as part of the broader regional development strategy.

The main tool to support regions in their S3 strategy design and implementation is the Smart Specialisation Platform (S3 Platform, see Figure 3). The platform is maintained by the EU Joint Research Centre, and provides guidance material and good practice examples, as well as facilitating peer review and mutual learning. The platform also supports access to relevant data. Incorporating S3 thinking has become part of policy making

processes across the EU. There are currently 179 European regions registered on the S3 Platform, plus 16 non-EU member state regions. 37 of these regions are Nordic (S3 Platform 2019). Being registered on the platform indicates a region's interest in smart specialisation and the international networking related to S3. The level of implementation of S3 strategies varies significantly between the registered regions. For example, some regions include smart specialisation strategies within their regional programmes, whereas other regions are currently at the stage of finding ways to incorporate an S3 approach in their strategy design.

Figure 3: Overview of regions and countries on S3P.
Source: S3 Platform 2019

Nordic national strategies supporting S3

As EU member states, Sweden, Finland and Denmark are required to draw up smart specialisation strategies to access Structural Funds, whereas Norway and Iceland, which are outside the EU, do not face the same requirement. Smart specialisation strategies may be developed at both the national and the regional levels, but it could be argued that S3 strategies are predominantly anchored in a synergy between the regional and the EU levels, whereas the role of the national government is to provide support. This dynamic is particularly evident in Sweden and Finland, where there is no overarching national S3 strategy, but where extensive regional S3 strategies have been devised. However, in Finland, smart specialisation efforts are co-ordinated and monitored from the national level (Helsinki–Uusimaa Regional Council, 2015). Thus, despite the lack of national S3 strategies in place in Finland and Sweden, there are national frameworks to include and support regional S3 efforts and strategies (see e.g., Helsinki–Uusimaa Regional Council, 2015).

The reception of smart specialisation policy strategies differs between Nordic countries. Often considered an 'S3 sceptic', Denmark (Lindqvist, Olsen, Perjo and Claessen, 2013) has developed a policy framework that consists of a number of national innovation-related strategies. These include the *Innovation Strategy: Denmark a Nation of Solutions (2012–20)*, which was complemented in 2015 by the growth and development strategy within the whole-of-Denmark strategy, as well as regional

growth and development strategies. Similarly, Sweden has created a multilevel S3 framework comprising several strategies for R&I, including regional development strategies, regional innovation strategies, the *National Innovation Strategy and the Research and Innovation Bill* (Sörvik, forthcoming). As a follow-up, several Swedish regions have developed S3 strategies according to the European Commission's S3 guide (Sörvik, forthcoming). Thus far, 16 Finnish regions have developed regional S3 strategies to varying degrees and registered on the European Commission's S3 Platform (EC, 2018). This signifies a considerable interest in strengthening the regions and creating new networks, while looking internationally to identify new potential collaborations. As non-EU member states, neither Iceland nor Norway is obliged to adopt regional S3 strategies, although some Norwegian regions have displayed significant interest in S3 policy tools.

Finland

In Finland, smart specialisation takes place only at the regional level, and not actively in all regions (Polverari, 2016). The authorities responsible for S3 are the regional councils (Teräs and Mäenpää, 2016). Please see Box 1 for an example of a regional smart specialisation strategy developed in Lapland.

Finland has decided not to develop a national smart specialisation strategy (Polverari, 2016), but smart specialisation is supported at the national level. The Finnish *Regional Strategy 2020* describes regional specialisation as an essential means to

Box 1: Lapland, Finland

Lapland in North Finland spans an area of 98,982 km² and has 183,330 inhabitants. Lapland is known for its tourism industry but also for its Arctic expertise in several areas, such as Arctic car testing, sustainable use of mines and processing industries. The region's research and education institutes include the University of Lapland and the Lapland University of Applied Sciences.

The regional smart specialisation strategy process in Lapland took place in two major phases: the S3 formation in 2012–2013, and the S3 implementation phase in 2015. Lapland's strategy is entitled the *Arctic*

Specialisation Strategy, and has three major themes: 1) the refining of Arctic natural resources, 2) the utilisation of Arctic natural conditions and 3) cross-cutting development enabling Arctic growth. The six-step S3 approach (analysis, governance, vision, priority selection, policy mix and monitoring/evaluation) was adopted and followed closely in Lapland.

After the strategy formulation, five Smart Clusters were introduced in 2014–2015: Arctic industry, Arctic rural networks, Arctic design, Arctic security and Arctic development infrastructure.

promote regional development and innovation, and efforts have been made to enhance collaboration and networking between citizens, regions and other actors to improve the effectiveness of regional development (Ministry of Employment and the Economy, 2010). The *Regional Strategy 2020* aims at highlighting Finnish specialised domains in the world economy by focusing on regional competences (Lindqvist et al., 2013).

Funding for regional smart specialisation efforts is available at the national level for 2016–2019 as part of the national innovation programme *Regional Innovations and Experimentations (AIKO)*. This funding platform links the concepts of smart specialisation and resilience, as the objective is to regenerate regional economies by supporting region-specific strengths and to implement measures to mitigate the impacts from ongoing structural transition. Another objective of the AIKO programme is to raise the specialisation profiles of regions so that they become more internationally significant. To achieve this, the national government has made strategic growth agreements between the Helsinki metropolitan region and six other cities. The government supports competitiveness efforts targeted at regional strengths through the formation of contract-based co-operation agreements between the regions and the central government.

Smart specialisation is gaining more ground in Finnish regional development. Currently, the regional councils, in collaboration with regional key actors, are preparing regional strategic programmes for the 2018–2021 period. Guided by the *Regional Development Act* (Ministry of Economic Affairs and Employment, n.d.), these programmes will steer and co-ordinate regional development. The current drafts focus significantly on smart specialisation; for example, smart specialisation is prominent in the regions of Pirkanmaa and Central Finland. There are also co-ordination, monitoring and evaluation measures at the national level, devised to oversee the preparation and implementation of regional strategic programmes. The forthcoming formulations on the implementation plans will set out the priority areas for national and EU funding. Currently, the implementation plan entails a resilience aspect as part of a regional preparation plan for future structural changes (ibid).

Recent national contributions to smart specialisation include a national analysis of regional core strengths, which has been conducted to support the regions in updating their regional strategies

and preparing for the coming EU programme period for 2021 onwards (Owal Group Oy, 2017).

Sweden

As an EU member state, Sweden is required to develop smart specialisation strategies to receive ERDF funding. The administrative level for developing smart specialisation frameworks is the national

Box 2: Värmland, Sweden

The Värmland region covers a 17,519 km² land mass in the midwestern part of Sweden. The region borders the Akershus, Østfold and Hedmark regions of Norway. The population of Värmland is 281,367 (SCB, 2018). The regional capital is Karlstad, with approximately 92,218 inhabitants (ibid.). The Värmland region is mostly known for its steel and forestry industries. The region has one major innovation centre, Karlstad University, which has over 16,000 students (Karlstad University, 2018; S3 Platform, 2017b).

The Värmland region prepared its RIS3 strategy during 2014–2015. After analysing available regional assets, officials in Värmland identified their targets for specialisation, i.e., their *S3 domains*. The region has put forward four different categories for specialisation. The first, *transverse specialisation* (value creation services), concerns a general level of specialisation and thus, is not central for developing domains. However, Värmland also emphasised *prioritised specialisation* (which includes a forest-based bioeconomy, digitalisation of welfare services, and advanced manufacturing and complex systems) and *specialisation under qualification* (the 'upcoming' areas of specialisation, which include nature, culture and place-based digitalised experiences, as well as system solutions with photovoltaics). Finally, the region included a category of *new areas of smart specialisation*, which are yet to be discovered.

Additionally, Värmland has developed the *Academy for Smart Specialisation*. This is a collaborative initiative between Karlstad University and Region Värmland to strengthen the research environment in the region and to renew the region's industry (Karlstad University, 2019). The project will run until 2020.

government and, to some extent, the regional governments (Polverari, 2016). Despite a strong national innovation system—including Sweden's Innovation Agency Vinnova and its Vinnväxt programmes, and Tillväxtverket, the Swedish Agency for Economic and Regional Growth—Sweden has decided not to develop a separate, designated national S3 strategy (Polverari, 2016). Nevertheless, some regions did. Please see Box 2 and 3 for examples of regional smart specialisation strategy developed in Värmland and Skåne.

The current Swedish national innovation strategies include some reference frameworks for regional smart specialisation. *The Swedish Innovation Strategy* (2012) states that Swedish regions will increase their innovation capacity based on their unique conditions. Furthermore, the regional strategies should be grounded in combined regional-national leadership. In turn, this will assist the dialogue between the national, regional and international levels. According to the *National Strategy for Sustainable Regional Growth and Attractiveness 2015–2020*, 'greater collaboration between academia, society and industry is required, to bring about joint strategic and long-term initiatives' (Government Offices of Sweden, 2015: 4). The strategy guides the development and implementation of regional

development strategies. Both strategies accentuate EU Cohesion Policy as an integrated part of the Swedish regional growth policy and the need for an alignment of the regional, national and EU strategies for regional growth.

There are national efforts to increase the up-take of smart specialisation strategies in Sweden. Tillväxtverket is a central actor strengthening regions in their work with smart specialisation. The agency's remit is to '*support actors that have regional development responsibilities regarding smart specialisation and to disseminate experiences and competences from this work*' (Tillväxtverket, n.d.) The agency's most important task is to ensure that EU funds are invested in projects that promote regional growth and employment. The agency has supported regions in their innovation and S3 strategy development within the Regional Work on Innovation and Clusters (RIK) programme. The work on smart specialisation will be continued, drawing on lessons learnt from the RIK programme (Tillväxtverket, n.d.)

Most Swedish regions work to develop their own S3 strategies in line with the EU recommendations (Tillväxtverket, n.d.; Henning et al., 2010). These can be either embedded in the respective regional development strategies for each region

Box 3: Skåne, Sweden

The Skåne region is the southernmost region in Sweden and spans an area of 10,968 km², with a population of 1,358,637 (SCB, 2018). The regional capital is Malmö, with 338,230 inhabitants (ibid.). Skåne has a diverse industry, with academic excellence in material science, medicine, mobile technology, food and nutrition (Lagnevik, 2012). Skåne hosts strong clusters in life science, clean-tech, ICT, packaging, food, mobile communication and film (Vanguard Initiative, n.d.; Cooke & Eriksson, 2012). A cross-border life-science cluster, known as Medicon Valley, operates in Skåne and the Danish capital city of Copenhagen. Other important co-operative initiatives have been introduced with Finnish Oulu (eHealth) and Tampere (Smart Cities) (Vanguard Initiative, n.d.).

The *International Innovation Strategy 2012–2020* for Skåne (2011) envisions Skåne as the most innovative region in Europe.

The strategy identifies three areas of relative strength: personal health, smart and sustainable cities and smart materials. Further, Skåne has taken advantage of the international scope of S3 by being part of the Vanguard Initiative, which aims to lead by example in industry-led interregional co-operation based on smart specialisation principles (cf. Vanguard Initiative, n.d.). Skåne has participated in S3 peer review activities since 2012.

Skåne's *International Innovation Strategy* and related documents are produced by the Skåne Research and Innovation Council and the Sounding Board for Innovation in Skåne, wherein universities, institutes of technology, municipalities, arenas, industry, the public sector and student representatives can work together to support innovation and create regional economic conditions that enhance growth.

or in general innovation strategies or they can be created as a separate document altogether, as a designated S3 strategy for the region. That said, the guidelines for mandatory regional development strategies already include some elements of an S3 approach. These strategies must be based on a regional analysis and contain goals and prioritisation for the work on regional growth (Tillväxtverket, n.d.). Most of these strategies already include prioritisations of economic sectors, clusters or innovation systems (Lindqvist et al., 2013). Interestingly, the Swedish national regional funds programme does not require a pre-existing (regional) priority setting (Tillväxtverket, n.d.).

Denmark

As mentioned above, Denmark has developed a policy framework that consists of a number of national innovation-related strategies. In 2012, Denmark launched a new innovation strategy, A Nation of Solutions, which included 27 policy initiatives focused on research, innovation and education. This policy document represented a shift to a more demand-driven innovation policy, in which enhanced knowledge flows and strengthened innovative capabilities in the education sector took centre stage. In 2015, the strategy was complemented by an additional strategy, Growth and Development in the Whole of Denmark (Vækst og udvikling i hele Danmark) that sought to foster regional growth and development using 'regional smart specialisation'. This strategy devised over 100 initiatives that targeted building partnerships between research institutions and businesses, with the aim of intensifying knowledge sharing and innovation in businesses (OECD, 2016).

As an EU member state, Denmark engages with the smart specialisation concept to benefit from the EU Structural Funds. Two Danish regions, Nordjylland and Midtjylland, have now joined the S3 Platform. In general, however, smart specialisation in Denmark is currently adopted at the national level only (Polverari, 2016).

The official national commitment towards smart specialisation is found in the national operational programme for the European Regional Development Fund (ERDF) 2014–2020, Innovative and Sustainable Enterprise Growth (Danish Business Authority, 2014). This programme comprises the preconditions that should be met to qualify for funding by the ERDF, and it highlights how Denmark's existing policy frameworks meet these

criteria. Viewing the Danish Government's innovation strategy—*The Danish Strategy for Cluster and Network Policy*—and existing regional growth and development strategies indicates that the existing national and regional S3 strategies are equivalent to the general layout of smart specialisation strategies.

Denmark's Strategy for *Cluster and Network Policy 2016–2018* designates that the Cluster Forum is responsible for '*discussing and co-ordinating regional strategies for smart specialisation and ensuring cohesion with the general strategy for the cluster and network policy*' (The Danish Ministry of Higher Education and Science and The Danish Agency for Science, Technology and Innovation, 2016: 5). The Cluster Forum is a Danish informal body where ministries, regions, municipalities and the regional cluster forums share knowledge and co-ordinate activities between clusters and networks. The forum's overall purpose is to support Danish cluster development and to create cohesion between local, regional, national and international cluster and network efforts (ibid, 2016.)

At the regional level, the regional growth forums are the focal points for business development (Danish Business Authority, n.d.) and they are responsible for the RIS3 process (Asheim, 2014). Design of regional growth and development strategies falls under the remit of the regions (Erhvervsstyrelsen, n.d.), whereas the regional growth forums decide how structural fund resources are to be allocated (Danish Business Authority, n.d.).

Norway

Norway, as a non-EU member state and does not have an ERDF-related incentive to adopt smart specialisation approaches. However, it has been found that since the introduction of the S3 concept in Nordland, '*many components of smart specialisation seem to have been applied, even if the concept has not been formally adopted*' (Lindqvist et al., 2013: 18). These adopted components include regional partnerships, prioritisation of sectors, knowledge development and the implementation of various policy measures (ibid). Regional authorities have the strategic and political responsibility for regional business development (KMD, 2018).

It is important to note the role of the *Planning and Building Act* from 2008 in underwriting the scale and scope of regional planning in Norway. The Act sets the framework for sustainable regional development for future generations by

Box 4: Nordland, Norway

Nordland county comprises 38,456 km² of land in the north-western part of Norway. It has a population of approximately 242,000 inhabitants, with the largest concentration centred in Bodø, the regional capital (which has about 50,000 inhabitants). Nordland is mostly known for its extensive fish farming activities, as one-tenth of the world's salmon is grown there. It also uses hydroelectricity extensively. The second largest cluster in Norway is situated in Helgeland, and it specialises in minerals, metal, fish, oil and gas and green hydroelectric power. Nordland's main innovation centre is the Nord University in Bodø, with 6,000 students.

Nordland has not published a separate S3 strategy document, but instead has produced a wider innovation-related Innovative Nordland strategy. Thus, smart specialisation is one part of the broader innovation activities, which tend to focus on educational

aspects for the region. The strategy work began in Nordland in 2013, when the regional authorities were informed of the possibilities of S3. An evaluation study was commissioned by the county, after which S3 was officially included in the regional innovation strategy in 2014. Nordland specialises in three distinctive areas: the seafood industry, processing industry (of metals, minerals, chemicals and machines) and experience-based tourism. The chosen fields represent the existing R&D and industrial sectors, and are all export orientated (Foray et al., 2012; Nordland County Council, 2014).

Nordland's County Administration has also taken steps to enhance the competences on S3 amongst key stakeholders in the region and hosted three lectures in a seminar series entitled 'the S3 School' during the autumn of 2017 (Nordland County Municipality, 2017).

co-ordinating the tasks relevant to actors at the national, regional and municipal levels. Its jurisdiction spans the protection and utilisation of natural resources, area planning, and appropriate and timely actor engagement (Lovdata §1-1, n.d.) In light of the development of smart specialisation strategies, the law regulates the framework within which S3 can develop, rather than specifying the processes required to fulfil legal requirements.

In September 2018, the Ministry of Local Government and Modernisation published a guideline (*Veileder*), *Smart Specialisation as a Method for Regional Business Development*, thus taking on a co-ordinating role and suggesting a growing overall interest in S3 in Norway (cf. *Smart Specialisation som metode for regional næringsutvikling*; KMD, 2018). This guidebook reiterates the compatibility of S3 and the *Planning and Building Act*, as the legal text does not concern strategies, although it does encourage further integration of S3 thinking in the revision of regional plans, which occurs every four years.

In recent years, the national support for regional smart specialisation has been undertaken by the Research Council of Norway (RCN, *Forskningsrådet*). The precursor for these guidelines was the *Programme for Regional R&D and Innovation* (VRI), which ran during 2007–2016. VRI's aim has

been to '*empower regions with competences and responsibility for research and innovation, and to give regions more autonomy in designing targeted policy mixes*' (Sörvik and Midtkandal, 2016: 157). In 2013, the Research Council of Norway decided that the VRI programme, with many features similar to S3, was to emulate the smart specialisation concept (RCN, 2013). One of VRI's key objectives was to develop methods for regional analyses, which resulted in the identification of a limited number of prioritised areas, and proposed targeted policy activities (Sörvik and Midtkandal, 2016). VRI's successor is the ongoing FORREGION (*Forskningsbasert innovasjon i regionene*) programme. This programme focuses on supporting research-based innovation at the regional level. Here, too, smart specialisation has inspired the design of the programme. For example, smart specialisation approaches guide the dialogue between various regional and national actors, and the FORREGION programme's specific activities will be '*based on the unique opportunities and challenges found in each region*' (RCN, 2017a). The RCN continues to gather knowledge and experience on smart specialisation by following up and monitoring the FORREGION initiative (RCN, 2017a). These programmes have been important for the building of partnerships at the regional level.

Several Norwegian regions have begun working with the smart specialisation concept (RCN, 2016), and seven regions have registered on the EU's S3 Platform. For example, the county of Møre og Romsdal developed an innovation strategy for 2016–2020 with the smart specialisation method in mind (Møre og Romsdal County Council, n.d.). Another county, Nordland, officially included S3 in its regional innovation strategy in 2014.

Although S3 does not bring entirely new concepts to Norwegian regional development efforts, it continues to provide the country with a rationale to guide its innovation system, thus incentivising further exploration of innovation (Mariussen and Finne, 2017).

Iceland

Icelandic policy making for innovation and economic development is dominated by policies at the national level, owing to the governance structure and the limited number of regional-level policies in the country (Lindqvist et al., 2013). In fact, the 'regional' concept is limited in use, as Iceland has a dual governance structure: national and municipal (ibid). Iceland, as a non-EU member, is not required by the ERDF incentives to adopt a smart specialisation approach in its regional development policies.

Although Iceland has not formally adopted the smart specialisation concept, some frameworks and processes incorporate the general rationale and ideas of S3. For example, Iceland 2020, a guiding Icelandic policy statement, is a product of collaboration and consultation with the general public, business interest groups, trade unions, local authorities and regional associations. Moreover, regional growth agreements between eight rural regions and the central government have uncovered regional prioritisations in, for example, tourism activities related to nature and culture, finished food products and renewable and eco-friendly energy (ibid.).

More recently, Iceland has devised *Regional Growth Plans* (*Sóknaráætlanir landshlutanna*) to incentivise place-based strategies for innovation and regional development (*Samgöngu og sveitarstjórnaráðuneyti*, 2018b). This is breaking with the tradition of innovation policies being concentrated at the national level, confirming the trend of shifting innovation and funding to the municipal level. In these instances, the municipalities collectively formulate innovation strategies. These strategies are developed in conjunction with the new na-

tional frameworks introduced in the *National Regional Plan. The Regional Destination Management Plans* for the tourism industry focus on regional strengths, echoing smart specialisation. Additionally, Iceland is currently developing a new *National Innovation Policy* to be introduced by the end of April 2019.

Smart specialisation remains a relatively unfamiliar concept in Iceland compared with the active integration of S3 into regional development policies elsewhere in the Nordic Region. The move towards stronger regions and a more devolved governance structure may incentivise S3-like policies in the future.

Faroe Islands, Greenland and Åland

The Government of the Faroe Islands does not engage actively in smart specialisation nor is it a partner in S3 networks. However, there are some specific areas of investment and collaboration that are in line with S3 thinking. The Faroe Islands government has decided to promote the country as 'a maritime service hub' and 'a shipping country' (The Government of the Faroe Islands, 2015). Support is also given to areas of aquaculture, tourism and various creative industries, such as gaming and film. Further, collaboration efforts have been initiated and supported between the University of the Faroe Islands, the research environment and industry (ibid).

In Greenland, there are no references to smart specialisation at the national level. Interest in an S3 approach to policy formation has been shown only by one municipality, Kujalleq. Taking part in the EU Regional Innovation in the Nordic Arctic (REGINA) project, which focuses on local smart specialisation (LS3) strategies, Kujalleq initially surveyed local companies to map out skills, competencies and development strategies in the region. The next step in its LS3 participation strategy is to engage local stakeholders in REGINA workshops to discuss local challenges and possible solutions. Kujalleq's current targets include skills development in food production and growth in innovative processing techniques (Jungsberg et al., 2017).

Åland has incorporated smart specialisation in its *Innovation Strategy 2014–2020*. The smart specialisation strategy builds on the region's *Structural Funds Programme: Entrepreneurship and Competences 2014–2020* and the education policy *Competence 2025*. The Ålandic approach to S3 emphasises EDP, seeking to support companies

in knowledge development rather than through traditional R&D investment (*Innovation Strategy 2014–2020*). Åland has identified special innovation potential in the maritime sector, and thus, it highlights maritime-related industries as a focus point for smart specialisation strategies (Ålands landskapsregering, 2014).

Regional level: S3 approaches in Nordic regions

The key objectives of the smart specialisation concept revolve around finding regional areas of strength and mobilising various relevant stakeholders in the process. However, this does not mean that the regions are developing narrow and exclusionary innovation policies. For the Structural Funds, these aspects are highlighted in regional-level strategies, regardless of whether these are labelled innovation strategies, separate S3 strategies or general regional programmes. However, there are diverging levels of engagement with the smart specialisation concept across different regions, ranging from full implementation of S3 strategies to merely probing the general rationale of the concept. Further, there are different emphases on whether the selection of priority areas or the level of stakeholder inclusion should be the primary focus of attention for regional authorities.

On a Nordic level, S3 engagement dates back longest in Sweden and Finland, and the most extensive S3 strategies can be found in Swedish and Finnish regions. Swedish Östergötland, Skåne, Värmland and Örebro, and Finnish South Ostrobothnia, Helsinki–Uusimaa, Kymenlaakso and Lapland exemplify substantive regional-level smart specialisation efforts. Some of these strategies, such as in the Finnish regions of South Ostrobothnia, Kymenlaakso and Helsinki–Uusimaa, include an action plan for monitoring the development of the strategy and its implementation. The most comprehensive strategies on S3 disclose the reasoning behind their priority selection, and comment extensively on stakeholder involvement (cf. Regional Council of South Ostrobothnia, 2014; Helsinki–Uusimaa Regional Council, 2015; Kymenlaakso Liitto, 2016). In Denmark, Syddanmark's smart specialisation strategy places sustainable energy, health and welfare technology, and experience-based businesses at the forefront of economic activities (Interreg Europe, 2018). Stakeholders in Midtjylland, in turn, have developed various programmes, methods and tools targeted towards

companies with growth potential (with manufacturing as the main industry) (S3 Platform, 2018).

Smart specialisation approaches are being incorporated into regional strategies to an increasing extent, as exemplified, for example, by ongoing strategy processes in Finland that are being structured according to the S3 concept (c.f. the Finnish Pirkanmaa and Central Finland's drafts for regional programmes). In its draft for the regional programme 2018–2021, Central Finland's overall goal of regional well-being/welfare is to be achieved through five identified S3 spearheads, and South Karelia's forthcoming innovation strategy will have the role of a designated regional S3 strategy (Regional Council of South Karelia, 2017). Smart specialisation is also figuring as a tool for regional economic growth and development in the Arctic region (Teräs et al., 2018). For more information, please see information box 5. Engaging with S3 showcases the fact that it is not regarded as a disconnected strategy in relation to regional programmes; instead, S3 is regarded as a potential foundation on which to build regional programmes and a tool for strengthening interregional collaboration.

Box 5: Smart Specialisation in Sparsely Populated Arctic Areas (Teräs et al., 2018)

S3 holds significant potential for addressing challenges in sparsely populated areas. Exploring S3 in an Arctic context, this report gives an overview of the relative contexts and support mechanisms available for S3 in these regions. Pioneering advanced interregional collaboration and joint efforts are part to unlocking the S3 potential in the Arctic, especially for ensuring critical mass formation. This evi-

dent in the case studies provided in the report.

The report was co-authored and published by the Joint Research Committee (European Commission) and Nordregio, 2018.

However, many regions keep smart specialisation separate from their regional programmes. Often, S3 has been allocated a designated place in regional innovation strategies or as a strategy of its own, either as a comprehensive overview of S3 objectives or as a brief overview. An interesting exception in this regard is the Finnish rural region of Kainuu. In its regional plan, Kainuu states that S3 approaches tend to prioritise high-level expertise in R&I, rather than allowing for a more diverse approach to ensure employment. Therefore, the industrial Kainuu region recognises a need to accommodate its top industries, which tend to require lower skilled labour, as well as identifying priorities within the framework of smart specialisation (Kainuun Liitto, 2017).

Not all regions have welcomed smart specialisation as a guiding tool. Some that have not welcomed S3 include regions of Norway and Denmark, and some of Sweden's southern regions. In Sweden, the regions of Jönköping, Halland, Kronoberg, Blekinge and Kalmar (SBHSS), which form an area that is predominantly rural, have not joined the S3 Platform. However, these regions have joined forces in regional economic development and, through their joint organisation known as SBHSS, they have identified two strong areas in which they continue to invest, namely smart housing and smart production². Although these regions clearly do prioritise specific areas of regional growth, smart specialisation has not been included in the regions' current development strategies or vocabularies. One step to further the adoption of S3 is the proposal by the SBHSS's managerial group, the 'chefgrupp', to establish a working group to identify the wider region's strengths within the S3 framework.

The selection of priority areas in different regions has not received a unanimously positive reception. Although Finnish regions tend to make specific prioritisations, some Swedish regions discard priority selection as a part of their strategy processes.

Smart specialisation and the green transition

In the Nordic context, smart specialisation as a place-based approach is also linked to the pursuit of a green transition due to the nature of resources

and knowledge available. When considering regional domains, the green economy, or the bioeconomy, holds a promising place in the quest for possible smart specialisation strategies. This builds on one of the EU's seven pillars for 'smart, sustainable and inclusive growth' across countries and regions in the union, the 'Innovative Union' (EC, 2010c: 11). The concept of the bioeconomy has gained increasing policy attention in recent years and is particularly prominent in R&I agendas across the EU. Additionally, it is considered a research priority. The report *Bioeconomy Development in EU Regions* states that 207 out of the 210 territorial units analysed include bioeconomy aspects in their R&I plans (EC, 2017). However, their focus areas for a bioeconomy vary significantly, with agro-food priorities being the most common (ibid). It is also important to note that the authors do not claim that smart specialisation causes the green transition. Rather, it is contributing to fine-tuning and developing new perspectives on the use of natural resources that may help push the green transition and the bioeconomy along.

The Vanguard Initiative is one such initiative (Vanguard Initiative, 2016). It creates transregional value chains in an industry-driven process, aided by public support to overcome the 'valley of death'. It applies the smart specialisation concept to make a difference in the market and has a pilot project on the bioeconomy (Vanguard Initiative, n.d.). With the bioeconomy playing an important part in the resurrection of regional economies across the EU, it would be interesting to take a closer look at its relevance to smart specialisation. Furthermore, a recent EU study maps the envisioned priorities and activities related to R&I in the bioeconomy in EU member states and regions (Spatial Foresight et al., 2017).

One example of using existing local and renewable resources to further local economic development through green smart specialisation is the renewed focus on the forestry sector. Smart specialisation may be a way to bolster the sector's role in a wider regional development perspective. Additionally, the forestry sector as part of the bioeconomy plays an integral part in a myriad of EU policy objectives. These include climate-energy, biodiversity (Bell et al., 2018), industrial policies and the EU's Cohesion Policy, with the latter being an important source of funding for SMEs and new entrepreneurial searches (McCann and Ortega-Argilés, 2013). At the very core of the smart spe-

² http://sbhss.eu/files/Handlingsprogram/Verksamhetsinrikting_forslag_2016.pdf

cialisation agenda is this 'partnership-based policy process', which draws on the insights of entrepreneurs and policy makers, ensuring strong links between regional and industrial policies and the creation of viable domains (ibid., 2013: 1300). Thus, the link between the bioeconomy's knowledge focus and forestry as a 'domain' in smart specialisation is highly relevant, as it fundamentally draws on local resources, tacit knowledge and know-how: simply put, it has an incremental potential to add value.

Bioeconomy and S3 in the Nordic Region

The bioeconomy is firmly situated within R&I frameworks. It adds to the knowledge economy, enhances innovation systems and demands favourable investment and policy frameworks. Local bioeconomy efforts indicate the potential for a renewed focus on industrial policy. Moreover, the bioeconomy allows for the creation of a smart specialisation strategy that encourages knowledge spillovers and innovative thinking in business models, as well as aggregating a range of relevant sectors and activities. Taking the Finnish and Swedish forestry sector as a case in point, it is evident that the innovations occurring in this sector of the bioeconomy hinge on the 'novel matching of existing scientific and technical knowledge' in the specific regions (Foray et al., 2011: 7), as well as increased R&D budgets to further explore innovative applications, for example, of nanotechnology and biotechnology, as has occurred in Finland (ibid.).

Considering the case of the *Paper Province* in Värmland, Sweden, the spillover effects and links established in the region have arguably encouraged entrepreneurship in associated sectors; this is the 'feeding and nursing' required to ensure a successful smart specialisation strategy (Foray et al., 2011). Furthermore, to ensure stable prospects for the use of forest resources, the continued use of smart specialisation strategies and the creation of an interconnected web of actors, favourable frameworks must be in place, in terms of both policy and investment opportunities. Thus, providing 'cushioning' for a 'bumpy risk landscape' through long-term funding mechanisms and the establishment of national or regional smart specialisation strategies is essential (McCann and Ortega-Argilés, 2013; Mazzucato, 2013).

Box 6: Paper Province

Paper Province is a forestry company cluster comprised of 100 companies located in Värmland, Sweden. It was established in 1999 in an effort to attract and recruit employees with the right competences. The Paper Province is a world leading cluster in forestry bioeconomy. The cluster received the EU's highest award for clusters in 2017 – Cluster Management Excellence Gold (Paper Province 2019a). Paper Province is also partaking in the Bioeconomy Region, an Interreg Sweden – Norway collaboration focusing on the commercialisation of products, services and new techniques in the bioeconomy, and the transition from a fossil economy to the green economy (Paper Province 2019b).

The green transition in a wider perspective

The bioeconomy as a domain under smart specialisation has wide-reaching effects and could feed into the green transition at a higher level. Digitalisation has revolutionised the way in which the bioeconomy sectors such as the forestry sector operate (see more about e.g. Intelligent Forests in Metsä Group n.d.), as well as it helps facilitating processes, collaboration and trade and, even more importantly, contributing to improved prospects for wider regional resilience. It can be argued that with the smart specialisation agenda, regional development becomes increasingly all-encompassing, placing emphasis on spatial planning and spillover effects between industries (McCann and Ortega-Argilés, 2015). In turn, this may assist in the renaissance of otherwise 'forgotten' industries, elevating them to greater national importance. This is particularly evident in terms of anticipated regional value creation (Bell et al., 2018), regional development and cohesion (McCann and Ortega-Argilés, 2015) and, arguably, the creation of a general optimistic outlook for the sector and its potential investors. The green transition will further realise the potential for viable regions in the future, which emphasises the importance of recognising the benefit of such domains. Together with smart specialisation and regional resilience, the bioeconomy and the subsequent green transition may work their way into the fabric of regions that are endowed with sustainable quantities of biomass and natural resources. Smart specialisation

may enhance the success rate in implementing the regional bioeconomy agenda through funding, R&I, knowledge sharing and entrepreneurship.

However, it is worth noting that although smart specialisation and regional resilience go hand in hand, smart specialisation can also increase regional disparities. As smart specialisation builds on innovation systems, it is inherently focused on R&I frameworks (McCann and Ortega-Argilés, 2015). Arguably, this requires and assumes certain prerequisites in terms of triple helix linkages (i.e., linkages between universities, companies and the public sector), or at least the existence of a university or research institute within the region that undertakes research relevant to the domain in question. As such, in regions with lower levels of

knowledge creation, smart specialisation coupled to the bioeconomy may have a negative effect. Thus, smart specialisation may create an increasingly bigger gap between regions that encompass both knowledge centres and natural resources, and those that do not. Furthermore, following the same logic as for competitive advantage, the bioeconomy in a smart specialisation perspective may act as a lock-in hindrance in the future. Thus, key questions are how this may be avoided, and how smart specialisation can remain sufficiently flexible to avoid regions 'getting stuck'. Achieving this agility and flexibility will be vital in ensuring the compatibility of domains, smart specialisation and regional resilience.

3. Methodology

This section will describe the methodology applied in this report. It will refer to the existing approaches to understanding S3 (often referred to as research and innovation for S3 [RIS3]) from a policy perspective and provide a summary of three comprehensive approaches identified through a literature review. Following this overview, a rationale for selecting the case studies for empirical research will be provided, followed by an overview of methods for data collection and their purposes in light of this report's objective.

Approaches to S3 policy analysis

As Foray and Goenaga (2013) aptly point out in their policy brief, *'the need for data and indicators about smart specialisation are critical ... [to] track progress, assess structural transformations and compare strategies'* (2013: 10). Despite the extensive spread of the S3 concept in the European policy context, information on how the impact of S3 can be measured quantitatively remains relatively scarce (e.g., Rodríguez-Pose et al., 2014). A *Handbook on Implementing Smart Specialisation Strategies* was released in 2016 to provide guidelines on how to plan the monitoring and evaluation

of S3 implementation. It states that the monitoring system for S3 should pursue two essential objectives: (i) assess the output produced by funded projects within the realm of each S3 priority; and (ii) measure the result in terms of socio-economic objectives achieved for each S3 priority. However, despite this set of guidelines, monitoring continues to be regarded by many regions as an *'additional burden rather than as an instrument for strategic management'* (Gianelle et al., 2016: 112). There are a few reasons for this attitude, namely:

- (i) the lack of indicators due to the novelty of the concept, which necessitates the building of new databases (Sörvik and Kleibrink, 2015)
- (ii) the complexity of the econometric analysis and the level of detail of the databases, which complicates the process of pre-and post-evaluations of RIS3 (Feder, 2015)
- (iii) the lack of a comprehensive theory and framework for evaluation (Feder, 2015).

Table 2 presents a selection of approaches to S3 studies identified through a literature review.

Table 2: Overview of approaches to S3 analysis

Approach	Brief description	References
Governance-based approach (to the interpretation of RIS3 outcomes)	This study suggests that diversity in implementation is strongly determined by differences in general institutions and, more importantly, regionally specific modes of governance.	Kroll, 2015
Connectivity analysis	Connectivity analysis is used as an input in structured dialogues among leading stakeholders on S3 policy making and implementation. This approach may lead to policy interventions supporting entrepreneurial discoveries.	Virkkala et al., 2017
S3 six-step framework for implementation	The study analyses similarities and differences in the smart specialisation implementation processes in different regions within the same national context.	Teräs and Mäenpää, 2016

Kroll (2014) systematically reflects on the first experiences of implementing RIS3 in European regions. Specifically, he addresses the persistent failures to achieve the S3 agenda's objectives and examines where policy makers have found that bottom-up RIS3 processes yield positive results in cost-benefit analyses. Two Europe-wide online surveys were conducted in 2013 and 2014. They yielded a sample of 80 full answers per survey, which was sufficient for a regression analysis but not for complex quantitative modelling. Based on these findings, the study shows that the requirements of smart specialisation, which is a complex process, are high for regional policy makers and cannot easily be fulfilled by many less experienced regions. Nevertheless, the study found that the RIS3 processes had benefits, with their major merit being *'in their contribution to changing routines and practices of governance even if those, for now, remain without measurable effect on policy'* (Kroll, 2015: 1). Table 3 summarises some outcomes of the RIS3 processes by EU member state groups. Kroll's study is an interesting benchmark to consider for the purpose of this report and to inspire implementation in the Nordic Region.

Another approach to RIS3 evaluation has been proposed by Virkkala et al. (2017). They suggest a connectivity analysis where triple helix stakeholders (universities, companies and the public sector) collaborate in an EDP specifically for monitoring the implementation of smart specialisation strategies. Figure 4 illustrates connectivity in the EDP and shows how increased co-operation creates more opportunities for innovative interaction. Proximities and gap analyses are the primary methods of the connectivity analysis and policy model.

Teräs and Mäenpää (2016) make use of a six-step framework to analyse and compare the differences in RIS3 strategy formulations in two Finnish regions, Ostrobothnia and Lapland. The steps comprise: (i) analysis of the regional context and potential for innovation; (ii) governance by ensuring participation and ownership; (iii) elaborating an overall vision for the future of the region; (iv) identification of priorities; (v) policy mix, preparation of policy mix, roadmap and action plan; and (vi) integration of monitoring and evaluation mechanisms. The study reveals first, that the implementation of S3 is time-consuming (compared with the estimated timeframe set by the European

Table 3: Outcomes of RIS3 process by EU member state groups

	Central Europe	Southern Europe	Eastern Europe	Contingency coefficient
<i>Novelty of process/routines</i>				
Not at all or only in some respects new	78.3%	55.6%	65.5%	0.054
In many respects or totally new	8.7%	38.9%	31.0%	
<i>Novelty of findings</i>				
High/very high degree of novelty	8.7%	38.9%	31.0%	0.390
Moderate degree of novelty	56.5%	44.4%	41.4%	
Low/very low degree of novelty	21.7%	11.1%	13.8%	
<i>Main effect/benefit</i>				
Clearer focus of allocations	38.1%	23.5%	6.9%	0.041
Better understanding of potentials	14.3%	58.8%	48.3%	
Renewal of planning culture	19.0%	5.9%	34.5%	
Technical improvement through methodological input	9.5%	0.0%	3.4%	
<i>Overall cost/benefit assessment</i>				
Benefits outweighed costs	43%	76%	38%	0.133
Benefits equalled costs	5%	12%	38%	
Costs outweighed benefits	14%	6%	17%

Figure 4: Triple helix connectivity in the entrepreneurial discovery process. Source: Virkkala et al., 2017

Commission) and second, limited participation by companies and entrepreneurs in the EDP increases the risk that existing regional capacity will not be realised. Third, it finds that regions are often motivated to participate in the S3 work primarily because of its status as an ex ante condition for receiving EU structural funding.

Empirical research: Case study selection

Nordic regions are at the centre of this empirical research on S3, and the empirical case studies are based on qualitative approaches. According to Yin (2018), using case studies—e.g., as a means to investigate the effect of introducing a policy strategy—is a holistic approach to understanding materials and evidence, and the complexity allows for a richer methodological approach. The case studies for this report consider the national policies and support systems for regional smart specialisation; the allocation of responsibilities in terms of S3 between national and regional levels; the readiness for and uptake of S3 in Nordic regions; and opportunities for Nordic collaboration in the light of interactions and interdependencies between the Nordic regions in terms of thematic innovation priorities, industrial clusters and value chains. Different typologies are utilised, as the challenges and opportunities faced by urban and sparsely populated regions in terms of S3 may differ.

Case study selection

The six case study areas were selected on the basis of territorial diversity in the Nordic Region, and

they cover urban and capital regions, rural regions, Arctic and island typologies, hi-tech and low-tech regions, university regions and regions with strong industrial sectors, as well as early adopters of S3 and 'latecomers'. Although smart specialisation is an EU ex ante conditionality, it was important for this report to adequately cover all Nordic countries, regardless of whether or not they are EU member states. Thus, the case studies in this report:

1. Represent a diverse set of regional typologies in the Nordic regions
2. Identify an approach to smart specialisation, or de facto smart specialisation, as a regional focus area
3. Allow for cross-case analysis to identify the existence of a Nordic model of smart specialisation.

As green aspects have a strong impetus in the Nordic industrial model, the report also addresses the ways in which smart specialisation may help drive the green growth agenda forwards in the Nordic Region.

Empirical data collection and analysis

This report used a variety of methods to collect the empirical data, as follows:

- *Desktop research:* Primary and secondary sources (strategy documents, policy briefs, academic articles etc).
- *Semi-structured stakeholder interviews:* 4–6 interviews were conducted for each case study, depending on the stakeholders' relative positions in

relation to the implementation and their roles in smart specialisation or innovation. More precisely, the interviewees were selected on the basis of their thematic relevance and the groups to which they belonged, which were classified as follows: regional growth agencies, regional administrative boards, national and regional funding agencies, stakeholders at universities or research institutes, cluster organisations and knowledge consortia. The interviewees were selected based on the authors' network. Interviewees were also identified on suggestions by regional and national stakeholders.

■ *Cross-case analysis and benchmarking:* Using the information gathered from the desktop research and the interviews, a comparative analysis of the case study regions and their positions with regards to smart specialisation was conducted, which assisted in benchmarking and making policy recommendations.

The table (Table 4) below presents the informants and the nature of their place in the regional innovation system. Note that regional differences and availability of actors was not uniformly available, and that for the case of Iceland, the national government is represented as there is no regional authority platform (Lindqvist et al 2013). The table also reflect the way in which the regions work with S3 and what emphasis it is given, as well as giving space for the different contexts pertaining to actor involvement and stages of S3 implementation.

Desktop research: Primary and secondary sources

In addition to conducting case studies, extensive desktop research was conducted, where documentary primary sources (e.g., regional development strategies, documents produced by government agencies, etc.) were analysed, and secondary sources (e.g., scholarly articles) were considered to further the contextual analysis. According to Vromen (2010), the qualitative use of primary sources is purposeful for providing an historical overview and adding context and depth to the case study analysis. The desktop research conducted for this report occurred both before and after the stakeholder interviews and informed the semi-structured interview process.

Semi-structured stakeholder interviews

Following a pre-defined question template, all interviewees were asked similar questions on aspects of smart specialisation in relation to their role in the region's innovation system. To allow for depth and elaboration on specific areas of interest, the interviews were semi-structured. The interviews were recorded and subsequently transcribed. The analysis that followed was based on what the interview questions and answers revealed to be the most pressing smart specialisation issues, with a particular focus on enablers and impediments to the innovation policy tool. The analysis was based on thematic resonance (Vromen, 2010), in that

Table 4: Informants 2018

Region	Regional/ National Authority	Innovation and Development Agency/ Corporation	Research Institutes/ Experts	Businesses	Business Clusters
Kymenlaakso	2	3	1	1	0
Stockholm	1	1	2	1	1
Midtjylland	1	1	1	1	0
Nordland	2	3	1	0	1
Iceland	3	0	2	0	0
Åland	3	0	1	0	0

Authors' elaboration based on table in Teräs (2008: 80).

codes and themes emerged from a comprehensive analysis of interview transcripts in the empirical research. The case studies also used a number of quotations from the interviewees to inform the content and scope of the analysis.

To ensure the anonymity of the stakeholder interviewees in the text, all quotes and in-text citations have been given a code pertaining to their region and their interview number (e.g. K1, S2, M3, N4, I5, Å6...). The interview list has been organised to follow in alphabetical order and it does not reflect the interview number. Neither does it reflect the regional code.

Cross-case analysis and benchmarking

In research focusing on regional development, success stories often take the central stage, according to Teräs (2008). The purpose of the case studies in this report is thus to highlight not only the stories of successful implementation of S3, but also take account of regions that are lagging behind – or indeed, countries that have not adopted an S3 policy at all. In terms of the latter, these cases will primarily focus on the characteristics of the country or region's innovation system as a means

to assess the potential of S3 in a specific context. Furthermore, the purpose of the cross-case analysis and subsequent benchmarking is to find common ground and develop 'good practice', i.e., examples that assist in developing and improving a smart specialisation discourse and policy objective in the Nordic countries.

Limitations of the study

It is important to note that this report is subject to limitations. Although the Nordic Region seem comparable on the surface, the countries differ in a number of different ways. This includes culture, innovation systems, industrial history and politics. As such, the report's starting point is from a framework based on contextualised comparisons (Locke and Thelen, 1995). Despite these differences, there still seem to be lessons learned through good practices across the countries formatted to fit the context of the country in question.

The study is also replying on a limited sample of regions, and with only one region from each country (except Finland: Kymenlaakso and Åland), the report is not intended to make generalisations for the countries at large.

4. Nordic regional case studies

Overview

This section presents the empirical findings from the case study research undertaken, and is based on desktop research and interviews with key stakeholders identified in the Nordic Region. The interviews were conducted between March and October 2018. To uphold stakeholder anonymity, the interviewees are not identified in the text and the codes provided are randomised. However, a full list of interviews is provided at the end of the report. The case studies vary in length, depending on the degree to which smart specialisation has

been adopted in the regions. All quotes in this case study, and to some extent the policy documents, have been translated from its original language to English.

As previously mentioned, the case study areas were selected to ensure the territorial diversity in the Nordic Region was reflected. They cover urban and capital regions, rural regions, the Arctic and islands, hi-tech and low-tech regions, university regions and regions with strong industrial sectors and, finally, early adopters of S3 and latecomers. Table 5 illustrates the case study regions identified.

Table 5: Case study regions

Country	Region	Typology
Finland	Kymenlaakso	Early adopter, industrial, rural, EU member
Sweden	Stockholm	Capital region (urban), hi-tech, EU member, universities, critical mass availability, late adopter
Norway	Nordland	Rural, industrial, university, non-EU member, early adopter
Denmark	Midtjylland	University, critical mass availability, rural, bioeconomy, strategic adopter
Iceland	Iceland	Challenge critical mass, rural, industrial, non-EU member
Åland Islands	Åland	Challenge critical mass, rural, strategic adopter

Figure 5: Map of the case study regions. Source: Eeva Turunen / Nordregio.

FINLAND: KYMENLAAKSO

by Eeva Turunen

Introduction

Kymenlaakso is situated in the south-east of Finland, between the Russian border and the Helsinki metropolitan area. Access to Russia has been significantly improved by a new fast train connection from Helsinki to St. Petersburg via Kouvola, and by significant investments in E18 motorway improvements. The European route E18 passes one of the busiest border crossing points (Vaalimaa–Torfjanovka) on the Finnish–Russian border and ends in St. Petersburg. Kymenlaakso is divided into two subregions: Kouvola to the north and Kotka–Hamina to the south.

The region is known especially for its favourable logistical possibilities and flourishing pulp and paper industry. The strongest regional cluster has been within the field of logistics. Both the Port of HaminaKotka and Kouvola's railway are among the biggest logistical centres in Finland. A vital rail and road node in Kouvola city functions as a thoroughfare for approx. 10 million tons of annual imports and exports (Ministry of Economic Affairs and Employment of Finland, 2018). The terminal centre is part of the Trans European Network.

Kouvola has high expectations regarding the development of cargo traffic. There are about 200 logistic companies in the region, employing around 2,000 people. A new route between Finland and China (Kouvola–Xi'an) was recently opened and will bring new business opportunities with China, Japan, Australia and South Korea. Currently, most exports are sawn timber, packaging products, machinery and equipment. A recent development in the Port of HaminaKotka has also shown potential growth possibilities (Ministry of Economic Affairs and Employment of Finland, 2018). The port has signed a letter of intent with Finnpulp Oy, a Finnish company that is planning to open a large softwood bioproduct mill in the city of Kuopio (Finnpulp Oy, 2018). This opportunity will increase its potential as an exporting port. The monthly transport flows from the Port of HaminaKotka are around 1.2–1.6 million tons (Port of HaminaKotka, 2018.)

Kymenlaakso has a versatile paper and pulp industry sector. UPM Kymi in Kouvola, with 870,000 tons of annual production, is one of the biggest pulp mills in Europe. After recent investments amounting to EUR 98 million, the mill strengthened

Kymenlaakso Region

Two centres and their surrounding rural areas: Kotka–Hamina subregion & Kouvola subregion

Number of residents: 175,511 (Dec 2017)

Area: 7,455,51 km² (including water areas)

S3 domains: Bioeconomy, logistics and digitalisation

its capacity by 32% and became a modernised mill, producing paper and bioenergy as well as pulp (Regional Council of Kymenlaakso, 2016: 14). KotkaMills and Sunila factory by Stora Enso are some of the other key actors in the region. They are known for their specialised products, such as KotkaMills's bio-based packaging products and Stora Enso's lignin-based products, the first produced in Europe.

Compared with other Finnish regions, Kymenlaakso has experienced a serious loss in its economic competitiveness; its gross domestic product per capita has been below the national average since the beginning of the 21st century (Ministry of Economic Affairs and Employment of Finland, 2018). Despite the challenges (e.g., closure of paper mills and geopolitical tensions, such as the EU–Russia sanctions), Kymenlaakso's strong orientation towards international markets, as well as its versatile logistics sector, promising forestry industry and areas of related know-how, are encouraging factors for the regional economy and its innovation environment.

Bioeconomy, intelligent logistics, the food industry, intelligent packaging technologies, games and cybersecurity are recognised as the strongest areas of growth in Kymenlaakso. Most of them are part of the region's smart specialisation strategy domains and are integrated into the regional development plan for 2018–2021 (Maakuntaohjelma), as well as in the shorter-term and more detailed regional implementation plan for 2018–2019 (Ministry of Economic Affairs and Employment of Finland, 2018). In establishing the focus on these domains, the recent investments in regional companies, prospects for development, the region's location close to Russia and the Baltic Sea and the existing know-how have been taken into account. The innovative potential is regarded as strongest within these domains because of their modernising capacity to foster the traditional business sec-

tors and their opportunity to create cross-cutting synergies, complementing each other's needs, or available capacities.

The regional innovation system and smart specialisation

Creating a new regional innovation system

Kymenlaakso's smart specialisation strategy, Kymenlaakso Research and Innovation Strategy (RIS3), was published in April 2016. Kymenlaakso was one of the first regions in Finland to adopt the S3 concept to streamline its strategic vision about the region's innovation system. One of the motivations for establishing the strategy was to create a striking profile with clear regional strengths. Such a profile would yield Structural Funds from the EU, but would also facilitate the understanding of joint regional economic potentials. The interviews conducted for this case study made it clear that Kymenlaakso was very willing to apply the S3 framework as a tool to establish S3 domains:

'Kymenlaakso RIS3 process was an important impulse towards creating a common regional vision about our long-term strengths and joint opportunities. It was a first attempt to comprehensively understand our real strengths and joint possibilities.' (Interview K3 & K5)

The initiative for the region's smart specialisation strategy and its planning process originated from co-operation between the Kymenlaakso University of Applied Sciences (KyAMK), Aalto University and the European Committee of the Regions. The University of Applied Sciences was participating in the Change2020 development programme led by Aalto University. The aim of the development programme was to *'provide a practical view on how project organisations, regions and project consortia involved in regional development projects can meet the smart specialisation requirements of the EU programme period 2014–2020'* (Pienonen and Markkanen, 2015) This programme opened the region's eyes to smart specialisation as a concept and to the work being carried out by other EU regions under the S3 framework. This realisation was the trigger for KyAMK and the Regional Council of Kymenlaakso to establish the Kymenlaakso RIS3 project. The *Change2020* programme was also the region's first introduction to the EU's ex ante conditionality. Before the regional S3 strategy, it had been relatively difficult for Kymenlaakso to receive Structural Funds from the ERDF or European Social Fund because of increased competition from other Finnish regions with similar economic or demographic profiles and the lower budgets for these regions.

Intelligent logistics play an important role in Kymenlaakso's smart specialisation strategy. Source: pixabay.com

A new regional innovation strategy was seen as the region's opportunity to create an innovation system that stood out from its neighbouring regions, by developing a highly focused strategy with prioritised areas of specialisation. In selecting the three focus domains, the region wanted to facilitate the focus areas' possibilities (e.g., through the allocation of available funds) to create a critical mass through specialisation and to stimulate investments from the private sector. The elaborate strategy was acknowledged as increasing the possibility of success in the tendering process for EU funding. The strategy was also expected to enhance the 'Kymenlaakso brand' and maximise the region's growth potential and international competitiveness by specialising in its actual strengths. These opportunities were well recognised at the regional governmental level. By focusing on strengthening the innovation environment within the selected domains, Kymenlaakso is aiming to build more synergies across the business sectors, and therefore, to build more resilience in the regional innovation systems.

Smart specialisation in Kymenlaakso: Optimising scarce resources as a small region

The governance of regional smart specialisation

The current Finnish Government has not directly adopted the S3 concept, but the government programme for 2015 and its priorities cover similar elements. This includes reinforcing the partnership between universities and the business/private sector, and the government's funding programme for 2016–2019, the *Regional Innovations and Experimentations* (AIKO fund), although these elements are not properly linked to foster the regional innovation strategies (Virkkala, 2015). At the national level, the Ministry of Economic Affairs and Employment is responsible for regional development in Finland. The ministry has informed regions about the EU's S3 ex ante conditionality, with innovation policy being tied to receiving Structural Funds. However, without national-level instruments, Kymenlaakso has had to take the initiative in building its own S3 strategy.

The project and the strategy process *Kymenlaakso RIS3—Smart Specialisation in Northern Growth Zones* started in June 2015, with the aim

of selecting the region's key domains. The project aimed to engage all regional key actors through joint workshops and different expert working groups. These consultation groups were focused on finding crucial challenges, key enabling technologies and business opportunities with the highest potential under each domain. Each preselected domain had its own consultation group that helped prepare the preliminary assessment of the domain's existing potential, and facilitated the evaluation and decision-making process for the regional strategy. This form of collective strategy work was a new opportunity for an increasingly tight-knit regional vision, according to one of the interviewees:

'Selecting the domains was a chance to engage different actors working for a common regional vision.'
(Interview K3 & K5)

As well as the leading role taken by the University of Applied Sciences, the involvement of the regional development corporations was clear from the beginning of the Kymenlaakso RIS3 process. These are local corporations that promote the subregion's business opportunities, support startup networks and provide services for regional companies to develop and access international markets. The development corporations, such as Kouvola Innovation (Kinno Oy) and Cursor Oy in Kymenlaakso, operate at the subregional level. Kinno Oy is owned by the city of Kouvola in the Kouvola subregion and Cursor Oy is co-owned by five southern municipalities in the Kotka–Hamina subregion.

During the Kymenlaakso RIS3 process and the ongoing strategy implementation phase, the development corporations have taken on a significant role. The corporations know the regional actors well and their operations are based on a regular dialogue between the regional companies and the regional management authorities. Together with the University of Applied Sciences, they are responsible for co-ordinating and further EDP, while simultaneously communicating the general priorities of the S3 strategy. The RIS3 process and the decision to develop a common vision was a new approach for the subregions, which had separate strategic visions. Nevertheless, the new shared strategic vision between Kouvola and Kotka–Hamina helped the main actors to find their roles and competent focus areas of work within the selected domains. Moreover, it facilitated a more

targeted regional strategy through focused decisions based on preselected areas of specialisation. As an interviewee explained:

'The concept is facilitating decision-making and creating more focused actions. The domains are bringing more careful consideration for the strategical work and decision-making.' (Interview K2)

The effects of Kymenlaakso RIS3

The S3 concept has helped small regions such as Kymenlaakso realise that determining their key strengths enables them to optimise available resources more effectively. Kymenlaakso's success in recognising its main strengths and identifying the S3 domains was the product of a shared vision, a strong network and close co-operation between the regional actors (Interview K1). The S3 concept encouraged the region to reinforce the industrial synergies and strong regional co-operation, which are acknowledged to be prerequisites for building a region with an inspiring, innovative environment and creating stronger economic competitiveness.

The region's early reaction and the favourable timing for the regional S3 strategy has had positive effects from an international perspective. Kymenlaakso is currently participating in several international projects, including EU macro-policy efforts in the Baltic Sea Region (BSR), such as Smart-up BSR (Cursor Oy) and BSR GoSmart (Kinno Oy), which are focused on furthering the work with the region's smart specialisation strategy and contributing to its strategic goals. These projects will continue to operate in tandem with the S3 strategy's implementation phase. Both projects aim to increase the capacity of the innovation actors through mutual learning, knowledge sharing and best practice cases. In addition to the S3 strategy being linked directly to such projects, the region has promoted its know-how and S3 domain-related specialities to garner further work with smart logistics (e.g., SmartLog³) and projects related to the circular economy and the bioeconomy (e.g., CircPro⁴, KYMBIO⁵ and NERO⁶).

3 SmartLog, cf. <https://www.kinno.fi/en/smartlog>

4 CircPro, cf. <https://www.kinno.fi/en/circpro>

5 KYMBIO, cf. <https://www.xamk.fi/tutkimus-ja-kehitys/kymenlaakson-biotalousuimintaympariston-kehittaminen-kymbio/>

6 NERO, cf. <https://www.kinno.fi/seudun-kehittaminen/kinno/projektit/nero-cost-reduction-nearly-zero-energy-wooden-buildings-northern>

International funding was received from different Interreg programmes (Interreg Central Baltic, Interreg Europe and Interreg BSR), as well as the Horizon2020 R&I programme.

'The first lesson learned from the Kymenlaakso RIS3 process was that smart specialisation is an evolutionary process of discovery through strong regional collaboration.' (Interview K3)

The clear regional focus and genuine willingness to build a shared vision helped Kymenlaakso to stand out in the tendering process for regional funds. The other desired effects of the regional S3 strategy were increased economies of scale and regional competitiveness. The evolutionary process of discovery and fostered regional collaboration were the key factors in achieving these qualities.

Contributions to a well-established innovation system

The final selected domains were **digitalisation**, **bioeconomy** and **logistics**. The relative potential of each of the preselected domains was evaluated against common criteria. These criteria were described in the regional smart specialisation strategy as follows:

- the growth potential arising from the development of the operational environment and markets
- key expertise in business enterprises and at universities and other higher educational institutions and the possibilities to further develop these
- development of domains leaning on the regional strengths
- companies' willingness to participate in EDP and the development process
- potential to succeed in the international tendering process
- targeting of the region's public investments
- possibility of stimulating investments in the private sector
- possibility of creating economies of scale through specialisation
- networking potential, both internationally and nationally
- other potential positive indirect effects on the region or other industry sectors (Regional Council of Kymenlaakso, 2016).

The three domains are well-known and established in Kymenlaakso. The priority areas are clearly pre-

sented as cross-cutting elements in other regional strategies and they are also recognised by the regional companies, especially by those that have some domain-related operations or activities (Interviews K4 and K7). However, stronger engagement of the companies remains a key next step in developing a more integrated S3 strategy, as well as focusing on international business opportunities and markets. However, for a small region such as Kymenlaakso, the advantage is that the actors know each other well and the RIS3 process has been an excellent opportunity to gain a greater understanding of each other's operations.

'The most amazing thing is to learn to know the other actors in the region well. By getting to know each other, the understanding increases, and companies' real needs and their surplus capacity are much easier to identify. It is also much easier to create new partnerships when the companies understand each other's operational work well. The concept has brought a successful operational framework to increase regional synergies.' (Interview K2)

Even though the domains are fixed and rather general in their description, their targeted focus areas and development priorities are changing and developing over time. This evolutionary process guarantees that regional funding and supported actions are targeted to the innovations with the most potential. The domains consist of more detailed subdomains that are founded on the basis of improved co-operation and active EDP. For example, by the end of the Kymenlaakso RIS3 process, the development priorities under the bioeconomy and circular economies were bioenergy, new resource-effective and low-carbon products and entrepreneurial activity. After active engagement of local companies, the focus domains were targeted specifically to construction and sustainable housing, packaging and new bio-based solutions through biochar and innovative waste management. From the beginning, digitalisation was agreed to be a cross-cutting domain that could facilitate the creation of interlinkages between conventional business sectors. This element has been an important motivator for clustering around blockchain solutions in logistics (SmartLog), e-Health and smart carbon packages (PackageMedia Oy). However, digitalisation's focus on cybersecurity and gamification have also been gaining growth potential, with recently established companies in these areas.

PackageMedia Oy is the largest digital package plant in the Nordic countries. Its business activity is an interesting example of innovative entrepreneurship rising at the interface of digital applications, bioeconomy and smart logistics. With its agile, flexible and tailored packaging material, its operations contribute to all the Kymenlaakso S3 domains. Digital package technology means utilising an omnichannel strategy approach in the physical packages.

The company has been involved in the process of S3 strategy formulation and is currently actively networking with regional companies and actors. It co-operates closely with regional sawmill KotkaMills Oy and has active connections to regional coding companies. The company's innovative approach of utilising digital solutions in the conventional industrial production chain creates an iterative learning and developing process. The production and the products are constantly developing and PackageMedia is open to creating synergies with regional companies and to developing their know-how. Negotiations for co-operation with the South-Eastern Finland University of Applied Sciences and with a regional educational centre have commenced. (Interview K4)

In Kymenlaakso, the network within the bioeconomy and circular economy is vast, with a few large actors (e.g., UPM Kymi and Stora Enso), and many micro or small-scale enterprises. Therefore, kick-starting EDP in this domain has required a great deal of work and active communication, which has largely been the responsibility of the consultation group. EDP under the bioeconomy domain commenced with mapping the regional companies and their operational activities, following the Kymenlaakso RIS3 process. The first phase of the EDP indicated the companies' willingness to participate and their positive attitude towards building regional synergies. The next phase of the EDP began when a cooperation between Xamk, the Regional Council of Kymenlaakso and Kinno Oy started a ERDF funded project to develop the operational environment of the bioeconomy in Kymenlaakso (KYMBIO). This project is continuing the systematic work of creating stronger networks between regional actors by focusing on their

strengths. The aim is to foster collaboration between research institutes, educational institutions (LUT, Xamk and Aalto University) and companies dealing with the bioeconomy or circular economy.

Monitoring the innovation system

'The potential of the KYMBIO project as well as that of the Smart-up BSR and BSR GoSmart projects to support the regional innovation system is acknowledged and noted at the regional administrative level. In fact, the regional expectations rely on these projects to update the regional S3 strategy, by creating a better monitoring mechanism for S3 implementation, continuing EDP and fostering the industrial symbiosis between the selected domains.' (Interview K3)

Cursor Oy and Kinno Oy are in regular dialogue about these parallel BSR projects. BSR GoSmart will focus on regional smart specialisation through practical joint actions for SMEs. The project is focusing on supporting SMEs in their internationalisation process and continuing the EDP with these companies. The project is managed by Kinno Oy. In contrast, the Smart-up BSR project has an emphasis on the region's overall S3 strategy. On a pan-Baltic scale, it is addressing the challenges that the regions face in implementing their regional R&I policies. As a representative of Cursor Oy states, *'the results are aiming to facilitate regions to realise their policies in practice, eliminate obstacles and leverage their collective knowledge and expertise to achieve effective regional and transnational collaboration'* (Cursor Oy, 2018). By the BSR GoSmart project Cursor Oy has been strengthening its role as a leader and co-ordinator of regional smart specialisation. Regional Council of Kymenlaakso is an associated partner in this project. The project is a continuation of the earlier co-operation with Aalto University, which is the lead partner of this pan-Baltic project.

In addition to the ongoing projects, the RIS3 expert working groups, i.e., consultation groups, are responsible for engaging key actors for clustering purposes and negotiating on the pivotal long-term development needs under each domain. Their meetings are held approximately twice a year, with the aim of determining which existing networks, know-how or entrepreneurship areas have the most potential to advance the cluster. Regular meetings were also intended to function as a monitoring mechanism for the S3 strategy.

However, according to an interviewee, some of the working groups have found it difficult to motivate or communicate the concrete benefits of the EDP to companies, which has slowed their activities.

Challenges and opportunities

Further work is required on the implementation process of the Kymenlaakso regional S3 strategy. The constantly developing EDP and the lack of well-functioning monitoring mechanisms are universally acknowledged as shortcomings of the current implementation phase of the strategy. The future plans for EDP are to engage and motivate more companies through more active and effective communication. The RIS3 expert working groups and especially the ongoing projects (Smart-up BSR, GoSmart, KYMBIO and Smart-Log) have a key role in this process. However, some informants stated that to encourage or improve the work of the consultation groups, better tools for communicating and motivating the regional companies need to be provided. This was pointed out by several interviewees for this case study:

'In order to create and maintain a resourceful strategy, the regional actors must understand the EDP as a dynamic process. It is a constant learning process to understand regional strengths and time-related opportunities.' (Interview K1)

During the Kymenlaakso RIS3 project, it was considered that one of the key success factors for the regional strategy was its dynamic co-ordination and management. Through systematic management of the ongoing projects, this target could be achieved. However, it is clear that the co-ordination and management of the strategy is focused around a few key actors who know each other well. In a small region such as Kymenlaakso, staffing changes that affect key people driving the strategy (e.g., retirement of a key actor who encouraged the development of the logistic cluster) may have detrimental effects regarding the communication of or commitment to the strategy.

One of the challenges identified and tied to the region's innovative environment is its economic structure, which has been based traditionally on large industries. However, recent developments have indicated that structural change is occurring, and the region is aiming to increase the number of SMEs with innovative and sustainable business ideas, using the S3 strategy as a beacon for at-

tracting actors. As an interviewee stated, *'Well-established domains are expected to work as signals to regional companies'*. (Interview K1)

The limited resources of regional councils to support regional projects or facilitate the co-ordination of the S3 strategy were acknowledged as possible impeding factors. However, the possible regional reform in Finland is aiming to devolve more administrative tasks to the regional level and therefore, the allocation of available resources and prioritisation of the S3 strategy could become easier. However, the regional reform is an ongoing governmental process and many uncertainties remain in relation to it.

The lack of concrete and implemented monitoring mechanisms was identified as one of the key shortcomings of the regional S3 strategy. In 2016, the Kymenlaakso RIS3 strategy published by the Regional Council of Kymenlaakso listed potential indicators to evaluate the implementation process. However, these indicators have not been well utilised. Therefore, the positive achievement of the Kymenlaakso RIS3 process was the continuation of the co-operation with Aalto University. The Smart-up BSR aims to help update and reinforce the regional strategy and facilitate and systemise its implementation, with the assistance of transnational collaboration and mutual learning.

Key findings

Kymenlaakso has successfully commenced integrating the S3 concept into its regional strategies. The region has a genuine willingness to enhance the support mechanisms for regional innovations and to reinforce promising domains that are re-

flective of the long-term strengths of the region. Well-established domains have already brought clearer common priorities to the agenda and facilitated the allocation of the region's available resources.

Fostering the region's strategic work with smart specialisation relies on the success of the ongoing projects to update the strategy, the creation of better monitoring mechanisms for project implementation, continuation of EDP and fostering the industrial symbiosis across the selected domains. These opportunities have resulted from the region's earlier efforts and achievements regarding regional smart specialisation.

The regional S3 strategy, the Kymenlaakso RIS3 process, has enabled the region to stand out in the tendering process for regional funds. The strategy's approach to the S3 domains and its essential EDP as a dynamic evolutionary process of discovery provide the flexibility to develop regional strengths and foster regional collaboration with an open-minded attitude.

In learning from institutional experiences, greater attention should be paid to small regions such as Kymenlaakso, where the role of a few key actors in driving the development of the region's innovative environment is essential. The ability of the companies to learn about and from smart specialisation depends on both their conceptual knowledge and the personal relations between regional companies. The benefits of a small region in working with S3 and achieving a successful EDP are that the actors know each other well and this can assist them to create new partnerships.

SWEDEN: STOCKHOLM

by Mari Wøien

Introduction

Stockholm is often hailed as the 'hidden' Silicon Valley of Europe, and its formidable innovation capacity should not be discounted. As such, the region theoretically holds an excellent position for fine-tuning its innovation system by employing a smart specialisation strategy. Nevertheless, it appears that there are hurdles to overcome before it can fully capitalise on the key concepts pertaining to the strategy.

This case study will examine the reasons for the slow adoption of smart specialisation in Stockholm and the structural challenges that smart specialisation may encounter in a strong innovative hub such as Stockholm, with a large variety of diverse actors on the scene.

Although a relatively small capital city on a European scale, Stockholm is an innovative powerhouse. A key question is whether Stockholm is suffering from a 'big city' problem, in that the complexity of the innovation system hampers the mobilisation of and engagement with a smart

Stockholm County

Biggest city: Stockholm, capital of Sweden

Number of residents: 2,336,404

Area: 6 524 km²

Areas of strategic importance: Green city, healthy city, smart city, inclusive city and attractive city

Source: SCB, 2018a and 2018b

specialisation strategy. Moreover, it may seem as though the work on regional development has been caught in a *Catch 22*-like position; outperformance resulting in less financial support for developing a refined smart specialisation strategy for future regional growth. The interviews conducted for this case study suggest that this is occurring and, coupled with a lack of political ownership of the strategy and the limited understanding about the added value of smart specialisation within the political governance structures, it has impeded organisation around the smart specialisation concept. The Stockholm case study presented in this section is based on both desktop research and interviews with local stakeholders and actors in the region.

The areas of strategic importance in Stockholm is centered around creating a smart and sustainable city.

Source: shutterstock.com

Stockholm's innovation system and the application of S3

Stockholm is Sweden's foremost region in terms of R&D (Stockholm Läns Landsting 2018b: 175). It is home to strong research institutions, including the Karolinska Institute, the Royal Institute of Technology (KTH), Stockholm University and Södertörn University; has a highly educated population; a broad business sector; and hosts various headquarters of multinational companies (Stockholm Läns Landsting, 2018b). The outward-looking focus for expanding markets and opportunities is an additional regional strength, and Stockholm's international reputation draws significant amounts of venture capital (ibid; Braunerhjelm et al, 2018). These preconditions are critical factors for fostering favourable entrepreneurial environments, building on the existing large knowledge hubs, and facilitating public infrastructure and human capital (Braunerhjelm et al, 2018; Stockholm Läns Landsting, 2018b). Moreover, Stockholm is the country's beating heart, a node for new ventures and development and an engine for innovation. It enjoys a special position as a capital city and the host of decision-making functions, as well as being culturally diverse and creative. Global Entrepreneurship Monitoring (GEM), which measures and analyses entrepreneurship, found that business opportunities in the Stockholm region were very high compared to the rest of Sweden in its 2018 national report.⁷ However, it also pointed to weakened entrepreneurial activities since its previous report in 2017 (Braunerhjelm et al, 2018: 7). Albeit, this report will focus on the environment pertaining to SMEs and the entrepreneurial discovery processes leading to establishing new domains, rather than start-ups.

Based on examining the EU's RIS performance for 2017, it is interesting to note that although Stockholm is performing at a very high standard in terms of SMEs' in-house innovations (EC, 2017a: 48), it scores lower than its neighbouring counties on the indicator 'innovative SMEs collaborating with others as a percentage of SMEs', and is only ahead of the south and west of Sweden in this regard (EC, 2017a: 49). This is in line with observations made by a regional actor interviewed for this case study, who pointed out that Stockholm has traditionally been suffering from weak cluster

politics and moreover, has tended to approach innovation and innovation strategies from a 'generalist' perspective. The lack of collaboration between innovative SMEs may be a result of this.

The initial idea of creating a collaborative platform to drive the regional innovation system forwards came from the County Governor at Stockholm County Administrative Board (CAB) in 2010, resulting in the establishment of the collaborative platform *Innovation Stockholm*. Founders of the platform were the Stockholm County Administrative Board, alongside Stockholm's Chamber of Commerce, the county council, the City of Stockholm, the Royal Institute of Technology (KTH), Stockholm University, Karolinska Institute, the collaboration of municipalities in Greater Stockholm and the Stockholm Business Region. Innovation Stockholm was tasked with the development and implementation of the regional innovation strategy *Stockholm 2025: The world's most innovation driven economy*, launched in 2012. Following dialogue-rounds with key stakeholders and thematic working groups, an adhering Action Plan was launched in 2013. In parallel, the strategy became an important input to the programming process for developing the operational program for the ERDF 2014–2020.

The innovation strategy *Stockholm 2025* aimed to create an increasingly attractive region with strong collaborations and high levels of R&D outputs to meet future global challenges. Several key actors from both the industry, academia and public sectors took part in formulating and implementing Stockholm's innovation strategy, which was completed before the EU's ex ante conditionality of smart specialisation strategies (S3) came into effect for EU member states. *Stockholm 2025* thus acted as a substitute for a smart specialisation strategy in the programme period 2014–2020, as the national authorities stated that Swedish regions were exempt from writing S3 strategies, in consultation with the EU. The structure of the strategy was commented on by one of the interviewees:

'Most regions have innovation strategies that have staked out areas of relative strengths, but the Stockholm region's innovation strategy has not. We have pointed out strategically important functions, principles and tools. We talk about capital, public procurement, efficient R&D&I systems, etc. but we do not talk about prioritised sectors or challenges we need to solve.' (Interview S4)

⁷ The GEM report for 2018 is based on 164,000 interviews from 54 countries (Braunerhjelm et al, 2018).

The efforts to consolidate innovation through the *Innovation Stockholm*-platform did however catalyse new processes and opportunities. For example, the Royal Institute of Technology took on the responsibilities for coordinating the R&D infrastructure action plan (KTH, 2015). This resulted in an analysis exploring the requirements and opportunities to enable the expansion of open laboratory environments for researchers, both nationally and regionally (Svensson, 2015). Through extensive consultations with other knowledge hubs, a total of approximately 90 facilities were identified in different universities or research institutes. The laboratory environments that were deemed suitable for public access at KTH were listed on the institutes' websites and contain 18 different labs with access to lab equipment for concept verification (KTH, 2018). The availability of such laboratories is an important step towards creating a milieu for technological development. However, some scepticism towards opening up for outsiders was noted (Svensson, 2015).

The S3-concept was lifted by the Stockholm CAB in an attempt to further anchor innovation as a strategic policy area for regional development. Through conversations with the EU's Directorate-General for the Regions in 2015, the existing *Stockholm 2025*-strategy was considered as a starting point for staking out S3-like prioritisations in the strategy's revision period. This was also because of the thorough process undertaken by Innovation Stockholm, as the *Stockholm 2025*-strategy was based on a process spanning nearly two years and the input from approximately 500 participants. As one interviewee recalled, 'we couldn't just throw that out' (Interview S4).

As coordinator of the collaborative platform Innovation Stockholm, the CAB initiated investigations to map the region's areas of strengths, in line with the EU's ex ante conditionality for S3 (Vad et al., 2015). The mapping reported a relatively fragmented or generally overarching areas of strength in the prevailing regional structure but traced out areas of particular strength such as life sciences, ICT, the creative industries and cleantech (Vad et al., 2015: 10). However, due to personnel changes and limited understanding of the added value of S3, the process of revising the innovation strategy was postponed, and in 2017, *Innovation Stockholm*-platform went idle as the County Governor retired. This suggests a highly person-dependent

structure for driving the platform and the work on S3 forwards.

The Structural Funds partnership and Regional Development

Stockholm's regional innovation system is supported by the Structural Funds partnership tasked with the management of the ERDF-funds. The Structural Funds partnership is largely a political organisation, which role is to devise calls for tenders on strategically important projects for regional development. Though not strictly focusing on innovation as it also includes the ESF, the Structural Funds partnership nevertheless developed and applied the *Stockholm Model*: a governance structure that can be summarised as a model to help concretise the use of EU funding in strategic initiatives to solve regional challenges through innovation (Sweco, 2017; Länsstyrelsen, n.d. a). However, a recent report by the Swedish consultancy group Sweco noted that the impact of the Stockholm Model has not yet reached beyond the scope of ERDF projects and is not well harmonised with the overall objectives of the Structural Funds (Sweco, 2017).

ERDF-funds have been used in the efforts to consolidate innovation-driven questions through the *Innovation Stockholm*-platform, in an attempt to stake out strategic areas of growth. Staking out these areas are necessary due to the limited funds provided the Stockholm region, both from the EU and the national level, one interviewee recounts (Interview S4). The interviewee further explained that the limited amount of funding from the EU level and the national level is partly due to the success of the region on international rankings in terms of innovation, but that it is also because of a lack of a national political mandate steering the objectives and manoeuvring options within the County Administrative Board itself. Acting as the state's agent in the county and tasked with regional innovation questions, the county administrative board has limited access to funding outside the yearly earmarked funds following the state budget allocations (for more, see Länsstyrelsen Stockholm 2017). This differs from the regional structures in e.g. Skåne and Västra Götaland, where the regional development policies are developed in the county council and thus additionally benefiting from regional tax income. The differences between e.g. the northern regions, such as Jämtland

Source: Jon Flobrant / unsplash.com

and Stockholm is evident in development funds for growth per capita (Braunerhjelm et al, 2018). As one of the Stockholm-based interviewees stated, *'in Stockholm, we do regional development funded by cinnamon buns'* (Interview S4).

Stockholm is the last region in Sweden to re-organise its regional structure, which came into effect on the 31st of January 2019 (Region Stockholm 2019).

Engaging actors in collaborative partnerships

According to an interviewee, forging arenas for cluster collaborations has been an Achilles' heel in the regional innovation system in Stockholm (Interview S4). With the lack of interest and support for developing a strategic innovation strategy based on cluster organisations, or indeed; S3-politics, from the political level, there has been a limited mandate to drive the question forward. According to this interviewee, the approach towards cluster politics, innovation and more recently, S3, has been largely interdisciplinary, to avoid 'picking winners'. Stockholm does host some strong clusters, such as life science, finance and ICT, but only a few of them (e.g. the film and fashion industry) have established cluster organisations to support business development, rooted in the ownership of sector specific companies (Vad et al., 2015).

Stockholm's County Administrative Board has encouraged the Stockholm-based science parks, collaborative platforms and incubators (e.g. Urban ICT Arena and Kista Science City, Södertälje Science Park, Flemingsberg Science Park, OpenLab and Grön Bostad) through the ERDF-funds to trace out prioritisations for strengthening these as cluster organisations. Despite the CAB's attempts to create a solid structure, the lack of a political mandate on the regional level limits its ability to manoeuvre such a system, and furthermore to devise an innovation strategy with clear prioritisations.

Engaging actors with a genuine interest in the field and those who are committed to particular strategic areas of specialisation is important. However, connecting the right actors has been a challenge in Stockholm. Based on interviewing national and regional actors within the innovation funding agencies, it is clear that the sheer number of large players and their relative financial strength presented a challenge in finding and inspiring the right actors from a regional development perspective. However, according to one interviewee, some larger actors have begun forming cluster organisations to secure and incentivise an ecosystem for ensuring competencies in the future. Nevertheless, the challenge of engaging actors persists:

'It is just that the actors are so big and have their own interest at heart, so it wouldn't really matter if there was a strategy. It is difficult. In a smaller town, companies want to collaborate to become stronger together.' (Interview S2)

The Agency for Regional Growth's recent S3-pilot study is one example of the operationalisation of such strategies on a nation-wide level, by gathering and educating cluster organisations to reach the companies more easily and ground the concept (Tillväxtverket, 2018). When employed in a strategically sound manner, smart specialisation may shed light on new opportunities within existing areas of competitive advantage, also within Stockholm. Engaging in creating bottom-up processes, with a clear grassroots ownership through actor engagement, is an important tool for ensuring the endurance of the concept and its manifestation at the ground level, according to a national expert interviewed for this case study:

'[It] highlights the importance of mainly engaging those that have a genuine interest in the field and [are] committed within one strand of strategical area of specialisation.' (Interview S3)

As such, it seems that smart specialisation must be framed to assess its added value to Stockholm's regional innovation system: it offers a different lens, depending on the purpose of the agency adopting the approach. The nature of smart specialisation as a bottom-up approach figures on two levels: 1) as a strategy for regional development, and 2) at the grassroots level as a method and framework to organise and orient entrepreneurial endeavours.

Smart specialisation is the furthering of the knowledge economy in practice, linking businesses, academia and the public sector. The private sphere is also increasingly visible in this equation. A good example of such collaboration with the surrounding companies through smart specialisation is Karlstad University in Värmland, Sweden. The regional council there has been acting as a node, facilitating collaboration and ensuring that there are clear priorities in academia, companies and the public sector, and providing an example of well-functioning, successful quadruple helixes. This is also the case for smart specialisation in Västra Götaland, where it is clear which agents represent the companies in areas pertaining to business de-

velopment in the region's work on innovation, according to one of the interviewees.

Given this, it might be worth considering the ties between universities as institutions for independent research and the national agendas for R&D funding. Although there are collaborative efforts with relevant companies in cluster formations, these collaborations often happen organically and in line with the universities' own working lives and not in accordance with regional policy agendas. However, there is increasing interest regarding collaboration from universities in the Stockholm region to secure resources and students in the future (Interview S4). However, one interviewee from an institute in Stockholm stated:

'In practice, at the universities ... I'm a bit sceptical [now] of this effort to force forward clusters in this manner, and whether it is the right thing to put a lot of effort towards. The universities have their inner life and processes for developing research in collaboration with the surrounding society, in a way that they may be globally competitive.' (Interview S1)

Forging these links between academia and businesses and building the ecosystem around clusters and focus areas may be an important first step in facilitating smart specialisation processes in the future, especially as the future wealth of a region tends to be considered in line with trends in R&D expenditure (EU Regional Innovation Scoreboard, 2017: 60). The recognition of this seems also evident in Stockholm County Council's⁸ recent publication *Regional Development Plan for the Stockholm Region: Europe's Most Attractive Big City Region (RUFs 2050)*. The RUFs 2015 is a long-term planning document that addresses a host of societal challenges, solutions and opportunities. It recognises the need to strengthen R&D and envisions an increase in public-private investment, looking to smart specialisation as a strategic tool for this purpose (Stockholm Läns Landsting, 2018b). In the report, the council considers that the decline in public spending on R&D is 'threatening the Stockholm region's position as a knowledge region' (Stockholm Läns Landsting, 2018: 29) and it envisions an increase of R&D spending from 3.8% of gross regional product to 4.5% during 2018–2026 (Stockholm Läns Landsting, 2018: 37). However, as

8 Stockholm County Council changed its name on the 1st of January 2019 to Region Stockholm (Region Stockholm 2018)

the authority on planning processes in the region, its R&D&I focus has largely been framed within long-term planning perspectives and a general approach to innovation related to healthcare and public transportation.

RUFS 2050 also makes note of the promising nature of smart specialisation (2018: 176) and emphasises the need for adequate societal planning to meet the needs and preconditions for creating entrepreneurship and supportive measures for enabling innovation. The report cites existing quadruple helixes such as Flemingsberg Science, Kista Science City and Södertälje Science Park as examples of innovative processes and platforms facilitating infrastructure. However, to reap the effects of smart specialisation and continue to build the innovative machinery of the Stockholm region, it is important to delve into the possibilities of what S3 might provide the region. Opening up the existing platforms to explore new domains will help create more dynamic processes. Furthermore, creating space for flexibility in the regional strategies will help tackle emerging challenges and needs; a general planning document may not be able to address these subtle or needed changes.

(Political) Leadership

Stockholm is often hailed as an epicentre for innovation and it figures high on the OECD's and EU's innovation rankings (OECD, 2013; EC, 2017b). However, when it comes to adopting the smart specialisation concept, Stockholm is falling be-

hind. As the EU granted Sweden an ex ante conditionality exemption for receiving ERDF-funding, key actors in Stockholm decided not to develop a smart specialisation strategy. The most recent EU Rio Report additionally points to the relative challenges of implementing smart specialisation strategies (S3) in Sweden at large, in bridging the national and the regional levels through the ERDF management mandate, the support operates at the NUTS2 level, which does not easily harmonise with the regional structures (counties and regions) in Sweden and is a '*challenge for co-ordination and cohesion*' (2017: 14). However, it should be noted that the Stockholm region corresponds to both the EU's NUTS2 and NUTS3 level and does not have this problem. Nevertheless, the report also highlights key challenges tied to '*the lack of a central actor that drives the development forward*' (Hallonsten and Slavcheva, 2017: 15) a central challenge in Stockholm. As reiterated by the county administrative board and the actors in the Structural Funds partnership, who are currently in charge of operationalising smart specialisation in the Stockholm region, '*[T]he problem is that we don't have any political commitment in the region*'. (Interview S4)

Bringing smart specialisation back to the regional level, the question of political ownership and leadership of the regional smart specialisation strategy is interesting in the Stockholm case. Analysis of the results of the interviews indicates that this is the greatest hurdle to be overcome.

Source: Louis Reed / unsplash.com

The size of the region in terms of the variety of actors available, the size of companies, the historical strength of the region to innovate and attract foreign and national investments, alongside the established and largely *laissez-faire* approach to innovation from a governance perspective, all make it harder to claim ownership of strategies and mobilise actors:

'It would be easier in a smaller town as it is easier to find the right partners to collaborate with, focus and mobilise for a common cause. This is what you usually would call the 'big city' problem. It is difficult.' (Interview S2)

Notwithstanding this claim, smart specialisation as a concept is a tool that is not restricted to a particular level of governance or organisation, and it needs to be framed in terms of the objective and the mandate of the actor in question (Foray, 2009: 91). For example, the actor engagement issue begs the question of whether the objective of a smart specialisation strategy will become a de facto innovation method adopted widely on both the political level and at the grassroots level, or whether it will become 'just another strategy' with no actions or commitments attached.

In the interviews, it was mentioned that the absence of unequivocal guidelines partly arises from the fact that prioritised thematic areas have not been adequately identified, but it is also the result of the long-established approach towards business development funding, as largely multidisciplinary and organic. Although smart specialisation figured as part of the future envisioned priorities of the former innovation platform *Innovation Stockholm* and is mentioned in the recent *RUFS 2050* as a method for staking out the main priorities in creating an innovative region, there has been no clear commitment to establishing clear prioritisations. For smart specialisation to work optimally in Stockholm, it would be worthwhile to clearly define areas or responsibilities, from creating platforms, to disseminating information from the EU to the businesses and clusters organisations and moreover, to clearly communicate the added value of smart specialisation. However, to mobilise, anchor and operationalise smart specialisation, there needs to be a firm ownership of the process at a strategic as well as on the operational level. As an interviewee stated, *'It is important to have a regional actor who would "own" a domain ... e.g., cluster organisation, forum'*. (Interview S3)

The responsibilities for regional growth and innovation moved from Stockholm County's administrative board to the county council, now Region Stockholm, in January 2019 (Stockholm Läns Landsting, 2018a; Region Stockholm 2019). The implications of this move are uncertain, although the county council's recent publication *RUFS 2050* is an indication of its commitment to ensuring innovation aspects are on the political agenda. It is decisive for the future of smart specialisation in Stockholm that the regional growth department in the Stockholm County Council places a substantial focus on developing the strategy: both for the advancement of the strategy beyond a de facto state and for taking the reins on channelling the funding into knowledge hubs that are strategically important for the region in the future. Likewise, the council should communicate the strategy to the political level, help align funding and consolidate the efforts towards creating an innovative resilient region for the future.

As the next EU programme period is likely to require a clear smart specialisation strategy in the Stockholm region, focusing on making prioritisations and tracing out *domains*, based on defined areas of strength in knowledge-intensive industries and areas that are strategically important to the region, may help direct the funding and ensure the financial instruments go further. According to an interviewee, the regional actors need to take ownership of the strategic development of these domains. From the interviews, it was clear that the public sector, like the business sector, must want and need something to catalyse change, and this should depart from a framework informed by clear political prioritisations.

De facto S3 in Stockholm

The Stockholm region has yet to adopt a formal smart specialisation strategy, but tendencies towards S3 are discernible. For example, in the Swedish Agency for Economic and Regional Growth's interim report 'Increasing competitiveness amongst SMEs' (*Öka konkurrenskraften hos små och medelstora företag*) the ERDF is evaluated for the programme period 2014–2020 (Tillväxtverket, 2017a; 2017b). In the report, smart specialisation in Stockholm is mentioned, and sorted under the umbrella objective of 'the sustainable city' and there are further areas pertaining to this objective, namely green city, healthy city, smart city, inclusive city and attractive city (Tillväxtverket, 2017b: 126).

In relation to S3, only a few projects have been funded, but they are large projects that concentrate resources in specified areas (ibid, 2017: 135). The way smart specialisation has been used as a guiding tool for regional development within key institutions on the national level, indicates that there is a tendency towards a de facto operationalisation of S3 at large, despite the lack of national guidelines. When the responsibilities for regional development was at the CAB, there were also tendencies towards steering their operationalisation of the plans in an S3-like direction. As one of the interviewees commented:

'[T]here isn't a formalised idea, though things happen. But it isn't called S3. And that is what I usually say: we work in line with S3 without a formal strategy.' (Interview S4)

Operationalisation of S3 at the grassroots level

Understanding the key concepts of smart specialisation, such as EDP and domains, is crucial for the manifestation of a systematic approach to innovation within the conceptual framework. Clear communication of the nature of concepts such as EDP and domains would demystify smart specialisation and make its benefits more apparent to those enabling these concepts, be they specialised cluster organisations or governance agencies.

Throughout the interviews, the concepts of domain and EDP were not discussed at length, as the interviewees were either not directly engaged in the operationalisation of the concepts, or they were not familiar with the terms. However, the concepts have been adopted to guide one existing cluster in Stockholm without guidance from the political and administrative levels in the region. According to one of the interviewees, the concept of smart specialisation is a strategic approach to organising and structuring clusters from within. In Kista's Urban ICT Arena, smart specialisation is refining and concretising business clusters, which in turn facilitates the process, naturally selects the appropriate actors within that space and becomes a beacon for those who are genuinely interested in exploring new niches where their potential might lie:

'S3 becomes a lighthouse ... it attracts the ones that are interested in getting there, and sends signals to those that [the lighthouse] might not be right for.' (Interview S5)

Smart specialisation as a strategy may help create strong hubs for expertise, attracting both new and established foreign companies to the city. Thus, 'cracking the smart specialisation code' may positively impact on the ability to stake out clear objectives for cluster collaboration and become a targeted tool for regional growth and branding. It may also be a tool for restructuring the focus within clusters to establish a clear direction:

'If it wasn't for S3, progress would have been much slower for us, or perhaps not at all. It enables us, clarifies our objectives and acts like a magnet. It allows you to attract the right stakeholders. Your role is to be the catalyst, facilitator and connector.' (Interview S5)

In contrast, in a more overarching, all-encompassing cluster, it can be unclear what roles the cluster can and cannot play for start-ups and companies, which was a concern expressed by one of the interviewees (Interview S6). Without a clear objective, the added value of smart specialisation when applied in a cluster remains within the realm of its collaborative platform, rather than discovering new or existing opportunities in a wider domain. As such, it was argued by one of the interviewees that smart specialisation might be a remedy for ensuring healthy and innovative clusters in the future by incentivising and supporting the exploration of new domains through EDP. One interviewee at a Stockholm-based innovation cluster formulated it this way:

'If you do not have S3 ... well, when everything is possible, nothing is possible. [S3] helps us nudge progress in a direction' (Interview S5)

In the areas within which smart specialisation has been adopted as an approach in Stockholm, e.g., at Urban ICT Arena, the key concepts of EDP and domain helps restructure methods connected to innovation. The domain is defined and the purpose of EDP is clear.

Key findings

Stockholm is Sweden's foremost region in terms of R&D and entrepreneurship, and frequently figure at the top of the EU's Innovation Scoreboard. The region's outward-looking focus for expanding markets is regional strength, and the city's international reputation draws venture capital to the region (ibid; Braunerhjelm et al, 2018). In examin-

ing enabling and impeding factors that influence the adoption of smart specialisation elements in Stockholm, it is worth considering the current innovation systems and platforms that are in place to steer innovation efforts. There is significant scope for improvements to create long-lasting collaborative structures in the region. With most of the budget spent for this programme period, it is difficult to finance new collaborative platforms and cluster projects in line with clearer prioritisations.

One of the key underlying questions asked in this case study is whether the nature of Stockholm's complex innovation system and the success of the existing system hamper the organisation around the smart specialisation concept, and thus falling victim to a 'big city'-complex. From the interviews conducted for this study, it seems evident that this may be the case. The current system is presently working, but the ability to plan for tomorrow's challenges might be lacking due to a path dependent approach to regional development, and the *laissez faire* approach to prioritise strategic areas of growth. Breaking Stockholm's tradition of non-involvement in defining areas of prioritisation for strategic support for businesses, may prove to be challenging as the innovative machinery persists regardless of the implementation of a new regional strategy. However, despite the lack of a regional smart specialisation strategy, it is clear from the interviews that the concept of smart specialisation can function without an overarching policy objective guiding funding towards regional and economic development, but at a grassroots level. This is also in line with Foray's vision of smart specialisation as a generic tool, rather than being restricted to a specific geographical or administrative level (Foray, 2015: 91). In a *Catch-22*-like position, the Stockholm region continues to outperform as an 'innovation hub', and the funding from the EU and from the national level continues to be much lower than for its Swedish counterparts. This contributes to limiting the resources towards creating a smart specialisation strategy. Coupled with a limited number of people tasked with regional development, and the division of tasks within the region, S3 is not taking the centre stage.

Considering the interviewees, the driving forces behind a reorientation towards an S3 policy strategy is highly person-dependent and it is valid to question whether the *added value* of smart specialisation indeed has been adequately understood. Consequently, the concept did not 'stick' at the political level in Stockholm resulting in the lack of political commitment to the concept, making it difficult to stake out a clear path for prioritisations of areas of strengths in the long term. Additionally, attracting relevant actors often rests on a sound political mandate from the authorities.

At the same time, S3 is operationalised in a *de facto* state as approaches to regional development from a regional governance perspective is happening in subtle ways – but by another name. Furthermore, a few cluster organisations, such as Urban ICT Arena, are adopting the concept and employing it on a grassroots level for clarifying their goals and ensuring that the right actors are attracted to their platform. S3 also figures on the national level through the Swedish Agency for Economic and Regional Growth, supporting SMEs by attracting larger cluster organisations in the nation at large. Stockholm has traditionally been suffering from weak cluster politics, and as such might to some extent miss out on possible kick-starters for mobilising around existing clusters that hold potentials for smart diversification through newly identified domains.

With its excellent performance on the EU's innovation scoreboard, it is pertinent to question the importance of applying this innovation tool to Stockholm County's policies for innovation and regional growth. This connects to the broader understanding and importance of smart specialisation as a strategy, in terms of its added value for the Stockholm region, and the way in which the strategy will take precedence for directing funding instruments. However, the use of the tool as a means to ensure a diverse yet interconnected and related economic and industrial base—referred to as related variety—and to further Stockholm's and Sweden's relative economic and social resilience, may prove a sound strategy. Nevertheless, its success depends on the successful organisation, political ownership to the S3 process and engagement of key actors.

DENMARK: MIDTJYLLAND

by Viktor Salenius

Introduction

Smart specialisation in Denmark is primarily seen as a set of criteria that must be met to obtain EU funding for regional development programmes. The national government has not initiated any significant communication with the regions about devising S3 strategies, and knowledge and interest about S3 is low among regional stakeholders because it is conceived as a foreign, 'imported' policy strategy.

However, this is not to say that the main ideas and aims of smart specialisation are missing from Danish innovation and regional development. On the contrary, the latter builds on principles that are very similar to the S3 framework, for example, in the form of bottom-up industry involvement when deciding on core development projects and revising regional strategies. The EU tacitly recognises this resemblance, and Danish regional development frameworks receiving S3-linked EU funding have been allowed to continue without significant restructuring.

This case study focuses on the Central Denmark Region (Midtjylland). The region's pragmatic approach towards smart specialisation exemplifies very well the overall image for Denmark that is outlined above. The Central Denmark Region is part of the EU S3 Platform, wherein it has laid out the core focus areas for developing its regional economy. Many features of the operations of regional innovation stakeholders resemble very closely the main methods and concepts of smart specialisation. However, the regional development strategy does not formally recognise or elaborate on smart specialisation or its core concepts, and neither regional authorities nor cluster organisations have purposefully adopted S3 in their regional development efforts.

Midtjylland's regional innovation system

Since the beginning of Danish innovation policy in the early 1990s, Denmark has developed into an efficient, skill-intensive knowledge economy, characterised by high labour-market mobility and flexibility and by a high share of SMEs in many key industries (Edquist and Hommen, 2018; Kristensen et al., 2011). Services and agricultural production

Midtjylland (Central Denmark Region)

Biggest city: Århus

Population: 1,316,368

Area: 13,006 km²

Areas of strategic importance: Food, energy and the environment, creative industry, ICT, tourism

constituted the focus areas for early economic specialisation and, while the share of GDP value-added has gradually shifted towards medium-tech and high-tech innovation, the same sectors have largely remained dominant. The Danish innovation system today is characterised and driven by several sector-specific cluster organisations (either national or region specific), and by a strong R&D presence from universities and other research institutions.

These general remarks also hold true in the case of the Central Denmark Region. The region is well developed and innovative, displaying the lowest unemployment levels in the country and the highest relative share of patent applications and it consistently scores well above the Danish and EU averages on several key innovation indicators (EC, 2018). The following paragraphs outline the main stakeholders of the regional innovation system in the Central Denmark Region. The data have been gathered through desktop research and interviews.

The cluster organisations maintain the industry networks needed for collaborative projects and thus, are a key stakeholder in the innovation system. All business development programmes need to be co-ordinated by an operator, and this is typically the cluster organisation. The clusters in the Central Denmark Region are described as mature and internationally oriented, and they have built up extensive networks among businesses, research institutions and consultants. Among the most significant clusters present in the Central Denmark Region is the wind cluster—the region hosts a large agglomeration of world-leading wind turbine producers and over half of all wind energy-related jobs in Denmark (State of Green, 2018).

The Central Denmark Region also has a very strong research base, maintained by its research institutions, most notably Århus University, which is Denmark's largest and second-oldest institute

The bioeconomy is a key strength of the Midtjylland region. Source: Jeremy Bishop / unsplash.com

of higher education, with over 40,000 students and 11,000 staff (Århus University, 2018). There are close networks between industry and research, and the university's testing facilities and research initiatives act as platforms around which other stakeholders have formed collaborations. For example, the regional authorities co-operated with the university to raise the overall awareness of and efforts regarding the circular economy when the concept was not yet widely known in industry, but was already a key focus in academic research. One interviewee emphasised that the role of universities in the innovation system has increased even more in recent years (Interview M2).

The regional authorities (the Regional Council and the Growth Forum) play an important role in supporting the clusters and research institutions in their efforts. So far, most significant efforts in cross-sector communication and collaboration on innovation strategies have been co-ordinated by the regional authorities, although the role of the latter may be smaller in the future due to administrative restructuring. The region also provides, for example, financial support to innovative SMEs as a targeted effort to strengthen the value chain in the region's strong economic sectors.

S3 in Midtjylland: Pragmatism through S3 equivalence

National level

At the national level, S3 is understood predominantly in the context of structural funding. On the one hand, S3 tools and concepts constitute an ex ante condition that must be met to secure EU funding. As extensive R&D&I strategies were already

in place in the country when smart specialisation was introduced, Denmark opted to amend these strategies and justify how the criteria for S3 were already being fulfilled by existing documents. The EU accepted this as an alternative to a designated smart specialisation strategy (Polverari, 2016). On the other hand, the concepts of S3 are seen to provide a space for dialogue between the key actors, i.e., the research, public sector and business community and thus, as an opportunity to form necessary partnerships for innovation and collaboration. In the Danish national context, as explained by one of the interviewees, these dialogues at the national-level Cluster Forum are seen as the way in which the S3 concept of specialisation domains is carried out in practice. Apart from the co-ordination of the national-level cluster organisations, and administration of structural funding by the Ministry for Higher Education and Science, there is little other S3-related involvement from national authorities.

Regional level

There is no apparent initiative to purposefully adopt S3 at the regional level in the Central Denmark Region. One interviewee pointed out that, in many cases, it could potentially be beneficial if the concepts and methods in regional innovation were harmonised more with those of other countries. As one interviewee commented:

'I was invited to speak in another country and they asked me to focus on smart specialisation in my presentation ... and I looked it up and studied it to see what kind of value it might have for us and I realised that a lot of things we already do.' (Interview M3)

However, as the interviewee continued, there has not been any communication from the national level to make this happen, nor is there sufficient regional and local knowledge about S3 to advise businesses and other actors on how to benefit from it. Instead, the existing regional development strategies are treated as S3 equivalent, and the Central Denmark EU Office provides assistance in filling out funding applications so that criteria are met. Another interviewee pointed to the allocation of structural funding by the Ministry of Higher Education and Science, noting that any distinct, competitive specialisations should have been drawn up at this earlier stage. Consequently, when the funding reaches the regional level where it is decided in detail how the money is used, S3 is very much understood merely as terminology linked to facilitating regional competitiveness by supporting strong sectors and clusters (for example, the food sector) and to meeting specific EU requirements (such as reducing the environmental footprint of food production).

Nor does the regional development strategy of the Central Denmark Region have any designated S3 element. The regional strategy delineates core focus areas and development themes, namely sustainable adaptability, cohesive urban development, knowledge and skills, and focused growth (Central Denmark Region, 2016), but these are not formulated as distinct competitive specialisations. Smart specialisation is not specifically elaborated on in the strategy, the newest edition of which was being adopted by regional stakeholders in late 2018, at the time of writing this report. Instead, the Sustainable Development Goals as devised

by the United Nations have been used as a basic framework in the regional development strategy process.

An additional challenge impeding formal adoption of S3 in the region is that there is no regional body with the capacity to co-ordinate substantive smart specialisation processes. Otherwise, the Regional Council and the Growth Forum could carry out this co-ordination role, as they already facilitate cross-sector dialogue between clusters and different stakeholders. However, according to one of the interviewees, after the completion of a reform that is currently taking place, the Danish regional authorities will not be able to conduct direct business development projects as before. Instead, the regions will procure these services from cluster organisations and other actors, encouraging them to collaborate with each other as much as possible. The sector-specific cluster organisations have traditionally been quite isolated from each other and do not currently have the cross-cutting initiative to establish formal smart specialisation tools.

Challenges and opportunities

Signs of de facto smart specialisation in the Central Denmark Region

Nonetheless, despite the issues outlined above, there are noteworthy correlations and resemblances between the self-developed strategies and processes in the Central Denmark Region and the original smart specialisation concepts. Keeping in mind that the region is a member of the EU S3 Platform, it may well be argued that S3 has a strong de facto presence in the region.

The focus on the bioeconomy and its different facets shows signs of de facto S3 in the Midtjylland region.
Source: Jed Owen / unsplash.com

The first of these S3 similarities relates to the process through which the regional growth and development strategy was devised, as it involved a proactive dialogue in which all stakeholders were heard and involved. As one interviewee recounted, the regional authorities invited municipalities, private companies, cluster organisations and other stakeholders to a series of workshops preparing the formulation of the strategy and culminating in large-scale seminars. It is apparent that the way in which the strategy process was carried out closely resembles the S3 EDP concept. In fact, the latter may resemble the strategy process even more closely than does the Sustainable Development Goal on Partnerships (SDG 17) that the regional authorities actually used as inspiration for the strategy seminars. Moreover, the bottom-up discussions in the Central Denmark Region are clearly aligned with supporting the potential and specific competitive advantages of the region:

'We must hold our nerve and continue to focus on the areas where we are ahead such as food, energy and the environment, creative industry, ICT, digital growth and tourism—all areas where an ambitious and concentrated effort is already in place.' (Central Denmark Region, 2016: 9).

The second notable parallel between smart specialisation and innovation in the Central Denmark Region is the way in which research institutions lead the way in finding new regional competitive advantages and applying traditional strengths. Århus University has been active in searching for new applications and solutions and potential future development areas, in particular in the food, agriculture and non-food bioeconomy, which are regionally important sectors. The focus of these activities is to make a sector that experiences many ongoing transitions and challenges, more knowledge intensive, competitive and sustainable, so that it develops into a distinct regional strength. It is telling that this research-driven innovation activity is one of the sectors described in the Central Denmark Region's membership profile on the S3 Platform. The link to smart specialisation thinking in the operation of the region's R&D stakeholders while implicit, is clearly present.

The third link between the independent innovation efforts in the Central Denmark Region and the smart specialisation framework is between the region's cross-sector collaborations and the

S3 concept of domain formation. The distinction is that while the Regional Council and Growth Forum are encouraging cross-sector projects and dialogue, there is no system or framework in place for co-ordinating these collaborations, whereas, in the case of S3 domains, such co-ordination would exist and be carried out by a regional S3 authority. However, the underlying mentality is the same, i.e., that sector-specific clusters do not always have all the knowledge they need and that significant opportunities for new synergies, innovations and regional growth areas go unnoticed unless different stakeholders and sectors collaborate. In the Central Denmark Region, the cluster organisations therefore seek collaborative initiatives in which they engage their constituent companies. The collaborative focus areas, such as new bioeconomy supply chains or products, are not referred to as domains, but more generally as regional growth opportunities. While there is no explicit reference to smart specialisation or adherence to a harmonised strategy in the region, the S3 way of thinking is present.

Clusters vs smart specialisation

Clusters and cluster associations clearly take centre stage in innovation and development in the Central Denmark Region and, due to restructuring of the roles of public stakeholders, this cluster-centrality is likely to persist. One perspective is that this may inhibit the emergence of cross-sector co-ordination and the frameworks that are required to achieve a more active adoption of and know-how about smart specialisation. As recounted by one interviewee:

'Clusters in Denmark are strong and mature with large networks, and it is not always easy to convince them [to collaborate] ... the companies are not always looking for new tools, concepts and methods. Trust within the cluster will help to promote new ideas and motivate them to start looking across sectors, but building trust takes many years, especially when you have most of your cluster companies partly located outside Europe.' (Interview M2)

The alternative perspective, on the other hand, is that this is not a categorical impediment against making use of S3 concepts or peer knowledge from other European regions. Since regional innovation within the Central Denmark Region seems to instinctively share much of the underlying rationale

for S3 and adopts similar working methods, albeit on a less formal basis, the region is remarkably well placed to take advantage from S3 more explicitly in the future.

Horizontal aspects: Nordic model for S3 and the green transition

Interviewees consistently mentioned the same themes when asked to describe a specific Nordic model of innovation/S3. High levels of trust among local enterprises and other actors as well as low hierarchical gaps and collaborative political and industrial traditions are highlighted as key characteristics of Nordic economies and innovation systems.

The circular economy and the green transition are recognised as fields in which the Central Denmark Region is particularly suited to benefit from smart specialisation and strategies that resemble S3. The region has a strong economic tradition in bioeconomy and agricultural production, as well as in green energy. Århus University and other stakeholders have undertaken consistent efforts to upgrade previous regional specialisations into new and sustainable applications and processes, and this remains one of the core focus areas for the regional innovation system. Cross-sector collaboration in developing the region's strengths in these fields has been relatively active and progressive, even despite the lack of centralised co-ordination along the lines of key S3 concepts, but this could be increased even more. As one interviewee noted:

'The main obstacle for quite a while was in raising an agenda that was not very salient yet. We are trying to push SMEs into converting to a more circular business model, but at the clusters there are not necessarily people who would be able to advise the companies on how to do that, so [regional authorities] end up with a double role of trying to educate [local authorities] and find knowledge abroad in order to get the transitions going.' (Interview M2)

Key findings

Much like Denmark overall, the Central Denmark Region takes a pragmatic approach towards smart specialisation. S3 was never communicated to the region as anything more than a set of conditions to secure structural funding to boost regional

competitiveness. Subsequently, the concept carries little substantive meaning for regional innovation stakeholders, and the practical applications of S3 are conceived as being limited to dialogue forums and partnerships. As the role of clusters and cluster associations continues to strengthen, regional authorities have a decreasing mandate to established formalised frameworks for cross-sector collaboration.

Putting aside the lack of formal structures and co-ordination mechanisms, however, the de facto resemblances to smart specialisation are striking, both in terms of theory and practice. The strategy process carried out in the regional Growth Forum as a dialogue between all types of stakeholders is inspired by United Nations frameworks, but it could just as well be characterised as a good practice example of S3 EDP. Academia and research institutions in the region have had an important role in refining and adapting traditional specialisations in the regional economy to find new applications and competitive advantages. Cross-sector collaboration on such specialisations, while lacking ownership by a co-ordinating body and the label of domains, forms an important part of the region's future economic development. The bioeconomy and green transition-related innovation is one of these strong points and it involves all key stakeholders in the Central Denmark Region.

Judging by the Central Denmark Region case, the S3 equivalence agreed between Denmark and the rest of the EU appears substantive. As Denmark is a knowledge economy, with traditional Nordic societal institutions characterised by high levels of trust and collaboration, and additionally by particularly localised economic co-ordination mechanisms when compared with its Nordic peers, it is not very surprising that such collaboration persists in the innovation system, even informally and without deliberate effort. The question for future policy makers to assess is what benefits could be attained if smart specialisation in the Central Denmark Region was formalised into specific outspoken S3 strategies and processes. One such benefit, as recognised by the interviewees, would be stronger communication and co-operation links to S3-active regions across Europe and the Nordic Region.

NORWAY: NORDLAND

by Mari Wøien

Introduction

Nordland was the first Norwegian region to incorporate smart specialisation in its innovation strategy in 2013, with a view to following the trend observed throughout Europe for an increasing focus on industrial specialisation. Realising that the region already worked in line with the concept, the county administration saw the potential to redirect a previously ideology-driven approach to regional development towards knowledge and research-based growth. Additionally, the introduction of smart specialisation/S3 has responded to *'the significant centralisation of research funding towards synergy research (sintersatsing) of national and international [funding] programmes'*⁹, which also corresponds to a wider societal need for increased specialisation (Nordland County, 2014: 7). Although not part of an EU member state, Nordland's application to take part in the EU's S3 Platform network was accepted. The S3 Platform allows Nordland County Municipality to continue its systematic approach to collaboration with its European regional counterparts, while developing a more *'targeted innovation policy based on networks and relevant stakeholders'* in the region (Nordland County, 2014: 7).

Since including smart specialisation as part of its innovation strategy, there has been a growing interest across Norway in the creation of similar approaches. Initially, the Ministry of Local Government and Modernisation wanted to see this development as a regional decision, giving space for a bottom-up approach. More recently, however, the ministry has seen the value of acting as the coordinator and facilitator of the S3 process. Thus, the Ministry of Local Government and Modernisation recently published a comprehensive guide (*Veileder*), *Smart Specialisation as a Method for Regional Industrial Development*¹⁰ (KMD, 2018b) to incentivise the development of S3 strategies. This guide highlights the role of the region as a catalyst for change and emphasises the necessity of 'own-

Nordland County

Biggest city: Bodø

Number of residents: 243,335 (Oct 2018)

Area: 36,090 km²

S3 domains: Aquaculture, process industry, tourism.

Source: SSB (2018)

ership' through clear political and administrative leadership and long-term visions, as well as the need to be willing to prioritise funding and focus.

This case study examines the status of smart specialisation in Nordland county and attempts to distil the most pressing issues that must be addressed to enable the smart specialisation strategy. The case study is structured as follows. First, a brief overview of smart specialisation in Nordland and Norway is provided. Second, the case study examines the empirical findings, based on interviews¹¹ conducted in Nordland in June

Box 8: Smart specialisation as a method for regional business development – A Handbook

The handbook (*Veileder*) was developed by the Ministry of Local Government and Modernisation on request by the counties. The Handbook is first and foremost developed as a tool for the county administrations in the region, due to their

role as an engine for regional development and growth. The handbook outlines the concept and how it may be used in a Norwegian context (KMD, 2018b).

⁹ All documents listed in the reference list from Norwegian sources are translated into English.

¹⁰ [KMD] Ministry of Local Government and Modernisation (2018b) *Veileder: Smart Spesialisering som metode for regional næringsutvikling*.

¹¹ All interviewees have been anonymised to the extent this has been possible, based on requests from the affected parties. The interviewees represented regional and national funding agencies, the county administration, research institutes and a science park.

Experience-based tourism is an important component of Nordland's S3 strategy. Source: pexels.com

2018, and considers in turn the enablers and hindrances for operationalising S3. Third, the case study turns to general comments regarding the potential of S3 as a tool for further consolidating the Norwegian national and regional innovation systems. Finally, and considering the current situation, it concludes that one of the most important findings from the empirical research case is a clear need for a multilevel governance approach to smart specialisation to concretise and create a dynamic but corresponding governance mechanism for regional development.

Smart specialisation: Norway and Nordland

Nordland was the first region in Norway to sign up to the EU's S3 Platform, a platform for all EU regions applying S3 as an innovation tool. The platform gives the county access to an important body of knowledge and an extensive network from which to draw lessons (Nordland County, 2014: 7). As a strategic tool, smart specialisation has been incorporated into the policy arena for innovation in Nordland and it is part of a broader policy strategy. The strategy was developed by the county administration and was built on the solid research

and analysis produced by the local research institute Nordlandsforskning. The expertise on smart specialisation already present in the regional innovation system in Nordland allowed the county administration to commence dialogues and hold seminars, and to learn from best practice cases and regional learnings in e.g. Vaasa, Finland.

Successfully implementing S3 requires an excellent understanding of the regional capabilities and areas of strength, the development of the region in question and its capacity to diversify (Boschma, 2016). Nordland County's administration for enterprise and industry is characterised by a genuine understanding of the regional innovation system, and it knows the industrial landscape and its history well, according to several interviewees for this case study:

'The administrative leadership in the Department for Enterprise and Industry has a very good understanding of research for regional development and works closely with the industry regarding R&D resources and, although they aren't the ones giving the premises, they are nevertheless an analytical and practical resource for the industry at large.' (Interview N1)

Moreover, it was noted by the Trailing Research Group on Smart Specialisation (*følgforskningsgruppe*) that 'soft learning' through various projects, e.g., Interreg, and best practice cases in Europe, has been beneficial. Thorough analyses and consultations were conducted prior to the strategy development (Mariussen et al., 2016), as noted by one of the interviewees. In other words, *'the county continues its tradition of basing strategy developments on locally anchored knowledge'* (Mariussen et al., 2016). This may be seen in the deeply specialised industries in the area, linked to fish farming and aquaculture, education, environment and processing industries, as emphasised in Nordland's *Innovation Strategy* (Nordland County, 2014; Madsen et al., 2017).

Furthermore, the Trailing Research Group pointed out how the place-based focus of the strategy breached the sectoral approach to the regional innovation system by focusing on the idea of domains. Starting with the interdisciplinary nature of the supplier industry, which later led to targeting Nordland's areas of strength—experience-based tourism, aquaculture and industry (Madsen et al., 2017: 10)—helped bring forward new synergies. The key concepts of EDP and domains are not new in the EU, nor are the concepts an entirely new approach to innovation on the sectoral level in Norway (cf. Clausen, 2009). For example, the Trailing Research Group on Smart Specialisation in Nordland pointed to key enabling features and related areas in the existing innovation and industrial systems that helped lift the oil and gas sector and fish farming, features such as the long traditions of ship building and herring fishing, with already existing industrial and knowledge ecosystems in place (Mariussen et al., 2016). Specialising in creating business opportunities within similar sectors, a process termed 'related variety', is also mentioned as a key strength in Norway, according to the government's *Handbook on Smart Specialisation*; the concept is in fact *'the foundation for most enterprises and business/industrial clusters'* in the country (KMD, 2018b: 9). In this regard, the *Handbook* points to the industrial expertise in the town of Raufoss and how it has diversified within advanced processes, finding new areas of applicability (KMD, 2018b).

In 2014, Nordland created a regional innovation strategy based on the visions in the County Plan (Fylkesplan), *A Creative Nordland*, with R&D and sectoral strategies for an all-encompassing

approach to increase regional prosperity (Nordland County, 2014). To create a comprehensive innovation strategy, the county municipality consulted over 600 stakeholders across different sectors, businesses and research institutes to identify and analyse the opportunities and challenges in the region (Nordland County, 2014).

Although Nordland does not have a separate overarching S3 document, the concept creates the foundation on which the Innovation Strategy 2014–2020 is built (Nordland, 2014). The justification for using the strategy is its targeted nature, and the potential it brings to diversifying and strengthening the region's competitive advantage. Furthermore, the place-based approach to S3 in the EU closely corresponds to the practices already existing in Nordland, which allows for the continued range of sectoral strategies, while simultaneously targeting and maximising the regional development funds. As one of the interviewees at the county administration stated:

'What we have observed is that both the regional and national instrument in an S3 perspective help us achieve more than if we spread the funds at random. The county administration has been very clear about how the S3 strategy relates to the industrial development in Nordland.' (Interview N6)

The focus and scope of smart specialisation differs from its predecessors, such as the RCN's VRI¹² programme, as it takes a more systemic approach to innovation by encouraging a wider set of tools for restructuring and enabling research and knowledge-based growth. Establishing well-functioning triple helixes are important for increasing the research capacity in this region, which, in turn, may facilitate the uptake of smart specialisation, according to the interviewees. This work commenced with the RCN's VRI programme, which led the county to encourage approaches based on triple-helix structures (Madsen et al., 2017: 11). According to the interviewees, the involvement of triple-helix representatives in the development of the smart specialisation strategy indicates the close relationship between the industry and the institutions in the county at large.

The VRI programme was succeeded by the FORREGION programme, which places emphasis

12 VRI stands for *Virkemidler for Regional FoU og Innovasjon* (in English, Instruments for Regional R&D and Innovation).

on building strategic partnerships and collaboration, in prioritised industries, between the RCN, the county administration and regional and national development agencies (e.g., Innovation Norway) (RCN, 2017: 6). The RCN is also inspired by the EU's smart specialisation approach and wants to see the strategy applied in Norwegian regions (RCN, 2017). It refers to smart specialisation in its regional policy, showing a similar approach in Norway for receiving funding based on the existence of strategies based on thorough regional analyses of strengths and expertise (RCN, 2014). There is a current European trend to focus public funding on stimulating private investments—which, by extension, influences the relative ability of different countries and regions to participate in various funding programmes, such as, for example, the *Horizon 2020* Eighth framework funding programme. Likewise, financial instruments for R&I are gradually following the same path, with funds being concentrated in centres for excellence in research in Norway (e.g., centres such as the Centre for Research-based Innovation, the Norwegian Centre of Excellence and the Centre for Environment-Friendly Energy Research (Nordland County, 2013). Such partnerships enable the development of a focused and a highly competitive research sector in Norway, which is necessary when competing for funding from the EU and other bodies (Nordland County, 2013).

Moreover, the Planning and Building Act may play a significant role in the formation and implementation of smart specialisation due to its prominent position in regional planning. According to the newly devised guide (*Veileder*), the Planning and Building Act underwrites the framework for development of all regional plans, and smart specialisation may help add depth and value to regional business development. This central Planning and Building Act is unique in the Nordic context, and its impact on the long-term prospects of the region may aid and bring forth a thorough integration of S3 at the regional level (KMD, 2018).

Actor engagement in Nordland: Adoption of key concepts

Nordland County has been organising a series of seminars on smart specialisation since 2017. This 'S3 School' as it is known, is aimed at the teaching the central actors in Nordland's innovation system about the theoretical and practical implications of S3 (see Nordland County, 2017). The participants

at these seminars included the county administration, Innovation Norway and the Northern Norway Tourist Board, and the interviewees who attended the seminars indicated that they were highly valued. The seminars, which enabled the actors to work with S3 in practical ways, were held on a monthly basis from September to December 2017 (Nordland County, 2017; Interviews). The purpose of the programme was to anchor the concepts and perspectives on S3 and the theoretical framework at the administrative level, to ensure that there was a united view and a mutual understanding of the innovation policy strategy ahead. The seminars were not only interesting to the actors in Nordland County, but drew attention to and encouraged the participation of other county administrations across Norway. According to one of the interviewees for this case study, the S3 School emphasised the need for a closer working relationship between the regional and the national levels and offered a renewed invitation to reconnect these ties to ensure regional growth through S3.

The S3 School was not aimed at the local business and industry sectors, as it was not seen as necessary for these sectors to understand the theoretical framework underlying the S3 concepts, such as EDP and domains. This view was commonly held among the interviewees. Instead, the S3 School was intended as a strategic tool for those setting the framework conditions for regional development. As one of the interviewees stated:

'All new concepts are just language for something that already exists. You describe what you see ... so perhaps you don't need to understand the concepts. The ones who need to understand them are the politicians and the administration, if you are to use it as a tool for industrial development.' (Interview N6)

However, it should be noted that the view expressed by this interviewee was not held by all interviewees. This points to an interesting debate around the framing of S3 as a concept and distinguishing between the macro- and micro-levels of innovation. According to one of the interviewees, S3 is both a strategic tool for the funding agencies, and a methodology for the entrepreneurs at the ground level. The concepts of 'domains' (a region's resources in terms of institutions, administration and tacit knowledge in the industry (Madsen et al., 2017: 10)) and of EDP (the dual process

of R&D (micro-level) and the 'self-discovery' of new areas of potential exploitation (Mariussen, 2017)) are guiding concepts that are well-suited to redirecting and renewing innovation policies at the local, regional or national level. In the Trailing Research Group's project on *Smart Specialisation in Nordland*, Madsen et al. (2017) writes that the focus on domains and EDP sketched out new ways to create new business opportunities and new sectors and clusters, and indicated how to find such opportunities. Understanding this policy tool for innovation may fundamentally change the existing approaches and help shape new development trajectories. This was echoed by several of the interviewees for this study, including in the following statement:

'EDP is one of the most complicated concepts, as it fundamentally changes things and helps these go in new directions. A whole new area suddenly opens up for development.' (Interview N6)

These concepts may be best suited to creating the correct frameworks that will facilitate the adoption of processes, such as entrepreneurial discoveries and the recognition of new domains at the regional level. However, it is worth questioning whether businesses need to be increasingly involved to anchor the working methods and legiti-

mise the working forms at the grass roots level. It is important to recognise the way in which EDP is framed, whether it is from the public authorities or the business sector. As one of the interviewees stated:

'I think it is important to differentiate between S3 as a designation for regional development [on the one hand] and, on the other hand, as a strategy that can support change. S3 has become shorthand for strategies, and that is because it is the public actors that are talking about it, and not the industry or the businesses themselves.' (Interview N1)

The concept of smart specialisation plays a guiding role in the innovation strategy in Nordland County. Although the concept has taken form through the efforts of a dedicated county administration and key actors in the innovation system, issues remain in relation to the dissemination of smart specialisation at the grassroots. By and large, smart specialisation is a grassroots concept, and its processes need to be allowed to grow organically in these spheres. This issue was mentioned by one of the interviewees working with entrepreneurship. Ensuring adoption at both the county and the enterprise levels and demystifying the academic governance concepts may be necessary.

Nordland's S3 strategy draws on its natural resources. Source: Andreea Chidu / unsplash.com

Empirical findings: The politics of innovation and governance for regional development

National policies for regional development

The relationship between the regional and the national levels was repeatedly mentioned throughout the interviews for this case study, both in terms of the scope to manoeuvre within the framework the regions are given and being part of shaping these premises for the future. A related issue is the financial instruments that are required for regional development, as these are anchored to the national level and follow national objectives. Currently, there is no S3 strategy at the national level. However, as the regions are turning towards S3, the national-level government needs to take a closer look at the relative ability of the regions to operationalise innovation strategies, such as enabling EDP to be part of the grassroots' innovative framework and development processes. S3 requires not only financial instruments that are connected to the regional level to a larger degree, but also multilevel governance structures that dynamically evolve with needs at the regional level in Norway. This comes back to the institutional structure that is required for a smart specialisation strategy to take form. Smart specialisation is inherently a tool for enhancing cohesion and levelling the ground for a more competitive state. This suggests the need for a more comprehensive and beneficial financial instrument structure as the regions develop their relative strengths.

However, one of the interviewees noted that limited funds in a region may hamper thorough development of the industrial sector: 'how [the county] operationalises [S3] is connected to how it manages its funds; it is the most important instrument the county has'. (Interview) Given the extent of the tasks that are within a region's mandate, prioritising S3 might prove a challenge, as one of the interviewees pointed out:

'The question is whether S3 would drown in everything else that they have to deal with, such as infrastructure and education. They would rather make the cuts in [S3] than in the budgets for education and roads ... I'm not sure it would be prioritised.' (Interview N7)

Based on the interviews, it is evident that although smart specialisation is considered a good idea and

a 'systematic approach to common sense', the region's means and mandate to operationalise the strategy might hamper its development and manifestation as an innovative framework.

There have been recent moves to transfer more responsibility for regional development to the regional level in Norway. However, as one interviewee emphasised, what is required is a closer and more comprehensive governance structure:

'Most financial instruments are connected to the national level today. But there are suggestions that the regional reform will transfer quite a few of these instruments to the regional level for the regions to have a broader set of responsibilities in regional development. The challenge is that we have so few instruments when creating an S3 strategy when it requires a policy mix and a multilevel governance structure.' (Interview N4)

The expert advisory group on the country-wide regional reform points out that transferring greater powers to the regional level in terms of industrial development without a firm agenda at the national level runs the risk of creating a less competitive industrial sector internationally. Although this was a general comment that did not refer to the S3 framework, it recognises the dangers of transferring such development powers to the region without harmonising these powers within a firmly embedded national agenda (KMD, 2018a: 61). The group also points to the need to develop the financial instruments from a regional development perspective (ibid).

The issue of funding, SMEs and 'branches'

Although the smart specialisation strategy is conceived and implemented at the regional level, it is important to note the implications when a collaborative structure between the national and the regional levels is lacking. This comes to the fore when considering the operationalisation of smart specialisation. As Norway is not a part of the EU, the regions in Norway are not required to create a smart specialisation strategy, nor do they receive funding from the ERDF to implement such strategies.

There is a regional R&D fund available to and managed by Norwegian regions. However, these are not county specific but pertain to larger geographical regions (typically two or three counties). Using this fund for regional S3 would require a har-

monisation of regional objectives. According to the interviewees, the Regional Research Fund in North Norway is not formatted optimally to serve the diversified R&D structure that may surface following an S3 strategy. Considering the R&D strategy developed by Nordland in 2013, the objective of the new common R&D strategy between the three counties of Nordland, Troms and Finnmark is to create common ground for the prioritisations of the financial funding in the Regional Research Fund. As one of the interviewees stated:

'There are three regions with three different structures, cultures and strategies. If you try to make something that will fit all, it will not fit anyone. The point is that the regions must have politics that complement each other. Having different strategies will not work in a larger region.' (Interview N4)

The strengthening of the regional research funds is a start, but it needs to be considered more systematically. With an increasing number of tasks following the regional reform and a budget likely to shrink in the coming years, operationalising S3 from a county administrative perspective might be challenging (KMD, 2018c: 3–6; Ministry of Finance, 2018). Unless regional research funds are increased, only small changes are possible. Allowing S3 to take precedence through a supportive county administration may only allow for smaller changes.

National R&D funding

The nature of the national funding opportunities plays an important role in S3. Although the type of funding pertains to the vision and purpose of the funding agency per se, the overarching national focus (e.g., technology development) limits the funding opportunities for alternative areas of research. This is in line with Fagerberg et al.'s observation regarding the Norwegian national innovation system and the *'selection environment for new entrepreneurial ventures'*; Fagerberg et al. state that new endeavours that have very weak links to the dominant sectors would find that the system poorly corresponds to their needs (2009: 5) To some extent, this rings true when examining the R&D grant amounts in the RCN's Project Bank (*Prosjektbanken*) (Cappelen et al., 2016; RCN, 2018).

However, this does not mean that these systems are closed to new ventures, but that the success stories have often been dependent on other sources of funds, such as foreign investment (Cap-

pelen et al., 2016). In terms of Nordland's focus on tourism as part of its S3 strategy, there is a tendency to consider funding for R&D in this sector extraneous. However, Nordland County is shifting away from the traditional tourism rationale and seeking to develop a more 'experience-based travel' sector. This was mentioned by several of the interviewees, as the following statement indicates:

'A lot has happened in tourism, and there has been a lot of work and research competencies built up focused on experience-based travel, rather than tourism per se ... There is a tendency to think that tourism does not have a need for financing like other industries do. It is not technology based. And that is a shame because we see that tourism has been lifted up after the industry started thinking about the production of experiences rather than regular tourism; tourism based on how a person experiences the place and not just the nature itself.' (Interview N6)

The criteria used to assess the allocation funding were mentioned as an issue by one interviewee from a research funding agency who stated that, often, the criteria target industries with a particularly technology-driven objective. Moreover, the financial instruments and funding tend to be tied to the dominant industrial sectors in Norway, the 'power houses'. Another interviewee commented on this, noting that funding criteria were connected to wider national objectives and the economic 'engines' in Norway:

'When the oil sector experiences a downturn, funds are stimulated centrally in e.g., aquaculture, and the focus shifts very quickly. That's when you get these synergies where tech transfer comes in. But something dramatic needs to happen, or the sector in question becomes so lucrative that it receives that kind of attention.' (Interview N7)

This may also explain the strong technology focus in the national funding bodies. Nevertheless, such a narrow focus might limit the possibility of exploring alternative specialisations outside the traditional sectors, such as Nordland's tourism sector. According to an expert on S3 in Nordland, and echoed by other interviewees for this case study, the situation in Norway makes it difficult to create a regional 'co-specialisation' structure. Using the tourism industry as an example, the S3 expert stated that:

'We have a situation in Norway that makes it difficult to build up a regional 'co-specialisation' structure. One example they use in Nordland is that they've spent 10 years building up capabilities in both the industry and in R&D to allow the tourism industry to transition from a service industry to an experience-based economy ... but then the funding channels are suddenly throttled in those areas of the specialisation that it is most needed. And these kinds of obstacles from a national policy level could be overcome by strengthening the foundations for multilevel governance.' (Interview N1)

The structural issues noted in this section, such as the attempt to establish an experience-based

tourism industry, highlight one of the core dichotomies in this case study: the relationship between the industry needs and the funding opportunities available. The available funding established the regions' relative ability to change paths in terms of R&D and industrial innovation. The case study interviews highlight an interesting perspective in the debate regarding agenda setting and the ties between the regional and the national levels; as an interviewee noted, *'the instruments needed for an S3 strategy [are] outside the region's control'*. (Interview N4) To read more about tourism as part of smart specialisation, please see Box 9.

Box 9: Tourism as a Focus of Smart Specialisation

Nordland County Municipality started working on new avenues connected to tourism in the mid-2000s. They have since then built close relations and collaborative partnerships with key local actors in academia, businesses, and local public authorities and organisations, developing common plans and strategies. Shifting the focus onto 'experience-based' tourism through discovery processes and systematic work is an extension of the previous regional growth programme on 'Coastal Cultures' (*Kystkultur*). This new focus on experience-based tourism took part in a research project which became part of the InnOPP-cluster, generated by the research project *Northern InSights* and VRI, specifically focusing on the knowledge-based aspects of the tourism industry. *Northern InSights* started in 2009 and ended in 2017 after a prolongation (Nordlandsforskning 2018). This collaborative effort between researchers, businesses and the public sector resulted in a knowledge and experience-based tourism and a range of new competencies, both theoretical and practical within the field of the experience-based economy (Interview N5).

The county council in Nordland reported however that the changing notion of tourism as a knowledge-based economy is not yet considered comprehensively at the national level. Tourism, as an industry, uses the same natural and common resources as e.g. aquaculture and faces similar challenges in

terms of conflicts with other industries and local communities. However, there are currently no funding opportunities through RCN that may be used to continue to build the tourism industry with R&D in mind. Moreover, the tourism industry is dominated by SMEs lacking the financial fortitude to invest in R&D. Tourism also faces another structural challenge as the largest tourism-oriented companies are often partly owned or owned by the public sector. This means that these companies tend to be disqualified from participating in tenders for R&D for growth, both in terms of business-oriented R&D and research-based funding. This may mean that the carefully constructed work undertaken on tourism in the local research institutes thus far, may fade. Therefore, systematic dialogues and collaborative efforts with the national level are crucial for the development of tourism as part of Nordland County's S3 strategy (Interview N5). The support letter *Tourism2X: Opportunities through National Strategies!* (*Reiseliv2X: Nasjonal strategi gir muligheter!*) backed by a range of key actors in the industry, such as Innovation Norway, The Norwegian Forum for Tourism, the Norwegian Confederation of Trade Unions, LO, Norwegian Hospitality Association, researchers, and the Enterprise Federation of Norway are lifting the cause to bring Norway to the forefront of sustainable tourism in light of global megatrends and new challenges (Nordlandsforskning n.d.).

EDP and engaging actors: Geographical and structural challenges

Engaging actors across the regional innovation system has proved a challenge. Geographical distances continue to make collaboration difficult despite the digital age. As the majority of the companies in Nordland are SMEs, this often means that their capacity to apply for funding (e.g., for R&D) is limited without support from larger companies (Nordland County, 2013). According to an interviewee working with entrepreneurship, the smallest companies tend to be highly specialised but also geographically bounded, which limits their ability to connect and collaborate with companies that could assist them in bolstering their position. According to this interviewee, distance may hamper collaboration, with the result that the SMEs' chances of winning the most competitive funding is reduced because *'collaboration is often a precondition'*. (Interview N3) This issue was also mentioned as a hurdle by the government's expert group on the regional reforms (cf. KMD, 2018a: 61), a statement echoed by that of another interviewee: *'The tendency to concentrate R&D and competencies ... and [the establishment of] branches¹³ ... limits our development potentials.'* (Interview N6)

This could mean that the ability to attain national funding is relatively uncertain, as the overall concentration of R&D in major innovation centres in Norway and the emphasis given to collaboration in R&D becomes an issue for regional development in Nordland. Closer harmonisation may benefit efforts to link the national needs with the existing regional economic structure. This is also relevant when considering the absorptive capacity of SMEs and it may further encourage a holistic view on regional innovation policies in light of the development of skills and competencies. As such issues fall within the regions' jurisdiction, it might be worth examining the systemic nature of the strategies to sustain future needs.

With regards to smart specialisation and the ability to ensure EDP, there are other issues that need to be considered as well. An examination of the R&D Strategy for Nordland clearly indicates that the largest companies in Nordland are the subsidiaries of larger firms, with their R&D facilities located elsewhere (Nordland County, 2013). This is particularly important in terms of the rela-

tive ability of the companies in Nordland to apply for funding for R&D because, as one of the interviewees stated, it is not the main 'concern' of the company branch. This was also recognised in Nordland's R&D strategy (2013). The relative size of the companies, their collaborative nature and the distances create an unfavourable environment for securing the funding required to realise key S3 concepts. As an interviewee stated:

'Many of the financial instruments we distribute favour larger businesses, or businesses that collaborate with others. And with large distances, collaboration becomes more difficult, and with a host of smaller enterprises, it becomes even more challenging.' (Interview N3)

According to the Norwegian Statistical Bureau, it is the most established companies that benefit most from the existing framework for financial instruments (Cappelen et al., 2016). This was also observed by Clausen (2009), who notes that firms with already existing innovation capabilities (e.g., as shown in relation to patenting activity) were *'significantly more likely to access public R&D funding'* (Clausen, 2009: 365). Thus, a self-reinforcing mechanism occurs, as firms with an innovative history are able to initiate more projects, resulting in a larger gap between the highly innovative firms and the less innovative firms or the *traditionally* less innovative firms or sectors. This is evident in sectors such as construction and tourism, which can suffer from too narrow a funding portfolio at the funding agencies:

'We have also got a very strong, proactive and innovative tourism industry, but we are struggling with finding the right financial instruments, and perhaps the instruments are not designed to include them.' (Interview N3)

Smart specialisation may assist in overcoming this problem, as the traditional sectors are generally favoured as investment opportunities in Norway—by public and private capital—even though there are signs of new sectors emerging. This may result in a diversified structure of related variety. However, this depends greatly on the location of the innovation departments and the increased knowledge opportunities discovered by the parent companies in a specific area. Cracking this code would release the potential of S3 and help connect

13 *'Filialisering'*.

Nordland's regional innovation system with an increased national or international presence.

EDP and risk management

Operationalising EDP may be challenging because of the mismatch between the regional S3 objectives and the availability of purposeful national financial instruments corresponding to the region's needs. This was clarified by one of the interviewees, who commented that *'EDP is difficult to operationalise when you do not have control over the funds that [are] needed to incentivise such a process'*. (Interview N4)

Another factor required to enable EDP to manifest at the ground level is the availability of investments and risk buffers. It is clear that the regions have a role in incentivising the development of entrepreneurial innovations through, for example, public procurement. Venture capital is also available in Nordland, but such companies tend to be risk averse, according to an interviewee, and target familiar areas or areas where they have already made investments, as previously mentioned in this case study (Mazzucato, 2013). Foreign investment is also important for new ventures to gain momentum in the Norwegian national innovation system, with most foreign investment arising from various EU funding mechanisms (Clausen, 2009). The Research Council of Norway's Project Bank (Prosjektbanken) indicates that the main recipients of such funding in Nordland County were the SME instruments for Phase 2 such as general R&I activities and small-scale research projects (RCN, 2018).

Returning to the issue of the resources that are available to companies and industries to reduce risk, it is clear from the interviews that public support is highly sought after to bolster new developments, especially in a region that is characterised by SMEs and sole proprietorships:

'The less resources available for reducing development risks, the more difficult it is to do development work. Sole proprietorship is high risk. Public support is very important in such instances. Even if it is a small project, it might develop into something larger.' (Interview N6)

In recognising risk as part of the S3 development objectives, two considerations need to be taken into account according to one of the interviewees: 1) prioritisations in terms of the quality and na-

ture of project applications to Norwegian funding agencies; and 2) the willingness to take on risks. Thus, the availability of funding and the risks entailed concern *'the public sector culture and their troublesome relationship to risks'*. (Interview N1) There is an argument for a stronger multileveled governance system to strengthen the framework within which EDP and the exploration of new domains may develop.

Norwegian path dependency and S3: Match made in heaven?

The existence of already well-established sectors is an important variable for the success or failure of new areas of innovation, as noted by Cappelen et al. (2016), Clausen (2009) and Neffke et al. (2011), among others. In Norway, successful innovation has historically been tied to the economic development of resource-intensive industries (Castellacci et al., 2009). Although similar mechanisms to those of EDP have previously been utilised (Mariussen et al., 2016), it is nevertheless interesting to note the viability of these innovative ideas in relation to established sectors (Clausen, 2009). In an article entitled *Industrial R&D Policy in Norway: Who Gets the Funding and What Are the Effects?*, Clausen notes that the beneficiaries of R&D and other funding tend to be connected to the larger industries and possess economics of scale and scope (Clausen, 2009). Considering the flows of R&D funding between governmental funding bodies and recipients, it is clear that the likelihood of receiving funding is higher when a recipient has already received funding from another agency in the national innovation system. In addition, there are recurring investments in the 'dominant' sectors of the former 'national champion' policies (Interviews; Cappelen et al., 2016; Innovation Norway, 2017). This has driven the call for a closer relationship between national and regional framework agendas in driving regional development politics.

The adoption of the key concepts such as EDP and domains is important for various reasons, as mentioned in the sections above, but the most pertinent issue is the homogenisation and streamlining of funding agencies so as to complement the innovation system and help drive the S3 agenda forwards. According to the interviewees, this has so far been a challenge, resulting in a narrow strategy.

Nordland's innovation system may be characterised in terms of the structure that spans Norway at large—an innovation system based on a

strong relationship between the sectoral and the national system (Fagerberg et al., 2009). According to Fagerberg et al., this system is co-evolutionary, in that the national system develops policies and institutions that corresponds to the traits seen in the sectors and the economic development process (ibid: p. 5). In such a system, these authors argue, the interaction between the national and the sectoral innovation systems reinforces an environment where new ventures are limited by increasing path dependency, rendering the success of new ventures dependent on the relative economic strengths of the sector to which they belong (Fagerberg et al., 2009). In other words, 'history matters' for 'new combinations' (Schumpeter, 1934 (2004)).

Considering the long tradition of sectoral innovation in Nordland, S3 should be able to unlock the potential of the main industries and diversify the industrial economic structure in the county. The key is overcoming the funding barrier at the national level.

The green transition and the Nordic model of S3

When asked about the role of smart specialisation in driving the green agenda, the interviewees consistently answered that green perspectives are by and large incorporated in the existing industrial and research processes, and often figure as a precondition for receiving funding and support from the state level. According to one interviewee, including aspects on sustainability and green growth is to the advantage of a project application:

'It is quite evident in our tender calls that [the green aspects] should be an advantage ... so when we work with project processes, we do make it clear that we are looking for sustainability aspects and how they are emphasised, because it is a criterion your project proposal is measured against.' (Interview N3)

The green transition is a component of a branding opportunity, but it also involves restructuring working processes, aligning these with other important mega trends, such as digitalisation, and influencing the old industrial paradigms. However, smart specialisation could be a method for further systematising the green transition and the circular economy, by means of EDP. To achieve this, one of the interviewees called for public actors to play a greater role as facilitators in incentivising changes to traditional industrial development.

The existence of a Nordic model for S3 was discussed during the interviews, and a few themes recurred in relation to the high levels of social capital and trust. In particular, willingness to change, including reorienting towards new ways of work is more likely when countries are more innovative and possess more social capital. Moreover, the high levels of education and the recruitment of academic labour power by regional and other authorities might mean a higher absorption capacity when it comes to understanding the need for change and building bridges between the public and private sectors. Nevertheless, as one interviewee notes: *'We are not sheltered from institutional drag'*. (Interview N1)

Key findings

Although the concept of smart specialisation is not entirely new in terms of the way in which the Norwegian innovation system operates, Nordland is the first region in Norway to adopt such a strategy, despite the fact that Norway remains outside the EU. Embedding the smart specialisation framework as part of the regional innovation strategy has proven beneficial for Nordland County, as it has helped target its prioritisations and channel funding. Smart specialisation is gaining momentum in Norway, and the Ministry of Local Government and Modernisation's recent guidelines to help navigate and introduce the S3 concept in the Norwegian context is an important symbolic step. The Norwegian path-dependent innovation system may provide a favourable environment for S3 to blossom, although there is a risk of stalling this process by focusing on the dominant expertise already in place, and preventing opportunities in new domains being realised.

Following the interviews conducted for this case study, it seems that there is some tension between the local, regional and national levels regarding innovation, promotion and funding of R&D&I. One way to potentially ease this tension is by finding a governance approach in which the financial instruments are supported in a complementary way. The creation of place-based regional innovation strategies is indeed in need of synchronisation through the alignment of funding. However, this should happen in a mutually reinforcing way, between the regional and the national level. It is natural that established structures are being challenged, as a process driven from the bottom-up gains momentum through the general disper-

sal of the S3 concept as a tool for enabling innovation at the regional level. However, joint efforts and initiatives at the regional level are needed to successfully adapt and develop the S3 concept in Nordland.

With limited room to manoeuvre in terms of available finance and an expected increase of tasks following the regional reforms, S3 seems more relevant than ever in enabling a focused and concerted approach to innovation. One of the requirements for successfully implementing S3 is to have a firm understanding of the regional areas of strength. Despite ticking the boxes for enabling such a strategy at the regional level in terms of leadership and targeted prioritisations, there are significant hindrances lurking in the decoupled structure of available financial instruments and funding opportunities between the national

and regional levels. This is particularly evident in relation to the proximity of companies and the ability to create domains, discover new entrepreneurial ventures and incentivise related variety. As Boschma states, '*Relatedness requires connectivity*' (2016: 6).

Following a thorough analysis of the region, Nordland has created a solid foundation from which to develop its strategies. With an engaged county administration, and with an extensive knowledge of the region's advantages taking ownership of the process, the S3 concept has the potential to spread across the region. Thus, it is important for the Nordland County administration to continue spearheading the concept by taking ownership of the processes alongside increasingly integrated and synchronised national policies on smart specialisation.

ICELAND

by Ágúst Bogason

Introduction

As Iceland is not an EU member, there are no requirements for it to adopt smart specialisation in its regional development plans. In Iceland's new regional policy (*Byggðaaætlun*) for 2018–2024, there is no formal mention of smart specialisation (*Samgöngu- og sveitarstjórnaráðuneyti*, 2018a). The same can be said for the Regional Growth Plans (*Sóknaráætlanir landshlutanna*) that each region develops around their own priorities. Although smart specialisation strategies are currently not formally used in Iceland and the concept is not mentioned in the relevant policy documents, there are many indicators that similar strategies are being used.

In the past, Icelandic policy making for innovation and economic development has been dominated by the national-level government. Due to the governance structure in Iceland, the term 'regional' is limited in use because there are only two governance levels: national and municipal (Lindqvist et al., 2013). Nonetheless, decision-making and policy making regarding regional priorities, innovation and funding have increasingly been moving from the national level to the municipalities, which collectively make growth plans for their regions. The *Regional Growth Plans*, along with Iceland's newly introduced National Regional Plan and the newly developed *Regional Destination Management Plans* for the tourism industry, have involved wide collaboration and consultation with business interest groups, trade unions, local authorities and regional associations, focusing on the existing strengths of each region. Work has also begun on a new *National Innovation Policy*, expected to be finished before the end of April 2019, and the development process for this will include participation by a wide range of stakeholders. The policy review that follows is based on desktop research and in-depth interviews with stakeholders.

Current policy and institutional framework

For the last few years, innovation activities have mainly been fostered by the Ministry of Industries and Innovation. However, certain activities in the field of innovation are the responsibility of

Iceland

Biggest city: Reykjavík, capital of Iceland

Population: 353,070 (July 2018)

Area: 103,000 km²

Areas of strategic importance: Tourism, fish processing, aluminium smelting, geothermal and hydropower

the Prime Minister's Office, the Ministry of Education and Culture and the Ministry for Environment and Natural Resources. The Prime Minister's Office is responsible for the activities of the *Science and Technology Council* (*Vísinda- og tækniráð*) which, among other things, has the responsibility of defining the government's policy regarding science, innovation and technology. Other funds that finance different R&D projects also exist. The administration of these funds is largely carried out by the Research Center of Iceland (*Rannís*), which again operates under the Ministry of Education and Culture (*Fjármála- og efnahagsráðuneytið*, 2018).

Other government-funded units, institutions and smaller funds operate in different regions of the country. The largest of these actors is the Icelandic Innovation Centre (*Nýsköpunarmiðstöð*), the main tasks of which include the interplay of technological consulting and business support, encouragement of innovation and support for the advance of new ideas through research, development projects, business development and professional advice and consulting (*Nýsköpunarmiðstöð*, 2018a). The Innovation Center operates in the City of Reykjavík but also has smaller facilities around the country (*Nýsköpunarmiðstöð*, 2018b). Matís is a government-owned, non-profit, independent research company founded in 2007 following the merger of three former public research institutes. Matís pursues R&D aligned to the food and biotechnology industries and has laboratories or Food Innovation Centers located in eight cities and towns around Iceland (Matís, 2018). The University of Iceland also has nine research centres outside the capital area (Háskóli Islands, 2018) and the University of Akureyri and the University of Reykjavík have been expanding their research activities around the country, an important move in furthering innovation at the regional level. As one of the interviewees stated:

Iceland finds synergy effects in its blue bioeconomy and tourism. Source: pexels.com

'The presence of the universities in more rural areas and the formation of knowledge-based clusters has had a great effect. It has encouraged innovative thinking, especially in the regional sense. The social impact this has had is considerable.' (Interview I2)

So-called business development agencies (*Atvinnuþróunarfélög*), which are part of the national innovation strategy, have also contributed to furthering innovation in more rural areas. They mainly work directly with business development and innovation in a regional or local context. These development agencies are linked to the Regional Organisations of Municipalities (*Landshlutasamtök sveitarfélaga*) that operate in eight different regions. In recent years, these organisations have taken on more responsibilities in regard to policy making and decision-making in innovative regional matters. This step has been essential in building a foundation for place-based innovation to occur. As the majority of the municipalities have very small populations and limited resources, these organisations have provided a platform to join forces and co-ordinate innovation efforts. Clusters in which public institutions, private and public companies, industry and universities combine their expertise have been developing around some areas in the last few years, mainly in relation to the energy,

food production, fishing, aluminium and tourism industries. The current Icelandic innovation system has placed Iceland eighth on the *European Innovation Scoreboard* in 2018. However, there is a structural difference between the EU and Iceland, as Iceland's GDP per capita is well above the EU average but, at the same time, the employment shares in manufacturing and high-tech manufacturing are well below the EU average. Innovation-friendly environments and attractive research systems are the strongest innovation dimensions when it comes to measuring innovation performance in Iceland, whereas sales impact and intellectual assets are the weakest innovation dimensions (European Commission, 2018).

R&D expenditure as a percentage of GDP has fluctuated over the past decade. It was at its lowest, 1.76%, in 2013, compared with a peak of 2.92% in 2006 (Hagstofa, 2018). In 2016, expenditure as a percentage of GDP in Iceland was 2.08%, compared with the OECD total of 2.23% (and 3.26% in Sweden, 2.75% in Finland, 2.87% in Denmark and 2.03% in Norway)¹⁴ (OECD, 2018).

In the guiding policy statement *Iceland 2020*, written as a response to the financial crisis of

¹⁴ The numbers from 2016 are the most recent comparable numbers available.

2008–2009, a goal of significantly increasing expenditure on R&D was espoused. In a policy strategy document released by the *Science and Technology Councils* in 2017, a goal of R&D expenditure amounting to 3% of GDP before 2024 was established. Today, around one-third of the R&D expenditure comes from public funds, whereas the rest comes from international R&D funds, EU initiatives and the private sector (*Mennta- og menningarmálaráðuneyti*, 2017a).

In recent years, there have been suggestions that the structure of the regional and innovation policies should be reformed, as evidenced in various policy documents. The proposed reforms include a simplification of regulations, increasing tax rebates for innovation and research funding and the creation of a better and more comprehensive support system for clusters (*Fjármála- og efnahagsráðuneytið*, 2018). A few changes have already been put into practice and have contributed to moving the policy making for innovation and economic development from the national level to the regions. This also includes the distribution of funds. Further structural changes are on the agenda and a new *National Innovation Policy* is now in the making.

Recent developments: Empowering the regions

There are eight informal Regional Organisations of Municipalities (*Landshlutasamtök sveitarfélaga*) in Iceland established by the Icelandic Association of Local Authorities (*Samband íslenskra sveitarfélaga*). These organisations consist of municipalities in a particular region and they are involved in the development of regional affairs and in safeguarding their interests for their specific area. Creating a platform for the municipalities to collectively organise and prioritise was considered necessary to further regional innovation matters. By establishing formal organisations of municipalities and sharing knowledge and resources, stronger units that are better equipped to move place-based innovation forward were created.

These organisations do not have the formal legal status of being a third branch of the public administration. Nevertheless, their creation has assisted in avoiding certain governance structural issues that would have hampered place-based innovative and regional development possibilities. According to one interviewee, the existence of these regional units has changed things for the better:

'Municipalities are not obligated to participate in the Regional Organisations but most of them do nonetheless, since not participating would also remove the possibility of influence. ... The creation of the Regional Organisations has been beneficial for everyone involved.' (Interview I4)

In recent years, these organisations have been encouraged by ministries and the Icelandic Regional Development Institute (*Byggðastofnun*) to develop independent strategies, so-called *Regional Growth Plans* (*Sóknaráætlanir landshlutanna*). These are strategic plans that cover the local operating areas of each Regional Association (*Landshlutasamtök sveitarfélaga*). They include a status assessment of the relevant region, a vision for the coming years, goals and actions to achieve those goals. The *Regional Growth Plans* specify regional priorities, while taking into account the main objectives of Iceland's rural and regional policy, development policy, cultural policy and, where appropriate, other public policies. A Governmental Steering Committee on Regional Issues (*Stýrihópur stjórnnarráðsins um byggðamál*) supports the regional associations in creating the *Regional Growth Plans* and making agreements between regional associations and ministries (*Samgöngu- og sveitarstjórnarráðuneyti*, 2018b).

'The aim of creating these Regional Growth Plans was mainly to bring the decision-making and responsibility to the regions so they themselves can prioritise and allocate state funds to their regional and community development projects.' (Interview I4)

At first, there was some doubt regarding how well the regional organisations were equipped to handle these new tasks. However, after a short adjustment period, all regions proved to handle the tasks well, according to the interviewees. The increased strength that followed municipal co-operation soon provided opportunities to develop more formal institutions around the regional issues. As a result, some areas have opened regional offices that provide a co-ordinated and interdisciplinary service related to economy, education and culture in the region. By moving these tasks to the regions, the municipal level has been empowered through the regional organisations, creating a more fertile ground for innovation. Although they are not formally the third level of administration, their active involvement has given small municipalities

a collective voice. After overcoming initial obstacles, the system is now running smoothly, so it is assumed that more responsibilities will be moved to the regions in the future.

Improved effectiveness and development

Two separate evaluations of the R&I environment in Iceland have pointed out that there is a lack of effective prioritisation of public investment in R&I (Taxell et al., 2009). One report argued that enhanced prioritisation could lead to better results, an increased impact of research efforts and more efficient use of human resources and funds (Heijis et al., 2014). The report of the European Research and Innovation Area Committee also suggested that it was important to link the development of research areas to the overall research priorities (European Council, 2014). Problems regarding the unclear link between government policy and the different R&D&I funds have also been discussed domestically (*Mennta- og menningarmálaráðuneyti*, 2017a). Therefore, one of the reasons for undertaking the recent structural changes to the system in Iceland was to tackle these problems, while ensuring the best use of funds and providing for more local participation (*Samgöngu og sveitarstjórnaráðuneyti*, 2018b).

One interviewee stated that the transparency of the whole process had increased simply by moving the decision-making to the regions (Interview I4). According to this interviewee, previously the division of funds could be regarded as highly person and network dependent, resulting in uneven funding across the country. Thus, the legitimacy of the process has been increased considerably by giving the municipalities more authority. New laws about public spending, mainly the *Public Finance Act*, which was established in 2015, have also played a part in changing this for the better.

Now, the *Regional Growth Plans* have also been implemented into law, with the Icelandic Association of Local Authorities (*Samband íslenskra sveitarfélaga*) involved in the process. This provides a better connection between the *National Regional Development Plan* and the *Regional Growth Plans* for each part of the country by integrating different policies on different issues into one. Before this, according to some of the interviewees, policies of one sector were not necessarily in line with policies of other sectors:

'Too often no funds were connected to the policies and as a result there was no monitoring or follow-up. As a result, too often, nothing happened.' (Interview I4)

This situation has been altered by changing the process and moving funds and decision-making to the regions and by re-evaluating the plans every year through a built-in evaluation system that has been put into place.

Therefore, the Icelandic innovation environment can best be described as being in a transition phase. Even though the centralisation of policy making and the distribution of funds for innovation have moved more towards the regions, formally the national government is still the main actor. The governance structure makes it hard to decentralise the public innovative system. Nonetheless, some steps have been made to move the process closer to the regions themselves. The process of targeting priorities and distributing funds, which used to be dominated by the national government in a very top-down way, has moved more towards a bottom-up process. The new system has created smaller and more independent units that are making their own plans with broad stakeholder participation. The decisions are increasingly taken at the regional level, while the government and ministries have adopted more of a monitoring role, providing the strategy and creating dialogue between different actors. In that sense, centralisation has decreased but, at the same time, the whole process has been regulated and formalised.

S3: Organic or by recipe? Limitations and applicability

While discussing the possibilities of smart specialisation as a strategy, some experts consulted in this case study expressed the view that the term might not be a 'game changer' that would revolutionise the way innovation is conducted, at least not in the Nordic countries. Some considered that, in a way, the smart specialisation strategy is simply a term that has developed from and replaced 'clusters'. Some of the interviewees revealed that this innovation development has been occurring organically in the Nordic countries for some time without guidance from some sort of framework:

'When encouraging innovation, the Nordic countries have for a long time put emphasis on exchanging

information and focusing on what is already being done well.' (Interview I3)

Other informants mentioned that the Nordic countries and the Baltic states had been focusing on the factors that smart specialisation highlights even before the concept was developed. They argue that different clusters in the Nordic countries have emerged more or less spontaneously when working with existing strengths in specific areas around certain ecosystems, industries or resources in co-operation with universities and authorities. Thus, smart specialisation has adopted and developed how these clusters have emerged and what has caused them to be successful in generating and fostering innovation. This includes focusing on what has been done well in these areas—using local knowledge and further using existing resources to develop valuables in innovative ways. One interviewee expressed the view that smart specialisation was, in fact, just a slightly different definition from the cluster concept but, by introducing a new term to replace the old one, certain priority aspects that are emphasised can be better defined. In this way, some aspects of the smart specialisation strategy have provided tools to sharpen the way in which innovative strategies are perceived, especially the focus on the local, place-based component. This is considered to align with the direction Nordic innovation has taken in recent years:

'You might say that the way of doing innovation in the Nordic countries is not necessarily based on the smart specialisation ideology, but rather that the smart specialisation ideology fits with what is being done at these places and has been done for quite some time.' (Interview I2)

In this manner, according to some of the interviewees, smart specialisation has adopted much of what was already in place in the Nordic countries. In Iceland, as well as the other Nordic countries, the focus in the last decade or so has been on complementing and working further with local uniqueness and specialties already in place in certain regions, increasing the inclusive and interactive process of stakeholders' involvement, encouraging the creation of co-operation platforms, support services and infrastructure that manage flows of knowledge and information between different actors and enhance a culture of innovation, creativity and quality. For the most part, these interviewees considered that this happened without a national framework or a strategy dominating the innovation sector.

Some even added that one of the main characteristics of Nordic innovation compared with innovation elsewhere was the way that innovative thinking has occurred over a longer period of time, which has encouraged ongoing dialogues between different actors and utilised existing strengths to

Source: [shutterstock.com](https://www.shutterstock.com)

create more value. This way of approaching innovation also led to another Nordic characteristic, whereby the consequences of innovation are often environmentally friendly:

'If I should name one thing to describe Nordic innovation it would be sustainability. That is a concept that is in the foreground of most Nordic innovation. Innovation is always in some way about problem solving and now, environmental problems are high on the agenda. Green solutions are, because of this, often a side effect of innovative thinking, at least in a Nordic context.' (Interview I2)

At the same time, these same informants expressed the view that smart specialisation, while in many ways useful, has some limitations for Iceland. These limitations are mainly due to the small population and the lack of industrial diversity and economic possibilities:

'Apart from the capital area, Akureyri and a handful of other towns, the settlements all have 4,000 inhabitants or less, most of them far less. The towns are almost all located along the coast, have the same climate and rely on the same resources. Culturally, there are no real differences, no language difference or even dialects and no historical minorities. This homogeneity of course affects the economic possibilities.' (Interview I1)

Because of the small population, limited funding and expertise, the possibilities for diversifying the economic activities and increasing regional resilience are diminished. The interviews conducted for this case study revealed that the small population has also resulted in a tendency to centralise decision-making. There are quite a few examples in Iceland where the focus has been on using the existing facilities and products along with the local knowledge that has evolved around it, to create more value in a creative and innovative way from raw materials and natural resources already in place. In that way, it can be argued that aspects of smart specialisation are already existing in the Icelandic innovation environment, even though the smart specialisation model has not been consciously used: that is, a de facto smart specialisation has emerged.

However, it should be taken into consideration that when the recent structural changes were be-

ing planned and developed in Iceland, the country had applied for EU membership and negotiations with the EU were ongoing. The EU membership was later revoked, but the *Regional Growth Plans* and other structural changes to innovative and regional matters were often made with EU guidelines in mind when they were developed.

A new innovation policy and future developments

While some steps have been taken recently to improve the innovation structural framework in Iceland, further changes are on the agenda. Now, efforts are being and have been made to strengthen the support system for entrepreneurs and startups, and work has begun on preparing an official cluster policy for Iceland, focusing on the strengths of different industries in different regions (*Fjármála- og efnahagsráðuneytið*, 2018). The preparation of a new innovation policy for Iceland has started in co-operation with representatives of political parties and various stakeholders in close consultation with the industry and the scientific community. This work will produce a comprehensive innovation policy for Iceland, providing guidance and suggestions for a strategic framework.

'I have expectations that the innovation strategy will, through this interdisciplinary co-operation, be able to cover all the different issues that innovation must take into consideration, and that our society as a whole will benefit.' Þórdís Kolbrún R. Gylfadóttir, Minister of Industries and Innovation (Ministry of Industries and Innovation, 2018b).

Formally, there is no smart specialisation on the agenda for Iceland's new innovation policy. Nonetheless, the future vision is that Iceland will be a leading actor when it comes to R&D, innovation and knowledge-based industries, to ensure that it is better prepared to face the social challenges caused by further diversification of the economic foundations, so that the well-being of citizens is based on a more solid foundation. The aim is that tax regulations, including rebates for research funding and acquisition of foreign expert advice, will be altered to further encourage innovation in companies, with the aim of increasing international research collaborations in accordance with the *Government's Policy Agreement* (*Fjármála- og efnahagsráðuneytið*, 2018).

Regulations and administrative affairs are to be simplified and a more comprehensive support system for companies, regional actors, universities and research centres to undertake innovation is to be developed. The goal of strengthening innovation, both in the private and the public sectors, is to be achieved through the integration of institutions and different funds along with better co-ordination of procedures. There is also a plan to better support the development of innovation at all levels of the educational system (Stjórðunarsáttmáli, 2017). Even though the term smart specialisation is not going to be in the foreground when this new innovation policy is developed, almost every single aspect targeted is similar to the S3 ideology. The new policy will mainly serve as a framework and strategic tool, providing guidelines for those working on innovative matters to achieve the desired goals. It is not meant to be a specifically place-based framework, but rather to help incorporate and encourage thinking similar to smart specialisation and, in that way, act as an instrument to further innovation in rural areas. It is hoped that the changes already put in place will be consolidated through the new innovation policy, as will other structural changes that are on the agenda, making the whole process more transparent and at the same time more beneficial for everyone involved. This includes the creation of a more formal review mechanism, improving the monitoring and evaluation of the whole process and enabling regular updates of the strategic choices made. Iceland's innovative framework has previously had a great deal in common with the strategy currently being targeted at a regional level in the EU and, if everything goes according to plan, will continue to evolve in that way. Thus, even though smart specialisation will not formally be used as a frame of reference in the process of developing a new policy, when examined in more detail, it is clear that it is, at the very least, a close relative of the S3 ideology.

Key findings

As a non-EU member, Iceland has no requirement to implement the smart specialisation approach to its regional policies and it is not likely to do so. Although steps have been taken to develop a more regional-based framework around innovation matters, and hopes are that even more responsibilities can be given to the regions, Icelanders are also realistic about how far they can go in that

direction. Lack of diversity in the economic activities in the different regions and the small population mean limited expertise and funds, as well as tendencies to centralise decision-making. The governance structure also has limitations and, while the national level has given more authority to the municipalities, it is likely that the national government will remain the most prominent player.

However, many similarities can be found between smart specialisation and how Iceland is developing its innovation strategy, and much of the current framework was partly or wholly developed while Iceland held candidate status for EU membership. Trying to integrate the regional aspect into more policies is an ongoing project that has called for greater local involvement. The creation of regional organisations with responsibility for *Regional Growth Plans* has made it necessary for different actors to have an ongoing dialogue, which has made the whole process more transparent and, in the end, more effective. This has many things in common with the ideology of smart specialisation. According to the interviewees, it can be debated whether the Nordic countries are basing their innovation strategies on smart specialisation or if the S3 ideology is simply following what the Nordic countries have been doing for the past decade.

Either way, more focus is now put on existing local knowledge, resources and strengths than some years ago. The interviewees expressed the view that this has occurred in part organically and in part based on learning from the experience of other Nordic countries that are developing clusters. Strategies in line with smart specialisation seem to be more apparent in smaller regions in Iceland, where companies are working on a smaller scale, whereas larger and more established Icelandic companies, operating in bigger markets, develop their own strategies for innovation.

There are many examples where innovation has produced interesting products in different places around Iceland by focusing on what already exists in the area and environment. In that way, people have defined in detail where value is already being produced, what national resources are in place, what kind of companies and businesses already exist in the area and what the local knowledge is based on. Then, focusing on those aspects, they have developed new innovative products and services. In this way, some areas have been able to optimise their scarce resources to create some-

thing new. Moreover, this way of thinking is being highlighted as a strategy for doing more innovative thinking in the future.

The links between a national innovation policy and the regional policies are not formally in place, but might be when the new national innovation policy has been developed. Regions have already defined their own challenges and been granted more authority in their own regional prioritisations. If further development of the innovative system goes as planned, different plans at regional and national levels will integrate with each other in the coming months and a framework closely re-

lated to smart specialisation will formally become part of Iceland's *National Innovation Policy*.

In many ways, Iceland has come a long way in generating innovative thinking in similar ways to its neighbouring countries. It has not formally adopted smart specialisation, but some processes incorporate the general ideas of the concept. However, it is a matter of debate whether Iceland is actively using smart specialisation or if smart specialisation is promoting what the Nordic countries have themselves developed when nurturing innovative matters in a regional context.

THE ÅLAND ISLANDS

by Laura Fagerlund and Mari Wøien

Introduction

Åland is an autonomous, demilitarised province in the Baltic Sea, officially part of Finland. Being autonomous, Åland has its own government, which answers to Åland's Parliament. Åland is also responsible for the functions undertaken by Finland's regional councils, such as regional and land-use planning. Åland's strength lies in its maritime sector, which accounts for approximately 20% of Åland's GDP (ÅSUB, 2017). Its maritime sector is a starting point for smart specialisation on Åland, but the sector relies heavily on co-ordination from mainland Finland. As a relatively small and open province, the maritime sector is also prone to changes on the international scene. Åland also has a strong tourism industry, a developed IT sector, and agricultural and energy sectors (ÅSUB, 2017). These also serve as a starting point for establishing smart specialisation on the island.

The Government of Åland's *Innovation Strategy 2014–2020* provides a comprehensive overview of the region's strengths, weaknesses, opportunities and challenges. Strengths include a strong tradition of self-employment and entrepreneurship, coupled with Åland's small scale, which is ideal for experimentation, its location between Finland and Sweden and core competences, especially in the maritime sector. The *Innovation Strategy* also refers to current challenges on Åland, related to its small-scale society, which contributes to the *law of Jante*¹⁵, enterprises that are founded without ambition to grow and expand outside the region, inflexibility in the education sector and difficulties matching supply and demand for certain competences (Ålands Landskapsregering, 2015). Åland's opportunities are centred around maximising the knowledge brought in by improving the education in adherence to Åland's core competences, as well as furthering tourism that focuses on Åland as an 'exotic island' (ibid.) This case study takes a closer look at the innovation system in place on Åland, alongside the enabling and impeding factors for the realisation of smart specialisation on the island. The analysis that follows is based on desktop research and interviews with stakeholders on Åland.

15 The law of Jante is a social code that disparages individual achievements and commends collective feats.

Åland

Biggest City: Mariehamn

Population: 29,733

Area: 1,581 km²

Areas of strategic importance: Maritime industries

Sources: ÅSUB (2017); Nordisk Samarbete (n.d.)

Policy and institutional framework

Employment of the term smart specialisation in Åland's *Innovation Strategy 2014–2020* is a response to the ex ante conditionality for receiving funds from the ERDF. However, the islands were already utilising smart specialisation methods and practices, according to one of Åland's experts on smart specialisation:

'Åland is doing the same things as it has been doing before but are now calling it smart specialisation'. (Interview Å3)

The operationalisation of the Government of Åland's *Innovation Strategy* responds to the challenges observed in the welfare sector, as well as to pressing issues concerning the environment and climate change, and the need to bolster both energy and food supplies. The long-term aim of the strategy is to increase productivity, levels of employment and further export of sustainable and competitive products (Ålands Landskapsregering, 2015).

The key actors for innovation and smart specialisation on Åland are the education sector, businesses and the business sector's organisations. Several actors were involved in the development process of the *Innovation Strategy*, including Åland's Growth Council, the Industry Department of the Government of Åland, a strategy group and six working groups for the new EU programmes 2014–2020, a monitoring committee and ex ante evaluators. Moreover, the process involved several workshops, discussions and seminars. Smart specialisation strategies regulate the European Structural Funds with the aim of securing a more effective use of public funding and stimulating private investments. Thus, it was in Åland's interest to develop a strategy for smart specialisation both from a financial and a development perspective, as the interviewees highlighted.

The maritime industry plays an important role in furthering the implementation of S3 in Åland.
Source: pixabay.com

Business strategies and EDP

Åland's *Innovation Strategy* is a horizontal approach to smart specialisation, focusing on technological and market-driven innovations and the existing know-how of businesses. Additionally, Åland's *Structural Funds Programme 2014–2020: Entrepreneurship and Competence* aligns with the *Innovation Strategy* and aims to support investments in innovation and research, and to buttress SMEs' ability to start new projects related to the enterprises' core competences (Ålands Landskapsregering, 2018b).

Åland has limited human and financial resources to build a strong technical research environment to further advance the core competences. Therefore, the best strategy for developing the business sector is considered to be based on 'market pull' ideas. This approach encourages businesses to identify their strengths and competences in relation to market needs and to develop services and products to meet this demand. The existence of venture capital funds is also positive for the viability of future business developments. For example, Åland Utvecklings AB possesses good financial in-

struments to co-fund and support promising new smart ventures and has an interesting portfolio of projects co-funded with the ERDF (ÅUAB, 2018). Thus, market-driven innovation is a strategy for operationalising entrepreneurial development processes within existing businesses, based on the existing capabilities on the island. In this way, it is a reactive rather than a proactive strategy for innovation.

Some practical examples that illustrate Åland's implementation of smart specialisation are Åland Business Lab and Åland Sailing Robots. According to two interviewees, Åland Business Lab assists entrepreneurs by giving them expert advice, help from a project leader, the opportunity to take part in a course in sales and physical office spaces (*Högskolan på Åland*, 2016b). Åland Sailing Robots is a project with the goal of building the first sailing robot to autonomously cross the Atlantic Ocean (*Högskolan på Åland*, 2016a). Both Åland Business Lab and Åland Sailing Robots have received financial support through the *Entrepreneurship and Competence* programme. Another example relates to wind power, which is rapidly de-

veloping on Åland. The FLEXe Demo project aims to make Åland a testbed for smart electricity grids with 100% renewable electricity generation (Ålands Landskapsregering, 2018a). Åland works well as a testbed for various reasons, including its size—being small means there is greater flexibility, enormous investments are not required and customers in the whole value chain can be involved. Åland is situated between two areas with different currencies (the Swedish krona and Finnish euro), which allows for cross-border trading. Moreover, the share of renewable electricity production in Åland is already high. The project is operated by the Finnish company CLIC Innovation, with energy companies on Åland and the Government of Åland participating in the project. As electricity grids will become more dependent on the weather with wind power, smart electricity grids will use electricity when availability is high, but use less when the availability is low (Ålands Landskapsregering, 2018a).

Despite its limited resources to develop strong knowledge hubs in an array of different sectors, Åland's smart specialisation strategy could be interpreted as aligning with the European Commission's description of innovation strategies as '*putting entrepreneurial knowledge to work*' (Ålands Landskapsregering, 2015: 8). Åland's aim when it comes to smart specialisation is to encourage and stimulate creative and innovative thinking, as the sub-targets are to support businesses' own knowledge growth and to develop the businesses' ability to commercialise their knowledge of their respective markets in a proactive way. Thus, Åland is encouraging the employment of EDP-like approaches. Creating environments for strong entrepreneurial attitudes are fundamental for spurring original and dynamic business developments in a region without much public funding or support.

Smart specialisation, sustainable development and education

The *Development and Sustainability Agenda for Åland* is an overarching strategy for sustainable development. According to an interviewee on Åland, the Government of Åland uses smart specialisation as a de facto tool for sustainable development, as the objective and approach of the concept are detectable in the strategy despite the concept not being mentioned. For example, the focus on developing the energy sector by drawing on the strength of natural resources (e.g., wind,

waves, sun and biogas) and its locality and situation, coupled with the 'market pull' approach to business development and entrepreneurship, may help create a favourable environment for discovering new opportunities through 'related variety'. Simultaneously, this focus on green growth and the bioeconomy may help develop closer ties between smart specialisation and sustainable development.

The education policy programme *Competence 2025* is another important component of the comprehensive take on smart specialisation on Åland, and is included in its *Innovation Strategy* (Ålands Landskapsregering, 2015). Through the education programme *Competence 2025*, the Government of Åland wants to encourage entrepreneurship and digitalisation among its students, as well as to further incorporate aspects on sustainability, equality, integration and flexibility. Examples of planned activities in this education programme are centred around a closer collaboration with the labour market, entrepreneurship courses, teaching programming, improving the availability of adult education and life-long learning, including Swedish as a foreign language, and identifying different needs in education (Ålands Landskapsregering, 2017).

Key findings

Prospects of S3 implementation on Åland

Åland is not a registered member of the EU Smart Specialisation Platform. However, Åland did use the smart specialisation procedures when developing its *Innovation Strategy*, as the inclusion of S3 was part of developing the Structural Funds Programme in Åland. The EU Commission encourages Åland to continue working to improve research, technological development and innovation, and to support employment and labour force mobility (Ålands Strukturfondsprogram 2014–2020). The latter should be particularly pertinent in the continuation of the work, as it focuses on the potential of youth and the successful integration of immigrants into the labour market. With this in mind, Åland is urged to consider the synergy effects created when supporting entrepreneurship and self-employment (Ålands Strukturfondsprogram 2014–2020).

Being dependent on importing expertise is a challenge for Åland and maintaining co-operation with its partners is important for the prosperity of the region. Currently, Åland is performing well

in this regard, as demonstrated by successful new projects, such as the aforementioned FLEXe Demo project. In the future, continued success will depend on the ability of the region to attract businesses and investment. Creating a strategy for maximising its R&I could help steer businesses to the island, drawn by existing knowledge hubs and the tacit know-how in the region. As such, employing a smart specialisation strategy to target funding in R&I in prioritised areas of existing strengths may help strengthen Åland's position as a desirable partner for collaboration in the future.

One sector to target is the agriculture and food production sector. Åland has a strong agricultural and dairy production sector, which is of great importance to local well-being. With a grounding in the societal fabric and its long traditions, R&I in the agricultural sector may serve as a potential area of smart specialisation in the future. One interviewee also mentioned Åland's finance sector, which has close links to its local IT sector, as an area that could be targeted under the smart specialisation strategy.

Concerning the prospects of smart specialisation on Åland and its implementation in *Entrepreneurship and Competence*, an interviewee commented:

'For us, S3 is first: business development, second: Åland's University of Applied Sciences, and third: commercialisation.' (Interview Å2)

This understanding of smart specialisation illustrates its implementation process on Åland: it is an integrated and comprehensive approach, with a focus on education, regional expertise and providing businesses with the means to develop their activities. As such, smart specialisation on Åland is indeed a practical process where implementation is more important than promoting the term smart specialisation (Teräs, 2017).

The future implementation of smart specialisation on Åland is likely to be shaped by a practical take on the implementation of smart specialisation and it is arguable that Åland may be challenged if it is not able to maximise its capabilities in R&I. However, by identifying key regional strengths and targeting its resources, the island may identify spearheads that allow it to remain an attractive collaborative partner and create a competitive edge. As Åland is highly dependent on the import of expertise and co-operation partners, smart specialisation may play a positive role in Åland in assisting such partnerships in the future.

5. Cross-case analysis

Based on the analysis conducted spanning six Nordic regions and their position in relation to smart specialisation, there is room for cross-case analysis. Smart specialisation appears to be an important key to unlocking regional potential in the Nordic Region.

Considering the implementation of S3 policies, the concept has the longest tradition in **Sweden** and in **Finland** and thus, the most extensive S3 strategies can be found in these countries. Each have different outlooks regarding the necessity of adopting such a strategy, and the case study regions, Stockholm and Kymenlaakso, display two very divergent results. On the one hand, **Kymenlaakso**, as one of the early adopters of smart specialisation, has a highly systematic and strategic approach to smart specialisation. Situated between the border to Russia and the Finnish capital region, Helsinki–Uusimaa, Kymenlaakso is the node for logistics in Finland. It is also the home of advanced biorefineries. Kymenlaakso has been able to maximise its strengths and it is a highly specialised region with a **clear regional vision**, which has enabled the region to attract both **international collaboration partners** through various Interreg programmes in the Baltic Sea Region, while successfully **securing funding from large EU funds**, such as Horizon2020 for R&D. On the other hand, and despite being an EU top performer on matters of innovation, the capital city of Sweden, **Stockholm**, has been less able to organise and mobilise around the concept of smart specialisation. With a tradition of providing minimal guidance regarding the creation of key objectives in innovation and research in the region, smart specialisation appears to sit uneasily in the existing innovation structures. Although there have been efforts to create objectives to focus funding, these remain overarching and non-specific. However, there are examples where the smart specialisation concept has been successfully implemented at the ground level, in business clusters. Moreover, there are indications of an increasing interest in the concept among key actors in the innovation system, in universities, businesses and regional agencies. In relation to

ownership and clear objectives in this space, it is clear that without a strong political mandate and a clear policy commitment from the national and regional level, S3 will be more a symbolic gesture than an applied pragmatic and strategical policy tool for regional growth. **The success or inability to apply the S3 concept in these regions may be indicative of its relevance and the predilection of different geographical areas and typologies.**

The **Midtjylland** region in **Denmark** and **Åland** in **Finland** are applying smart specialisation pragmatically, as a mechanism to receive ERDF funding. However, their existing innovation systems do indicate an existing **de facto** smart specialisation, as the structures resemble the characteristics of the EU tool, with targeted sectors and the tightening of connections between knowledge centres and the regional industries. Smart specialisation would help clarify the structural difficulties in ensuring regional growth, as well as the pursuit of a green transition and sustainable bioeconomy.

The varying results and natures of the application of smart specialisation is interesting with regards to its adoption outside of the EU. **Norway**, a non-EU member, has an increasing number of regions discovering the value and appropriateness of the concept, despite not receiving funding from the ERDF. The Ministry of Local Government and Modernisation recently published a guide on smart specialisation, encouraging regions to develop similar structures. This could be interpreted as a way of recognising and responding to the strengthening of regional advantages across the EU, wishing to remain relevant in R&I in the future. In turn, this re-emphasises Bellini's claim that the fundamental goals of territorial cohesion through EU regional policy have finally become cemented within the objectives of innovation and competition (2015).

Nordland was the first region in Norway to adopt the strategy and has applied it in line with its R&D&I strategies. The strategic and methodological work to implement the strategy is being upheld as a regional 'recipe' for the creation of such strategies. However, the operationalisation of the strategy remains a challenge, as the key

funding mechanisms and objectives are defined at the national level. **The alignment of funding structures** is key to favourable outcomes at the regional level, which is a hurdle to be overcome in Nordland. The lack of **multilevel governance structures** is also part of the problem in realising smart specialisation in **Stockholm**. However, the experiences of other regions in Sweden, such as Värmland, indicate that the successful implementation can occur without active support from the national level. However, this largely depends on how the region has been organised internally, and whether or not they respond to the national or the regional political level, which has been one of the weaknesses in Stockholm. Stockholm could therefore benefit from better communication across all levels of government. A clear **political mandate** is thus necessary. To some extent, this also applies to Iceland. Although Iceland is not a member of the EU and does not explicitly apply the smart specialisation concept in its quest for increased innovative competitiveness, there are moves to **devolve powers** to the regional associations. Although the national level maintains control over the R&D funding, the geographical distribution of universities and university colleges provides a promising vision for the future. From a policy perspective, the **relation between regional smart specialisation strategies and national policy thus remain an interesting challenge**.

Concluding remarks

From this cross-case analysis, it is evident that there is no uniform Nordic approach to smart specialisation, but there are shared common features detectable across the regions. The regions act on their existing preconditions, and whilst some regions may have been heavily involved in innovative activities and have found a method that works

optimally, other regions have benefitted from the nudge S3 has given them for developing a more targeted regional innovation policy. This is also true for the green transition, or the bioeconomy, as the Nordic region's economic structure rests on natural resources and the development of these. However, it can be argued that the efficiency and the range of products and new processes may benefit from a regional S3 strategy, also in that it may contribute to creating a more comprehensive ecosystem around key industries. In the long term this may help lift regional attractiveness and contribute towards territorial cohesion. Analysing the cases also begs the question of the existence of a regional 'optimal size', to avoid 'big city'-problems or the struggle to gain the critical mass necessary. Although there might be an 'optimal size' – medium-sized regions with access to knowledge institutions, industries and sufficient critical mass – hybrid versions have been detected (Teräs et al, 2018; see also Box 5, Chapter 2). Considering these hybrid versions operating S3 on the basis of collaboration for attaining key resources was beyond the scope of this study, but it is nevertheless an interesting aspect in the 'optimal size'-debate.

As such, the existence of a Nordic Model thus not appear, but the quick adoption of the strategy tool in some regions may point to a highly compatible innovation environment. Throughout the case studies, an S3-equivalent structure for innovation has been detected, and it is thus worth discussion whether the innovation systems in the Nordic countries are a form of *de facto* smart specialisation. Therefore, the division of success is thus not wholly dependent on the status of a Nordic country or region as an EU-member state, but rather on its willingness to tweak its structures to accommodate for new innovation systems.

6. Key findings and policy recommendations

In this report, we have attempted to shed light on the role and potential of smart specialisation for enhancing innovation and resilience in the Nordic countries. The report was centred around four research questions: 1) How do the national and regional levels support S3 processes, and what tools are in place for this purpose? 2) What are the enabling and impeding factors influencing the adoption of S3 elements at the regional level? 3) To what extent does the S3 approach aid the understanding of the relevant processes in regional innovation systems and the stimulation of necessary synergetic co-operation within it? and 4) As a place-based approach how does S3 contribute to driving the green growth agenda?

The regions considered for this case study were the Kymenlaakso region, in Finland; Stockholm, Sweden; Midtjylland, Denmark; Nordland, Norway; the Åland Islands as part of Finland; and Iceland. Due to the lack of a regional governance level on Iceland, the report took a holistic approach to studying the potential of smart specialisation there.

The purpose of this report and its aims are in line with the objectives of the Nordic Thematic Group on Innovative and Resilient Regions 2017–2020. Commissioned by the Nordic Council of Ministers, the overall ambition is to create an understanding of how the different Nordic regions adapt to the S3 policy concept, and furthermore, to analyse the added value of its implementation in the Nordic context.

This report has provided a thorough knowledge and policy overview of smart specialisation in the Nordic Region. In attempting to obtain a systematic overview of how the Nordic regions have adopted and adapted the concept of smart specialisation in their respective regional innovation strategies, it is evident that there is a significant knowledge gap in understanding how the respective countries position themselves compared with their Nordic counterparts. This is particularly relevant for future collaborative cross-border work,

as well as for identifying whether there is a specific Nordic model of smart specialisation, considering both the presence of natural resources and the governance frameworks in place supporting innovation.

In the context of this report and its findings, it is important to note that smart specialisation is first and foremost an EU ex ante conditionality in line with the objectives of creating territorial cohesion. Thus, neither Norway nor Iceland are under any obligation to employ smart specialisation as a regional strategy tool for enhanced innovation. Therefore, this report considers the potential of smart specialisation in the context of the already existing innovation systems, looking at the ways in which it has been employed, but also what needs to be in place for it to manifest on the ground. Consequently, the structure and focus of the case studies are centred around the structural necessities and the requirements for the operationalisation of the strategy. Smart specialisation in this report is understood as a regional development tool for increasing R&D through a restructuring of funding and developmental power at the regional level.

The following section outlines and summarises the key findings from the case studies. The section is structured according to the research questions stipulated above.

Main findings: Empirical research

RQ 1: How do the national and regional levels support S3 processes, and what tools are in place for this purpose?

Smart specialisation/S3 takes on different roles across the Nordic Region and, although it seems that its prominent position as an ex ante conditionality in the ERDF would indicate a stronger position in EU member states, this is not the case in the Nordic countries. The advancement of S3 as an innovation tool has indeed been implemented in both EU member states and non-EU member

states alike. Furthermore, its relative success depends not on the EU or the ERDF, but on the commitment of regional and national actors in understanding the relative added value that the tool might bring. This is perhaps most apparent in the S3 commitments displayed in Norway, where the Ministry of Local Government and Modernisation has taken on a co-ordinating role. The commitment towards S3 is also evident in Sweden and Finland, while Denmark has demonstrated a lack of interest in the concept beyond its strategical value as a source of funding. Iceland is not an EU member, and smart specialisation does not figure on either the national- or regional-level agendas.

National level

In **Sweden**, the Swedish Agency for Economic and Regional Growth (Tillväxtverket) is co-ordinating S3 efforts and is a central actor strengthening regions in their work with smart specialisation. The agency's most important task is to ensure that EU funds are invested in projects that promote regional growth and employment. The Swedish Government's agency administering funding for R&D&I, Vinnova, is not visible in the work on smart specialisation. This organisation presents a challenge, as the Agency for Economic and Regional Growth tasked with the co-ordination of smart specialisation is mainly concerned with financial instruments tied to rapid growth in SMEs and companies, rather than innovation. Innovation requires long-term investment, something which Vinnova provides. Certain Vinnova Vinnväxt programmes encourage smart specialisation to receive funding, but this programme is provided at the national level and does not involve the regional place-based aspect of smart specialisation. Thus, in the coming programme period, the organisation of smart specialisation would benefit from a clearer structure.

The national level in **Finland** is supporting measures for smart specialisation but has not adopted an S3 strategy. However, the government programme for 2015 covers similar elements to S3 and reinforces the partnership between the universities and the private sector. In 2016, it also introduced a new funding programme for Regional Innovation and Experimentations, the AIKO fund, running until 2019. Nevertheless, these efforts remain largely decoupled from the regional innovation strategies (Virkkala, 2015). However, the concept does have significant support from the national government. In the *Regional Strategy*

2020, smart specialisation is considered an essential tool for promoting regional development and innovation, and the ministry has taken steps to inform the regions of the EU's ex ante requirement (Ministry of Employment and the Economy, 2010). However, the development of such strategies remains within the regions' responsibilities.

Smart specialisation is largely considered a way to access the EU's Structural Funds in **Denmark**, and the country has been labelled an 'S3 sceptic' in the past. Although the concept is primarily co-ordinated from the national level, three Danish regions, Nordjylland, Midtjylland and the Region of Southern Denmark have joined the S3 Platform (S3 Platform 2018). The Danish policy framework for innovation encompasses a range of related strategies, which includes a focus on regional growth and development. However, the focus on the regional level may change in the coming years, as a centralisation of regional domains and responsibilities has recently been devised.

In **Norway**, the Ministry of Local Government and Modernisation has taken on the role of co-ordinator for smart specialisation. It published a guideline (Veileder) on regional applications for S3 in September 2018. Previous efforts to empower regions with competences and responsibilities for R&D encouraged the development of relatively autonomous and targeted policy mix designs, as demonstrated by both the Research Council of Norway's (*Forskningsrådet*) *Programme for Regional R&D and Innovation* (VRI) for 2007–2016, and its successor FORREGION. The latter programme draws inspiration from smart specialisation, as stated in its programme description.

Due to the lack of a regional authority in **Iceland**, any strategies pertaining to smart specialisation would be implemented at the national level. As a non-EU member, Iceland is not required to adopt a smart specialisation approach in its regional development, and it has not formally adopted the concept. However, collaborative and consultative processes, including civil society, branch organisations, trade unions, local authorities and regional associations, have taken place, and resulted in the policy statement on innovation.

Åland's approach to smart specialisation is incorporated in two of the region's *Structural Funds Programme: Entrepreneurship and Competences 2014–2020 and the education policy Competence 2025*.

Regional level

When examining the operationalisation of smart specialisation on the ground, the regional councils play a significant role, although commitment to and actual implementation of smart specialisation varies across the EU. On the surface level, smart specialisation is a method for concretising regional visions and goals, with a view to strengthening regional SMEs and research institutes, and assisting in the creation of spearheads that attract funding on the national and international stages. This may occur through the use of regions' R&D funds to mobilise industries and to support industries and regional research institute in the application processes for tender calls from larger funding bodies. Taking a closer look at the operationalisation of the concept, however, it seems clear that one of the challenges is the persistent prevalence of established institutes and companies receiving funding.

The levels of maturity are also indicative of the performance level, although being an early adopter does not equate to having smooth S3 machinery. However, the methodology and strategies connected to the implementation are important for the uptake of S3 in the region, which was the case, for example, in **Nordland**.

The **Swedish and Finnish** case study regions, as part of the EU, are the early adopters of the smart specialisation strategy, but **Nordland** in Norway also displays high levels of maturity in the application of the concept. In terms of S3 operationalisation, **Danish regions** are lagging behind with their S3 approach, despite having regions present on the EU S3 Platform. Regardless of their level of maturity, S3 policies may help create a more attractive region, drawing investment and funding from home and abroad.

Overall, the region may function as the channel between the companies at the regional level and the larger EU machinery. This is particularly evident in Finland and **Kymenlaakso**, where the strategy is employed as a way to attract funding and policy assistance from the EU.

Tools supporting RIS3

The ex ante conditionality is a powerful tool for incentivising the adoption of smart specialisation. In fact, in **Denmark**, the concept seems to be adopted only because of the ex ante conditionality. Regarding **Åland**, smart specialisation is largely implemented strategically for receiving funding, but is nevertheless part of a comprehensive approach

to structuring the innovation system to gather relevant actors and promote entrepreneurship and competitiveness.

In **Finland** and **Sweden**, the ERDF remains the main funding body for regional innovation and development. In Finland, AIKO has been an important separate funding body, but the regions will take the main responsibility for the development of S3 policies and the support mechanisms that might be inspired among regional actors and stakeholders. However, the AIKO fund is part of the Finnish government's regional policy initiatives for 2016-2019 and is not guaranteed to be continued.

In **Norway**, the regions are encouraged to develop regional innovation strategies in line with smart specialisation, and the concept has inspired the Research Council of Norway's most recent FORREGION programme. However, a closer alignment of the funding objectives and availability for ensuring true regional variety is could be strengthened. It is important to recognise the role of funding measures for ensuring regional competitiveness but, nevertheless, there needs to be a clear distinction between national funding priorities for sustaining performance levels in R&D&I in terms of international competition and rankings, and excellence in nation-wide regional R&I centres targeting regional development goals.

As a regional development tool, the level on which S3 is operationalised partly depends on the national interest in the concept, but also on how it has been organised and communicated. Thus, clear communication and a sound governance structure to ensure accessibility of additional funding outside the ERDF are interesting aspects that arguably should be considered.

RQ 2: What are the enabling and impeding factors influencing the adoption of S3 elements at the regional level?

Enabling factors

The enabling factors associated with the successful implementation of smart specialisation in the Nordic Region can be summarised as follows: 1) clear regional ownership and leadership, with the right set of capabilities for realising change; 2) inclusiveness and actor engagement for a comprehensive strategy development; and 3) social capital, and 4) peer regions allowing for transregional and transnational knowledge sharing (e.g., as enabled by the S3 Platform in Seville).

At the regional level, what is needed to support S3 processes is clear ownership of the process and a leader to spearhead implementation and operationalisation. Performing the role of regional pioneers in Norway, the county administrative board in **Nordland** has demonstrated the benefits of taking on responsibilities, breaking new ground for a restructuring of regional innovation strategies. Building on a meticulous and thorough regional analysis, involving a range of key actors in the region and beyond, Nordland has been able to stake out its strengths and prioritisations. Revealing the de facto S3 aspects of the regional innovation system may also assist in this process. Understanding the necessity of creating a strong regional objective to attract investments and of ensuring future competitive advantage by appropriately positioning the regional economy, as has been seen in **Kymenlaakso and Nordland**.

Moreover, well-functioning multilevel governance structures are key to furthering smart specialisation at the regional level. Based on the case studies, it is evident that a strengthened connection between the different levels—businesses, regional actors and national authorities—may play to a region's advantage in constructing a strong regional economy. For example, this may be discerned as a key difference between the **Kymenlaakso** region in Finland, where the Ministry of Employment and the Economy has long recognised the added value of S3, and **Nordland**, where the national authorities have recently discovered the potency of S3 for regional development.

Regarding inclusiveness, attempts to invite and engage actors have been successful and in **Kymenlaakso**, where the development corporations representing regional actors and their interests sit comfortably at the intersection between the companies and the regional management authorities.

The region may also play a key role as a source for transnational collaboration, as was the case regarding the knowledge sharing and best practice learning opportunities between **Nordland and Ostrobothnia** when Nordland first began developing its strategy. When employed in the right way, smart specialisation may further transnational collaborations, as seen in the various Baltic Sea Region collaborations in which Kymenlaakso is engaged. This is also evident in Sweden, where cross-border collaborations on forestry specialisations occur across the **Swedish–Norwegian border** be-

tween Värmland, Hedmark and Oppland¹⁶ as part of Interreg Sweden-Norway (Interreg Sweden-Norway, n.d).

Impeding factors

The impeding factors found by analysing the empirical research are presented to help point out the drawbacks and gaps and assess how situations may be improved.

Struggling to engage actors is a problem seen in some of the regions considered for this case study, particularly in **Stockholm**. Many of the challenges in Stockholm appear to relate to the issue of there being an 'optimal size' for a region implementing smart specialisation, in terms of the number of actors available and the strength of large portfolios of various thematic areas. This highlights the need to recognise that there are no 'ideal models' (Tödtling and Trippel, 2005: 1215), that different types of regions need different types of policies to adequately address the needs of the region. S3 may be comprehensive enough to account for these changes but understanding that different regions might need different processes to achieve the similar results needs to be considered in this equation. What works in Arctic regions, such as Lapland, or industrial or forestry regions such as Värmland might not work in Stockholm. These findings highlight that there might be an urban–rural or typological divide, which should encourage further studies to investigate whether there is an 'optimal' size for smart specialisation. Based on the findings in this report, the mid-level regions seem to be the well-positioned for implementing smart specialisation strategies, whereas capital regions and the island regions seem to struggle, either with the presence of too many relevant actors or lacking in critical mass, as in the case of **Åland**.

Moreover, the 'monopoly of funding' and internal objectives of the large actors and universities present in **Stockholm** may be an issue limiting the adoption of smart specialisation, although a strong regional authority may be capable of engaging these actors. Engaging small and medium-sized actors has also been a challenge in S3 oriented efforts, although this most likely pertains to the role of the regional authorities in the local innovation system and that the funding mecha-

16 To read more, visit The Bioeconomy Region (Interreg Sweden-Norway): <http://www.interreg-sverige-norge.com/?portfolio=the-bioeconomy-region-2> Accessed Jan 2019.

nisms available tend to come from national agencies. Moreover, in traditionally strong innovation environments, such as Midtjylland, although the university has adopted the role of a catalyst for cluster collaborations, the effects are likely weaker than if the region had acted as a co-ordinator. This is also true for Stockholm, where the larger universities are working in line with their internal research plans and agendas.

Additionally, the existence flexible financial instruments on the national level that can help ensure that the regions effort in creating industrial and economic variety in line with their S3 strategies, seems to be key, albeit absent to some extent. Steering and incentivising processes is a challenge when the financial means and instruments are outside the region's domain. This is the case for **Nordland**; despite its wish to specialise in tourism (See Box 9), the financial instruments from national agencies favour technology development and basic research over social innovation. What is missing is a multilevel governance structure that dynamically evolves with the needs at the regional level to enable interregional variety.

The lack of political ownership related to adoption of smart specialisation is particularly evident in the **Stockholm** case. Despite the efforts of key regional actors on the ground, the level at which S3 has been devised hampers further development of the concept. In turn, this impacts on the ability to mobilise key actors around concepts such as EDP and domains. Although **Stockholm** is lagging behind in the adoption of the smart specialisation concept, other Swedish regions, such as **Värmland and Skåne**, are aptly positioned for the future. These regions have had a clear mandate from their regional authorities, due to the liberties the administration has in the county council as opposed to the county administration boards, which are bound by national politics. Coming back to the structure and the division of tasks in the Stockholm innovation system, it is arguable that although the personal commitment of civil servants and key stakeholders is invaluable, the success of a strategy depends on the political mandate these are given for completing the task. If the national level is uncommitted to the process and the task for regional development and growth is located in the state's representative in the region, there will not be sufficient funds or hours to implement a new innovation strategy. However, it is too early to say to what extent the existence of smart spe-

cialisation strategies is decisive for the prosperity of a region, as the Stockholm region remains one of the most innovative regions in Europe, despite not having a formal S3 strategy.

RQ 3: To what extent does the S3 approach aid the understanding of the relevant processes in regional innovation systems and the stimulation of necessary synergetic co-operation within it?

Smart specialisation contributes to furthering the understanding of regional potential when considered in the context of the case study regions in this report. It elevates the enabling and impeding features of the existing innovation system in terms of its ability to accommodate smart specialisation as a tool for restructuring processes. The evidence presented in this report suggests that regions should take on the important role of ensuring regional development through smart specialisation by encouraging and structuring the possibilities for diversifying the economic structure at the ground level. The scope of this role is particularly evident in the way that the region can play a role in facilitating EDP and collaborations to establish and identify new domains, and in its capacity to go beyond the traditional innovative bodies, such as, for example, the universities.

Understanding the relevant processes in the regional innovation systems for unlocking the potential of S3 has figured as a key component in **Nordland**, where the lecture series, the 'S3 School', helped shed light on the roles of the different key stakeholders through a thorough introduction of the key concepts, EDP and domains. Understanding the need for creating a connecting 'node' is another key feature worth mentioning, for example in the Smart Specialisation Academy in Karlstad, Värmland (see Box 2). These systematic approaches to exploring smart specialisation have been instrumental in the development of strong S3 strategies, evident in both of the aforementioned regions.

As a place-based approach, smart specialisation adds to the legitimacy of the region as an actor for change. Regional administrations and similar actors bring businesses and industries closer to the decision-making and policy-making bodies. This may create a more dynamic economic structure, responding to the needs of the businesses and industries at the regional level. Thus, one of the key added values of smart specialisation is related to the role of the region as a risk buffer and

reliable partner in fostering new opportunities by providing platforms and connections. The case studies also revealed the limited and/or extensive power the regional agency may have, and that this depends on the way in which tasks are divided and the relative autonomy the region has to employ new policies, in terms of both human and financial resources. This was also discussed in the section above (RQ 2).

However, it is also important to understand the nature of the agency applying the S3 concept, to understand the way it has been framed. As was mentioned in the **Stockholm** case study, the added value of S3 is found by recognising the role of the agency or organisation applying the concept; it 'offers a different lens' depending on the relative position of the organisation applying it. To echo Foray, smart specialisation as a concept is a tool that is 'not restricted to a particular level of governance or organisation' (2009: 91).

New domains and opportunities

At the regional level, smart specialisation is not a replacement strategy, but a complementary tool for unlocking the potential of the existing innovation structures and strategies. Although it may appear to be a new strategy, it is in fact a tool enabling the operationalisation of a more comprehensive innovation system (Ketels et al., 2013). Furthermore, smart specialisation is a driver for discovering new synergies between actors, beyond their traditional sectors. This enables the innovation system to continue developing its main innovative 'engines', while creating a favourable environment for exploring opportunities in 'related variety': from 'inward'-looking structures and 'outward'-looking clusters in, for example, circular economy initiatives. In the Nordic context, smart specialisation is often understood as a new frame for renewing the cluster idea. Even though the two concepts differ in their scope and focus, the potential for using clusters as 'core toolkit' is there (Ketels et al., 2013: 5). It complements the cluster structure present across all Nordic countries and makes it increasingly comprehensive. It also has the potential to connect and link a wider segment of the regional economy. This is particularly evident when examining the industrial transition experiences in **Kymenlaakso**, or the role of the IT and financial sector in **Åland**.

The role of smart specialisation in furthering the potentially comprehensive and inclusive as-

pects of EDP aspects may be detected in **Åland's** approach. By focusing on creating a sustainable, smart and inclusive community through the development of competences and skills for entrepreneurship, it provides a good example of how innovation takes on a comprehensive role. EDP should be described as a collective, overarching concept, rather than a process undertaken by a sole entrepreneur. In this way, smart specialisation and EDP may be a way to continue building value chains beyond what is traditionally within the scope and power of a few businesses alone. This may also be the way in which the S3 concept differentiates itself from the 'old' cluster policies. EDP as a place-based, bottom-up approach grounds the strategy, and creates linkages between institutional layers.

These grounding processes are also evident in **Stockholm**, for example, despite the fact that they remain within the sphere of businesses and clusters. The Urban ICT Arena in the Kista area of Stockholm is a good example of an implementer of S3, and it has subsequently been used as an example of best practice by the county administrative board.

The case studies revealed important aspects of applying the key concepts of smart specialisation. To some extent, they show that S3 reaches beyond the traditional R&D focus on high-tech and process innovation, and that there is a tendency towards creating new ecosystems by reaching across. Smart specialisation has also demonstrated that it may bring about aspects of social innovation, such as in the tourism industry. Tourism as a possible area of specialisation was detected in **Nordland**, where the traditional understanding of tourism is shifting towards an understanding of it as 'experience based' and comprehensive, ranging from infrastructure and facilitation to content and adventure. Thus, smart specialisation brings added value in terms of the types and varieties of innovation it enables.

It is too early to say the extent to which S3 has had a significant impact in the Nordic Region, but there are data that indicate attempts to restructure innovation systems and raise the role of the regions in ensuring their economic security, for example, in **Finland, Norway, Sweden** and **Åland**. Although there are few signs thus far, the implementation of the smart specialisation strategy in certain regions may serve as a benchmark in the future. Furthermore, smart specialisation will allow for Europe-wide benchmarking opportunities and transregional knowledge exchanges.

RQ 4: As a place-based approach how does S3 contribute to driving the green growth agenda?

One of the objectives of this report was to consider to what extent smart specialisation is a driver for the green transition in the Nordic Region. From the case studies, it is evident that green perspectives often are included in the overall objective in industrial transitions, and smart specialisation does assist in focusing on green products and systems. With an industrial structure heavily based on natural resources, smart specialisation becomes a tool for bolstering the R&D aspects of these industrial endeavours. This is particularly evident in the case of Kymenlaakso, Finland, where the specialised areas are drawing on the existing strengths of a strong bioeconomy, coupled with the logistics and circular economy and attracting funding, for example, from Horizon 2020, to consolidate R&I efforts in the region.

The vast natural resources in the Nordic Region, including the blue and green bioeconomies, renewable energy sources, such as wind, tidal and hydropower, and the mining and maritime industries, hold great potential for driving green growth through strategically applied smart specialisation objectives. This includes the development of high-tech processes and products, but it also necessitates capitalising on old and new techniques. The mixture of old and new techniques coupled with natural resources helps further the objective of territorial and regional cohesiveness, bringing life to green, alternative innovation. Their existing know-how and defined structures for R&I may help justify targeted regional policies, while encouraging businesses and industries, or clusters, to engage in a widening of their product portfolio, so as to avoid systemic 'lock-in' in the future (Ketels et al. 2013). Rather than merely 'following the yellow brick road', S3 through EDP may aid historically path-dependent systems to break into a plethora of alternative trajectories, bolstering the future of national economic engines. Thus, when applied to the green growth agenda, smart specialisation may also have an inclusive function, bringing prosperity not only to the 'elite' regions but also to rural and peripheral areas.

The green transition and smart specialisation may be particularly compatible, as the Nordic countries have been able to prioritise 'green thinking': this could be understood as being part of a new and refined version of the Nordic model. For

example, in Norway, the role of green or sustainability aspects is firmly ingrained in calls for tenders in securing project funding for R&I. Low- to zero-emission solutions are favoured in public tenders, even, for example, in determining the types of ferries allowed on public water ways (Miljøstiftelsen ZERO, 2017). Such steps may play an important role in cementing the green transition and smart specialisation as mutually reinforcing concepts. However, it requires a careful consideration of the availability of alternative funding for research within untraditional sectors, such as tourism.

The discourse surrounding green growth and the bioeconomy is a vehicle for smart specialisation to take form and become part of the dominant conversation on the green transition. In this way, smart specialisation may contribute to an increase in the knowledge capacity, and the diversification of the 'greenification' of industries and businesses.

Both the EU and national funding agencies allocate significant funding and financial instruments towards the realisation of the green growth agenda. In turn, this may help assist in boosting innovation. Hence, green growth and technology development become not only a 'good to have', but a 'smart to have'. Several Nordic regions are showing signs that would suggest the exploitation of this trend. Unlocking S3 at the grassroots in the context of green growth may also occur through targeted financial instruments for green technologies, bypassing the region altogether. However, this does challenge aspects of natural resource protection and conservation. Striking the balance between these competing discourses may be part of the discussion on smart specialisation and the green transition in the future. Thus, Nordic smart specialisation and the green transition may go hand in hand as a trait of a region moving into a new industrial era.

Additional findings

De facto S3

The existence of a de facto smart specialisation approach in the Nordic Region at large is evident from the case studies. Moreover, it was suggested in the case study on **Iceland** that the nature of smart specialisation is very closely aligned to what is already taking place in the Nordic countries, although more refined. Smart specialisation is adopted to varying degrees in the Nordic regions studied for this report, and it is possible to trace

the existence of a de facto smart specialisation. De facto specialisation is the instance where regions are working in line with the concept despite not having formally adopted its methods and processes (Teräs et al, 2018). This was detected both in **Midtjylland** and in **Stockholm**, in that the ways in which the Nordic innovation systems and markets are organised are often in line with the foundations and ideas of smart specialisation.

In terms of **Midtjylland**, several similarities have been detected. First, the process leading to the regional growth and development strategy included an active dialogue, during which all stakeholders were heard, which closely resembles EDP. Second, finding new regional competitive advantages and the application of traditional strengths have been part of, for example, Århus University's strategy when searching for new applications and solutions and potential future development areas. Third, the region's approach to cross-sectoral collaboration resembles the S3 process for identifying domains. Although the processes do differ, the underlying idea remains the same: that clusters may not possess all the knowledge and the synergies that they may be required for future developments.

Åland is another good example of a region where de facto smart specialisation has taken place due to its geographical location and natural resources. It has adopted practices that prompt associations to smart specialisation. This was also detected in Iceland, as the main industries encourage the development of 'related' ecosystems in aquaculture. Regarding the Nordic territories of the Faroe Islands and Greenland, a deeper exploration of their innovation strategies in relation to the nature of their strengths and available resources would be worthwhile to determine whether these show signs of de facto S3 approaches.

In many respects, a well-functioning bioeconomy and circular economy structures need de facto S3 policies to move ahead, not only by way of diversifying markets, but also to secure funding and investment in the future. Various guises of de facto smart specialisation may be present in the 'systems thinking' in Nordic countries.

The Nordic model of S3

Across the case studies, the Nordic Region is displaying high levels of de facto smart specialisation, where the nature of the concept is comparable to the system already in place. Nevertheless, smart specialisation does bring an additional and more

targeted lens through which one may understand and construct policies for R&I. Hence, smart specialisation seems highly compatible with the existing structures in place in the Nordic case study regions, although regional variety is observed.

The shared geographies and typologies in the Nordic Region, and the corresponding structures building on these natural resource endowments are all part of the 'shared experiences' in Nordic economic history (Kristensen and Lilja, 2011). Moreover, opportunities for transnational learning play an important part in the realisation of smart specialisation. The development of similar structures and innovation systems across the Nordic Region shows the effect of learning from best practice examples, as demonstrated by Nordland's adoption of the S3 concept despite not having an ex ante requirement. Additionally, there was a shared understanding amongst the case study interviewees that the Nordic countries are applying S3 from the same starting point – and the commonalities between the countries seem to create a sense of a Nordic Model.

Such shared characteristics seem to be evident in the structure of capital in the Nordic Region, which is often long-term, patient and relatively predictable, based on the empirical evidence in this report. Similarly, the small home markets force the Nordic countries to look beyond their borders to expand and develop. Although this is something that is already happening spontaneously to some degree (Kristensen and Lilja, 2011), smart specialisation may compel the Nordic regions to consider alternative market opportunities and new segments.

Furthermore, many of the underlying structures required for the adoption of smart specialisation in the Nordic countries were consistent across the case studies. Such structures include high levels of trust in the social and political systems, flat hierarchies and highly educated populations. Furthermore, social capital and actor-network relationships in the local innovation systems support the likelihood of developing new products, methods and processes. The collaborative tradition between the political and the industrial levels, and the adaptability of systems were also mentioned in the case studies as idiosyncrasies of both Nordic innovation and the Nordic economic systems. These are important components worth capitalising on, enabling economic growth in the existing structures.

These underlying structures are also noted in the literature on the nature of Nordic capitalism (Kristensen and Lilja, 2011). In their book, *Nordic Capitalisms and Globalization: New Forms of Economic Organization and Welfare Institutions*, Kristensen and Lilja note that some of the reasons for the success of the Nordic Region are the conformity of market needs and adaptability to new institutional and industrial design, which enable the Nordic Region to deal with both national and global challenges as they emerge (2011: 6). Smart specialisation, and particularly EDP, have been adopted to promote and develop regional strengths in line with identified market niches. This is further cemented in the close relationship between the business and industry sectors and public agencies, where innovation strategies are drawn up and based on dynamic dialogue and pro-

cesses, as was the case in Stockholm, Kymenlaakso and Nordland.

Hence, the first signs of a Nordic model of smart specialisation are already present on the scene. The Nordic Region seems to hold a promising position in advancing its regional advantage, both in terms of green growth and institutional change. This leads us to contemplate the question of whether the presence of de facto smart specialisation is an important element the Nordic model by default.

Policy recommendations

The following list presents the recommendations derived from the empirical and desktop research conducted for the purpose of this report. The recommendations that follow are targeted towards policy makers in the Nordic Region.

Policy recommendations	
1.	<p>Multilevel governance</p> <ul style="list-style-type: none"> ■ Create guidelines Following the regional interest in the S3 concept at the regional level in Norway, the Ministry of Local Government and Modernisation published a handbook (Veileder) on navigating the Norwegian political and planning systems in implementing S3. Signalling national interest in the concept may assist regions to consider their regional business and industrial development in a new light, and steer towards increased regional specialisation. ■ Balancing national and regional relationships This is particularly important for the operationalisation of S3. There needs to be a strong collaboration to find the best governance model between the regional and the ERDF structure/ national level to make RIS3 a relevant and viable tool. It is additionally important to refrain from making an overarching policy that overrules the regional place-based component.
2.	<p>Enable regional transitioning</p> <ul style="list-style-type: none"> ■ Ensure availability and appropriateness of funding mechanisms This depends on the nature and strength of the collaborative relationships in the region, but also on the availability of appropriate financing from the national level. ■ Create flexibility for unlocking true regional variety Recognising the need for different types of funding instruments on the regional and the national level to allow for a wider set of priorities may be valuable in the long term. ■ Stability through long-term commitment Regional and national co-creation for ensuring critical mass and well-balanced measures in a long-term perspective is crucial for success.
3.	<p>Mobilise actors to empower the regions</p> <ul style="list-style-type: none"> ■ Increase inclusiveness and engagement of actors Ensure that actors across the regional network have the opportunity to participate in the planning processes leading to the strategy development. It is also important for the region to demonstrate what service the region might be able to provide to its business and industrial ecosystem. ■ Build trust for stability and long-term investments Long-term stability requires high levels of trust and ownership and allows actors to co-create regional S3 strategies. Moreover, it creates incentives for investments as the framework is firmly embedded in regional plans. ■ Favourable environments for EDP and identifying 'domains' Facilitate the development of new ideas by providing a platform where stakeholders may come together and create new networks.

4.	<p>Ownership and leadership</p> <ul style="list-style-type: none"> ■ Be a leader of S3 processes Communicate the role of the regions in the creation of S3 strategies and ensure a clear vision for the future. Clear leadership is key to mobilising actors in a region. ■ Delegate and divide responsibilities Determine who does what, when and how. Whose involvement is required to get S3 off the ground? ■ Invest in key persons to lead and inspire S3 processes (mavericks) Change agents are important for mobilising actors behind S3, taking leadership and ownership of the process or 'steering the ship'. ■ Think like an entrepreneur Identify the enabling and impeding features of entrepreneurship to understand the needs of new developments and discoveries.
5.	<p>Avoid redressing 'old' approaches</p> <ul style="list-style-type: none"> ■ Discover new opportunities and domains Consider going beyond the cluster structure to discover synergy effects with other sectors or work together for industrial transformation by adding new branches to the cluster. ■ Rebranding old approaches only, without additional measures, is neither smart nor special Recognise the added value of restructuring old innovation strategies to allow for something new. It may enable new entrepreneurial discoveries to emerge.
6.	<p>Beyond ex ante conditionalities</p> <ul style="list-style-type: none"> ■ Consider the added value of S3 as an approach in its own right Consider S3 beyond the need to obtain ERDF funding. What value can S3 add to the region as a tool to sharpen and further develop the regional innovation system?
7.	<p>Optimal size for S3</p> <ul style="list-style-type: none"> ■ Consider the typology and size of the region when implementing S3 Mobilising actors in regions with high levels of innovation capacity and diverse industrial sectors may be difficult. Mid-size regions with fewer actors on the scene but strong industries may be better suited to S3 than metropolitan regions, particularly in those areas where expertise and R&D facilities may be shared.
8.	<p>De facto S3</p> <ul style="list-style-type: none"> ■ Reveal the de facto S3 aspects in the region Revealing existing S3 similarities helps in fast-forwarding the S3 process, facilitating and strengthening the implementation of S3 in a place-based setting. The Nordic regions are front-runners in discovering de facto S3. ■ Do not 'reinvent the wheel': build on existing knowledge where relevant Conducting a thorough analysis of the existing regional strengths and building on this may help kick-start the process of finding new domains and areas of prioritisation.
9.	<p>Nordic model of S3</p> <ul style="list-style-type: none"> ■ Appreciating the value of transnational collaboration Optimise responses to the new wave of S3 across Europe and seeing opportunities for cross-border collaboration between small regions. Sharing best practice examples across the Nordic Region has aided a deeper understanding of S3 and how it may be executed. This shows to the high level of trust between actors. ■ Good pre-understanding of the mechanisms of smart specialisation De facto smart specialisation revealed in the regions adopting the concept. ■ Investments in increased knowledge on the ground S3 is a relatively new concept and further research into its nature is necessary to gain sufficient knowledge to create comprehensive approaches. The S3 School in Nordland and the S3 Academy in Värmland are good examples of investments in knowledge for furthering regional S3 onsite.
10.	<p>Remember operationalisation</p> <ul style="list-style-type: none"> ■ Focus on implementation A strategy without an action plan and implementation is just a strategy without a result. Regions that do not follow up on their strategies are falling behind. Proper implementation of the strategy results in improvements (e.g., the Swedish region of Värmland and Finnish Lapland).

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Stakeholders consulted in the process*

Interviews: Kymenlaakso

Kirsi Tallinen, Research Manager at Xamk South-Eastern Finland University of Applied Sciences
Marja Holopainen, S3 specialist and Project Manager at Cursor Oy
Mauri Reinilä, CEO at Package Media Oy
Petri Tolmunen, Head of International affairs and Project Manager at Cursor Oy
Tiina Heinikainen, Specialist in international affairs at Kinno Oy
Tytti Lankinen, Specialist in Smart Specialisation and international affairs at Kinno Oy
Toni Vanhala, Development Director at the Regional Council of Kymenlaakso

Interviews: Stockholm

Cecilia Johansson, Tillväxtverket
Jens Sörvik, National expert on S3 and formerly at the European Commission's S3 in Seville
Maria Lindqvist, Development Manager Innovation, Department of Business, Stockholm County Administrative Board
Petra Dalunde, Chief Operating Officer, Urban ICT Arena
Tim Nordh and William Brandt, CEO and Founder, respectively, of a startup tied to a cluster in Östra-Mellan Sverige
Ulrika Ljungman, Business Manager, the Royal Institute of Technology (KTH)

Interviews: Midtjylland

Anne Mette Sørensen Langvad, Head Consultant on energy and the circular economy, Central Denmark Region
Benita Simonsen, Cluster Manager, Lifestyle & Design Cluster
Claus Bo Andreasen, Chief Consultant, Danish Centre for Food and Agriculture, Århus University
Susanne Johansen, Division for Result, Impact and Policy, Danish Business Authority

Interviews: Nordland

Beate Rotefoss, Senior Adviser on Innovation, the Industrial Development Corporation of Norway (SIVA)
Bjørn G. Nilsen, Special Adviser on Business and Technology for Region Nordland, Research Council of Norway
Hanne Østerdal, Industry and Development Manager, Nordland County Administration
Håkon Finne, Senior Research Scientist, SINTEF (Stiftelsen for industriell og teknisk forskning)
Inger Teigstad, Department Manager, Innovation Norway
Pål Ove Henden, Senior Adviser, Bodø Science Park
Una Sjørbotten, Senior Adviser, Nordland County Administration

Interviews: Iceland

Einar Olavi Mantyla, Project Manager at the University of Iceland, Division of Science and Innovation
Geir Oddsson, Senior Adviser at the Foreign Ministry of Iceland
Hólmfríður Sveinsdóttir, formerly a specialist at the Icelandic Regional Development Institute, currently a Senior Adviser at the Ministry of Transport and Local Government, Department of Local Government and Regional Affairs
Þórlindur Kjartansson, Chairman of the steering group formulating Iceland's new Innovation Policy and former Chairman of Innovit
Torfi Geirmundsson, Senior Adviser at the Nordic Council of Ministers

Interviews: Åland

Christel Lindholm, Co-ordinator, Government of Åland
Jouko Kinnunen, Head of Research, Statistics and Research Åland
Linnea Johansson, Avdelningschef, Näringsavdelningen, Government of Åland
Susanne Strand, Head of Division (Allmänna byrån), Department of Business, Government of Åland

***Note:** The order of the interview list does not correspond to the numbering used in the text

Annex 1.

Table 6: Compilation of nation S3 approaches in the Nordic region

Country	Name of the S3-related strategy	Content of the strategy	Major actors involved	Policy support for S3
Denmark	<i>National Operational Programme for the European Regional Development Fund, 2014–2020 (2014)</i>	Entails the preconditions for qualifying for the ERDF and argues how Denmark with its existing policy framework qualifies for the ERDF	The Danish Business Authority, The Cluster Forum, Regional Growth Forums	Finance Bill allocations to R&D&I activities, including regional development funds; Structural Funds; Growth Agreements
Finland	<i>Finnish Regional Strategy 2020 (2010)</i>	A strategy aiming at a specialised role for Finland in the world economy through regional competences	The Ministry of Economic Affairs and Employment, Regional Councils	<ul style="list-style-type: none"> ■ Funding via ALKO programme ■ Growth agreements ■ Information (a national mapping of regional strengths)
Iceland	Governmental policy statement for the economy and community <i>Iceland 2020 (2011)</i> <i>Regional Growth Plan (Sóknarættanir landshlutanna)</i>	A policy statement for an efficient economy and society; emphasis on smart growth, innovation and R&D, knowledge economy development and clustering. A response to the Financial Crisis 2008/09. Place-based strategies for innovation and regional development	The Government Offices of Iceland The Ministry of Industries and Innovation; The Ministry of Transport and Local Government; Icelandic Association of Local Authorities; Regional organisations	N/A
Norway	<i>FORREGION Programme (2017)</i> Guide (<i>Veileder</i>): Smart Specialisation as a Method for Regional Business Development (2018)	Promotes research-based innovation in the regions and strengthens the connection between regional, national and international efforts to promote this The guide presents the concept of S3 for the Norwegian context and is a tool for enabling and guiding the county municipality administrations considering smart specialisation	The Research Council; the county councils; Innovation Norway and the Industrial Development Corporation of Norway (Sivod) The Ministry of Local Government and Modernisation; County Municipality Administration.	Regional Research Funds in the Research Council of Norway (RCN) N/A
Sweden	<i>Sweden's National Strategy for Sustainable Regional Growth and Attractiveness 2015–2020 (2015)</i>	Guides the development of regional development strategies	County councils and other regional authorities, Tillväxtverket	Tillväxtverket supports regions in their S3 strategy formulation, Vinnväxt
Åland	<i>Åland's Innovation Strategy 2014–2020</i>	Entails the smart specialisation strategy as an annex	Landskapsregeringen (the Government of Åland)	Åland Utvecklings AB co-funds initiatives alongside the ERDF

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