WP 2: Building operational capacity for RIS3 implementation

GoA 2.3: Monitoring and Review System for Evaluating, Monitoring and Benchmarking Blue Growth

Smart Blue Regions
Main Output Report

Author:

PP01 Dr. Barbara Weig

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Content

LIST OF ABBREVIATIONS

AI	Artificial Intelligence
CIB	Centre for Industrial Biotechnology
EEK.SH	Competence Centre Renewable Energies and Climate Protection
EE.SH	Renewable Energies Cluster Schleswig-Holstein
ERDF	European Research and Development Fund
GDP	Gross Domestic Product
GMT	Gesellschaft für maritime Technologie (Society for Maritime Technology)
IB.SH	Investitionsbank Schleswig-Holstein
ITF.SH	Innovation and Technology Forum Schleswig-Holstein
ISIT	Institute for Silicon Technology
LSN	Life Science Nord (Cluster)
MCN	Maritime Cluster Northern Germany
MWVATT	Ministry of Economic Affairs, Transport, Employment, Technology and Tourism Schleswig-Holstein
NACE	Nomenclature statistique des activités économiques dans la Communauté Européenne (Classification of economic activities in the European Union)
OP ERDF	Operational Programme European Research and Development Fund
R&D	Research and Development
RIS3	Research and Innovation Strategy
SWOT	Strength, Weaknesses, Opportunities and Threats (Analysis)
VSM	Verband für Schiffbau und Meerestechnik (Association for Shipbuilding and Marine Technology)
WTSH	Business Development and Technology Transfer Corporation of Schleswig-Holstein

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1. Introduction

The project Smart Blue Regions, financed by the INTERREG Baltic Sea Region Programme, deals with Research and Innovation Strategies (RIS3) and Blue Growth. Both concepts are rooted in the Europe 2020 Strategy, endorsed in 2010. In times of economic crises, this strategy suggests a way towards growth by fostering smart, sustainable and inclusive growth (European Commission, 2010).

Shortly afterwards, the **blue growth** concept was introduced by the Directorate-General for Maritime Affairs and Fisheries (dg mare) as the maritime pillar of the Europe 2020 strategy. Blue growth is defined as "smart, sustainable and inclusive economic and employment growth from the oceans, seas and coasts" (ECORYS et al., 2012: 26). However, a clear definition of what is included in the blue growth concept is still under debate (European Parliament, 2014; Valetta Declaration, 2017). The European Commission fosters a rather narrow approach, limiting the concept of blue growth to the support of five small maritime sectors which are promising in terms of future innovations (European Commission, 2012). Other EU bodies (Committee of the Regions, 2013; European Economic and Social Committee, 2013) rather favour a more comprehensive understanding of blue growth, including all sectors related to the sea and focusing on synergies between those. Rather independent from this discussion, the partners of the Smart Blue Regions project decided to focus on three different blue fields: 1. machinery & technology; 2. energy; 3. lifesciences & blue medicine.

The starting point of the **RIS3** process was the decision of the European Commission to request RIS3 documents as an ex ante conditionality for ERDF funding in priority axis 1 for the programme period 2014-2020. The RIS3 process is based on the concept of smart specialisation, introduced by Dominique Foray and his working group at the École Polytechnique Fédérale de Lausanne to the European Commission. The main intention behind this concept is to use funding sources for innovation projects in a targeted way by focusing on a limited number of cautiously chosen specialisation fields. Those specialisation fields are supposed to reflect the innovative potential of the region as well as regional comparative advantages. In addition, those specialisation fields, elaborated within a participatory entrepreneurial discovery process, should show related variety among themselves. That means that cross-innovations driven forward by actors from different specialisation fields should be realistic and probable (Foray, 2015). The theoretical concept was transformed in an ex ante conditionality for all regions receiving ERDF funding within priority axis 1: Support of the regional innovation potential.

Both concepts – RIS3 and blue growth – are not easy to implement. A new way of thinking outside the common boxes and a lot of cross-sectoral cooperation is needed. Thus an exchange between different regions, as intended by the Smart Blue Regions project, is helpful. To learn from each other and to exchange best practice cases, is an appropriate way

forward to take up new challenges and opportunities regions are facing. In order to bring those two concepts together, the project is committed to delivering a monitoring and review system for evaluating, monitoring and benchmarking blue growth in RIS3. A general monitoring and evaluation system is obligatory within the RIS3 process and part of each strategy. A specific focus on sectors or concepts like blue growth, however, is not foreseen and, therefore, non-existent.

Monitoring is a means to keep track of the developments within prioritised areas. The aim is to compare the real development with the aims, indicated in the strategy. Monitoring is not about meeting target values after a specific period of time, it is about the question, if a certain development goes in the right direction or not. Within the RIS3 process, monitoring is supposed to be secured through ongoing dialogues with stakeholders. Generally, monitoring is a pre-condition for conducting any meaningful evaluation. In contrast to the ongoing monitoring process, an **evaluation** is conducted after a certain period of time. The aim is to check, whether target values are reached or not. Based on the evaluation the strategy can be updated. **Benchmarking** in turn refers to the comparison of experiences and results with other regions. It aims in transfering good practices (GIANELLE & KLEIBRINK, 2015; NAVARRO ET AL., 2014; SCARPA, 2012; TECHNOPOLIS GROUP & MIOIR, 2012).

While developing a monitoring and review scheme for blue growth in RIS3, three main obstacles appeared:

- First, the regions participating in the Smart Blue Regions project differ in many aspects. Differences appear not only regarding the status of their RIS3 process, but also in their understanding of smart specialisation and blue growth, their possibilities in influencing the processes and in the availability of data. This finding led to the decision to design a rather flexible modularised monitoring and review scheme. The developed scheme can be used as a whole or in parts, depending on the respective needs. Despite the effort to design a flexible scheme, useful for all regions, Schleswig-Holstein (SH) was the only partner region willing to test this monitoring scheme.
- Second, it appeared to be difficult to grasp blue growth in general and especially to find specific enough statistics. Blue growth is no accepted category. Several definitions exist. In official statistics, there are no pure ”blue” categories. However, to conduct a high quality quantitative evaluation, existing statistical data are a prerequisite. Values from the starting date are usually compared to the values at the time of evaluation. If no data from the starting date is available, this method cannot be applied. To avoid the problem of missing data, a rather qualitative approach with some quantitative elements – whenever possible – was developed.

- A third problem is subject to all approaches of evaluation or monitoring. Statistical data and time series can only give information on the change process of values. It is difficult, however, to identify the factors influencing this process. In most cases a complex mesh of factors stands behind every process. An answer to the question whether the RIS3 positively influences blue growth or not will always be based on assumptions and estimations. This is another argument in favour of a mixed approach with a large share of qualitative methods. Applying qualitative methods enables collecting and analysing the perception of stakeholders among other facts. In combination with quantitative methods, this is a reasonable approach to evaluate and update processes. However, qualitative methods are quite time-consuming. For this reason, existing monitoring advices, such as the Innovation and Technology Forum Schleswig-Holstein and cooperations with the Maritime Cluster Northern Germany as well as with other INTERREG projects were used for testing the developed scheme in Schleswig-Holstein.

Due to those challenges, the developed scheme is rather following a monitoring approach. For a proper evaluation, the available statistics are not sophisticated enough and benchmarking is not possible without results from other regions to compare. The following report starts with a description of the general monitoring scheme for blue growth in RIS3, developed in the context of the Smart Blue Regions project. In chapter 3, the methods to implement this scheme are described, indicating their specific contribution to assess the RIS3 in terms of blue growth. Chapter 4 is dedicated to the case of Schleswig-Holstein. It is described, how the methods were applied in this case and which results were obtained. How can the RIS3 in SH be improved to better support blue growth? Recommendations on this question are given at the end of the chapter. Finally in chapter 5, the experiences in applying the monitoring scheme in Schleswig-Holstein are reflected and critically discussed. Finally, the report gives a short summary and conclusion.

2. RIS3 Monitoring and Review System for Blue Growth

The developed monitoring and review system for Blue Growth in RIS3 processes (see fig. 1) is built on two pillars: the blue growth economy in the respective region and the RIS3 including implementation measures (e.g. OP ERDF). The aim of the review process is to compare real characteristics, needs and developments of the blue growth sector with aims and priorities included in the RIS3 and its implementation programmes.

Four modules were identified as being crucial for analysis:

Module 1 deals with the question: **Does the RIS3 cover all important blue growth fields of the region?** To answer this question, it is important to know, which subfields of blue growth are present in the region. How important are they? How innovative are they? How do they develop and what is their potential for cross-innovations? On the other hand, an analysis of the RIS3 document is necessary to check, whether all important fields are covered by the specialisation fields nominated in the RIS3 document. In this case, not only the headlines but also the detailed descriptions of the specialisation fields provide important information.

Module 2 addresses the question: **Does the RIS3 foster important key-technologies and cross-innovation topics relevant for blue growth?** Within the RIS3 document, key-technologies and cross-innovation topics are named. This module aims in identifying important cross-innovation topics and key-technologies for the blue growth sectors of the region and to compare those with the indicated technologies and topics in the RIS3 document.

Module 3 concentrates on the question: **Does the RIS3 cover the needs of "blue" actors regarding smart specialisation topics?** In the RIS3 document different topics such as expansion of universities and other research institutes, support of institutions for knowledge and technology transfer or availability of skilled workers are nominated as important means to enhance the regional innovation process. The aim of this module is to compare the identified topics in the RIS3 documents with the specific needs of the blue growth actors. Are the most important needs of the blue growth sector covered by the regional innovation strategy?

Module 4 finally follows up with the implementation measures and raises the question: **Do the implementation measures meet the needs of the "blue" actors?** Without concrete measures to support innovation, the strategy would just be a list of wishes to come true. Therefore it is important to include the implementation measures into the monitoring scheme. Measures are not always directly part of the RIS3 document. Other programmes such as the OP ERDF need to be taken into account. Are the listed measures used by blue growth actors? Are blue growth actors successful in applications? Which measures are most suitable for blue growth actors? What are their constraints? What kind of measures would be important for blue growth actors, but are missing so far?

Answers to those four main questions and related sub-questions provide a picture of the current situation: does the RIS3 foster blue growth? Where are gaps to be filled? Which ideas exist among the actors to fill those and to improve the support of blue growth? However, it should be kept in mind that regional innovation strategies are NOT primarily in place to foster blue growth. They are meant to identify the region's most important innovation areas and to efficiently allocate innovation support. It needs to be discussed, whether blue growth is important for the region, if it is supported in a sufficient way or if improvement is needed. Results of the applied monitoring scheme provide a good basis for such discussion processes in the region.

To answer all the questions in a sound way, a multi-tools approach is recommended. Sufficient data for a pure statistical analysis is not available on the regional level and for specific "blue" subfields. A set of possible alternative methods will be presented and discussed in the next section. Depending on regional characteristics and opportunities, the presented tools can be combined in various ways.

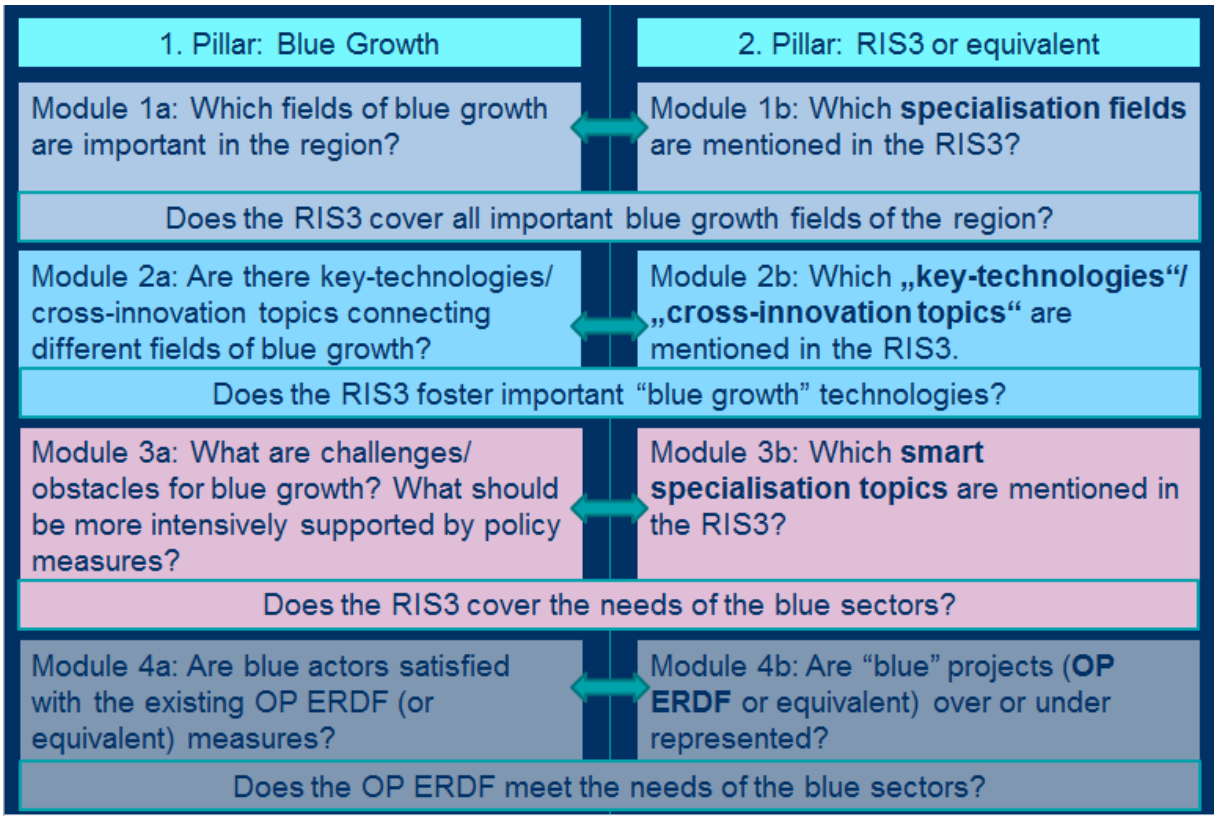

Figure 1: RIS3 Monitoring and Review System for Blue Growth

3. Methods/ Tools

Based on our experiences in the INTERREG project Smart Blue Regions, we decided to develop a flexible multi-tools approach. The chosen tools can be combined and used in a flexible way, depending on the regional situation, possibilities and aims. The mix of tools furthermore provides advantages, independent from regional differences. A mix of methods always avoids the risk of generating one-sided results. Consequently multi-tools approaches facilitate a broader acceptance. Different perspectives can be taken into account and finally be combined, to draw a detailed picture of the current situation.

In the following section, different qualitative and quantitative methods are described. Their specific contribution to give an answer on the guiding questions of the four modules is explained. Advantages and limitations of the respective methods are laid out. In chapter 4, the results of applying those methods to monitor the RIS3 in Schleswig-Holstein regarding blue growth are presented.

3.1. Document Analysis

To start with, for a proper monitoring of the RIS3 it is inevitable to have a close look at the strategy document itself. Furthermore the OP ERDF or other programmes providing implementation measures should be analysed. This method aims at getting a first overview of how much blue growth is included in the regional documents, and at detecting first gaps. Some guiding questions for each of the above described modules help to analyse the content in a structured and thus efficient way.

Module 1: Which specialisation fields are mentioned in the RIS3 document? How are they described? This second question leads to an important aspect: the name of the specialisation field alone does not always allow for capturing the whole range. Are blue aspects directly or indirectly mentioned in the description of the specialisation fields? Is there a clearly blue oriented specialisation field? The list of blue growth fields mentioned in the specialisation fields can later be compared to the real importance of those fields in the region, using other methods such as statistical analyses or questionnaires.

Module 2: Which key-technologies and which cross-technologies are mentioned in the respective RIS3 document? In which context are they mentioned? Are they connected with blue growth topics? In a further step, the identified technologies can be analysed according to their relevance for blue growth using other methods such as questionnaires, interviews and workshops.

Module 3: Which smart specialisation topics are listed in the RIS3? How are they described and justified? Is there any direct connection to blue growth mentioned? In a next step, the

identified topics can be evaluated by blue growth actors using a questionnaire, to compare their needs with the focus of the strategy.

Module 4: Which measures exist to implement the aims formulated in the RIS3 document? In some cases, measures might be included in the RIS3 document in other cases additional programmes (e.g. OP ERDF) provide measures to be used for implementing innovation policies. Therefore it is important to analyse the available measures. Which measures are listed and how are they described? Are there specific measures for blue growth? If not, it does not mean, that they are not suitable to support blue growth. Further analyses are recommended. How intensive do blue growth actors use the available measures? Are blue actors successful in applications? Which measures are used most by blue actors and why? Are there challenges of the blue sector that are not yet covered by existing measures? These questions can be answered by analysing lists of accepted projects or by using questionnaires, interviews or stakeholder workshops.

In general the document analysis should be done first to get an overview. However this method leaves a lot of unanswered questions. It cannot identify the needs and opinions of the actors themselves. The aims and visions indicated in the RIS3 document do not tell what really happens. Most RIS3 documents do not deal with the topic of blue growth specifically. Additional methods for analysis are necessary to find out more about the relationship between RIS3 and blue growth.

3.2. Statistical (Blue Growth) Analysis

Existing official statistics usually do not use the category blue economy or blue growth. They rather follow a sectoral approach, often a quite general one. There have been attempts to estimate blue growth from existing statistics (EUNETMAR, 2013), relating blue growth fields to statistical categories such as NACE codes. Some blue fields are spread over several statistical categories. Others however cannot at all be allocated in the NACE system (e.g. blue biotechnology, offshore wind, ocean renewable energy or carbon capture and storage (EUNETMAR, 2013: 4)). The results of an analysis based on official statistics can thus only lead to estimates, which need to be interpreted carefully.

Another limitation is the regional scope of statistical data. Most detailed sector information is only available on a broad geographical scale, such as the national level. To monitor and review the development of blue growth with regard to the RIS3 process, regional data is needed. On this level, the availability of official data is limited and estimates get even fuzzier.

Other sources to be used are studies conducted on blue growth in the respective region. If such studies are available they should definitely be used for analysis. Otherwise estimates or questionnaires need to replace missing statistical data.

Module 1: For module 1, any available data on blue growth activities is highly relevant. To evaluate if the blue economy is reasonably included in the RIS3, any evidence on how the blue economy in the region looks like and which actors are present, is necessary. Guiding questions might be: Which blue growth fields are most important in the region, concerning innovation, growth, employment, GDP? How did they develop in recent years? Did new, promising fields arise recently? Information on the blue economy within the region should then be discussed in relation to its importance within the RIS3. Does the RIS3 cover all important blue growth fields of the region?

Module 4: Another option to use statistical analyses is module 4. A quantitative analysis of existing lists of approved projects gives an impression of how measures are used by blue actors. Does the share of blue projects match the share of the blue economy within the region? Which measures are primarily used by blue actors? If data is available the number of applications can be compared with the number of accepted projects, to find out if the share of successful blue projects is on average. However, the challenge concerning this endeavour is to clearly identify blue projects. Furthermore the result does not say anything on the rationale behind. Why do blue actors apply or not for specific measures? Are the measures suitable or not? Which are obstacles or challenges for the blue economy to benefit from the existing measures? Other methods such as questionnaires, interviews or workshops are needed to fill those gaps.

3.3. Questionnaire

A questionnaire is particularly suitable to query opinions, needs and ideas of a large number of stakeholders. Its advantage is that this method allows for anonymous answers. This might in the best case lead to more honest answers, because the interviewee feels free. However, the interviewee can also exploit the unobserved situation and not take the questionnaire serious or easily ignore the request. Low response rates are a common problem of studies using questionnaires. If the survey is successful and there are enough participants, the large number of answers results in reliable and representative data. However standardised questions and mostly also standardised answers are necessary to handle this method. This in turn reduces the depth of information that can be gathered.

Module 1: In case neither statistical data nor surveys on blue growth are available in the respective region, a questionnaire distributed among actors of blue sectors (e.g. via networks, clusters, associations or the chamber of commerce) can give an answer on the question: which blue fields are important in the region.

Module 2: A questionnaire is well suitable to address expert knowledge on current trends concerning key-technologies and cross-innovation themes. Experts can be asked about their currently planned projects.

Module 3: Regarding smart specialisation topics, a questionnaire is well placed to ask a large number of actors about their needs. The method for instance allows for a ranking of existing smart specialisation topic or the identification of gaps.

Module 4: A questionnaire also helps to learn about the needs of actors concerning measures. Which measures are used and why? What are obstacles for applying? Are there measures that are missing, but would be very helpful for the innovation process in blue growth?

The greatest challenge concerning questionnaires is to convince stakeholders to participate in such a survey. Filling out a questionnaire costs time and experts usually receive many questionnaires. Therefore it is helpful to use existing cluster or network structures. Members feel attached to and rely on them. Questionnaires might be online or printed on paper to be filled out and handed back.

3.4. Interviews/ SWOT Analysis

While questionnaires allow for getting a large number of answers, with a limited depth of information, interviews enable a small number of detailed and sophisticated in-depth answers. Interviews are time consuming for the interviewer, because thorough preparation, time for the interview itself and a non-standardised analysis and interpretation of the results is needed. For the addressed purpose of monitoring the RIS3 process with regard to blue growth, in depth interviews are most suitable to evaluate specific measures of the OP ERDF.

Module 4: The method of a SWOT Analysis helps to identify strengths, weaknesses, opportunities and threats of specific measures like clusters or competence centres. Interviews can be conducted with experts on different levels, such as measure owners, beneficiaries or individuals belonging to the respective target group. Comparing the detailed answers from different perspectives allows for drawing a precise picture of what goes right and what goes wrong. Based on the results, adjustments can be elaborated and suggestions formulated. Furthermore to analyse several measures using the same approach enables a comparison and benchmarking of different measures. Lessons learnt in one measure can also help to improve other measures.

3.5. Workshops

Workshops are the most direct, most interactive and most comprehensive method presented in this multi-tools approach. Bringing stakeholders together and make them think and exchange in a structured and moderated way can be a value-added if the following framework conditions are set.

The most important factor for success is the size and especially the composition of the group. The participants need to be involved in the topic and participants should represent different perspectives. The second challenge is the choice of topic. It has to be precise but not too

narrow. Some general knowledge on the topic is needed; missing information has to be provided at the beginning of the workshop. The time needed for discussion, depends on the topic and the prior knowledge of the participants. In some cases even several workshops with time in between to reflect and to gather information might be needed. Last but not least, the success of a workshop depends on the structured guidance of the moderator. An experienced moderator asking guiding questions, bringing discussions back on track and documenting the most important results is essential.

Workshops can be used to gather opinions and needs and to collect different perspectives but also to brainstorm on possible ways to improve the strategy. The method is well suitable to discover gaps and to let them be filled by ideas, provided by the stakeholders themselves. The method can contribute to all for modules.

Module 1: Concerning specialisation fields, workshops can be used to check if the chosen specialisation fields are still relevant. Did new fields for specialisation arise? Is an important field missing? Furthermore, the description of the specialisation fields and fields of potential within the specialisation fields can be discussed and updated, with the help of experts participating in the workshop. Visions and future scenarios within specialisation fields can be elaborated.

Module 2: Workshops can also be used to discuss innovative processes concerning key-technologies and cross-innovation topics. The discussion between experts from different fields enhances the exchange on current developments within and between different sectors. In this way, new trends can be detected and included in the RIS3.

Module 3: Workshops are also suitable to make an assessment of different smart specialisation topics. What are the most urgent needs of the stakeholders? Are they met by the smart specialisation topics chosen within the RIS3 or is an update necessary?

Module 4: Workshops can also be used to discuss the suitability of measures listed in the OP ERDF. Do the measures meet the needs of the actors? What are bottlenecks in application and approval of projects? Which solutions could solve the current problems?

4. Monitoring and Evaluating Blue Growth in RIS3 Schleswig-Holstein

Being responsible to put the RIS3 in place, the Ministry of Economic Affairs, Transport, Employment, Technology and Tourism (MWVATT) commissioned the consulting company *Prognos* to carry out the required process and to develop the strategy in cooperation with the Centre for Regional and Innovation Economics at the University of Bremen. *Prognos* organised a workshop, inviting all related groups of intermediaries and stakeholders/ beneficiaries. In addition, interviews were conducted with actors of the innovation system Schleswig-Holstein. Based on a SWOT analysis, a workshop and interviews, *Prognos* elaborated the current RIS3 document in close cooperation with the ministry. The strategy was then presented to the European Commission and accepted. On December 10th 2013, the cabinet of Schleswig-Holstein approved the innovation strategy (RIS3). It came into force just in time for the start of the ERDF funding period 2014-2020.

The RIS3 SH consists of six main chapters. The first part comprises a description of the innovation location Schleswig-Holstein, indicating potentials and challenges, elaborated by means of a SWOT analysis. In the second part, the five specialisation fields for innovation are presented and specific innovation potentials within each field are highlighted. The chosen specialisation fields are:

1. Maritime Economy;
2. Life Sciences;
3. Renewable Energies;
4. Food Industry;
5. Information and Communication Technologies and Media.

This choice is justified by the results of the former SWOT analysis. In the third part, a vision and guiding principles of the targeted innovation system are laid out. The vision of the RIS3 SH is:

> *"Schleswig-Holstein addresses the global challenges of climate change, energy transition and demographic change with innovative solutions and thus evolves to become one of the most important European drivers for innovation until 2020. Thereby Schleswig-Holstein ensures economic growth, attractive jobs as well as sustainable development."*

This vision is complemented by ten principle guidelines to enable a most effective implementation of the strategy. In the following, these guidelines are transformed into four main goals and nine strategic target fields. Those strategic target fields are further explained and substantiated in part 4 of the RIS3 SH. The fifth part covers the required monitoring scheme. The monitoring approach for RIS3 SH is built up on two pillars: the strategy controlling and the strategy review for a deeper assessment of innovation policy measures.

Several effect, result and output indicators are listed as possible guiding values. However, the listed indicators are general and not specific to any specialisation field. The sixth part finally deals with financing sources and governance structures supporting the RIS3 SH.

The importance of blue growth for Schleswig-Holstein is highly related to its location between the Baltic Sea and the North Sea. Schleswig-Holstein is home to some 2.8 million inhabitants and spans an area of almost 15,800 km². In the maritime sector, Schleswig-Holstein has 1,800[1] companies (16% of all companies), 42,000[2] employees (4.4% of all employees subject to social insurance) and an annual turnover of € 9.2 billion[3] (11% of the GDP). The core of the maritime economy consists of ship building companies and their supply industries. Other important blue fields are maritime logistics, boat and yacht building, offshore and underwater technologies, marine research, fisheries and aquaculture, marine biotechnology as well as hydrographic and other maritime services. The maritime economy is characterised by small and medium sized enterprises. Besides the business landscape Schleswig-Holstein hosts a variety of marine and coastal science and research institutes. The cluster organisation of the Maritime Cluster Northern Germany connects different maritime actors in Schleswig-Holstein and beyond. Blue growth is not only contained in the specialisation field "maritime economy". Due to cross innovations blue aspects can be found in all specialisation fields. Life Sciences include blue biotechnology for pharmaceutics and cosmetics. Food industry comprises aquaculture and blue biotechnology for food supplements. Renewable Energies includes offshore wind energy and information and communication technologies are among other applications also used for the equipment on modern vessels. Blue growth is thus not reduced to maritime economy as such; blue growth is divers and offers many possibilities for cross innovation in Schleswig-Holsten.

4.1. Procedure of monitoring Blue Growth in RIS3 SH

To implement the monitoring scheme for blue growth and the RIS3 SH, all methods described above in the multi-tools approach have been used. In the context of the **document analysis**, the RIS3 SH as well as the Operational Programme of Schleswig-Holsten for the European Regional Development Fund (OP ERDF) have been analysed as core documents. For the **statistical (blue growth) analysis**, sources such as the regional statistical office and the German national statistical office (destatis) have been checked for suitable data. Additionally, regional blue growth studies such as Dr. Hegenbart & Partner (2008) and Ministry of Economic Affairs, Employment, Transport and Technology of Land Schleswig-Holstein (2012, 2015) have been consulted.

[1] IHK Schleswig-Holstein
[2] IHK Schleswig-Holstein
[3] IHK Schleswig-Holstein

Additionally a **questionnaire** to be answered by all members of the Maritime Cluster Northern Germany (MCN) in Schleswig-Holsten has been established. The questionnaire was developed jointly by the regional MCN office in Schleswig-Holstein, the INTERREG Europe projects CLIPPER and MARIE as well as the INTERREG Baltic Sea Programme project Smart Blue Regions. This cooperation aimed at making use of synergies and avoiding double work for stakeholders, being addressed by different projects with different but similar questionnaires around the same time. Furthermore there was an overlapping interest in certain questions by all three projects. Including the MCN entailed the advantage of having direct access to the stakeholders. The cluster members know and rely on the cluster management. Trust and direct contact raise the probability of stakeholders to participate in the questionnaire. The questionnaire consists of 13 questions, most of them in form of closed questions with pre-given answers. For the online survey we used the services of "survey monkey"[4]. All members of the MCN Schleswig-Holstein were invited by email to fill out the online questionnaire. The questionnaire was open from September 19th until October 31st 2018. The response rate was 3%. Altogether only 5 members filled out the online questionnaire. This shows the difficulty of online questionnaires on one hand and leads on the other hand to the evidence, that the answers from the questionnaire cannot be considered representative. Nevertheless, they are included in this report to give a careful first insight. The respondents are from the fields of building ships and boats (1), transport and logistics (1), maritime services (2) and "others" (3). Two of the responding enterprises have up to ten employees while the other three companies are slightly bigger, with up to 50 employees. One of the enterprises is five or less years old, while the other four companies are older than ten years. One of the responding enterprises indicated that research and development is a core issue of its business. Two other companies ticked the box, "yes there are some R&D activities going on in our company. One responding enterprise answered, that no research and development is taking place and one respondent skipped this question. This leads to the conclusion that the participating enterprises are at least quite divers, representing different groups within the maritime cluster.

Furthermore, **qualitative interviews** were conducted to analyse the strengths and weaknesses of certain measures, such as clusters and competence centres. These two measures of the OP ERDF are quite established and offer a variety of benefits for blue actors. The interviews have been conducted with three groups of interviewees. First the owners of the measures, without exception ministry employees, have been asked individually about their perception of the strengths, weaknesses, opportunities and threads (SWOT) of the different clusters and competence centres in Schleswig-Holstein. In addition some questions with regard to blue growth have been asked: Is this measure appropriate to enhance blue growth, or are other

[4] https://www.surveymonkey.de/

measures more suitable? How important is blue growth for Schleswig-Holsten and how could it best be supported? Those interviews were conducted in form of face-to-face interviews. In a second step, beneficiaries of the measures, in other words cluster managers and directors of competence centres, have been interviewed, using the same guiding questions. Some of those interviews have been conducted face-to-face, others by phone, depending on the availability and location of the interviewees. In a third step, members of the Maritime Cluster Northern Germany were interviewed, regarding their perception of strengths and weaknesses of the cluster. The MCN was chosen exemplarily because all its members are blue growth actors. The addressed and interviewed enterprises were suggested by the cluster manager of the MCN.

Last but not least, a **stakeholder workshop** was used to assess the RIS3 SH in terms of blue growth. For this workshop, the Innovation and Technology Forum Schleswig-Holstein (ITF.SH) has been used. This forum is integral part of the RIS3 process in Schleswig-Holsten. It is an event format, intended to take place twice a year. The ITF.SH is jointly organized by the respective ministries for economic affairs and science, depending on the current allocation of those topics among the ministries. The forum addresses a great variety of participants with different backgrounds, interested in shaping the innovation process in Schleswig-Holstein. The majority of the participants are from universities, universities of applied sciences, research institutes and different intermediaries. Enterprises are invited as well, but do not participate as numerous as expected and desired by the organisers. The 3rd ITF.SH took place on May 2nd 2018 and included parallel workshops for each specialisation field. The workshops were run by cluster managers or other experts of the respective fields. All workshops were structured the same way. It was intended to work on the following guiding questions: Do the five specialisation fields cover the strengths of Schleswig-Holstein in an appropriate way? Which aspects within the specialisation fields need more attention? Which topics could be fruitful fields of cross-innovation, connecting different specialisation fields?

In the following section, results from all methods are gathered and structured according to the four modules of the monitoring scheme. The section ends with recommendations on how to improve the RIS3 SH to better support blue growth. In the subsequent section, the used methods and tools are critically reflected. What went well, what could be improved next time when assessing the RIS3 SH in the context of blue growth?

4.2. Results of the monitoring process

4.2.1. Specialisation Fields

Document Analysis RIS3

Even though the term "blue growth" or "blue economy" is not mentioned in the RIS3 SH, blue sectors and technologies are prominent throughout the strategy and spread across all specialisation fields. The most important specialisation field with regard to blue growth is "maritime economy". All mentioned activities, technologies and future potentials of this specialisation field are blue. The core industries of this specialisation field are **specialised shipyards and their suppliers**. Additionally **maritime logistics** (**shipping, ports, Kiel Canal**), **boat and yacht building**, **offshore and underwater technologies**, **marine sciences and natural resources**, **fisheries and mariculture**, **hydrography**, **hydraulic constructions** and **maritime services** are mentioned as important activities in the maritime economy of Schleswig-Holstein. Ports are highlighted as important infrastructure for the development of not only the maritime economy but also for energy transition.

Research and development (R&D) is particularly significant in the fields of **marine technologies for offshore energies**, **maritime environmental technologies** and **polar technologies**. Another maritime field of high-tech in Schleswig-Holstein is **special shipbuilding** (cruise ships, mega yachts and submarine boats). Research institutes and universities are specialised in **shipbuilding, navigation** and **marine technologies,** as well as in **technologies for marine research**, **hydrography** and **marine biotechnology**. Business support structures in the context of maritime economy comprise the Maritime Cluster Northern Germany (MCN), the National Competence Centre Marine Aquaculture as well as the former competence centre for marine biotechnology, today part of the GEOMAR Institute (GEOMAR Biotech). Regarding the MCN, cooperation with other northern German states is highlighted.

Future development paths are detected primarily in **marine technology** (**deep-sea exploration**), **specialised shipbuilding**, **offshore energies** (wind, oil, gas) and **marine biotechnologies**. Further potential is seen for the **ports** to develop as production and installation/ service ports for the offshore wind industry. LNG is seen as future potential in the shipping industry to reduce sulphur emissions. Ports are asked to invest in this new technology to be used by the shipping industry. But also the growing cruise shipping industry is seen as a driver of port development.

Derived from this description and analysis the authors of the RIS3 SH come to the conclusion that core competences in Schleswig-Holstein are on the business side mainly in shipbuilding, suppliers, marine technologies, maritime environmental technologies, polar technology and marine aquaculture, including marine biotechnology. On the science side, competences are

highest in blue biotechnology, aquaculture, circular economy and the extraction of mineral resources. Based on those findings, future topics for the specialisation field maritime economy are derived: technology for marine research, aquaculture, marine mining and gas hydrates.

The specialisation field "life sciences" is based on two pillars: medical technologies and biotechnology/ pharma. While the first one does not include blue sectors, the second comprises blue aspects, such as **fisheries, aquaculture and marine biotechnology**. Research on algae for fighting against cancer is just one example of specialisation in Schleswig-Holstein. While the description of the specialisation field life science focuses on non-blue aspects, the paragraph on development potential is exclusively based on maritime biotechnology for food, pharma, cosmetics and energy production. There seems to be a logical break within the description of this specialisation field.

The specialisation field "renewable energies" is based on three main topics: wind energy, energetic biomass production and energy distribution & storage. Blue economy is represented by **offshore wind energy**. In this regard, the RIS3 SH states that in case, the important offshore wind ports in Bremerhaven and Lower Saxony get to their limits, ports in Schleswig-Holstein are ready to serve as offshore wind hubs. However, in the following, the description of the specialisation field focuses on key technologies such as nanotechnologies and power electronics and their various fields of application. The topic of renewable energies is not taken up directly any more, which gives the impression of another logical break, in the description of this specialisation field.

The specialisation field "food industry" refers to **fisheries** as one of its core fields. Later on **aquaculture and marine biotechnology** are mentioned as well, but only in terms of relevant business support organisations for this specialisation field. Again the description of the specialisation field is not stringent in all parts.

The specialisation field "information and communication technologies & media" rather represents a cross-sectional topic. With regard to blue growth, the application of ICT for **maritime IT**, software for **offshore wind** farms and smart grids are mentioned. The RIS3 SH states, that ICT can be seen as a driver for energy and environmental technologies, shipbuilding and logistics. Developmental potential is seen among others in IT for ship's bridges and the online orientation of rotor blades in offshore wind farms.

To conclude, all five specialisation fields of the RIS3 SH contain blue aspects or at least are related to blue applications. A huge variety of blue fields and technologies are mentioned, often in several contexts. However surprisingly, the overview on page 89 of the RIS3 SH identifies potentials within the maritime economy that are not in line with the above listed potentials. It mentions: nanotechnology, materials and coatings, plant and process technologies, maritime IT, shipbuilding technologies and marine technologies. This summary

rather confuses the reader and stands exemplarily for the main criticism in terms of specialisation fields: the RIS3 SH shows several logical breaks. It does not become clear, what constitutes each specialisation field? What are key technologies? What are cross innovations? And which blue fields belong to which specialisation field? Some cross-topics are named specialisation fields (ICT) others are mentioned somewhere in the long strategy document but are not elaborated further. Fields identified as important development paths for the future at the beginning of the chapter are not the same as those named in the summary. And what is the role of basic sectors such as tourism, logistics and engineering, suddenly appearing on page 89 in the overview? In some parts, future challenges to be addressed according to the general vision are taken up, but not always. Same applies to applications of specific technologies. The lists of applications seem rather random and neither exhaustive nor based on a profound selection. Different terms like growth potential (Entwicklungspotential), future growth paths (Wachstumspfade für die Zukunft), competency profile (Kompetenzprofil), key technologies (Schlüsseltechnologien), specific innovation potential (spezifische Innovationspotenziale) are used and each filled with a long list of repetitively named technologies and subfields belonging to the respective specialisation field. The ordinary reader however does not understand the difference between those terms. The RIS3 SH lacks a consistent and logically transparent approach in terms of elaborating the specialisation fields. Instead, aspects are mentioned in a seemingly random way. This impression will be underlined by the results of the workshop.

National and regional statistics

Public national and regional statistics only cover selected blue fields. The statistical office for Schleswig-Holstein (Statistikamt Nord) for instance provides data on tourism and shipping. In tourism, the number of accommodations in Schleswig-Holstein decreased between 2014 and 2017 (from 4.256 to 4.005) while the number of offered beds increased in the same timeframe (from 175.426 to 182.393). This indicates an increase of size regarding accommodation services. The arrivals of tourists in Schleswig-Holstein increased from year to year (see fig. 2), starting with 6.8 Mio. arrivals in 2014 up to 7.7 Mio. arrivals in 2017 (Statistikamt Nord, 2018). This results in an average yearly growth rate of 5.2%. Concerning the development of overnight stays, the average yearly growth rate is only slightly lower, with 4.8%. The occupancy rate of offered beds increased from 39.7% in 2014 to 42.2% in 2017. Tourism is not (yet) included in the RIS3 SH. However tourism and especially coastal tourism is an important and growing economic sector in Schleswig-Holstein.

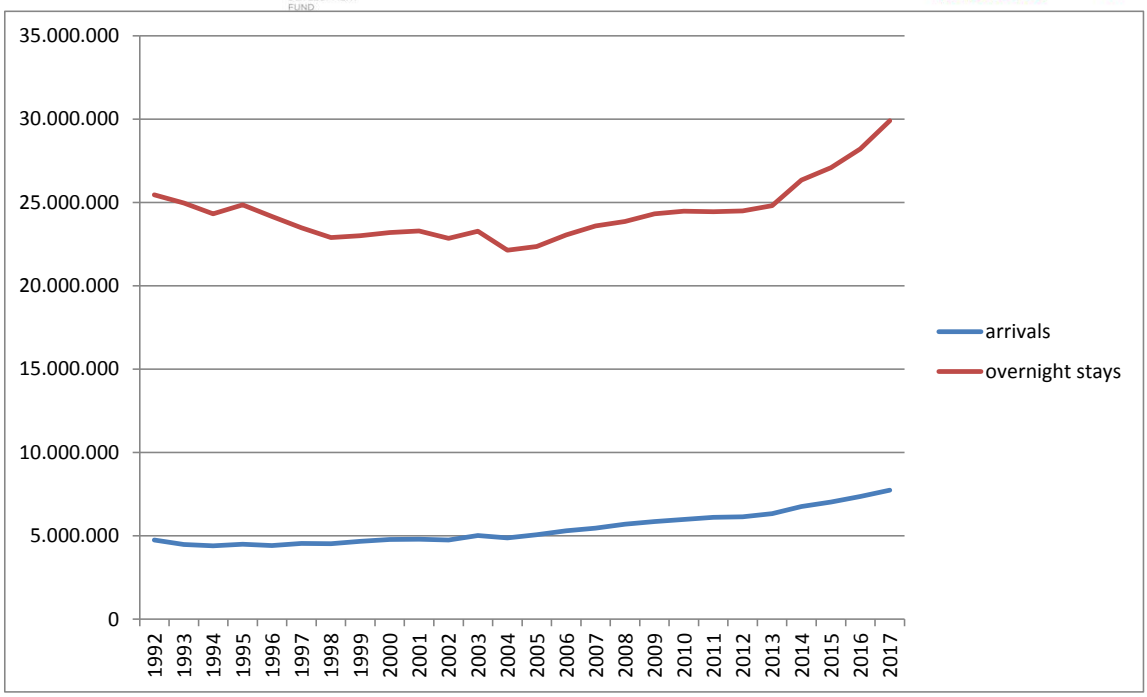

Figure 2: Development of arrivals and overnight stays in Schleswig-Holstein from 1992-2017 (source of data: Statistikamt Nord and DESTATIS)

The amount of goods shipped via ports in Schleswig-Holstein decreased from 2014 (36 Mio. tonnes) to 2015 (35 Mio. tonnes) and increased in the two following years up to 38 Mio. tonnes in 2017. However this development is not the same in all ports. While in some ports the amount of goods handled increased by more than 10% between 2015 and 2016 (Kiel and Puttgarden), other ports registered losses of 16.4% (Flensburg) or even 17% (Husum) (Statistikamt Nord, 2018). The development in shipping is subject to fluctuations from year to year and from port to port.

The national statistical office of Germany provides statistics on aquaculture. In Schleswig-Holstein, the amount of fish produced in aquaculture decreased from 261.878 kg in 2014 to 222.421 kg in 2017. Those statistics also include fishpond cultivation, which is not necessarily maritime or blue. More important and increasing is the production of mussels in aquaculture. The amount of mussels increased from 3.8 million kg in 2014 to 13.2 million kg in 2017. Data for crustaceans produced in aquaculture in Schleswig-Holstein is only available for the year 2016 (Statistisches Bundesamt, 2018). Information on algae production is missing completely even though it does exist in Schleswig-Holstein. This leads to the conclusion that there are significant gaps in the statistics and thus, statistics can only be used in a limited and additional way in assessing RIS3 in terms of blue growth.

Other fields of blue growth are subsumed under wider statistical categories such as production industry or renewable energies. Those statistics are of no use for monitoring blue growth in Schleswig-Holstein. Furthermore, statistics only give information on general indicators such

as growth. It does not say much on innovative activities. Specific statistics on patents and R&D indicators are not available for specific sectors and on a regional level.

Regional blue growth studies

Commissioned by the Ministry of Economic Affairs Schleswig-Holstein, Dr. Hegenbart & Partner repeatedly publish results of a potential analysis of the maritime economy in Schleswig-Holstein. The first report was published in 2005. Since then, several updated versions of this document have been provided. Due to the lack of appropriate statistics, the analysis is based on a great variety of sources, indicated in the report (Dr. Hegenbart & Partner, 2014). Based on their analysis, Dr. Hegenbart & Partner define 16 maritime sectors for Schleswig-Holstein. Most sectors are covered by the specialisation field "maritime economy" and other specialisation fields of the RIS3 SH: shipping, boat and yacht building, shipbuilding, suppliers for shipbuilding and offshore constructions, offshore oil & gas, hydrographic and coastal engineering, ports, aquaculture, fisheries, fish processing and trade, offshore wind energy, marine technologies, maritime services, research and education. In addition to the blue fields already covered by the RIS3 SH, the potential analysis highlights maritime tourism and the navy as having great potential within the maritime economy of Schleswig-Holstein. Furthermore, the study gives information on turnover and jobs as well as the development of the maritime sectors. However, for most sectors latest data in the current report is from 2012 and thus the statistics do not cover the timeframe in which the RIS3 SH has been in place (since 2014). Consequently, the report cannot indicate any development influenced by the RIS3.

Workshop

In the context of the 3rd Innovation and Technology Forum Schleswig-Holstein, five parallel workshops according to the five specialisation fields in the RIS3 SH took place. The questions to be discussed were the same in all workshops:

- Do the five specialisation fields cover the strengths of Schleswig-Holstein in an appropriate way?
- Which aspects within the specialisation fields need more attention?
- Which topics could be fruitful fields of cross-innovation, connecting different specialisation fields?

Even though, the questions to be discussed were the same, the outcomes of the five workshops were quite different. The workshop on Maritime Economy was attended by five participants from business, eight participants from science and four participants from the field of technology transfer or others. The main tenor of the discussion was circling around the question: do specialisation fields and thus thinking in boxes make sense in terms of innovation policy? During the lively discussion it became apparent, that not much knowledge about the RIS3 SH was present among the participants, instead many misunderstandings came

to light. The discussion during the workshop made clear, that for the participants the existence of specialisation fields (which for them are strict and rigid categories) while at the same time aiming for cross-innovations is not understandable. Instead the participants suggested developing specialisation fields according to cross-sectoral topics like for instance "circular economy". The distinction between specialisation fields and cross-innovation topics was not clear anyway, especially because ICT as a cross-topic is one of the five specialisation fields in Schleswig-Holstein. Another misunderstanding was that actors that do not fit into one of the five "boxes" (specialisation fields) are not able to receive funding from ERDF innovation funds. In reality consortia dealing with topics, related to one of the five specialisation fields, can quite well contain actors from many different fields, also from outside the boxes. This fact was not understood by the participants. Furthermore the question was raised, how big/ precise should a specialisation field be?

The experiences during this workshop have proven that the stakeholders are only vaguely informed about the RIS3 and especially about the concept behind the strategy. Consequently the acceptance is low, which in turn hampers activities in terms of innovation projects. Some participants commented on the danger to miss trends and opportunities by sticking too long to outdated specialisation fields. This comment shows the necessity, to update the RIS3 SH more often and to make the process behind the strategy document more transparent and open to the public. In theory the RIS3 process is meant to be an ongoing process, avoiding sticking to outdated paths and strategies (Foray, 2015). This idea behind the concept is not known or rather has not yet been realized in Schleswig-Holstein. In addition it was criticised that the creative economy is not included in the RIS3 SH, even though this field contributes substantially to innovation in Schleswig-Holstein, having a great cross-innovation potential. The same applies to nanotechnologies/ material sciences.

The other four workshops were rather focused on the respective specialisation field itself. New fields of potential and currently important cross-innovation topics were collected as well as general concerns in terms of innovation funding policy. Blue aspects were not mentioned explicitly in this context. However in general the other workshops came to the conclusion that the existing specialisation fields are well chosen and reasonable.

Conclusion specialisation fields

To conclude, the RIS3 SH document analysis in comparison with national and regional statistics, regional blue growth studies and the outcome of the workshops conducted during the 3rd Innovation and Technology Forum revealed some aspects of possible improvement, regarding specialisation fields in Schleswig-Holstein.

Generally, there is a lot of blue economy in the RIS3 SH and many different fields and technologies important for blue growth are covered by the five specialisation fields. However the term "blue growth" is not mentioned directly. Furthermore, maritime tourism is an

important blue field for Schleswig-Holstein, which is missing so far in the RIS3 SH. Two other fields that are missing in the current strategy are creative industry and material sciences (nano/ surface technologies). Those fields are rather cross-innovation topics however with significant connection to the blue economy.

A general weakness of the RIS3 SH is the fact that it does not clearly distinguish between specialisation fields and cross-innovation topics. ICT is named a cross-sectoral topic, but is at the same time declared as specialisation field. This approach leads to misunderstandings and criticism among actors.

Another weakness is the existence of obvious logical breaks in the descriptions of the five specialisation fields. Subfields that are intensively described at the beginning are not mentioned in the summary any more. A more reader-friendly version with clear categories and defined terms would probably increase the acceptance of the strategy as well as the willingness of actors to contribute in making Schleswig-Holstein more innovative, not only in the blue economy. The presentation of the specialisation fields so far does not clearly show the strengths and potentials of the respective fields. No clear picture is visible of where the journey could go to. Strategic aspects are rare in the part of the RIS3 SH, dealing with specialisation fields.

Last but not least, the results of the workshops have shown, that the RIS3 document and even more importantly the process and the concept behind it, are not understood by the actors in Schleswig-Holstein. There is still room for improvement to make the process more transparent and to explain what the RIS3 is about and how it is supposed to work. This would also improve the acceptance of those actors needed to implement the RIS3 in Schleswig-Holstein. A strategy is only a paper giving guidelines. Innovation needs to be actively done by entrepreneurs and scientists.

4.2.2. Key Technologies/ Cross-Innovation Topics

Document Analysis RIS3 SH

The topic of key (enabling) technologies are taken up in the first part of the RIS3 SH. Derived from an analysis of funding databases, the authors of the RIS3 SH come to the conclusion that nano- and material technologies play a major role in Schleswig-Holstein, as well as biotechnologies, climate, environmental and sustainability, innovation in education health sciences and medical technologies. Additional qualitative interviews lead to the choice of five key technologies:

- maritime/marine technologies
- biomedical technologies (life sciences)
- micro- and nanotechnologies & power electronics
- food technologies
- technologies of the information and science society

Those five key technologies guide the way towards the five specialisation fields. However it is not quite clear, why and how micro- and nanotechnologies have been somehow stuffed into the renewable energies specialisation field. This relation does not become clear as already mentioned in the section on specialisation fields (see above). The topics of climate, environment and sustainability are not taken up again, without any justification.

In addition, within the descriptions of the five specialisation fields, key technologies of the respective field are outlined (see above) and cross-innovation topics between specialisation fields are presented, however not in a structured way. Cross-innovation topics are rather mentioned here and there. Examples might be biotechnology with applications in food industry, pharma (life sciences) and renewable energies (energetic biomass from algae) but being also part of the specialisation field "maritime economy". Other cross-innovation topics are derived from the general vision, formulated within the RIS3 SH. Climate change, demographic change and energy transition are challenges addressed by several specialisation fields. In addition, the description of the specialisation field ICT & media starts with the reference, that this is rather a cross-sectoral topic. In sum, it does not seem clear and straight forward, what are key technologies and what are cross-innovation topics? The respective analyses are not comprehensive. For instance relationships towards the three challenges are not elaborated for all five specialisation fields. Cross-innovation topics seem to be mentioned in a random way, while so-called key technologies are listed in a very detailed way and on different levels, without choosing a small number of real KEY technologies important for the innovation process in Schleswig-Holstein. This implies also for the blue technologies. Rather all existing technologies, covered by the enterprises or scientific institutions in Schleswig-Holstein are listed without selection and focus.

Maritime technologies are understood as key technologies for the sustainable use of the seas, for energy transition (exploration of new resources, optimising energy efficiency in maritime economy) and for strategies against climate change. Furthermore, maritime technologies are key technologies for the food industry, combined with other key technologies such as ICT, nano-technologies and power electronics. Practical applications of maritime technologies are among others in the field of laying sea cables for energy and communication as well as in the extraction of mineral resources, both fossil and renewable. Cross innovations in the field of maritime economy contribute in fighting against climate change and resource scarcity as well as in fostering sustainability, health and food supply.

Workshop

Similar to the outcome of the workshop in terms of specialisation fields it has to be stated that the need for both specialisation fields and cross-innovation topics was not understood by the participants of the workshop. In the current version of the RIS3 SH, the focus is on specialisation fields as a framework for funding. However, according to the participants,

cross-innovation and interdisciplinary cooperation is much more important in terms of innovation. Many ideas of possible and necessary current and future fields of cooperation were named.

Comparing the results of all workshops concerning the question on future cross-innovation topics it is interesting, that some topics appear in several or even all workshop groups (see table 1). Digitalisation, autonomous systems in transportation and artificial intelligence (AI) as well as nanotechnologies are mentioned by several workshop groups. There could be a relationship between packaging industry named in the food workshop and plastics technology in LifeSciences. Furthermore food and life-science see a strong need to cooperate vice versa. Additional cross-topics mentioned by only one workshop group each are circular economy and creative economy (maritime economy), biophotonics (life sciences) and IT security as well as education (ICT & media).

Food	**Maritime Economy**	**Life Sciences**	**Renewable Energies**	**ICT & media**
Digitalisation	Digitalisation		IT sector	
Logistics	Autonomous systems/ AI	Robotic/ ICT	Autonomous shipping/ e- mobility	Transportation (infrastructure)
	Surface research (nanotechnology)	Nanotechnology		
Packaging industry		Plastics technology		
Health		Food		

Table 1: Cross-innovation topics mentioned during the workshops

This result shows that there is potential for cross-cooperation among the specialisation fields in Schleswig-Holsten, using certain key technologies and processes. Cross-innovation is in the heads of the actors and they see the future going in this direction. For updating the RIS3 SH this should be taken into account. Possible cross-innovation topics with regional comparative advantage based on the resources, specific know-how and infrastructure should be further elaborated and highlighted. This would foster not only blue growth, but also other innovative fields in Schleswig-Holstein.

Questionnaire

In the questionnaire it was asked: "Which of the following framework conditions, developments or capabilities are according to your opinion drivers for innovation in the maritime economy?" The respondents were allowed to tick up to three different answers. One respondent skipped this question. The other four respondents gave seven answers altogether. Sustainability was ticked three times. Circular economy, integrated solutions (cross-innovations), digitalisation and creative economy were ticked once each. Nano technology and biologization were not chosen as answers. However, because of the low number of respondents this result should be taken with caution.

Conclusion key technologies/ cross innovation topics

The term "key technologies" is not quite clear. Are key technologies the most important technologies applied and developed in the region or are key technologies all technologies important for the specialisation fields? A clear distinction and a focus on real KEY technologies would ease the understanding and meaning of this category.

The issue of cross-innovation topics is rather randomly scattered within the descriptions of the specialisation fields. A comprehensive and elaborated section on cross-innovation topics specific to Schleswig-Holstein is missing. Taking into account, that the actors participating in the workshops were more interested in cross-innovation topics than in specialisation topics, more focus should be laid on this issue, when updating the RIS3 SH. Future visions, based on cross-innovation topics seem to address the actors more directly than simple categories. Therefore it would be helpful to have one separate paragraph at the end of each description of specialisation fields, indicating the most important cross-innovation topics of this field. Additionally a whole chapter providing an overview of cross-innovation topics, connecting the five specialisation fields, would be helpful and encouraging.

4.2.3. Smart Specialisation Topics

Document Analysis RIS3 SH

Based on the vision the current RIS3 SH names four main goals and nine strategic target fields (smart specialisation topics), which are overarching and not specific to any of the five specialisation fields. The four main goals comprise: 1. Fostering research, development and innovation capacity in Science, Economy, State and Society; 2. Enhancing competitiveness especially for SMEs, by extending and stabilising of supporting innovation activities; 3. Expanding R&D-activities in terms of energy transition and reduction of CO_2 in all sectors of the economy; 4. Increasing the quality and effectiveness of the regional education and training system as well as further developing a regional pool of employees for the knowledge based economy in cooperation with all social partners. Those four main goals are then substantiated within the following nine strategic target fields:

1. Targeted expansion of the regional knowledge infrastructure and linking of the scientific potential to strengthen R&D capacities
2. Expansion of the business related R&D infrastructure by means of competence centres to further develop profile-building innovation priorities
3. Structural innovations and intensification of communication in the context of knowledge and technology transfer to enable faster exchange processes
4. Sharpening the locational profile by targeted development and strengthening of clusters and networks with a profile defining, internationally respected quality
5. Increased funding of business creation (start-ups) to increase knowledge and technology intensive company formations and to establish a culture of entrepreneurship
6. Strengthening of business related innovation support to improve innovative activities and to continuously expand the innovation basis
7. Realisation of the energy transition and an economy low in CO_2 emission by fostering R&D activities in terms of renewable energies, energy and resource efficiency and bioeconomy
8. Development of experts as an intellectual basis of the innovation system in Schleswig-Holstein
9. Expansion of the innovation capacity in Schleswig-Holstein by a smart use of cross-border linkages

Those nine smart specialisation topics are then further elaborated. Specific measures to reach the goals are described. In German language there is a difference between business creations in general (see no. 5) and start-ups in specific. The trendy word start-up is not yet included in the current RIS3 SH however this specific group of innovative, science-based business creations are highly supported. An update of the RIS3 SH in this context is recommended.

Furthermore the topics have relatively long and complicated titles. It is not easy to memorize them, which makes the reading, understanding and implementation of the RIS3 SH unnecessarily difficult. Short and easy to grasp key words would make it easier to get a first overview.

Workshop

Even though the smart specialisation topics were not directly focused within the workshops, important opinions related to this topic have been expressed by participants. In terms of business related R&D infrastructure (no.2) participants of the life science workshop highlighted, that investments in hubs, co-working spaces and technology centres should be fostered. Especially buildings, space and adequate infrastructure for the innovative community is rare, while there are enough intermediates already in place. Instead, incubators and accelerator programmes are needed for young innovative actors to get installed. Regarding cluster managements (no.4) the general opinion in the workshops on maritime

economy and ICT was that they are very important and well established in Schleswig-Holstein. However, more cross-cluster cooperation could be fostered. The support of business formation/ start-ups (no.5) is seen as common theme throughout the current RIS3 SH. This is seen very positively by the workshop participants. However, more could be done to support the start-up scene especially in terms of co-working spaces, incubators and accelerator programmes. Another important topic mentioned by the workshop participants was education and training and the development of a pool of experts (no.8). Especially in the ICT sector, young innovative people need space and possibilities to let of steam. The example of digital offices in Bavaria, have been mentioned. Furthermore, investment in (holistic) education and early learning to make use of the curiosity of young children has been mentioned as important prerequisite for an innovative environment in Schleswig-Holsten. In the renewable energy workshop one issue was how to support scientists and enterprises in bringing new technologies to the market? And how to support enterprises running the risk connected to new technologies? Unfortunately the limited time of the workshops did not allow finding answers. But those questions might be relevant to be asked and discussed again in other occasions.

Conclusion Smart Specialisation Topics

In general, the nine smart specialisation topics seem to be well chosen. However it would be worth shortening the titles of the topics for a better understanding and faster capturing. Furthermore, several smart specialisation topics need some update or an additional focus. Topic no.5 for instance should include start-up support. Additionally more cooperation among actors in Schleswig-Holstein is requested, to result in products made in Schleswig-Holsten. Therefore infrastructure (rooms, buildings) for the community to meet and cooperate would be helpful, same as co-working spaces, incubators, accelerator programmes or digital offices. Generally the work of cluster managements is seen positively, but more cross-cluster cooperation could be aimed for. Another important topic for the actors is education and training as well as the support of enterprises in risky situations.

4.2.4. Measures (OP ERDF)

The RIS3 SH does not provide own measures and funding. Instead, the strategy is linked to the operational programme of the European Regional Development Fund (ERDF). To analyse whether the measures taken to implement the RIS3 SH are suitable to foster blue growth, the operational programme of the ERDF in Schleswig-Holstein 2014-2020 has to be analysed rather than the RIS3 SH itself. The OP ERDF refers to the smart specialisation topics listed in the RIS3 SH. However measures are not directly connected to any specialisation field. All measures are open for all topics covered by the five specialisation fields. Therefore there are no specific measures to support blue growth either. The task of the following analysis will be to review how the provided measures meet the needs of the blue economy.

Document Analysis OP ERDF in Schleswig-Holstein 2014-2020

The following document analysis is based on the OP ERDF in Schleswig-Holstein 2014-2020, approved by the European Commission on September 11th 2014. The operational programme is structured in four priority axis and the technical assistance (to support the implementation of the OP ERDF). The total amount of ERDF money available in Schleswig-Holstein for this period is 271.244.600 €. This amount is distributed unevenly among the four priority axis and its investment priorities.

The smart specialisation topics defined in the RIS3 are taken up by the OP ERDF. The following section gives an overview of the priorities, related to the RIS3 SH, and the measures attached to them.

Priority Axis 1: Enhancing the regional innovation potential

Investment priority 1a is dedicated to the "expansion of the infrastructure in the field of research and innovation as well as capacities for the development of R&D excellence; support of competence centres, especially for those of European interest". Within the programme period 2014-2020, 41.9 Mio € are dedicated to this topic, which comprises the smart specialisation topics 1 and 2 described in the RIS3 SH (see above 4.2.3). To reach this goal, two measures are chosen:

The measure "**Expansion of application-oriented R&D Infrastructure**" is restricted to the five specialisation fields, nominated in the RIS3 SH. This measure supports the establishment of application-oriented research structures by fostering human resources, the construction of buildings and provision of technical equipment. Funding priorities at universities are buildings and their equipment, especially in the field of medicine technology and medical nano technology, by involving the regional economy. Funding priorities at non-university research institutes are expansion of application-oriented institutes by founding new centres and project groups, developing existing institutes and establishing new institutes. The support method is financial funding through grants. Eligible costs are investment, material and staff costs.

"Competence centres" are thematically connected to one or several scientific institutions and regional enterprises. Within competence centres professional expertise is produced and transferred to regional enterprises. Support is provided in form of grants. Eligible costs are mainly material and personnel as well as investment costs. Funding includes the establishment of new competence centres, but also the expansion of existing ones. Funding is limited to the five specialisation fields, nominated in the RIS3 SH.

Investment priority 1b comprises the "support of operational investments in R&D, development of networks and synergies between enterprises, R&D centres and universities". This investment priority is equipped with a total amount of 50.75 Mio € in the period 2014-

2020 and is related to the smart specialisation topics 3 and 4 of the RIS3 SH. To reach this goal four measures are offered:

"Consortia- and cooperation projects" support joint projects of enterprises (primarily SME without own research capacities) and research institutes. The aim is to generate scientific knowledge as a precondition for new products, processes or services. Moreover interdisciplinary projects developing system services (e.g. technology platforms) are supported.

"Company's Innovation" supports enterprises in terms of research, development and innovation, validation of innovative products and services, market exploitation and scaling of technologies. The funding is provided in form of grants. Eligible costs are personnel, investment and material costs as well as external services. Funding is mainly meant for SME, but is also open for other enterprises

"Innovation assistants" are highly qualified employees, supporting enterprises in innovation projects, innovative processes or in applying new technologies. Support is given in form of a fixed sum to support SME in hiring university graduates.

The measure "**Transfer, Cluster and Network Structures"** focuses on the qualitative development and establishment of professional transfer, cluster and network structures. Cluster managements are the central contact point, giving advice and arranging contacts between cluster members. In addition the management supports cooperation projects in their initial phase. Networking and cooperation projects are supported, to establish long-term network structures, cooperation and marketing platforms. Funding is provided in form of grants for personnel and material costs including costs for marketing and events.

Even though only the measures of priority axis 1 are thematically restricted to the five specialisation fields nominated in the RIS3 SH, the measures of the other priority axis also take up smart specialisation topics developed within the RIS3. Therefore all blue growth relevant measures will be presented here.

Priority Axis 2: Development of a competitive and sustainable economic structure

Investment priority 3a is related to the "support of entrepreneurial spirit, particularly by facilitating the use of new ideas and support of start-ups, also from incubators". 8.75 Mio. € are budgeted for this priority related to the smart specialisation topic 5. To reach this goal, two measures are chosen:

The "**seed and start-up fund"** provides investment capital for spin-offs from universities, non-university research institutes and R&D / science-based enterprises (seed phase) as well as for young innovative SME (start-up phase). The support is provided in form of equity capital with a credit period of 10 years.

"Technology and Start-up centres" provide facilities, technical equipment and services for young enterprises for a limited period of time. This measure aims primarily to support existing Technology and Start-up Centres, while the establishment of new ones should rather be exceptional. The support is provided as financial funding in form of grants for construction costs and investment in technical equipment.

Investment priority 3d is dedicated to the "support of SMEs to take part in the growth process of regional, national and international markets as well as in the innovation process". 44.2 Mio. € are budgeted for this priority, implementing the smart specialisation topic 6. Three different measures are provided to reach this goal:

"Productive investments of SME in structurally weak regions" is a measure supporting single SME, investing in new locations or expanding respectively modernising their old production sites in peripheral regions of Schleswig-Holstein. The support method is funding in form of grants.

The "**investment fund for SME"** provides investment capital for the expansion or modernisation of enterprises. This also implies the application of new products or processes within the enterprise. The support is provided in form of venture capital with a credit period of 10 years. There is no support of projects. The aim of this measure is to support enterprises in their economic substance.

The measure "**internationalisation of SME"** aims to specifically support SME in exploring and opening up new markets by funding fair presentations and consultation for foreign trade. The support is provided in form of grants for external consultancy and trips to international fairs. In the context of tourism, marketing for opening up foreign source markets is included as well.

Priority Axis 3: Energy transition – Development of environmentally friendly economic - and infrastructures

Investment priority 4a is dedicated to the "support of production and distribution of energy from renewable sources". 17.5 Mio. € are available within the programme period 2014-2020. The priority is related to the smart specialisation topic 7. One measure serves to reach this goal:

The measure **"R&D and demonstration projects to foster production, distribution and storage of renewable energies"** supports R&D projects, opening up new possibilities for efficient production and distribution plants, storage technologies and smart grids. Moreover demonstration projects, testing the application of innovative solutions concerning energy and heat are supported. Support is provided in form of grants for investment, personnel and material costs.

Investment priority 4b focuses on "enhancing energy efficiency and the use of renewable energies in enterprises", and provides 19 Mio € of funding in the programme period 2014-2020. This priority is related to the smart specialisation topic 7 as is investment priority 4a. Two measures are available to reach this goal:

The measure **"environmental innovations"** aims at reducing risks in research and tries to foster environmental innovation. The focus is on R&D projects of enterprises dealing with the topics of energy efficiency, resource efficiency and bio economy. The support method is grants for production and process innovations that reduce the need of energy and resources within the enterprise.

The measure **"energetic optimisation in SME"** supports enterprises in using consulting activities to reduce their CO2 emissions, by improving energy efficiency and by using renewable energies. The support includes grants for consulting, but no investments to implement measures for CO2 reduction.

All other investment priorities are not directly related to the RIS3 SH. This applies to the ***investment priority 4c:*** support of **"energy efficiency in public infrastructure, public buildings and housing"**, as well as to the two investment priorities of **priority axis 4**, dealing with sustainable use of existing resources. Those priorities and their measures are not described here, as they are not relevant for the implementation of the RIS3 SH. The OP ERDF covers all smart specialisation topics included in the RIS3 SH, except for the topics 8 (experts) and 9 (cross-border linkages). Even though most priority axis are somehow related to and based on the smart specialisation topics listed in the RIS3 SH, the limitation of funding for actors from the five specialisation fields only applies for the measures in priority axis 1.

The OP ERDF itself does not allow for any assessment concerning whether or not the measures are suitable to support blue growth or not. Generally all measures can be used by actors from blue growth sectors. One exception is the maritime tourism, being excluded from the measures in priority axis 1 so far. A further analysis of successful project applications and opinions from stakeholders, gathered in workshops, interviews and by using a questionnaire will give more information on how the opportunities provided by the OP ERDF are used by blue growth players.

Statistical analysis: evaluation of projects database

A list of all committed projects in Schleswig-Holstein, funded with money from the ERDF can be extracted from the website of the Investitionsbank Schleswig-Holstein (IB.SH[5]). The most recent figures have been extracted on July 16th, 2018. The list includes all projects receiving ERDF funding in Schleswig-Holstein between the start of the funding period in

[5] https://www.ib-sh.de/fileadmin/user_upload/.../LPW-Liste-der-Vorhaben.xlsx

2014 and July 16th, 2018. However, the list does not include projects that are planned, but not yet committed.

In total, 342 projects have so far been committed in the programme period 2014-2020 in Schleswig-Holstein. 18.4% of those projects (63) can be identified as being blue. Another 8.7% of the projects (30) are partly blue. The classification has been done by the author of this report, based on project descriptions and the profile of the respective recipient of grants. Keeping in mind, that 16% of all companies in Schleswig-Holstein are blue, only 4,4% of all employees are working for blue sectors and 11% of the GDP is generated in blue sectors, this result shows a positive participation of blue actors in the ERDF funding. However, the amount of eligible costs as well as the share of ERDF funding varies significantly between different projects. Therefore an analysis based on the pure number of projects is only of limited value. An analysis based on the effective amount of money spent for blue projects shows a slightly different picture: Taking all committed projects into account, only 9% of the funding was/ is spent for blue projects, another 34% of the amount is dedicated to partly blue projects. This difference shows, that the blue economy is involved in many but small projects, with low total eligible expenditure allocated to the operation. The average blue project comprises a total eligible expenditure of around 355.000 Euro, while the average non blue project is worth around 517.000 Euro (own calculation based on the list of projects, provided by *Investitionsbank* Schleswig-Holstein).

This section shows in more detail, which measures are prioritized by blue actors and which measures, are less attractive for them. Depending on the basis of analysis (number of projects or share of effective funding) the outcome only differs slightly (see table 2 and 3). Generally it can be noted, that there is a relatively high share of blue projects regarding the following measures: “R&D and demonstration projects to foster production, distribution and storage of renewable energies” (48% of the effective funding), “Internationalisation of SME” (33% of the effective funding), “Innovation Assistants” (19%), “Environment Innovation” (15%), “Competence Centres” and “Transfer, Cluster and Network Structures” (14 % each). In addition, committed funding so far goes with 100% to partly blue projects in the measures “Expansion of application-oriented R&D Infrastructure “, “Seed and Start-up Funds” and “Technology and Start-up Centres”. Furthermore, 39% of the effective funding amount for “Consortia and Cooperation Projects” is also dedicated to partly blue projects. The blue actors are so far underrepresented in the following measures: “Company's Innovation”, “Investment Funds for SME”, “Energetic Optimisation in SME” and “Consortia and Cooperation Projects” (in terms of exclusively blue projects).

	measures	blue	non blue	partly blue
Priority Axis 1	Expansion of application-oriented R&D Infrastructure	0%	0%	100%
	Competence Centres	25%	50%	25%
	Consortia- and Cooperation Projects	0%	79%	21%
	Company's Innovation	9%	88%	3%
	Innovation Assistants	17%	83%	0%
	Transfer, Cluster and Network Structures.	14%	36%	50%
Priority Axis 2	Seed and Start-up Funds	0%	0%	100%
	Technology and Start-up Centers	0%	0%	100%
	Investment Funds for SME	6%	88%	6%
	Internationalisation of SME	23%	71%	6%
Priority Axis 3	R&D and demonstration projects to foster production, distribution and storage of renewable	20%	80%	0%
	Environmental Innovations	20%	80%	0%
	Energetic Optimisation in SME.	0%	100%	0%
	support of energy efficiency in public infrastructure	0%	100%	0%

Table 2: Share of blue projects per measure based on the number of committed projects

	measures	blue	non blue	partly blue
Priority Axis 1	Expansion of application-oriented R&D Infrastructure	0%	0%	100%
	Competence Centres	14%	77%	9%
	Consortia- and Cooperation Projects	0%	61%	39%
	Company's Innovation	7%	91%	2%
	Innovation Assistants	19%	81%	0%
	Transfer, Cluster and Network Structures.	14%	12%	74%
Priority Axis 2	Seed and Start-up Funds	0%	0%	100%
	Technology and Start-up Centers	0%	0%	100%
	Investment Funds for SME	4%	94%	2%
	Internationalisation of SME	33%	59%	7%
Priority Axis 3	R&D and demonstration projects to foster production, distribution and storage of renewable energies.	48%	52%	0%
	Environmental Innovations	15%	85%	0%
	Energetic Optimisation in SME	0%	100%	0%
	support of energy efficiency in public infrastructure	0%	100%	0%

Table 3: Share of blue projects per measure based on the effective funding amount of committed projects

However, this analysis only considers committed projects (as of July 16th, 2018). Even though more than half of the programme period is over, the listed projects only cover 27% of the available amount of ERDF funding in Schleswig-Holstein. This percentage changes significantly depending on the measure and investment priority. However most of the non-committed money is already planned for certain projects, which are not committed yet and therefore not published.

It can be concluded, that the share of the blue sector based on the pure number of projects even exceeds the share of blue enterprises in Schleswig-Holstein. However, the committed blue projects are rather small in terms of the subsidy amount. Additionally it can be stated, that the measures obviously differ in their attractiveness for the blue economy. Results from

the workshop, from interviews and a questionnaire will complement these results by providing information on the awareness and opinion of the actors.

Workshop

The workshops having taken place in the context of the 3rd ITF.SH did not specifically deal with the operational programme but with the RIS3 SH. Nonetheless, the RIS3 is an ex ante conditionality for the operational programme. Those two documents cannot and should not be discussed isolated from each other. Remarks and opinions of participants regarding certain measures and the funding programme in general have been collected during the workshops.

During the workshop on maritime economy it was critically mentioned that on one hand the funding programme is long-term oriented and not flexible enough. This seems particularly problematic against the background of the intended innovation policy. On the other hand, projects are usually funded for three years only, which is not enough time to implement the developed innovative ideas, products or processes, according to the actors. Furthermore, the participants of the workshop criticized that funding projects in Schleswig-Holstein lack certain system thinking. The question was raised: how can we foster regional actors to cooperate on innovative projects in order to come up with innovations made in Schleswig-Holstein? In addition, it was mentioned that the processes until a project is committed, takes too much time. Especially SMEs, presenting the majority of the maritime enterprises in Schleswig-Holstein, need a quick start of projects. Those aspects give a first answer on what needs to be improved to foster blue growth based on the RIS3 SH and the OP ERDF.

The participants of the Life Science workshop recommended focusing on small funding projects, with shorter phases of application and less bureaucracy. Furthermore, they suggested accepting more chaos in funding. From their point of view, not everything needs to be completely structured. Funds should be provided for concept studies related to medical products. The licensing for start-ups should be performed under fair conditions. The participants of the renewable energies workshop pointed out, that funding programmes for human capital are missing so far. While participants of the ICT workshop emphasised on improving their cluster by strengthening the external effect of the cluster and by fostering cross-cluster cooperation. Furthermore, they express their wish, that the funding landscape should be more transparent. Flagship projects could be better promoted and the existence of innovation consultants should be more widely introduced.

The summary of comments regarding the OP ERDF collected during the workshops shows that no specific measure is criticized but rather the administrative framework being responsible to implement the aims of the RIS3 SH by applying the OP ERDF.

Questionnaire

In the questionnaire it was asked: “What kind of projects should be supported more strongly in Schleswig-Holstein?” Six different options were offered. The respondents were asked to

tick up to three answers. One respondent skipped this question. The other four respondents gave nine answers altogether. Three respondents voted for more small projects for SMEs (internationalisation measures, special personal costs, small investments). The categories "R&D and knowledge transfer" as well as "assurance and support for skilled labour" were ticked by two respondents each. The categories "joint device and technology pools and incubators" as well as "large projects for SMEs (operational innovation, productive investment, R&D in companies)" have been ticked once each. The only category which was not ticked at all was "cluster managements and associations". This means that the five respondents think that enough support is given for those institutions. In another question the cluster members were asked, if they have already applied for public funding via the Investmentbank Schleswig-Holstein or the Business Development and Technology Transfer Corporation of Schleswig-Holstein (WTSH). One respondent skipped the question, one respondent answered "yes", one respondent ticked the box "we tried but gave up", two respondents did not yet apply for public funding. One of them justified it with a lack of time and capacity; the other one stated that he has no interest in public funding. No one ticked the box "yes we applied but did not succeed". In a third question it was asked, how could the process of application for public funding be facilitated? Two respondents skipped this question. The four given answers were ticked twice each, so there is no obvious preference. The possible answers were:

- More information and transparency regarding guidelines and procurement procedures
- Qualified advice regarding funding by specialised service providers
- Simplification of applications (e.g. lump sums, thresholds)
- Midterm financing to ensure liquidity

The suggestion of using alternative financing methods, like crowd funding or business angels, was not ticked by anyone. However, due to the low respondent rate, these results are not representative.

Qualitative Interviews

Cluster and Competence Centres have been chosen exemplarily for in-depth analysis. Using the method of SWOT analysis, individual interviews have been conducted. The analysis includes stakeholders from three different levels: 1. The responsible and supervising employee for each cluster and competence centre at the MWVATT ("measure owners"). 2. The managers of clusters and competence centres ("target group"). 3. Members of clusters ("beneficiaries"). The following section shows the results of the SWOT analysis for clusters and competence centres separately. Furthermore, differences in the awareness, needs and opinions between measure owners, target group and beneficiaries will be identified.

Cluster development/ funding

This measure supports the qualitative development and establishment of professional cluster structures. Cluster managements are central contact points of certain business sectors, giving advice and arranging contacts between cluster members. In addition the management supports cooperation projects in their initial phase. The five themes of clusters are at the same time the five specialisation fields nominated in the RIS3 Schleswig-Holstein.

- Maritime Cluster Northern Germany (MCN)
- Life Science North (institutional funding, no ERDF funded project) (LSN)
- Renewable Energies Schleswig-Holstein (EE.SH)
- Digital Economy Schleswig-Holstein (DiWiSH)
- Food region

- *Tourism Cluster Schleswig-Holstein (no ERDF funding)*

An additional sixth cluster is the tourism cluster Schleswig-Holstein, which however is not financed with money from the ERDF, as tourism is not coverd by any of the specialisation fields in the current RIS3 SH. Nevertheless, the tourism cluster has been included in our analysis. Another exception in terms of financing is the Life Science Nord cluster, which does not receive ERDF funding either, but institutional funding from the Land Schleswig-Holstein. Different funding schemes and the future financing structure of the clusters is currently part of intensive discussions and will be further elaborated in the next sections. With regard to blue growth, the Maritime Cluster Northern Germany is obviously the most important cluster, comprising many blue topics related to machinery and technology. Life Science Nord once dealt with the topic of blue biotechnology, but decided to focus on their core competences, which are not within the scope of blue growth. The renewable energies cluster covers the topic of blue energy, which is in parts also included in the work of the MCN. The cluster for digital economy Schleswig-Holstein is not directly involved in blue topics, but cooperates very closely with the MCN, working on cross-topics between ICT and the maritime sector. Food regio shows only small connections to blue growth. There are some enterprises in Schleswig-Holstein, using marine resources for food, however, the focus in the cluster is rather different. The tourism cluster Schleswig-Holstein however, has a strong focus on maritime tourism and thus covers an important blue growth topic of Schleswig-Holstein. To conclude, blue growth topics are quite well covered by the existing clusters, except for blue biotechnology. Aquaculture is partly covered by the MCN, but without being a core topic.

Strengths of the current cluster policy in Schleswig-Holstein

The cluster owners mentioned that the possibility to fund cluster managements with help of ERDF money enables supporting thematic fields in which possible action otherwise would be limited. This is the strength, they see in the cluster policy of Schleswig-Holstein.

The cluster managers came up with several strengths of the current cluster policy in Schleswig-Holstein. From their point of view it is an important precondition that clusters are

politically intended and thus financially supported, but not politically steered. Regional politics and administration currently only define targets to be fulfilled by the cluster managements. Apart from that, the clusters are more business-driven, than policy-driven. Furthermore the existing cluster strategy for Schleswig-Holstein is mentioned as being very important and helpful for the work of the cluster managements. The cluster policy is embedded in the RIS3 process, which enables clusters to use the linked funding environment. In addition, the RIS3 process has cleared the cluster landscape. Currently there are six strong clusters, covering the five specialisation fields and tourism. The cluster managers furthermore experience the existence of a cluster coordinator/ agency as an important strength of the cluster policy. It is important and good to have someone who cares about the clusters and facilitates trainings for cluster managements, so the unanimous opinion of the cluster managers.

Strengths of the cluster managements

According to the cluster owners the main strength of the cluster managements is the professionality of the cluster managers. They have good knowledge of the sector and strong ties to the stakeholders. Another advantage of the clusters is the connection between the cluster managements and to the Business Development and Technology Transfer Corporation of Schleswig-Holstein (WTSH). Three of the six cluster managements are located on the premises of the WTSH and can use their advisory services. Another advantage is seen in the thematic focus of clusters. Clusters do not only cover one sector or one technology, but a variety of related sectors, belonging to one specialisation field. Nevertheless, the cluster managements have more specific sector knowledge than the WTSH and they are therefore experienced as a fruitful supplement. Furthermore, clusters integrate players from the whole Land of Schleswig-Holstein and bring together enterprises and scientists from different regions. Clusters are well connected with the universities and universities of applied sciences in Schleswig-Holstein, which enables them to recruit young start-ups right away. This comprehensive understanding of clusters enhances the visibility of the specialisation fields and links them to the image of the Land Schleswig-Holstein. The cluster managements furthermore show visible learning processes, since the beginning of the cluster policy. Cluster managements have learnt from mistakes, made at the beginning.

The cluster managers stress the form of organisation (public-private) as being one of the most important strengths of their clusters. All members are encouraged to actively participate. “A cluster is not a loose network, it is a well-organized institution.” The cluster management is self-organised. The staff for the cluster management is chosen based on their business knowledge and not because of administrative experience. This is beneficial in their daily work, as they need to understand the companies and their challenges. Furthermore, during the first years of existence all cluster managements have spent quite some effort to become known and visible. This pays off now. All clusters in Schleswig-Holstein are labelled by the

European Secretariat for Cluster Analysis: Life Science Nord has the gold label, food regio has the silver label and all others are bronze labelled. Those labels enable a benchmarking of European cluster managements. The Maritime Cluster as well as Life Science Nord are furthermore internationally well visible and most clusters are actively engaged in projects, mainly in the Baltic Sea region.

Asked about the strength of the cluster management from their point of view, the interviewed members of the MCN primarily emphasise the broad range of members across common thematic borders. Within the cluster a significant number of enterprises from different maritime fields get together for networking, building up trustful relationships and thus open up opportunities for cooperation projects. A second strength mentioned by the members of the MCN deals with the services offered by the cluster management. The members recognize the huge variety of initiatives, working groups, workshops and events, organised by the management. Again they stress the thematic diversity, which makes the services of the cluster management special and unique. Furthermore the members feel well served by the cluster management. Another strength mentioned by one interviewee is the strengthened political awareness of maritime issues, through the existence of the maritime cluster.

Weaknesses of the current cluster policy in Schleswig-Holstein

According to the cluster owners, the main weakness of the current cluster policy in Schleswig-Holstein is the heterogeneous and uneven financing of the six clusters. While one cluster (LSN) receives institutional funding from resources of the Land Schleswig-Holstein, all other clusters receive project funding limited to three years, with an option of extension, but not necessarily. This leads to insecurity in terms of planning and staff members leave because they look for more stable jobs. For the work of clusters, which is based on trust and long-term stability, this financing scheme is far from optimum. Project funding moreover implies that co-financing is needed (from the Land Schleswig-Holstein, and/or through membership fees). The significantly different structure of cluster members increases the imbalance among the clusters. Some clusters comprise primarily SMEs while others have a significant share of bigger companies in their portfolio. The members of the tourism cluster are associations and no enterprises at all.

Furthermore, it is difficult for clusters, which are formally “projects” and no institutions, to attract additional project money and to work in international project consortia. Missing planning security and the restrictive state aid law hamper an active role of the clusters in this field. While the cluster managers see the reduction to six strong clusters, related to the specialisation fields as advantageous, one cluster owner expresses, that this might also be a weakness of the cluster policy. The choice of topics for clusters is thereby fixed and limited. Another weak point of the cluster policy is the fact that the benefit of supporting clusters cannot be shown in numbers. Many activities of clusters (e.g. networking) do not immediately result in new jobs, new patents, new companies or other measureable effects. This makes it

more difficult to prove, that cluster funding is reasonable and enhances economic development and innovation in Schleswig-Holstein. One cluster owner mentions his suspicion, that Schleswig-Holstein only supports clusters, because it is a current trend, followed by other regions as well. So the second main weakness besides the funding seems to be, that cluster policy is not yet fully accepted and not all stakeholders are fully convinced, because the benefits are not directly visible and measurable.

The interviews with the cluster managers approved those two main weaknesses: financing and acceptance. They further elaborated that the term cluster is difficult to explain. Again something new had to be introduced to the sector. Some players were rather hesitating to become a member at first. However, with some effort, most actors could be convinced and the clusters are established by now. However, the weakness of the current financing situation is not yet solved for most cluster managements. The number of staff members affordable by the provided amount of money does not always allow fulfilling all requested tasks. Furthermore the limited timeframe of funding and late the confirmation of project extensions led to a high level of volatility among employees of the cluster managements in the past. Additionally to those two main aspects, one cluster manager points out, that clusters could be used more intensively for strategic purposes by the politicians/ administrative bodies. Cluster managements should be involved in questions like: Do we have a suitable research infrastructure? Do we have the right university programmes/ training programmes? Being the central contact point, cluster managements have the best overview and the broadest perspective to judge issues as indicated above. So far, this opportunity is missed, which is seen as a weakness of the cluster policy.

Weaknesses of the cluster managements

The cluster owners mentioned a variety of rather small weaknesses: the cluster owners criticise, that common site marketing by the cluster managements is missing and some cluster managements are struggling to take members from all parts of Schleswig-Holstein on board. One of the cluster owners states, that from his point of view, it might be a weakness, that several cluster managements are located directly at the premises of the WTSH. The cluster managers themselves however mentioned this fact as an advantage.

Among the cluster managers, two main weaknesses were mentioned. The first one relates to a weakness mentioned by the cluster owners, the difficulty to convince all potential members to join the cluster. Clusters are relatively new and compete with existing sector institutions. Membership in clusters is completely voluntarily. Some important entrepreneurs would be very valuable for the cluster, but are still sceptical and hesitate to become a member. The second weakness is related to the topic internationalisation, a field of activity that should be treated with more importance within the clusters. Enterprises in Schleswig-Holstein need to learn about international modes of work, different forms of hierarchies in enterprises and the

various forms of labour markets, to be competitive in the future. Cluster managements can and should provide more activities in this direction.

From the members' point of view, the most severe weakness of the MCN is the unclear organisational structure. The change of the structure at the beginning of 2018 has led to severe internal frictions. In consequence of these internal difficulties, between the five Länder and between the general association and the five regional offices, some members considered leaving the cluster. Generally the members consider the five Länder structure of the MCN as strength. However, there is an imbalance of members. While there are many members from Schleswig-Holstein and Hamburg, the other 3 Länder (Bremen, Lower Saxony and Mecklenburg Western-Pomerania) have difficulties to attract a similar amount of members from their regions. This is seen as a weakness of the MCN by one of the interviewees. Another member criticises overlapping activities between the cluster and other maritime associations (e.g. GMT, VSM etc.). Yet another interviewee stresses that clear political aims are missing in terms of maritime economy. The cooperation of the five northern German countries within the Maritime Cluster Northern Germany could and should be used to better match the regional aims and to bundle scarce resources in a cross-regional way.

Opportunities arising through the current cluster policy

The cluster owners indicate two main opportunities that arise from the cluster policy as such: First, the cluster policy facilitates concentrating efforts in terms of economic development and growth on detected fields of potential. Funding can thus take place in a more target oriented way. Second, cluster policy, start-up and industry policy could and should be combined in thinking. This allows for even more positive effects.

The cluster managers focus in their answers on two other issues: First, for them it is important that policy and administration do not only fund but also shape the clusters through the cluster policy and in cooperation with science and business. All three partners are equal. This fact enables benefits for all three parties: politicians and the administrative bodies receive targeted first-hand information from the cluster managements; science and business are closer to decision makers and get access to cooperation projects and funding for innovation projects. The second opportunity is seen in building-up networks of trust. To make use of this opportunity however, stability of staff and long-term thinking is necessary, which is only possible if funding is secured more than on a three years project basis. One cluster management already enjoys this advantageous funding structure. Its manager emphasizes the opportunities arising for all other clusters if this structure would be transferred.

Opportunities arising through cluster managements

Cluster managements, as established in Schleswig-Holstein provide a huge variety of opportunities according to the cluster owners: They foster the internal and external visibility of the regional economic strengths. They provide opportunities for SMEs. Small and medium sized enterprises can improve their innovation potential by cooperating. Clusters are

particularly oriented towards the needs of SMEs. In some cases, it can be proved, that cluster managements have contributed to spin-offs and job-creation in the respective sector. However, there are two main fields of opportunities, enabled through the establishment of cluster managements: First, they provide services for their members. Services provided by the cluster managements in Schleswig-Holstein comprise many different kinds of events, which are well accepted and attract many participants. Cluster managements help with project development, they organise educational/ training programmes and develop university programmes together with SMEs. Second, and most importantly they foster networking on different levels. Players of the sector get opportunities to network during the cluster events. The cluster managements support networking between science, business and administration/ politics. Cluster managements are well connected to other regional institutions like the chambers of commerce, the chambers of crafts and different business support organisations. Furthermore, the networking and cooperation between the six clusters in Schleswig-Holstein opens up new opportunities. Some clusters even go beyond the borders of Schleswig-Holstein, following an inter-regional approach. Life Science Nord for instance is a joint cluster of Schleswig-Holstein and Hamburg, while the Maritime Cluster Northern Germany even comprises all five northern German Länder. These inter-regional structures open doors for new and enriching possibilities but also create opportunities for potential difficulties. Last but not least, the cluster managements in Schleswig-Holstein are connected to clusters dealing with the same topic in other German Länder or internationally.

The cluster managers themselves come up with a lot of issues already mentioned by the cluster owners, but also with additional aspects and other perspectives. The services, provided by the cluster managements are also seen as important opportunity arising from their work. Additionally to the examples mentioned, they emphasize their important function as link between SME and regional politics, their engagement in qualification of future CEOs and their contribution in and support of surveys and studies. Networking is the second big issue identified. In contrast to the cluster owners, the managers stress the importance of international contacts, trips for members and identifying gaps in the innovation chain to be filled with international partners. Furthermore in terms of networking, the cluster managers experience the direct contact to the ministry as an important opportunity. The cluster managers understand themselves externally as the voice of the sector and internally as contact point for all players. The cluster management brings innovation topics into the sector, provides information material, organises events, invites experts, generates stimuli, and enables knowledge transfer and thus innovation. Hidden champions can be detected and promoted by cluster managements. Being more precise than the cluster owners, the cluster managers highlight the importance of medium sized companies for the clusters. They are most motivated and best suited to engage themselves and thus to benefit from being member of a cluster.

Threats to the current cluster policy and cluster managements in Schleswig-Holstein

When asked about possible threats to the current clusters in Schleswig-Holstein, the cluster owners came up with a whole string of answers. One threat is seen in the misunderstanding of cluster policy. Cluster managements are not primarily in place to help single enterprises, but to develop the whole sector in Schleswig-Holstein. Members might misunderstand the purpose of clusters and resign because of disappointment. Clusters however depend on their members. Another threat always occurs, when public money is spent. The cluster managements need to prove carefully, that the money is spent for the right activities bringing benefit for Schleswig-Holstein. Otherwise, a sceptical government can easily decide to stop cluster funding. This leads to another threat, the reliance of the clusters on the interest of the current government. Another future threat has already been discussed in the section on weaknesses: a long-term financing structure for cluster managements does not exist yet. Depending on the result of this discussion, this weakness might turn into a threat for the clusters. Another issue that always has to be kept in mind is the European state aid law. Cluster managements are not allowed to do business support, their activities have to be non-discriminatory and open for all. This law however is applied differently, sometimes stricter sometimes more relaxed. A stricter interpretation of the state aid law might also be a threat for the clusters. Last but not least some clusters struggle with organisational problems, with complicated structures and restructuring processes. If no acceptable solution for all parties is found, this might also threaten the existence of those clusters.

The cluster managers confirm that the most serious threat to cluster policy is represented by its dependency on funding and thus the willingness of respective governments/ ministers to spend money on cluster managements as well as the voluntary engagement of cluster members. Being a cluster member however does not automatically lead to more success of a company. Members need to invest time to participate in cluster events and to cooperate in project applications, which sometimes even do not succeed in funding. Some members have wrong expectations concerning being a cluster member. Frustrated members more often talk loudly and openly about their disappointing experiences than satisfied members. This represents a serious threat for the image of clusters and their managements. In the worst case these critics even influence the government/ minister. Another difficult situation arises towards sector associations. If cluster policy is done correctly, there should be no feeling of competition. Clusters follow a broader approach, including the whole ecosystem. However, this is not understood by everyone. The discussion if clusters are needed, additionally to several existing sector associations, might also influence the government/ minister. One last threat mentioned by one cluster manager is the threat of lock-in, meaning that the actors in Schleswig-Holstein tend to build up strong ties with each other, ignoring what is happening outside the region. However this threat can easily be avoided by keeping the eyes open for new trends also from outside Schleswig-Holstein.

Competence Centres

Competence Centres are thematically connected to one or several scientific institutions and regional enterprises. Within competence centres professional expertise is produced and transferred to regional enterprises. Eight different competence centres in Schleswig-Holstein received ERDF funding in the period 2014-2020 so far:

- Fraunhofer Future Food (extension of the competence centre ”Fraunhofer Institution for Marine Biotechnology”)
- National Competence Centre Marine Aquaculture Phase III
- Competence Centre Nanosystem Technology - Phase II
- Centre for Industrial Biotechnology (CIB) - Phase III
- Competence Centre Renewable Energies and Climate Protection (EEK.SH)
- *Competence Centre Human Resources and Vocational Training Schleswig-Holstein*
- *Broadband Competence Centre Schleswig-Holstein 2015 – 2023*
- *Muthesius Transfer Centre*

The last 3 listed competence centres (in italic letters) are not directly linked to blue growth and thus not included in the study.

Funding of competence centres usually is committed for periods of three years. Up to three phases can be funded, in case of positive evaluation. After nine years of funding, competence centres are supposed to be self-sustaining. Two competence centres, funded in earlier ERDF periods, still exist and show relevance in the blue growth context.

- GEOMAR Biotech (formally KiWiZ, now attached to Helmholtz Centre GEOMAR)
- Competence Centre Power Electronics (attached to ISIT Fraunhofer Institute in Itzehoe)

The list of competence centres shows, that blue topics play quite an important role, in terms of competence centres. The topics blue biotechnology and aquaculture, but also renewable blue energies are focused. More established blue sectors however, are not covered by this measure. Clusters and competence centres can thus be understood as supplementary measures.

Strengths of the competence centres in Schleswig-Holstein

The competence centre Owners see the most important strength of competence centres in serving as central contact point for enterprises and universities alike, dealing with a specific future oriented technology. Further strengths of competence centres are seen in networking, knowledge and technology transfer, analyses of the regional value chain, market observations, uncovering regional potentials and implementing measures for development, the development of business plans and impulses for further projects. Furthermore competence centres deal with future topics and cross-topics possessing high potential for innovations. The measure enables funding staff for the competence centre, for administration, public relations and coordination.

Furthermore, technical infrastructure for common use is funded. Money for those tasks is otherwise rather rare. Several of the existing competence centres in Schleswig-Holstein have gained international reputation. They attract high quality scientists and thus strengthen the scientific location Schleswig-Holstein.

The managers of the competence centres emphasized the following strengths: First, the funding of staff for project management enables to apply for and attract more projects and to involve more different enterprises. Furthermore, the scientists working in projects can often stay longer and participate in several subsequent projects, because a competence centre acquires more projects than an average university institute. This advantage makes the competence centre attractive for high quality scientists. As a consequence competence centres concentrate competences under one roof, which results in extended external visibility and high reputation, not only for the institute itself, but also for Schleswig-Holstein. Furthermore, communication has improved and new connections have been developed through the structures build-up by the competence centres. Competence centres enable to build-up mixed project teams with employees of enterprises and scientists. For this kind of cooperation, trustful relationships are required. Such relations are build-up through long-term cooperation within the competence centre. Competence centres are not exclusively located in the economic centres of Schleswig-Holstein. Centres in peripheral regions are particularly welcomed and supported by the regional administration. They offer good opportunities for the region to develop economically, to attract highly skilled people and to gain reputation.

Weaknesses of the competence centres in Schleswig-Holstein

The competence centre owners primarily focused on the current funding scheme as being a weakness of the competence centres. Funding is limited to 3 phases à 3 years. It was intended to reduce the share of funding from phase to phase to gradually transfer competence centres into self-sustaining structures. This plan does not succeed so far. Several competence centres did not pass the first mid-term evaluation. Funding was stopped, the competence centreswere closed. Three years of funding were partly lost and not used in a sustainable way. Some topics chosen by competence centres are difficult for investors because of high costs, risks and legal requirements. Therefore little interest from the business side and few cooperation partners are the consequence.

Furthermore it is seen as a weakness of competence centres, that even though there are closely located centres dealing with related topics, they do not cooperate or exchange. Instead they behave like competitors. Moreover, some competence centres have difficulties to decide on their core competences. They change their focus from time to time because no topic succeeds explicitly. Furthermore, it is difficult for competence centres to apply for project funding, because possibilities of co-financing are limited. Only a small share of all projects is successful at the end. Those products/ technologies/ processes are sold after a while and do not support the competence centres in the long run. This statement is partly contradictory to

other statements, expressing that competence centres are particularly successful in acquiring projects. Another weakness mentioned by the competence centre owners is the fact, that some competence centres are no competence centres at all but rather a consortia- or cooperation project. The reason for that can be found in the relatively low requirements for application and implementation of a competence centre compared to other ERDF measures.

The managers of the competence centres in Schleswig-Holstein confirmed the weaknesses in terms of funding. Additionally they mentioned that there was a gap of funding between period 1 and 2, due to delays in the programme adoption. Such a delay and shortfalls in financing disturb the work of competence centres significantly and in the worst case lead into bankruptcy. Furthermore the managers complained, that the more external financing they acquire, the less public money they receive. This procedure does not motivate to apply for external funding. Moreover, projects applied for by the competence centres have to be pre-financed. This financial burden is difficult to absorb for an institution with a very small financial backbone. In times with many projects being accepted at the same time, the situation becomes critical. Moreover for some projects, the refunding comes very late, which then additionally leads to serious financial problems. Another weakness mentioned by the managers is the temporary status of working contracts, except for professors. Competences of the scientific staff are lost over and over again. This fact however applies to all scientific institutes. And as stated earlier, competence centres have a higher probability to keep their staff for longer, by acquiring many projects at a time. Concerning this aspect, the answers of the different interviewees are not consistent. Temporary contracts and the dependence on projects and co-financing is a general problem in science. The interviews generally give the impression, that competence centres are better off then university institutes in this respect. However the fact that this issue is mentioned as well in terms of weaknesses shows that the situation is nevertheless not satisfactory. Another weakness is the difficulty to measure the contribution of a competence centre. Most centres are totally interwoven into a university, and the temporarily created jobs cannot really be counted as new jobs. Moreover, some competence centres are not yet known to all enterprises that could benefit from its existence. More effort on public relations is necessary in those cases. Last but not least, the compliance with the state aid law restricts the possibilities of competence centres as it does for clusters.

Opportunities arising from the competence centres in Schleswig-Holstein

According to the competence centre owners, opportunities arise for a whole range of actors: universities benefit from additional possibilities of project applications, enterprises benefit from innovations, the locations of competence centres (those might also be rather peripheral regions) benefit from the reputation of the centre as well as from the attractive jobs generated for scientists, technicians and administrative staff. Furthermore, competence centres deal with future oriented technologies, supporting the development of the high-tech sector in Schleswig-Holstein. The competitiveness of the regional research landscape improves and is

supported by competence centres. Last but not least, spin-offs from competence centres already exist and should be further supported in the future, according to the competence centre owners.

From the managers' point of view, enterprises benefit most from the existence of competence centres. The managers understand their centre as a service provider for enterprises. Those can use laboratories and equipment, which they could not afford to purchase themselves. Universities benefit as well; they get new opportunities for project applications and pick up ideas from enterprises. Students are also among the group of beneficiaries. They can use the equipment of the competence centres for their bachelor and master thesis research and get in touch with enterprises. Several spin-offs from former Ph.D. students have been recorded. Additionally, competence centres train technical staff for the future. The funding of competence centres has pushed the respective sectors in Schleswig-Holstein and opened up opportunities for the development of future technologies and the promotion of the research and technology landscape Schleswig-Holstein.

Threats to competence centres and the policy supporting them in Schleswig-Holstein

The most sever threat of competence centres is the complete cutting of finances but also the gradual reduction of financing without having enough investors from the business side. This threat is mentioned by owners and managers alike. Another threat mentioned by the managers is the competition between the competence centres, instead of cooperation and exchange. This behaviour does not lead to an optimal performance. The owners mentioned one more threat which is rather related to their own risk in funding competence centres: It is difficult to predict, which technologies will be important in the future. Competence centres are intended to support an early development of future technologies. So it might happen that either the wrong technology is supported and money is lost, or important topics are missed and this is realized too late. The funding of competence centres therefore poses a certain risk for the owners. The question, if the available money is spent for the right topic can only be answered in retrospect.

Questionnaire

The survey conducted among members of the MCN also included some questions about their satisfaction with the work of the cluster. A first question deals with the length of being member. Among the five answering members, there is one enterprise being member for more than two years, one is member for more than three years and the other two companies are members for more than five years already. One respondent skipped this question.

The next question deals with the services provided by the cluster. Which kind of services have been used and how satisfied are the enterprises with the services. Again this question was only answered by four enterprises. All for respondents have taken part in different events. Three of them were satisfied while one respondent was only rather satisfied. Two respondents are active in expert groups initiated and organised by the cluster management. One respondent

is satisfied with this service while the other one is only rather satisfied. Two respondents have used the service of the cluster management to get advice for funding and how to initiate innovation projects. Regarding this service, one respondent was very satisfied and the other one was satisfied. One respondent used the service of arranging cooperation partners. This respondent was satisfied with this service. Other services like support by the local office in Kiel or the central office in Hamburg as well as public relations work such as newsletter, websites or print media have not been used by the respondents.

Asked about the direct benefit of being member of the MCN, only three enterprises answered. Two of them agree that being member facilitates access to public funding. Two respondents state that the membership enhances the motivation and possibility of cooperation. Other benefits such as "facilitating access to market and sector specific trends", "facilitating access to other financing sources", "deepening existing and building up new contacts", "enhancing publicity" and "enhancing cooperation with local and regional business support organisations" were ticked once each. Two categories were not ticked at all: "deepening existing and building up new contacts outside of Schleswig-Holstein" and "intensifying innovation and R&D activities". Asked about the fact if those services have met their expectations, the reaction is divers. Especially regarding the aim of enhancing the motivation and possibility of cooperation, their expectations were rather not met. Same applies to the aim of facilitating access to other financing sources. All other expectations are met or at least partly met.

However, due to the low response rate, these results have to be treated carefully. They are far from being representative and only show the opinion of single members.

Conclusion Measures (ERDF)

To conclude, the ERDF measures in the OP ERDF Schleswig-Holstein are not sector specific. The measures of priority axis 1 however are only open for projects related to the five specialisation fields. With regard to blue growth this means for the current programme period, that for most actors those measures are accessible, except for the maritime tourism sector. Besides this exception all measures theoretically provide the possibility to foster blue growth. The analysis of real projects funded under ERDF in the current funding period reveals that generally the blue economy is well represented, based on the share of committed projects. This picture changes when taking into account the amount of money behind those projects. Blue projects are rather small projects in terms of subsidy amount. Furthermore, in certain measures, the blue economy is rather underrepresented. This applies to: "Company's Innovation", "Investment Funds for SME", "Energetic Optimisation in SME" and "Consortia and Cooperation Projects" (in terms of exclusively blue projects). The question concerning the why arises: Are those measures generally not interesting for blue actors or are there any specific obstacles? The SWOT analysis of clusters and competence centres has shown that

those two measures are well suitable to foster blue growth. Competence centres are particularly suitable to foster young innovative technologies, with still a strong focus on science/ research but ready for initial entrepreneurial experiences. Clusters cover a comparatively broader thematic scope and connect established and young enterprises. Both measures are important tools to support blue growth. However, the analysis also revealed some weaknesses that might turn into threats if not tackled soon. The main scope of duty with regard to clusters and competence centres in the near future will be to establish a long-term funding system enabling sustainable managements as well as further promotion of the services and advantages offered by those institutions. The most serious challenges for enterprises to apply for ERDF funding can be seen in the bureaucratic burden, the difficulty of pre-financing and the huge personnel costs, needed for the application. Most blue enterprises are SMEs with a limited personal and financial backbone.

4.3. Recommendations for updating the RIS3 SH

The monitoring results with focus on blue growth revealed several weaknesses and pointed to some room for improvement. In the following section, recommendations for a future update of the RIS3 SH are presented. Some aspects are directly related to blue growth others however intend to improve the RIS3 and its implementation in general. Indirectly though, improving the implementation of the RIS3 SH will foster all specialisation fields and therefore also most blue growth sectors. There is no exclusively blue RIS3 in Schleswig-Holstein, but the regional innovation strategy includes most blue sectors. The following recommendations are related to four central issues that need improvement:

1. Adopting the obligatory part of the RIS3 SH;
2. Using RIS3 as a strategic tool for innovation policy;
3. Strengthening the acceptance of the RIS3 SH;
4. Harmonising RIS3 and OP ERDF.

Adopting the obligatory part of the RIS3 SH

Obligatory parts of the RIS3 SH are, among others, the nomination of specialisation fields and a choice of relevant smart specialisation topics. Those parts of the RIS3 are of a rather restrictive nature. The intention is to concentrate funding for innovation projects in most promising fields. Because of the restrictive effect, it is particularly important to choose the specialisation fields and smart specialisation topics carefully.

In terms of specialisation fields, the last four years since the beginning of the funding period (2014-2020) have proven that Schleswig-Holstein should include more fields. When elaborating the RIS3 SH, the responsible actors were told not to nominate more than five specialisation fields. However, a comparison of different RIS3 in Germany and the Baltic Sea

region revealed that not all RIS3 are restricted to five specialisation fields. Furthermore, other regions have differentiated between specialisation fields and cross-cutting themes. The German Länder Berlin and Brandenburg, who had chosen this approach for their joint RIS3, were even mentioned as best practice example in the guideline on how to do a RIS3 provided by the European Commission (2012b). This is an interesting approach which should be taken into consideration for an update of the RIS3 SH.

Except for maritime tourism, all blue sectors relevant in Schleswig-Holstein are covered by the existing RIS3 SH. Taking into account that tourism is an important pillar of the economy in Schleswig-Holstein, that there is already an established cluster for tourism and recognizing that modern tourism is not reduced to standard infrastructure but needs innovative ideas, technologies and concepts, I recommend including tourism as a specialisation field into the RIS3 SH. To remain competitive, the tourism sector in Schleswig-Holstein needs innovations. Innovative projects in the interface of tourism and ICT, tourism and the maritime economy or food or renewable energy industry show great potential and open up promising future innovation paths for the region.

Furthermore, there are two other promising fields in Schleswig-Holstein which are not blue by themselves but related to blue fields. Creative economy and material sciences/ nano technology show a huge potential in terms of innovation. Those two sectors are well established in Schleswig-Holstein and strongly connected to the existing fields of specialisation. Thus, they are particularly suitable to be treated as cross-cutting themes. Both sectors are also strongly connected to the maritime economy. Blue innovations in the interface of creative economy and/ or material sciences/ nano technology and the maritime economy are very likely.

To be more stringent in differentiating between specialisation fields and cross-cutting themes, I also recommend treating the former specialisation field ICT and media as a cross-cutting theme. The description of this specialisation field starts with reference to the cross-cutting function of the digital economy. This should then consequently lead into the categorization of cross-cutting themes.

Summarising those recommendations results into a new scheme of five specialisation fields and three cross-cutting themes (see fig. 3). This proposal includes all significantly innovative sectors, present in Schleswig-Holstein. All of them are closely related to each other, which makes innovations in the interfaces very likely. Before introducing this new scheme into the RIS3 SH, it should, however, be clarified, how to deal with these two categories in the future funding practice. Will all projects related to the cross-cutting themes be open for innovation funding from ERDF, or only those with regard to one of the five specialisation fields?

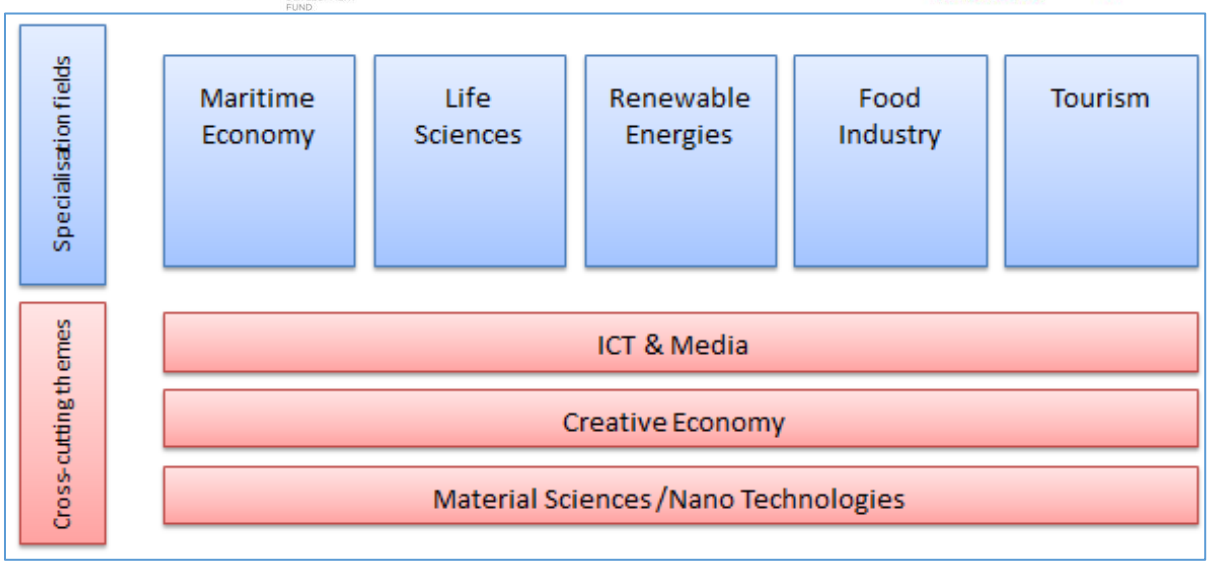

Figure 3: Proposed of a new RIS3 scheme for Schleswig-Holstein

Another obligatory and restrictive part of the RIS3 are the so called smart specialisation topics ("*strategische Zielfelder*"). Those topics are not sector-specific and therefore not directly related to blue growth. However, observing the development in regional innovation policy during the last years revealed two topics that should get more attention in an updated RIS3: **start-ups and internationalisation**.

I recommend including the term "start-up" into the updated RIS3 SH. So far, the term "*Gründungen"* is used (smart specialisation field no. 6) in combination with knowledge and technology orientation. During the last years innovation policy in Schleswig-Holsten focused on the support of start-ups and the establishment of a start-up ecosystem. The term "start-up" refers to a specific group of young enterprises, based on innovative business ideas; they need to have a scalable, sustainable and profitable business model. Start-ups have to be privately owned and younger than five years. Their yearly turnover must be below 843.300€[6]. This group of young enterprises needs special attention because they have more difficulties than other young enterprises to attract investors or convince banks to provide credit. Alternative ways like crowd-funding are often used. Because of the innovative nature of their technologies and products, the success of start-ups is even more unpredictable than for other young enterprises[7]. Nevertheless, those innovative businesses are main drivers of the regional innovation process. This should be taken into account when updating and adopting the RIS3 SH to new circumstances.

Internationalisation is another aspect that gained rising importance in the last years. Several managers of clusters and competence centres mentioned that there is need for more internationalisation in Schleswig-Holstein. The term "internationalisation" does not appear in

[6] MWVATT: Homepage Start-up Summercamp Schleswig-Holstein. Online: https://startupcamp.sh/

[7] Rechtsportal jura-basic.de. Online: http://lexikon.jura-basic.de/aufruf.php?file=3&art=6&find=Existenzgr%FCndung

the RIS3 SH so far. Instead, the last smart specialisation topic includes the wording "smart use of cross-border linkages." This represents a rather vague statement without clear orientation. The use of comparative advantages in cross-border value chains and international cooperation in research and development are important requisites for blue growth and future economic prosperity in general. A specific focus could be laid on the Baltic Sea region. Anyways, I recommend reformulating the last smart specialisation topic and become more specific. The term "internationalisation" should be used here and filled with content.

Additionally, more focus on cross-cluster cooperation and general cooperation projects within Schleswig-Holstein had been requested. Enhancing products "made in Schleswig-Holstein", in cooperation with several regional actors, were suggested. This need and wish for more regional cooperation could be included in the description of smart specialisation topic no. 4 "Sharpening the locational profile by targeted development and strengthening of clusters and networks with a profile defining, internationally respected quality".

Using RIS3 as a strategic tool for innovation policy

According to the initial concept of smart specialisation (Foray, 2015), underlying the RIS3 process, the regional innovation strategy is intended to be more than a list of specialisation fields and smart specialisation topics, restricting the possibilities of spending ERDF money. In fact, the strategy should be used as a regional strategic tool to enhance interaction between players and to open the eyes for new innovative opportunities arising within or between specialisation fields. The strategy should support the generation of ideas and give impulses. The process should enhance the exchange of actors and foster reflections on past innovation projects. I recommend further **developing the existing RIS3 SH in a more strategic direction.**

The monitoring revealed that the current version of the RIS3 SH is rather descriptive than strategic. The descriptions of the specialisation fields so far consist of long lists. Different technologies, subfields and important players are listed. This approach provides a good picture of the current situation, but does not contribute to a strategic orientation. First, the current RIS3 SH lacks of justifications and explanations. Why are certain future development paths chosen, and others are not? Why are certain technologies called key technologies, and others are not? This applies to the blue specialisation field of maritime economy as well as to all other specialisation fields. Second, I highly recommend **elaborating strategic aims and visions for each specialisation field and cross-cutting theme**. Which are possible, innovative topics with regional comparative advantage within the respective field? Are there any unique characteristics and capabilities within the respective field? Schleswig-Holstein is not the only region nominating maritime economy, life sciences or renewable energies as a specialisation field. How can Schleswig-Holstein differentiate from other regions having the same specialisation fields? More effort should be made to elaborate the outstanding

characteristics and capacities of the regional actors in the respective fields. Where are the comparative strengths of the regional economy? The indicated cooperation with players from Hamburg and other coastal regions in the current RIS3 SH is reasonable but should be accomplished by indicating the specific role and strength of Schleswig-Holsten in this inter-regional cooperation.

Additionally **more focus should be laid on the opportunities arising from the links between the specialisation fields and with regard to the cross-cutting themes**. Where are possible innovation paths in the interface of different specialisation fields? This is the core issue of the original concept of smart specialisation! Smart specialisation is not about restrictions and stereotyped thinking in the first place, it is about opening new possibilities and fostering cross-innovations. A comprehensive and elaborated section on current and future cross innovation topics should be added at the end of each description of the specialisation fields and cross-cutting themes. The RIS3 SH should provide answers on the question marks indicated in Figure 4.

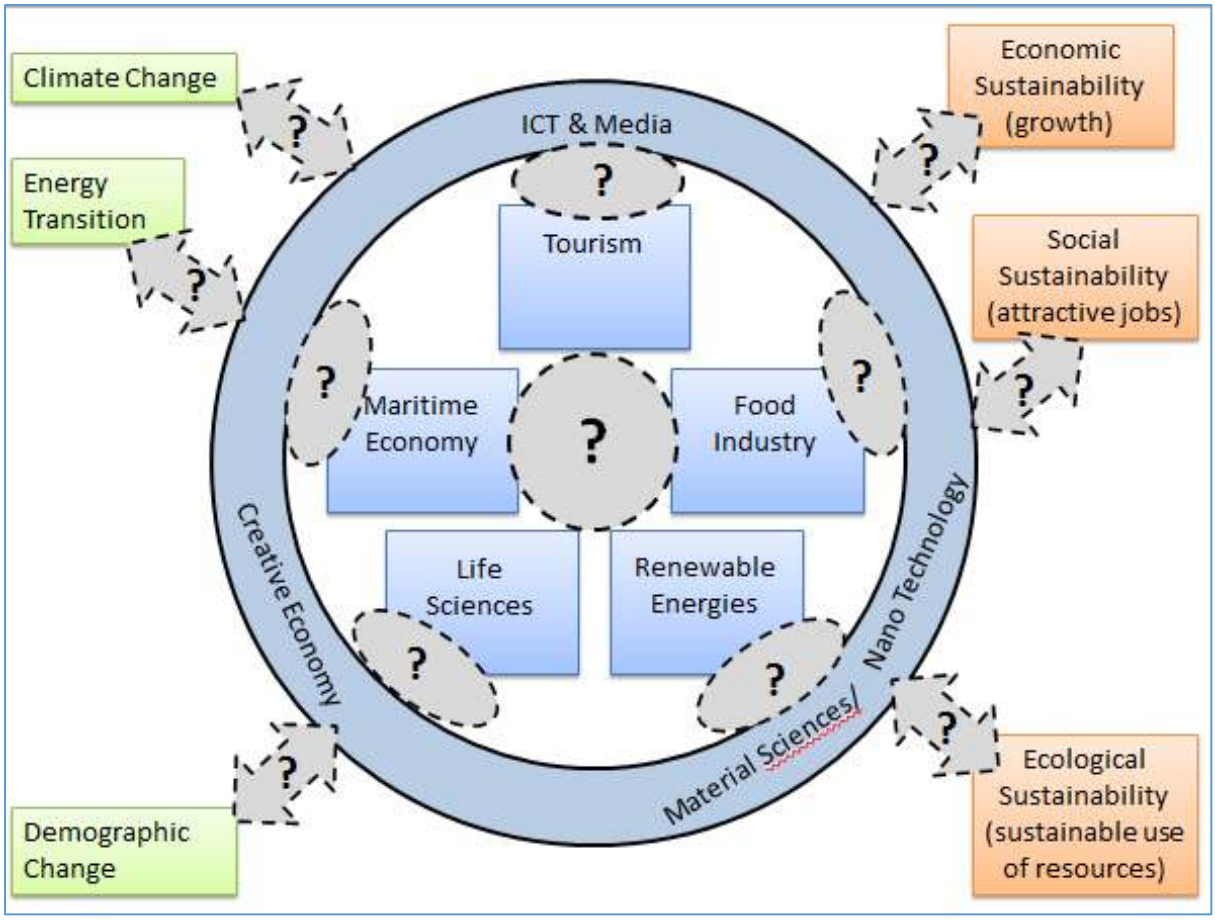

Figure 4: Complex system of smart specialisation in Schleswig-Holstein

Furthermore, **possible solutions to reach the goals** described in the vision should be developed by all specialisation fields and cross-cutting themes. What are possible contributions of the respective fields towards the challenges of climate change, energy transition and demographic change? Which innovative approaches are conceivable to contribute to the aims of sustainability? How can each specialisation field contribute to economic growth, attractive jobs and a sustainable use of resources in Schleswig-Holstein?

In general, more focus should be on **relationships**. Smart specialisation is about complexities. Starting points should be all the questions marks, indicated in Figure 4. What are possible innovation paths in the interface of the specialisation fields? What are possible innovation paths in the interface of the specialisation fields and the cross-cutting themes? And how can this whole system of specialisation fields and cross-cutting themes contribute to tackling the most severe challenges (climate change, energy transition and demographic change) by following the aims of (economic, social and ecological) sustainability.

To elaborate a more strategical vision of possible innovation paths I recommend making **use of the six existing cluster managements**. Additionally, bodies representing the new fields need to be found. I suggest the Muthesius Transfer Centre[8] to take over the lead for the crosscutting-theme creative economy and NINa SH e.V. [9] for nano technology. The managements are very well connected to different kinds of actors. They best know the community and enjoy good reputation among their members. This advantage should be used to make the RIS3 a successful process, shaped by the actors themselves and accepted by the majority. The RIS3 is meant to be a process and not a rigid document. The clusters are very well suited to accompany and guide this process for their respective specialisation field. Not every single enterprise or scientist needs to fully understand the concept of smart specialisation or the mechanisms behind the RIS3 process. For the future process it would be helpful to instruct intermediates like cluster managements to guide their respective groups of actors. However with respect to blue growth, it has to be stated that even though aquaculture and blue biotechnology are mentioned in the RIS3 under the specialisation field Life Science, the respective cluster Life Science Nord is excluding those topics, concentrating on their core fields medical technology and pharmaceutics. Aquaculture is partly covered by the work of the Maritime Cluster Northern Germany. However, it should be discussed, who is responsible to audit the further development in those two fields and to include them into the RIS3 process. In terms of aquaculture the competence network KNAQ[10] could take over this task. In the field of blue biotechnology, a rather new association was established the "*Nordverbund*

[8] https://transferpark.muthesius-kunsthochschule.de/2017/06/01/muthesius-transferzentrum/
[9] North German Initiative Nanotechnology Schleswig-Holstein (http://www.nina-sh.de/?page_id=461)
[10] http://www.knaq-sh.de/en.html

Marine Biotechnologie"[11]. However, I recommend avoiding too much fragmentation, as the aim is smart specialisation.

Last but not least, being located between two seas, blue economy definitely plays an important role in Schleswig-Holstein. Therefore, I recommend including the term "blue economy" or "blue growth" in the updated RIS3 SH. The term blue growth, as introduced by the European Commission (European Commission, 2012) is focused to five young and innovative sectors: aquaculture, blue biotechnology, cruise shipping, marine mining and renewable energies. Except for cruise shipping, those sectors are supported by the current RIS3 SH. However, rather traditional blue sectors are more important for the region. I therefore suggest using a broader definition of blue growth for Schleswig-Holstein, including all innovative blue sectors. Following the blue growth strategy is a good starting point for cross-innovations and the support of blue innovation paths.

Strengthening the acceptance of the RIS3 SH

The contributions and discussions during the workshops in the context of the Innovation and Technology Forum demonstrated that the RIS3 and the concept of smart specialisation have not yet reached the actors. There is a lot of misunderstanding around, leading to rejection and mistrust. Therefore, I recommend introducing the concept of smart specialisation, its background, the opportunities but also the challenges and consequences arising through this new approach of innovation policy in a **clearly structured and easy to understand** way. A brochure telling the original story, summarising the main aspects and explaining the intention behind the strategy could be a starting point. An appealing, well-structured presentation during an Innovation and Technology Forum would be another possibility to convince the community, concerning the necessity and usefulness of the RIS3. Taking the experiences into account, it is important to develop an accompanying programme to make the RIS3 more understandable and thus to improve its implementation.

The aspect of more reader-friendliness should also be taken into account when updating the RIS3 SH. I recommend a **clear and consistent use of terms as well as clear definitions for the new strategy**. The current version is full of technical terms. They all sound similar and lack any explanation. What is the difference between growth potential (Entwicklungs-potential) and future growth paths (Wachstumspfade für die Zukunft)? What is the difference between competency profiles (Kompetenzprofil), key technologies (Schlüsseltechnologien) and specific innovation potentials (spezifische Innovationspotenziale)? Under all those headings, the current RIS3 SH lists a number of subsectors and technologies. For the reader it is hard to understand the relevance of those different lists. Reading a document, which is hard to understand, is not suitable to convince anyone to actively participate in a process. Furthermore, I observed several logical errors within the descriptions of the specialisation

[11] https://nvmb.de/en/sample-page/

fields. On one hand, core aspects that focused on in the first part of the chapter do not reappear in the conclusions and on the other hand, new fields suddenly appear in an overview not having been mentioned before. I highly recommend going through the document again and revising it in terms of consistency and use of terms. To gain acceptance the strategy needs to be clear in structure and terms and should not have obvious logical errors.

Another recommendation regarding the smart specialisation topics is to **shorten the titles**. So far, the nine topics have very complicated and long headlines. It is difficult and takes time to grasp them as a reader. Short and concise titles would enable a faster understanding and a better memorising of the most important topics chosen for smart specialisation.

Acceptance and engagement are key requisites for a successful implementation of the RIS3 and therefore a successful innovation policy under current EU regulations. The concept of smart specialisation and the introduction of the RIS3 received strong approval on the EU level so far. Therefore, it is rather unrealistic that the EU will change its innovation policy in near future. For the regions this means, that they should make the best out of it and learn from initial mistakes. Some recommendations, where to start updating the RIS3 document and how to improve the process have been given in this report. Last but not least, the RIS3 is closely related to the OP ERDF. A harmonisation of both documents is therefore definitely necessary.

Harmonising RIS3 and OP ERDF

The measures to implement the RIS3 SH are not included in the RIS3 SH itself, but introduced in the OP ERDF. The analysis of the measures with regard to blue growth has shown that clusters and competence centres are well suited to foster blue growth. However, a long-term, sustainable support of most clusters and competence centres is not secured yet. Even though this is not part of the RIS3 document, I recommend finding long-term solutions to keep those institutions alive. The clusters are very valuable for the RIS3 process and should receive a more active role in carrying this process forward. Therefore they need planning security. Competence centres have a slightly different function. They are rather important for young, innovative sectors, such as the core “blue growth” sectors like aquaculture, blue biotechnology or blue energy. To foster blue growth in the long-run and to make competence centres more sustainable, solutions need to be found, how to gradually involve enterprises and investors and how to build on previous successes, when the initial funding for competence centres is over.

Another result is the fact, that the blue projects funded under ERDF are in average smaller regarding the funding amount than non-blue projects. This might be related to the fact, that most blue enterprises are SMEs. However, blue clusters (MCN) and competence centres (for aquaculture and blue biotechnology) might have an eye on this issue and foster the application of bigger projects within the blue community.

Furthermore, I observed during the last years, that the OP ERDF was updated while the RIS3 process of evaluation and updating was delayed and did not yet take place. I highly recommend evaluating and updating the RIS3 from time to time. For this process it would be advantageous to choose a phase in which a new OP ERDF is not yet under discussion. Such a situation allows for a general assessment and uptake of new trends into the strategy that afterwards should be considered in the development of the next OP ERDF. The update of the RIS3 should not only be a reaction on changes in the operational programme, but should rather consider general new trends and needs for the regional innovation policy. The strategy and the operational programme should go hand in hand. They need to be in line to avoid friction and loss of funding options. Close cooperation between the two responsible departments should be ensured.

Concluding recommendations

The above mentioned recommendations for updating the RIS3 SH will be provided in German language to the Ministry of Economic Affairs, Transport, Employment, Technology and Tourism Schleswig-Holstein. However, it should be considered that this analysis was done from a blue growth perspective. My recommendations do not substitute a proper evaluation and update of the RIS3 SH, due to in the near future.

The chosen mix of methods revealed a significant number of possible issues for improvement. However, the chosen tools are not all completely easy to apply and free of friction. Therefore, the tools will be reflected in the next section to give advice on the strengths and weaknesses of the used tools and to assess the quality of the developed monitoring scheme.

5. Reflections

The aim of the present report was to develop a monitoring and evaluation scheme for RIS3 in terms of blue growth. This scheme was then tested for the case of Schleswig-Holstein and recommendations were provided on how to improve the strategy towards this aim. The developed framework includes eight modules to be analysed with help of several tools such as document analyses, statistical analyses, a questionnaire, interviews and workshops. The following reflection will cover all tools and highlight their respective strengths and weaknesses.

Document analysis RIS3 and OP ERDF

The document analysis is definitely a very important part of this mix of methods. It provides a very good overview of the core subject and reveals first weaknesses when reading the strategy and the programme. An outsider who was not involved in developing the documents will soon detect first weaknesses. However to fully understand why the strategy looks the way it does, it is necessary to talk with responsible colleagues. There are a lot of background stories and reasons for the one or the other decision. Those aspects are not covered by the document

itself. What is written in the document is only the surface, selected information open to public. To read between the lines and to understand the background by asking those involved in the development of the documents seems necessary to monitor and evaluate properly and to provide reasonable recommendations.

Moreover, the document analysis is not suitable to analyse the success in implementation. To analyse the success of the OP ERDF in terms of blue growth, a list of actual funded projects was analysed. This list however did not tell the whole story either. A lot of insider knowledge is necessary to interpret the results in the correct way and to draw the right conclusions. Conversation with responsible actors is central in this case as well. Several projects are planned but not yet committed. This leads to the impression that a lot of funding is still available. Furthermore it is not always clear, if a project is blue or not. Therefore a category of partly blue has been used. However, how to deal with such a category? Anyway, blue growth is a difficult category with different definitions. Where does blue growth start and where does it end? Those difficulties generally related to blue growth become particularly obvious when trying to assess its development.

Statistical analysis

To conduct a statistical analysis on the regional level on blue growth is very challenging. Blue growth is no statistical category. The different sectors subsumed under the term blue growth first have to be identified. However, some of them are very specific and no statistical category either. They are combined with other non-blue sectors in broader statistical categories. Furthermore to assess the success of the RIS3, the development of statistical values need to be taken into account. And the focus is on innovation indicators like patents, R&D expenditures etc. Those specific values are not available on the regional level for very specific sectors. Therefore a serious statistical blue growth analysis in terms of innovation on the regional level is not feasible. This problem was confirmed by the methods applied in existing blue growth or maritime economy studies. All studies are based on a mix of methods trying to approximate the development of blue growth. An unambiguous, objective statistical analysis is not possible yet with the existing statistical data.

Only selected sectors can be analysed in terms of their development in jobs and revenue over the last years. These results, however, do not clearly indicate the contribution of the RIS3 process on this development. Anyway, it is very difficult to statistically analyse the influence of a strategy on sector development. This is a complex process, influenced by many aspects. Results should be treated cautiously as wrong conclusions can easily be drawn. Statistical analysis should always be accompanied by other methods.

Questionnaire

The response rate of 3% with a total of five responses and one respondent skipping most questions, demonstrates the most severe limitation of this method. Online surveys are quite anonymous. Nobody can be forced to participate and the request to fill out the questionnaire can easily be ignored without any need for justification. To successfully conduct an online survey direct contact with the group of respondents is necessary. Lots of publicity, information, personal requests and reminding talks or emails are needed; otherwise, the results can hardly be used in a proper way.

On the other hand, a questionnaire delivers clear and easy to analyse results. The method is less time consuming than other methods and leads to a profound quantitative basis for further research. With an online questionnaire one can easily reach respondents from different locations and one gets standardised answers. However, to be able to use the results in a proper way, it needs to be guaranteed that the response rate is high enough. Therefore it should be considered if the online questionnaire is the best suitable method in the respective case or if it is better to address the respondents directly and ask for a personal interview. The non-response is lower in that case, as an active rejection and justification is needed.

Interviews / SWOT analysis

Interviews are a good method to gain deep insights from experts. However, interviews are very time consuming. Each interview took about one hour, plus additional time for preparation, wrap up and interpretation. A single interview is very subjective, so only a whole range of interviews leads to relatively secure results. The analysis of the interview results showed that the answers differ a lot. Most answers are based on singular opinions. To draw conclusions from single answers needs a careful interpretation and handling. How to deal with contradictory answers?

Furthermore, the method of the SWOT analysis was not an easy one in this context. The difference between strengths and opportunities on one side and weaknesses and threats on the other side was not clear for every interview partner. Therefore, those questions partly resulted in the same answers.

Workshop

The workshop conducted in the context of the 3rd Innovation and Technology Forum did not quite lead to the expected outcome. One reason for that was the very limited timeframe. Originally 90 minutes were foreseen, but because the first part of the event took longer, the workshop ended up with 40 minutes only. This is too little time for a group of people, coming together for the first time. A second reason for the unexpected outcome was the fact, that almost no maritime player was present in the workshop for the specialisation field maritime economy. Instead participants were from universities, universities of applied sciences and

research institutes, often in the position of representatives for knowledge and technology transfer or programme coordinators. There were some representatives of enterprises present, however not directly from the maritime sector, but from the fields of logistics and consulting. Against this backdrop it's no wonder that the workshop did not result in the expected outcome. Additionally, the participants in the workshop for maritime economy seemed to have only partly knowledge on the RIS3. They have picked up parts of the smart specialisation concept (especially the limiting consequences of specialisation fields) and entered the workshop with a rejecting attitude towards the RIS3 in general. Instead of working on the given questions, they complained generally that the regional innovation strategy is not helpful, and from their understanding and point of view rather counterproductive in terms of innovation policy. Most reasons given for this view were however based on misunderstanding.

Workshops are suitable to discuss issues with a larger group of people. Participants can interact and react directly on the contributions of others. Workshops are well suitable to collect ideas and opinions, to structure them and to think jointly about solutions. It is possible to use tools to visualise results. However, some general preconditions need to be given: enough time, suitable participants, enough knowledge on the topic to be discussed and a trained moderator to guide the discussion. Otherwise, the workshop ends up with unintended results, which are not helpful for the intended aim of the workshop. The workshop on maritime economy in the context of the 3rd Innovation and Technology Forum was eye-opening towards the manifold possibilities of misunderstanding the RIS3 and the concept of smart specialisation and to get an impression of how the community thinks about it. However, the workshop did not result in constructive ideas on how to further develop the strategy in terms of maritime economy as it was the intended aim.

Concluding reflections

To conclude it was good to decide for a mix of method. Each method revealed strengths but also severe weaknesses. Those weaknesses could be somewhat balanced by this mix. Generally, it was not possible to assess the effect of the RIS3 on blue growth. However, the methods revealed several weak points and room for improvement, to better adjust the RIS3 and the OP ERDF to the needs of the blue economy. Furthermore it became apparent, that generally the blue economy is relatively well represented in the RIS3 as well as in the committed innovation projects. The results show that more severe problems are of general nature. They are related to the lacking acceptance of the strategy, its descriptive character and the missing strategic orientation. The application of the monitoring and evaluation scheme developed within the Smart Blue Regions project has revealed a long list of recommendations on how to improve the RIS3 and its implementation in Schleswig-Holstein. The analysis based on the developed monitoring scheme can therefore be considered to be successful.

6. Summary

Despite all challenges that had to be taken up, this report confirms that it is possible and worth to develop a monitoring scheme to assess the RIS3 in terms of blue growth. Taking into account different preconditions and opportunities per region, a flexible system of eight modules was developed. Four modules are based on the content of the current RIS3 (concerning specialisation fields, key technologies/ cross-innovation topics and smart specialisation topics) and OP ERDF (measures). The other four modules are related to the blue growth sector and serve as comparing the needs of the sector with the aims and measures written down in the strategy/ programme.

Based on this modular scheme, a mix of quantitative and qualitative methods was introduced. Document analyses of the RIS3, the OP ERDF and regional blue growth studies should be combined with statistical blue growth analyses, a quantitative survey based on a questionnaire, qualitative interviews using the SWOT analysis and stakeholder workshops. Despite some weaknesses, all tools turned up to be suitable. Certain requirements, however, should be given to secure a successful output. The tools can be combined in a flexible way, depending on the regional needs and opportunities.

The comprehensive and time consuming monitoring process in Schleswig-Holstein resulted in a long list of detected weaknesses of the current RIS3 process and recommendations for an update. Some minor adaptations are recommended for updating the obligatory part of the RIS3 SH (in terms of specialisation fields and smart specialisation topics). Furthermore, it is suggested to strengthen the use of the RIS3 as a strategic tool for innovation policy and not simply as a restrictive ex ante conditionality for ERDF funding. An updated RIS3 SH should focus more on cross-innovations, scenarios and visions instead of describing the current situation. Additionally, it is proposed to harmonise RIS3 and OP ERDF. Several points for adjustment were identified. Last but not least, it appears to be important to strengthen the acceptance of the RIS3 in Schleswig-Holstein. For being innovative more than a strategy is needed! The RIS3 should not be considered as a document only. It is rather a process which needs to be carried forward by as many actors as possible. The only way to make use of the RIS3, not only in terms of blue growth, is to convince the innovation community of concept and strategy guiding the process. Recommendations on how to possibly achieve this aim as well as an assessment of past weaknesses have been collected during the monitoring process and are summarised in this report. The rich outcome of the monitoring process confirms the quality and suitability of the developed monitoring scheme and the chosen mix of methods.

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