ANNEX TO THE ANNUAL REPORT 2018:

2. OVERVIEW OF THE IMPLEMENTATION OF THE COOPERATION PROGRAMME

Key information on the implementation of the operational programme for the year concerned, including on financial instruments, with relation to the financial and indicator data.

Indicator	Achieved	Target	Percentage achieved	Analysis
Number of enterprises cooperating with new / improved knowledge partnerships	1063	1429	74,4%	Specific objective 1.1 is well on its way to being achieved. According to programme-level targets, there was an achievement of 213% of this objective by end of 2018.
Number of improved or new innovation support measures launched for businesses	67	152	44,1%	Specific objective 1.2 is well on its way to being achieved. According to programme-level targets, there was an achievement of 319% of this objective by end of 2018.
Number of improved or new innovation support measures launched for public service delivery	14	82	17,1%	Specific objective 1.3 is not as far toward achievement of the target as 1.1 and 1.2. According to programme-level targets, there was an achievement of 67% of this objective by end of 2018.
Number of green products, services and processes piloted and/or adopted by the project	93	290	32,1%	The output indicator for specific objectives 2.1 and 2.2 is well on its way to being achieved. According to programme-level targets, there was an achievement of 172% of this objective by end of 2018.
Number of new and/or improved climate change adaptation methods demonstrated	19	58	32,8%	Specific objective 3.1 is well on its way to being achieved. According to programme-level targets, there was an achievement of 90% of this objective by end of 2018.
Number of sites managed using new solutions supporting long-term sustainability	44	93	47,3%	Specific objective 3.2 is well on its way to being achieved. According to programme-level targets, there was an achievement of 126% of this objective by end of 2018.
Number of new and/or improved green transport solutions adopted	45	151	29,8%	The output indicator for specific objectives 4.1 and 4.2 is well on its way to being achieved. According to programme-level targets, there was an achievement of 83% of this objective by end of 2018.
Number of enterprises participating in cross-border, transnational or interregional research projects	1962	3196	61,4%	
Number of research institutions participating in cross-border, transnational or interregional research projects	427	555	76,9%	

Number of organizations/ enterprises adopting new solutions by project end	1121	4205	26,7%	
Number of organizations/ enterprises informed about new solutions by project end	245879	105941	232,1%	

Status of indicator information provided
Regarding the number of full applications received and assessed, all four thematic priorities saw an overachievement of the 2018 milestone.

There is one output indicator for each specific objective, and these are automatically selected for the projects. In addition, all projects must provide information on the compulsory indicators as most of these data are aggregated by the European Commission to measure progress throughout the European Union. Projects report on all five indicators – even if the target is zero. As the projects progress, the Joint Secretariat has processed an increasing number of reports. Achievement of output indicator targets can be seen below. This table also includes an analysis of achievement against programme-level targets. From these numbers, it is already quite clear that nearly all output targets have been overachieved by the end of 2018, and these overachievement figures will only increase given that many projects have not begun reporting and not all programme funding has been allocated. In respect to this, the Secretariat is in touch with the European Commission about the annual reporting of indicators and will bring this issue up as part of the dialogue.

3. IMPLEMENTATION OF THE PRIORITY AXIS

3.1. Overview of the implementation

5. Technical Assistance
(This is a continuation of the text provided in the SFC under this heading).

For those who have had their project applications approved, another type of event, Implementation Seminars, is offered. These type of semainars are a longstanding wish form the project community. Theyare arranged on a regular basis and their main purpose is to provide the project community with a platform for networking with other project participants within their field. Many project partners have the same type of thematical and technical questions and queries and often spend much time on inventing solutions which are already availableor familiar to other projects. By providing this additional platform for cooperation, project partners are able to effectively exchange knowledge and good practice in an informal environment.

Secondly, the seminars serve as a vehicle for communication between the programme and the projects e.g. in terms of identifying issues which have proven difficult for projects to deal with and where help from the Joint Secretariat is needed or exchanging good practices and spreading experiences gained either at project level or at secretariat level. In previous programming periods similar seminars were held but only for the project lead partners. This worked well but quite often some of the important messages intended for the entire project partnerships did not reach all of the partners. This, in turn, led to misunderstandings and in some cases errors and as a consequence of this, the new Implementation Seminars are open for all partners. The day to day operation of the Joint Secretariat is guided by the programme Business Plan, which in turn is approved by the Monitoring Committee. The Business Plan provides overall guidance for how to prioritize the different tasks facing the Joint Secretariat, addresses the tasks anticipated in the different phases of the programme delivery. Itincludes the TA budget, staffing plan and physical location of the secretariat. The Business Plan has been in place since programme approval and is revised on a regular basis. The latest revision was completed and approved by the Monitoring Committee in the first half of 2018.

The evaluation plan for the programme was approved by the Monitoring Committee in 2016 and submitted to the European Commission the same year. The evaluation process has been subject to discussions at most meetings in the Monitoring Committee since then but in the first half of 2018 the tender process was finally prepared and launched. In November 2018 the Monitoring Committee selected a contractor based on a recommendation from the Evaluation Steering Group who had been in charge of the selection process. It is anticipated that the midterm milestone report will be delivered in 2019 including the main part of the impact evaluation. The final report is due in 2020.

The On-line Monitoring System (OMS) which provides an administrative back bone for all project applicants, approved projects and the Monitoring & Steering Committees was completed in 2017 but still had some minor outstanding updates and adjustments af ter this time. All outstanding updates and adjustments have been completed in 2018. The OMS has proven to be a very valuable support tool, not just for projects and committees but also for the Managing Authority, the Audit Authority and the Group of Auditors. The system has been reviewed as part of the systems control check performed by the Audit Authority in 2017 and 2018 and in both cases praised for it performance and cost efficiency. In both cases the overall assessment of Key Requirements 2-3 & 4-6 was Category 1: Works well; only minor improvements are needed.

3. IMPLEMENTATION OF THE PRIORITY AXIS

3.1. Overview of the implementation

1. Thinking Growth: Supporting growth in North Sea Region economies

(This is a continuation of the text provided in the SFC under this heading):

Priority 1 results expected and achieved:

Call #	Project name	Result description	Quantified target	Achievement through 2018
7	BLING	Bling will significantly improve the body of knowledge about how to develop and deploy blockchain-enabled services in local/regional government	30 government organisations	
		Deliver a more cost-effective government by reducing the cost of developing and accelerating the deployment of blockchain-enabled services	20% increase in cost effectiveness (of services changed)	
3	CORA	Enhanced level of local authorities' awareness around new telecommunication technologies and effective solutions for creating advanced digital environment in rural areas	50 local authorities being informed and trained	
		Improved level of digital inclusion and public digital skills (local communities and enterprises) in rural areas	25% increase in share of citizens and enterprises using digital technologies and services in selected pilots	
		Mainstreaming CORA approach and developing a transnational rural community around digital inclusion	200 CORA rural community members (online community platform around rural digital inclusion)	
1	CC	Converging creative technologies (CCT) employment	20% increase in NSR CCT jobs for SMEs involved in the project	
		NSR Competitiveness	20% increase on marginal turnover of SMEs involved in project	
5	CUPIDO	Stronger cross-sector knowledge-based cooperation	8 long lasting partnerships, embodied in culture centers of excellences	
		Increased culture business capacity	40 SMEs established	
		Increased regional attractiveness	8 (qualitative perception indicator)	
7	FBD	Structurally Strengthening regional innovation ecosystems through horizon-	6 HSKT hubs set up and ready to be run	

		scanning and knowledge transfer (HSKT)-hubs		
		Increasing innovation capacity of SMEs	150 SMEs	
		Increasing data-maturity of regional SMEs	150 SMEs	
3	GrowIn4.0	Collection of new and improved methods and tools, ready for publication to business support organisations and other relevant target groups.	3 tool collections	
		Test and evaluation of I4.0 tools and methods, which will help SMEs to implement new business models, techniques or competences	80 SMEs	
2	In For Care	Increase economic growth by enhancing regional innovation demand	€0.5 million growth in turnover of SMEs supported by project	
		Improve the effectiveness of delivery of (healthcare) services by enhanced cooperation between formal and informal networks	10% increase in user experience and satisfaction	
		Improve service delivery through increased efficiency of networks between formal and informal service delivery	3% reduction of costs of operating budget per year	
2	Inn2POWER	Number of participants successfully completing the MBA module (being organized using the methodology developed in the project) within the project lifetime.	70% of participants successful	
		Number of SMEs that enter new transnational markets (in conreto this means delivering services or goods in a country where the SME was not active before)	50 SMEs	
		Number of long-term (=LT) transnational SME collaborations. The LT intention involves minimum 5 years.	15 Long-term transnational innovative SME collaborations.	1
2	Like!	Deliver the next generation of smart services (with the use of data, digitization, co-design) to support increased customer value across the NSR	10% increased customer satisfaction of end users per new, redesigned or digitized service within the Like! project	
		Deliver more cost-efficient services (for those services where process-changes occur within the Like! Project)	5% reduction in costs of those services which have been redesigned	
3	Inno-Quarter	More cost-effective start-up programmes	25% reduction of average costs per start-up programme	
		Increased regional market uptake of innovations	Market uptake of 30 products, services that have been realised via the integral public service of the Inno-Quarter approach	

3	PERISCOPE	New emerging Blue Growth markets	€50 million p.a. estimated market value potential	
		New transnational SME collaborations pursuing novel Blue Growth market opportunities	10 collaborations	
		Transregional Blue Growth innovation projects	2 projects	
5	PROWAD LINK	Increased income from nature visitors / sustainable offers with focus on off-season periods.	€5 million	
		Increased investment in sustainability	€2 million	
		Long-term engagement and collaboration of SMEs in local and transnational networks	1000 partners	
1	REFRAME	Political and Consumer commitment to new products of food related SMEs	€2 million	€1,575,000
		Increase in average turnover for SMEs participating in an RCA	5%	
		New and/or better equipped food related SMEs	100 new business activities	126 new business activities
5	RIGHT	Increased innovation capacity	75% of participating SMEs	
		Increase in innovation expenditure	10% increase	
		Planned innovation expenditure 2022	5% increase	
1	SHINE	Spin-offs from healthcare organisations	3 Spin-offs from healthcare organisations using the transnational SHINE approach based on shared value creation	9
		Strengthen regional innovation capacity	3 implementations of the jointly development integrated Business model for complex partnerships in the healthcare economy	11
		Transnational networking in healthcare innovation	15 SME Transnational Trade contacts embedded in a strategic network platform	10
3	SCORE	Reduction in service provision costs using data-driven and open source solutions	10%	
		Improvement in service provision of authorities in the sectors of sustainability, environment and urbanism from data-driven and open source solutions	20%	
		Reduction in solution development time	30%	
1	Lean Landing for Micro SME's	Increased turnover and/or export and/or employment	20%	
		Created long-term viable knowledge network	1 Soft landing network consisting of 6 NSR member countries	

		Delivered concrete marketable new products, services or processes	160 partnerships that result in concrete new products, services or processes	
2	Northern Connections	Enterprises in partner regions collaborating with innovation partners outside their own country	40% increase	
		Enterprises moving at least one step up on the technology readiness level	25% increase	10%

The following provides an overview of the projects, their stages of implementation and expected results:

BLING: 13 beneficiaries from 6 NSR countries are involved in the project (BE, DE, NL, DK, SE and UK). BLING targets the use of blockchain technology for public service delivery. Blockchain-enabled systems will allow governments to deliver a range of new solutions and service designs that have the potential to redefine the relationship between governments, citizens and SMEs in terms of transparency, trust and data-sharing. The project builds upon the substantial investments by the EU, national governments, corporations, SMEs and wider networks to provide one of the first dedicated platforms to bring these tools and approaches into local and regional services. BLING provides a unique combination of public authorities, knowledge institutions and SMEs who will work to develop and deploy blockchain-enabled public services focusing on Identity, Direct Democracy, and Customer Services. A number of pilots will be tested to demonstrate the viability of the blockchain technology for government services and other public service delivery. The project results will improve capacity-building in this cutting-edge technology applied to the public sector and help reduce the costs of public service delivery. The project was approved in December 2018. The project is expected to hold their kick-off meeting in February 2019 and submit their first report later that year.

CORA 18 beneficiaries from all seven NSR countries are targeting the rural digital divide in the NSR, focusing on digital infrastructure, services and skills, aiming to enhance the adoption of internet, digital technologies and e-services in rural areas and create an environment stimulating digital innovation. To this end, the project is working on enabling local authorities' areas to identify their digital barriers and empowers them to test new tools facilitating the development of advanced digital infrastructure, services as well as enhancing their digital skills. In 2018, CORA developed their digital transformation ecosystem model and conducted a survey in the partner regions to identify the main local and regional challenges regarding digital infrastructure, services and skills. The findings were published in a diagnostic report, which served as the basis for the CORA comprehendible guiding measures for local authorities. Furthermore, the CORA training concept was developed, and the technical design of CORA e-learning platform was finalized, which will be used by local trainers to improve the knowledge and skills of local authorities, enterprises and communities. In this regard, CORA also took first steps towards the implementation of their ten pilots.

Create Converge: 9 beneficiaries (public and private) from 5 NSR countries (UK, DE, NL, SE, DK) are focusing on getting visualisation and gaming technology sector to work together with a wide range of other sectors from architecture to science to deliver converging creative technologies (CCTs). They want to connect creative digital to these sectors to show, tell and sell. The project targets all kinds of creative technologies like animation, screen, visual effects, virtual reality, augmented reality and games; and users beyond entertainment like fashion, energy, architecture, healthcare and screen tourism. In this way, the project aims to ensure that technology is no longer seen as a niche activity, or a sort of science fiction process, but as an integral part of business as usual, driving improvements in productivity, design and delivery.

The project was launched in 2016 and has submitted their third progress report in 2018. In this reporting period, the project reports to have hosted more than 20 events and workshops across all partner countries and partners have again attended half a dozen events carrying high the banner for Create Converge. The project's networking platform was commissioned and is almost good to go. The relationship between the partners remains highly supportive and collaborative with partners sharing and facilitating contact and access to their networks.

CUPIDO: 16 partners from 7 NSR countries (BE, DK, DK, NL, SE, UK and NO) are working to develop new business opportunities in the cultural and cultural heritage sector around the North Sea, to reinforce the economic position, competitiveness and social cohesion of local rural communities in areas with a declining population. The project intends to strengthen a viable and sustainable future economy, based on the social historic role and core qualities and values of the involved regions, cities and local communities. The project is mainly about commercialisation of the cultural sector that contributes towards creating vibrant, sustainable rural municipalities/communities that attract people to live, work and enjoy life. It enables insight into new business approaches, stimulates the development of products and services, and aims at in average five new start-ups per area and support to existing SME's.
The project was launched in October 2018 with a kick off meeting in Karlstad, Sweden and is expected to submit their first report in 2019.

FBD 12 partners from 5 Member States (BE, DE, NL, SE, UK) are working to enable SMEs at the end of the value chain, typically located in hinterlands of larger innovation hubs, to innovate and increase productivity. While critical to regional economies, their capacity for success is limited by insufficient access to and ability to analyses data - about finance, legal changes and markets. The project will create a virtual transnational horizon-scanning and knowledge transfer (HSKT) hub connecting six real hubs in each region, co-design support measures in the HSKT, and evaluate and disseminate the experiences from HSKT and data analytics tools. By working with 50+ SMEs in each region in the health technology, light engineering and agri-technology sectors, the project will stimulate sharing knowledge, ideas and regional experiences to support the involved SMEs to become more data-driven and better informed about the economic, technological, policy and supply chain changes that will shape their futures. The project was approved in December 2018.

Growin 4.0: 15 beneficiaries (public and private) from 5 NSR countries (DK, G, B, UK, NL) are involved in the project. The focus of the GrowIn 4.0 project is the common challenges manufacturing SMEs throughout the NSR face today. If the manufacturing industry in the NSR is to remain competitive, it needs to capture the potential for productivity and growth that Industry 4.0 has to offer. There is a profound need for an experience based and smart gathering of efficient methods, tools and knowledge to guide SMEs in their transformation towards Industry 4.0. GrowIn 4.0 aims to build strong competences and tools in the participating regions for the benefit of manufacturing SMEs. The overall objective is to raise the level of innovation and to create more growth within manufacturing SMEs who are heading for Industry 4.0. The approach is to establish a strong partnership which pool knowledge on the manufacturing industry and Industry 4.0. Main challenges and solutions in regards of implementing Industry 4.0 will be investigated.

The project was approved in June 2017 and has submitted their second report end 2018. The consortium has started collecting tools from the five different countries that can help SMEs in the manufacturing industry in the transition to Industry 4.0. For example, it concerns self-assessments that enable SMEs to determine how smart their factory already is and what the next steps are in their digital transformation. The tools also include methods to coach and supervise SMEs in workshop forms. The tools are tested by the target group. The best come in a validated toolbox that enables SMEs to benefit from the end of 2020.

In For Care addresses the rising costs and need for health and elderly care in the North Sea Region by focusing on informal and voluntary care. The partnership, consisting of 16 beneficiaries (public and private) from 6 NSR countries (NL, NO, SE, BE, DK, UK), is using a quadruple helix model and co-creation sessions to improve the cooperation between informal and formal care, develop smart technological solutions to help voluntary and informal caregivers, and to foster informal care networks cooperation. In 2018, the project put together a report comparing the partner countries regarding informal and voluntary care and published a Quadruple Helix cooperation guide. In for Care has continued co-creation sessions with stakeholders in all partner regions to assess user needs and established a permanent way of cooperation between government, universities and SMEs allowing the development of new services and the integration of existing solutions that match with those end-user needs. Project partners have also started to test tools and methods to recruit and keep volunteers and to train informal carers. The coordination tool ‘FRIDA’ was chosen to be piloted transnationally. Other highlights include the set-up of an Informal care HUB in Aalst, the opening of the pop-up location 't Geburt in Turnhout' and a technology roadshow organized by Albertay University together with the Fife society for the blind.

Inn2Power: 11 beneficiaries (public and private) from 5 NSR countries (NL, BE, UK, DK, DE) NSR regional clusters and other supporting organisations in the Offshore Wind Industry are working closely together on the shared goal of bringing their SMEs across the borders to engage them in innovative business collaboration. During 2018, a series of B2B networking events and fieldtrips has brought SME's within the offshore wind industry closer to each other transnationally. Based on the efforts realised to date, project partners have now supported one successful transnational innovative collaboration involving 2 SMEs from Denmark and the Netherlands.

Like!: 10 beneficiaries (public) from 5 NSR countries (NL, DE, BE, UK, DK) are collaborating to develop a Local Digital Innovation Culture across the NSR, giving authorities & practitioners new skills and knowledge to deliver innovative services, to develop new ways to engage with communities, and to build more inclusive services. The Like! project addresses the themes local government are coping with in order to improve customer service delivery.
The project was approved in September 2016 and their kick off meeting took place in December 2016 in Groningen, NL. In their third reporting period, the Like! consortium showed their most important output during the successful Mid Term Event, hosted by Angus County Council, Scotland. Almost 100 people visited this free conference. Furthermore, the partnership went on with several activities. The project, for example, prepared several pilots on both place value and city-dashboards, worked on platforms for citizen engagement, addressed special target groups, developed new tools and strategies for customer services, piloted Internet of Things (IoT) applications, and shared findings on innovation culture.

INNO-QUARTER: 12 beneficiaries (public and private) from 5 NSR countries (NL, SE, B, DK, DE) are involved in the project. Inno-Quarter (IQ) provides a new way to short track innovation processes and improve the cost-effectiveness of startup support mechanisms and redirect funds towards sustainable commercialisation of more innovations. The project uses European festivals as living labs where innovators within the North Sea Region can work on their product or service and go from idea to market launch very fast.

In 2018, the project held their second partner meeting in Varberg, Sweden. Here it was decided to launch a project website where innovators can apply for a spot-on festival to plug in their innovation. To help the project makes the right decisions and to receive some recommendations, a jury/committee was composed consisting of people from every participating North Sea region, with different strengths and expertise: entrepreneurs, policy makers, knowledge institutions and end-users.

In 2018 the project had two festivals that opened their doors for the start-ups. After a selection, eleven innovators plugged in their innovation at a festival in the first festival period.

PERISCOPE: 12 beneficiaries (public and private) from 6 NSR countries (DK, UK, NO, NL, SE, DE) are involved in the project. To understand and open up emerging technological and market opportunities, which lead to sustainable innovations, PERISCOPE will establish an entrepreneurial discovery process to reinforce the knowledge base, identify and valorise innovation ideas, and open up a Blue Growth ecosystem to stimulate industry-driven action on the concrete opportunities ahead. Concretely, PERISCOPE will enhance the capacity of 300+ NSR actors within the blue economy, kick start 10+ Blue Growth innovation partnerships within the NSR, accelerate at least two major cross-border innovation projects, and increase understanding of innovation support and conditions for blue business development in the NSR. Linking innovations in blue growth with access to sources of finance, and leveraging the role of ports as poles – the key takeaways from European Week of Regions and Cities in 2018 was successfully presented by Anne-Grete Ellingsen, CEO of GCE NODE, the oil and gas cluster in southern Norway and moderator of the afternoon, added that *"Periscope could be the industry-led flagship supporting the blue economy, regional smart specialization and cross-border innovation."*

PROWAD LINK: 14 beneficiaries from 6 NSR countries (DE, DK, NL, SE, UK and NO) aims to support sustainable economic growth in the North Sea Region (NSR) by engaging SMEs in nature conservation, unlocking the potential of nature heritage brands as a driver for jobs and sustainable regional development. The project will develop and test innovative tools and strategies for SMEs in the NSR in order to improve access to brands provided by natural heritage sites with economic value; enhance SME sustainability in the NSR; and develop innovative marketable offers and products in a co-creation process with knowledge partners. The main results will be sustainable offers and products which transmit brand values and support protection of natural areas in the NSR, increased investment in sustainability and establishment of long-term collaborations in cross-sector knowledge partnerships at regional and transnational level. Combined, these results will initiate new sustainable economic growth within the NSR and support continued development beyond the life of the project. The project will be carried out and implemented in selected pilot areas (Wadden Sea World Heritage Site, Wash & North Norfolk Coast European Marine Site) to ensure transferability of all outputs and results to designated natural areas and World Heritage properties on a national, European and potentially global scale. The project was approved in June 2018 and held their kick off meeting in Hamburg, DE, in September 2018. The project is expected to submit their first report in 2019.

REFRAME: 15 beneficiaries (public and private) from 5 NSR countries (NL, BE, DE, DK, SE) looking to establish a Regional Food Frame (RFF) as an effective set of measures to scale up and accommodate urban food demands and regional supplies. The project was officially launched in 2016 with their kick off meeting was in April 2016 and since then they have been busy with partner meetings and initial project activities. The project submitted their first basic periodic report and a full periodic report (report #2) in 2017. Working towards a durable transnational training and learning network Reframe has built regional networks, identified and described best practices, developed new smart specialization strategies, shared these in their networks and took steps to make them available online in the Reframe Online Reference Center. The project works towards cooperation and other

arrangements between regional suppliers and large-scale consumers to provide a sizable regional B2B food market. Reframe works on cooperation in logistics in the Swedish Food Hub network and a Food Hub network in the Groningen region, inspired by the Swedish example. Reframe in Flanders and Sweden stimulates large scale distributors to include more regional suppliers.

The Reframe project stimulates large scale urban consumers (public & corporate) to utilize regional sourcing, to cooperate with regional suppliers and thus foster a regional innovative food frame. Reframe helps food related SMEs to find and develop smart specialization options, and to fulfill a role in a regional supply proposition. Thus, Reframe has so far developed 33 smart specializations and support measures.

Following up on their work of the previous years, the REFRAME consortium has managed to unlock Political and Consumer commitment to new products of food related SMEs to an amount of 1.575.000 Euro. Examples include: in Groningen where the municipality adjusted its procurement strategy in such a way that it enabled the participation of more local and regional food related SMEs, in Denmark where municipalities affected the shift to locally sourced products, in Groningen again where a hospital catering facility sourced its products locally and inspired 11 other large kitchens. In Germany the beneficiary Wesermarsch and Diakonisches Werk are taking steps to procure more food-related products from regional SMEs for larger institutions, such as homes for the elderly.

RIGHT 14 beneficiaries (public and private) from all seven NSPR countries are working on strengthening the competitiveness and innovation support capacity of the regional economy. More specifically, they address future challenges brought on by disruptive innovations in the blue growth and energy sector, which will not be met by the current level of education and competencies. The project aims to bridge this skills gap by adapting dynamic educational programmes, including aspect of human mobility and transversal skills, to prepare a strong workforce with the necessary skills to support future growth and eventually to unlock NSR innovation capacity. To this end, the project will publish regional and transnational sector skills gap analyses, pilot tailored educational and training programmes, and develop tools for policy making and further roll-out. These activities will result in a 25 % increase in innovation investments in participating SMEs and a 75 % innovation capacity increase in the share of participating SME. The project was approved in June 2018 and held their kick off at the end of November 2018. The project is expected to submit their first report in 2019.

SHINE: 8 beneficiaries (public) from 3 NSR countries (BE, UK, NL) are working with integrated business models for the healthcare economy based on the regions' smart specialization strategy. The project had their kick off meeting in 2016 and has completed their third report in 2018. The project will end on 31 July 2019.

As a response to findings of a study enacted by the project, the project has partially changed their strategy towards achieving their objectives. The findings clearly showed that the Board of Management of healthcare organizations is a crucial factor in whether or not to deploy integrated business models in the healthcare sector. Thus, for various reasons, the Board can prevent promising innovations from

being developed into a fully-fledged product or service combination. In order to explain the importance of good governance, a symposium was organized on 9 November 2017 with the title: "A new perspective on governance in the healthcare sector" to which 81 interested parties subscribed. The project has continued their efforts by promoting new business models and pilots by coaching them and giving them the opportunity to pitch their ideas.

Furthermore, the project has written evaluation reports of regional startup tracks, in which they analyzed interviews with the participants of these programs. The project has also organized trade shows to Scotland, the UK and Flanders and has recently published their online tool which aims to guide companies, healthcare organizations and other stakeholders involved in the ecosystem of the healthcare economy to create shared value by developing integrated business models.

SCORE: 13 beneficiaries (mainly public) from all 7 NSR countries are involved in the project. SCORE aims to improve the delivery of public services like parking, sustainable mobility, and water and waste management, by using innovative software solutions based on open data which are open sourced and replicable for other cities. To create these solutions, SCORE is building an engaged community of cities, developers, open data experts, and specialists in the domains of water, mobility, and environment. Together they will work in an open, agile and transnational way, where they put end-users, city operators and citizens at the heart of development.

The project was approved in June 2017 and in 2018, they have submitted their first report. The project started by having each of the 9 city partners define 5 local challenges their cities face. The challenges range from giving citizens and businesses better and earlier warnings about floods, to providing people with more information about how to avoid traffic during big events in their area.

The SCORE partners are currently focusing on tools, methods and process that help to identify the right people involving in the right conversation and conversing in such a way which does not exclude new collaborators joining. As a next step, SCORE will continue to develop the first set of prototypes and components for the selected challenges and they keep building on their collaborative network across partner cities and beyond.

Lean Landings: The Lean Landing project has created a long-term viable and sustainable soft-landing network consisting of 16 SMEs, incubators, business development and knowledge organizations in6 NSR countries (DK, SE, NO, DE, UK and NL) . In 2018, at least another 131 SMEs were using the network. This has been done by designing an online platform, where project partners can discuss the SMEs they want to send abroad via the Lean Landing program. This online platform will over time also be offered to external stakeholders to create a soft-landing network by 2020.

The Lean Landing concept has been developed via joint business development sessions hosted in the different partner countries. This iterative concept design process has resulted in a blue print for carrying out lean landings for SMEs. The blue print has been tested on SMEs from all partner regions via interviews.

So far, 35 SMEs have already been abroad and had their soft Lean Landing in a foreign market. In this way, the project formed new profit enhancing partnerships abroad. Furthermore, 96 SMEs are currently in the process of going abroad.

Northern Connections is a project of 21 clusters, cities, regions and knowledge institutions from all 7 NSR countries working together to create innovation connections between their enterprises and clusters in the energy sector, to involve more enterprises in transnational innovation cooperation and to support SME internationalization. To do so, the project wants to align and improve innovation support measures, to test their validity transnationally and to develop political support for exploiting the growth potential of increased internationalization. In 2018, Northern Connections published a regional innovation strategies report, which shows a great variety in how the partner clusters conduct service to their members in the cluster but also in their level of activity and of the involvement of the political level. The project developed, continuously updated and encouraged the use of a toolbox, which serves as a catalogue of cluster-SME interaction tools. The partners also started working on a similar toolbox for the political level and on a set of targeted policy recommendations and had a close dialogue with local/regional authorities to discuss local challenges and to foster political support. Moreover, the project introduced a webinar series "innovation tool of the month", developed a living lab guide and prepared the implementation of their living lab sessions.

2. Eco-innovation: Stimulating the green economy

(This is a continuation of the text provided in the SFC under this heading):

Priority 2 results expected and achieved:

Call #	Project name	Result description	Quantified target	Achievement through 2018
1	Dual Ports	COST REDUCTION by concretely implementing tangible low carbon solutions in DUAL Ports Regional Entrepreneurial Ports	20% DUAL Ports DECARBONISATION PROGRAMME COST REDUCTION	
		CARBON REDUCTION by concretely piloting and/or adopting tangible low carbon products and green technologies that improve utilities in DUAL Ports Regional Entrepreneurial Ports	12% DUAL Ports DECARBONISATION PROGRAMME CARBON REDUCTION	
1	SCALE-UP	25 Green solutions piloted / demonstrated from the meet the buyers event	These products, services and processes will expect to result in a 10% reduction in carbon emissions	
2	COBEN	Climate improvement	18 CO2 reductions - Number of NSR communities exhibiting reduction in CO2 emissions up against the 2016 values due to adoption of COBEN's climate-energy models by the year 2030.	
		Civic energy uptake	7.5% of the North Sea Region area served by civic energy due to the adoption of one of the COBEN Civic Energy Business Models by 2030	
3	Smart-Green	Productivity and quality	5 days - reduction in production time (average)	
		Energy saving with respect to heating and supplemental light	15% reduction in kWh and gas (m3)	
		Energy efficiency increase	10% of first data of energy efficiency per produced unit	
3	BIOCAS	CO2 reduction	608 CO2 reduction realized by processing biomass streams by the developed BCA's, new techniques and products during the project period	
		Biomass transformed	26 000 Tonnes waste, biomass transformed to resources or	

			used for new applications till project end.	
3	2IMPRESZ	Increased awareness in schools on energy and energy saving	50% % increase of students, teachers and other personnel that are aware of the concepts of energy and energy saving	
		Increased level of energy saving in existing school buildings via 2IMPREZS energy saving programme.	30 % of fossil derived energy saved (against baseline value)	
		Decreased environmental footprint of existing school buildings by CO2-reduction via 2IMPREZS energy challenges concept	7320 tonnes of CO2 related to energy consumption for heating and electricity	
3	SalFAR	Energy per year needed for pumping out saltwater back into the sea to keep the farmland saltwater free.	Reduction of energy consumption by 20% by allowing more seawater in for saline farming methods.	
		Reduction of fresh water consumption in order to improve resource efficiency	Reduction of fresh water use by 10 % by end of the project.	
5	Carbon Farming	Enhanced uptake of carbon farming in the agri-food chain to reduce carbon emissions above ground	10,000 Tons of Co2 (equivalent) sequestered in farming ground	
		Optimise the application of carbon sequestration techniques to increase the effects and impact.	20 % improved soil quality in structure, water holding, biology	
		Increased awareness of carbon sequestration as a technique to reduce carbon emission in the food supply chain and as a -regional- option to compensate for carbon emissions.	10 economic actors in the food supply chain (farmers, producers/processors, retailers, consumers) and third parties (i.e. outside the food supply chain)	
5	DeComTools	Carbon reduction in offshore decommissioning operations	25% By piloting innovative processes and services that improve logistical and technological concepts for offshore dismantling and recycling operations BASELINE: see C.2.1 Project overall objective	
		Cost reduction in offshore decommissioning operations	20% By piloting innovative processes and services that improve logistical and technological concepts for offshore dismantling and recycling operations BASELINE: see C.2.1 Project overall objective	

		Raise know-how/expertise capacity in offshore decommissioning operations	1250 Raise know-how/expertise capacity in offshore decommissioning operations	
5	INDU-ZERO	Cost reduction	Cost reduction of 50% for the production of renovation packages. The automation production process will reduce 50% of the cost compared to current manual production of renovation packages	
		Reducing NSR environment footprint	The showcases will reduce CO2 in the NSR region by 21,6 kton Co2 during the project. Adoption of INDU-ZERO will result in NSR CO2 reduction of 79 Mega-tonnes (Mt).	
7	ACCESS	Reduction of smart energy grid project costs	20% Lower costs for smart grid development using upscaling methodology.	
		Reduction of CO2 emissions	25% Average CO2 emissions reduction per city related to the pilots. General baseline: European average carbon intensity electricity*electricity consumption.	
		Reduction of smart energy grid project development time	30% Reduced time for the set-up and implementation of smart grid demonstrator projects.	
7	ProCirc	CO2 % saved per pilot	20%	
		% Virgin materials avoided per pilot	20%	
		% of waste prevented per pilot	25%	
7	EMPOWER2.0	Increased uptake of renewable energy by households	1% 14000 households. 50% of their electricity consumption generated either by generation on their own building or on a site into which the household has invested and 100%	
		Reduction of carbon dioxide emissions in North Sea region as result of transition to renewable energy	14.700 tonnes - Average CO2 reduction per household is 2.1 tonnes with transition to 100% renewable energy. 2.1 tonnes times 0.5 times 14000 households make 14700 tonnes total at the end of the project.	

7	OESA	Increased ocean energy capacity deployed within the North Sea Region	30%	
		Reduced CO2 emissions in the North Sea Region	102.000 Tonnes of reduced CO2 emissions	
7	SoilCOM	Utilized amount of water, pesticides and inorganic fertilizers	-5% L/ha per farm or enterprise (water, pesticides); Kg/ha per farm or enterprise (fertilizers)	
		Crop productivity	10% Kg/ha or pieces/ha	
		Utilized amount of quality compost	20% Kg/ha at farm or enterprise	

The following provides an overview of the projects, their stages of implementation and expected results:

Dual Ports aims to decarbonise regional entrepreneurial ports resources through a shared eco-innovation port programme that minimises their environmental footprint. It is a project whose partnership consists of 10 public authorities and companies from five North Sea Region countries – Belgium, Germany, the Netherlands, Denmark, and the UK. Together they are exploring how to enhance ports' energy efficiency and performance, facilitating low carbonisation at reduced cost, with added value in terms of knowledge and investment. During 2018, they were approved an extension; adding 7 new pilots that will continue to produce carbon reduction by piloting and / or adopting tangible low carbon products and green technologies that improve utilities in ports by 10%.

SCALE-UP (Supporting Clean-tech innovators in Accessing Large Enterprises through Unlocking Procurement) has been developing, implementing and promoting clean tech innovators to establish 5 clusters across the North Sea Region. Paving the way for new transnational business development services and take up of 25 green products to be adopted by the market. The SCALE-UP partnership consists of 8 public and private partners from the Netherlands, Sweden, Belgium, Denmark, and the UK. Among other activities, they ran workshops and seminars promoting 76 tailored "Meet the Buyer" events in which 50 large technology buyers meets up to 300 relevant clean tech innovators with high potential of commercial use, providing specialized technical skills training to innovators and setting up a voucher scheme that reduce barriers for international business development. The objective is to provide a better cooperation between cleantech industry and offers transnational business support services to harness renewable materials and energy sources, reduce the use of natural resources, and cut or eliminate emissions and waste. The partners in this project expect that their work will accelerate the greening of the NSR economy, which will result in a 10% reduction in carbon emissions by mid-2020.' In 2018, the multiple "Meet the Buyer events" lead towards the first pilot contracts for green products, solutions and services being adopted. So far, 2

projects are in a letter of intent stage and both are set to start on early 2018. In addition, at least 18 others are in different development stages.

COBEN, which stands for 'Delivering Community Benefits of Civic Energy', is a project whose partnership consists of 9 public authorities and institutions of higher learning from 6 North Sea Region countries – Germany, Belgium, the Netherlands, Norway, Denmark and the UK. Together they are exploring how to improve climate and civic energy uptake. This is mainly being done by facilitating transnational cooperation on local energy promotion within a collaborative civic energy network. The key highlight during 2018 was that all pilots are now up and running. This means that in 2019 will see the delivery of the matching business models that are currently being inventorized.

SmartGreen use novel Big Data analysis combined with practical demonstrations in SMEs securing a leap towards a greener, sustainable, and more energy efficient (by 10%) production system. Delivery requires a transnational collaboration to synthesize leading competences and to build new ways of linking SMEs to the greening action. The focus is on reducing energy consumption in greenhouse production of fruit, vegetables and ornamental plants in the North Sea Region without compromising quality.12 beneficiaries from 6 countries (DK, DE, NL, NO, UK, B) are involved. In 2018, the various pilots have started – all with the common goal to contribute to less pollution, lower emissions and longer-lasting use of resources such as 15% less energy use and 10% higher energy efficiency. For instance, the big data set from commercial tomato nurseries has been used to develop new Deep Late Fusion Multitask Prediction model has been developed to predict a week ahead yield and production for tomato crop, while a new Multistep-ahead growth forecasting using a wavelet deep neural network approach was also developed for ornamental plants. Access to a new big data platform (Siemens, Mindsphere) has been granted for big data exploration for SmartGreen through Lincoln University.

The main aim of **BIOCAS** is to realize concrete Biomass Cascading Alliances (BCA's) for a more sustainable conversion of biomass. 18 beneficiaries from 4 countries (NL, DE, DK, B) are involved. The project connects 18 regional initiatives around technologies, processes, and businesses for the conversion of biomass streams. Within the different BCA's various pilots/tests were performed, for instance: 100 tonnes of red clovers were processed to obtain amongst others a protein fraction which possibly can be used in high-end applications in the future. The festival cups were tested in the backstage area of festivals in Leeuwarden and Aarhus to obtain insight in the use, durability, do's and don'ts and the how the end-users reviewed these new bio-based cups. Students were involved in design labs for further development in the design of the cups. Next to this, the first steps of the Value Chain Assessments for different BCA's were started. Preliminary information about business models were gathered in student reports.

2IMPREZS aims to foster both behavioural and energy saving measures in schools in the North Sea Region, reducing the schools' energy consumption and lowering their CO2 emissions. This project's innovative angle is that it will tackle the whole spectrum of energy efficiency measures in schools: the

behavioural, the technical, and the financial, rather than just one of them. Their aim is to reach 30% energy savings in 141 schools throughout the region. 10 beneficiaries from 5 countries (are involved. The main project result is an estimated carbon reduction of 2155 tones in the 86 schools directly involved. In 2018, the project has focused on active participation and initiatives of school stakeholders (teachers, students, management), as well as on the project partners' experiences, the project has created a joint energy saving programme through Energy Challenges in schools and an innovative decision making model, developed, tested and validated incorporating cost-effective educational, technical and financial measures.

SalFar aims to promote resource efficiency by (re)using degraded farmland and reducing fresh water consumption. The partnership consists of 15 beneficiaries from all countries around the North Sea Region. Ten open field labs will be set up in each participating region to demonstrate innovative methods of farming on saline soil with natural adaptation processes in plants and crops. On 17 October 2018 the former Secretary-General of the United Nations, Ban Ki-moon, opened the Global Center on Climate Adaptation at the University of Groningen. The project manager Angelica Kaus presented the project during a symposium after the opening ceremony. Angelica also got the chance to talk to Ban Ki-moon in person and handed over the project leaflet.

Carbon Farming was approved in call 5 in June 2018. 7 beneficiaries (private and public) from four countries (NL, B, DE, NO) are involved in the project. The partnership will focus on new and innovative farming methods to reduce the carbon footprint of agriculture in the North Sea region – not only of the agricultural sector itself but also the whole food supply chain. The project is expected to submit their first report in 2019.

DeComTools 13 beneficiaries (private and public) from six countries (DE, DK, B, NL, NO, UK) are involved in the project. The partnership aims to develop and overall sustainable approach to the offshore wind farms' end of lifecycle. While such approaches are well-developed for onshore wind parks and offshore oil rigs, similar knowledge is lacking but highly demanded for offshore wind turbines, as the operational lifetime of the first wind turbines in the NSR is coming to an end. Decom tools will close this gap by devising and developing eco-innovative processes of decommissioning and repowering offshore wind parks that reduce the costs of decommissioning by 20 % and the environmental footprint by 25 %. To this end, the project will research approaches by combining innovative and already existing technologies in the areas of logistics, safety, ship design and up-/re-cycling and validate these by demonstration pilots. The project was approved in June 2018 and held their kick off in October 2018. The project is expected to submit their first report in 2019.

INDU-ZERO was approved in call 5 in June 2018. 15 beneficiaries (private and public) from five countries (NL, UK, DE, NO, SE) are involved in the project. The aim of the design is to produce standard renovation packages at an industrial scale (at least 15,000 per year). The packages will contain various components that are necessary to make homes sustainable, such as insulation material for walls and roofs, heat pumps, solar panels, energy converters and ventilation systems. The components will be put together in a way that is as circular and bio-based as possible. The aim is to be

able to offer the total package of measures for half the current price. The project is expected to submit their first report in 2019.

ACCESS aims to advance the coordination of future low-carbon energy grids development in cities by increasing the capacity of governments to scale up and plan investments in low-carbon smart grids, thus contributing to a successful transition of the NSR's energy systems. A transnational and transferrable Upscaling Framework will be developed for supporting cities in systematically upscale their smart grid projects with reduced costs and time. The project's aims to reduce CO2 emissions in smart-grid pilots by at least 25% through the uptake of resource-efficient, sustainable technologies and processes enabling increased renewable energy generation, reduced consumption and optimised management. 10 beneficiaries (private and public) from five countries (B, SE, DK, UK, NL) are involved in the project. The project was approved in call 7 in December 2018. The project is expected to submit their first report in 2019.

ProCirc brings together 8 public and 3 private sector organisations from 6 countries (NL, B, DK, UK, NO, SE) that will leverage 30 plus circular procurement pilots with a combined value of €40M to address this. Each pilot aims to reduce 20-25% raw materials, waste and CO2 emissions. was approved in call 7 in December 2018. The project is expected to submit their first report in 2019.

EMPOWER2.0 15 partners from different sectors and from 4 NSR countries (BE, DK, NL and UK) are addressing entry barriers to citizen-led energy transition in the NSR. Citizens encounter significant challenges (governance, technical, legal, financial) to play an active role in the energy market. Empower will create a framework to remove these barriers through empowerment of "prosumers" (citizens or social structures that produce as well as consume energy) and local energy communities. As such, the project focuses on end-user involvement and capacity-building through co-creation processes, whereas technological elements are not addressed. Citizen empowerment is moreover seen as a contribution to the transition towards sustainable energy production. The project will map existing barriers to entry for civil society structures, develop and trial prosumer propositions and eventually disseminate the findings through a toolkit and other dissemination exercises. By doing so, the project aims to empower 14000 households in the directly involved municipalities and regions of the partners, to increase the uptake of renewable energy by 1% of the households in the NSR and a reduction of 28000 carbon dioxide emissions in the NSR. The project was approved in December 2018.

OESA brings together 13 beneficiaries from 6 NSR countries (DE, NL, UK, SE, NO, DK) to create an accelerator programme for SMEs in the marine energy sector. OESA partners work together to develop new services to support accelerated deployment of ocean energy parks in NSR. This is the first project building an alliance between the Nordics and North-West Europe. It already realises the deployment of 5 pilots during the project that will increase the installed ocean energy capacity with 30% and reduce 100.000 tonnes CO2 emission. In addition, OESA engages policy makers, offshore

companies and investors to realise even more deployments. The project was approved in December 2018 and is expected to submit their first report in 2019.

SoilCOM brings together 12 beneficiaries from 5 NSR countries (DE, DK, NL, BE and UK) to develop and implement new quality compost products for specific uses, as economically and environmentally effective soil improvers, thereby increasing the demand for compost and enhancing the recycling of biological waste suitable for composts as part of the growing circular economy. The project also involves a governance element and wants to provide NSR authorities involved in biological waste, compost and water management with tools to regulate and administer the sector. The project was approved in December 2018 and is expected to submit their first report in 2019.

3. Sustainable North Sea Region: Protecting against climate change and preserving the environment

(This is a continuation of the text provided in the SFC under this heading):

Priority 3 results expected and achieved:

Call #	Project name	Result description	Quantified target	Achievement through 2018
1	BWN	Climate change resilience increase at target sites. Percentage of improvement (+10%) of reduced long term (projected) erosion and flood probabilities at target sites	10	17
		New catchment areas managed using shared BwN techniques as a result of the effectiveness of project demonstrations, based on Building with Nature principles.	550 km	-
		New coastline plans using shared insights, designs and demonstrations of the effectiveness of the methods of Sand Nourishments, based on Building with Nature principles.	700 km	-
1	FAIR	Increase in the number of functions of the targeted infrastructure in comparison to current mono functions	2 # of functions	-
		Reduction of life cycle costs of flood protection infrastructure	5 percentage decrease	-
		Increase in the lifespan of targeted infrastructure	5 percentage decrease	-
1	NorthSEE	Reductions of time spent on application procedures for interconnectors and transboundary EIA procedures	36 Months	-
		Avoidance of stranded investments for application of wind farms in designated shipping routes, and of sunk costs for development of unsuitable environmental areas.	60 Mio. Euro.	-
		Cost savings by exchange of data. Euro. Cost savings in data analysis, cumulative 250 000 €.	250000 Euro	-
1	TOPSOIL	Water quality. Improvement of quality by 20%. Baseline value is different for each of 16 pilots in the project	20%	-
		Water quantity. Improvement of buffer capacity by 20%, Baseline		-

		value is different for each of 16 pilots in the project		
1	WaterCoGovernance	Long term cross sector commitment (sustainability) to co-governance in pilot areas	3 years	-
		Increased return on public investment by adopting participatory/ co-governance approaches to management of NSR ecosystems	20 % increase	-
		Improvements to the environmental status of pilot areas	15 % increase	-
2	BEGIN	Reduced probability of floods from extreme rainfall	30 %	7,9 %
		Reduced expected impact from flood events in NSR by 2020	7 Mio. €	4.049.105 €
		Increased long-term financial performance of investments, including social, environmental and financial benefits	200 Mio. €	1.200.000 €
2	FRAMES	Resilient authorities: Increase the awareness, capacity and policy drivers for public authorities and practitioners to taking action to reduce the impact of flooding	2 scale increase from baseline; aggregated improved resilience level for 13 flood prone areas measured by increase of average capacity on a scale from 1 to 10	4
		Resilient areas: Achieve an improved level of resilience against the impact of flooding in areas	2 scale increase from baseline; aggregated improved resilience level for 13 flood prone areas measured by increase on 1 to 10 scale	5
		Resilient communities: Achieve an improved level of resilience against the impact of flooding in at-risk communities	432 stakeholders and 2800 inhabitants have an increased level of self-efficacy and resilience in case	-

			of flooding through empowerment of inhabitants and sustainable coalitions	
2	NuReDrain	Direct reuse of P-containing filter material as fertilizer	20 %	-
		N removal in demonstration sites	50 %	60%
		P removal at demonstration sites	70 %	59%
2	PARTRIDGE	Increased capacity to improve farmland ecosystems across NSR	80%	20%
		Farmland ecosystems improved	30%	10%
2	Sullied Sediments	Reduced economic cost of disposal of dredged material	10%	
		Reduced level of selected watch list chemicals in outflow from waste-water sites piloting spore technology	25%	
		Reduced level of selected watch list chemicals in inflow to waste-water sites in catchments piloting behaviour change activity	20%	
3	CANAPE	Carbon captured.	1640 Tons of CO_2-eq/year	-
		Profit per Hectare	2089 €	-
		Reduction in flood risk	228600 Cubic meters of water per year	-
		Conservation Saving Achieved per hectare	500	-
3	CATCH	Reduced costs from flood events due to extreme rainfall	20 %	-
		Reduced probability of floods due to extreme rainfall	30 %	-
		Increased awareness of the need to accelerate the formulation and execution of water sensitive climate adaptation strategies in midsize cities	1000 people	-
3	JOMOPANS	Promoting ecosystems services: Proportion of the North Sea for which underwater noise can be managed	90%	
		Promoting ecosystems services: Potential for management to reduce the area adversely affected by underwater noise. The capacity to	10%	

		identify and validate measures to reduce the area adversely affected by ambient noise will be built.		
		Reduction in cost resulting from JOMOPANS being a single standardized, joint monitoring approach instead of national monitoring programmes.	50%	
5	IMMERSE	Increased potential delivery of measure benefits, resulting from advances in measure development during the project	25%	
		Increased stakeholder acceptance of measure designs and subsequent implementation	25%	
5	North Sea Wrecks (NSW)	Increased capacity of key stakeholders for sustainable & efficient management of the North Sea, reducing the risks associated to wrecks, munitions, related pollution and hazardous substances for human-being, life species and blue growth options	14 uptake of management measures by key stakeholders as a part of a holistic assessment of mitigation options for shipwrecks and dumped munitions during user testing (2-4 scenarios x 3 locations)	-
		Improved coordination between the relevant NSR actors and stakeholders, especially for cross-border and transnational agreements, such as OSPAR or providing relevant portals (EMODnet) with decision-relevant data	5 number of national policies (regulations, initiatives, strategies) influenced by the project thanks to the input provided (1 by participant country (NO,DK, DE, NL, BE))	-
		New knowledge used by stakeholder organisations about risks of hazardous substances – better access to knowledge & information: 1. improved access to existing data, 2. providing missing eco-toxicological data 3. applying data for decision support	20 number of square miles with sensitivity indicators, where the inventory and comparable data about risks of hazardous	-

			substances in selected/ representative North Sea sub-regions are used (4 pilot studies x 5 square miles = 20)	
7	C5A	Increased number of multi-benefits (functions / services / outcomes) delivered	3. No. of additional functions of the targeted infrastructure / system	-
		Improving long-term risk reduction for less whole life investment	5. Benefit-Cost Ratio (BCR) of the investment in flood protection, in percentages of increase	-
		Increased adaptability of flood management approaches	3. No. of additional adaptation pathways available to the decision maker to choose from	-
7	GEANS	Improved transnational environmental health assessment	7 competent authorities	-
		Increased time-efficiency	60 %	-
		Cost reduction	40 %	-

Below is an overview of the projects, including their overarching objectives and main activities. Please note that 13 out of 17 projects had reported on their activities and finances by the end of 2018. Reports from IMMERSE, NSW, C5A and GEANS are expected in 2019.

BWN – Building with Nature

The Building with Nature project takes place in a crowded region with high economic stakes, vulnerable to flooding. The idea of Building with Nature is to allow nature to help you achieve your flood prevention goals, irrespective whether that involves waves, currents, sedimentation and erosion patterns or vegetative growth. The 15 partners from 6 countries (SE, NL, DE, DK, BE, UK) are focusing their cooperation on both coastal and catchment systems and use a cross-sectorial transnational approach to knowledge exchange and development. The project studies 13 living laboratories on the technical aspects (geomorphology, biology etc.), followed by endeavoring socio-economic aspects such as business case guidance and

governance barrier analysis. These products will lead to a framework that can be used for opportunity mapping in order to indicate chances to apply nature-based way of thinking, designing and building. The activities to promote governance acceptance and uptake of relevant techniques and paradigms are supported by its Policy Learning Group.

Main achievements in 2018 are:

- The Building with Nature Mid term event, March was a tremendous success, with over 150 participants. It was held together with Interreg NSR project FAIR and hosted contributions of several fellow NSR projects (BEGIN, FRAMES, CATCH, CANAPE and Topsoil) and the US Army Corps of Engineers.
- The coastal work package demonstrates climate change solutions at 7 coastal living laboratories on North Sea and Wadden Sea Coasts (NL, DE, DK, and SE). The nourishment solutions and eelgrass experiment and the analyses on a national level were finalized at the end of 2018. The results will teach partners and stakeholders on effects of the individual measures in individual subsystems. The transnational co-analysis of nourishments will follow in 2019.
- The transnational co-analysis will strengthen the knowledge base tremendously by generating a more comprehensive insight in the behavior of nourishments along the North Sea shoreline. It will open opportunities for system scale interventions and asset management of Nature based Solutions.
- The Twin Dikes are under construction: the inner Dike has been constructed and a start has been made with strengthening the inside of the outer Dike. With partner initiator province of Groningen the conditions for future users of the protection zone have been developed.
- Exchange on transnational best practice on nourishment and sediment transport strategies was particularly facilitated by the Wadden Sea Board´s Task Group Climate (TGC), and by the collected material in the BwN climate change adaptation platform. Knowledge on climate change, sand nourishment and sedimentation in the Wadden Sea was shared at the Wadden Sea Day, Wilhelmshaven, Germany (30. August) and at the Trilateral Governmental Conference in Leeuwarden, the Netherlands (17-18 May).
- The catchment work package demonstrating climate change solutions at 6 catchment living laboratories (B, NL, SE and Scotland) is picking up the individual projects and performing overall analyses. Business case guidance was developed, tried and tested in 10 quick scan business cases.
- The partner Tweed Forum has developed the specification to tender for a catchment model based on the Eddleston Water catchment. The model will help the project to identify sites for future BwN measures. The Eddleston catchment has become an outdoor research laboratory for Universities Government and its agencies to assess BwN techniques and assess their multiple benefits. The Scottish partners are working to develop a business case for Eddleston

and this will help SEPA and local authorities to develop BwN solutions for the next flood risk management planning process.

- The Tweed Forum was host to Ms Rosanna Cunningham, the Cabinet Secretary for Environment, Climate Change and Land Reform at her visit of the sites of the Eddleston Water projects and she was briefed about the Interreg BwN and Eddleston Water projects.
- The technical evidence base is created through appraisal of the work carried out in the partner countries. Through the business case guidance this is molded into comparable business cases.
- Results are disseminated through the specialist fora that partners are represented in and also through an endeavor like the Natural and Nature Based features Guidance, prepared in close cooperation with the USACE and EA.
- Governance aspects are well covered by the Policy Learning Group that is actively supporting dissemination of project results. UNESCO IHE has developed and executed a capacity development pilot program. Summer courses at UNESCO IHE Delft provide capacity building within the NSR but, given the nature of the institute, also worldwide.
- The UN World Water Development report 2018, "Nature Based Solutions for Water" has the BwN project as the example on a practical approach to shape Nature Based Solution implementation through integrating disciplines. The project is highlighted in the report, box 5.9 (NBS and the EU WFD: Experiences from pilot projects in the North Sea Region).
- The Building with Nature project won the Interreg NSR film contest on the annual North Sea Conference, June.

FAIR - Flood defense infrastructure: Asset management and Investment in Resilience, adaptation and maintenance

Funded by the EU INTERREG North Sea Region (NSR) Programme and led by Rijkswaterstaat, FAIR focuses on sharing approaches to better enable the development of more resilient, multi-functional and adaptive approaches to flood defense infrastructure. Within FAIR asset owners and experts (the Science team) work closely together to support the development of the next generation of asset management and investment planning methods. For this purpose, FAIR works with an innovative 'buddy' system, linking each asset owner to a member of the Science team. The partnership consists of 12 partners from 6 countries (SE, UK, DK, BE, DE, NL) and is working with 6 pilot sites. Through an approved major change request, the partnership was enlarged with the beneficiaries Municipality of Esbjerg, DK and HAN University of Applied Sciences, NL. One beneficiary was designated as inactive.

Progress on specific activities in 2018 includes:

- The science team has continued to support and provide advice to the asset owners across the NSR partner countries with access to expert knowledge (and tools where available). Through collaboration with the Asset Owners the barriers to adaptive asset management have been

explored and potential opportunities to overcome them discussed during the FAIR coordination group meetings (CGM). The results have been presented at the 7th International Conference on Flood Management (ICFM7).

- Good progress has been made with the performance analysis of assets and systems for the pilots the asset owners are working on in FAIR with support of the science team by means of discussions during regular consortium meetings and bilateral discussions between the buddies on specific issues (for example on joint probability analysis, system risk analysis and inundation modeling). The science team also supports the asset owners to help demonstrate asset management strategies and investment programmes and gain a better understanding of alternative asset management methods and their application in practice.
- In March 2018 the preliminary results of FAIR were presented at the FAIR / Building with Nature Midterm event. The keynote speech was delivered by Dr. Todd Bridges, the U.S. Army Corps of Engineers (USACE) Senior Research Scientist for Environmental Science. The representatives of the USACE took part in all sessions and discussions during the Midterm event.
- At the midterm event FAIR dissemination took a big step. The baseline of asset management practices based on data for the North Sea Region countries was disseminated in the Policy Debate and the Policy Learning Group. In the debate the asset owners pitched and discussed their key improvement challenges. The insights of the debate were used to inform the opportunities for transnational Peer-to-Peer learning between Asset owners.
- During the regular Coordination Group and Technical Meetings, the Asset owners with support of the scientific team have developed a Peer-to-Peer learning programme. Furthermore, the insights of the debate will be translated by the Scientific team into recommendations for policy makers (FAIR policy brief), which will be widely disseminated by the PLG members in the year to follow.
- The insights of the debate have also been used by the Scientific team to inform the remaining research gaps (beyond FAIR) to be addressed by a spin-off Interreg NSR project, called C5A.
- Last but not least, the FAIR online learning platform has been launched at the Mid Term event and disseminated through the FAIR website. This platform will regularly be updated with new insights and courses.
- To develop organizational plans for a network, to be sustained after finishing FAIR, discussions are taking place with the Institute of Asset Management (IAM) in the UK. This institute is the professional body for asset management professionals. It has over 22,000 members in 158 countries.

NorthSEE - A North Sea Perspective on Shipping, Energy and Environmental Aspects in Maritime Spatial Planning

The North Sea Region (NSR) is one of the busiest areas for shipping and utilization of natural resources (oil, gas, wind, etc.) in the world, and contains unique natural reserves. The countries around the NSR are frontrunners when it comes to Maritime Spatial Planning. Their mandated authorities are using national planning methods and processes to develop maritime spatial plans. Exchange of the different approaches can serve as a source of inspiration for improving national MSP and mutual understanding of the different national MSP systems. As many activities in the North Sea are of transnational nature (e.g. linear infrastructure, shipping lanes), coordination among national Maritime Spatial Plans is useful to capture synergies and to prevent incompatibilities concerning shipping routes, energy infrastructure and environmental protection. Having all countries involved, the he NorthSEE project aims to achieve greater coherence in Maritime Spatial Planning processes and plans and creating better conditions for sustainable development of the area in the fields of shipping, energy and environmental protection.

The projects main achievements in 2018 were:

- New insights were provided on the status of the MSP process of the countries by a timeline exercise, stipulating their MSP process for the coming 3 years in more concrete steps. A tool was developed for comparing MSP processes and identifying transnational issues. The project has also developed the concept of friction cases, which are concrete cases, where different sea uses compete on space causing a friction. Besides cooperation on maritime spatial planning systems, the project did also make substantial progress on the three sectors.

- On shipping a large number of studies were completed and findings are presented in reports: "Transnational Maritime Spatial Planning in the North Sea: The Shipping Context" and on "Improving the co-existence of Offshore Energy Installations & Shipping"; Info graphics: "The Spatial Planners' guide to distances between Shipping & Offshore Renewable Energy Installations" and "4 Shipping trends".

- On energy (off shore wind farms and transmissions infrastructure) a large number of studies were completed and findings are presented in reports: " Status quo report on offshore energy planning provisions in the North Sea Region"; Info-graphics on: "National and EU energy policies seascape across the North Sea Region in the short- (up to 2020), medium- (2030) and long-term (2050)", " North Sea Offshore Energy Institutional framework", " Timeline of transnational energy cooperation between North Sea countries" and " Timeline of Offshore Renewable Energy development and Maritime Spatial Planning in the North Sea".

- The work on environment was delayed, because 2 partners with major environmental tasks were designated as in-active. The project had to reorganize the tasks and redistribute the tasks within the partnership. The project has completed the report "Connectivity among marine protected areas, particularly valuable and vulnerable areas in the greater North Sea and Celtic Seas regions". Work on a comprehensive environmental report is still ongoing.

- The project has delivered substantial progress on the MSP Coordination tools and the MSP Challenge simulation game which was tested with stakeholders at workshops on Environment - April, Energy - October and Shipping – November.
- The project is cooperating with the BSR BalticLINes and the projects have prepared a joint Conference, which will be held on 13 – 14 February 2019. Some partners of the NorthSEE project are also participating in the MSP working group under the North Sea Energy cooperation.
- The project steering group held two meetings during the year.

TOPSOIL – Top soil and water – The climate challenge in the near subsurface

The top 30-70 m layers of soil and groundwater aquifers are responding rapidly to climate change. This leads to increased risk of flooding in some areas, whilst other regions are facing drought and drinking water scarcity. Currently, the knowledge of this complex upper layer of the soil is rudimentary and coarse, which makes it difficult to know how individual areas will respond to rising temperatures. In addition, with more detailed knowledge, the subsoil zone may itself become an integrated part of new solutions to existing and future problems.

TOPSOIL is addressing those issues by inventing and deploying new, cost-effective methods of mapping the subsoil structures, enabling experts to predict how specific local areas will respond to climate change. This is combined with developing and trialling new climate adaptation solutions and governance methods based on this type of knowledge.

The Topsoil project deals with five climate adaptation challenges: solutions will improve management of flooding; preempt saltwater intrusion into freshwater reserves; use of groundwater buffer to store excess rain water for irrigation in periods of draught; improving soil conditions and capacity to break down nutrients and environmentally hazardous pollutants.

There are 24 partners working with the challenges in 16 pilot areas in 5 countries (UK, DK, BE, DE, NL). All pilots are developing modeling tools, completing field trials and implementing new governance approaches. They are developed and implemented jointly and tested across the pilots in between the countries.

Major achievements in 2018 were:

- A wealth of different investigation methods was tested, developed and deployed in the 16 pilot areas, including the electromagnetic tTEM system used for detailed, three-dimensional hydrology and geology mapping in the subsoil layers (30-70 m depth). The project is further

developing the tTEM system into the FloaTEM system, which can be used on water to reveal water quality and the hydro-geological setting on lakes, rivers, fjords, or sea.

- So far, the project has demonstrated 10 new climate change adaptation solutions in its pilots, with more under way.
- A large number of stakeholder consultations and workshops at all levels were carried out with direct involvement and engagement with a diverse range of stakeholders, identified in the stakeholder involvement strategies prepared for each pilot area. The project is involving 72 enterprises and 46 research institutions.
- There is a substantial professional interest in these methods in the US. The project cooperates with the US Geological Survey which has conducted a few surveys using the tTEM method in the Mississippi delta, and Stanford University, which is deploying the tTEM method in California.
- In the North Sea Region, the project's preliminary results have already led to several significant improvements in climate-smart planning and management. For example, in Lower Saxony, Germany, TOPSOIL results have provided the frame for new long-term contracts with farmers on soil and groundwater management. Tramline trials in UK pilots have enabled a wider uptake of the technology by farming peers.
- The benefit of understanding the soil properties and applying this knowledge to cope with climate change is gaining attention at the policy level. In the UK, TOPSOIL is enabling groundwater management to become much more mainstream and is co-chairing a new national working group on water resources management. At the latest TOPSOIL Partner meeting, member of the European Parliament Dr Joachim Schuster was present to give a speech.
- The experience with the use of SkyTEM in the province of Zeeland and in the TOPSOIL pilot of the Province Drenthe inspired the national institute Deltares to start a nationwide project called "Freshem" to fly the remaining parts of the Dutch coastal zones with SkyTEM. The province of Groningen is also considering participating in this SkyTEM project. Local SkyTEM results in the Province of Drenthe (the Netherlands) led to a broader discussion involving different provinces, waterboards and scientists in the North of The Netherlands. Solutions to make better maps are now in progress.
- In the UK, collaboration with other projects has enabled TOPSOIL to deliver practical interventions on the ground resulting in the delivery of more than 750,000 m3 of water 'replenished' to the natural environment.
- On 8 December 2018, TOPSOIL presented its preliminary results at the Interreg Climate Change Network session organized as part of the UN Climate COP24 in Katowice, Poland.

- The project did also present preliminary results at the following occasions in 2018:
    - European Geosciences Union General Assembly, April Vienna
    - Saltwater Intrusion Conference (SWIM), June Gdansk
    - Official opening by former UN Secretary General Ban Ki-moon of the Global Centre on Adaptation, Groningen, October. TOPSOIL was presented at the ensuing symposium.

WaterCoG – Water Co-Governance for sustainable ecosystems
WaterCoG is a project whose partnership consists of nine partners from five different North Sea Region countries (United Kingdom, Denmark, Sweden, Germany, the Netherlands).

The overall objective of the project is to develop and demonstrate new solutions and technologies for delivering sustainable ecosystem management of the North Sea Region. The project will demonstrate through the adoption of new participatory, ecosystem service-based approaches that implementation and integration of different water management frameworks can be achieved at the same time as providing additional social, economic and environmental benefits.

During the first two years of implementation first meetings have enabled a significant level of knowledge exchange and enhanced the collective understanding of the common need for "co-governance" based solutions to water management. The 14 pilots are up and running and enable new co-governance approaches to be implemented to solve water management.
Since external communication is critical to the success of the project WaterCoG, partners have actively promoted the aims of the project and the new solutions being developed through numerous channels. More widely, the project activities help to shape policy developments in several partner countries.

Some of the main activities in 2018 were:

- The establishment of a national network of stakeholders and authorities to discuss the implementation of a more co-governance approach to the delivery of the Water Framework Directive in Denmark.

- The concept of catchment officers was piloted in Denmark as part of the WaterCoG project and it has accelerated the concept to a national roll out of catchment officers to supporting the local delivery of wetland schemes to reduce nitrogen from agriculture reaching surface waters. 28 new Danish catchment officers visited the Lead Beneficiary The Rivers Trust for a knowledge exchange meeting to learn about the work of Rivers Trust advisors, how they go about delivering farm advice and how they support reducing diffuse pollution from agriculture.

- Completion of an online survey to capture stakeholder views on current approaches to co-governance in water management. The survey was made available in Swedish, German, Dutch, Danish and English and attracted over 500 respondents. Work is now underway to analyses the results.

- The launch of a refreshed web platform to support participation and knowledge exchange in water co-governance. The web platform provides case studies, guidance materials, examples of best practice, tools and a user forum with translation functionality.

- A specific focus on engaging the business/private sector to participate in collaborative management within the UK is producing great results with several exemplar projects in development and representation from WaterCoG at a high-level event convened and attended by HRH Prince Charles to highlight the need for collaborative cross-sector catchment management. The event included a declaration for commitment to action that has since been signed by over 100 organisations.

- In Denmark a new concept for characterising and designing the timeline and process for improved stakeholder involvement in Water Framework Directive planning was introduced into the Skive Fjord pilot. This has included examining 36 years of data from a national monitoring program and developing new models for involving stakeholders at an early stage when implementing the Water Framework Directive.

- In the Netherlands work with farmers to explore the issue of salinization on the Isle of Texel is continuing with great success. Participation by farmers in the collection of monitoring data is leading to a much greater understanding of the issue and trust in the data - paving the way for the implementation of new management solutions.

- In Sweden the project is providing a catalyst for the adoption and integration of local participation processes in various areas of water management. This includes a national investigation of the Swedish organisation for the Water Framework Directive and wider exploration of how collaboration between regional and local authorities and the local public can be developed to stimulate sustainable use of land, water and business development.

BEGIN – Blue Green Infrastructure through Social Innovation

BEGIN is a project whose partnership consists of 16 cities and research institutions from six countries in the programme area – Belgium, the Netherlands, Norway, Sweden Germany and United Kingdom.

The project will use their pilots in order to demonstrate how cities can improve climate resilience with Blue Green Infrastructure (BGI), involving stakeholders in a value-based

decision-making process. The BEGIN project helps cities to overcome implementation barriers for BGI´s through Social Innovation (SI) that empowers multiple stakeholders to contribute to the design, construction and maintenance of BGIs.

During year one of project implementation the first final designs of the pilots have been created and will be studied and approved. Additionally, a transnational city-to-city (C2C) learning programme has been developed based on the inventory of each city´s strength and weaknesses which will lead to more effective knowledge exchange.

Some of the main activities in 2018 were:

- Achievement of first remarkable project results (see table above)
- Progress made towards finalising the designs for their blue-green (BGI) pilot sites. Some pilots have already started their construction phase and/or are analysing its expected positive impact on reduced flood risk for the city.
- Intensive involvement of different types of stakeholders, from neighbours participating in the design phase to local institutions and companies, among others.
- Effective dissemination activities, f. ex. presentation of the project at specialised and high-level conferences, creating scientific papers and making use of social media tools.
- 9 C2C workshops took place in 2018. The cities were gathered in groups with similar needs. They exchanged ideas among them and were supported by specialised scientific partners.

FRAMES – Flood Resilient Areas by Multi-layEred Safety

FRAMES is a project whose partnership consists of 16 partners from five countries in the programme area – the Netherlands, Belgium, Germany, Denmark and the Unitied Kingdom. More frequent and severe flooding due to climate change is one of the most significant risks for the North Sea region. FRAMES aim to reduce the effects and impacts of flooding and reduce recovery time through enhanced resilience of flood prone areas and communities in several selected target sites. The project wants to combine resilience measures in the Multi-Layer Safety (MLS) concept. The MLS concept is a strategy that integrates measures for: prevention, mitigation via spatial planning and emergency response. Through MLS, institutional and sectorial barriers are lifted, and the stakeholders jointly apply the most effective combination of solutions to realize sustainable strategies and improve the capacity of authorities and society to cope with flooding.

During the first year FRAMES partners have started exchanging information with stakeholders to set up the MLS activities in the 13 pilot areas. A survey was done in all pilot areas to determine an aggregated improved baseline for resilience.

FRAMES is behind schedule, but the project is busy finding ways to speed up the project implementation process. This is reflected in the main activities in 2018 which included:

- development of an action plan that provided information about how the project will catch up with the delays as well as an overview about how all planned activities can be managed until project end.

- progress with MLS implementation in the pilot areas.

- progress with development Decision Support System (DSS).

- In the Frames pilot areas involvement of stakeholders has been increased by organising meetings and workshops for experts, members of communities, representatives of regional and local authorities (FRAMES Days).

- The pilot Electricity Grid Zeeland has been completed; the report is published on the NSR/Frames website.

NuReDrain – Nutrients Removal and Recovery from Drainage Water

NuReDrain is a project whose partnership consists of eleven partners from three different North Sea Region countries (Belgium, Germany and Denmark).

The North Sea region is recognized as an intensive farming area and nutrient inputs from land have resulted in eutrophication in rivers, lakes, estuaries and coastal zones. The NuReDrain project aims at developing a technology for trapping phosphorus and nitrogen in agricultural waste streams such as drainage discharges and greenhouse effluents. The project wants to stimulate joint development of cost-effective filter technologies, targeting nutrients removal for different situations and regions, reuse the recovered phosphorus for agricultural purposes and eventually offer guidance to policy makers about implementation strategies.

Within the first year of project implementation the NuReDrain project consortium generated a database summarizing techno-economic characteristic of 15 phosphorus absorbing and 2 nitrate removing materials. Meanwhile, all project partners started with the preparatory work for the first round of field tests.

Main activities in 2018 include:

- Several lab tests have been carried out that revealed which materials are suitable for an efficient phosphorus removal. Noteworthy is the fact that filter materials used to remove low concentrations of phosphorus can later be reused to remove high concentrations of phosphorus.

- Several filter materials have already been tested in the field and different filter materials have achieved 59%-99% phosphorus removal in different environments. Challenge: Clogging due to algae blooms in the surface water - prefiltration and backwash of the system is investigated.

- Nitrogen-removal has also been tested out in the field with the success rate of 30-73%. Challenge: Installation of filter in remote areas and keep it operational at low temperatures.

- First pot trials to reuse removed phosphorus as fertilizers were not successful but it was decided that saturated filter materials will undergo a pre-treatment. Several pretreatments are tested on the saturated filter materials to facilitate the phosphorus release and to explore various valorization routes.

PARTRIDGE (Protecting the Areas Resources through Researched Innovative Demonstration of Good Examples), which consists of 11 partners in four NSR countries (UK, NL, BE, DE), aims to demonstrate how new best practice management solutions can improve biodiversity and ecosystem services by up 30% in four years, and how these can be transferred across all regions of the NSR and the EU. The project measures are tailored to their flagship species, the Grey Partridge, because existing evidence shows that partridge-friendly measures benefit farmland biodiversity in general. The partners had a very busy year in 2018. Primary achievements include:

- introducing high quality habitats (mainly perennial PARTRIDGE flower mixes, but also beetle banks, winter stubbles and flower margins) at all demo sites.

- providing supplementary winter feeding during the hungry winter gap and indirect predation management by providing up to 1-ha PARTRIDGE habitat blocks, which help reduce mortality of ground nesting birds. Legal lethal predator management is being carried out at six sites.

- signing on 69 farmers at demo sites to implement project measures, together with 39 hunters and more than 100 volunteers. Progress is being monitored at all sites, using key bio-indicator species and ecosystem services to prove that t measures work. The data is being compared with 10 reference sites where the same data is collected but no additional management measures take place. The partners have involved 21 researchers, more than 200 students and around 150 members of the general public in monitoring activities to date.

- informing key stakeholders, ranging from farmers, hunters, farmland advisers, agronomists, NGO's, local, regional, national, EU, CAP and Brexit agri-policy makers and influencers by holding 102 farm walks, which reached more than 1300 people directly
- expanding outreach within the NSR and across the EU, informing more than 900 organisations that are relevant to the cause.

- ensuring that measures continue to be implemented beyond the end of the project by establishing local stakeholder cluster groups at eight sites and lobbying for the inclusion of our measures into future national Agri-environmental Schemes (AES). This has led to the inclusion of beetle banks and the PARTRIDGE flower mix into AES in the Netherlands, with preparations currently underway to include our PARTRIDGE mix into the Flemish AES.

- planting at least 300 ha of high-quality PARTRIDGE mixes outside demo sites, including areas in Austria, Northern Ireland, Ireland, Hungary and Italy, with numbers steadily rising. This is directly helping to increase farmland biodiversity across Europe.

- published more than 200 articles in the printed and social media; and featuring on regional and national TV and radio to inform the public more widely about the farmland biodiversity crisis in Europe and what can be done to fix it; between 3-4 million people have been reached this way.

- holding 15 in-depth key stakeholders' interviews in each partner country to help find answers as to how to improve the quality and uptake of national agri-environmental schemes to bring about the recovery of farmland wildlife across the North Sea Region that is so urgently needed. This because current AES's have not managed to halt the ongoing decline of farmland biodiversity across the EU, despite commitments made in the Biodiversity 2020 targets.

- working across borders with a wide range of experts and rural stakeholders based on a bottom-up approach, which is proving to be a very successful strategy to achieve project aims. The project is being increasingly heard up to the highest political levels and numerous farmland conservation projects are copying the approach across the EU.

Sullied Sediments (Sediment Assessment and Clean Up Pilots in Inland Waterways in the North Sea Region) has 13 partners in four member states (BE, DE, NL, UK). The aim of the project is to enable regulators and water managers to make better decisions with regard to sediment management, removal and disposal, thereby reducing economic costs and the impact of these pollutants on the environment. The partnership will also endeavor to reduce the amount of chemicals entering the water system by raising awareness about what consumers are releasing into the environment using common drugs and household products. Achievements in 2018 include:

- The project developed a set of professionally designed marketing materials for use by the project partnership. The first edition of their newsletter was also published. In addition, beneficiaries in all three river catchments took part in a few external events and conferences that have helped to raise the profile of the project across the North Sea Region and beyond.

- The core activity of WP3-SA involved each of the three catchments (namely the Humber, Scheldt and Elbe) in identifying three sampling locations and agreeing a standard sampling procedure, as well as database approach. The first region-wide sampling occurred in October 2017 and the sediments collected shared among all partners involved in the analysis of specific chemical levels as well as various biological ecotoxicity tests. In parallel, the additional datasets required for ecosystems level impacts were identified. Three sediment sampling events took place across the region within 2018, making excellent progress towards building a seasonal profile of chemical levels and biological impacts across the catchments.

- The partners identified the best spore/pollen-derived sporopollenin exine capsules (SpECs) for the removal of diclofenac, triclosan or estradiol from water in lab conditions. Also, in the lab, iron-loaded SpECs were prepared as a possible way of removal of phosphate. A protocol was finalised for studying the reduced bioavailability of watch list chemicals (WLCs) when adsorbed (locked away) onto SpECs, which will be hopefully concluded in the forthcoming period.

- OVAM's end-of-waste assessment, with the aim to promote an increase in the use of treated sediment had relevant protocols drafted, and presentations made to Flemish stakeholders at the Sullied Sediments annual meeting.

- WP5-CB progressed according to the delivery plan in that the first of the dipsticks which can detect phosphates were made available and piloted with volunteers in the field in December 2018. A working version of the RiverDip app is also available now. The media-wide citizen engagement campaign and volunteer campaign are both being developed for implementation in the spring of 2019.

CANAPé - Creating a New Approach to Peatland Ecosystems

Fenlands and Bogs used to be a major part of the landscape in the low-lying areas around the North Sea. For centuries peat has been an important resource, as people have drained the fens and bogs for land to produce food and used the dried peat as a fuel. This leads to releases of CO2 from the dried peat, and a reduction in capacity of the land to store water leading to reduced protection from floods. Ancient bogs and fens contain many thousands of tons of carbon in an area the size of a football pitch. Once damaged, these sites release this carbon as CO2 into the atmosphere and drive global

warming. The project responds to these issues by restoring wetland areas to reduce their CO2 emissions and improve their capacity to store water, and by aiming to develop the markets for products produced from wetland ecosystems - a type of farming known as Paludiculture. There are 14 partners from 5 countries (UK, BE, NL, DE, DK) working together on new solutions tested in 8 wetlands, bogs and fens.

Across the programme area the story of the summer 2018 was obviously the drought that led to dry landscapes, peat wildfires in many parts of Europe, and outbreaks of Blue-Green Algae at project sites. The extreme weather highlights the importance of the CANAPE work, both in reducing the climate impact our land management has, and in increasing the resilience of our landscape to extreme weather by raising water levels and improving the water quality.

The project's main achievements in 2018 were:

- After the Kick-Off meeting in October 2017 the project has in 2018 focused on the launch of the project, and the preparatory work needed at the various project sites to allow the restoration work to begin.
- On project sites, the first monitoring programmes have been put in place to allow assessment of the success of the project in capturing carbon and retaining water and allow clear understanding of the sites the project will be working on. Alongside this, detailed discussions have been taking place on which parameters to measure the carbon storage of the sites. The project is focusing on measuring by proxy the release and storage of gases by identifying the composition of the soil, and the types of plants growing on the restored sites.
- For the investment work to begin, planning permits have been sought for the sites in the UK, Belgium and Denmark. Construction work has begun at Lille Vildmose in Denmark, Barver Moor in Germany and Hickling Broad in the UK.
- A workshop was held on PC Lake restoration tool, allowing knowledge held by our Dutch partners to be used by partners across the project area.
- Work has begun on surveying the sphagnum paludiculture sites, including taking soil samples and planning how water will reach the sites, and sourcing material for growing sphagnum.
- The study on populations relationships with peatland and interventions to manage peatland has begun.
- The project website has been set up using the NSR webspace, and a series of news articles about the project have been published on it. Extensive local media coverage has been obtained by the partners, covering a range of publications with a substantial readership.
- Project management structure was fully operational from the beginning of 2018; revisions to the project application requested by the SC was approved in June; 2 PSG meeting were held in 2018.

CATCH – water sensitive Cities: The Answer to Challenges of extreme weather events

CATCH is a project whose partnership consists of 12 beneficiaries from six North Sea region countries - the Netherlands, Germany, Sweden, Belgium, Denmark and UK. Regional and local public authorities as well as an institution of higher education and research and an infrastructure and (public) service provider will focus on the redesign of urban water management of midsize cities to become climate resilient cities.

The project runs seven pilots that will test out the joint developed decision support tool and roadmap that will help to formulate long term climate adaptation strategies.

The kick-off meeting as well as a formal opening event of the CATCH project took place in November 2017 in Enschede. The first project report only included the period until mid 2018. The main activities were:

- investigation of the climate vulnerabilities and the specific needs of mid-size cities and their stakeholders in the NSR region.
- development of self-assessment to determine the current situation of the pilot cities.
- first outline of decision support tool made (including three components: planning of actions, assessing the governance situation and creating added value for climate measures).
- partners and a variety of stakeholders were interviewed to several meetings to deliver their perspectives of the situation in the pilot cities regarding climate change adaptation.
- dissemination activities, as for example the presentation of the CATCH project at the International Water Week in Singapore and the Open European Day in Bonn.

JOMOPANS (Joint Monitoring Programme for Ambient Noise North Sea) is a project whose partnership consists of 11 partners from all seven member states. The aim of this project is to develop a framework for a fully operational joint monitoring programme for ambient noise in the North Sea. The project kicked off in January 2018 and partners have been busy ever since. Accomplishments in 2018 include:

- preparation of a first draft on standard procedures for terminology for ocean noise monitoring.
- preparation of a first draft on standard procedures for equipment performance, equipment calibration, and deployment.

- deployment of the first sound measurement stations in the North Sea for a trial period of one month.

- presentation of the JOMOPANS project at the United Nations-organized meeting under the 'Open-ended Informal Consultative Process on Oceans and the Law of the Sea' on underwater noise.

- benchmark on various methods for modelling sound propagation in shallow water.

- meeting of the Policy Advisory Board in June to discuss the uptake of the project results in regular work.

- attention from the Dutch news source NOS, which featured the project in a televised news story in October.

Including the January kick-off, the partners had three formal meetings in 2018 and expectations for sound results to be reported in 2019 are high.

IMMERSE (Implementing Measures for Sustainable Estuaries) is a project consisting of 11 partner organisations from six NSR countries (Denmark, Flanders, Germany, the Netherlands, Sweden, and the UK). IMMERSE aims to accelerate the implementation of large-scale measures that address multiple estuary management challenges, while increasing their cost-efficiency and enhancing stakeholder commitment. The partnership will focus on seven estuaries in the North Sea Region:

- Scheldt (NL/BE)
- Elbe (DE)
- Humber (UK)
- Isefjord/Holbaekfjord (DK)
- Roskildefjord (DK)
- Göta älv (SE)
- Tees (UK)

The project kicked off in October and will run through the end of September 2021. A first progress report is expected in mid-2019.

North Sea Wrecks (NSW) is a project consisting of nine partner organisations from five NSR countries (Germany, Belgium, Denmark, the Netherlands and Norway). The project aims to develop and implement a common approach for facing economic, environmental and safety challenges caused by existing ship and aircraft wrecks, lost cargo and munitions in order to improve the sustainable management of the North Sea ecosystem. The consortium will generate and share information about the location of the polluting and potentially dangerous items and assess and prioritize their risk. This will strengthen the capacity of key stakeholders as well as promote the North Sea as a safer space for new business opportunities for a better use of natural and maritime resources (as for example blue

growth activities). One objective is also to define transnational policy recommendations to address hazards. In addition, the project wants to preserve cultural and historic heritage by developing the travelling exhibition "Hazardous Waters". The exhibition is part of a sensibilization campaign in order to raise awareness and social acceptance for the problems arising from wrecks and dumped munitions.

The project kicked off in October and will run through the end of October 2022.

C5A - Cluster for Cloud to Coast Climate Change Adaptation

The North Sea Region (NSR) is facing a significant increase in the frequency and severity of floods in response to climate change. Flood management approaches must urgently adapt to this new reality to keep people safe, the environment healthy and our economies prosperous.

To respond to this challenge the project Cluster for Cloud to Coast Climate Change Adaptation (C5A) will deliver a from 'Cloud-to-Coast' (C2C) approach to the management of flood risk. The whole-of-system approach will integrate four constituent systems (catchment, coasts, cities, infrastructure networks) and enable the development of multifunctional and adaptable solutions that deliver more sustainable, integrated and multifunctional solutions across the NSR. To do so, the project will build upon the outcomes of seven ongoing Interreg NSR projects to ensure our approach is both evidence-based and practical.

Building on the seven ongoing Interreg NSR projects, the 10 C5A partners from 6 countries (NL, SE, DK, DE, UK, B) (will co-create the C2C approach. The project will develop a multi-beneficial, advantageous and resilient way of working on flood management from Cloud to Coast that can be applied in practice. The project will organise 7 case studies, 2 sessions with EU DGs and a high-level policy learning group. Project partners will reach out to local, national, transnational and global networks to raise awareness and acceptance in- and outside the NSR. C5A builds capacity and support for the take-up of Cloud to Coast by relevant authorities and practitioners across the NSR, and beyond.

The project was approved in December 2018 and will kick-Off in February 2019.

GEANS is a project consisting of nine partner organisations from all NSR member states. The project is operating in the field of ecosystem health assessment of the North Sea Region and will promote the shift from morphological species identification to harmonized genetic tools. The first step is to develop a reliable DNA sequence reference library, which will be complementary to traditional monitoring and allow continuity over time. A set of pilot studies will be carried out by the project in order to implement genetic approaches into existing environmental assessment and management. Finally, the project will develop a decision support framework, which will facilitate the implementation of a transnational uniform DNA-based approach by all competent authorities. A harmonized genetic approach will reduce conflicts and create synergies and improve the environmental health assessment, as demanded by different EU directives. In addition, it is supposed

to result in an increased time-efficiency by 60% as well as cost reduction by 40%. The project was approved in December and will kick off in March 2019.

4. Promoting green transport and mobility

(This is a continuation of the text provided in the SFC under this heading):

Priority 4 results expected and achieved:

Call #	Project name	Result description	Quantified target	Achievement through 2018
3	#IWTS2.0	Number of companies and institutions adopting new concepts	40	3 of these have been achieved as of the end of 2018
		Long distance modal shifts from road to IWT in t/km in 2020	20,000,000 t/km per year	1,445,000 t/km has been achieved as of the end of 2018
7	ART-Forum	Removing bottlenecks: Improved efficiency and safety in passenger and freight transport	50%	
		Increased capacity of authorities in the NSR to future proof their transport strategies – 100 organisations	100 organisations	
		Revised Transport Strategies	75%	
7	BITS	Reduction of CO2 emission thanks to cycling (instead of using other modes)	9%	
		Increase in cycling use (kms) of commuters, students, school children and recreational cyclists within the project period	10%	
		Realisation of a CyclingDataHub as an open platform to share cycling data in the North Sea Region	100 datasets	
3	G-Patra	Additional passenger transport km using green transport solutions	100,000 passenger kilometers	1,924 km has been achieved as of the end of 2018
		Demonstrate reductions in CO2 emissions from remote, rural and island transport using lighthouse projects and business cases	10%	
2	HyTrEc2	Reduction in the cost of hydrogen vans, large trucks and other tested vehicles	25%	
		Number of public sector organisations and transport operators investing in hydrogen vans and other tested vehicles	18	
		CO2 reductions from tested vehicles	18 kilograms per vehicle per month	
5	MOVE	Reducing the use of private cars in local mobility streams	10% reduction of the number of single local private cars trips	

			of target groups individuals	
		Increase in the usage of sustainable mobility solutions	20% increase in number of passengers	
		Increase social integration through mobility	20% increase of yearly travel in km using sustainable mobility solutions	
1	SHARE-North	New or improved shared mobility services	25	15 of these have been achieved as of the end of 2018
		Cars removed from public streets through car-sharing	4,000	6,000 have been replaced as of end of 2018
		Reduction of local and global transport-related emissions	13,458 tonnes of CO2 saved during project lifecycle	The project has already overachieved on this result – 25,850 tonnes as of the end of 2018
3	SURFLOGH	Number of authorities/practitioners using smart urban distribution solutions to reduce CO2 emissions	15	The project has already overachieved on this result – 30 have been achieved as of the end of 2018
		Increase in the use of zero emission urban vehicles in last mile distribution	25%	
		Reduce freight traffic in last mile by using combining tools aiming at bundling of goods flows	10%	
1	SEEV4-City	Increase of real zero emission kilometers in the SEEV4-City Operational Pilots	150 tons CO2 emissions avoided annually	
		Increase in energy autonomy in SEEV4-City sites	25%	
		Potentially avoided grid related investments	100,000,000 EUR in 10 years	
7	Stronger Combined (SC)	Relative increase in number of passengers in rural public transport (implying increase cost coverage and profitability of public transport services)	30%	
		Decreased aggregated CO2 emissions (CO2e) from private and public transport (as a result of a shift from single-person private car trips to multiple-person shared vehicle trips)	100 tonnes CO2	

Below is an overview of the projects, including their overarching objectives and main activities. Please note that only six out of ten projects – #IWTS2.0, G-PaTRA, HyTrEc2, SHARE-North, SURFLOGH and SEEV4-City – had reported on their activities and finances by the end of 2018.

#IWTS 2.0 (#Inland Waterway Transport Solutions) is a project made up of ten partners in five of the member states – Belgium, Germany, the Netherlands, Sweden, and the UK. The project promotes the use of inland waterways for freight transport and identifies some of the barriers to the use of IWT. The following activities have been the focus of the project in 2018:

- The project has collected a large amount of data on the goods and cargo that are coming into the Humber Ports. They have had conversations with MDS Transmodal about the best way to refresh this data.

- The project is enacting an engineering study on Bullholme Lock, which is one of the key bottlenecks the project wants to find a long-term solution for. They want to do this by expanding it for it to accommodate Euro Class II barges.

- The development of a smaller adaptable barge is well underway - the propulsion system and the hull shape are currently the main focus.

- The project has finalized and published an investigation in cooperation with the European "EDINNA" network of IWT educational institutions. The outcome shows that IWT on smaller waterways is an issue in some institutions in Western Europe but is not highlighted in any curricula of the educational institutes that have been contacted.

The third partner meeting and the "Freight by water" conference was held on 9-10 October 2018 in Leeds, UK.

ART-Forum's (Automated Road Transport Forum for the North Sea Region) partnership consists of 16 organisations located in Germany, UK, Belgium, Denmark, Netherlands, and Norway. The overarching aim of the project, which was approved in December 2018, is to raise awareness among public stakeholders and develop policy recommendations that enable local and regional authorities to take advantage of the opportunities of automated road transport in order to support sustainable transport and territorial development goals and improve the quality of life in communities. Project activities focus on gathering knowledge through stakeholder and community forums and synthesizing existing information and research, as well as carrying out a few small-scale pilots and research by partners, on autonomous road transport (ART). The project kick-off meeting will be held in late April 2019.

BITS (Bicycles and ITS) is a project approved in December 2018 that includes 10 partners from Denmark, the Netherlands, the UK, Germany and Flanders. The overall objective of the project is to increase cycling in the pilot regions by making cycling more attractive, safer, more comfortable and more efficient through ITS (Intelligent Transport Systems). The partnership will focus on:

- Implementing ITS solutions that directly increase the take-up of cycling and reduce CO2 emissions within target groups.

- Sharing cycling data and building a CyclingDataHub to share, analyse, and visualize the data.

- Using collected data to get better insight to the needs of cyclists to drastically improve cycling policies.

- Integrating the ITS methodologies and datasets into broader multi-modality, thus anchoring cycling in wider mobility policies and sharing this data for a multimodal future.

The project will kick off in early March 2019.

G-PaTRA (Green Passenger Transport in Rural Areas) has 12 beneficiaries and one co-beneficiary from Denmark, Flanders, Germany, the Netherlands, Norway and the UK. The project aims to promote green transport and mobility by enhancing the capacity of authorities to reduce CO2 from personal transport in remote, rural and island areas by embedding more zero emission vehicles in rural transport systems and by improving, optimizing, and better integrating available passenger transport resources.

In 2018 the project partners held workshops to establish state of the art for zero emission vehicles in rural areas and to discuss benchmarking and metrics in order to ensure consistency in measuring KPIs and demonstrating the effectiveness of transport interventions. Several of the beneficiaries made progress on the six lighthouse projects that are at the core of the project. This included:

- lease and service agreement for a new electric bus that will be trialed on a scheduled route in the Scottish Highlands.
- establishment of the first “youthbus” ride offer in the Leine-Weser region in Lower Saxony
- survey on the potential for car sharing in rural Flanders.
- rolling out of the Quality Neighbourhoods campaign in Beveren-Aan-De-Ijzer, in the rural Westhoek Region (30 days without a car in exchange for testing out a range of sustainable alternatives) and concept of rural mobihubs (mobipunten) throughout the Flanders region.
- data gathering and initiation of the development of a travel coordination and optimisation dashboard in the Netherlands.
- events and workshops in Norway for the private and public sector to raise awareness of G-PaTRA and the potential of local hydrogen power in transport operations.

The project is beginning to make inroads to achievement of their results (as can be seen in the table above.)

HyTrEc2 (Hydrogen Transport Economy in the North Sea Region 2) is a project whose partnership consists of eight partners in the UK, Sweden, Germany, and the Netherlands. Together they are

exploring how to improve conditions for hydrogen-fueled transport across the North Sea Region. The project is behind schedule, mainly due to the partners' difficulty in obtaining the vehicles necessary to carry out their pilots. However, the organisations involved in the project are busy finding ways to circumvent this challenge, as well as other activities, including:

- retrofitting of a Nissan env200 van by Aberdeen City Council and a Renault Kangoo and 'Streetscooter' by Geemente Groningen.
- modelling of a large Forklift Truck Simulation by RISE.
- development of HyTrEc2 app led by the EIFI in collaboration with H2 mobility in Germany.
- successful operation of Geemente Groningen's portable Hydrogen Refuelling Station using solar energy to produce green hydrogen.
- discussions in Aberdeen about off-site production of green hydrogen to be distributed via one of Aberdeen's Hydrogen Refuelling Stations.
- procurement of means of green hydrogen production by Provincie Drenthe.
- contributions to a Supply Chain Map for the North Sea Region, a draft of which was presented at the North Sea Conference in June.

MOVE (Mobility Opportunities Valuable to Everybody) is a project whose partnership consists of eleven beneficiaries (including one local partnership) from the Netherlands, Belgium, Germany, Denmark, and the UK. The project wants to develop and disseminate innovative, environmentally sustainable and economically viable mobility initiatives through multidisciplinary co-creation, bringing together different stakeholder. The project will use local specificities to create practical solutions in four pilots based on unlikely combinations. MOVE supports the greening of the transport sector by offering solutions aiming at a reduction in the use of individual vehicles and by using alternative greener options. The overall objective is to enhance accessibility of small and middle-sized cities/ towns and their surroundings within the North Sea region. The project was approved in June 2018 and the first report is expected in May 2019.

SHARE-North (Shared Mobility Solutions for a Liveable and Low-Carbon North Sea Region) The SHARE-North partnership consists of 11 public and private partners from Germany, Sweden, Belgium, Norway, the Netherlands, and the UK. Highlights in 2018 include the opening of the first mobil.punkt in the City of Bergen on May 8th, which was inspired by the City of Bremen to adopt and expand Bremen's mobil.punkt strategy, and a three-year extension of the project granted by the NSRP Steering Committee in December.

The opening of the mobilpunkt in Bergen on May 7th attracted local, national and international media attention as it was the first of nine mobil.punkte currently in planning in Bergen to go into operation.

This has continued to inspire the mobihub movement in Flanders and the Netherlands, which began in earnest in 2017 and spurred ideas for possible expansion and implementation in the UK.

Other highlights in 2018 include the publication of the "Analysis of the Impact of Car-Sharing in Bremen", a study of the mobility and consumer behaviour of car-sharing users in Bremen. The results are transferable to other cities with station-based car-sharing and provided valuable insights for organisations keen to communicate the positive impacts of car-sharing on car-ownership in cities as well as environmentally friendly travel behaviour.

In communication activities, the "Shared Mobility Rocks" event in Aalst, Belgium was a definite highlight. The conference was all about the impacts and benefits of shared mobility but gave a modern, fun twist to an expert conference that will be remembered by all participants. At the event, the Green Deal Shared Mobility in Flanders was increased to more than 100 signatories and inspired the idea to begin working on an international/European Green Deal on Shared Mobility. Internal project communication was bolstered by all partners' involvement in the now annual summer academy in August.

The extension granted in December expands the partnership to 11 from 10 with the addition of a UK beneficiary. The project partners plan to work with this new partner to take the mobil.punkt concept into the UK. With the extension, the project timeline and budget have been doubled and they encompass new activities, deliverables, and revised output and result indicator targets.

SEEV4-City (**S**mart, clean **E**nergy and **E**lectric **V**ehicles **4** the **City**) is a project whose partnership consists of 11 public authorities, institutions of higher learning, and companies from Belgium, the Netherlands, Norway, and the UK. Together they are demonstrating smart electric mobility solutions, integrating renewable-energy sources, and encouraging take-up of both in cities. The main highlight of 2018 was the June launch of the 3-megawatt energy storage system in Johan Cruijff ArenA, which is one of the project pilots. This innovative system is the largest European energy storage system using second-life and new electric vehicle batteries in a commercial building, and it plays an important role in balancing supply and demand of energy in the arena. Other activities during 2018 included a mid-term policy-oriented conference in Paris entitled 'Electromobility in practice - solutions experiences & lessons learnt' and another mid-term event in Genk, Belgium entitled 'A debate about the future of V2G and Smart Charging.' In addition, here are some highlights of progress made on a few of the other pilots:

- Loughborough: First results show that smart charging improves project KPIs. It shows that a combination of profitable services would make the most economically rewarding solution to the V4ES business model. Work to get a V2G unit is ongoing.
- Oslo: Different pricing models being tested on a pilot that has been running since the start of the project.
- Kortrijk: Because of load patterns smart charging did not add much to KPIs. Now working on a static battery for delivery to grid and more impact on KPIs.

- Amsterdam City: Flexpower 1 with static smart charging profile and 50 chargers finished by end of 2018.

SURFLOGH (Smart Urban Freight Logistics Hubs) is a project whose partnership consists of six beneficiaries from four North Sea region countries - The Netherlands, Belgium, Sweden and UK. Regional and local public authorities as well as an institution of higher education and research are focusing on the improvement of the role of logistic hubs in the structure of urban logistics. By investigating, evaluating and implementing different actions, techniques, organizational forms and logistic tools, the goal is to increase the efficiency of last mile logistics between hubs and to stimulate green transport solutions. The project had it´s kick-off in the beginning of 2018 and has started with its activities, including:

- organization of an innovation lab meeting, focusing on data collection and mapping of good flows.

- preparation work for the different pilots.

- opening of urban freight hub Groningen/ Eelde and microhubs that already serve more than 10 businesses (pilot).

- launching of last mile distribution with cargo bikes, which already serves businesses by delivering more than 40 packages every day (pilot).

- City of Groningen was appointed to host the International Cargo Bike Festival 2019.

- starting the development of a framework for business models for urban freight hubs (pilots = living labs).

- preparation for the official SURFLOGH starting conference that took place in November 2018.

Stronger Combined (SC, Combined Mobility in the rural public transport system to build sustainable rural public services in symbiosis with private mobility providers and citizens). The Stronger Combined partnership consists of 15 beneficiaries (including two local partnerships) from all seven member states in the North Sea region. The project wants to investigate the future role of public transport authorities regarding combined mobility in sparsely populated areas. By presenting open data infrastructure, validated service models and public-private mobility cooperation, the project want to stimulate the take-up and application of green transport solutions for personal transport. As a result of a shift from single-person private car trips to multiple-person shared vehicle trips, CO2 emissions are expected to be decreased. Stronger Combined was approved in December 2018 and the kick-off meeting will take place end of March 2019.

13. SMART, SUSTAINABLE AND INCLUSIVE GROWTH

Information and assessment of the programme contribution to achieving the Union strategy for smart, sustainable and inclusive growth.

This is a continuation of the text provided in the SFC under this heading.

#4.1.2 IWTS2.0 develops **pilot solutions to remove barriers** for selected waterways in GB, SE and NL, also using the simulators of Maritieme Academie Harlingen for research and testing. Waterwegen en Zeekanaal will assess these solutions from the perspective of a NSR managing authority.

ShareNorth: Establishment of shared mobility hubs in different NSR cities. Shared travel plans and support for nearly 300 businesses and employment centres, and digital tools facilitating shared mobility at business parks and enterprises. Handbook for cities to implement mobihubs and mobipunt websites First Mobihub Academy; a hands-on event about how to plan, implement and market mobihubs. 50+ local governments are now designing their own mobihubs. Bike-sharing schemes.

#4.1.3 Ensure that NSR services and routes link up to the major corridors being promoted by the European Union (TEN-T) IWTS2.0 (see also 4.1.2) focuses on the facilitation of transport on waterways with links to the main TEN-T corridors since a significant share of goods on the main corridors originates from or is bound for places outside the main links. Making complementary waterways more easily accessible for IWT transport will create sound business models to support shippers towards a modal shift.

#4.2.2 Continue to promote and prepare for the wider roll out of alternative fuels for privately owned vehicles. By Using advanced vehicle-to-grid (V2G) concepts, SEEV4-City creates flexibility in the energy flow between vehicles, renewable energy, and the power grid. This greatly advances energy demand/production peaks that tend to disrupt grid operations. Th project partnership launched a V2G system, a state-of-the-art energy storage system, a pilot with smart battery storage and flexible charging to shave load at peak times and a a smart grid system. The projects generation significant interest amongst industry players and policymakers and discusses charging and driving regulations with NSR national government bodies and exploring flexible grid capacity tariffs with NSR city administrations.

#4.2.3 Support other long-term solutions like changes to planning rules and practices to reduce travel need and promote healthier forms of mobility. Using intelligent transport services BITS aims to increase cycling use with 10% in NSR pilot regions by making cycling more attractive, safe, comfortable and efficient. The partnership creates a CycleDataHub, to bring together various cycling data in one virtual platform. The data helps to get a better insight in specific needs of cyclists to drastically improve cycling policies, anchor cycling in the broader mobility policies and share this data to be used for a multi modal future.

ArtForum raises awareness among public stakeholders and develops policy recommendations that enable local and regional authorities in the NSR to take advantage of the opportunities of automated road transport in order to support sustainable transport and territorial development goals as well as improve the quality of life in communities. The project carries small-scale pilots and research to build strategies and recommendations for transport and urban planning policy making throughout the NSR.

StrongerCombined investigates the future role of NSR public transport authorities regarding combined mobility in sparsely populated areas. Outputs include an open traffic data platform and transnationally validated service concepts for rural combined mobility. The project seeks to achieve a measurable long-term impact on rural living standards, mobility patterns and aggregated CO2 emissions.

13. SMART, SUSTAINABLE AND INCLUSIVE GROWTH

Information and assessment of the programme contribution to achieving the Union strategy for smart, sustainable and inclusive growth.

This is the detailed information for the annex.

The programme has identified key challenges and potentials to be addressed in the framework of European Territorial Cooperation (ETC) in the 2014-2020 programming period in its Cooperation Programme. They are broken down by priority and specific objectives. This set-up allows projects to address specific topics that are of relevance for the North Sea region (NSR) in the framework of ETC.

All in all, 60 projects have been selected so far and 83% of the funding has been allocated. There is a total of **28 specific challenges and potentials in the context of ETC** that were identified for the programme. In the following the contribution of the projects to tackle the key challenges in the NSR and to improve its potentials are listed. The overview follows the logical sequence of the programme's priorities and specific objectives (e.g. #2.1.2 stands for priority 2 and specific objective 1, challenge/opportunity 2).

NSR CHALLENGES AND OPPORTUNITIES ADDRESSED IN THE FRAMEWORK OF EUROPEAN TERRITORIAL COOPERATION

#1.1.1 To ensure **better knowledge exchange between knowledge institutions and businesses** the Inn2POWER consortium aims to expand the capacity for innovation and to improve access to the offshore wind industry for SMEs in the NSR. They are designing 4 transnational and SME focused MBA level course modules for this highly relevant NSR sector on: A) Operational Leadership, B) Innovation in Project Management, C) Creating Future, and D) Legal Issues in the Offshore Wind Sector.

#1.1.2 To **increase R&D expenditure especially in the private sector** the Create Converge is showcasing and demonstrating Virtual Reality/Augmented Reality potentials for NSR SMEs. It engages and work with NSR based SMEs and VR labs including testing a motion capturing smartsuit.

#1.1.3 There are a number of initiatives aiming to **increase the number of new commercial products and services developed by businesses** in the NSR. Living labs is a well-known method and the InnoQuarter project uses European festivals where innovators within the NSR can work on their product or service and go from idea to market launch very fast. So far 27 eager innovators from around the NSR applied and wanted a spot on a festival. 11 of them plugged in their innovation at festivals in the Netherlands and in Sweden. Every applicant was obligated to contribute to at least 1 of the 17 UN Sustainability Development Goals.

The Northern Connections project uses living labs as transnational market places where potential suppliers and innovation partners across different countries are matched to the challenges of a specific city/municipality/region. In November 2018 Syd Energi Danmark met with companies who presented their ideas, technologies or methodologies within the fields of Smart Home, Sensor Technology or More Green Behaviour and Steen & Strøm and Storebrand (infrastructure developer in Oslo) met with clean-tech companies to connect Northern European suppliers to participate in renewable technologies development projects in Oslo.

The Lean Landing project develops a 'Lean Start-up methodology' and so far, 232 SMEs are participating out of which 113 have already entered new NSR markets. The project's story has been covered by euronews: https://www.youtube.com/watch?v=GOeyPWqLNOY

The Inn2POWER project (see also 1.1.1) also addresses the NSR industry directly by developing a publicly available supply chain portal allowing offshore wind industry companies to advertise their services and expertise amongst a European audience and search the NSR industry supply chain for potential collaboration partners and future clients.

#1.2.1 Joint analysis of gaps in regional innovation capacity and development of methods to address them - Shine addresses barriers in transnational trade and implements integrated business models to tackle them. They have made an inventory, which is included in their report "Barriers to SME Transnational Trade in Europe – The Health Cure and Care Sector". The project promotes the use of the integrated business model in public-private partnerships and aims to stimulate spin-off activities for NSR healthcare institutions and their clients.

Right focuses on different equally important NSR sectors and aims to prepare the future work force in the energy and blue growth sector, to increase the innovation capacity of SMEs in those sectors. It looks into transnational innovation and skills gap, the need for common transnational pilots, and the need for upskilling. The project has just started its activities and there are no achievements yet.

#1.2.2 A number of projects is working on **long-term coordination around, for example, joint training offers, shared R&D infrastructure, etc**. One of the main outputs the GrowIn 4.0 project is the development of a portfolio of training tools to improve the quality of skills and knowledge in NSR

SMEs. The collection of developed and tested tools and methods will be available for all organisations involved in business

The project Right (see also #1.2.1) designs and tests tailored educational programmes and initiatives to bridge future skills gaps of businesses in the NSR energy and blue growth sector. These can be e.g online or face-to-face trainings, courses, or workshops.

The CORA project is setting up local workshops and online courses for citizens (i.e. internet, programming, and social media courses), for enterprises (i.e. e-commerce, website development, online sale, and e-advertisement) and for local authorities (i.e. planning, provision as well as promotion of e-services). They are also developing a transnational e-learning platform for rural digital inclusion and innovation.

The Lean Landing activities also needs to be mentioned – please see #1.1.3.

#1.2.3. There are a number of **initiatives cooperating to identify new innovation potentials outside existing innovation hotspots in the NSR**. Reframe has the ambition to re-connect regional food production with urban demand and to stimulate SMEs to innovate. Currently the project helps food related SMEs to find and develop smart specialization options and to cooperate in related networks.

The CUPIDO project brings players from different NSR sectors based in rural coastal areas together; incl. tourism, IT, cultural and natural heritage, education, and health. The sector crossover provides knowledge to support market introduction of new NSR businesses.

ProwadLINK engages with communities and businesses in the Wadden sea areas of the NSR. It works with branding in regional partnership programmes by co-branding; access to branding tools; enhanced brand visibility - linking nature values with culture/livelihood; developing emotional selling points; developing brand ownership methods and structures. The partnership also develops a transnational platform to enhance the targeted regional networks.

The CORA project (see also 1.2.2) develops a model with a comprehensive set of guiding measures towards digitalization in NSR rural areas. Digital hubs provide in-place advice, technology demonstration and incubator spaces. The partnership also provides related training to enhance digital skills in rural areas, building on e.g. train the trainer and online training (see #1.2.2). Results aim to improve level of digital inclusion and public digital skills, enhanced local authorities' awareness around new telecommunication technologies and solutions for advanced digital environments in rural areas.

The FBD project develops a framework to access information of innovation hubs that somehow gets lost on its way to NSR SMEs at the end of the global value chain. The partners create 6 regional add-ons to existing hubs and 1 transnational digital hub for scanning and knowledge transfer to provide NSR SMEs access to data, data-based processes and data analytics methodologies.

#1.3.1 Share knowledge on how services are delivered and how innovation can improve this through, for example, increased digitalisation

The Like! project addresses shared NSR challenges in the development and delivery of next generation public services. It delivers a range of skills, tools, techniques, and pilots that show how authorities across the NSR can address their shared challenges, and then implement change to deliver new and innovative public services more easily. A concrete example is the development of a track & trace service pilot for driver's license and passport, offering a new service to citizens to look up information themselves without having to contact the municipality.

BLING brings together a unique combination of public authorities, knowledge institutions and SMEs to develop and deploy blockchain-enabled public services focusing on identity, direct democracy, and customer services. It provides guides to demystify and de-risk blockchain technologies by explaining the benefit for citizens, SMEs and communities across the NSR.

The SCORE project works around potential public challenges that could be addressed by re-using data that is already available. The NSR related challenges range from giving citizens and businesses better and earlier warnings about floods, to providing people with more information about how to avoid traffic during big events in their area.

#1.3.2 In order to **analyse the need for new products and services to address shared challenges such as the ageing population, movement to urban areas, the need for greater efficiency etc**. the SCORE project (see #1.3.1) tests solutions for NSR real-time monitoring for groundwater and rainfall to better understand and predict floods, to see how 'busy' a town is by combining real-time data of crowds on squares, train stations, roads, and shared bike infrastructure, and develops a map with all e.g. sensors, cameras and beacons in a city to understand which data is being collected where, who owns and maintains the devices, and how they or their data could potentially be shared.

CUPIDO (see #1.2.3) forwards art, dance, music as well as cultural heritage as a driver in local & regional development policies to develop new business opportunities in the cultural and cultural heritage sector around the NSR, to reinforce the local rural communities with a declining population.

InForCare is dedicated to volunteering/informal care. In a first step young NSR carers were invited to find out about their views, needs and demands. Looking into the needs of NSR employers the project identified the need for flexibility of policies and regulations, the need of wider sharing of instruments regarding informal care HR policies, and the need for support of SMEs, which are more vulnerable for sick leave.

#1.3.3 Support collaboration on how to stimulate businesses to deliver innovative solutions that can reduce the burden on public services

InForCare (see 1.3.2) identified failures/lacks innovation in health and care and healthcare projects, products and concepts within an actual house. This created an understanding for businesses of the need, but also the social impact of new technologies.

#2.1.1 Pilots to identify resource savings through innovative industrial design and manufacturing processes

The NSR building sector is not creating the necessary production facilities for creating energy neutral houses and so far, the process is too expensive. Which is why the project INDU-ZERO aims to industrialize sustainable housing in an innovative way by focusing on a blueprint for an innovative factory.

The DUAL Ports runs 15 pilots demonstrating green port concepts. In 2018 e.g. innovative LED lighting was installed, with 80% carbon savings; savings of €240,000 were achieved through resource sharing; a pilot recycling demolition waste, fly ash and slag for port construction inspired several similar schemes in the region. The project indicates that pilot investments are beneficial. DUAL Ports has been showcased on Danish TV - https://www.tv2east.dk/nyheder/03-11-2016/1930/baeredygtigt-havneprojekt-i-vordingborg?autoplay=1#player - and at international events.

#2.1.2 One of the **pilots to experiment with new uses of renewable and locally sourced materials** is the BIOCAS project bicycle bridge made of flax and resin. 80% of the materials used is natural and it has not been used before on such a big scale.

The OESA project has just been launched and is planning 5 pilots to increase the installed ocean energy capacity with 30% and reduce 100.000 tonnes CO2 emission.

#2.1.3 Increased recycling of non-renewable materials supported by improved lifecycle design

ProCirc establishes new circular economy practices in the NSR through long term collaboration of transnational Communities of Practice. Each pilot aims to reduce 20-25% raw materials, waste and CO2 emissions.

Decom tools covers all relevant steps to find ways of decommissioning and certifying the operational lifetime of offshore wind turbines across the North Sea Region. Repowering is also an integral component. It pilots the dismantling of a small wind farm and recycling of wind turbines blades to a valuable end-product

#2.1.4 A number of activities are taking place to **raise awareness of greening methods and results.** The SCALE-UP collaborations between SMEs and large enterprises have so far created 12 new sustainable products.

SalFar spearheads saline farming as a new opportunity for coastal farming. So far 15 products and recipes with salt-tolerant crops demonstrate ways to reduce freshwater consumption. The project has put saline farming on the policy agenda of the Dutch Province of Fryslân and presented the concepts to the Minster for Federal and European Affairs and Regional Development of Lower Saxony and former UN General Secretary Ban Ki-Moon.

SOILCOM carries out research and demonstration trial and informs growers about advantages of a good quality compost as crop health, resilience against diseases, decreasing water use, fertilizers and

pesticides for the benefit of the environment. Demonstration days, field days, trips and workshops for relevant NSR stakeholders are organised.

Carbon Farming currently identifies relevant criteria for carbon sequestration business models to be used to raise awareness of NSR stakeholders and governments.

Empower 2.0 addresses energy transition in the NSR and the role of prosumers. 14 living labs for students, policy makers and market stakeholders demonstrate possibilities for citizen prosumership and behaviour change through participation.

#2.2.1 OESA **identifies viable opportunities for installing additional renewables infrastructure** by realising a transnational Pilot Accelerator Programme. The partners develop new services to support accelerated deployment of ocean energy parks in NSR. Despite the enormous potential of ocean energy, the sector is struggling to efficiently scale up. This is caused by the lack of transnational collaboration within the sector and limited engagement of relevant stakeholder groups.

#2.2.2. At the same time the project runs 5 **pilot installation of newer renewable technologies such as wave power and blue energy -** see #2.1.2.

#2.2.3 Access demonstrates the **application of smart grid technologies as a way of saving energy and integrating more renewable power in the energy mix** by implementing innovative smart grid pilots to adopt innovative energy technologies and services to the NSR, facilitating 25% CO2 emissions reduction and optimised energy consumption.

#2.2.4 Reduce overall energy use by changing behaviour and increasing take-up of energy saving technologies

2IMPRESZ empowers school children at 141 schools in the NSR in reaching 30% energy savings and reducing CO2 by 7,320 tonnes. The school kids are 'agents of change' and involved in all core activities as energy audits and assessments and designing a plan for improvements. Each school nominates 'Energisers' and more than 20,000 NSR students participated in 2018 alone.

Empower creates local energy communities in the NSR via existing civil society structures by looking into new organisational solutions and adoption of solutions for energy ownership to increase the uptake of renewable energy by households. See also #2.2.1.

COBEN continues its dialogue with DG Energy, the European Economic and Social Committee and the Committee of the Regions to establish the NSR as a level playing field between centralized corporate energy and local energy initiatives.

SmartGreen demonstrates new lighting technologies, innovative climate regulation strategies and possibilities for implementation of renewable energy sources. More than 850 relevant stakeholders visited the project's NSR greenhouse trials so far.

#3.1.1 Exchange of knowledge on the latest flood defence construction techniques targeting especially 'build with nature' methods

FAIR is sharing approaches of more resilient, multi-functional and adaptive approaches to NSR flood defence infrastructure. Asset owners and experts work closely on next generation of asset management and investment planning methods to increase the number of functions compared to current mono functions, reduction of life cycle costs and increase in the lifespan.

Build with Nature is using natural processes to keep the NSR safe against coastal erosion and flooding. The project demonstrates climate change solutions at 7 coastal target sites aiming at 700 km of coastline plans using BwN methods. The project won the NSR video award 2018: https://youtu.be/ppefJGRIdNM

TopSoil improves tools and methods to map ground water flows such as rising groundwater tables, caused by changing precipitation patterns in the NSR to improve water quality by 20% on average for the 16 project pilots.

The project Cluster for Cloud to Coast Climate Change Adaptation has just been launched to deliver a from 'Cloud-to-Coast' systems approach to the management of flood risk. Results will build on outcomes of seven ongoing Interreg NSR projects.

#3.1.2 Improved environmental and catchment management to improve the flood resilience of NSR landscapes

TopSoil (see also #3.1.1) develops a range of advanced scientific tools and methods to map groundwater flows and topsoil layers that will deliver 3 dimensional maps, models and quantified scenarios to improve buffer capacity by 20% on average for the 16 project pilots.

Build with Nature (see also #3.1.1) demonstrates climate change solutions at 6 NSR catchment sites in living laboratories. The aim is 550 km of new NSR catchment areas managed using shared BwN techniques.

CANAPE restores NSR wetland areas to reduce their CO2 emissions and improve their capacity to store water to improve protection from floods and is aiming to develop the markets for products produced from wetland ecosystems. The aims are to capture 1.640 tons of CO2-eq/year and a reduction in flood risk of 228.600 cubic meters of water per year based on its pilot sites.

The WaterCog transnational partnership is piloting at one of Denmark's largest watercourses which is challenged by lack of good ecological status and flooding of farmland. The pilot develops a holistic solution to ensure a more optimal resource allocation and create a synergy effect between the various interests by working with uphill thinking and increased local involvement.

#3.1.3 Exchange of knowledge and demonstrations of new urban planning and infrastructure approaches to improve resilience

Begin carries out a transnational city-to-city learning programme, gathering NSR cities in groups with similar needs, supported by specialised scientific partners. Begin supports the implementation of Blue Green Infrastructure and development of business cases to improve resilience.

CATCH redesigns urban water management of midsize NSR cities to become climate resilient. A first version of the joint developed decision support tool and roadmap has been released. Pilots are dealing with urban future planning as for example a creek to catch rainwater from the surrounding areas and to decouple rainwater from the sewage system.

FRAMES focus on different pilots in five different member states, in the following categories: catchment management, applying multi-layer-safety (MLS) to critical health and social care facilities, vital infrastructure, recovery after severe flooding, MLS in areas without conventional flood protection, contingency exercises and planning.

#3.2.1 Develop and implement long-term strategies for sustainable management of North Sea landscapes and the North Sea itself

Jomopans implements in close co-operation between North Sea countries a strategy for monitoring ambient noise. Sound maps of the North Sea will be the result to display the spatial and temporal distribution of ambient sound. Field measurements at 14 locations were co-ordinated in 2018. The project also provides tools for policy makers to develop programmes to manage underwater noise.

GEANS promotes the shift from morphological species identification to harmonized genetic tools to reduce conflicts and create synergies and improve the environmental health assessment, as demanded by different EU directives. A set of pilot studies are carried out to implement genetic approaches into existing environmental assessment and management. A decision support framework facilitates the implementation by all competent NSR authorities.

NSW implements a common approach for facing challenges caused by existing ship and aircraft wrecks, lost cargo and munitions to improve the NSR ecosystem. There is a lack of a co-operation and only fragmented action at national level exist.

IMMERSE implements management measures for NSR estuaries, considering existing barriers and governance structures. Transnational exchange labs start in June 2019. 7 tests, pilots and feasibility studies focus on on tidal intrusion, stabilisation of contaminated material, river engineering measures and the creation of intertidal habitat.

#3.2.2 Several projects are **developing and testing new methods and technologies for tackling environmental problems.** Sullied Sediments develops tools to prevent further watch list (WL) chemicals from entering NSR waterways. It covers nine sites across the North Sea Region and three sediment sampling events took place as well.

NuReDrain develops new filter materials to trap nitrogen (N) and phosphorus (P) to improve the NSR water quality. Testing suitable filter materials 59 to 92% of P and 30 to 73% of N were removed from drainage water and saturated filter materials are intended to be reused as fertilizers.

GEANS (also see 3.1.1) new approach based on the DNA methodology aims to increase time-efficiency by 60% and cost reduction by 40%.

CANAPE (see also 3.1.2) has initiated construction work as 2 NSR moor sites: Lille Vildmose, DK and Hickling Broad, UK. Preparations take place in De Nol, BE and Barver Moor, DE. De Nol carried out a radar survey by Euro-Radar, to design clay screen to raise water levels.

Partridge showcases new and improved solutions to increase NSR farmland biodiversity and key NSR ecosystem services by 30%. The partnership establishes 10 demonstration and 10 reference sites for novel and improved high-quality habitats. The number of high-quality habitats is now above the required 7% and further habitat improvements are to be implemented.

TopSoil (see also #3.1.2) examines variations in soil capacity to store and break down nutrients to manage contaminated land in the NSR, like landfills

#3.2.3 A number of projects **use participatory processes to win stakeholder support for environmental measures including promoting understanding of ecosystem services.** One of the examples is WaterCoG where farmers are provided with a little electrode and a smartphone app to measure salt concentration in water. They become more aware of how salty the water really is. The measurement results are collected in a NSR crowd monitoring database and can be viewed by other NSR farmers. Based on the collected data, they can better decide on how to better use and transport water for farming.

TopSoil (see also 3.2.2) develops new cooperation frameworks with NSR farmers to improve protection of groundwater and reduce run-offs from fields

Sullied Sediments (see also #3.2.2.) aims is to change citizen behaviour regarding the use of common watch list chemicals through a c communications campaign and coordinated field sampling programme using volunteers across the NSR. A dipstick developed for this purpose to detect phosphates were piloted with volunteers in December 2018. The media-wide citizen engagement and volunteer campaign are planned for spring 2019.

BEGIN (See also 3.1.3) initiated the Ghent Summer School in 2018. Participants designed green axes, which are the connecting elements within a city-wide green climate robustness structure.

The Norwich CATCH pilot involves inhabitants who are asked to help reduce the risk of flooding in parts of Norwich with free water butts or rainwater planters, to reduce the risk of flooding by slowing the flow of rainfall into sewers.

Build with Nature (see also 3.1.2) tries and tests business case guidance via 10 quick scan business cases.

Partridge (see also 3.2.2) has held 102 demonstration site farm walks across the NSR to show-case best practise management measures, exchange knowledge and directly engage with more than 1300 stakeholders from residents to Environment Ministers. Document sharing continues for a science-based booklet explaining the benefits of the management measures used to a wide NSR audience from citizen to politician by mid-2019.

In the FRAMES pilot in Belgium actions for a climate-adaptive neighbourhood are explored by gathering citizens, the city administration and other local stakeholder to discuss actions on multi-layered water safety. This should lead to an NSR neighbourhood that is resilient both for flooding and droughts. Another pilot carried out workshops on multi-layered water safety in primary schools to raise children's awareness on flooding.

#4.1.1 Identify viable multimodal routes and goods flows, and the barriers to wider use of these routes IWTS2.0 identifies solutions for waterway bottlenecks and their impact on modal shifts from road to water. SSPA Sweden, University of Hull and Canal and River Trust perform freight flow mapping on various NSR waterways and identify potential solutions for this hinderances. A full mission simulator is used for manoeuvring assessments. Canal and River Trust, Provincie Fryslan, Waterwegen en Zeekanaal and Gemeente Smallingerlan asses the output from NSR managing authority perspectives.

Surflogh stimulates a more efficient cargo distribution in urban areas, and thereby maintain efficiency in long distance transport. Focus is on optimizating the interaction between hubs and urban logistics systems in smaller and medium-sized cities and city networks. By establishing city labs, a transnational platform is created, bringing various actors together to exchange knowledge, work on new pilot projects.

If we consider switch from cycle to car, bus to train, ride-share to bus, etc. multimodal then SHARE-North's mobile hubs are a perfect example. The project has identified congestion and lack of awareness as barriers to smooth traffic flows within cities, and use of care-sharing, ridesharing and bike-sharing as viable ways to transport people and reduce CO2 emissions.

#4.1.2 IWTS2.0 (see also 4.1.1) develops **pilot solutions to remove barriers** for selected waterways in GB, SE and NL, also using the simulators of Maritieme Academie Harlingen for research and testing. Waterwegen en Zeekanaal will assess these solutions from the perspective of a NSR managing authority.

Surflogh (see also 4.1.1) pilots: Urban Freight Hub to explore innovative city distribution concepts. Microhub serving 10+ businesses. Sustainable inner-city distribution model to develop hubs and last-mile delivery concepts in a NSR city centre. Last-mile-distribution pilot including cargo bikes. The cargo bikes currently serve business by delivering 40+ packages every day. City distribution to test cargo solutions for small parcels.

ShareNorth (see also 4.1.1): Establishment of shared mobility hubs in different NSR cities. Shared travel plans and support for nearly 300 businesses and employment centres, and digital tools

facilitating shared mobility at business parks and enterprises. Handbook for cities to implement mobihubs and mobipunt websites First Mobihub Academy; a hands-on event about how to plan, implement and market mobihubs. 50+ local governments are now designing their own mobihubs. Bike-sharing schemes.

#4.1.3 Ensure that NSR services and routes link up to the major corridors being promoted by the European Union (TEN-T) IWTS2.0 (see also 4.1.2) focuses on the facilitation of transport on waterways with links to the main TEN-T corridors since a significant share of goods on the main corridors originates from or is bound for places outside the main links. Making complementary waterways more easily accessible for IWT transport will create sound business models to support shippers towards a modal shift.

#4.1.4 IWTS 2.0 (see also 4.1.3) **supports the development of improved logistics solutions** by developing a smaller, adaptable CO2 neutral barge concept, including construction planning, installation requirements for alternative fuels (battery), and a concept for possibilities to use it. Development of 2 smaller dedicated, self-propelled IWT vessels, including alternative propulsion system, and autonomous sailing.

#4.2.1 Demonstrate the potential of immediately available solutions such as car-sharing, multi-use vehicles, and non-conventional fuels for urban public transport and freight distribution systems. ShareNorth (see also 4.1.2) promotes car-sharing as a part of national initiatives about Green Deals on Shared Mobility, through presentations at conferences, additional research and cooperation. It also promotes via a subsidy project to attract investment to roll-out a car sharing scheme to increase regional car sharing, bringing carsharing closer to citizens via mobihubs/mobil.punkte, digital tools for businesses and employees, events as the mobipunt academies, and webinars for policy makers and a broad audience.

HyTrEc2 uses solar energy to produce green hydrogen. Discussions are ongoing for investing in off-site production of green hydrogen to be distributed at a Hydrogen Refuelling Stations, to fuel hydrogen buses. Procurement is ongoing to develop green hydrogen production.

#4.2.2 Continue to promote and prepare for the wider roll out of alternative fuels for privately owned vehicles. By Using advanced vehicle-to-grid (V2G) concepts, SEEV4-City creates flexibility in the energy flow between vehicles, renewable energy, and the power grid. This greatly advances energy demand/production peaks that tend to disrupt grid operations. Th project partnership launched a V2G system, a state-of-the-art energy storage system, a pilot with smart battery storage and flexible charging to shave load at peak times and a a smart grid system. The projects generation significant interest amongst industry players and policymakers and discusses charging and driving regulations with NSR national government bodies and exploring flexible grid capacity tariffs with NSR city administrations.

#4.2.3 Support other long-term solutions like changes to planning rules and practices to reduce travel need and promote healthier forms of mobility. Using intelligent transport services BITS aims to increase cycling use with 10% in NSR pilot regions by making cycling more attractive, safe,

comfortable and efficient. The partnership creates a CycleDataHub, to bring together various cycling data in one virtual platform. The data helps to get a better insight in specific needs of cyclists to drastically improve cycling policies, anchor cycling in the broader mobility policies and share this data to be used for a multi modal future.

ArtForum raises awareness among public stakeholders and develops policy recommendations that enable local and regional authorities in the NSR to take advantage of the opportunities of automated road transport in order to support sustainable transport and territorial development goals as well as improve the quality of life in communities. The project carries small-scale pilots and research to build strategies and recommendations for transport and urban planning policy making throughout the NSR.

StrongerCombined investigates the future role of NSR public transport authorities regarding combined mobility in sparsely populated areas. Outputs include an open traffic data platform and transnationally validated service concepts for rural combined mobility. The project seeks to achieve a measurable long-term impact on rural living standards, mobility patterns and aggregated CO2 emissions.

MOVE develops and disseminates innovative, environmentally sustainable and economically viable mobility initiatives through multidisciplinary co-creation. It brings together local authorities, knowledge centres, local economic players and inhabitants. MOVE will use local specificities to create practical solutions in 4 pilots based on unlikely combinations, with tangible business plans, to be implemented, tested and evaluated. The partnership offers solutions to increase accessibility, reduce individual cars use, emissions and costs throughout the NSR.

G-PaTRA builds the capacity of authorities to integrate low-emission vehicles in rural transport systems and make smarter use of existing resources. The partnership launched a dial-a-bus scheme trial, established a “youth bus” ride offer, launched shared mobility hubs across the region and rolled out the Quality Neighbourhoods campaign where citizens spend a month to test alternatives to private cars.