

# IS THE COAST CLEAR?

The role of digitalisation for enabling blue growth  
in the cross-border region of Svinesund

By Mari Wøien

NORDREGIO REPORT 2019:9



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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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# Foreword

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Nordregio, on behalf of the Nordic Council of Ministers Committee of Civil Servants for Regional Affairs, is the secretariat for the Nordic thematic group for innovative and resilient regions 2017–2020. The current programme has focused on expanding knowledge on thematic areas such as resilience, smart specialisation, digitalisation and skills in a regional perspective and identifying policy-relevant solutions to potential future challenges. The Nordic thematic working group is also engaged in elevating the Nordic cross-border perspectives, which is the background for this report on the Svinesund area. The Svinesund area is comprised of the Swedish Västra Götaland region and the Norwegian county of Østfold. The area borders to the Skagerrak waters – a rich and nutritious sea and home to the national parks of Koster (Sweden) and Outer Hvaler (Norway).

The report in front of you takes a closer look at how digitalisation may help buttress developments in micro- and small and medium enterprises (SMEs) engaged in the marine sector in the Svinesund area. The collaboration between the counties is strong, but with the increasing focus on aquaculture as part of our diets the Svinesund area has the potential to grow further. Coupled with the digitalisation mega-trend and the focus on competence and skills, the collaborative efforts amongst public and private actors across the border is pertinent.

The report takes a look at the current framework and opportunities available to support and prioritise the development of digitalisation strategies in micro- and SMEs in the Svinesund area, as well as considering the social and political context within which these stakeholders are operating. The aim of the report is to identify policy recommendations for the regional and national authorities to help elevate the support mechanisms. The report also points to the necessity of an increasingly flexible approach for business development amongst small enterprises and enable true cross-border integration.

We hope that you, as a reader, will find this report and other publications of the thematic group useful and relevant. We would also love to hear your comments, so please contact us if you have ideas and feedback to share.



Birgitte Wohl Sem

*Chair of the Nordic thematic group for innovative and resilient regions 2019–2020*



Elsie Hellström

*Member of the Nordic thematic group for innovative and resilient regions 2019–2020 on behalf of the Svinesund Committee*

# Executive summary

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This complimentary study, *Is the coast clear? The role of digitalisation for enabling blue growth in the cross-border region of Svinesund*, was conducted by Nordregio on behalf of the Nordic thematic group for innovative and resilient regions 2017–2020 and its cross-border member Svinesundskommittén. It explored the role of digitalisation as a tool for enabling blue growth in the cross-border region of Svinesund, comprising of Østfold (Norway) and Västra Götaland (Sweden). For the report, we conducted in-depth interviews with regional stakeholders and authorities, and hosted two workshops drawing entrepreneurs, fishermen and civil servants from both Sweden and Norway to discuss the challenges and opportunities for blue growth through digitalisation. The main research question guiding this study was: *What role does digitalisation play in the context of business development and growth in the marine sector in the Svinesund area, and what factors enable or impede digitalisation as a means for blue growth?*

The case studies undertaken in this report indicate that although digitalisation operates as a horizontal policy objective, there are significant hurdles hampering the potential of digitalisation as an enabler of blue growth. Financial and consultative support functions are often structured in a way that is not inclusive to micro and small marine businesses, and resource and time constraints

may dissuade businesses from prioritising and investing in digitalisation. It is evident that while the prospect of a larger market in the form of an interregional mega-region in the Svinesund area is enticing to many, regions still remain largely concerned with the well-being of their internal labour markets. However, projects such as Marine Border Forum Skagerrak (Marint Grenseforum Skagerrak) play a central role in tying regional actors together on both sides of the border and in attempting to create a stronger regional brand to be promoted in global markets. Working together to elevate the mega-regional brand through unique products and services is key for blue growth, helping not only to overcome physical borders but to encourage the development of a stronger cross-border region under the Svinesund 'brand'.

We conclude that a more flexible approach, particularly towards micro and small businesses, is required in Svinesund in order to harness the potential of digitalisation as an enabler for blue growth. While it is up to the businesses to navigate and take advantage of these opportunities from digitalisation, the regional and national actors also have a part to play in ensuring that the coast is clear: There needs to be a level playing field for all actors both in the regulatory framework and in access to support functions and infrastructure.

# 1. Introduction

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Digitalisation is impacting various facets of society and holds great potential in radically changing the ways businesses are operating. Despite these radical changes, little has been said about the impact of digitalisation on micro-, small and medium sized businesses within the marine sector. To close this gap, this complimentary report, *Is the coast clear? The role of digitalisation for enabling blue growth in the cross-border region of Svinesund* is a follow-up study of Randal and Berlina's report **Governing the digital transition in Nordic regions: The human element (2019)**. The latter report was written 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. The present,

complimentary study on digitalisation and blue growth has been developed on behalf of the Nordic thematic working group's member *Svinesunds-kommittén (The Svinesund committee)*. The study explores what role digitalisation plays in the context of business development and growth in the marine sector in the Svinesund area<sup>1</sup>; the different challenges and opportunities that surface in this context; and what role the Svinesund mega-region may play for the future of blue growth.

The main research question guiding this study was: *What role does digitalisation play in the context of business development and growth in the marine sector in the Svinesund area, and what factors enable or impede digitalisation as a means for blue growth?*

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<sup>1</sup> Svinesund is comprised of the Swedish region of Västra Götaland and the bordering municipalities of the Norwegian region of Østfold (Viken County as of January 1st 2020).



*The archipelago in Bohuslän, Västra Götaland. Picture: Unsplash*

The cross-border study by the Svinesund committee and Nordregio also aimed to address the following sub-questions:

- 1. What is the need of digitalisation for blue growth, and to this end: what is the role of the Svinesund area as a mega region?*
- 2. What are the existing support systems for digitalisation and innovation in blue businesses in Svinesund (regional and national level), and what is the role of cross-border collaboration?*
- 3. What are the challenges and opportunities of digitalisation in marine businesses in Svinesund?*

The report is structured as follows: After an introductory **Part 1** presenting the study and its research question, **Part 2** presents the methodology used and the motivation for commissioning the re-

port. **Part 3** provides a short knowledge overview, focusing on Randall and Berlina's report ***Governing the digital transition in Nordic regions: The human element (2019)*** from which this report derives. The knowledge overview maps out the state of play of digitalisation in the Nordic context. **Part 4** considers in brief the national and regional policies connected to digitalisation, marine and maritime policies, respectively. **Part 5** presents the empirical research, drawing on insights from both the of Västra Götaland and Østfold regions. The section also addresses the aspect on cross-border collaboration and presents the results from the two workshops conducted for this report. **Part 6** presents the key findings from the conducted research, followed by a presentation of policy recommendations in **Part 7**.

## 2. Methodology

The purpose of this study is to investigate the role of digitalisation in the cross-border region of Svinesund – an area straddling the Swedish-Norwegian border northwest of Gothenburg in Västra Götaland. As digitalisation is a horizontal policy objective, this report aims to uncover the prospect and present cases of digitalisation applied in the marine sector to promote blue growth. The case study regions, Västra Götaland in Sweden and Østfold in Norway, were nominated by the Svinesund committee, member of the *Thematic Group on Innovative and Resilient Region* appointed by the Nordic Council of Ministers. These regions were selected so as to provide the group with insight into and case-examples of Nordic cross-border cooperation and integration, whilst highlighting specific challenges and opportunities connected to digitalisation for blue growth in the Svinesund area. The thematic area of digitisation and blue growth was accepted in November 2017 as the main focus of the study. Considering the various dimensions of this area of research, the report was based on a desk-based study exploring regional industrial and entrepreneurial development policies, the marine sector, and regional digitalisation plans and policies. The desk study

also focused on existing cross-border policies. This was complimented by empirical research, undertaken through interviews with key actors in the identified policy areas on both sides of the border. Six representatives from across the border region participated in the interviews.

The interviews were semi-structured and lasted approximately 30 minutes. The interviews were conducted via telephone and video conference calls, and the interview recordings were subsequently transcribed and analysed for identifying key topics and themes. Some of the interviews conducted via telephone relied predominantly on annotations taken during the interviews. All interviewees agreed to the recordings and all personal data was safely stored as long as required for the purposes of the research project.

The interviews were complimented by analyses from two workshops hosted by the Svinesund committee, in June 2018 and February 2019, respectively. Each workshop brought together approximately 20 participants, including entrepreneurs and other private sector representatives as well as civil servants representing various administrative bodies and governance levels.

**Table 1. Overview of interviewees**

Country	Organisation/representative	Area	Interviews
Norway	Østfold County Council	Industrial development and SMEs	1
Norway	Smart Innovation Norway	Digitalisation agency	1
Sweden	Västra Götaland Region	County Council	1
Sweden	Västra Götaland Region	Senior Maritime/Marine Expert	1
Sweden – Norway	Entrepreneur	Blue growth	1
Norway	Marint Grenseforum Skagerrak	Project leader	1
Sweden	Marint Grenseforum Skagerrak/Svinesundskommittén	Project leader	1

# 3. Knowledge Overview

## Digitalisation in the Nordic Region

Digitalisation increasingly appears as a **horizontal policy consideration** across Europe, and the Nordic region is considered as digital front-runner not only within the European context but also on a global scale (Randall and Berlina, 2019). In the Nordic region, digitalisation is **challenging traditional silos** as it cuts across policy areas and levels of government, on a national, regional and local level. To remain at the forefront of digital development, the Nordic countries are addressing and welcoming the digital transformation as part the **new modus operandi**.

This knowledge overview draws and builds on the report *Governing the digital transition in Nordic regions: The human element* by Randall and Berlina (2019), with an emphasis on SMEs and blue growth. The in-depth study by Randall and Berlina (2019) takes a closer look at the implementation of **regional and national digitalisation strategies in the Nordic region**, including the challenges and opportunities associated with the digital transformation and which actors (public sector, businesses, and civil society) are playing a key role for enabling digitalisation on the ground.

As concluded by to Randall and Berlina, 'the most consistent finding across the regional case studies was the idea that digitalisation is more a human process than a technical one' (2019: 8). Randall and Berlina suggest that **digitalisation could be described as being 20% technology dependent and 80% people-dependent**. One of the key findings of the in-depth study is precisely **the human element**: for digitalisation to come to fruition and reach its full potential, it is dependent on a process of change management relating to **change in both culture and mindset**. Naturally, these processes took on different shapes and forms across the regional case studies in the re-

“**Digitalisation** is the transformation of all sectors of our economy, government and society based on the large-scale adoption of existing and emerging digital technologies

**RANDALL AND BERLINA, 2019:12**

port, but all studied processes seemed to rely on a trusted 'maverick' paving the way through **leadership and change management attitudes**, as well as a concerted team in the business or authority fulfilling the needs identified throughout the digitalisation processes.

**An experimental governance approach** of 'testing the grounds' was taken towards digitalisation in the studied regions. Avoiding detailed strategy-documents with targets and action plans was also observed as a deliberate part of the experimental approaches undertaken by the regional authorities. **Bottom-up approaches responding to pressing local challenges and needs** demonstrated the most efficient attempts to harness digitalisation in the Nordic region, which demonstrates that digital priorities and agendas should be set in accordance with the priorities and areas of responsibility of the respective governance level.

Digitalisation figures as a cross-cutting policy theme on the regional level of governance and is also considered an **important part of policy-making for regional business development**. Despite the region's role in developing the industry and business sector, it was largely the regional business associations that played a key role in digitalisation, supporting start-ups and SMEs in navigating the various regulations and support functions connected to the public sector and legislation, according to Randall and Berlina (2019).

# 4. Policy context

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As stated in the previous section, digitalisation is a cross-sectoral megatrend affecting various facets of policy making. Digitalisation has potential as a tool for economic prosperity and may help strengthen the position of SMEs. This section will consider the role of digitalisation in light of blue growth. First off, it is important to mention that digitalisation is dealt with here as a meta-trend, the foremost impact of which is the changing of mindsets and the altering of organisational structures – it is not concerned with other aspects of technology development than the societal applications and implications of the latter. Thus, when speaking of blue growth and digitalisation, it is safe to assume that the nature of this relationship is affected by the characteristics of the sector in

the area in question, such as the relative ability of businesses to grow. Digitalisation is thus a tool to facilitate change and is a new method for approaching a 'sectoral theme', e.g. blue bioeconomy and aquaculture, but is not necessarily concerned with the development of new technologies – although this may be an outcome of an increasingly digitalised business.

This section presents an overview of the Swedish and Norwegian digitalisation strategies (see Figure 1), but also their strategies relating to marine and maritime industries. This is to provide a framework on which to build empirical research on digitalisation and blue growth in part 5: Empirical Findings.

*Fish farming plays an important role in the Norwegian national economy. Picture: Unsplash*



**Table 2. Overview of national policies**

Country	Level	Key documents: Digitalisation	Key Documents: Marine and Maritime industries
Sweden	Government	<p><i>Digital Agenda, For a Sustainable Digitalised Sweden (2017)</i></p> <p><i>Digital First Policy for the Digitalisation of the Public Sector (2015–2018)</i></p> <p><i>Digital Agenda, ICT for Everyone (2011)</i></p>	<p><i>The Swedish Maritime Strategy – for people, jobs and the environment (2015)</i></p>
	Other	<p><i>Digilyft (2016–2019) stimulates increased digitalisation of SMEs in the industrial sector</i></p> <p><i>Broadband strategy 2.1: Broadband where you live, work and stay (2018) (Västra Götaland)</i></p>	<p><i>Digilyft (2016–2019) stimulates increased digitalisation of SMEs in the industrial sector</i></p> <p><i>Broadband strategy 2.1: Broadband where you live, work and stay (2018) (Västra Götaland)</i></p> <p><i>Report: Follow-up of the Maritime Strategy (2018) (Swedish Agency for Marine and Water Management)</i></p> <p><i>Maritime strategy for Västra Götaland (2008)</i></p>
Norway	Government	<p><i>Digital Agenda for Norway: ICT for an Easier Everyday Life and Increased Productivity (2016)</i></p> <p><i>White Paper 27 (2016–2017): The Industry – Greener, Smarter and Creative</i></p>	<p><i>Blue Opportunities – the government’s updated ocean strategy (2019)</i></p> <p><i>New Growth, Proud History. The Norwegian Government’s Ocean Strategy (2017)</i></p> <p><i>Meld. St. 22 (2016–2017) White paper: The ocean in a foreign affairs and international development perspective</i></p> <p><i>Maritime Opportunities – Blue Growth for a Green Future (2015)</i></p>
	Other	<p><i>Digitalisation Strategy for Municipalities and Counties 2017–2020 (Norwegian Association of Local and Regional Authorities)</i></p> <p><i>Digital21 (2017–2018) – the governments cross-sectoral expert group, recommending strategies for furthering digitalisation for industrial growth and businesses</i></p>	<p><i>HAV21 (2011–2012) R&amp;D strategy for an ocean nation of great dimension (Appointed expert group on R&amp;D)</i></p> <p><i>Value creation based on productive oceans in 2050 (Royal Norwegian Society of Sciences and Letters &amp; Norwegian Academy of Technological Sciences)</i></p>

Source: Adapted from Randall and Berlina (2019: 22) + author’s own addition

## National level

### Digitalisation

This section outlines the existing policies pertaining to digitalisation on the national level in Sweden and Norway and draws on the report by Randall and Berlina (2019).

### Sweden

In Sweden, digitalisation figures as a horizontal policy objective that cuts across all government agencies and ministries. Digitalisation and *digitalisation* have been featured as key concepts on the national agenda for nearly a decade. The strategy *Digital Agenda for Sweden: ICT for everyone* was written in 2011 and served as a point of departure for the devising of digital strategies on the regional level. Since 2011, a handful of strategies have been written, spanning digitalisation in the public sector with a focus on e-governance, digitalisation as a tool for SMEs in the industrial sector, and digitalisation as a tool serving societal goals in employment, competitiveness, and environmental and social sustainability (Randall and Berlina, 2019: 30). The strategy *Digital Agenda, For Sustainable Digital Transformation in Sweden* (2017) encompasses a wide range of target areas linking digitalisation to its overall societal role. These include digital infrastructure, digital leadership, digital skills, digital security and digital innovation (Randall and Berlina, 2019: 31). This digital strategy was written to help elevate Sweden as a digital frontrunner on the international stage.

The strategy, *Digital Agenda, For Sustainable Digital Transformation in Sweden* emphasises the need for digital cohesion, in that rural areas may benefit from digitalisation and that in doing so, the engagement with digitalisation needs to be driven to a greater extent by the local and regional authorities. The digitalisation strategy furthermore encourages the creation of stronger linkages to digitalisation in the respective regional development strategies (Government Offices of Sweden, 2017). According to Randall and Berlina, the strategy does not suggest specific policy actions but provides a framework for the future of digitalisation in Sweden.

Randall and Berlina (2019) note in their study that although the regional and local approaches to digitalisation play an important role for the overall implementation and realisation of Sweden's digital strategies and visions, these levels of governance are free to devise their own digitalisation priorities

and approaches within the framework and institutional support provided by the national level of governance. In 2018, the Swedish government introduced a two-year initiative to support digitalisation on the regional level (Government Offices of Sweden, 2018). This initiative is supported by the Swedish National Agency for Growth, which will enable platforms for networking and skills development opportunities amongst those coordinating digitalisation efforts on the regional level (ibid).

### Norway

Digitalisation is an important megatrend impacting all levels of Norwegian society (cf. e.g. Meld. St. 27 2016–2017; Meld St. 29 2016–2017; Digital21; Meld St. 27 2015–2016). This is exemplified in the establishment of the Digitalisation Council in 2016 to facilitate a dialogue about overlapping policy objectives and digitalisation processes for identifying synergies and for avoiding conflicts of interest between ministries (Ministry of Local Government and Modernisation 2018). The council has no political mandate for decision-making, which in itself enables an agile and politically decentralised approach to new digital trends and challenges. The guiding strategy for the developments in the past few years has been the White Paper Digital Agenda for Norway (Meld St. 27 2015–2016), which has been written to mirror the digitalisation policies of the European Union (EU). The Nordic co-operative aspect is also regarded as an important dimension of the Norwegian work on digitalisation.

Another guiding White Paper connected to digitalisation is the 2017 White Paper 'The Industry—Greener, Smarter and Creative' (Meld St. 27 2016–2017). This White Paper lists the challenges and opportunities in the Norwegian industry in the years to come, connecting these to the potential of digitalisation and automation (Ministry of Trade, Industry and Fisheries, 2017). In this vein, digitalisation is also considered to be closely connected to business development and management, green aspects of industrial development, and, by extension, skills and competence development. This White Paper resulted in the expert committee Digital21, which in September 2018 launched a comprehensive dossier of policy recommendations for the government concerning digitalisation and business development. Four areas were considered of strategic importance for Norway, namely: AI, big data, IoT, and autonomous vehicles. The ex-

pert group emphasised the cross-sectoral aspects of digitalisation and user demand for increasingly standardised solutions, and furthermore encouraged organisational change to break down thematic and ministerial silos.

The Norwegian Association of Local and Regional Authorities is the main coordinating body between the local, regional and national levels of governance, and the agency's Digitalisation Strategy 2017–2020, which encourages digitalisation-strategy formulation in regions and municipalities, is closely aligned with the aforementioned national Digital Agenda from 2016. Digitalisation may also play an important role in the operationalisation of the new Norwegian regions after on-going regional reforms are completed on the 1<sup>st</sup> of January 2020 (Randall and Berlina, 2019). Buttressing education, culture, health, business development and infrastructure, alongside the nationally devolved responsibilities to the regions, it is likely that the development of digital solutions will emerge from the necessity of more efficient services (The Norwegian Government, 2018).

### **Marine and maritime policies**

This section provides an overview of existing national-level policies connected to marine and maritime sectors in Sweden and Norway.

#### **Sweden**

Sweden has a long tradition as a maritime nation. With one of the longest coasts in Europe, the potential for growth in ocean industries is high. The national strategy *'The Swedish Maritime Strategy – for people, jobs and the environment'* was launched in 2015. In this strategy, the maritime industries are defined to encompass any activity that happens in connection to, or is dependent on, sea-based resources. This includes products and services that are directly connected to maritime activities, but also activities connected to the coastline, such as tourism (Government Offices of Sweden, 2015: 6-7). In Sweden, the majority of activities connected to the sea are in the maritime shipping segment and in tourism, followed by fisheries, energy, and marine technologies. These sectors are expected to grow dramatically over the next few decades (Government Offices of Sweden, 2015). The vision set out by the government of Sweden for the maritime sector is based on the premise of sustainable environmental, economic and societal development in a maritime context. Building on

these aspects, three sub-categories that enable success have been identified: 1) Balanced Seas; 2) Competitive maritime industries, and 3) Attractive coastal areas (Government Offices of Sweden, 2015:14).

Aquaculture is highlighted in the strategy from 2015 as an area of significant growth potential, both nationally and internationally. The main aquaculture products in Sweden are fish, shellfish and algae, but while the access to water resources is abundant in Sweden the environmental status of these waters limits the potential for growth – excess nutrients may be detrimental to the health of the lake or water ecosystems in the longer term (Government Offices of Sweden, 2015: 39). Fish and shellfish farming are consequently under strict regulation.

In 2017, the Swedish Agency for Marine and Water Management (SwAM) was presented with the mandate to develop indicators and conduct an evaluation of the Swedish Maritime Strategy (Havs- och vattenmyndigheten, 2017). Alongside the National Board of Housing, Building and Planning, the Swedish Energy Agency, the Swedish Board of Agriculture, the Swedish Agency for Economic and Regional Growth, the Swedish Transport Agency and Statistics Sweden, the SwAM suggested and created a monitoring and evaluation system of the maritime strategy, which captures the three premises of sustainable maritime development (Havs- och vattenmyndigheten 2017: 1). The results from the initial evaluation by the SwAM (HaV) points to a negative impact on Swedish waters, limiting Sweden's ability to achieve a high level of environmental status recognition for healthy seas. The sectors that are the most dependent on a good environmental status of the Swedish seas include fisheries and tourism (Havs- och vattenmyndigheten, 2017:60).

The most important aspect for the continued development of the seafood industry in Sweden is reliability. This includes a good balance between the number of fishing vessels and available catch, as well as continued investments and a smooth generational shift (Government Offices of Sweden 2015: 38). Fishing fleets face greater reliance on well-handled logistics by local ports, which has led to the identification of some need for improvement of the processing industries. According to the government's maritime strategy, the growth of Swedish industries is not dependent on specific sectors, and success is often tied to a sec-

tor's prowess in scaling up for internationalisation (Government Offices of Sweden, 2015). Västerhavet (Skagerrak, Kattegat and Öresund) is not mentioned in the strategy from 2015, but the Baltic sea is mentioned several times.

## Norway

With one of the longest coastlines in the world, the ocean has played and still plays an important role for Norway, both with regards to the country's historic and cultural connections to the sea and with regard to the Norwegian economy (Ministry of Trade and Fisheries, 2017). Norway is the second-largest exporter of seafood in the world, and the products are held in high regard on the global market (Ministry of Trade and Fisheries 2017: 20). The ocean industry also plays an important societal role for coastal communities, both in terms of value creation and employment<sup>2</sup> (see Figure 2, page 21).

In the Norwegian Government's strategy *New Growth, Proud History. The Norwegian Government's Ocean Strategy* (2017), the government takes stock of the current status and future prospects of the ocean industries, laying out the objectives guiding the government's ocean policies for coming years. Framed through the lens of value creation and employment, the strategy engages three different levels of engagement. These are policies surrounding management and the regulatory framework; knowledge and competence development; and market access, internationalisation and profiling. In addition, the viability of blue growth is consistently measured against its environmental footprint (Ministry of Trade and Fisheries 2017: 53). The government further published an updated strategy in June 2019: *Blue opportunities – the government's updated ocean strategy*. The updated strategy focuses on the rapid technological advancements and how digitalisation affects skills and competences needed in the marine sector in years to come. This is particularly directed

towards vocational high schools and technical colleges, where aquaculture and the marine sector may play a stronger role (2019: 21–22). The increased focus on marine sectors in vocational and technical colleges go hand in hand with the focus on digitalisation. In 2016, the government opened up for financing 1500 new enrolments to ICT related subjects in universities and colleges, ensuring a steady supply of digital competence in the future. An increased focus on digitalisation in marine and aquaculture sector is part of the government's objectives (2019: 21–22).

The government has divided the seafood industry into three sub-sectors: Aquaculture, fisheries, and the seafood processing industry (Ministry of Trade and Fisheries 2017: 20). Aquaculture has been the most profitable of these sub-sectors. According to the strategy, this is because of the high market price of salmon (ibid.). There are about 100 companies dealing in salmon and trout farming, with a mix of both large and small businesses situated predominantly along the northern coastlines. The availability of capital in small and medium-sized enterprises is also considered by this strategy, as this is often a part of the risk landscape for smaller businesses in the seafood industry. The government has set up a number of instruments that can help commercially (and socioeconomically) viable projects to survive and grow. The government states in the strategy that these instruments have been strengthened in order to attract private investment through seed funding (Ministry of Trade and Fisheries 2017: 39). Innovation Norway plays a role in supporting industries in blue growth – especially those industries with ambition to internationalise. Innovation Norway offers a range of services to support internationalisation, including loans and grants, skills development programmes, and support for industrial research and development (2017:90).

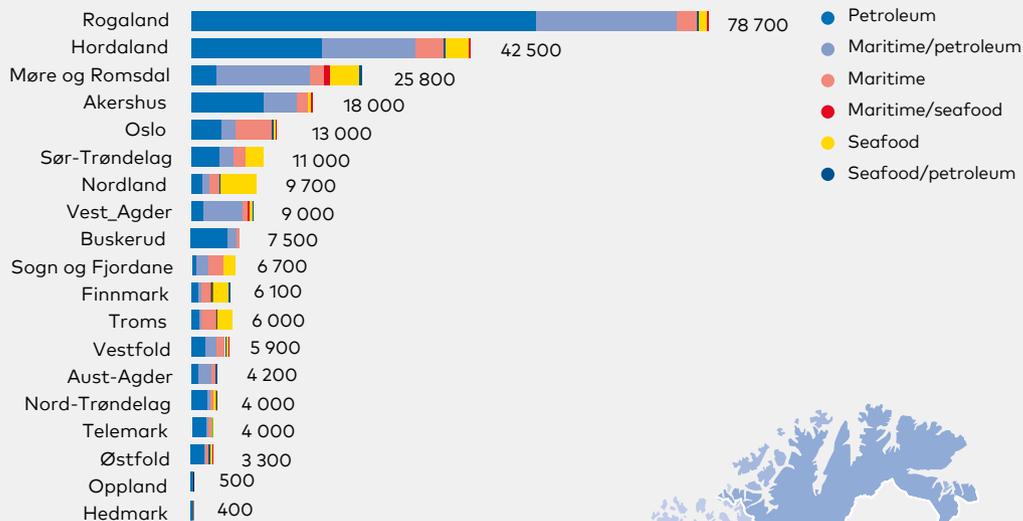
As its Swedish counterpart, none of the Norwegian strategies mention Skagerrak – they mainly focus on the most profitable sectors of the north and western Norwegian counties.

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2 The numbers of fishermen and vessels has decreased with more efficient fishing and a more stringently regulated fishing over the past 30–40 years. In 2017, the Statistics Norway counted 11,307 fishermen across the country, and only 9,500 of these has fishing as their primary profession (SSB 2019; Steinset 2019) with a total catch of 2,423,321 tonnes (SSB 2019). As a traditionally physically demanding profession, the majority of fishermen have been just that – men. Of the 9500 fulltime fishermen, 300 are women (Steinset, 2019). About 1,200 of these had an income of between 1 and 2 million NOK, and 90 has a yearly income of more than 4 MNOK (Steinset 2019). The women earn consistently less than their male counterparts.

## Employment and value creation in the ocean industries by county

### Employment in the ocean industries



### Share of value creation by county

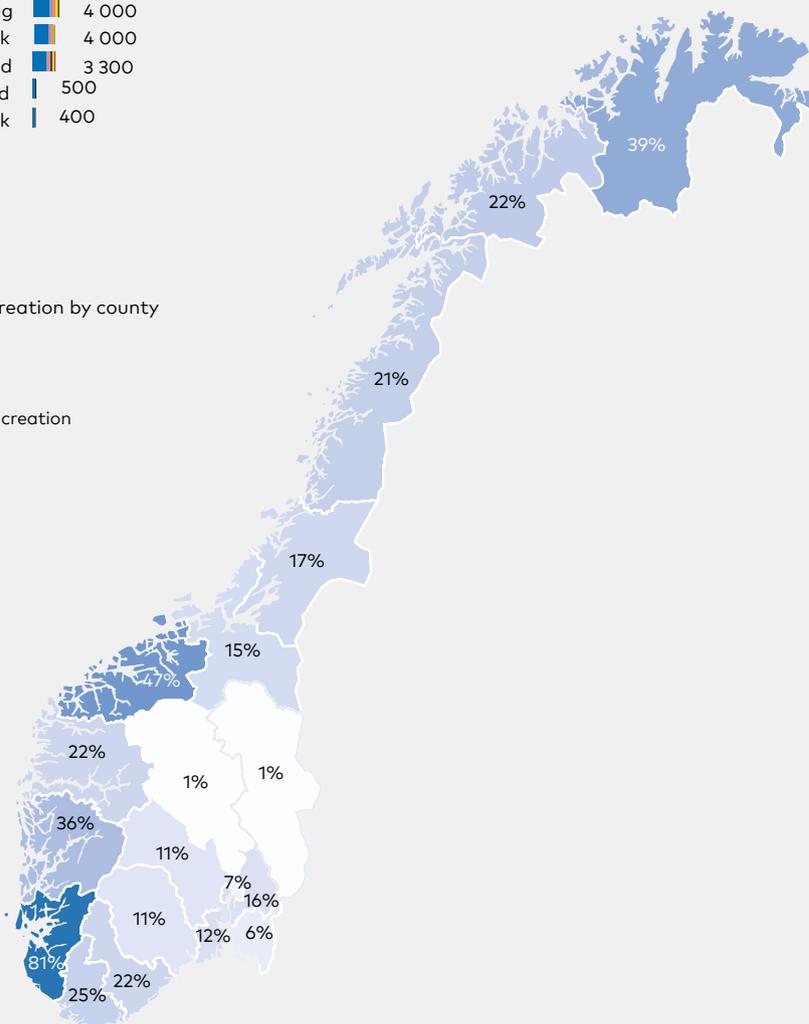


Figure 1. Overview of employment and value creation in ocean industries in Norway. Source: The Ministry of Trade and Fisheries (2017:16 [Menon (2016)])



*The sea is pertinent to coastal towns and villages in Västra Götaland and Østfold. Picture: Shutterstock*

## **Regional level: Østfold and Västra Götaland**

### **Digitalisation**

Østfold has no separate digitalisation strategy, but it is evident that the county is working with digitalisation by supporting businesses and sectors in the digitalisation process. This work is administered by Innovation Norway, with a mandate from Østfold County (Østfold Fylkeskommune, 2017). The lack of a concrete digitalisation strategy may be due to the on-going regional reform, whereby Østfold is joining the larger Viken County. Processes surrounding the internal strategies for the new county are underway (Viken 2018). The new county of Viken (a regional merger between Østfold, Buskerud and Akershus) is also setting off to become a 'smart' region under the banner of 'Smart Viken', with a strong user-focus and smart solutions for the operationalisation of new advancements in the region (Viken, 2018).

Digitalisation efforts are further supported by Smart Innovation Norway in Halden, a city in the southern part of Østfold. Smart Innovation Norway help businesses navigate regulation and legis-

lation where national and regional support mechanisms are not in place. This relates in particular to the management of digitalisation processes and manoeuvring other national frameworks (Smart Innovation Norway, 2019). Digitalisation and the digital transformation under the umbrella of 'Smart Cities' play a key role in Østfold's smart specialisation (S3 Platform, 2019; Østfold Fylkeskommune, 2017).

'Smart Region Västra Götaland' lays out the overall objective for Västra Götaland: regional digitalisation efforts aimed at integrating national services and goals into the regional framework. In this process it is important to draw on the experience from businesses and people and to create collaborative platforms, especially around businesses that could benefit from digitalisation for increased value creation (Region Västra Götaland 2015c: 4; 2015a). These efforts are supported in the regional development plan *Västra Götaland 2020* (Region Västra Götaland, 2013). The strategic point of departure for the digital agenda is through the collaborative efforts between the regional council and the municipalities in Västra Götaland (Region

Västra Götaland 2019b). According to the regional council, the purpose of the regional digital agenda is to 'influence the development of the regional digital transition to ensure that the development promotes digitalisation as a service for people' (Region Västra Götaland 2015c: 7).

'Smart Region Västra Götaland' has three overarching goals (Region Västra Götaland 2015c: 4–6): 1) A simpler life for businesses and people; 2) Smarter and more transparent governance to support innovation and participation; 3) Higher quality and efficiency in activities.

In connection with the preparations and implementation of the digital agenda the region and the municipalities have established a working group – the Digitalisation Council – to advise and coordinate activities and projects as well as to synchronise digitalisation strategies across the region. The Digitalisation Council (Digitaliseringsrådet) comprise several actors from key sectors in the region, including representatives from business, the tourism industry, public transportation services, environmental and cultural sectors, representatives from higher education, the county administrative boards, the municipalities and the regional council. The council is financed by the regional development committee in Västra Götaland. One of the key reasons for establishing a digitalisation council was to create a body for quick adaptation to and adoption of new strategies for emerging digital trends (Region Västra Götaland 2015a: 13).

The region of Västra Götaland decided in 2018 to develop a new strategy: '*Broadband strategy 2.1: Broadband where you live, work and stay*' (Region Västra Götaland (2018a). This strategy is built around the continued collaboration between the fibre associations<sup>3</sup>, but also sets out to clarify and coordinate the role of the public sector in supporting this development (Region Västra Götaland 2018a: 5).

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3 Fibre optic cable development in rural areas is attributed first and foremost to these fibre associations (Fiberföreningar). The UBit -group established by the region and its municipalities in 2007-2008 for the development of broadband and IT infrastructure (Region Västra Götaland, 2018b). A support organisation helping other development is e.g Västfiber (Västfiber 201). The government stipulates who is eligible to apply for government support here, Jordbruksverket (2019): <http://www.jordbruksverket.se/amnesomraden/stod/stodilandsbygdsprogrammet/bredband/villkorforbredbandsstodet.4.44141f7315158c431c5b9202.html>

## **Marine and Maritime policies**

The region of Västra Götaland developed a marine strategy as early as 2008, prompted by the EU moving towards an increasingly integrated marine strategy in 2007. These strategies were developed before the development of a similar strategy on the Swedish national level in 2015 (Government Offices of Sweden, 2015). The maritime sector plays an important part of the industries in Västra Götaland (Region Västra Götaland, 2015b).

The 'Maritime strategy for Västra Götaland' aligns its definition of 'maritime' with that of the EU, thus opening up the concept for a much broader use than 'shipping' (Region Västra Götaland, 2015b). The strategy states that 'maritime' in this context encompasses any category of private or public activities, business and industry, authorities, research, policies, regulations and laws that relate to the sea (Region Västra Götaland 2008: 10; 2015b). The strategy document from 2008 builds on the premise that any strategic document needs to be dynamic to be viable (2008: 4). The vision for the strategy draws inspiration from neighbouring countries and is formulated as follows: 'A common course for the Blue West: Western Sweden shall be one of Europe's leading maritime regions, with solutions oriented towards innovation and environmentally sound growth' (Region Västra Götaland 2008: 4). It also builds on increasing knowledge capacity in maritime industries in the area (Region Västra Götaland, 2015b). Interpreted through the current-day situation, this would naturally extend to the firm integration of digitalisation as an essential part of this objective. The maritime industries were also the subject to an analysis of the state of play amongst maritime clusters after the 2008 strategy implementation in the region of Västra Götaland (Carlberg et al. 2012). Conclusions by Carlberg et al. (2012) referenced the need for stronger organisational frameworks and better structures to enable strong maritime sectors in the region.

The potential for blue growth in Østfold was subject to analysis in the project *Fremtiden er Blå* (The Future is Blue), supported by Interreg Sweden-Norway in 2017–2018 to create favourable conditions for collaboration in the marine and maritime sectors. The report found that municipalities in the Svinesund region were poorly equipped to enable blue growth and have not prioritised the marine industries despite the existing business po-

tential, mainly due to a lack of know-how and competence in handling marine businesses (Interreg Sverige–Norge, 2017). The project also points out that while there are some existing plans that cover the coastal zone in Østfold, the specific focus on developing marine industries is lacking (Fremtiden er Blå 2017).

The objective of the regional coastal zone plan is 'to manage the coastal areas through use and protection in a sustainable perspective' (Østfold Fylkeskommune, 2014: 5) balancing natural values, landscape and culture against recreational purposes and productive use of the sea. Giving attention to marine business and industries, the focus is primarily on existing prawn fishing, though mo-

bilising for R&D, developing networks and clusters, entrepreneurship and innovation are also part of the overall objective. Blue growth is part of the county's bioeconomy strategy, which references to marine biomass (Østfold Fylkeskommune, 2016).

The recent Interreg project Marine Border Forum Skagerrak (2019), where both Østfold County and Västra Götaland region take part, continues the work of Fremtiden er Blå and aims to uncover the potential of the marine industries and heighten the status of resources available in the Skagerrak waters (Interreg Sverige-Norge, 2019). This continued effort demonstrates that there is willingness to amplify the focus on marine and maritime industries in the region at large.

Sector	Akershus	Oslo	Østfold
Agriculture and forestry	0.5	0.0	1.1
Fishing and aquaculture	0.0	0.0	0.1
Mining and quarrying	0.4	0.0	0.0
Manufacturing	0.6	0.3	1.4
Electricity gas and steam	0.2	0.7	0.5
Sewerage and water supply	1.0	0.7	1.2
Construction	0.9	0.8	1.3
Wholesale and retail trade, repair of motor vehicles	1.4	1.0	1.1
Transport via pipelines	0.0	0.0	0.0
Ocean transport	0.9	1.2	0.1
Transport activities excluding ocean transport	1.3	0.8	0.9
Postal and courier activities	1.8	1.3	1.1
Accommodation and food service activities	1.0	1.2	0.8
Information and communication	1.5	2.4	0.5
Financial and insurance activities	0.7	2.8	0.5
Real estates activities	0.9	1.3	1.1
Professional, scientific and technical activities	1.3	1.6	0.7
Administrative and support service activities	1.1	1.6	0.8
Public administration and defence	0.8	1.5	0.9
Education	0.9	0.9	0.9
Health and social work	1.0	0.6	1.1
Arts, entertainment and other service activities	0.8	1.9	0.8

Figure 2. Locational quotient of employment in Østfold, 2014. Source: OECD (2018: 164) + own addition.

### **Locational quotient of the marine sector: Svinesund**

A census of fishermen in Østfold by the Directorate of Fisheries counts 133 fishers in the region, 70% of whom are accounted for by the municipalities of Fredrikstad and Hvaler (Fiskeridirektoratet 2019). In Västra Götaland, the number of people working as fish farmers or fishermen was 255 in 2016 (Region Västra Götaland, 2019a). Relatively few people work in the fishing industry (OECD, 2018), and the locational quotient of the trade in

Østfold is low at 0.1<sup>4</sup> (OECD 2018; see Figure 2, p.21). A somewhat higher local quotient is seen for fishing and aquaculture in Västra Götaland, but in this figure (Figure 3), fisheries are considered in connection to agriculture and forestry.

<sup>4</sup> OECD 2018: The locational quotient for each sector is the ration between the sector weight in the regional gross value added/employment, and the weight of the same sector in the national value added/employment. A value above 1 indicates that the region is more specialised in that sector than the rest of the economy.

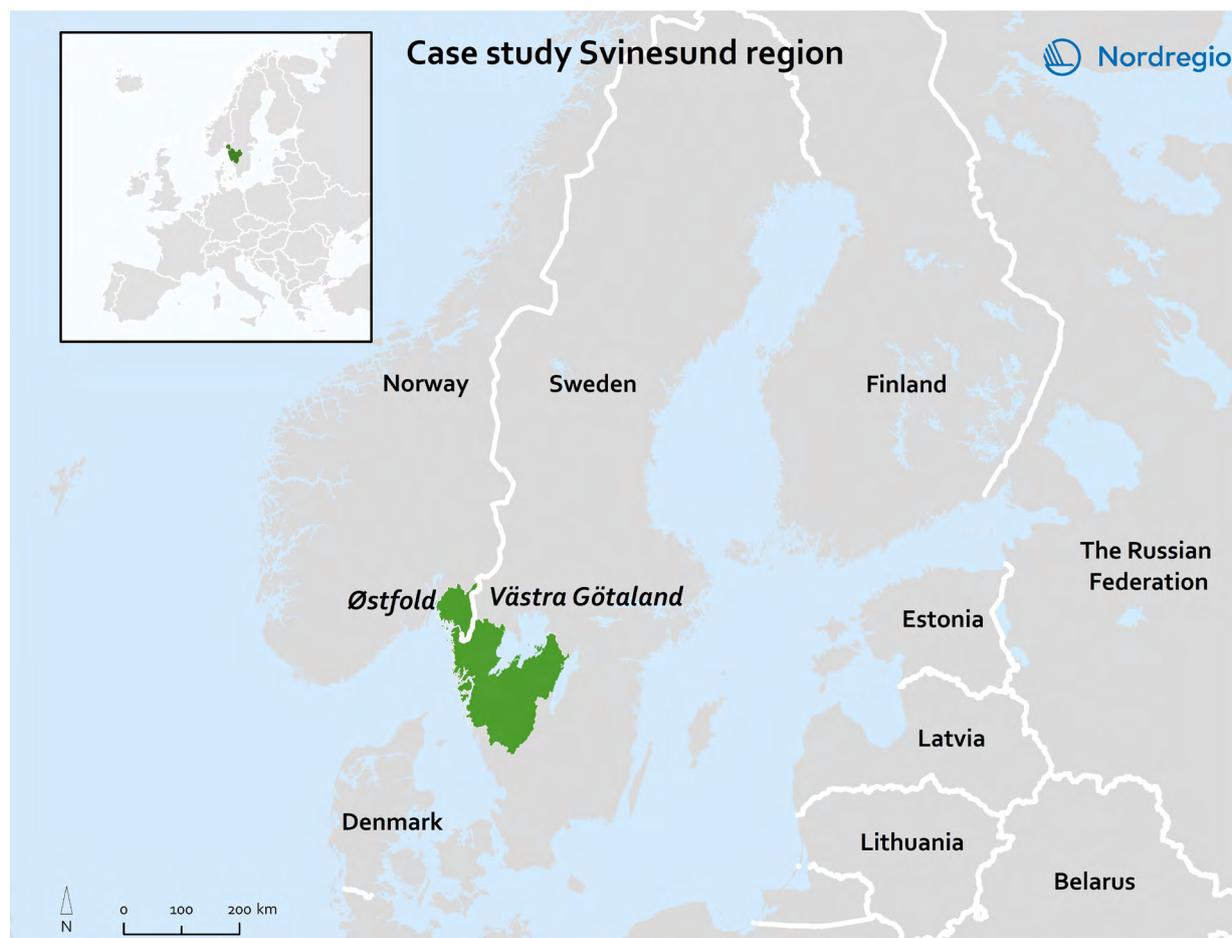
	Halland	Västra Götaland
Agriculture, forestry and fishing	1.6	0.7
Manufacturing	1.1	1.2
Industry (excluding manufacturing)	2.1	0.7
Construction	1.1	1.0
Distributive trade, transport, accomodation and food	1.1	1.1
Information and communication	0.4	0.8
Financial and insurance	0.7	0.6
Real estate activities	1.4	1.0
Professional, scientific and technical activities	0.7	0.9
Public administration, education and health	1.0	1.0
Other services	0.9	0.9

*Figure 3. Locational quotient, employment Västra Götaland and Halland, 2013. Source: OECD (2018: 189) + own addition.*

# 5. Case study: The Svinesund Region

The cross-border region of Svinesund is the home to 1 896 028 Swedish and Norwegian citizens who for many decades past have travelled across the border, contributing to the workforce and supporting business development through extensive trade. Regional collaboration has benefitted from Nordic cooperation initiatives since the 1950s, which has incentivised the emergence of cross-border collaboration, and in more recent years this has been supported by the EU's Interreg programmes (OECD, 2018). The collaboration in the cross-border region has been essential to the prosperity of the areas across the Swedish-Norwegian border (Svinesundskommittén, n.d.; Interview 2).

This section presents the empirical findings and analyses following interviews with key stakeholders and actors on both sides of the Norwegian-Swedish border (See Map 1). The study sets out to describe the regional approach to digitalisation and explore how the regions work to implement digitalisation strategies and engage key stakeholders in blue growth, but also to map how the regions of Østfold and Västra Götaland are collaborating in these policy areas. The key aspect of this study is to identify the challenges and opportunities in the cross-border region. The empirical findings are supplemented by information contained in available strategy documents on



Map 1. The Svinesund Region. Source: Eeva Turunen, Nordregio (2019)

both maritime/marine industries and digitalisation in the case study regions. The mega-regional case study highlights the importance of collaboration in bolstering the focus on blue growth in this area as a whole and lays out how this may be supported by the digitalisation process in a long-term perspective.

### **INFOBOX 1: The Svinesund region**

**Västra Götaland** is the second-most populous in Sweden with 1,690,782 inhabitants, and spans 23,800 km<sup>2</sup> (Regionfakta, 2019). It is located in the south-western part of Sweden. Gothenburg, Sweden's second-largest city, is located in Västra Götaland. Västra Götaland borders Norwegian Østfold county in the north-west, and the Swedish regions of Värmland and Örebro to the north, Östergöteland to the north-east, Jönköping to the south-east, and Halland to the south. Main industries include the automotive industry and life sciences, but the maritime industry and maritime technology have a long history in the area.

**Østfold County** is a small region spanning 4182.25 km<sup>2</sup> in the south-eastern corner of Norway, bordering the Swedish regions of Västra Götaland to the south and Värmland to the east, and the Norwegian county of Akershus to the north. The region is home to 295 420 inhabitants, of which 205 246 live in municipalities considered part of the Svinesund area (SSB, 2019). The largest city is Fredrikstad. The main industries are the manufacturing sector and bioeconomy (forestry and agriculture) (Østfold Fylkeskommune, 2018). Østfold has a small labour market and faces challenges in the creation of jobs (Ministry of Trade and Fisheries, 2017).

### **Blue Growth by Digitalisation in Svinesund**

The inter-linkages between blue growth and digitalisation are considered in both Västra Götaland and Østfold under the overarching umbrella of the potential of small and medium-sized enterprises

(SMEs). Digitalisation in and of itself has played a relatively small part in the overall quest towards developing company portfolios as interest towards these developments has been lacking in the area (Interview 1). Although there is significant potential for digitalisation, some may be worried about risks connected to the uptake of new digital tools (Interview 1). This depends on the relative digital maturity of the company. Moreover, the interest and need for digital tools depends on the individual context of the maritime business owner in question, whether about simplified online processes or about concrete digital solutions such as feeding systems and underwater surveillance cameras for oyster and mussel farming (Interview 1; Interview 5; Interview 6). Using data in different ways to enable digitalisation and support SMEs has also been on the agenda for regional authorities in Västra Götaland, which has organised workshops with consultancies to try and find new ways of harnessing the opportunities and applications of data (Interview 1).

### **Digitalising SMEs for blue growth**

Digitalisation in small enterprises in the marine industries is a challenge, but oftentimes small marine enterprises are subjected to digitalisation without reflecting on it, for example through the reporting of catches (Interview 7). The realisation that digitalisation may mean simple tools and processes is an important step for developing businesses – digitalisation is often considered both time consuming and resource intensive (Interview 6). This is a general challenge for most SMEs, not only in the marine industry (Interview 7; Interview 6).

Supporting small and medium sized enterprises in digitalisation strategy development is important for the prosperity of the mega-region. In the region of Västra Götaland, the digital agenda from 2015 'Smart Region Västra Götaland' connects and amplifies the important links between the regional growth focus of the VG2020 agenda and digitalisation (Region Västra Götaland 2015c: 9). As part of their regional development programme for VG2020, the region offers monetary support of up to 250 000 SEK for developing new added value to the company through the development of digital strategies, new business models transforming the company's activity or processes (Region Västra Götaland, 2019c). The funding is geared towards the engagement of an external consultant and is not meant for the develop-

ment of new specific products or services (Region Västra Götaland, 2019c).

To be eligible for this development support, projects cannot be more than 1 year in length and the beneficiary needs to fulfil three criteria:

- 2–49 employees
- Annual turnover of 3 million SEK (max 10 million EUR)
- Stable and organised company finances

Applications are reviewed on a monthly basis by three agencies: the Region of Västra Götaland, the national growth and investment agency ALMI, and the Swedish Agency for Economic and Regional Growth.

According to one of the interviewees, this support mechanism is beyond reach for many of the SMEs in the marine and aquaculture sector (Interview 5). This was also brought up by companies at the workshops held in Halden for the purpose of the present report. Companies in this sector are often too small and have annual turn-overs below 3 MSEK. It still remains unclear whether this could be solved by, for example, a cluster organisation gathering several actors in the pursuit of acquiring digitalisation support, but joining clusters is often not high on the agenda for entrepreneurs in the

field (Interview 6): Time is money for small companies, which have to maintain focus and efficiency in their core businesses.

Østfold features to various initiatives, support mechanisms and institutions, such as Smart Innovation Norway (see Infobox 2), Innovation Norway, and Smart City initiatives, which strengthen digitalisation on the municipal level. According to an interviewee, the region supports businesses that want to develop digital strategies – the operationalisation of this support is undertaken by Innovation Norway. Another interviewee notes that while a business may be given support to cover half of the costs connected to digital strategy projects, the threshold for applying for this funding seems to be too high for the businesses to actively participate (Interview 3). Promoting digitalisation as part of developing a more strategic business model is thus important (Interview 3). Innovation Norway also support SMEs in digitalisation through their programme 'Omstillingsmotor' (Engine for Change), coupling successful applicants to clusters in Innovation Norway's cluster programme *Norwegian Innovation Clusters*. In this programme, the clusters will share their expertise and knowledge, thus supporting businesses in developing competences in digitalisation, digital transformation and innovation capacities (Innovation Norway, 2018).

## INFOBOX 2: Smart Innovation Norway AS

is a non-profit Science Park located in Halden established in 2003 (then: *Inkubator Halden*). The Science Park has five focus areas: Smart Incubator; Innovation Lab: Design Thinking and Visualisation; R&I within renewable energy and new business models in the digital area; Smart Cities; NCE Smart Energy Markets. Smart Innovation Norway help support start-ups and SMEs with networks and clusters, encourages open innovation, and help businesses navigate the regulatory system and support frameworks where a business' competence might be lacking (Interview). Digitalisation figures as integral to the development of business models by placing the customer and the customer experience at the centre (Interview 4).

Smart Innovation Norway's industrial cluster is comprised of some of the most advanced IT companies and academic milieus

on Big Data Analytics in Norway. The presence of their industrial cluster indicates that significant competence and expertise is available in the regional business environment for how to maximise new technologies and big data (Interview 4). The technology is also considered transferrable to the surrounding businesses and industries in the region and the country at large (Smart Innovation Norway, 2019). Moreover, collaboration between businesses to develop synergies is crucial for creating a dynamic and resilient business environment.

Smart Innovation Norway also participate in international research and collaborative projects, such as EU Interreg Sweden-Norway. Smart Innovation Norway is currently supporting Marine Border Forum Skagerrak (Interview 4; Interview 7).

Østfold's Smart Innovation Norway is part of one of the *Norwegian Innovation Clusters* (Interview 4).

SkatteFUNN is another support mechanism that may help businesses in overcoming the initial hurdle of financing digitalisation projects (Interview 4). Through SkatteFUNN, SMEs are able to obtain 20% of all project costs as tax deductions in their annual tax settlements. To be eligible for SkatteFUNN, a company needs to fulfil two criteria (SkatteFUNN 2019; RCN, 2019):

#### **Small enterprises**

Less than 50 employees

Annual turnover of less than 10 MEUR

#### **Medium-sized enterprises**

Less than 250 employees

Continued balance of no more than 43 MEUR

To be eligible, projects need to revolve around new or improved services, production processes or goods that may benefit the company in question (RCN 2019). In 2018, 225 projects in Østfold were granted tax deductions, of which 49 came from businesses in ICT, 10 in the maritime industry and 5 from businesses in the marine and aquaculture sector (RCN, 2018). More specific information about the applications has not been made publicly available.

Beyond SkatteFunn and Innovation Norway's programmes, companies still need help to continue to thrive. Smart Innovation Norway help such businesses and plays an important role for the development of a dynamic business sector in Østfold, significantly contributing to value creation in the region. Nevertheless, an interviewee stated that there are still few marine and aquaculture businesses amongst the client base of Smart Innovation Norway (Interview 4). They do, however, participate in the EU Interreg project *Marin Border Forum Skagerrak*, seeking to connect to marine businesses this way. Coupling the identified needs of the customer to larger knowledge environments with expertise in e.g. technology may thus be a way of ensuring continuous and dynamic business development in the future. Bringing companies on board and piquing their interest is the main hurdle, as clearly identified by the interviewees.

Despite differences in how digitalisation efforts in SMEs are supported in Västra Götaland and Østfold, the two regional funding structures also share some traits in common. In both regions,

digitalisation in SMEs is much more about change management processes than about concrete development of new digital tools, (Interview 6). This is also the major finding in Randall and Berlina's report on Digitalisation in 2019.

### **Status and challenges for digitalisation in marine SMEs**

**Equal access to digital infrastructure.** On a basic level, ensuring physical digital infrastructure is important for creating a favourable business environment in any sector. Like physical transport

#### **INFOBOX 3: Marine and Maritime Smart Specialisation in Västra Götaland**

The marine and maritime sector plays an important part in the region's smart specialisation strategy. Västra Götaland is part of the EU's smart specialisation (S3) platform, which forms an important section of the overall regional strategy for growth and innovation for 2014-2020. The overall strategy is known as VG2020. Of the six strategic areas of prioritisation in Västra Götaland's S3, maritime and the marine industries are highlighted as a key area of development (Region Västra Götaland n.d.). The maritime and marine industries are divided into four sub-categories: Shipping, Seafood, Marine and coastal tourism, Marine energy (S3 Platform 2018). Part of VG2020, the S3 strategy is naturally connected to the overall rationale of digitalisation in the region's growth and development plans. The regional strategy was, in turn, further developed in 2016 in the VG2020 and is one of the reasons why the marine and maritime industries are prioritised in S3 (Interview 1). Connecting with SMEs by raising issues that are relevant for the companies has been an important part of working to develop areas for blue growth. According to an interviewee, working on the thematic area of marine industries in S3, creating platforms for establishing linkages between research environments and companies, as well as lifting digitalisation as part of the growth process, have been part of the role of the coordinators of the marine and aquaculture S3 action plan.

infrastructure, which is highlighted in the OECD Territorial Review as one of the most important aspects for integrating the megaregion, the digital infrastructure plays an important role for the future. Moreover, ensuring equal digital access and quality throughout the mega-region is equally important for creating a stronger mega-region, especially in coastal areas where fisheries and aquaculture play a key role. Improving digital infrastructure in remote areas has been one of the most important goals in the years following the launch of Västra Götaland's digital agenda, according to an interviewee (Interview 2). The digital agenda was subsequently followed by a broadband strategy in 2018 *'Broadband strategy 2.1: Broadband where you live, work and stay'*. Bridging the broadband gap in rural areas with fewer inhabitants is crucial in order to develop a more balanced regional growth profile (Interview 2). As value creation is increasingly connected to digitalisation by way of reaching and responding to customer needs, there is a crucial need for access to basic infrastructure to capitalise on the potential that digitalisation might have for SMEs and start-ups (Interview 2).

For example, the development of broadband connection and infrastructure is market-driven in Sweden, which means that the developments have primarily happened in those areas where this has been commercially profitable (Region Västra Götaland 2018b). This generally means larger towns and villages. One of the interviewees recounted that the establishment of associations and organisations to help to put weight and money behind the development of fibre optic cable connections is a common occurrence in the region, especially in smaller villages with a population of only a few hundred. Some of these associations have also been established in collaborative projects between the municipalities and the regional authorities but engaging other actors to join in has been necessary. One of the interviewees stated that the role of the private sector as engines for change was crucial for the development. For the private sector, good internet is needed for the development of business opportunities and value creation. This is a bare necessity regardless of whether the business is located in large urban areas or in micro-municipalities populating the south-western coast of Västra Götaland (Interview 2). Insufficient broadband connections may limit the overall frame of possibilities in a municipality, one of the interviewees stated, and added:

*'Our society is pushing for digital solutions and requirements, but fulfilling these are difficult when the basic framework is not in place'* (Interview 2)

Ensuring equal access to digital infrastructure is key to seeing digitalisation as a tool for enhanced growth in marine SMEs (Interview 2).

**Regulatory framework.** One of the main reasons that marine SMEs are struggling to engage with digitalisation is due to overshadowing concerns about issues related to the legal and regulatory frameworks and the risk that they will hamper business development in both Østfold and Västra Götaland (Interview 6; Interview 5; Interview 3). Issues relating to legal frameworks are also mentioned in Swedish Government's Maritime Strategy from 2015, especially with regards to the need for greater harmonisation between the various legal categories to which fishing and aquaculture are subjected (e.g. food safety, transport and fisheries) (2015: 28). Furthermore, the government recognises the way the laws are targeting large-scale industries and land-based activities (Government Offices of Sweden, 2015). Two of the interviewees also pointed out that some types of aquaculture now in place, such as algal farming, were not engaged in when the marine legislation was shaped (Interview 2; Interview 1). Development permissions are often denied if they relate to development defined in the ocean directives as environmental concerns. This, in turn, makes it difficult to attract investment and plan ahead:

*'When it comes to land-based fish and shellfish farming, well, they'll still emit a bit [of phosphorous] into the ocean despite their 'state of the art' systems, but these are negligible amounts in comparison to conventional agriculture. But that is the law; it just doesn't work and that is difficult.'* (Interview 1)

The minimal sharing of data and outdated regulations were also reported as a problem that, if overcome, could play an important role for the prosperity of the megaregion (Interview 5). For example, this includes import of smolt across the border from Norway to Sweden, maritime spatial planning, taxation, and access to data (Interview 2; Interview 7). The issue with regards to the import of smolt is in the potential risk of diseases (Interview 1; Jordbruksverket, 2018). The spread of diseases is usually seen in connection to ocean-based fish farming, according to a marine specialist interviewed, but as the smolt would be used in

connection to land-based fish farming the spread of diseases is more contained. The regulation on the Swedish side still stands:

*'It's too new still. The development has gone past the law (...) You could say that the law is all-encompassing and quite general, but they seem not to be able to see Västra Götaland and Østfold as the same area for regional development where different actors across the border have to collaborate. The fact that there is a national border shouldn't be a hindrance really, but it becomes a huge one'* (Interview 2)

Another interesting aspect is a divergence in regulation with regards to the harvesting of Pacific oyster (*Crassostrea gigas*) – landing the catch in ports on either side might be problematic due to the differences between Swedish and Norwegian regulations in terms of ownership to the oyster catch (Interview 3; Interview 7; Interview 5). Considered an invasive species, using the Swedish Maritime Cluster's project 'Scary Seafood' may trigger ideas of how to utilise Pacific oyster harvests for different purposes (Interview 5). It is also key to work with municipalities and companies to understand how they work with the challenges that they face in the development of aquaculture and marine industries (Interview 1).

**Prioritising digitalisation.** Kick-starting the marine businesses and helping other SMEs in the sector scale up is thus challenging due to prevailing legal and regulatory frameworks. Relating to the upscaling of marine industries outside digitalisation, it is possible to identify a first few impediments to development. Understanding the potential of digitalisation as a method of creating a closer relation to the customer or as a means to simplify operations is part of the knowledge and awareness raising that is needed in the sector. As business models are changing, not being part of the development may hamper the future prospects of more traditional sectors (Interview 3). Although digitalisation may help buttress development within clusters and companies and help link companies together for further knowledge exchanges across the border, the regulatory systems to which the sector complies build high walls that are hard to circumvent.

**Blue and digital expectations.** Companies in marine industries are relatively young, few and small, but the prospect of bringing in digitalisation

aspects into their business models may help the businesses in the long-term, as the companies are rapidly changing and adapting to survive (Interview 7). Working together in clusters is considered one important measure for enhancing digitalisation as a tool for maximising long-term value creation. Although such clusters exist, for example in the Norwegian county of Vestfold, there are relatively few that choose to collaborate with each other, especially within the field of digitalisation in the Svinesund area (Interview 7). One interviewee commented that the nature of start-ups and small companies in this business sector is to keep a close eye on the bottom-line, and clusters without clear objectives and vision are thus less interesting to spend time on (Interview 6). The 'why' is an important consideration for businesses considering whether to join a cluster or network; there need to be good incentives in place (Interview 7; Workshop 1). Stronger collaborations through clusters with Telemark, Vestfold and Agder counties in Norway, may help make the area more visible on the national level, providing impetus for appropriate policies aimed at greater diversity of fishing and aquaculture policies in Norway and, similarly, in Sweden. Fortifying the collaboration for creating a stronger regional profile is important:

*'We cannot compete with the Norwegian coast [in the west and the north] but that is also not our intention. We need to find our own niche: What premises can we build on based on the conditions we have? We have ascidians in our nutritious ocean, for example: they contribute to growth and they purify the water'* (Interview 7)

Looking to the enormously profitable aquaculture and marine industries in the northern and north-western regions of Norway, it is evident that digitalisation is contributing to increased efficiency and product development (see e.g. TekFisk, 2018). However, these companies are part of one of the most profitable sectors in Norway and, furthermore, they also link up to the oil and gas sector through knowledge-sharing (Giacometti and Teräs, 2019). In other words, replicating this success is not necessarily feasible.

Moreover, the role of Skagerrak in the overall national focus for maritime and marine industries is negligible in comparison to the attention given the challenges and opportunities seen in connection to the Baltic Sea or the North Sea (Interview

1; Interview 2; Interview 3). Despite the publication of the Swedish national maritime strategy in 2015, the overall focus on aquaculture and marine sectors is understood to be quite low on the national scale. In the same vein, Skagerrak is not mentioned in the Norwegian marine strategy from 2017 and in the most recent strategy *Blue Opportunities – the government’s updated ocean strategy* (2019).

According to the interviewees, a greater focus on the potential of Skagerrak through national research programme and tenders would be an important stride towards placing blue growth on the agenda.

*‘The region’s engagement for these industries will not be enough in the long-term, the [national level] must get on it to realise such [developments] (...) We are working to show civil servants and the national level that there is a future for blue growth in Västra Götaland’* (Interview 1)

Moreover, it is important to amplify the role of Skagerrak as a different type of ocean space, with a warmer and more nutritious type of sea with different maritime flora and fauna, because these factors have distinct implications as to what kind of livelihoods this maritime area supports and how it contributes to the overall settlement along the coast. The value creation connected to crab fishing, seaweed, oysters, mussels or *ascidiacea* (sea squirts) is not analogous to salmon fishing along the north-western coast of Norway but placing increased focus on the former may bring about positive change in the affected regions, both environmentally and culturally, as well as diversifying aquaculture and contributing towards innovation (Interview 3). The businesses working in this field are currently focused on making ends meet and could be further supported by the national level in both Sweden and Norway by having the area recognised as part of the overall focus on productive oceans.

### **Opportunities for blue growth in Svinesund**

**A unified sector across borders.** Marine and maritime industries have the potential to stand out as a unified sector and a starting point for blue growth in Svinesund as part of a Scandinavian mega-region, as noted by a recent report by the OECD (2018). Integrated approaches to support collaboration in the Skagerrak sea is part of creating a stronger cross-border region ‘brand’, by elevating

the natural ecosystem diversity and the potential for a broader spectrum of aquaculture initiatives (Interview 2; Interview 5; Interview 7). Digitalisation may play an important role in this work as a method for supporting SMEs and, by extension, blue growth. Joining these aspects together is a natural part of developing their logic in support of a stronger border-region. To fully capitalise on the potential of the Svinesund area and the Skagerrak sea, access to and the sharing of data is of high importance, says one interviewee. Working in the same sea, it would benefit all to share data on toxins in the water and algae bloom, and thereby help contribute to an ever more sustainable coastal area (Interview 5).

**Positive labour market impacts.** The interviewees’ remarks about the labour market impacts that digitalisation might bring were almost exclusively positive. Although it is assumed that certain professions may disappear and that this might impact on the overall geographic and demographic structure of the region, digitalisation is also seen as potentially bringing new life to the marine sector and contributing to blue growth in the longer term (Interview 2). This may be because of changing work tasks and alleviation of the physically demanding parts traditionally associated with the fishing industry, but also because digitalisation might bring new working methods that make labour less intense and attract younger generations to seek employment in the sector (Interview 5). This optimism echoes the commonly held understanding in the Nordic region at large that the digital age may help bring a younger and more dynamic workforce to smaller and more peripheral areas (Randall and Berlina 2019). Although menial elements of jobs may disappear, new tasks and aspects of existing or new jobs may appear. This requires a shift in education programmes towards more competence -based degrees that focus on the transferability of skills.

Blue growth in the border region is also reliant on the steady supply of a skilled, competent and young labour force. Collaborative efforts have been attempted in this area as well, but so far little has come to fruition (Interview 5). According to the OECD Report (2018), this segment is pointed out as one of the main objectives and areas of development in the future. Continued efforts are needed to strengthen exchanges across the border and to tear down the psychological border hinders:

*'Connecting universities, colleges and students in the concrete projects [we have] is probably the most important thing that we can do'* (Interview 3)

There are significant opportunities in the Svinesund area, but the ability to capitalise on these opportunities is dependent on the ability to communicate and share information, market the area and create a stronger Svinesund 'brand' by focusing on the unique position and seafood potential of the area. Successfully lifting this mega-region's profile may bring newfound optimism and interest from national actors, potentially enabling a new bloom for the marine industries in the area. This may also help ensure the steady supply of labour and contribute towards thriving coastal and rural areas on both sides of the border. Regional development is about taking part in the development of industries and businesses, strengthening the appropriate competences, infrastructure and planning efforts that are necessary for long-term success. One interviewee stated that the future will continue to see an increase and flow of goods and people across the border, and thus regional planning efforts in Västra Götaland and Østfold need to be developed in conjunction (Interview 2). More closely connecting Gothenburg and Oslo to Västra Götaland and Østfold will also be important for raising the regional profile (Interview 2).

### **Cross-border collaborations on blue growth and digitalisation**

The Svinesund region is working actively with digitalisation in different Interreg projects, such as *Marin Border Forum Skagerrak* as well as the green bioeconomy project 'Rethinking Wood' (Interview 7; Svinesundskommittén, 2019). Consciously using digitalisation as a strategic tool for enabling growth on both sides of the border is key, according to the interviewees (Interview 5; Interview 2). Digitalisation plays an important role in facilitating quicker collaboration and correspondence across the border. Naturally, regional authorities are working with separate internal systems, but cross-border collaborative efforts have worked to overcome these hurdles, for example, the Interreg Sweden-Norway project *Marine Border Forum for Skagerrak* has implemented the use of Microsoft Office 360 TEAMS to ensure easier communication. Teams is also used internally in the three other *Interreg Sweden-Norway* projects, and in addition to 'Hub Spot' and Skype, the Interreg projects

have also created a common GDPR-compliant CRM network for clients and customers (Interview 5). Creating a common system enables a relevant digital dialogue with and between partners, which drives forward collaboration around business sectors and industries. Moreover, creating simple solutions for information flow and digital knowledge-sharing between companies and the project leaders in projects such as *Marine Border Forum Skagerrak* is crucial for demonstrating the benefits of increased digitalisation in marine and other businesses.

According to the majority of the interviewees, digitalisation sits high on the agenda in both Østfold and Västra Götaland as a tool for encouraging and inciting regional growth and development. Digitalisation helps open up the mega-region's potential as a larger market for marine businesses and start-ups. Drawing on knowledge and expertise across the border is facilitated by a change in mind-sets, to be able to look beyond the regional border and understand the mega-region as one entity (Interview 4). Raising awareness on the composition of the market and industries operating in the area and being able to connect across sectoral lines is crucial for lifting the mega-region's profile as a competitive region in blue growth (Interview 4; Interview 1). Continuing cross-border collaboration through forums such as *Marine Border Forum Skagerrak* are important for raising awareness and connecting people and businesses (Interview 7; Interview 5; Interview 1; Interview 3).

There have been several efforts to streamline the idea of using digitalisation as an enabler for increased value creation and to simplify working methods for small companies working with blue growth (see e.g. *The Future is Blue in Svinesund*, and *Marint Grenseforum Skagerrak*). This may also facilitate increased activities in the tourism segment as part of the regions' focus on blue growth (See Infobox 4). Digitalisation as such is considered a paradigm shift (Interview 5). These collaborative projects mainly seek to find the key mechanisms for cross-border collaboration between companies and actively work to develop digitalisation strategies for promoting further integration between companies and people (Interview 5). Building comprehensive databases is thus important (Interview 7). Digitalisation runs as a red thread throughout all events and outreach programmes under the flagship of the *Marine Border Forum Skagerrak* project. Finding common solutions to ensure the

sustainability of national park areas and protected coastal landscapes in the Skagerrak sea is part of this effort. Ensuring information flow and sharing data is important in this regard, but this also requires communication around regional spatial planning, as the regions are responsible for the coastal area up to one nautical mile off the coast (Interview 3). Coordinating these efforts to a greater extent is important for business development in the area, including in the tourism industry.

However, according to the 2018 OECD Territorial Review of Western Scandinavia, there are still areas that would benefit from greater collaboration, particularly within transport and infrastructure, in order to achieve a more integrated megaregion. Taking a closer look at the megaregion of

Western Scandinavia<sup>5</sup>, there have been few concrete policy achievements outside cross-border knowledge-sharing. This is not for the lack of trying, but rather due to a lack of 'hard power' in the networks and collaborative bodies across the border in mitigating a range of national differences in the legal, fiscal and regulatory policies (OECD 2018: 85). The OECD review additionally points to the lack of a clear objective; a strong 'why', to present to the national level, promoting and showcasing the benefits of stronger, more committed collaboration:

*'Western Scandinavia currently lacks a clear vision of what to achieve collectively. It has a weak capacity to speak with one voice and present strong*

#### **INFOBOX 4: Blue tourism in cross-border collaboration**

Blue growth also encompasses tourism. This is one of the industries where collaboration is seen as a necessity for lifting the profile of the oceanic landscapes/archipelago of Koster (SWE) and Hvaler (NOR). These national parks are unique, both on a national as well as an international scale (Interview 2; Interview 5; Interview 7). Building on shared experiences and knowledge, the collaborative project 'Gränsen som attraktion' (The border as the attraction) has been active since 2017 and continues until January 1st, 2020. The project is co-financed by Interreg Sweden-Norway and is receiving financial support from both Østfold county and the region of Västra Götaland, the surrounding municipalities and the tourist boards in the regions.

The project's objective is to 'strengthen the collaboration between the tourism industries in the border region' and to create an environment for long-term collaboration between companies. Elevating the regional brand by focusing on the development of region-specific products and experiences is considered key to creating a competitive region in the tourism sector (Svinesundskommittén,

2018). The project helps companies working in the tourism sector by providing a network and platform for collaboration, study trips across the border, business development courses and focus groups, and help in promoting the company. This type of cross-border collaboration has proven a success in the northernmost regions of the Nordic countries, where enterprises across Northern Norway, Northern Finland, Northern Sweden and Sápmi have been collaborating to promote Arctic tourism ('Visit Arctic Europe'). According to a recent report on Arctic Smart Specialisation, the Visit Arctic Europe project had in its second year 33,000 new holidays sold in the period November 2016 to September 2017, including 78 new multi-destination travel packages sold in the cross-border Nordic Arctic region (Teräs et al., 2018).

Working together across the border in the Svinesund region may hold great potential if the area can be elevated as an interesting tourist destination (Interview 2). Although not explicitly working with digitalisation in the attractive border- project in Svinesund, supporting the development of new business models should be a natural extension of the focus on digitalisation as a means for blue growth in the Svinesund region.

5 OECD 2018 defines Western Scandinavia as eight counties and cities along the coastline between Norway and Sweden.

evidence to the two respective governments that what is good for the region is ultimately good for the country' (OECD, 2018: 118).

Finding methods for collaboration and increase the status of cross-border collaborations also through 'hard power' may be beneficial not only for the people and various industries and businesses in the area, but for both Norway and Sweden in general. Recognising the collective power through communication and concrete policies for a further integrated region may be necessary for ensuring an increasingly connected and dynamic Nordic region.

### **Workshops on digitalisation and blue growth in Svinesund**

Two workshops were hosted at Smart Innovation Norway in Halden in June 2018 and February 2019, with the aim to identify ways in which digitalisation may promote blue growth in the border region of Svinesund. Furthermore, the purpose of these workshops was to gather actors from across the marine value chain, from the directorates and re-

gional authorities, Interreg-partners, small and large marine businesses, with the aim of creating networks and links and inspiring knowledge-sharing across stakeholders. Digitalisation was the unifying agenda throughout both of the workshops: the focus was on rethinking innovation and growth through digitalisation from the starting point of the businesses and their customers' needs.

The workshops also sought to identify challenges connected particularly to the small marine industries to the Svinesund area. Table 3 (next page) highlights some of the most discussed themes and issues brought up during the group discussions.

The workshop resulted in a few collaborative efforts across the Swedish-Norwegian border. One of these is the collaboration between Disce AS and Marin Feed working on a pre-prototype for protecting mussels-farming from the common eider, a species of sea duck native to the area. According to the project leaders, the common eider is capable of eating up to 2 kg of mussels a day, leading to significant harvest losses – a challenge

*Workshop on digitalisation and blue growth at Smart Innovation Norway in Halden, Østfold. Picture: Ingela Skärström*



**Table 3. Barriers and counter-measures identified during the workshops in June 2018 and February 2019**

	<b>Politics &amp; Society</b>	<b>Organisation &amp; Society</b>	<b>Users, customers and consumers</b>
<b>Barriers</b>	<p><b>Regulations</b> lagging behind in Sweden prohibiting up-scaling businesses.</p> <p><b>Licences and the legal frameworks</b> need to be simplified and made more accessible. Better digital solutions on a national level.</p> <p><b>Digital infrastructure</b> (coverage) at sea needs to be better.</p> <p><b>Reliable systems</b></p>	<p><b>Traditional industry.</b> Difficult to change. Status quo prevails.</p> <p><b>Resources.</b> Particularly difficult for small businesses</p> <p><b>Practical value of digitalisation.</b> High initial costs.</p> <p><b>Knowledge of existing support functions and resources.</b></p> <p><b>Knowledge-sharing</b> among businesses need to be better</p> <p>Reaching <b>the new generation</b> of people wishing to work in marine industries in the Svinesund area</p>	<p><b>Resources</b> for training</p> <p><b>Defining the need</b> for digitalisation in marine and maritime industries: seeing opportunities</p> <p><b>Time</b> to devise digital strategies benefiting the customers and the business</p> <p><b>Culture.</b> Difficult to change</p> <p><b>Knowledge and understanding</b> digitalisation</p>
<b>Measures</b>	<p><b>Lobbying</b> for change through organisations</p> <p><b>Enhance knowledge</b> amongst key actors</p> <p><b>Presence of actors</b> in the field for understanding the nature of marine industries in Svinesund</p> <p><b>Common goals and definitions</b></p>	<p>Identifying <b>barriers</b> that can be <b>removed by technology</b></p> <p><b>Training</b> for digital competence and maturity</p> <p>Identifying the <b>relevance of digitalisation</b> for individual businesses</p>	<p><b>Communication between consumers, users and digitalisation experts</b> for identifying sustainable solutions</p> <p>Simplified <b>marketing tools</b></p> <p>Identify <b>new digital markets</b></p>

recognised both along the Norwegian and the Swedish coast (Interview 6). The existing protection systems are costly, and the common eider recognises and adapts to these protection systems, thus the collaboration sought to identify a simpler and less costly solution based on digital methods and tools with the customer in mind. This project is both a testament to the possibility of solving common challenges through cross-border collaboration, but also a creative example of how technology can help actors in the marine industries.

The project also highlights the ways in which digitalisation is interpreted amongst different actors in the marine sector. Digitalisation figures as a concrete tool for carving out niches in the market by identifying the needs of the industry. However, bearing in mind the established actors in traditional aquaculture and marine industry, digitalisation should be considered primarily as a tool for simplifying working methods and expanding markets through closer and more dynamic customer-relations.

## 6. Key Findings

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This report set out to address the following research question: *'What role does digitalisation play in the context of business development and growth in the marine sector in the Svinesund area, and what factors enable or impede digitalisation as a means for blue growth?'* Supported by the following sub-questions:

*RQ1. What is the need of digitalisation for blue growth, and to this end: what is the role of Svinesund-area as a mega region?*

*RQ2. What are the existing support systems for digitalisation and innovation in blue businesses in Svinesund (regional and national level), and what is the role of cross-border collaboration?*

*RQ3. What are the challenges and opportunities of digitalisation in marine businesses in Svinesund?*

Based on the desk research and the empirical research undertaken for this report, it is evident that **digitalisation holds great potential for general business development in Svinesund**, leaning on regional and national support functions. These include Innovation Norway, SkatteFUNN and Västra Götaland's digitalisation agenda (Region Västra Götaland 2019b), as well as on institutes such as Smart Innovation Norway buttressing digital developments through consultative guidance, tax deductions, digital strategy development and financial support. Østfold and Västra Götaland are confirming the general trend of digitalisation approaches in the Nordic region (see further Randall and Berlina, 2019). Digitalisation is addressed in relation to areas such as skills development, security and public services, and in this case, most prominently in business development and growth (Workshop 2018, 2019; Randall and Berlina, 2019). **Digitalisation is a horizontal policy objective and is thus not directly concerned with particular sectoral businesses** on neither the regional nor the national level in neither Sweden nor Norway. It is a tool and a method for enabling growth through new or improved opportunities for companies, both in terms of product and service development and larger markets.

There are nevertheless some hurdles that limit the access to taking part in the digitalisation era in Svinesund. Firstly, although digitalisation is encouraged and supported in different ways at the regional level, the uptake of digitalisation as an integral part of a new business model highly **depends on the needs and willingness of the user to develop a digitalisation strategy** or to recognise which role digitalisation may play. Among the predominant impeding factors to digitalisation are thus challenges connected to people, echoing the findings in Randall and Berlina's report (2019). This may not only be due to **felt risks and reluctance** connected to using new digital tools, but also a **lack of time and resources** to learn about new tools or methods or devise new digital strategies. Connecting this to the regional and national level, businesses wishing to develop digital strategies may be supported by various national and regional funds, but the empirical findings in this report suggest that there are challenges connected to **reaching out to and mobilising marine businesses** in Østfold and a gap between the **ability to qualify for digitalisation support and the marine industries** in Västra Götaland.

Secondly, there are some challenges specifically connected to the marine industries and the uptake of digitalisation in the Svinesund area. These tend to be issues surrounding **regulatory issues** regarding **the potential of upscaling current marine business** or creating new business opportunities. Although this is not connected to the ability of the businesses to be part of the digitalisation mega-trend, the limits of the sector may easily overshadow efforts in making digitalisation a development priority. This was consistently voiced by all interviewees as one of the greatest hurdles to be overcome, and corresponds particularly to Sweden. With **regulations pertaining to marine industries lagging behind on the national level**, developing aquaculture industries such as land-based fish farming is difficult. The import of smolt from Norway for land-based fish farming in Sweden is a prime example wherein Swedish aquaculture regulations are informed and shaped by former methods and practices rather than new

technologies and developments. Moreover, marine policies on the national level tend to target the marine and maritime industries more generally, and the Skagerrak sea and its unique character is not considered or even mentioned in these national strategies. Due to some of these limitations, digitalisation is not necessarily on top of the agenda of marine sector workers and entrepreneurs in the area.

Thirdly, **digitalisation also requires good access to digital infrastructure.** Practices regarding the establishment of fibre optic cable infrastructure differ across Norway and Sweden and could create an unlevel playing field amongst regional business actors in the marine industries in the long term. It can be argued that access to internet becomes a question of equality and democracy, and further builds up under the relative resilience and attractiveness of rural and coastal areas potentially influencing the geographic structure. It may also further impact on the demographic balance.

Nevertheless, it is evident that there is **untapped potential resting in blue growth**, and that **digitalisation may help in catalysing this potential.** Digitalisation is part of the future business model, changing the dynamics in the industry – also in smaller segments of the marine sector. Finding new working methods becomes key, through the **knowledge-sharing across borders** between micro, small and medium sized businesses. Enabled by *Marine Border Forum Skagerrak* or the *Svinesund committee's* platforms and networks, knowledge-sharing

is an important component for demonstrating the scope of opportunities in digitalisation. Moreover, **demystifying digitalisation** is an important step in raising awareness around the potential of digitalisation. **Placing customer needs at the heart of the digitalisation strategy** is one way to make digitalisation feel more attainable for all businesses, echoing Randall and Berlina's (2019) finding that digitalisation is more about people than technology.

Seeing the Svinesund area as one mega-region is a key component in the effort to elevate the role of the Skagerrak sea and its products on the global market. It is important to emphasise the products, methods and practices into which the marine sector in this area is contributing. Identifying this niche and collaborating along the coast of Skagerrak to strengthen the Svinesund brand will be crucial for the marine businesses in this area in the years to come. Digitalisation in this context may become a vehicle for change and support blue growth, but only insofar that it is considered an integral part of the restructuring of old business models. Digitalisation may inherently be a bottom-up process, but the frameworks need to be in place to capitalise on its value added. It is up to the captain to navigate how digitalisation may contribute to wider impacts and enable blue growth, but it is up to the regional and national actors to ensure that the coast is clear: leveling the playing field for all actors by ensuring equal access and by lowering the threshold for participation, within and across the border.

# 7. Policy Recommendations

The following list presents the recommendations derived from the empirical and desk research conducted for the purpose of this report. The recom-

mendations that follow are targeted towards national policy makers in Sweden and Norway and regional actors in Svinesund.

## Policy recommendations for regional actors: Facilitating growth through digitalisation in marine SMEs in the Svinesund region

1	<b>Harmonise regulations.</b> This includes identifying and breaking down border barriers in relation to import and export, and help businesses by providing clear guidelines on reporting and taxation policies in the respective countries. (CUT data)
2	<b>Share data and information.</b> Finding means to share data that ensures safe and sustainable marine practices and aquaculture.
3	<b>Recognise the mega-region as one market.</b> Elevate the regional development potential through value creation and the exchange of goods and services across the border. This will help strengthening the stakeholders in the region.
4	<b>Elevate the Svinesund brand.</b> Create a unique Svinesund-brand by focusing on the unique products and services in the region.
5	<b>Ensure equal access to digital infrastructure.</b> Access to good internet is crucial for business development, but also for a more balanced regional profile.
6	<b>Raise awareness around digitalisation.</b> Digitalisation is a means and a method to simplify practices and revolutionise business models. Digitalisation helps placing the customer at the centre and ensure a more readily response to their needs.
7	<b>Ensure flexible support measures for digitalisation.</b> Identify barriers to entry for business support and create more targeted and more diverse methods for helping businesses develop digital strategies.
8	<b>Applaud 'learning processes'.</b> Highlight good cases of knowledge sharing and experiences in the border region or learn from others.
9	<b>Upgrade digital skills in SMEs.</b> Lift the opportunities and support functions that are in place for digitalising SMEs.

# References

- Carlberg, A., Wenblad, A., Lindegarth, S. and Hanning, A. (2012) Innovation and Development of the Maritime Clusters in Västra Götaland. Project plan. Available: [https://www.gu.se/digitalAssets/1378/1378432\\_5042\\_maritime\\_cluster\\_folder\\_eng.pdf](https://www.gu.se/digitalAssets/1378/1378432_5042_maritime_cluster_folder_eng.pdf) (Accessed: March 2019)
- Fiskeridirektoratet (2019) Fiskemantallet, available: [https://register.fiskeridir.no/fiskermanntallet/?m=utl\\_mant](https://register.fiskeridir.no/fiskermanntallet/?m=utl_mant)
- Government Offices of Sweden (2015) A Swedish Maritime Strategy – For people, jobs and the environment (En svensk maritime strategi – för människor, job och miljö). Available at: <https://www.regeringen.se/contentassets/86a578f7a521469e9b6b8c62ac5aa128/maritim-strategi.pdf> (Accessed: 9<sup>th</sup> of April 2019).
- Government Offices of Sweden (2017) För ett hållbart digitaliserat Sverige – en digitaliseringsstrategi
- Government Offices of Sweden (2018) Regeringen genomför insatser för att stärka arbetet med digitalisering på regional nivå. Available at: <https://www.regeringen.se/pressmeddelanden/2018/07/regeringen-genomfor-insatser-for-att-starka-arbetet-med-digitalisering-pa-regional-niva/> (accessed: March 2019)
- Havs- och vattenmyndigheten (2018) Havs- och vattenmyndighetens rapport 2018:11: Uppföljning av den maritima strategin Redovisning Regeringsuppdrag N2017/02641/MRT. Available at: <https://www.havochvatten.se/download/18.4fb25a86161d5b963fc42aea/1520601737669/rapport-2018-11-uppfoljning-maritima-strategin.pdf> (Accessed: 9<sup>th</sup> of April 2019)
- Innovation Norway (2018) Omstillingsmotor: Digitalisering. Available: <https://www.innovasjon Norge.no/no/tjenester/innovasjon-og-utvikling/samarbeid-klynger-nettverk/omstillingsmotor-digitalisering/> (Accessed: March 2019)
- Interreg Sverige-Norge (2017) Fremtiden er blå i Svinesundsregionen.
- Interreg Sverige- Norge (2019) Om Marint Grenseforum Skagerrak. Available: <https://info.ostfoldfk.no/om-marint-grenseforum-skagerrak?hsCtaTracking=a4d0758e-1c35-487a-9509-1466b8849632%7Ce170bd8f-a3f1-46ce-b19a-480fe4e61201><https://blogg.ostfoldfk.no/produktivt-skagerrak> (Accessed: March 2019)
- Jordbruksverket (2018) Det här gäller när du för fiskar och andra vattenbruksdjur till Sverige. Available: <http://www.jordbruksverket.se/arnesomraden/djur/resorochtransporter/fiskarochandravattenbruksdjur/fiskarochandravattenbruksdjurinforse1.4.7a446fa211f3c824a0e8000171706.html> (Accessed: Feb 2019)
- Jordbruksverket (2019) Stöd till bredbandsutbyggnad, available: <http://www.jordbruksverket.se/arnesomraden/stod/stodilandsbygdsprogrammet/bredband.4.37e9ac46144f41921cd2c761.html> (Accessed: April 2019)
- Ministry of Trade and Fisheries (2015) Maritime muligheter – blå vekst for grønn fremtid Regjeringens maritime strategi. Available: [https://www.regjeringen.no/contentassets/05c0e04689cf4fc895398bf8814ab04c/maritim-strategi\\_web290515.pdf](https://www.regjeringen.no/contentassets/05c0e04689cf4fc895398bf8814ab04c/maritim-strategi_web290515.pdf) (Accessed: March 2019)
- Ministry of Trade and Fisheries (2017) *New Growth, Proud History. The Norwegian Government's Ocean Strategy* (Accessed: March 2019)
- Ministry of Trade, Industry and Fisheries (2017) White Paper 27 (2016–2017): The Industry – Greener, Smarter and Creative.
- Ministry of Trade, Industry and Fisheries (2019) Blue opportunities – the government's updated ocean strategy. Available: [https://www.regjeringen.no/globalassets/departmentene/nfd/dokumenter/strategier/nfd\\_havstrategi\\_2019\\_norsk.pdf](https://www.regjeringen.no/globalassets/departmentene/nfd/dokumenter/strategier/nfd_havstrategi_2019_norsk.pdf) (Accessed: June 2019).
- Ministry of Foreign Affairs (2016) White paper 22 (2016-2017) The ocean as part of foreign affairs and development policies. Available: <https://www.regjeringen.no/contentassets/1b21c0734b5042e489c24234e9927b73/no/pdfs/stm201620170022000dddpdfs.pdf>
- Ministry of Local Government and Modernisation (2018) Digitaliseringsrådet. Available: <https://www.regjeringen.no/no/dep/kmd/org/styrer->

- rad-og-utvalg/digitaliseringsradet/id2472347/ (Accessed: Jan 2019)
- OECD (2018), *OECD Territorial Reviews: The Megaregion of Western Scandinavia*, OECD Territorial Reviews, OECD Publishing, Paris, <https://doi.org/10.1787/9789264290679-en>.
- Randall, L., & Berlina, A. (2019). Governing the digital transition in Nordic Regions: The human element.
- Region Västra Götaland (2008) Maritim strategi för Västra Götaland. Available: [http://www2.vgregion.se/upload/Regionutveckling/Naringsliv/Maritimt/Rapport\\_Maritim\\_strategi.pdf](http://www2.vgregion.se/upload/Regionutveckling/Naringsliv/Maritimt/Rapport_Maritim_strategi.pdf)
- Region Västra Götaland (2013) Västra Götaland 2020. Available: <https://alfresco.vgregion.se/alfresco/service/vgr/storage/node/content/28389/V%C3%A4sta%20G%C3%B6taland%202020%20-%20strategi%20f%C3%B6r%20tillv%C3%A4xt%20och%20utveckling.pdf?a=false&guest=true> (Accessed: Jan 2019)
- Region Västra Götaland (2015a) Digital agenda: Digital Handlingsplan. Available: [https://www.vgregion.se/siteassets/vgregion.se/regional-utveckling/projekt\\_ru/digitalagenda/digitalagendahandlingsplan.pdf](https://www.vgregion.se/siteassets/vgregion.se/regional-utveckling/projekt_ru/digitalagenda/digitalagendahandlingsplan.pdf)
- Region Västra Götaland (2015b) Maritim strategi för Västra Götaland. Available: <https://alfresco.vgregion.se/alfresco/service/vgr/storage/node/content/28336/Maritim%20strategi%20f%C3%B6r%20V%C3%A4stra%20G%C3%B6taland.pdf?a=false&guest=true>
- Region Västra Götaland (2015c) Smart Region Västra Götaland: Enklare, öppnare, effektivare och hållbar. Available: [http://www2.vgregion.se/upload/Regionutveckling/Infrastruktur-IT/DigitalAgenda/Handlingsplan\\_DA\\_10%20sept.pdf](http://www2.vgregion.se/upload/Regionutveckling/Infrastruktur-IT/DigitalAgenda/Handlingsplan_DA_10%20sept.pdf) (Accessed Jan 2019)
- Region Västra Götaland (2016) Handlingsprogram för hållbara maritima näringar. Available: <https://alfresco.vgregion.se/alfresco/service/vgr/storage/node/content/workspace/SpacesStore/b83f10a6-f1b9-4598-9162-95da31b4aadf/Handlingsprogram%20f%C3%B6r%20h%C3%A5llbara%20maritima%20n%C3%A4ringar%202016-2019.pdf?a=false&guest=true>
- Region Västra Götaland (2018a) Bredbandstrategi 2.1 Västra Götalands län. Bredband där du bor, verkar och vistas. Available: <https://alfresco.vgregion.se/alfresco/service/vgr/storage/node/content/workspace/SpacesStore/9246c968-a9ae-4d11-9623-39ac18f44041/VGR%20bredbandsstrategi%202.1,%20rev%201.0.pdf?a=false&guest=true>
- Region Västra Götaland (2018b) Bredband i Västra Götaland. Mål och Strategier. Available: <https://www.vgregion.se/regional-utveckling/verksamhetsomraden/digitalisering/bredband/mal-och-strategier/> (Accessed: March 2019)
- Region Västra Götaland (2019a) Statistikdatabas Västra Götalandsregionen. Anställda 16-64 år med arbetsplats i regionen (dagbefolkning), 2014- efter tid, region, kön och yrke (SSYK 2012). Available: [http://pxwebb2017.vgregion.se/PXWeb/pxweb/sv/Arbetsmarknad%20och%20N%C3%A4ringsliv/Arbetsmarknad%20och%20N%C3%A4ringsliv\\_\\_Yrke/yrke\\_2014.px/table/tableViewLayout1/?rxid=41618624-9d6b-4d14-8dcd-b9f3e48cb1ab](http://pxwebb2017.vgregion.se/PXWeb/pxweb/sv/Arbetsmarknad%20och%20N%C3%A4ringsliv/Arbetsmarknad%20och%20N%C3%A4ringsliv__Yrke/yrke_2014.px/table/tableViewLayout1/?rxid=41618624-9d6b-4d14-8dcd-b9f3e48cb1ab)
- Region Västra Götaland (2019b) Digital agenda: Arbetsgrupp. Available: <https://www.vgregion.se/regional-utveckling/verksamhetsomraden/digitalisering/digital-agenda/arbetsgrupp/>
- Region Västra Götaland (2019c) Digitalisering. Available: <https://www.vgregion.se/regional-utveckling/verksamhetsomraden/naringsliv/foretagsfinansiering/digitalisering/> (Accessed: Feb 2019)
- Research Council of Norway and Norwegian Tax Authority (2019) SkatteFUNN, available: <https://www.skattefunn.no/siteassets/skattefunn-2018.pdf>
- Research Council of Norway (2012) *R&D strategy for an ocean nation of great dimension*. Available: <https://www.forskningsradet.no/globalassets/publikasjoner/1253983223753.pdf> (Accessed: April 2019)
- Royal Norwegian Society of Sciences and Letters & Norwegian Academy of Technological Sciences (2012) *Value creation based on productive oceans 2050*. Available: [https://www.sintef.no/globalassets/upload/fiskeri\\_og\\_havbruk/publikasjoner/verdiskaping-basert-pa-produktive-hav-i-2050.pdf](https://www.sintef.no/globalassets/upload/fiskeri_og_havbruk/publikasjoner/verdiskaping-basert-pa-produktive-hav-i-2050.pdf) (Accessed: Feb 2019)
- S3 Plattform (2018) Västra Götaland County. Available: <http://s3plattform.jrc.ec.europa.eu/regions/SE232/tags/SE232>

- S3 Platform (2019) Østfold County.  
Available: [http://s3platform.jrc.ec.europa.eu/map?p\\_p\\_id=captargmap\\_WAR\\_CapTargMapportlet&\\_captargmap\\_WAR\\_CapTargMapportlet\\_non-eu-country=true&\\_captargmap\\_WAR\\_CapTargMapportlet\\_non-eu-region=true&\\_captargmap\\_WAR\\_CapTargMapportlet\\_regionids=734](http://s3platform.jrc.ec.europa.eu/map?p_p_id=captargmap_WAR_CapTargMapportlet&_captargmap_WAR_CapTargMapportlet_non-eu-country=true&_captargmap_WAR_CapTargMapportlet_non-eu-region=true&_captargmap_WAR_CapTargMapportlet_regionids=734)
- Statistics Norway (2018) KOSTRA Østfold  
<https://www.ssb.no/kommunefakta/kostra/ostfold/befolkningsprofil>
- Steinset, Trond A. (2019) Kven er yrkesfiskaren – og kva tener han? Available: <https://www.ssb.no/jord-skog-jakt-og-fiskeri/artikler-og-publikasjoner/kven-er-yrkesfiskaren-og-kva-tener-han> (Accessed: April 2019)
- Svinesundskommittén (n.d.) Om oss. Available: <https://svinesundskommitten.com/om-oss/> (Accessed: Jan 2019)
- Svinesundskommittén (2018) Hållbar turism i attraktivt område, available: <https://svinesundskommitten.com/turism/> (Accessed: April 2019)
- Svinesundskommittén (2019) Grön tillväxt trä – rethinking wood, available: <https://svinesundskommitten.com/grontillvaxt/gron-tillvaxt-tra/>
- Havs- och vattenmyndigheten SwAM (2017) <https://www.havochvatten.se/download/18.1dabe62016240ece6c551ff0/1521632455473/summary-marine-strategy.pdf>
- TekFisk (2018) Nyttan av digitalisering i marin og maritim sektor. Article by Uksnøy, W. Available: <https://fiskeribladet.no/teknisk/nyheter/?artikkel=63460> (Accessed: December 2018)
- Teräs, J., Salenius, V., Fagerlund, L., & Stanionyte, L. (2018). *Smart Specialisation in Sparsely Populated European Arctic Regions* (No. JRC114273). Joint Research Centre (Seville site).
- Viken County (2018) Digitalisering, samhandling og innovasjon. Utredning. Powerpoint. Available: [https://www.ostfoldfk.no/\\_f/p1/i978311c6-e867-410a-8476-29024104d2ef/utredning-viken-digitalisering-og-samhandling-powerpoint\\_kopi1.pptx](https://www.ostfoldfk.no/_f/p1/i978311c6-e867-410a-8476-29024104d2ef/utredning-viken-digitalisering-og-samhandling-powerpoint_kopi1.pptx)
- Västfiber (n.d.) Om oss. Available: <https://www.vastfiber.se/om-oss/> (Accessed: March 2019)
- Østfold Fylkeskommune (2016) Strategi for bioøkonomi i Østfold. Available: [https://www.ostfoldfk.no/\\_f/p1/ie8cc272f-bb7a-4e44-bed9-ee1ab19bdd45/strategi-for-biookonomi-september-2016.pdf](https://www.ostfoldfk.no/_f/p1/ie8cc272f-bb7a-4e44-bed9-ee1ab19bdd45/strategi-for-biookonomi-september-2016.pdf) (Accessed: March 2019)
- Østfold Fylkeskommune (2017) Regional plan for næringsutvikling, forskning og innovasjon i Østfold 2017-2021. Available: [https://www.ostfoldfk.no/\\_f/p1/i8aed43ec-983c-4990-9a2e-99f08e44b6ed/regional-plan-for-nfi-bilderogrammer.pdf](https://www.ostfoldfk.no/_f/p1/i8aed43ec-983c-4990-9a2e-99f08e44b6ed/regional-plan-for-nfi-bilderogrammer.pdf)
- Østfold Fylkeskommune (2018) <https://www.ostfoldfk.no/om-fylkeskommunen/om-ostfold/>

# Appendix 1

## Stakeholders consulted for the report\*:

\*Note that the interview number is randomised to preserve anonymity and does not correspond to the interview list provided alphabetically below.

- Bjørn Horten, Project leader, Department of Business Development, Østfold County/Marine Border Forum Skagerrak
- Fredrik Norén, R&D Manager, Marin Feed
- Ingela Skärström, Project leader in Business Development, Marin Border Forum Skagerrak/Svinesundskommittén
- Jessica Hjerpe Olausson, Senior Maritime Expert, Region Västra Götaland
- Kjell Reidar Mydske, Head of NCE Smart Energy Markets, Smart Innovation Norway
- Tore Hansen, Senior Advisor, Business Development Department, Østfold County
- Ulf Eriksson, Politician, Regional Council of Västra Götaland





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