

# Research and Innovation Strategy for Smart Specialization (RIS3) Northern Netherlands





**Research and Innovation Strategy  
for Smart Specialization (RIS3)  
Northern Netherlands**

September 2013



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# 1 Our Ambition

## Northern Netherlands

We in the Northern Netherlands are aware that our region faces many of the same pressing societal and economic challenges as the rest of Europe.

Our aim is to develop the region into one that, in the Europe of 2020, is celebrated for its ability to maximize social and economic benefits by utilising technological advances and cutting edge research.

We are committed as a region to become an inspiring exemplar of smart, sustainable and inclusive growth as advocated by Europe 2020.

Together with our residents. Together with our innovative businesses. Together with our institutes of higher knowledge. Together with our public authorities. And last, but certainly not least: together with Europe.

## European Challenges

Europe faces complex challenges in the areas of food, health, demographic trends, energy transition and sustainable use of resources. Complex challenges require innovative solutions. Solutions require the involvement of as many people as possible for their discovery, development and implementation. Innovation is not the sole province of business and knowledge institutions: it occurs through ordinary awareness of the innovative possibilities by people from all walks of life, and a daily commitment to make use of those innovations. These are the prerequisites for success.

## Research and Innovation Strategy: Smart Specialization

The Northern Netherlands have translated this commitment into their Research and Innovation Strategy for Smart Specialization (RIS3). The European Commission (EC) set drafting an RIS3 as a precondition to be eligible for support from the European Regional Development Fund (ERDF) for regional innovation policy over 2014-2020. The EC invites regions, in their RIS3, to opt for smart specializations in which they can concentrate their regional efforts.

In 2011 The Northern Netherlands drafted a position paper that stressed the pro-active, even pioneering, role the region endeavours to assume within Europe. In their RIS3, the Northern Netherlands go beyond the formal requirements set forth by the EC. The RIS3 is to be a guiding principle that brings together the businesses community, knowledge institutes, citizens and authorities with the primary aim of using innovation to make a difference. This can best be achieved by the RIS3 not only pertaining to a future ERDF programme, but also influencing regional and national policy and other Europe-driven programmes like Interreg, ESF, EAFRD, EMFF and Horizon2020. Hence, the importance of the RIS3 is not limited to only the Northern Netherlands. The RIS3 describes how the Northern Netherlands can contribute to tackling societal challenges on a European level.

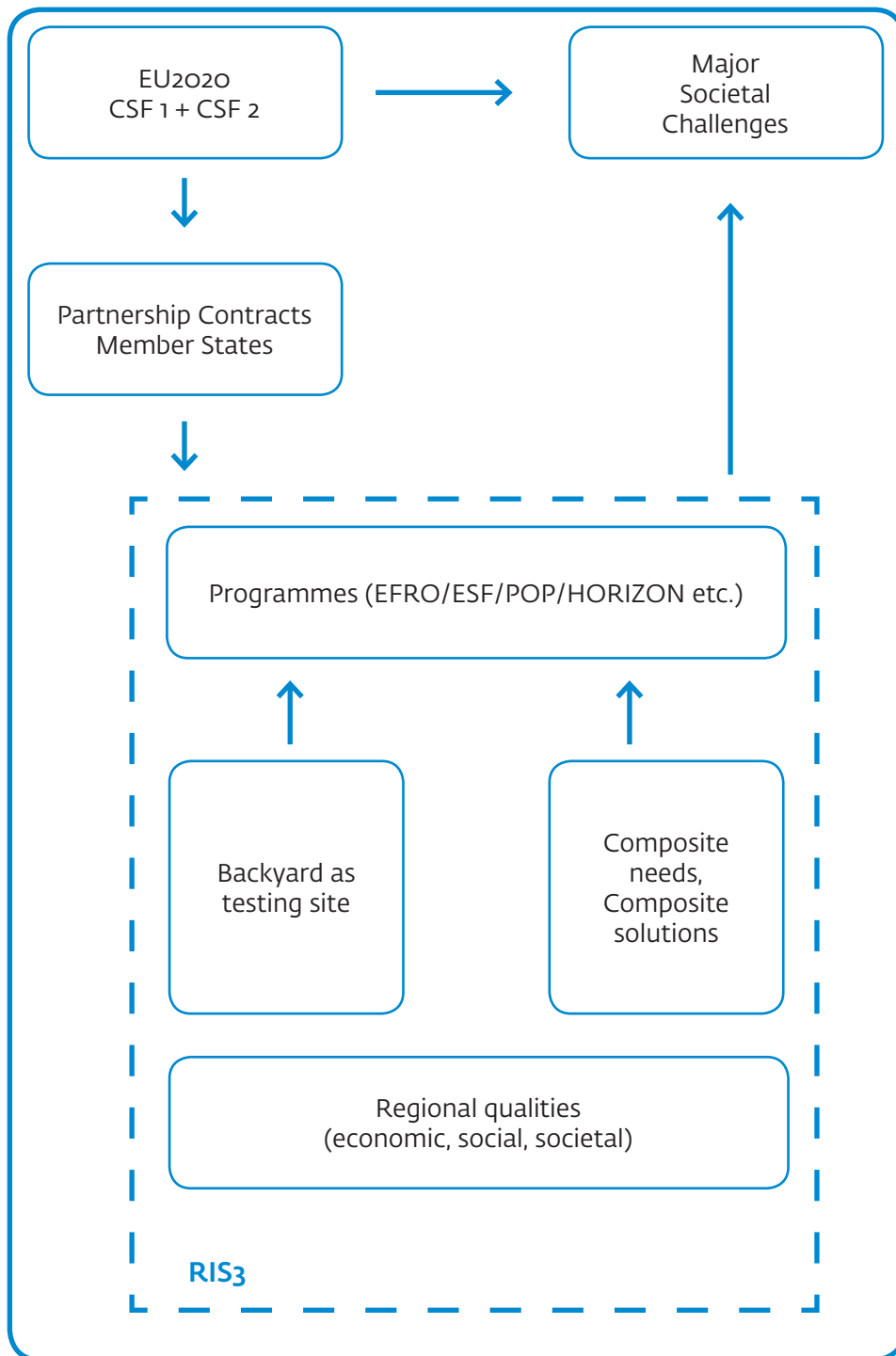


Figure 1: RIS3 in the European context

## 2 The Northern Netherlands' philosophy

### Establishing a Standard

Our Smart Specialization strategy raises the bar by designating societal challenges as the key focus. This is a deliberate choice which aims to put innovation and entrepreneurship in the spotlight. The results need to be both visible and beneficial to society – 'society' here is comprised not only of our community, but also includes The Netherlands, the European Union and our world at large. Cooperation is of the utmost importance.

By focusing on societal challenges in our strategy, we create an environment that not just encourages, but promotes, substantial innovation. Instead of referees choosing between industries and niches in advance, a substantive standard is established – that is to say, one that has been shaped by societal challenges. Meeting this standard requires a mix of excellence and implementation "know-how". Businesses and knowledge institutions respond to societal demands and develop marketable innovations. Our commitment to turning ambition into reality is based in part on the Northern Netherlands' regional profile. The commitment of our strong economic clusters, for instance, is one precondition for realising the desired level of innovation.

### In Three Steps

To narrow our focus and work towards concrete achievements, we adopted the following philosophical approach for the RIS3:

1. We are focusing on specific societal challenges in our RIS3:
  - These challenges are felt both in our region and outside our boundaries. This dual focus on challenges from the region, as well as the national and even global scale, provides entree to the international market.
  - a. The Northern Netherlands is home to promising clusters of businesses, Universities and other knowledge institutions which are closely connected to the societal challenges. They help guarantee that innovations developed in the region meet standards.
2. The RIS3 is deployed to find innovative solutions to these challenges. The distinguishing feature of innovation in the Northern Netherlands is that the vision is not only envisioned and developed here, but also applied. Innovations can be tested in practice, in a real environment and by actual end users. The Northern Netherlands see themselves as a region of valorisation and as a Living Lab region.
  - a. In this way, we 'produce' knowledge and solutions in the Northern Netherlands: which have been proven to actually work as a solution to major societal challenges on a regional, national and global scale;
  - b. which can be brought to the regional, national and international markets by businesses and knowledge institutes. This will improve the Northern Netherlands' standing as an export region, increase productivity, empower economic growth and create more employment opportunities.



## 3 From DNA to Specialisation

The first step in drafting a RIS3 for the Northern Netherlands is an analysis of its regional DNA: What are the characteristics of the region that underpin the RIS3 specialization? The Northern Netherlands' strong economic clusters are of primary importance. These clusters represent the economic dynamics and concentrations of economic activity and knowledge that are the motors of innovation. But there are also other strong regional characteristics that help make up the regional DNA. This DNA forms the foundation for drafting the RIS3 and determines which European societal challenges the Northern Netherlands are best equipped to take on.

### SWOT Analysis

The regional DNA description and the regional cluster choices are based on an extensive analysis of the region. More specifically, we consulted (1) the SWOT analysis published by the Northern Netherlands' Social and Economical Council in its 'Met Kennis Beter' report on the smart specialization strategy. In addition, a SWOT analysis was included in (2) the fact sheets for seven industry sectors. Finally, we consulted the SWOT analysis carried out within the framework of (3) the analysis of the wider area.

### 3.1 Regional DNA

One glance shows that the same threats facing Europe are also clearly present in the Northern Netherlands. Although some challenges may not be as urgent or extensive here as in other parts of the EU, the Northern Netherlands region matches, to an above-average extent, the Europe 2020 profile and the challenges defined by the EC.



Close examination of the region's DNA reveals four areas of considerable interest: strong business and knowledge clusters; a focus on applicability which is characteristic of the Northern economy; a resilient and enduring human dimension in dealings between society and business; and finally, a deep-rooted concern among all parties for the peripheries of the labour market.

### Regional Clusters

We conducted an analysis to identify those clusters best able to contribute both to the competitive strength of the Northern Netherlands, and to solving the major societal challenges. We looked at the region's well-developed industries and industrial niches that demonstrate potential for further growth. The Northern Netherlands 'Charcoal Sketch' and the 'Met Kennis Beter' report issued by the Northern Netherlands' Social and Economical Council were taken as base points of our analysis, which identifies the seven clusters that best substantiate the specialization we selected for the Northern Netherlands.

These seven clusters<sup>1</sup> were investigated further. The results have been detailed in fact sheets. The approach, the analysis and the fact sheets are only available in Dutch. Here, we will only provide a summary of the fact sheets and the importance of the industry sectors analysed.

Agrifood	
Evidence	<ul style="list-style-type: none"> <li>• Largest sector in the region, entire chain present</li> <li>• Many cross-over fields with other clusters</li> <li>• Good examples are Dairy Campus, Van Hall Larenstein and the Carbohydrate Competence Center (CCC)</li> </ul>
Policy basis	<ul style="list-style-type: none"> <li>• Deeply rooted in the policy of all three provinces</li> <li>• Declared a top sector by the National Government</li> </ul>
Innovation potential	<ul style="list-style-type: none"> <li>• Strong in starches, seed potatoes and dairy products, with ample growth opportunities in the future</li> <li>• Also a great deal of cross-over potential, e.g. bio-based economy and smart and healthy foods</li> </ul>
Life cycle	<ul style="list-style-type: none"> <li>• Established industry with large differences between niches. Starches, seed potatoes and dairy products all strong niches in the Northern Netherlands</li> <li>• Bio-based economy a potentially newly started life cycle</li> </ul>
Chemistry	
Evidence	<ul style="list-style-type: none"> <li>• A few large companies like DSM, Tejin and AkzoNobel, with large production sites. In addition, numerous innovative SMEs.</li> <li>• A number of specialised knowledge institutes (various Groningen University departments, Zernike Institute for Advanced Materials, CCC, Stenden PRE and Kanon).</li> </ul>
Policy basis	<ul style="list-style-type: none"> <li>• Emmen works vigorously on developing (green) chemistry. The Province of Drenthe supports the Emmtec cluster.</li> <li>• The Province of Groningen supports clustering at the Delfzijl chemical park.</li> <li>• Declared a top sector. The Emmen/Zwolle region is likely to be declared a Centre for Open Chemical Innovation (COCI) with respect to polymer chemistry and synthetic and composite materials.</li> </ul>
Innovation potential	<ul style="list-style-type: none"> <li>• (Smart) materials and green chemistry strong niches in Northern Netherlands' chemical industry.</li> <li>• Aimed at maximum cascading, being high in the value pyramid. Innovation potential mainly to be found in green chemistry, important carrier of bio-based economy.</li> </ul>
Life cycle	<ul style="list-style-type: none"> <li>• Established sector as a whole, in the midst of modernization process with a focus on bio-based economy, sizeable investments in the Emmen region by Tejin and others, and in the Delfzijl region, by BioMCN and others.</li> <li>• Early in (new) life cycle of niches like sustainability and greening, with a lot of potential.</li> </ul>

<sup>1</sup> Agrifood, Healthy Ageing, Energy, Water Technology, Sensor Systems, Chemistry, Tourism & Recreation



Energy	
Evidence	<ul style="list-style-type: none"> <li>• Major sector in terms of employment.</li> <li>• Increased involvement by SMEs.</li> <li>• Major players present, strategically located in North-Western Europe.</li> <li>• Quality of the subsoil and gas hub present.</li> </ul>
Policy basis	<ul style="list-style-type: none"> <li>• North is acknowledged as being an 'energy region'.</li> <li>• Collaboration within Energy Valley/ Energy Academy/ Energy College/ Energy Centre of Expertise.</li> <li>• Declared a top sector by the National Government.</li> <li>• Collaboration within Lower Saxony, Scotland and Norway.</li> </ul>
Innovation potential	<ul style="list-style-type: none"> <li>• Sustainability and greening most important challenges.</li> <li>• Gas ideal transition fuel, but this transition needs to be initiated.</li> </ul>
Life cycle	<ul style="list-style-type: none"> <li>• Traditional part of industry is established, late in its life cycle.</li> <li>• Opportunities present for re-invention, building on the past but working towards the future.</li> </ul>

Healthy Ageing	
Evidence	<ul style="list-style-type: none"> <li>• Healthcare chain present in full in Northern Netherlands.</li> <li>• Major investments, rapid growth in employment (+18% in 6 years).</li> <li>• Leading projects/institutes like Lifelines, ERIBA, Healthy Ageing and the Centre of Expertise for Health.</li> </ul>
Policy basis	<ul style="list-style-type: none"> <li>• Wide-spread acknowledgement of the importance of the industry, especially on the European level.</li> <li>• Provinces, cities and knowledge institutions work on developing the Healthy Ageing sector.</li> <li>• Acknowledged within the Health and Life Sciences top sector.</li> </ul>
Innovation potential	<ul style="list-style-type: none"> <li>• Ageing, contraction, accessibility, increase in cost of healthcare offer a great deal of potential.</li> <li>• Investing in Food &amp; Nutrition &amp; Healthy Lifestyle niches provide opportunities.</li> <li>• Potential to provide a sizeable contribution to kick-starting labour market initiatives.</li> </ul>
Life cycle	<ul style="list-style-type: none"> <li>• Cluster early in its life cycle, but growing quickly and showing a lot of potential.</li> </ul>

Tourism and Recreation (incl. Water sports)	
Evidence	<ul style="list-style-type: none"> <li>• Foremost employers in Northern Netherlands.</li> <li>• Well-known tourist attractions like the Wadden Sea, Emmen Zoo and Frisian lakes.</li> <li>• Contribution to tackling societal challenges negligible.</li> </ul>
Policy basis	<ul style="list-style-type: none"> <li>• Provinces emphasise the importance of the sector.</li> <li>• ETFI nationally-recognized tourist knowledge institute.</li> </ul>
Innovation potential	<ul style="list-style-type: none"> <li>• Limited R&amp;D expenditure. However, increasing attention to the importance of innovation.</li> <li>• Innovation potential mainly concerns incremental innovation within own industry (mostly SMEs).</li> </ul>
Life cycle	<ul style="list-style-type: none"> <li>• Niches are spread out over all life cycle stages.</li> </ul>

High Tech Sensor Systems	
Evidence	<ul style="list-style-type: none"> <li>• Relatively small industry, difficult to define as an independent sector. Concerns application within other industries.</li> <li>• Part of the HTSM top sector. A lot of SMEs work in the field of HTSM, without necessarily being directly involved with sensors.</li> <li>• Enabling sector, ubiquitous, but not really to be considered an industry on its own.</li> </ul>
Policy basis	<ul style="list-style-type: none"> <li>• Past years saw a lot of investment in sensor systems, e.g. by way of Sensor Universe.</li> <li>• INCAS3, HIT and Astron important sensor knowledge institutions.</li> <li>• Innovation potential.</li> </ul>
Innovation potential	<ul style="list-style-type: none"> <li>• Sensors are increasingly used in all sorts of applications and this trend will continue. Big Data a distinguishing theme for the Northern Netherlands.</li> </ul>
Life cycle	<ul style="list-style-type: none"> <li>• Life cycle stage varies wildly, depends on the individual companies.</li> <li>• May concern established industries in the process of re-inventing themselves by focusing on sensor systems, but also newly started companies.</li> <li>• started companies start-ups.</li> </ul>
Water Technology	
Evidence	<ul style="list-style-type: none"> <li>• Strong growth over the past five years.</li> <li>• Deeply rooted industry, particularly in Fryslân.</li> </ul>
Policy basis	<ul style="list-style-type: none"> <li>• Major investments over the past few years.</li> <li>• Establishment of a network centred on Water Alliance.</li> <li>• Wetsus leading international knowledge institute.</li> <li>• Prominent place in Water top sector.</li> <li>• Innovation potential.</li> <li>• Solutions for major international challenges.</li> <li>• Very sizeable private R&amp;D investment (e.g. Wetsus cash contributions).</li> </ul>
Innovation potential	<ul style="list-style-type: none"> <li>• Solutions for major international challenges</li> <li>• Very sizeable private R&amp;D investment (e.g. cash contributions Wetsus)</li> </ul>
Life cycle	<ul style="list-style-type: none"> <li>• Industry long established, but has modernized itself.</li> <li>• Early in its life cycle in terms of activity, lots of potential.</li> </ul>

Using three criteria, we investigated whether these clusters, which contain the reliable base for developing high quality solutions, contained strong or rapidly growing concentrations of business activity and knowledge directly related to the relevant social challenges.

The first criterion we examined was evidence based. Utilising the life cycle approach (as detailed in Annexe B), we combined statistical evidence with qualitative information obtained from interviews and desk research. The second criterion was policy based and utilised the already existing initiatives within the industry sectors. The final criterion concerned the innovation potential of the industry sectors under investigation, meaning the contribution the sectors or clusters could provide in order to tackle the major societal challenges. This requires a very high level of knowledge and implementation. On the basis of the above-mentioned criteria, five key clusters were identified as providing a firm foundation for the RIS3, namely: Agrifood, Energy, Healthy Ageing, Smart (Sensor) Systems and Materials and Water Technology. These clusters distinguish the Northern Netherlands and constitute an important contribution to the region's area of

specialization. The businesses involved in these clusters, together with locally available relevant knowledge, provide the essential building blocks for developing and implementing solutions to the societal challenges the Northern Netherlands consider their area of specialization in the RIS3. These clusters also add dimension to a regional interpretation of the national top sectors.

### Focus on Applicability

The Northern economy is characterized by a considerable over-representation of SME's as compared to the Dutch national average. Northern entrepreneurs are highly specialized in the application of knowledge, which is traditionally well suited to the regional character and preference for straightforward implementation. This creates an ideal environment for both radical and incremental innovation: small but important adaptations of completely new methods and techniques ensure that innovations are effective in practice.



### Human Dimension

"The North still has a human dimension," is an oft-repeated statement by consultants. The region is made of close-knit communities where people still care for one another and are willing to help each other out. This is evident in the many local initiatives, ranging from community centres to energy co-ops. This human dimension constitutes a paramount incentive for businesses to establish themselves in the Northern Netherlands. The North has little in the way of red tape, and networks are closely knit. This is the ideal environment for testing, assessing and adjusting innovations. Social responsibility is strongly valued in the North and for this reason many here are willing to participate in pilots and research.

### Inclusive Human Capital Agenda

The news about the economy of the Northern Netherlands is not all positive. For instance, relevant parties share a common concern about the labour market, particularly as regards opportunities for those shut out of the market. Unemployment levels in the Northern Netherlands are (still) higher than the Dutch average. Additionally, Northern Netherlands residents, on average, complete lower levels of education than their compatriots. This means that an inclusive human capital agenda is vital to promoting sustainable economic success and must form an integral part of a smart specialization strategy. Investing in the labour market is investing in the economy.

## 3.2 Societal Challenges

The Northern Netherlands have a healthy personal interest in tackling major societal challenges. Energy provision, water, health & participation, and food production are certainly important examples. But in the Northern Netherlands, these challenges exist side by side with concerns like ageing, quality of life in the rural areas and environmental issues. Considerable knowledge about and activities concerning important societal themes are concentrated in the cities, but a large portion of the societal challenges also deal with the surrounding rural areas. In other words, the urban and rural areas are tightly connected.

The Northern Netherlands want to focus on four specific societal challenges which are felt sharply in both the region and in Europe. However, these also entail challenges the North is uniquely able to tackle. With its key clusters, the region possesses the knowledge and business activity that is perfectly geared to making this difference. The challenges detailed below have also been identified in the Horizon 2020 strategy, or have been derived from it. This fits in perfectly with the sustainable economic growth strategy that the Northern Netherlands is advocating.

### 1. Health, Demography and Welfare

The population composition of the Northern Netherlands is changing drastically. The 65-and-over age bracket has been rapidly growing for years. The greying of the population increases, while overall population growth has come to a virtual standstill. The north-eastern part of the province of Groningen is widely known as a contraction region. This demographic change results in labour supply shortages. For instance, there is a current severe shortage of healthcare professionals, which, in light of the rapidly ageing populace, are sorely needed. The Northern Netherlands are a European leader in the field of Healthy Ageing and have for a long time now been involved with boosting the knowledge of and activities for the field.

Dealing with demographic change, including the issue of how to maintain affordable and accessible healthcare, is one Europe's major challenges. The Active and Healthy Ageing topic is high on Europe's agenda; our goal is for all EU citizens to live in good health for an average of two more years by 2020.

### 2. Food Security, Sustainable Agriculture and Bio-economy

The transformation into a bio-based economy requires a sea change in thinking. Due to its traditionally strong industries, like agrifood and energy, the Northern Netherlands have a strong starting position for the conversion to a bio-economy, especially when the innovative chemical companies are brought into the equation. But the Northern Netherlands also find themselves blessed with a populace open to and actively involved with realizing such a profound change in thinking.

Our supplies of natural oil and coal are finite. This is why thinking about alternative energy sources is of the essence, especially in light of the continuing growth of the world's population. The role of renewable biological assets like plants, microbes and animals is becoming increasingly important, not just in terms of meeting the demand for safe and healthy food, but also in terms of serving as resources for chemical processes, energy production and other biological products. This requires a transformation into a bio-based economy able to produce more from fewer resources, for instance by making use of waste streams. In addition, negative environmental effects need to be reduced. The agricultural industry believes it is tasked with becoming less of an environmental burden, contributing to bio-diversity, improving the spatial quality of rural areas and, at the same time, increasing production.

The combination of its vigorous agrifood, energy and chemistry industries and its open and active population make the Northern Netherlands ideally suited to take on this challenge.

### 3. Reliable, Clean and Efficient Energy

The Northern Netherlands are of course blessed with natural gas reserves, gas being a premier transitional fuel. In addition, the region has acquired a wealth of knowledge and experience on the subject of energy over the past decades and plays an important role in the European energy network due to its location and companies. This combination provides the region with a golden opportunity to lead the way for the EU Member States. The increasing scarcity of natural resources, the increasing demand for energy and the changing climate require the EU Member States to make the switch to a reliable, sustainable and competitive energy system. The European Union is strengthened by improvements in energy efficiency and use of materials. Greening the economy does, however, require making far-reaching decisions. Just like transitioning into a bio-based economy requires a consistent and progressive government policy.

### 4. Clean, Safe Water

The Northern Netherlands are traditionally very involved in water and water technology. Our ongoing battle with the water has given us an awareness of the importance of (clean and safe) water. This challenge ties in to global scale issues like the threat of priority hazardous substances and water scarcity. Meeting these challenges requires monitoring,

advanced water purification methods and re-use of waste water. But it also concerns the increasing need for industry to take into account the most stringent safety requirements, for instance, where food is concerned.

Access to clean and safe drinking water saves lives. In the Netherlands, we might think it normal for water to come out of the tap, but many places all over the world suffer from a lack of clean and safe drinking water. Water also plays a vital role in the industrial processes of the food, chemical and agricultural industries, amongst others. Water, water purification and the re-use of energy and resources from waste water are of vital importance for global society and the world economy.

### 3.3 The Route



The Northern Netherlands are proud of their strong business and knowledge clusters which, when taken together, provide a strong basis for an RIS3 aimed at tackling societal challenges on the European and/or global levels.

Our vision is closely tied to the 'Charcoal Sketch' referred to earlier. It involves two paths to implementation: 1) Backyard as a testing site (Living Laboratory Region), and 2) Composite needs, composite solutions (cross-overs). The solution to the societal challenges we face will not be found by looking from one perspective, or in any single industry sector. Contemporary society (and its accompanying challenges) is composite and multi-faceted. And that requires an integrated approach.

The solution for the societal challenges we facing cannot be found by looking from one perspective or one industry sector. Contemporary society and its challenges are composed of composite and multi-branched needs which require an integrated approach. Substantial innovations are produced at the exact point where industry and development meet. Societal challenges constitute the substantive agenda in implementation of our specialization strategy. In addition, the Northern Netherlands region provides both literal and figurative space for implementing innovation - primarily by virtue of the strong SME presence in the region, of which the business sector concerned with converting knowledge into practical solutions is primarily composed. As previously mentioned, the Northern Netherlands region is well suited to the initial implementation of new innovations. The human dimension, which plays such a crucial role in the success of this undertaking, is still very much alive here.

#### Backyard as Testing Site

Converting knowledge into solutions for societal problems is accomplished with concrete new applications. New products, new concepts and new services - the Northern Netherlands consider themselves a "Living Laboratory" for their implementation. The companies' backyard will become the testing site for applications. In a Living Laboratory Region, co-creation, exploration, experimentation and evaluation are all key. The Northern Netherlands possess a large number of living laboratories which are in various stages of development. However, we are more than just a region with numerous living laboratories: innovations here are not only tested in closed environments and institutes, they are actually implemented in society. Products and services can be developed in consultation with the user (co-creation). New possibilities for use, behaviour and opportunities can be discovered and tested (exploration). Inventions can be tested for feasibility in a realistic setting (experimentation) and there is ample room for evaluation. Assessment of concepts, products and services can be conducted unequivocally and consistently. Assessment results can be used to drive further innovation or improve running processes. The Northern Netherlands wish to internalize the focal points of the living laboratory. So they become an integral part of the North's approach to work. The

sheer number of existing living laboratories in the region demonstrates that significant steps have already been taken towards this goal. Our challenge is to bring the concepts together and transform them into a regional development strategy.

The goal of a living laboratory is not, of course, simply to allow testing and assessment in a real world situation, but for the testing and improvement method to lead to products and services which can be marketed and exported to greater Europe as well as globally. In this way, living laboratories contribute to increased regional competitive strength, more employment opportunities and improvements in welfare.

### **Living Laboratories**

The Northern Netherlands already possess an impressive number of living laboratories. The region is a European leader in this respect.

### **LifeLines**

A research study that began in 2006, involving monitoring of 165,000 residents of the Northern Netherlands for a period of 30 years. Participants are invited for a check-up every five years at one of eleven locations which are spread throughout the region.

### **IJkakker**

The IJkakker project was designed as a living laboratory for the development of crop farming precision agriculture services. The IJkakker project involves taking very intensive measurements of the soil and crops on three different locations (fields and sandy and clay soils and on reclaimed peat) over three years.

### **Wetterskip Fryslân Demo Site**

Wetterskip Fryslân established a unique waste water purification technology demo site at the Leeuwarden waste water treatment plant, allowing the Water Board and various companies to conduct waste water purification technology research and testing.

### **EnergySense**

A large scale investigation into household energy consumption and use and at the same time a network allowing for innovative interventions and field tests. Participants are actively involved and contribute to the innovation process required to speed up the energy transition process.

### **EnTranCe**

The 'Energy Transition Centre' connects the business sector, entrepreneurs and education institutions to jointly work on the energy supply of tomorrow. It is an initiative by BAM Infra, GasTerra, Gasunie, Groningen Hanze University of Applied Sciences & Imtech.

### **FlexiNet**

This living laboratory at the Groningen Zernike Campus is focused on the integration of solar and wind energy in existing systems, innovative decentralised energy systems and smart energy management systems. It allows energy grid managers to work together with the individual consumer to prevent grid fluctuations.

### **LiveDijken**

LiveDijken involves the fitting of existing dykes and water barriers with sensor equipment. These sensor systems measure the current structural strength of the dykes and estimate their future strength. LiveDijken can be found on various spots all over the Northern Netherlands, including in the Eemshaven port and the Noorderzijlvest area.

### **PowerMatching City**

KEMA, in association with ECN, Essent and the Humiq software company, has created a 'smart' energy grid in the Groningen neighbourhood of Hoogkerk. It is the first 'live' smart grid on this scale to be found in the world.

### **Sensor City**

Sensor City in Assen is an ambitious project involving the establishment of a large-scale urban measuring network allowing for the development of various practical applications for complex sensor systems. The site is a globally unique testing site and display for the application of sensor systems.

### Composite needs, composite solutions

The Northern Netherlands are facing complex and interwoven societal challenges. It is impossible to develop solutions for just one organisation, one industry sector or one innovation. For example, consider ageing. Healthy ageing depends on healthcare and lifestyle, but is also influenced by the social environment and the availability of facilities and services. This means that solutions may be found by the medical profession, but may also be found by maintaining the quality of facilities. Smart food or robotics may also offer help. Healthy ageing allows the elderly to not only be socially active longer, but to also remain physically active and ambitious.

This is just one example of a societal challenge which requires a composite package of solutions. Cooperation between industry sectors and organisations is increasingly becoming necessary to achieve innovative solutions.

Cross-overs between sectors are, therefore, a key focal point in the Northern Netherlands' RIS3. This primarily concerns cross-overs between the key sectors, but also between key and other relevant sectors, both inside and outside of the region. Improving regional strength cannot be realized just from the inside. For a region which focuses on actual application, there is a particular need for fundamental and applied knowledge. Such knowledge may also come from outside of the region. Tailor-made solutions can be offered by combining this new knowledge with regional knowledge.

### Cross-overs

Interesting sector cross-overs take place in the Northern Netherlands on both a structural and a project basis. Examples include:

#### Carbohydrate Competence Centre

As evidenced by the name, the Carbohydrate Competence Centre is a new expertise centre concerned with carbohydrates. The CCC is a cross-over between Agribusiness, Healthy Ageing en Energy.

#### Sneek Noorderhoek Waterschoon Sanitation System

232 new houses in the Sneek residential area of Noorderhoek have been connected to a new sanitation system. This involves a cross-over between Agribusiness, Energy, Healthy Ageing, HTSM and Water Technology.

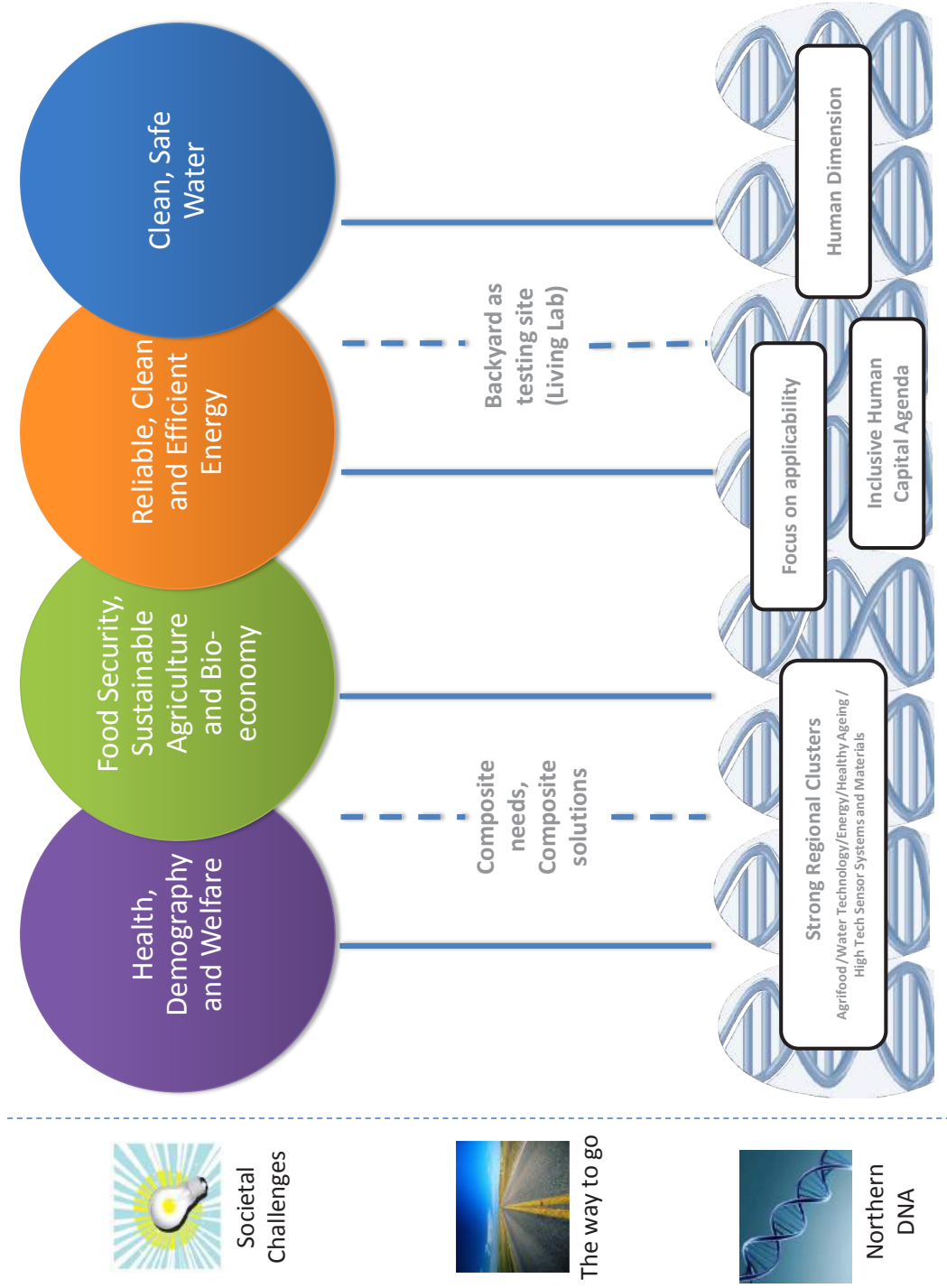
#### Fall Prevention

The elderly wandering lost and falling forms a major point of concern for healthcare professionals. The Fall Prevention project aims to reduce the incidence of falling. Apart from being an example of a cross-over project between Healthy Ageing and High Tech Sensor Systems this also serves as an example of a trans-border cross-over project, as it involves collaboration with Klinikum Oldenburg in Germany.

### In Summary:

The figure below summarizes the Northern Netherlands' RIS3. Four major societal challenges serve as the starting point of the RIS2 and form its substantive focus. The strong points of the Northern Netherlands (the Northern DNA) are the foundation of the Northern Netherlands' ability to provide a unique and substantial contribution to finding solutions to these societal challenges. The route to achieving this is shaped by two paths: Composite solutions for composite needs, and providing the region itself as a living laboratory.





## 4 Implementation Strategy

### 4.1 RIS<sub>3</sub> in Practice

Our RIS<sub>3</sub> is an ambitious strategy. For us, the guiding principle is not so much the European requirement to have an RIS<sub>3</sub> programme, but our desire to develop a comprehensive and distinctive innovation strategy for the region which is based on the region's strong clusters and focused on finding innovative solutions to pressing societal issues.

We have set the bar high. This ambition can only be made reality when authorities and knowledge institutions couple their strategy to the RIS<sub>3</sub> and vice versa. Innovative entrepreneurs will have to experience through actual practice that the various stimulation programmes, the investment in (knowledge) infrastructure, and policies not aimed at limitation but at facilitation, are all connected.

This requires an implementation agenda on a regional scale. An agenda which provides guidance, but which also allows for space. Businesses, knowledge institutions, social organisations and authorities, in the time to come, will work together to provide concrete shape to this implementation agenda. This implementation is framed by five leading themes:

1. Results-Oriented Approach
2. Monitoring and Evaluation
3. Strategy
4. Regional Collaboration
5. National and International Collaboration

### 4.2 Results-Oriented Approach

Any strategy aimed at providing innovative solutions to societal challenges will have to specify, at the very least, the societal effects the strategy aims to achieve. Within a few years from now, we have to be able to measure what the Northern Netherlands have achieved in terms of, for example, food security and healthcare.

Apart from aiming for a number of societal effects, we will also need to state employment and growth targets. Examples include: employment, the degree to which knowledge created by knowledge institutions is actually translated into products and services, the degree to which smaller and larger companies collaborate on the basis of their respective strong points, the investment to result ratio (value for money), and export growth. It is important, though, to have targets relate to subjects which can be influenced by the RIS<sub>3</sub> and its related programmes and policy.

Like the EU, all regional stakeholders emphasise the value of specific and accountable targets, allowing for an annual assessment of the strategy and further specification or

adjustment, as necessary. It is also essential to expressly connect the RIS3 to a revenue model, including as concerns the implementation of the related programmes, projects and selection processes.

#### 4.3 Monitoring and Evaluation

Setting targets and assessing results will not be possible without proper monitoring and evaluation processes in place. We are aiming for an index on the level of the entire Northern Netherlands region. Ideally, this index would be consistent with the programmes related to the RIS3 and improve the accessibility of the results.

The RIS3 is not solely concerned with obtaining societal effects and meeting growth and employment targets, it also stands for realizing innovative collaboration - including political innovation - on the regional level and having society be more actively involved.

Hence, the monitoring process of the RIS3 does not just entail the usual quantitative indicators, but also qualitative ones, which can focus on the degree to which the RIS3 advances innovation and collaboration, the degree to which the RIS3 is experienced as a true participation strategy, and the impact the strategy has on the residents of the Northern Netherlands.

In order to define quantitative indicators, we will consult with the other Dutch regions and Statistics Netherlands. The aim is to make use of regionalized top sector indicators, making use of the Community Innovation Survey and other tools.

The Northern Netherlands' index could be built up from the data of a composite monitoring system:

- Bundling and coordination of regional surveys already conducted, like the labour market survey;
- Regionalization of the Statistics Netherlands top sector monitor;
- Qualitative monitoring on the regional scale;
- Project-level monitoring, as required for European programmes.

The dynamic character of innovation requires regular and structured consultation with the business sector and knowledge institutions. In a further elaboration of its facilitating role, Northern Netherlands authorities can act as organiser of both the Northern Netherlands' index and of targeted consultations with businesses and knowledge institutions to further detail the innovation strategy in the years to come.

#### 4.4 Strategy

A results-orientated approach, regular and meticulous assessment of the results and adjusting the RIS3 and its related programmes where necessary on the basis of such results: these all form part of a dynamic, strategic process. The strategy of making societal challenges the express focus for developing innovative applications is increasingly opted for, and not just on the European level. Germany, an important partner in particular for the Northern Netherlands, also opts to focus its innovation policy on (future) global problems.

The strong clusters of the Northern Netherlands play an important role in developing, testing and applying innovation. Apart from these clusters, other industry sectors like Tourism & Recreation and the Maritime industry will also be given room and there will be an important role to play for 'enabling technologies' in connecting industry sectors and

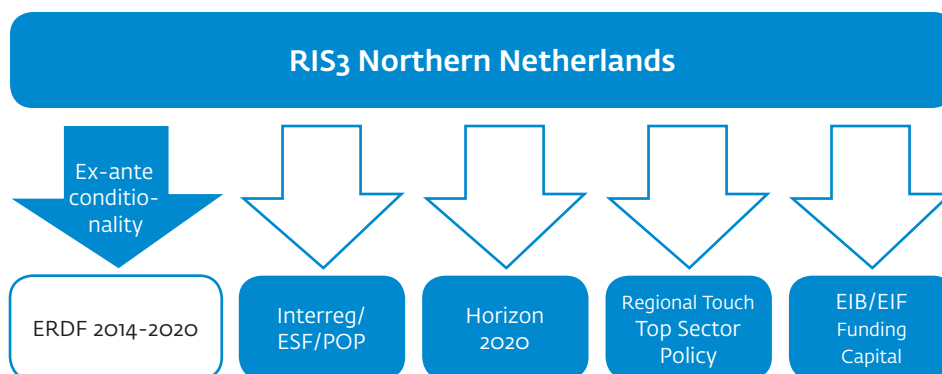
clusters. The same also applies to businesses which are part of the Northern Netherlands' creative sector. The RIS3 aims to provide a guideline for all such activities, without going as far as prescribing such activities in full detail. There is a real reason why Europe considers 'entrepreneurial discovery' to be the foundation of an RIS3.

It connects seamlessly to the 'dynamic specialization' theme. Apart from the current specializations which allowed the Northern Netherlands to strengthen their international position, there will be ample room for new specializations, especially at the juncture of clusters and industry sectors. Providing space for future specializations in the RIS3 and its implementation underlines the dynamic nature of the RIS3. By applying the specialization matrix in the fact sheets, we are already anticipating such new specialization.

The societal relevance of the RIS3 is further strengthened by a focus, also as part of the living laboratory strategy, on those themes and areas which are in most urgent need of innovative solutions.

### RIS3 Scope

The Northern Netherlands' high ambitions and potential for innovation require a bundling of forces in multiple areas. One of these areas is guiding, influencing and using the various stimulation programmes. The integral nature of the RIS3 touches upon many more aspects than the ERDF programme's priority one, innovation. If we are to implement the RIS3, we will also need to avail ourselves of the support of other programmes, like ESF, Interreg, Horizon2020, POP, the national top sector policy and the various regional programmes.



The pressing societal challenges are a major theme of the Horizon2020 programme. This programme can be used for the development of excellent research programmes which focus on themes relevant to the Northern Netherlands. Knowledge institutions have an important role to play in this process. In addition, if the Northern Netherlands are to achieve their ambitions, they will also need, in particular, to involve the SMEs in the programme. This would require the development of a targeted strategy.

The Interreg programme, too, has an important part to play. The Northern Netherlands want to be a partner region for those regions looking to collaborate to realize ambitions together. This applies at the very least to the bordering German regions. Both the characteristics of these regions and the German innovation policy's focus on tackling societal challenges are of great value to the Northern Netherlands' RIS3. Collaborative ventures given shape by substantive issues can be started up with other European regions as well. This, too, forms a part of the strategy implementation.

### Horizontal Themes

One special RIS3 point of attention concerns dovetailing with horizontal themes, as defined by the European Commission. Examples of horizontal themes include the Digital Agenda and education and talent development.

What these two themes have in common is the opportunity they provide to involve a larger part of society. Digitization provides opportunities for the smart development of new products and services, but also for sizeable groups of people to participate in this development.

Europe also recognizes education and talent development as being an important factor to the eventual success of an RIS3. By linking innovation and application, the RIS3 focuses on both gaining knowledge and developing skills. This shows that the results of the RIS3 will benefit more people than just the most highly-educated segment of the population.

## 4.5 Regional Collaboration

An RIS3 on the scale of the entire Northern Netherlands requires collaboration on the scale of the entire Northern Netherlands. Such collaboration is developing ever more in practice. We can see such collaboration developing ever more in practice. Companies and supporting intermediary organisations connect on a regional scale, albeit guided by economic reality. For the various industry sectors all have their own, varying priorities. A specific point of attention is realizing collaboration between the SMEs and the larger companies active in the region. The companies themselves note that profit can be gained by combining the size and clout of the larger company with the flexibility of the SME, especially as concerns specific applications.

The knowledge institutions, too, respond to both the need for collaboration on the regional level and the desire for a sharper focus. Examples of such developments include the Northern Netherlands Sector Plan and the increased educational progression covenant concluded in late 2012. Apart from academic and private knowledge institutions, the knowledge institutions of the universities for applied sciences in the Northern Netherlands play an important part, as exemplified by their Centres of Expertise. Secondary vocational education institutions are represented in the Innovative Craftsmanship Centres. Such centres give concrete shape to collaboration between the business and education sectors.

Social organizations are also involved because social inclusion is an important RIS3 implementation principle. Innovative applications need to be visible at all layers of society. Stimulating the populace to participate in living laboratories and creating employment opportunities, also for the lower labour market segments, these are also highly important. Involving social organizations in strategies and programmes which are mainly economically oriented is not a very common thing to do. Providing express attention to the way such social organizations will become involved is, therefore, a strict condition.

The authorities, too, play a significant part in giving concrete shape to collaboration in the Northern Netherlands. The RIS3 economic and social dimensions are, by definition, cross-domain and the challenges faced do not end at the municipal or provincial border. Getting the parties from various industry sectors and domains to unite requires new consultation and decision-making systems. Providing leadership to see the ambitious strategy come into its own - in the Northern Netherlands, national, and even internationally - is crucial.

#### 4.6 National and International Collaboration

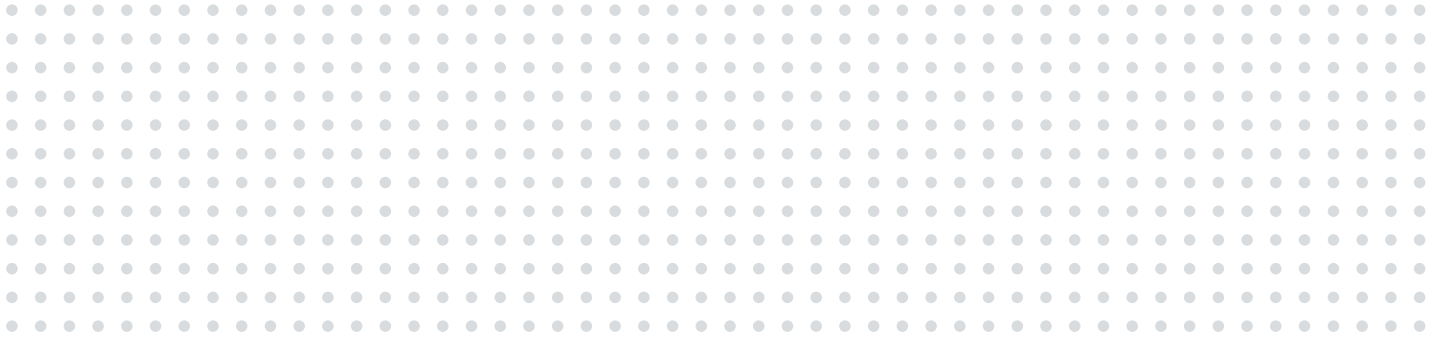
Open innovation is key to the Northern Netherlands' RIS3. Creating and making use of innovation requires open borders and also implies inter-regional, nationwide and international export of products and services. The knowledge available within the region is insufficient to come to solutions, so cross-border collaboration plays a very important role in this respect.

New partnerships will need to be developed, and existing partnerships will need to be extended. This connects to the real situation of, amongst others, the Northern Netherlands' strong clusters which have started up and are developing international ventures. By doing so, they are contributing significantly to the Northern Netherlands' international profile. As concerns coming to new collaborative ventures with other (European) regions, this forms an invaluable point of departure.

One of the regions the Northern Netherlands are actively collaborating with is Northern Germany. In preparation of the new Interreg programme, both regions have mapped their strong industry sectors, knowledge institutions, and available entrepreneurial networks, and established where there are opportunities and challenges for tying in to the RIS3 strategies.

The Northern Netherlands also actively participate in European networks related to RIS3, so they can learn from other regions and bring their own profile to the attention of possible partner regions. Concrete arrangements on investigating possibilities for collaborations have by now been concluded with the Swedish Skåne region. Preliminary contact is made with a limited number of other European regions (e.g., in Finland).

National collaboration is also being expanded. Businesses and knowledge institutions are natural partners. The RIS3 process, in which other regions are also focusing on their own, specific strong points, provides an extra impulse to further develop the collaboration with other innovative regions, building upon the available strong points. The foundation already laid by the Northern Netherlands provides a great deal of perspective for a successful continuation in the future.





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