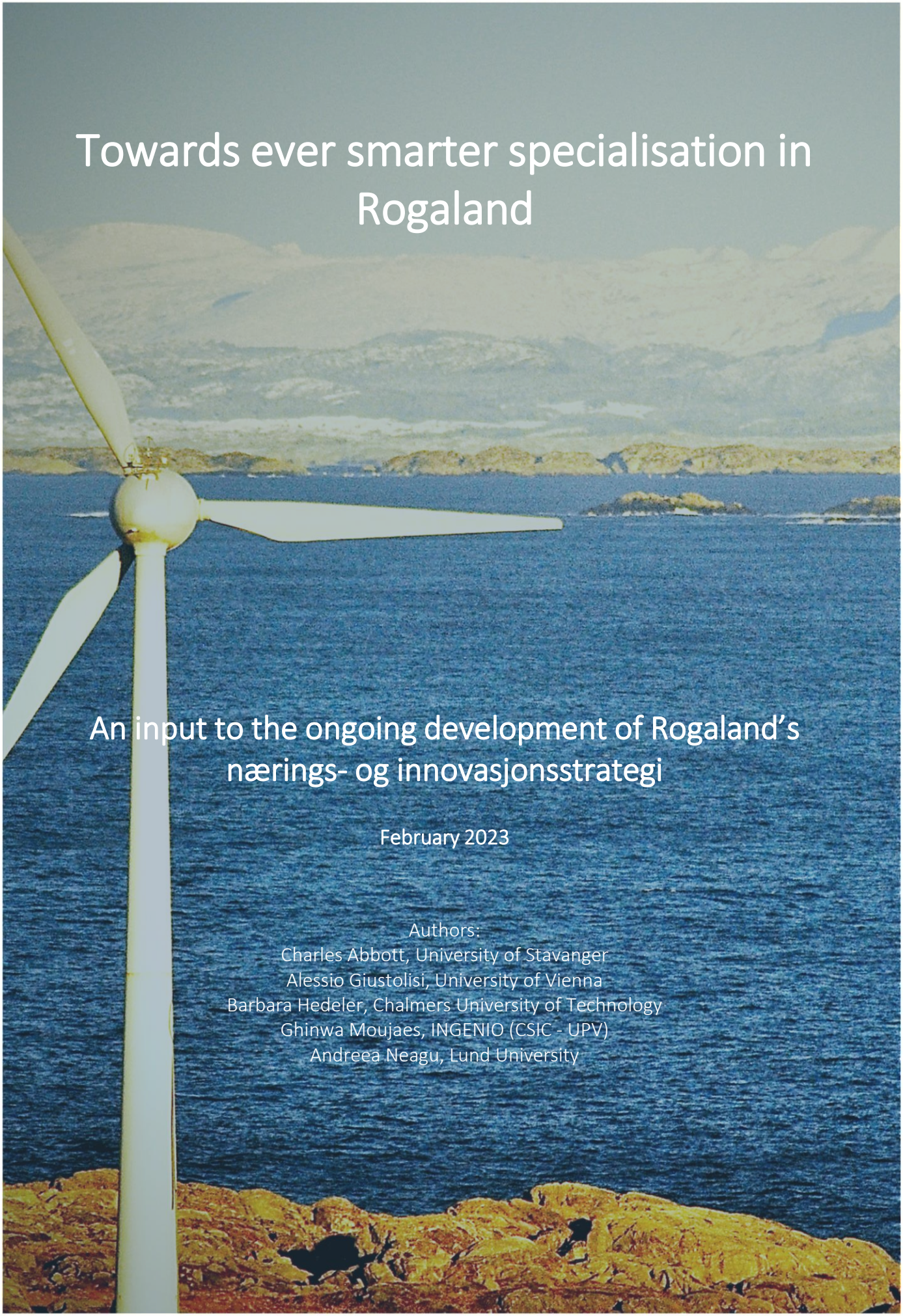

Towards ever smarter specialisation in Rogaland

An input to the ongoing development of Rogaland's nærings- og innovasjonsstrategi

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Contents

Executive Summary

- Smart specialisation represents a new method of regional development, focused on prioritising public funding across a number of domains whereby regions can achieve a competitive advantage with a view to industrial diversification

- This report aims to develop understanding and help refine the smart specialisation process in Rogaland, south-western Norway – a highly specialised, geographically diverse region centred on offshore oil and gas

- Rogaland's adoption of smart specialisation was largely in line with theoretical guidance, although implementation has revealed certain challenges in the policy

- The smart specialisation approach focuses on both internal and external connectivity. Whilst theoretical underpinnings and policy practice tends to focus on smart specialisation at the regional level, the approach can be mobilised to secure greater interregional linkages to foster diversification

- Transformational policies such as smart specialisation should refrain from too much sector focus. In line with the theory, RIS3 policies in practice should bridge the gap between horizontal and vertical policies, and allow projects to develop outwith proscribed domains

Policy Recommendations

- Adapt the regional funding mechanism, VRI, to reflect a need for intersectoral projects 'between' the domains

- Opening funding up to partners outwith the region may be a route to develop new avenues for diversification exploiting interregional linkages

- Policy success and legitimacy should incorporate more responsive indicators and techniques for monitoring

1.0
Introduction and context

Whether and to which extent governments ought to intervene in the direction of industrial investment has long been a question for policymakers. However, since the emergence of smart specialisation as a salient concept to foster place-based innovation, increasing emphasis has been placed at the level of regional governance to prioritise public research and innovation investments in line with proven opportunities to diversify regional economies. This has largely been affected by the inclusion of an ex-ante conditionality within the 2014-2020 EU Cohesion Policy, stipulating that EU regions ought to have a Research and Innovation Strategy for Smart Specialisation (RIS3) in place to use the European Regional Development Fund for research and innovation-related activities [1]. Regions are now expected, through a process of broader stakeholder engagement along the principles of an 'entrepreneurial discovery process' (EDP) to map the regional economic landscape and make informed decisions on where to target research and innovation funding. Such a process has marked a step change in how regional governments are expected to operate, and entrepreneurial discovery constitutes a new methodology of policy-making. It entails a regional government's having to shepherd the regional stakeholder base throughout a prioritisation process; to stimulate the rise of new industrial domains in those areas where a competitive advantage can be identified.

This short policy paper seeks to make a series of recommendations to the County Council of Rogaland, with a view to improving the ongoing process of developing the smart specialisation approach. Despite being an approach embedded within EU policy, a number of Norwegian regions have also adopted the approach over recent years. As Norway is not an EU Member State, this process has been of a voluntary nature, albeit encouraged over time by guidelines from the Norwegian Government [2]. Rogaland, in the country's southwest, adopted the smart specialisation process from 2019 onwards with the adoption of a new Business and Innovation Strategy led by the region's government, Rogaland Fylkeskommune (Rogaland County Council). However – and as with regions across Europe since the policy's inception – the progress of the implementation of RIS3 experienced a number of issues following the initial development of the strategy. Some of these challenges inevitably emanate from the concept of smart specialisation itself: this is a relatively new approach to regional development. Unlike previous iterations of regional innovation policies, the smart specialisation approach involves prioritisation and the funding of one activity over another. These issues have included certain legitimacy challenges relating to a recent reprioritisation and reorientation of the funding priorities.

Whilst the literature on smart specialisation offers little concrete to solve these issues at the regional level, a number of tweaks to the strategy as part of its continuous development may serve to guide the County Council in making the strategy more responsive to the needs and expectations of regional stakeholders.

Box 1

Rogaland County in the path dependency context?

Whereas some elements of the literature have argued that Norwegian institutions played the role in retaining a knowledge and innovation-driven dynamic, and thus avoiding the 'resource course' [27], others may emphasise that in Norway, and especially in Stavanger, the growth of the petroleum industry has happened at the expense of other sectors [28]. Authors have stressed that the silver lining of such developments has resulted in related industries which have grown alongside the petroleum industry; leading to overall economic growth [28]. However, it is recognised that path dependency is not easy to escape, primarily due to issues of labour mobility amongst others. Nonetheless, as the positive results to the economy of such resource-intense industry are recognized, they also state the vulnerabilities to downturns in the global petroleum market that this affiliation has had. This is in line with the research employed by Sachs and Warner [29] likewise, who conclude on macroeconomic effects of the resource course leading to currency overvaluation. Similarly, natural resources may breed conflict and delay institutional development [30].

The story of how one sector influences the development of others in the economy is not the only effect of the resource course. Combination of insufficient clustering, limited economies of agglomeration and externalities and geographical remoteness generally tends to hinder the potential return of high investment in R&D [27]. This is a problem in relation to the economic growth of an economy with many externalities which tries to connect with the global economy already on the verge of a transformational change. As current transformational change often takes innovation trajectories as a proxy, but focuses also on addressing the double social and environmental challenges [24,31], problems of externalities have to be confronted. Weber and Rohracher [32] propose policies on transformative change to begin with the recognition of four types of failures: directionality, policy coordination, demand-articulation and reflexivity. This is due to the failures of the previous frames, e.g., R&D (1) and National Systems of Change (2), which were only focused on growth, either linear from science to applied R&D commercialisation (as Frame 1) or through innovation among different actors foregrounding collaboration (as Frame 2) [24].

In Rogaland, contrary to the expectation of theories that highlight the importance of collaboration, agglomeration and clustering, face-to-face regional collaboration and agglomeration have generally been shown to not be as relevant factors in the generation of product innovation in southwest Norway [27]. Whereas, long-distance collaboration has been the case for the petroleum industry in Stavanger [27], it has been shown that externalities can often be dealt with regionally [24]. New policies which can retain the knowledge-base domestically have to be considered to better understand externalities and innovation performance [33].

2.0
Theoretical perspectives on Smart Specialisation policies

Smart specialisation ultimately emphasises, that, because each and every place cannot be competitive in everything, research and innovation spending should be directed at what it is they do best [3]. This is based on a process of discovery, whereby actors across different 'socio-technical systems' [4] cooperate to understand what this unique competitive advantage could be through the EDP. The EDP advocates improving the connectivity between existing sectors within the wider regional innovation system, and in doing so, aims to create new industrial domains through the unveiling of hidden scientific and technological strengths [5]. This notion of connectivity, therefore, sits at the heart of the theoretical approach, whereby new entrepreneurial activity is stimulated at the regional level through new intersectoral linkages across the prioritised domains.

Smart specialisation policies, such as RIS3, aim to guide regions in taking a longer-term perspective in setting priorities through a process of **continued prioritisation**, whereby actors at the regional level avail themselves of the latest available evidence as regards economic activity at the regional level and develop new areas of activity based on that. Through this process, smart specialisation foresees that regions are better able to understand where their priorities may also complement or compete with those of other regions, either at the domestic, macro-regional or international levels.

Smart specialisation has marked a distinct turn from the theory underpinning previous regional development approaches. It encourages regions to concentrate on so-called 'smarter' industrial diversification based on their related strengths. In this way and as opposed to fostering the development of shorter-term 'smart' policies which focus on technologies or applications thereof, smart specialisation can as much be seen as a case of innovation in the policy process itself, which should itself result in greater product or service innovation at the regional level. In such a way, smart specialisation seeks to transform the functioning of the regional innovation system – something to which many have argued that different types of regions, with different regional and national institutional and industrial structures, are more or less adapted.

Considering this, we suggest that adding **a focus on the elements, dynamics and patterns of innovation processes holds promise in understanding the connection between smart specialisation and the outcomes of innovation and economic growth.** In the following, three complementary perspectives are presented on the determinants and outcomes of innovation processes and outline the theoretical roots of policy evaluation and monitoring are discussed.

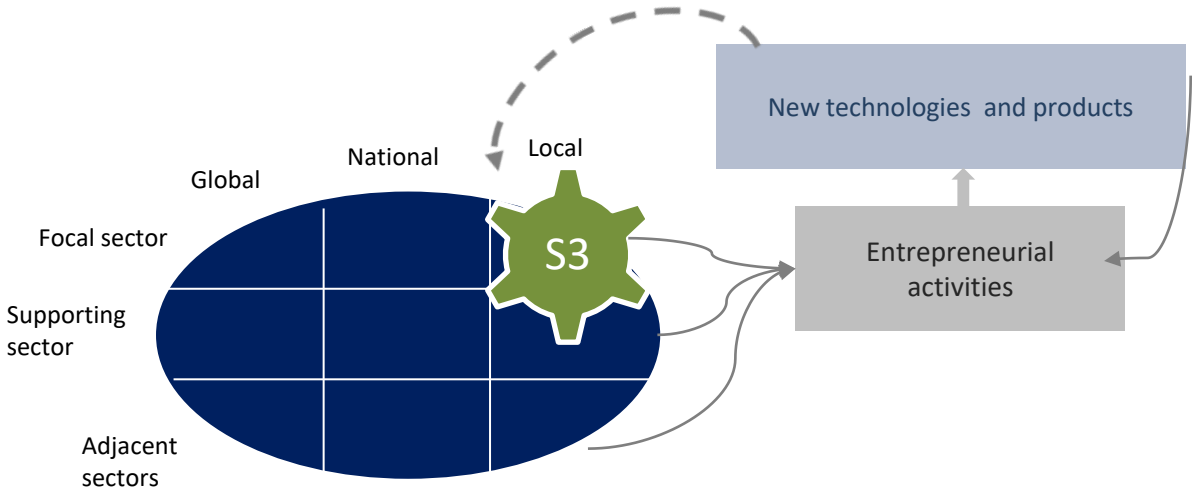

Figure 1: Smart Specialisation policies in an innovation system context. Own illustration, building upon Hoijckova et al. 2020 [6]

Smart Specialisation policies promote entrepreneurial activities in selected sectors, but the process of technical change and industrial development requires collaborations across regions and sectors

2.1
The often (underlooked) importance of interregional cooperation

In regional studies, the importance of inter-regional cooperation has been debated for many decades. Asheim and Gertler [7] provide insights into the importance of inter-regional cooperation for innovation-based growth. The authors argue that innovation is not just the result of individual firms or organisations but rather a complex process involving a network of actors within and outside a region. They suggest that inter-regional cooperation can help to connect these networks and create new opportunities for innovation and growth. Uyarra et al. [8] argue that inter-regional cooperation is necessary to strengthen regional innovation systems (RIS). They provide several examples of successful inter-regional cooperation initiatives, such as the European Union's Framework Programmes for Research and Technological Development.

While scholars emphasise the role of external linkages for cluster emergence [9] there has been a wide consensus that external linkages can potentially develop whole new or transform existing industries [10,11]. Sharing resources, knowledge, and expertise, creating new ideas, products, and services foster innovation-based growth and, thus, new path development.

However, novel place-based innovation policies have failed to include connectivity in their perspective [12]. In this regard, smart specialisation, which largely builds on endogenous strength and internal capabilities to transform existing industries, proved to be difficult in less advanced regions [13]. Based on these discussions, Giustolisi, Benner, and Trippl's [14] critique highlighted that policymakers need to understand their internal and external knowledge flows to target specific bottlenecks. Regional specificities differ, and so do policy interventions that target external connectivity. For example, regions that face industrial lock-in [15] could benefit from the entrance of novel actors or the internationalisation of local firms.

2.2
Importance of intersectoral collaboration in innovation projects

The importance of intersectoral collaboration - the cooperation between actors cutting across sectoral boundaries - underpins the success of a smart specialisation approach. In a technological innovation context, such intersectoral collaborations involve actors from producing, using, and innovating sectors [16]. Innovation research has examined the role of combining knowledge across such sectors, with a focus on the determinants of intersectoral collaboration and the effects on innovation processes.

With the increasing complexity of knowledge, firms tend to specialise in different fields. Hence, collaboration across sectoral boundaries has many benefits for regional actors, ranging from overcoming individual limitations [17] to the identification and exploitation of ideas as new business opportunities [18]. Other studies have scrutinised the knowledge flows enforced by complementarities between sectors. For example, Stephan et al. [16] show that the development of knowledge on lithium-ion batteries has been facilitated by patent citations within and between several different sectors, including electronics, industrial equipment, chemicals, and metal mining. Moreover, Mäkitie et al. [19] suggest that third parties, such as knowledge brokers and intermediaries, have been important in bringing previously unconnected sectors together in the case of Norwegian coastal shipping.

Given its importance, the RIS3 approach advocates new domain creation between sectors at the regional level. However, whilst some regions may be endowed with endogenous strengths, tendencies towards path dependency may be reinforced if the often underlooked component of interregional connectivity remains underdeveloped within smart specialisation. Recent work by Balland and Boschma has underscored how RIS3 processes might be further strengthened by the creation of links **outwith** the region in those areas where complementary skills, competencies and expertise may exist elsewhere domestically or abroad [10]. Enabling regional actors to identify those actors abroad who might bring benefit to the region can be seen as an additional string to the RIS3 bow. Although procedures in EU legislation have long existed to enable regions to develop competence elsewhere, it has rarely been explored in practice.

On a general level, the literature emphasises that differences in knowledge bases and learning patterns may affect how knowledge flows are initiated and implemented between sectors, and subsequently translated into commercial technologies and products. The theoretical advances made by innovation scholars put emphasis on the role of policymakers in facilitating connectivity across sectors. Hedeler et al. [20], for example, stress that different types of actors and actor networks may need different forms of support to develop, diffuse, and use new technologies. For example, Finnish forest and oil industries benefited from learning networks orchestrated by research institutes to venture into biofuels, while for small, specialised technology suppliers the creation of networks with potential customers in the early phases has been crucial to align expectations and characteristics of emerging technologies [20}.

2.3
From projects to innovations and new industries: on variety creation and selection

While the past two sections emphasise the importance of integrating a geographical and sectoral perspective into innovation in a smart specialisation context, this section argues for a temporal perspective on industrial change and innovation.

Innovation research has long emphasised that there is a risk of going in the wrong direction when accelerating the rate of innovation and the development of new products. Given the uncertain nature of innovation, actors typically experiment with different designs and alternatives [21]. The extant evolutionary innovation literature has shown that entrepreneurial actors that get a head start through political support may gain from learning effects and increase the cost and performance advantages of their selected technologies, and thus lock out other entrepreneurial actors and technological designs [22].

Path dependency implies that technologies with characteristics closer to prevailing systems get selected easier [23]. Consequently, political support is necessary to induce change. The established literature agrees on the importance of creating and maintaining variety. In recent years, there has been a growing scholarly debate about the direction, rate, and pace of innovation in the context of grand societal challenges, such as climatic change [24]. One policy idea that could play an important role in this policy approach is mission-oriented innovation policies [25]. Rather than picking winners and losers, policymakers in this view set the overall goal and direction of change and let as many 'flowers bloom' as possible to achieve such goals [25]. The specifics of smart specialisation are to align existing capabilities with an overall direction of change.

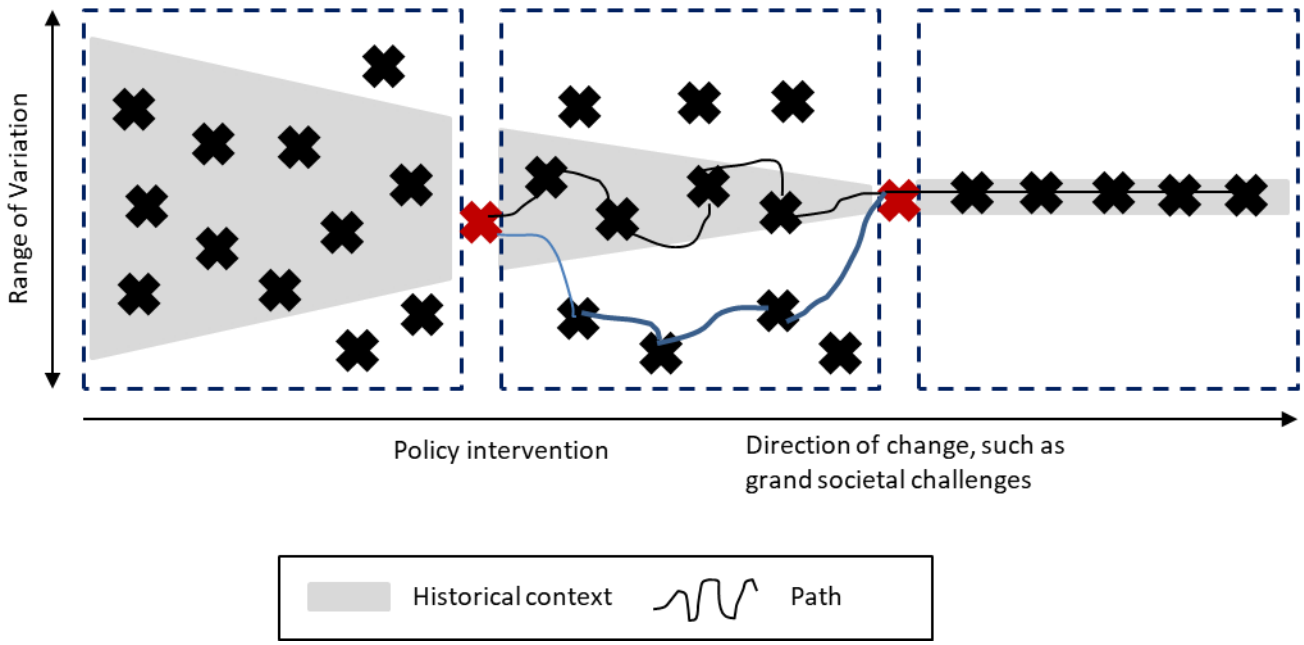

Figure 2: Smart Specialisation policies in a temporal perspective. Own illustration, building upon Sydow and Koch [26]

History matters in smart specialisation, but direction, rate, and pace of innovation processes can be aligned with grand challenges, such as climate change

2.4
More effective monitoring of smart specialisation

To understand the necessity of monitoring, it is important to recognise the premise that policy-makers, whether intentionally or unintentionally, make mistakes [34]. They do not have access to perfect knowledge or perfect information, and cannot foresee the future and the local reaction or behaviours to even the most thoroughly studied policies. Following this logic, the shift of focus away from policymaking being a one-time choice of winners (sectors, industries, firms and other organisations) to a process of error detection and error correction becomes evident. In fact, especially in a policy deemed as an "experimental" policy, such as Smart Specialisation [35], the need for monitoring is essential.

The European Commission encourages regions to regularly report on their performance and encourages regions to be involved in peer-review exchanges to promote mutual learning [36]. This has necessitated the need for a monitoring system. The influence of monitoring, however, is more rooted in its contributions to policy learning. However, it is important to design a system that not only captures the "success" of the policy process, despite the political pressure to do so. Being able to capture the potential challenges and weaknesses of the policy will contribute to improving it in the long run and ensuring it adapts to natural changes within the local context.

To design a locally tailored monitoring system, the functions of monitoring need to be understood. Specifically relevant for the case of Rogaland are the functions of [37]:

- Gathering and processing information which can be relevant to identify gaps and areas for improvement throughout the policy implementation first and when evaluation is conducted second
- Communicating openly and responsibly the policy goals and process in order to ensure the credibility, reputation and trust of the plan among the local stakeholders

The first function would help register the local reactions to the policy until eventually an assessment can be made if the positive outcomes are outweighed by the negative ones. The second function is relevant to the relationship between local governments and the relevant stakeholders involved. In a simplistic way, if the stakeholders are aware of and begin to believe in the goal of the policy, their reactions to it might become more positive and less resistant to change with time.

Various guidelines may provide accurate recommendations on how monitoring should be conducted [1,36,38,39]. For the case of Rogaland and in order to design a relevant and useful monitoring system, it is essential that the system is designed in a locally tailored and feasible way. It should be designed as part of the Smart Specialisation approach, require assets which are locally feasible and available, and target the local needs relevant to Rogaland's Smart Specialisation process and challenges. Overcomplicating the monitoring process will lead for policy makers to abandon it and miss out on utilizing it. Thus, any recommended approach needs to be met with local feasibility.

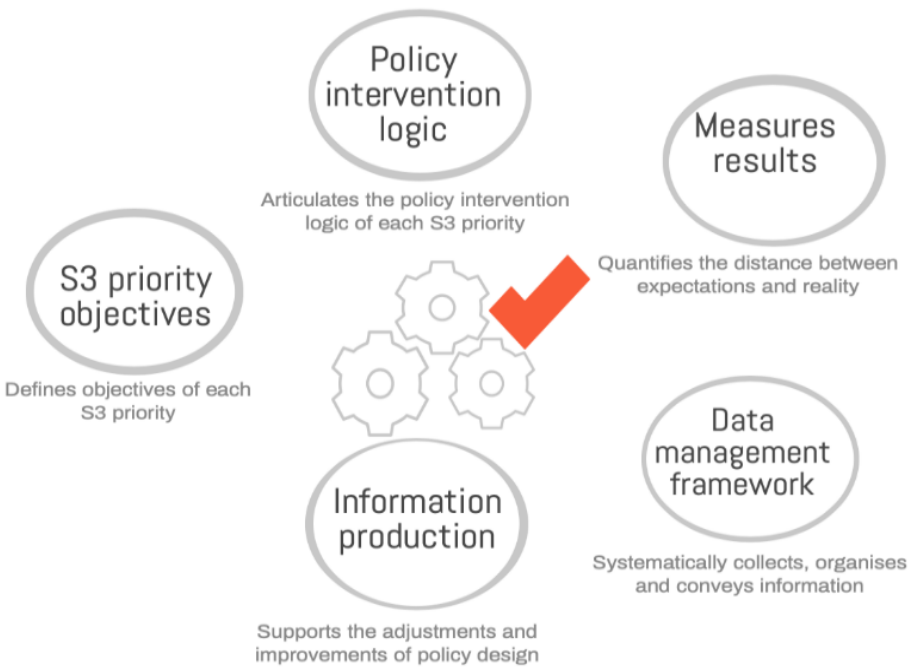

Figure 3: **Criteria of Effective Smart Specialization Monitoring System**
Source: Hegyi 2021 [40]

3.0
Smart Specialisation in Rogaland: The story so far

Rogaland County has been an adopter of smart specialisation since 2019. The region has been characterised as being highly specialised in its industrial structure around the oil and gas industry [41]; largely centred on the city of Stavanger in the county's industrialised central belt. Such industrial specialisation has driven the economic motor county since the arrival of oil and gas, though has more recently been recognised as a potential vulnerability - especially were the industry to suffer a similar fate as has befallen the area following the demise of previous industries, such as herring canning and shipbuilding.

Accordingly, the County Council has recently adopted the smart specialisation approach in its development and adoption of a **nærings- og- innovasjonsstrategi** ('Business and Innovation strategy' – NIS) [42], to augment the traditional regional planning process. The aim of the NIS is to foster a longer-term outlook to help Rogaland diversify its economic activities in view of the impact of any potential future downscaling of oil and gas. A principal regional funding mechanism, the **Virkemidler for Regional Forskning og Innovasjon** ('Funding Tools for Regional Research and Innovation' – VRI) has been mobilised to this end, with funding now explicitly aligned with the ambitions of the NIS. Importantly, the VRI works through a network of **regional competency brokers**; key regional actors whose role it is to identify new ideas across the region for support through VRI.

Closely aligned to the theoretical underpinnings of the smart specialisation approach, the role of the strategy has been to identify new industrial domains at the County-level, and create a basis for mustering national and international funding to affect diversification based on the existing knowledge, skills and competence across the region. In line with the 'Entrepreneurial Discovery Process' approach inherent to smart specialisation, priority-setting has reflected the outcomes of this new type of consultation process at the regional level; which saw the County conduct a digitised process of discovery (during the COVID-19 pandemic) resulting in the identification of four main strategic priorities. These were **clean (and marine) energy, food, travel and tourism**, as well as a fourth priority of **smart societies**. One year on, a revision of the strategy saw the final domain of smart cities **dropped**, with the latest iteration of Rogaland's NIS identifying **just the first three main priority areas**, set against a backdrop of a several overarching number of guiding principles.

This reprioritisation on three priorities instead of four, aligns with a key aspect of the smart specialisation process from a theoretical perspective. Smart specialisation strategy ought not be static process – it should be dynamic, continually monitored and adapted as evidence suggests a change in circumstances. However, having moved from four to three areas, questions arise as to what the opportunity costs may be of dropping a priority domain – both in terms of what might happen to those promising projects which sit outside the three priority domains, and also what that may mean for stakeholder buy-in of the process.

A number of issues have arisen from the reprioritisation:

- Projects and ideas may be in too early a stage to be 'assigned' to a particular priority domain
- Promising innovation projects outwith priority areas may face exclusion from funding through VRI
- The growing health sector – which has numerous connections to a burgeoning 'smart care cluster' in Stavanger – is not identified as a priority domain in itself

The case of smart specialisation in Rogaland thus raises many of the theoretical issues increasingly identified in an academic body of literature which is catching-up with eight years' of policy implementation in Europe. As has been identified with regards to Nordland [43], the way of working within the EDP approach has required new parameters to be set which may go against the prevailing ways in which policies are made, consulted upon and monitored at the regional level. The case of Rogaland implies that particular issues in dynamic policy processes arise, where, as has recently been demonstrated by Jordahl, Deegan and Solheim [44], a smart specialisation policy has been developed and implemented with a **high degree of alignment with theoretical policy guidance.**

4.0
Policy implications for towards ever smarter specialisation in Rogaland

Recommendations for the continued development of Rogaland County's NIS must consider the systemic relationship between those actors at the regional level which stimulate innovation. As the wider Regional Innovation System includes institutions, policies, networks and social values which facilitate interaction [27], the exchange of knowledge should be focused on dynamic interactions and continued consultation processes with stakeholders.

The analysis done by Fitjar and Timmermans [28] on labour mobility in Stavanger shows the difficulty of escaping the path-dependency development process when the resource industries are growing. Nonetheless, the authors advise reaping the benefits of externalities during periods of growth. Yet, we would also advise investing such profits in technologising industry as a route to diversification, in order to reduce the upcoming risks and increase regional resilience. Such risks today may be seen as emanating from different European policies, in particular, as regards mitigating and adapting to climate change, which carry both physical and transition risks. Exploring alternative markets for technologies is an idea mentioned by Fitjar and Timmermans [28] as well, as well as their emphasis on the diversification of the industrial structure. Nonetheless, due to the inputs from the competency brokers, we would argue that such industries have to be retained and transformed, but greater feedback along the way to ensure legitimacy is necessary. **Mobilising feedback through continuous communication, and data collection inherent to this is therefore critical.**

Finally, new actors and stakeholders beyond the traditional regional innovation system are needed (something stressed by the work of Arnold and Barker [31]). Those authors also highlight the need for an extension of the organisations which can be part of the measurement of performance and innovation governance.

Based on this, three recommendations for the continued development of the smart specialisation approach in Rogaland can be made:

4.1
Intersectoral investment

Since regions with a higher concentration of physical and human capital and density of top universities and research centres tend to innovate more and generate greater knowledge spillovers, this is likely to be the case for Rogaland as well. Sectors which can collaborate together (not only focusing on one sector in particular) are a proposed recommendation for a better allocation of funds toward successful projects, and the creation of "virtuous circles of innovation" as Fitjar and Rodriguez-Pose [27] would define it. **Internal connectivity, from our view, has to be fostered, and a certain percentage of funds to be allocated to cross-collaborative projects.**

4.2
New interregional linkages

As a core ambition of the smart specialisation approach is not just to reform the mode of operation of the internal regional innovation system, the County might explore greater options for external regional connectivity. Whilst Balland and Boschma [10] offer a methodology for exploring those regions which may have complementary capabilities, employing EU-level policy mechanisms to foster joint regional cooperation may assist the County in building and/or strengthening new or existing regional linkages where such capabilities exist.

This might involve an investigation as to whether a certain percentage of the VRI at the regional level might be opened to collaborative projects whereby partners cooperate with an actor from a pre-identified region.

Such models have been explored previously under the remit of the 2014-2020 Common Provisions Regulation governing the use of European Structural Investment Funds in Europe, which allowed for up to 15% of regional funding to be used outwith the programming area. Finding commonality in this space with a regional government (either domestically through another region by means of the VRI) may enable small areas of jointly-managed interregional funding. As a step towards this, undertaking exploration of membership in the Thematic Smart Specialisation Platforms at the EU level may be of interest to the County. These platforms contain a number of thematic areas of activity which aim to connect regional-level authorities on the basis of potential economic complementarity and may offer the County a potential route to network with other regions and develop joint industrial diversification efforts.

4.3
Monitoring

Feedback gathered from the competency brokers highlighted that Rogaland can and should set up a system of gathering data on the implementation of the policy and the local reactions to it. While designing the monitoring system it is important for the indicators to measure:

- Where the money is being spent, why, and a timely assessment of the results that this spending is leading to
- Who is benefiting from this funding, including information on the geographical distribution and sectoral integration of participants in the funded projects
- Which part of the innovation system is missing out, why and to what extent
- Local reactions to the policy implementation

In addition, the monitoring system can be utilised as an effective communication tool between policymakers, relevant stakeholders and the local community. By communicating the importance and the vision of the policy process, mutual trust and accountability can be established.

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