DELIVERABLE 5.2

STAKEHOLDER INTERACTIONS AND ENGAGEMENT IN PILOTS

Work Package 5
Stakeholder engagement

version 3

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ACRONYMS

BPNS	Belgian Part of the North Sea
BE	Belgium
DSS	Decision Support System
DE	Germany
DK	Denmark
DIN	Dissolved Inorganic Nitrogen
EU	European Union
EIA	Environmental Impact Assessment
GR	Greece
IMTA	Integrated Multi Trophic Aquaculture
MU	Multi-Use
MSP	Maritime Spatial Planning
NL	Netherlands
OWF	Offshore wind farms
SEA	Strategic Environmental Assessment
WP	Work Package

EXECUTIVE SUMMARY

Introduction

Ocean multi-use can potentially contribute to a more sustainable and efficient use of ocean resources and provide tangible environmental benefits, among other. UNITED project promotes the ocean multi-use through the installation of real-world demonstration pilots exploring, among other, environmental requirements and impacts.

This deliverable reflects the status of the UNITED project pilots regarding stakeholder engagement in the pilots' development and operations.

Methodology

The report aims to provide an **overview of stakeholder engagement in each of the pilots as well as in the UNITED project as a whole.** The information is collected based on the pilot background, desk research, and discussion with those involved in pilots' implementation and leading engagement activities in the project. The report records the stakeholder engagement that took place to date and provides the outlook for the future. Lessons learned that were collected throughout the engagement process are highlighted in the report and are meant to support future stakeholder engagement endeavours in the project and beyond.

The report **highlights the tools and methods used for the engagement**, what worked in what setting and in relation to different engagement cultures. The UNITED pilots also have different engagement needs, some are more advanced in terms of the pre-engagement than others, thus this is also reflected in the report.

The review focuses on **five specific ocean multi-use pilots** which are to be developed and demonstrated in the UNITED project:

1. Offshore wind, blue mussels and seaweed (Germany)
2. Offshore wind, solar and seaweed (Netherlands)
3. Offshore wind, flat oyster aquaculture & restoration, & seaweed cultivation (Belgium)
4. Offshore wind and tourism (Denmark)
5. Aquaculture and tourism (Greece)

The report is structured in a way that **for each of the five pilots, the following aspects are presented**:

- Baseline stakeholder ecosystem account in the pilot site
  - Engagement rational
  - Existing connections
  - Existing issues
- Socially responsible mission of the pilot
- General overview of regulatory requirements for the stakeholder engagement / public hearing for the given pilot
- Overview of the current engagement results and tools and methods used
  - Who was engaged
  - How
  - Tool & methods - what worked well and what not
- Recommendations for the pilot
- Conclusions

Main results

The review has shown that **most of the UNITED pilots already have a solid stakeholder environment. …**

Recommendations based on this study may be transferable between the DE, BE and NL pilots as these combine wind and seaweed multi-use. However, as the DE pilot represents a far remote, high wind and high wave environment, these unique DE-pilot recommendations might only be partially of interest for the more near-shore pilots in BE and NL and vice versa. Yet, each pilot delivers valuable insights into different environments, that are of high interest for future more remote or closer to shore off-shore projects.

While the **Netherlands has the community of practice, and a multi-use procedure** for applying for the offshore wind multi-use permit, similar practices have not been identified in other countries[1]. It is thus relevant to assess for what types of offshore wind multi-uses this procedure may be (partially) applicable and in which countries such practice could be replicated.

Next steps and input to other research pillars of UNITED

The Assessment Framework will be applied in the five pilots where more specific information will be collected for each of the pilots and effects will be assessed.

Engagement is ongoing – workshops flyer and more intensive local engagement for the development of the commercialisation roadmap and blueprint.

Nevertheless, the report may also provide thought-provoking insights to other readers including policy developers and regulators, as well as wider industry and research community.

1. INTRODUCTION

The UNITED project aims to provide evidence for the viability of ocean multi-use through the development of five demonstration pilots in the marine environment. As such, it will address current challenges for the employment of multi-use across five key pillars:

1. technological,
2. economic,
3. societal;
4. legal/policy/governance; and
5. environmental.

The careful combination of different maritime uses may lead to a positive or negative socio-economic impact and/or added socio-economic benefits and/or costs when compared to a situation where each maritime use is conducted independently[2]. Moreover, any development in the coastal and maritime domain may cause local unacceptance, risks or perceptions and worries about the possible impacts. Therefore, a timely communication and ecosystem building and empowerment is crucial.

The Social pillar of UNITED project will address current gaps in know-how on **how to engage stakeholders in** ocean multi-use, both at the local and at a broader ecosystem level.

This report presents the results of a first step in addressing the social pillar. It aims to provide a **review of the current status of pilots**, **as well as future outlooks and capacities.**

The review focuses on **five specific ocean multi-use pilots** which are to be developed and demonstrated in the UNITED project:

1. Offshore wind, blue mussels and seaweed (Germany)
2. Offshore wind, solar and seaweed (Netherlands)
3. Offshore wind, flat oyster aquaculture & restoration, & seaweed cultivation (Belgium)

[1] More about the Dutch Multi-Use procedure available at: https://www.noordzeeboerderij.nl/en/projects/multi-use-procedure

[2] Angela Schultz-Zehden, Ivana Lukic, Joseph Onwona Ansong, Susanne Altvater, Rebecca Bamlett, et al. (2018). Ocean Multi-Use Action Plan, MUSES project. Edinburgh.

4. Offshore wind and tourism (Denmark)
5. Aquaculture and tourism (Greece)

Deliverable 5.2 summarizes the work conducted under the task 5.2. This task aims to support the implementation of a stakeholder engagement process in each of the pilots, following the guidance developed under T5.1. The support to stakeholder engagement in the pilots includes the stakeholder identification and mapping, the analysis of which stakeholders are relevant to include at which step of each pilot, and the understanding of stakeholder needs, in relation to knowledge transfer and commercialization purposes. This understanding brings support to T5.3 in the organization of training workshops for stakeholder engagement, taking place in parallel. All the stakeholder engagement processes are being monitored and will be evaluated within T5.4, and T5.5 will draw recommendations on approaches to shape the participation of stakeholders in the design of multiuse platforms.

It is also relevant to note that the COVID 19 and associated restrictions across the EU have significantly affected the project. Namely, due to the travel and gathering restrictions in person meetings, interviews, workshops and other forms of engagements were not possible for the biggest part of the project. Moreover, reaching the relevant stakeholders was also not as easy as the only means of communication the project could rely on was the email and telephone. Finding stakeholders where they are e.g. at conferences and other events was not possible for the large part of the project. Nevertheless, partners managed to onboard a variety of online tools to support in reaching out and engaging the target audiences. For example, a series of online workshops, knowledge and tech transfer sessions and webinars were held and a variety of involvement tools such as Miro and Slido have been sued in order to allow for the effective exchange. Many of the pilots were also able to hold in person demonstration sessions and outreach campaigns in the persons when the pandemic restrictions were not in effect. Others have found creative ways to engage with the public during their on-land activities e.g. during the preparation of the material, tests, etc. The UNITED partnership feels well equipped to take on the stakeholder engagement further in the coming final months of the project in a hope that more in person engagement will be possible and fruitful for the project and its pilots.

2. LINK WITH OTHER WORK PACKAGES

WP1: Blueprints

The task 1.1 has conducted the initial scoping in terms of the stakeholders engagement needs in the project. The summary of the engagement needs as expressed in the questionary undertaken in March are available in the Deliverable D1.1. Identification of key stakeholders is of relevance to the WP 1 especially with regard to the shaping of the multi-use blueprints and business models meant to provide relevant information to the key target groups of UNITED.

WP3: Economics

Work Package 3 of UNITED addresses the 'Economics of Multi-use Platforms'. This WP supports the assessment of multi-use combinations by providing and applying a multi-method economic assessment framework. This includes an assessment of the costs and benefits of multiuse as compared with single use alternatives. The outcomes of the assessment framework can advise future decisions regarding multi-use of the different pilots. The work in WP5 is crucial for the understanding of the economics of multi-use and the identification of relevant indicators to measure changes in associated ecosystem services that affect human wellbeing. The stakeholders have been engaged in the form of interviews and workshops in each of the pilot sites in order to collect the information for the business cases, economic analysis as well as to validate the findings. While the in-person workshop mode was preferred, a hybrid and full online was also practiced in order to gather a larger number of stakeholders and accommodate for the preferences of those reluctant to travel due to the health or sustainability reasons.

WP7: Pilots implementation

The identification and engagement of stakeholder is of particular importance for the proposer implementation of pilots. The active stakeholder engagement ensures that the key target groups of stakeholders are empowered,

while the established collaborations not only improve capacities of those involved but also provide a base for knowledge and technology transfer and uptake of pilot results.

WP8: Assessment and validation

The UNITED Assessment Framework (UAF) was developed under WP8, as a tool for assessment of the impacts of multi-use projects in the marine space, against alternative scenarios, including no-use and single uses. As such, the UNITED Assessment Framework could demonstrate the added value of multi-use projects in comparison with alternative uses. To do this, the perceived concerns of multi-use projects will be assessed through different assessment criteria, after which the outcomes will be compared with the outcomes of the assessments of alternative scenarios.The concerns of the different scenarios are approached around the five pillars of the UNITED project. Each of these pillars will apply different tools and assessment criteria in the scope for concerns and assessment of impacts, allowing flexibility for each pillar. However, the key steps that are followed will be the same for all pillars and these steps form the backbone of the UNITED Assessment Framework.

Schematically, the UNITED Assessment Framework looks as in Figure 1.

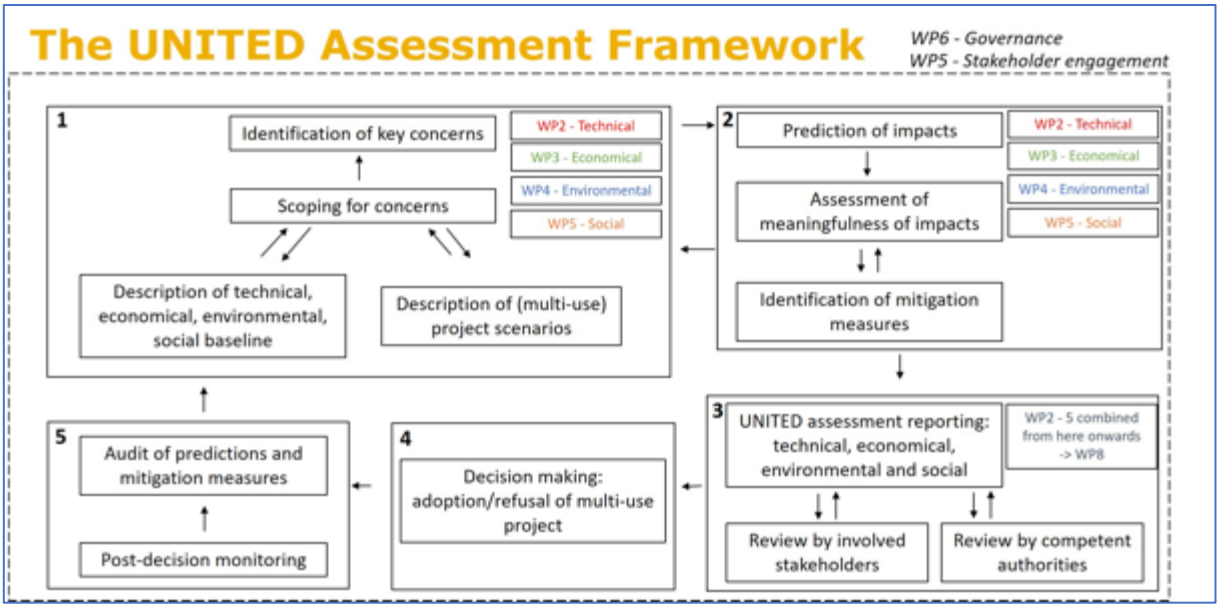

Figure 1 UNITED Assessment Framework

The first step (Early Stages, Box 1) for each pillar starts with a description of the baseline situation and of the proposed multi-use project; be it from a technical, economical, regulatory, environmental or societal perspective. Based on these descriptions, a scope for concerns is conducted, followed by the identification of key concerns. These are those concerns that are considered priority issues for further processing during the Prediction Stages. In the Prediction Stages (Box 2), the impacts related to the key concerns, are predicted and the meaningfulness of these impacts is assessed. Comparison between the alternative scenarios enables to inform on the added value of multi-use. If relevant, also mitigation measures are identified to deal with undesirable impacts of the preferred scenario.

For each pillar, different tools are applied, such as life-cycle analysis, cost-benefit analysis and environmental impact analysis, to identify the concerns and predict the impacts. Regarding the social pillar, the social impacts of the pilots are identified by various stakeholders during a participatory session, after validation by the same group of stakeholders of the results of the cost-benefit analysis (economic pillar) within an overarching socioeconomic workshop.

The next step consists of reporting the outcomes of the different analyses and reviewing these by the competent authorities (Reporting Stages, Box 3). Based on this, the optimal scenario is chosen (Decision Stage, Box 4). When adopted, a monitoring scheme is implemented to audit the predictions and mitigation measures proposed during

the assessment (Monitoring Stages, Box 5). Governance and stakeholder engagement (may) encompass all steps of the UNITED Assessment Framework.

WP9: Communication

The collaboration between the WP5 and WP9 takes place throughout the project in order to adapt the communication, dissemination and exploitation activities to the stakeholder profiles their needs, awareness levels and mitigate possible issues that may arise in terms of the pilots' implementation. The WP9 provides the technical support in the organisation of all the in-person and online meetings, pre-and-post event promotion, outreach and reporting as well as in the moderation of events. The WP9 ensures that the communication material used during the engagement process is suitable to the given audience thus ensuring that the planned impact is achieved. The WP9 identifies the most relevant events, networks and, multipliers where the key stakeholders can be identified reached. The tools and methods used at the events both in person and online are well planned to ensure that the event is engaging, providing not only the knowledge and technology transfer exchange platform but also a space for networking and informal exchange and awareness raising.

3. METHODOLOGY

3.1. General Approach

The report aims to provide an **overview of stakeholder engagement in each of the pilots as well as in the UNITED project as a whole.** The information is collected based on the pilot background, desk research, and discussion with those involved in pilots' implementation and leading on the engagement activities in the project. The report records the stakeholder engagement that took place to date and provides the outlook for the future. Lessons learned that were collected throughout the engagement process are highlighted in the report and are meant to support future stakeholder engagement endeavours in the project and beyond.

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  - Who was engaged
  - How: Tool & methods
  - Lessons learned: what worked well and what not
- Recommendations for the pilot

- Engagement in the project as a whole
    - Workshops and interactive sessions
    - Interviews
    - Results of the survey and link with Task 5.4
- Conclusions

3.2. Stakeholder Engagement Training

Several internal stakeholder engagement training sessions have taken place to bring the partners to the same level of understanding and capacity for the engagement actions ahead.

A set of dedicated guiding sessions for running the workshop, interviews and survey communication took place as presented in the line-up below:

Step 1: February 2021 (General Assembly)

A 1h30 general introduction to participative approaches was delivered to the consortium during its first General Assembly. The session aimed to raise awareness about stakeholder engagement, stabilize the vocabulary we use to communicate internally and externally on this topic, introduce the tools developed for UNITED internal use (stakeholder register, glossary) and the role of the stakeholder interlocutors, and clarify GDPR requirements. The training itself was interactive, showing the partners different ways of making an online workshop effectively participative and engaging, in a context of severe travel restriction due to covid.

Step 2: June 2022 (Re-UNITED meeting)

A 1.5h session at the Re-UNITED meeting was used to provide partners with detailed clarifications and training in terms of the stakeholder engagement, present the minimum requirements agreement and align on the workshops that were to take place in the coming period. The meeting enabled for better alignment between the different stakeholder engagement needs and timings in various work packages, thus streamlining the topics and timings of upcoming stakeholder workshops in pilots and at the EU level.

Step 3: November 2022 to January 2023

A 1h30 training for facilitation skills was specifically designed and delivered to the teams in charge of the organization of the socioeconomic workshop, taking place separately in each pilot. To date, this training as been delivered online to the Belgian and Dutch pilot teams in November and December and could be repeated with the Greek and Danish pilots in January 2023 in preparation for their respective socioeconomic workshops. These training are followed up by an individual support to the organization of the workshops, especially on the use of participative methods.

3.3. Stakeholder mapping

A first overall stakeholder mapping has been conducted in task 5.1, depicting the stakeholders considered relevant for the UNITED project and clustering them by "roles", such as future investors, operators, suppliers, media, general public, authorities, competitors, partners.

The pilots were then encouraged to develop a stakeholder register form, and start gathering the information of relevant stakeholders, including an evaluation of the power and interest of each of them. The register took form of an excel form on a joint SharePoint of the project. The overall aim of the register was to list all the stakeholders and collaborators in each of the pilot sites, generate a power/influence chart, review the entries to highlight and avoid any possible overlaps across the pilots as well as the gaps. Three of the pilots effectively used the stakeholder register tool, one used it more as a potential commercial partners listing, and one chose not to use it.

In order to carry out effectively a stakeholder identification step for each pilot, specific "stakeholder interlocutors" have been designated for each pilot, and WP5 partners established an individual follow-up with these interlocutors. These individual meetings have been taking place from October 2021 (M22 of the UNITED project) and allowed a tailored support to the pilot and a significant documentation on their stakeholder engagement processes, as explained in section 3.5.

3.4. Understanding the stakeholder engagement needs

An interview was conducted with all the Work Package and pilot leads early on in the project in order to better understand what the stakeholder engagement needs may be in each of the work packages and pilot sites. The key point for possible stakeholder engagement were identified by looking into the Grant Agreement, e.g., where the information needed to be collected, validated, or solutions co-developed. These were extracted per each WP and task and discussed with the WP and pilot leads to understand what format the stakeholder engagement may take and when. The idea was to streamline and align the stakeholder engagement in the project and avoid possible 'stakeholder fatigue'. The table 1 below provides an overview of all the questions per each of the tasks used for this exercise. A regular follow up took place as part of the stakeholder engagement monitoring as outlined in 36 below.

Table 1 Overview of stakeholder engagement needs questions per each project task

		Questions
WP1	T1.3	-How will you optimize business cases? will you be in touch with business development experts, economists or? Do you foresee a workshop in each of the pilots in order to come up with the business canvas? - Requirements definition: How do you plan to do the identification of technological, economic, environmental, social and health and safety requirements (as in D1.3)? Will you contact experts to discuss this? i.e. interviews or workshop?
	T2.5	-How will you conduct the "identification and the assessment of the optimal financial, economic and social location and management of relevant investments and sites over time and space, while considering different risk, technology, geospatial and policy frameworks"? -Will you conduct interviews or a workshop with experts to determine all the variables that the system may need? -Will you have interviews with experts to collect the data that is not readily available online (i.e. perceived risks, socially and/or financially optimal location, regulatory requirements)
WP2	T2.6	-How will you collect the requirements of the stakeholders? -"depending on the requirements of the stakeholders, the task will elucidate where for instance design procedures have to be improved in order to be accepted as a part of the MUCL or what unknown risk that unknown operators pose on other industry." -With whom do you plan to engage to better understand and collect necessary information for the study?
	T3.2	-How will you determine what factors/variables should be taken into consideration in the Assessment Framework to Determine Economic Feasibility of Multi-Use Platforms (deliverable D3.2)? -Will you talk to the industry players or economy experts to better understand what may be "financial costs and revenues of MUCLs and their efficiency (value for money) " as well as "economic impacts that are difficult to capture in monetary terms i.e. changes in local employment levels, changes in ecosystem services and functions)." -Please note that that the engagement of users throughout the development process increases the actual uptake of results – future take up of the assessment framework by project developers or authorities.
WP3	T3.3	-Do you require interviews or a workshop to take place in each of the pilots for the information to be collected for this task? -"This task will firstly aim to collect relevant cost and revenue data from each of the pilots (i.e. costs associated with the implementation, maintenance, management, as well as revenues from harvest and use)."

	T3.4	-Do you foresee engaging stakeholders to optimize business models?
	T4.2	-Will the assessment framework be co-developed together with relevant stakeholders? -Will you engage local authorities to better understand the individual (and if present combined) EIA requirements for each of the sectors in each of the pilot countries and/or other EU Member States? -Will you engage environmental experts, industry, NGOs to better understand impacts and factors that may need to be considered in the Assessment Framework?
	T4.3	-Will you use expert judgement during the application of the Assessment Approach? Which experts will you engage and how (i.e. interviews and/or workshop)? -"This task will firstly aim to collect relevant environmental data from each of the pilots." -How will you collect relevant environmental data from each of the pilots? The literature review in D4.1 showed that there are still quite some gaps that may need to be filled in via interviews. Do you foresee to use interviews and/or workshops to collect this data?
	T4.4	-How will you optimize the model and judge transferability across pilots?
WP4	T4.5	-Will you get in touch with project developers to find out what type of guidance they need and/or to test the guidance to ensure that the guidance is 'user friendly'? Please note that that the engagement of users throughout the development process increases the actual uptake of results – future take up of the guidance and assessment framework by project developers.
WP5	T5.4	-How will you evaluate the level of societal awareness and acceptance? You need the baseline to be able to monitor and evaluate at the end if awareness and acceptance changed. -Would it make sense to do two sets of surveys at each of the pilot sites i.e. with the authorities, local businesses, NGOs, one now and one at the end of the project after the engagement and dissemination have taken place?
	T6.1	-How will you collect the case specific issues from stakeholders (i.e. inventory of legal and insurance aspects, risks and risk management options) to be addressed under WP6?
	T6.2	-How will you collect the following information (i.e. those that are not readily available online/in the literature): "A legal (comparative) research on licenses, access or prohibition of entry by non-multi-use participants will be conducted per pilot; potential relations with EU habitats directive, international shipping, fisheries, liability and insurance of activities, and potential damage caused or injuries sustained by third parties and the legal ramifications of such are all core elements to this task."
WP6	T6.3	-How will you collect these legal requirements from each pilot site – will you need interviews with regulators and/or legal experts? "Through close collaboration with Task 6.2 the legal requirements and obligations both from EU, local authorities, and national insurers will be analysed and included in the risk assessment."

WP7		-When do you need to engage with authorities to obtain licences if any? -Do you need to hold public hearing or public involvement? -Who may need to be involved or consulted and when to support with the Technology aspects? -Who should be informed and whose opinion should be heard concerning environmental impacts (i.e. introduction of new species, NGOs) and at what stage within the project? -Who are those that may use the pilot results (after UNITED scenario: commercialisation) that should be involved already now (e.g. investors, windfarm operators? -How and in which other fields can the pilot benefit from stakeholder/expert engagement (e.g. social acceptance, regulations, producers, licences, risks for insurance) and when? -Are there stakeholders that need to be engaged to discuss the multi-use solution who are not already a part of the project? i.e. local offshore wind farm operator, aquaculture business owners, local tourism board or companies? -Marketing opportunities – who are the target groups and how will you collect their preferences?
WP8		-Who do you need to engage and when for various evaluations that take place in WP8 - more specifically how do you plan to assess and validate the economic acceptability of the proposed solutions in T 8.1.? -What is the role of expert opinion in such an assessment? -What form of engagement/involvement may be the most suitable for this purpose (i.e. interviews, workshop/focus group meeting, online workshop, online questionnaire? -Have you facilitated such engagement in the past already?

3.5. Minimum requirements agreement

To ensure commitment towards the stakeholder engagement and emphasize on the importance of co-development and validation in the project the document titled 'Minimum requirements for stakeholder engagement in pilots' has been developed. This short document specified the importance of engagement in the project as well as the minimum requirements for engagement including the number of stakeholders to be engaged, type of stakeholder for each of the pilots, purpose of the engagement and overall timeline.

The minimum requirement document has been agreed upon by all the pilot leads, thus officialising their commitment towards the stakeholder engagement in the project.

3.6. Monitoring and follow up procedure

The monitoring took place from two perspectives – 1) in terms of the adherence to the minimum requirements agreement and procedures and guidelines set out in the D5.1, and 2) from the perspective of stakeholder satisfaction with engagement activities and awareness improvement due to the engagement. A set of questions (e.g. as the one showed in 3.3 above) has been used to understand the engagement needs in work packages and pilots. In general, three follow up periods have been used to date to understand and monitor engagement levels in pilots:

1. STEP 1: August - October 2020 – Stakeholder mapping, current status and needs
2. STEP 2: October - December 2021 – Activities to date, and next steps
3. STEP 3: February - April 2022 – Activities to date and the identification of gaps to be filled out until the end of the project and beyond.
4. STEP 4: October – November 2023 -Final assessment of the stakeholder engagement in the project and the recommendations for the future endeavours in the pilot locations and beyond.

An online survey has been used to measure the satisfaction and awareness of stakeholders. The survey was distributed during all the engagement activities that took place during the project, and placed on the QR code on a printed handout, as well as on the project website for easier access to the link during meetings, workshops and conferences.

Results of the Stakeholder Engagement Questionnaire

A questionnaire was executed early on in the project to measure stakeholder satisfaction with the engagement and communication methods used in UNITED. Until 1 December 53 respondents have answered to the survey. The survey has been extensively shared with all the stakeholders involved in the project be it via the interview, workshop or other means.

The results show that most respondents have been interacting with the UNITED project through participation in specific pilot events, such as the Belgian pilot (7), the Dutch pilot (6), the Danish pilot (4), the German pilot (4), and the Greek pilot (4). Many also mention interacting with the project through general UNITED events, communication or contacts (14). Some respondents mention other situations (3) and one respondents did not specify how they have been interacting with the UNITED project.

The results show that the majority of engaged respondents have already received information about UNITED through newsletters (18), workshops (15), webinars (14), and the website (14). Other ways that respondents have received information about UNITED include pilot meetings (7), other (6), social media (5), ResearchGate (2), and blog-posts (1).

The results show that the majority of respondents are in general satisfied with the current way they receive information about the project and its pilots. The results also show that in the future respondents would like to receive information about UNITED through newsletters (25), workshops (20), webinars (19), and the website (18). Some also mentioned interest in pilot meetings (7), blog-posts (4), social media (4), and ResearchGate (2) as ways to receive information about UNITED. Other responses included "Other" and "Don't know" (1 each).

4. DANISH PILOT: OFFSHORE WIND AND TOURISM

The Danish pilot is piloting the multi-use combination of offshore wind and tourism, consisting of in-person boat tours to the wind farm as well as a virtual tour. The pilot is located off Copenhagen in the Middelgrunden offshore wind farm (Figure 2). The wind farm is located relatively close to shore, 3.5 km from Denmark's capital, visible from the most popular city beach and some rooftops. The wind farm started operation in 2000 and produces up to 100,000 MWh of electricity annually, equivalent to three per cent of Copenhagen's total power consumption.

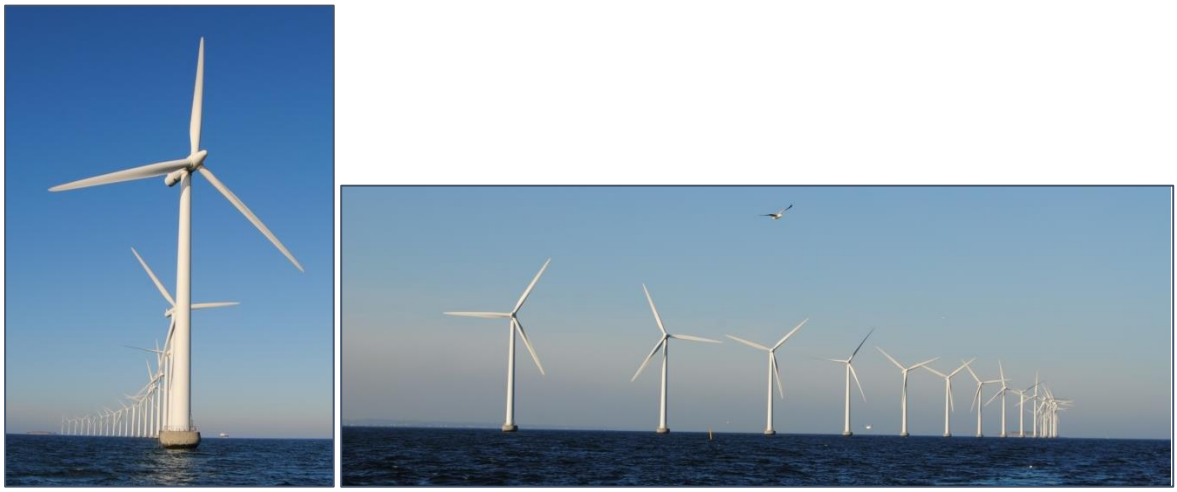

Figure 2 Middelgrunden Wind Farm from the visitors perspective (@SPOK)

The wind farm consists of 20 turbines, each 2 MW, which are equally shared (i.e. 10 each) by its developers "Københavns Energi" (today HOFOR utility) and "Middelgrundens Vindmøllelaug" (Middelgrunden Cooperative), a private cooperative partnership with 8000 owners. The utility had the financing and engineering expertise in place, while the cooperative gathered positive local citizens, who turned to be advocates and ambassadors of the project to their relatives and friends.

The physical tour to the offshore wind farm is organised by representatives of the Middelgrunden cooperative, who also contracts the boat operators. This took place a few years after the commissioning of the wind farm. The

other owner of the windfarm has no intention to establish a visiting program. Two boat operators are used for the tour, which is scheduled in advance depending on boat and guide availability and weather conditions. One of the boats is also used for leisure fishing, thus providing the boat company with an alternative source of income. The other boat operator is conducting leisure tours with fast Zodiacs vessels and a visit to the wind farm is just one option out of many.

The local engagement in planning and layout of the farm ended up being the pre-condition for the acceptance and rollout of the multi-use. The fact that 10 of the turbines are owned by the cooperative makes it easier to have access to the turbine and develop additional related add-ons such as tours and educational programs. In Denmark there has been since the 1980-ies a tradition to have an annual opportunity for the turbine owners to climb their wind turbine. This event has slowly been developing to tourism allowing all people to visit wind turbines and learn about wind energy.

Local economy and human activities:

The tours have contributed to local businesses – mainly boat tour operators and tour guides. It provides an alternative source of income for sectors in decline such as fishing, and it diversifies the local tourism offer. It is drawing tourists out of Copenhagen, thereby diversifying tourism geographically.

Many other human activities that take place in the vicinity of the pilot site given the close proximity of the capital city. These include the tourism and recreation, local fishery, beach activities and diving.

The educational and awareness raising elements of the tour have contributed to improved understanding and knowledge about the role and importance of offshore wind for energy security in the context of the climate crisis. It generally allows discussions on how electricity could be produced, how a wind turbine works and the characteristics of an offshore environment. The tour has been offered to both locals and universities from abroad, as well as wind energy companies who use it for building their internal capacities and showcasing it to international clients and visitors.

4.1. Baseline stakeholder ecosystem account in the pilot site

4.1.1. STAKEHOLDER IDENTIFICATION PROCESS

The baseline stakeholder ecosystem assessment has been conducted early in the project (March 2020) in conjunction with Task 1.1. Already at that time all the relevant stakeholders have been identified, mainly due to the long history in the pilot site. The knowledge of local stakeholders was qualified as excellent.

Over 10 key stakeholders have been identified in this pilot in the stakeholder register. These include:

- SPOK, the company organising tours.
- Boat companies providing the boat to the tours.
- Divers, who eventually can also utilise the location of Middelgrunden Wind farm.
- Visit Copenhagen, the Danish association promoting tourism in Denmark for citizens.
- Wonderful Copenhagen, Danish association promoting tourism in Copenhagen for citizens.
- StateofGreen, the Danish association promoting knowledge exchange and export of Danish companies to the world.
- The shareholders of Middelgrunden Wind.
- The Danish wind turbine manufacturers like Vestas and Siemens Gamesa, who have shown interest in the tours we organise.
- The developers of offshore wind projects like CIP, Ørsted, Vattenfall represented by greenpowerdenmark.dk, who have shown interest in the tours we organise.
- The museums/tall buildings from where Middelgrunden offshore wind farm can be seen.
- Insurance companies

4.1.2. ENGAGEMENT RATIONAL

The rational for stakeholder engagement in the Danish multi-use pilot combining offshore wind farms and boat tours is to involve all relevant parties in the planning and development of the pilot project. This includes the project developers and manufacturers, who should be consulted to support with technology aspects, and insurance companies and legal bodies, who should be engaged to ease the licensing and obtaining of insurance as early as possible in the process. In order to roll out the tour on a wider scale and raise awareness about the importance of renewable energy, it is also necessary to engage with additional boat operators, tourism agencies, and universities. To roll out the virtual tour, extensive engagement is also needed with the operators of high rise buildings in the area, museums, and owners of places where the QR code with the virtual tour can be placed. Involving these stakeholders can help to ensure the success and sustainability of the pilot.

4.1.3. PRE-EXISTING CONNECTIONS AND INVOLVEMENTS

Policymakers and Regulators

The involvement of Policy makers and regulators were essential in the establishment of Middelgrunden Wind farm. However the site was not selected by them as of initial interest for offshore developments, instead the project was following the "open door procedure" by the two developers: Middelgrunden Cooperative and Copenhagen Energy. The project only became a reality thanks to the joint effort of these three parties.

Research organisations

There are several research organisations working with wind energy and related topics in Denmark. One of the most recognised wind research institutes internationally is DTU / Risø. DTU has been one regular client to the guided tours organised in Middelgrunden Wind Farm. This is probably because the knowledge generated at the tour is something unique and that cannot be taught at indoor classes, not even by the most knowledgeable experts in the field. For example, Risø several wind test facilities at the Risø campus and at Jutland, west of Denmark – about 5-hour drive from Copenhagen. Whereas Middelgrunden wind farm can be reached in a 30.min sailing trip from the city centre. Further on, most of these facilities cannot be accessed as they are part of different research programs and therefore cannot be stopped as needed when visiting.

Needless to say that also Risø had a very important role at the establishment of Middelgrunden Wind Farm, i.e. when estimating a met mast and the production losses due to wake effects (and thus incomes) from turbine number 1 to turbine number 20 (the Southest one).

Insurance companies

Whereas the boat operator has an insurance over the period it is transporting the client from the harbour, the tour guide (tour operator) insurance comes into play from the moment the client leaves the boat through the ladder and access the foundation, and vice-versa.

It was an easy procedure to obtain the relevant insurance by contracting it on the phone and hand over the safety instruction. As co-owners of Middelgrunden Wind farm, shareholders were covered by their own insurance when visiting the wind farm up to 2017.

NGOs and other intermediaries representing the local communities

In the establishment of Middelgrunden offshore wind farm, NGOs and communities represntatives were involved in the planning process of the wind farm.

Midddelgrunden Cooperative could indeed be thought of as a representation of citizens with an interest in developing, exploiting and harnessing wind energy. It is an old Danish tradition that the 3rd Saturday of June, in the wind turbine day, owners open their turbines and these can be visited. This is the origin of the tourism activities of the Danish Pilot.

The local community represented by Middelgrunden Cooperative has been a key enabler of this activity, as every year about 200 shareholders are interested in visiting the wind turbines, sometimes bringing too their families and friends.

4.2. MISSION AND AIM OF THE STAKEHOLDER ENGAGEMENT IN THE Danish PILOT

The mission of the Middelgrunden pilot is to engage the local communities, but also the general public from other regions, and their representatives to improve the awareness about offshore wind and its synergies with the local economic activities and wellbeing, thus ensuring a wider uptake of offshore wind energy projects in Denmark and beyond.

The stakeholder activities are implemented in this pilot with an aim to ensure better social acceptance, attractiveness, better consideration of touristic trends, better functioning and advertising the trip to the wind farm.

4.3. GENERAL OVERVIEW OF REGULATORY REQUIREMENTS

In general, it is important to ensure compliance with all relevant regulatory requirements for public engagement in order to avoid any potential issues or delays in the project. Based on the information provided by the pilot leads, it appears that the general regulatory requirements for the pilot project included engaging with authorities to obtain licenses for certain aspects of the pilot project, such as repowering (being considered for the future developments and enlargement of the farm) and tourism.

The engagement with the local police took place to confirm whether a license was required for the tourism aspect of the project. It is also noted that although public hearings and consultation have already taken place during the development of the wind farm, the tourism aspect was not considered in the environmental impact assessment report. Namely, the extensive public hearing and consultation already took place during the development of the wind farm.

The involvement of the cooperative ensured that the public is properly involved, and their needs and perspectives considered. The cooperative members are running the boat tours to the turbine and the UNITED pilot, as a bottom-up initiative.

4.4. OVERVIEW OF THE CURRENT ENGAGEMENT RESULTS, TOOLS AND METHODS USED

The stakeholders in the DK pilot can be classified as:

- **Informants** – those that should be informed, and whose awareness, interest and capacities may need to be improved. Nevertheless, their opinion/satisfaction is also important in order to better shape the tour and associated service offer. For doing so a survey has been developed (scan figure 1 to access the survey) and will be used in the future – filled out during each of the tours to better understand the satisfaction with the tour and take onboard possible suggestions for improvement. These are often also a target of the local outreach activities conducted in the WP9.
- **Consultees** – those whose opinion and expertise is crucial for the functioning of the tour and implementation of the pilot solutions.
- **Partners** – those who may need to be win over as partners for the expansion of the pilot activity and improved readiness level of the pilot. To a certain extent these are also involved in the decision-making processes in the pilot and may act as owners of some of the solutions.

Figure 3 QR with the survey to measure the satisfaction with the Danish pilot tour

More information about each of the three groups of stakeholders, the process of their engagement has been described in detail in the following sections.

Informants

Visitor groups:

Universities, offshore professionals (e.g. visitors attended though the office of the Danish Agency StateofGreen), conference goers, energy companies (e.g. from Korea), universities (e.g. mainly from the US and Denmark), and local population have been main visitors. Visits are part of for teambuilding, as side events also, groups visiting the conference (e.g. technical visit on request) and local population.

The shareholders (owner of the COOP) are also stakeholders

Purpose of the involvement: Raising the awareness about the pilot, knowledge transfer, marketing and promoting the tour.

Communication tools used: oral information and power point presentation. After the trip usually some references are sent, including a brochure about Middelgrunden wind farm and something of specific interest to the group.

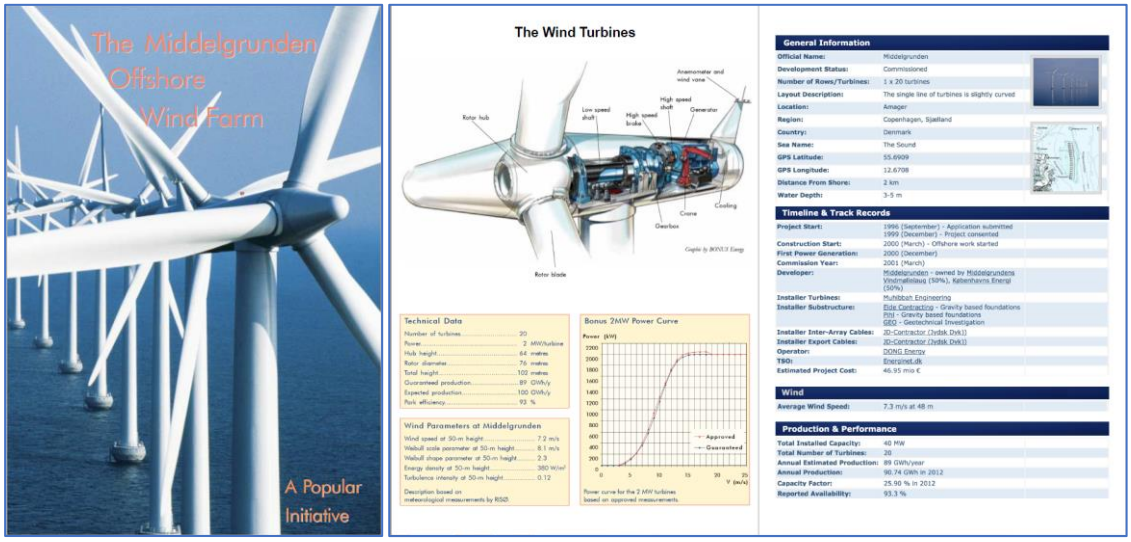

Figure 4 Example of some of the education materials used for awareness raising at the Danish pilot @SPOK

Perceptions are positive and interested about the pilot and multi-use concept.

All but offshore wind company representatives had rather **low level of awareness** about the multi-use concept. The wind energy companies' awareness was high with many of them looking into specific implementation of multi-use in their localities, mainly for the improvement of the acceptance rates of new projects.

Communication tools used: Power point presentation and written and oral information about the tour provided. The guided tour involved a lot of knowledge sharing in a form of oral presentation at the site for each of the sections of the trip, history of the site and the project, and turbine elements and functioning. In general, it can be noted that the participants' awareness improved with the information provided as the questions received towards the end and after the tour, were more mature and specific comparing to those received at the beginning/ start of the tour.

Engagement tools used: direct email exchange and phone calls before the tour, and the activities on the day of the tour including an extensive Q&A with the tour guide and collection of satisfaction rates and improvement suggestions from attendees.

Utilities, wind manufacture and project developers:

Perceptions: These groups have all access to an offshore wind turbine. However, strict rules apply to their own wind turbines, for example all visitors have to follow the rules established for the maintenance team, whom need to be able to start the turbines during the visits and therefore need to wear safety belt. This results in a situation where tourism is not possible as they do not it is possible to have two sets of safety rules, one for the teams operating & maintaining the turbines, and other set of rules for *just* visitors.

They make use of the simple visiting programme we offer instead.

Purpose of the involvement: Want to show offshore wind projects for politicians and potential customers, or a side event activity after working technical meetings, for example.

Communication and engagement tools used: Oral presentation, interview

Consultees

Lawyer for the health and safety and insurance company:

Purpose of the involvement: to get insurance and prepare the health and safety procedure

Communication and engagement tools used: Phone communication, e-mail and in-person meetings

Authorities:

Purpose of the involvement: Marine Authorities and police to check if there is a need to obtain any specific permit. The authorities communicated back, concluded the meeting no need to change anything in the pilot or obtain additional permits for taking people on board for the tour. It would be a different situation if the turbine would be moving - since it is fixed no need to change anything in the pilot.

Perceptions: The standard rules related to ship transport of tourists are sufficient. The safety rules in the turbine are decided by the tour operator based on the rules used by professionals servicing the turbines. The insurance companies could influence the rules.

Communication and engagement tools used: Phone communication in combination with e-mail.

Partners

Boat operators:

Purpose of the involvement: In order to have a standard offer the boat operators needed to be engaged, fast rubber boat for 12 people was needed.

Communication and engagement tools used: Phone communication, e-mail and in-person meetings

Museums, high rise building owners, waste energy and biomass plants, info center, city tower:

Purpose of the involvement: for the placement of the virtual tour QR code

Perceptions: The interest is high but just adding a QR code has to be evaluated and designed according to the marketing department of the museum, and fitting into the design and the other information on the high-rise buildings.

Communication and engagement tools used: Phone communication, e-mail and in-person meetings

Tourism board, tourism companies (Danish and international):

Purpose of the involvement: For the promotion of the tour approx. 10 tourism operators/companies have been engaged.

Perceptions: It has been difficult to assess any special attention to the boat tours offered. It is like "just another activity in the pallet of visiting Copenhagen".

Communication tools used: Phone and e-mail

Engagement tools used: A description of the different tours.

Purpose of the involvement: To convince more members to get trained to become the tour guides

Perceptions: It is difficult as people have to do the guided tours taking hours out of the daily work. One retired person has been recruited and another one taking only trips when it fits into his daily routine, e.g. tours starting after working hours.

Communication and engagement tools used: In-person meetings

Diving groups:

Purpose of the involvement: For the expansion of the tourism/recreational offer e.g. divers use the wind platform for rest or trainings. The level of awareness and understanding has improved throughout the interview.

Perceptions: It looks like the divers have realised that the benefit of having access to electricity at the foundation platform is not a valid argument as they can skip the generator used as the diving is not only taking place around the foundation but also at a distance so a cable from the platform is not sufficient.

Communication tools used: Interview.

Organised events

The Danish Pilot has organised 3 Open House events where the general public had an opportunity to get informed about the pilot at the outside open-air stand and by taking the boat tour. Moreover, several tours and independent stakeholder meetings took place in person over the course of 2020 – 2023. The pilot has also organised a workshop focusing on the socio-economic aspects of the pilot. The pilot has also been presented at several international in-person events, for example:

- 18th May 2022. Final Blue Deal Conference. Ravenna, Italy
- 19th June, 2022. Open House Day of Middelgrunden Wind Farm demonstrating the UNITED pilot to over 200 attendees, Copenhagen, Denmark.
- 30th Nov., 2022. Community of Practice – energy to feed into the eMSP, the Netherlands, The Hague.

4.5. RECOMMENDATIONS FOR THE PILOT

While the Danish pilot already has well developed engagement activities a set of recommendations has been generated in order to improve the engagement impacts and ensure a wider outreach and uptake of pilot results:

- A more structured feedback process with the visitors: implementation of a post/during tour satisfaction survey is necessary with a careful follow up to better under understand the perceptions and needs of those attending the tour. This can potentially improve the number of visitors and give better insight if the tour is fit for its purpose and if it is reaching the intended impact.
- A more structured outreach to the potential visitors: There is a need to maximise outreach to those who can ensure the most impact is achieved (e.g. developers, universities) in terms of rising awareness about the importance of renewables and their sustainable integration into the local communities. Thus a targeted communication campaign may be needed to attract more universities and renewable energy developers during the Open House/Demo days.

4.6. Conclusions

Engagement with stakeholders in the Danish pilot has been comprehensive and has provided concrete results for the pilot while at the same time improving the awareness about the topic of renewable energy multi-use. The following outcomes are highlighted as particularly important:

- Engaging a new boat tour company as a service provider and marketing partner – e.g. there is an add advertising trips to the wind farm on the boat tour company web page.
- Securing a more professional guide system including full insurance coverage for the visits.
- Established the possibility of presenting the project by virtual visits with access from high rise buildings and the Science Museum.
- Substantial improvement of tours attendance in 2022 compared to previous years, increasing the revenue.

References and further reading

- "The Middelgrunden Offshore Wind Farm – A Popular Initiative", available here.
- "Experiences from Middelgrunden 40 MW Offshore Wind Farm, Copenhagen Offshore Wind 26-28 October 2005" , available here.

- "Cooperatives – a local and democratic ownership to wind turbines", available here.

5. GERMAN PILOT: OFFSHORE WIND, MUSSEL & SEAWEED CULTIVATION

The German pilot is combining offshore wind energy research, mussel and seaweed aquaculture. The pilot is located at the FINO 3 research platform in the North Sea, within the German EEZ, about 45 nautical miles (80 kilometers) west of Sylt Figure 5**Error! Reference source not found.**,close to the offshore wind farms: Butendiek, Dan-Tysk and Sandbank.**Error! Reference source not found.**

The North Sea is a relatively shallow shelf sea with a wide opening to the North Atlantic Ocean in the north. The oceanic climate of the North Sea - characterized by salinity and temperature - is largely determined by this northern opening to the Atlantic. In the southwest, the Atlantic has less influence on the North Sea due to the shallow English Channel and the narrow Dover Strait.

Figure 5 Location of the German pilot site at the research platform FINO3 in the North Sea

Local economy and human activities: As FINO3 is located quite far offshore, no interaction with the general public takes place, also due to the location neither the monopile structure nor the mussel or algae system is visible from land. So, the whole system cannot be perceived as disturbing from an on shore or on land dwelling point.

The construction and operation of the FINO3 platform and the aquaculture plant **does not have any impact on cultural and other tangible assets.**

5.1. The area itself is barred from any ship traffic, a safety zone of 500m around the monopile is established that is not to be entered without permission. Ship cruises and helicopter rides are necessary for installation, maintenance and decommissioning of the aquaculture farm. Baseline stakeholder ecosystem account in the pilot site

5.1.1. STAKEHOLDER IDENTIFICATION PROCESS

Task 5.1 mapped the key stakeholders and cooperaators for each pilot. The information was collected at the beginning of the project and further amended during the ongoing works. The German pilot focusses on integration and combination of wind energy, and low trophic aquaculture of algae and mussels. The far remote location of the German pilot, FION3 also removes the pilot from most interactions with the general public and tourists..

Hence main stakeholders were identified as:

- Windfarm operators
- Mussel producers
- Algae producers
- Supporting industry for algae and mussel producers
- Technical consultants for offshore technique (calculating forces on the installations)
- Offshore shipping companies
- Permitting agency Federal Maritime and Hydrographic Agency of Germany (Bundesamt für Seeschifffahrt und Hydrographie)
- Local energy and environmental ministry(Ministerium für Energiewende , Klimaschutz, Umwelt und Natur, MEKUN)
- Insurance companies
- Environmental NGOs (WWF, NABU)
- Algae and mussel processing industries
- Resellers of algae and mussel products
- Universities
- General public

5.1.2. ENGAGEMENT RATIONAL

Depending on the type of stakeholder the rational ranged from:

- Showing novel possibilities
- Opening novel markets
- Sparking interest
- Educating
- Informing
- Interacting

In general, the rational for stakeholder engagement was to involve all relevant parties in the planning and development of the project. This includes offshore technicians and specialists, who should be consulted to support with technology aspects and to obtain insurance. In order to ensure compliance with environmental regulations and protect against potential impacts, it is necessary to inform and consult with the local ministry for environment, NGOs, and other relevant parties. Potential users of the pilot results; including wind farm operators, mussel producers, algae producers, shipping companies, permitting agencies, and the general public, should also be involved from the beginning to ensure the success and sustainability of the project. Engaging with these stakeholders can also help to generate social acceptance, navigate regulatory requirements, and identify potential risks for insurance.

5.1.3. PRE-EXISTING CONNECTIONS AND INVOLVEMENTS

Some pre-existing connections have already been in place in the German pilot due to the fact that the FINO3 research platform has been in operation for years and that the aquaculture farm has already been operational before the pilot was established. Thus, the pilot focused on the ocean multi-use related engagement, especially those relevant for planning, permitting and operation of the multi-use pilot project offshore as well as the initial close to shore tests.

Pre-existing engagement and involvement gaps did not exist. However, in general the far offshore locations are seldom recognised by the general public, creating awareness of something that is not visible due to the great distance to shore is often forgotten as it is literally "out of sight" on a daily life basis. As FINO3 is far out, acceptance is, in general, not thought of until it is brought into the spotlight. Also, environmental protection does play a major role and has to be taken seriously during any offshore project planning as it can seriously stall the project approval.

Table 2 Summary of the pre-existing stakeholder connections and involvements at the German pilot site

Key general target groups of the project	Pre-existing involvement yes/no	Explanation of involvement activities
Policymakers and regulators	yes	Due to many projects at the FINO3 platform contacts did exist (MEKUN) and were deepened during the UNITED project. Regulators in this context are seen as the level after the policy makers that set the things in motion and work on the permits and controlling and checking the regulations. Contact was already in existence (e.g. BSH).
Research organisations	yes	Close relations already existed with the University of applied sciences in Kiel, the University of Kiel and the GEOMAR.
Classification societies	yes	Connections pre-exist to the organic EU certification agency (through Kieler Meeresfarm) and also to ISO certification bodies.
Insurance companies	yes	The current installations were already insured thus the contact with the insurance agencies was already there. The insurances were then extended and modified to include the novel algae and mussel cultivation systems.
Funding bodies	yes	Connections to several banks pre-exist, but were not expected to play a major role in this pilot.
NGOs and other intermediaries representing the local communities	yes	Connections were already in place with some of the major NGOs in the area such as the WWF.
Commercial Businesses	yes	Connections were already in place with some shipping companies.
Business support – consultancies	no	

5.2. SOCIALLY RESPONSIBLE MISSION OF THE PILOT

As the pilot is very remote social engagement does only occur on the new digital media. Hence it was focused on interviews and also it was encouraged to take an active part in public presentations of the German pilot in national newspapers and also on TV presentations when possible. Also the Project was presented in several conferences. All the presentations aimed also to educate the public and show a more responsible way of interaction with the environment by combining different uses of offshore locations also low trophic aquaculture, the successful establishment of which is one aim of the German pilot shows ways of socially responsible use of marine resources.

5.3. GENERAL OVERVIEW OF REGULATORY REQUIREMENTS

To obtain necessary licenses for the German pilot project, it is advised to engage with authorities approximately eight weeks prior to installation. However, due to the novelty of multi-use projects in Germany, the permitting process took much longer than stated and the permit was granted after eight months. The permitting agency has

now gained experience in permitting offshore multi-use projects, which should expedite the process in the future and open possibilities for faster permitting of future multi-use projects. While a public hearing is not required, the project team aims to act transparently and inform the public as much as possible in order to increase public acceptance.

5.4. OVERVIEW OF THE CURRENT ENGAGEMENT RESULTS, TOOLS AND METHODS USED

The main method of engagement for this pilot was through direct phone interviews, online and in-person presentations, meetings, and workshops. These methods were chosen within the strict limits of the pandemic to use every possible option and for the ability to reach and interact with a large number of stakeholders.

To raise awareness before the interviews, flyers, posters, videos, and presentations were used.

The majority of perceptions were positive, though there were some critical views, particularly regarding the protection of endangered species such as harbour porpoises. To address these concerns, careful explanations of the precautions were taken and the thorough monitoring system established in cooperation with authorities were provided. The level of awareness improved as a result of the communication efforts, though the effectiveness varied depending on the approach used. Direct interviews were more effective in measuring and improving awareness than general presentations, but workshops, flyers, press releases, and talks reached a larger audience and resulted in a broader distribution of knowledge and higher rate of understanding.

Stakeholder input was valuable in the pilot design and led to adjustments in net types and the improvement of the harbour porpoise monitoring system. Namely, the permitting agencies provided valuable advice that was implemented directly. Additionally, input from shipping companies and mussel system developers was used to refine the anchoring system and the sea area marking techniques. Protocols for algae seeding were also obtained and adapted to the specific conditions at sea. The stakeholders were kept informed of how their input was taken into consideration through ongoing reporting, and any necessary improvements will be implemented.

More information about each of the German pilot target groups of stakeholders, the process of their engagement has been described in detail in Table below.

Table 3 The overview of target groups, engagement tools and methods used and outcomes

Target group	Tools and methods of engagement	Co-creation yes/no	Input taken onboard yes/no	Outcome	Stakeholder engaged
Permitting agency	several meetings, Interaction for permits, workshops	yes	yes	Establishment of positive working environment, permit granted, paving the way for future permits for other users	BSH
German wind farmer association	several meetings, workshops, presentation of project	no	n/a	Creating curiosity, showing possibilities, sparking idea of multiuse connection with other stakeholders outside of the windfarm business	German windfarm associaton
Algae nursery	Meetings, workshops	yes	yes	Establishment of novel algae line and connections for future projects and offshore multiuse customers	2 Algae cultivators
Mussel system Producer	Meetings, workshops	yes	yes	Establishment of novel mussel cultivation system for offshore submerged mussel cultivation.	1 Technical company
Seaweed system producer	Meetings, workshops	yes	yes	Establishment of novel seaweed cultivation system for offshore submerged mussel cultivation.	1 Technical company

Shipping company	Meetings, workshops	yes	yes	Establishment of novel techniques and processes for first setup and maintenance of offshore algae and mussel production system	1 Shipping company
Environmental Monitoring consultant	Setup of harbour porpoise monitoring system, work meetings	yes	yes	Establishment of monitoring system (c-pods) and experience in handling equipment, connection to multi-use offshore producers	1 consultant
Energy network Company, Baltic Sea	Presentation on Baltic Sea Conference and Meeting	no	n/a	Presenting and interaction with energy net provider in the Baltic, showing possibilities of Multi-use and integration possibilities and lessons learned from the North Sea	1 Energy company
Anti-fouling manufacturers	Meetings, presentations, workshops, testing of products	yes	yes	Testing and finding environmental friendly food safe antifouling coating/antifouling solutions for offshore installations, sensors and equipment. connection with other multi-use stakeholders. Spreading of knowledge	4 manufacturers
Environmental NGOs	Discussions and consultations	yes	yes	Knowledge transfer about environmental aspects of multi-use, presentations and talks	WWF
Manufacturers for offshore monitoring equipment	Discussions, consultations, workshops	yes	yes	finding of offshore solutions, remote monitoring, parameter discussions and connections for different branches	3 Manufacturere
Environmental monitoring equipment suppliers	Supplying sensors for the project, meetings, discussions, consultations, workshops	yes	yes	Remote monitoring, setup of sensors: accuracies, frequencies, intervals, maintenance etc.	7 companies
Engineering offices	Supplying verification models for the project, meetings, discussions and consultations	yes	yes	Verified offshore aquaculture designs for seaweed and mussels for FINO3 location, according to different offshore guidelines and standards	3 companies)
Politics	Meeting to present UNITED	yes	yes	Interested in Multi-use and want to be informed about the course of the project and the results	Ministry of Economy Schleswig-Holstein
Investors	Presenting UNITED at one of their workshops	no	n/a	Interested in multi-use and want to be informed about the course of the project and the results	Investment Bank Schleswig-Holstein
Fishery sector	Presenting UNITED, discussion about change in fisheries sector	no	n/a	Interested in Multi-use and want to be informed about the course of the project and the results	Association of Fishers in Schleswig-Holstein

Organised events

The German Pilot has organised several educational and awareness raising events the local schools, students had an opportunity to get informed about the concept of offshore aquaculture, multi-use and UNITED pilot. Many of the students and professors participated in the organised tour to the farm close to shore and demonstration activities. Moreover, several independent stakeholder meetings took place in person over the course of 2020 – 2023. In late 2022, the pilot has also organised a workshop focusing on the socio-economic aspects of the pilot. The German Pilot has also been extensively presented at several international in-person events, for example:

- Presentation and poster at Wind Energy conference 2021 in Copenhagen
- Presentation at Aquaculture Europe 2020, 2021, 2022
- Presentations at the 5 UNITED Workshops
- Presentation at Wind Energy association in Germany
- Enlit Europe Conference in Frankfurt, Germany November 2022

5.5. RECOMMENDATIONS FOR THE PILOT

Effective stakeholder engagement in the German pilot requires careful planning and backup. Building relationships with stakeholders takes time and requires the development of mutual trust. A slow, steady approach that fosters stable connections and trust is more effective in the long run than a fast, rushed approach. The engagement process in the German pilot began with raising awareness and has continued to focus on collaboration and the long-term prospects for the rollout of the multi-use system in the region. It is an ongoing, integrative process that requires patience and a commitment to building strong, lasting relationships.

5.6. Conclusions

The German pilot is located in a remote area, which can make it difficult to create awareness about the potential benefits of a multi-use system in wind energy parks. However, this also means that the general public is not normally disturbed by the pilot. Experts and stakeholders, including wind energy producers, mussel and algae producers, and supporting companies such as shipping, algae nurseries, and mussel production systems for farmers, were initially hesitant to share information and needs but became more open to suggestions as trust was established. The permitting authorities were also engaged in the process and now have the tools and knowledge necessary for a faster permitting process in the future. While the legal requirements for offshore multi-use in Germany are still being developed, the UNITED project has made good progress and generated interest and excitement for future possibilities. However, the final legal approval must be granted by German politicians.

6. BELGIAN PILOT: OFFSHORE WIND, AQUACULTURE AND RESTORATION

The Belgian Pilot combines flat oyster aquaculture, flat oyster reef restoration, seaweed aquaculture and offshore wind energy production. The primary objective of the pilot is to evaluate wind farms as location for restoring native flat oyster reefs in combination with culturing flat oysters for human consumption. The secondary objective of the pilot is to compare the growth of seaweed grown offshore and nearshore. The experiment takes place at two locations: one offshore within the offshore wind farm Belwind (50km from the shore in the North Sea), and one nearshore (5km off the coast in front of Nieuwpoort).

6.1. Baseline stakeholder ecosystem account in the pilot site

6.1.1. STAKEHOLDER IDENTIFICATION PROCESS

The baseline stakeholder ecosystem assessment has been conducted early in the project (March 2020) in conjunction with Task 1.1. 32 key stakeholders have been initially identified in this pilot in the D5.1 stakeholder register. In general, these include:

- **4SEA (group of 4 NGOs: Greenpeace, WWF, Bond Beter Leefmilieu, Natuurpunt**), who constitutes a pressure group to advocate for the preservation of environment. They follow the activities of the pilot and are subscribed to the newsletter of UNITED. The nearshore site of the pilot is located within a NATURA 2000 protected area, therefore activities taking place in this area were of interest for the NGOs. In addition, there are concerns about the development of aquaculture in windfarms. New concessions for wind farms have been designated inside the NATURA 2000 marine protected area in the most recent Belgian Maritime Spatial Plan (2020-2026). Therefore, even though the current UNITED pilot offshore site is located in a wind farm that is not in a protected area, the development of this kind of practices could later lead to having multi-use, hence aquaculture, installed in a wind farm located in a marine protected area.
- **Industries:** some of them are partners of UNITED (Colruyt, Wind farm operator Parkwind, Jan de Nul)
- **The fishery sector**: These stakeholders could benefit from multi-use projects, because having activities that require exclusive use of a marine area in the wind farm, where fishing already is forbidden, frees space elsewhere that remains available for fishing activities. The combination of aquaculture and wind energy production into a single area avoids the loss of additional space for other users.
- **The port authorities:** They could also benefit from multi-use, since it may have a positive impact on employment and the development of the ports.
- **Local recreational activities:** The local population is involved in several form of recreational activities, such as sailing activities and recreational fishing. They are organized in associations and clubs (sailing clubs, recreational boat owners, recreational ports). They would be in favour of multi-use if it helps preserving the nearshore areas free of new activities.
- **Mayors, local representatives**: They could be interested in what multi-use can bring: employment, extra touristic activities, local food processing industry.
- **Tourism offices:** who could also show an interest in multi-use due to the sustainable and innovative image of the locality this could bring for tourism.
- **The Regional Flemish Government**: in charge of the coastal areas and of the management of the land protected areas.
- **The Federal Government:** for the management of the sea and marine protected areas.
- **The MUMM** (federal authority for control and advice about marine activities).

There is globally a good social acceptability of the pilot, as long as the protected area and local recreational uses are preserved. A variety of local stakeholder express an interest for the concept of multi-use. However, the demand for seaweed in Belgium is currently small (it concerns several small-scale entities interested in using seaweed biomass, e.g. Studio Zeewier in Ostend, Nomet…).

6.1.2. ENGAGEMENT RATIONALE

The stakeholder engagement rationale for the Belgian ocean multi-use pilot is based on the need to involve a variety of experts and stakeholders in order to ensure the success of the pilot. Subcontractors were hired to assist with the installation of the screw anchors and the aquaculture structure, and external expertise was recruited for the geological search for war remains on the pilot site. These stakeholders were engaged for their technical expertise and experience in the relevant areas, and their contributions were essential to the success of the pilot. NGOs were regularly informed about the project and invited to participate in a consultation and cocreation step in December 2022, though they did not ultimately participate. This was important in order to ensure transparency and address any potential concerns about environmental impacts, particularly the introduction of new species. The MUMM (federal authorities for control and advice about marine activities) was also involved in order to

provide advice about species and diseases. The wind farm operator and retailer, as well as a marine engineering company, are partners in the UNITED consortium and will be among those who may use the pilot results after commercialization. However, other engineering companies may also be interested in the results and have already expressed their interest. Engaging with these stakeholders is important in order to ensure the commercial success of the pilot and to facilitate the development of the multi-use market. Stakeholder and expert engagement is also necessary in other areas, such as social acceptance, regulations, licences, and risks for insurance. One of the key challenges for the pilot is the regulation and legal aspects, and it will be necessary to engage with insurance companies in order to secure coverage at a reasonable cost. The insurance has been procured through a tender process, but the costs have been higher than expected. It will be important to communicate with insurance companies and explore strategies for lowering the price in order to mitigate this risk. Overall, stakeholder and expert engagement is crucial for addressing a wide range of issues and will be ongoing throughout the project.

6.1.3. PRE-EXISTING CONNECTIONS AND INVOLVEMENTS

Some initial connections were in place and involvement took place prior to the UNITED pilot. This was mainly in the context of the wind farm development and previous relevant projects which the pilot leads were part of (e.g. EDULIS). However, there have been no reported issues with acceptance of the current pilot by the general public as the site is not visible from the shore. However, environmental NGOs have expressed support for the restoration efforts but have been hesitant about the aquaculture aspect due to concerns about the potential for aquaculture to be installed in new wind farm concessions located in marine protected areas. These NGOs have made regular statements against this possibility in the press and have been regularly informed about the pilot. While multi-use platforms may be perceived as a relatively new concept by some members of the public and professionals, they are becoming more accepted politically and legally in Belgium. This may have contributed to initial resistance or hesitation from certain stakeholders. However, as awareness and understanding of multi-use platforms grows, it is expected that acceptance will continue to improve. The table 4 below provides the summary of the pre-existing stakeholder connections and involvements at the Belgian pilot site.

Table 4 Summary of the pre-existing stakeholder connections and involvements at the Belgian pilot site

Key general target groups of the project	Pre-existing involvement yes/no	Explanation of involvement activities
Policymakers	Yes	FOD (Federal public service for health, food chain, safety and the environment): RBINS/MUMM advised them on legal aspects for feasibility of the pilot in a Natura 2000 area and species to consider for the pilot (biological and environmental aspects of the pilot).
Regulators	Yes	FOD (Federal public service for health, food chain, safety and the environment): RBINS/MUMM advised them on legal aspects for feasibility of the pilot in a Natura 2000 area and species to consider for the pilot (biological and environmental aspects of the pilot).
Research organisations	No	
Classification societies	No	

Insurance companies	Yes	Through UGENT, who consulted the market. Former contacts from research project EDULIS were used.
Funding bodies	No	
NGOs and other intermediaries representing the local communities	Yes	WWF was made aware of the plans for the pilot before the start of UNITED
Commercial Businesses	Yes	Both Brevisco and Colruyt were consulted after the end of the EDULIS project, and integrated as partners in the UNITED pilot Jan de Nul Group and DEME were consulted as well, and Jan de Nul Group became a partner in UNITED.
Business support – consultancies	Yes	UGENT contacted a consultancy to be the intermediate between the university and the insurance companies, in order to choose one.
Other	No	

6.2. MISSION AND AIM OF THE STAKEHOLDER ENGAGEMENT IN THE BELGIAN PILOT

There are three main goals for the stakeholder engagement process in the Belgian pilot:

1. Develop a full understanding of the impacts, including the ones that could not be foreseen by the pilot partners, by involving a wide variety of stakeholder to take part in the assessment and receiving their feedback.
2. Increase the social understanding and acceptance of multi-use.
3. Demonstrate to the relevant stakeholders that multi-use is feasible and possible to be implemented at large scale, by showing a concrete project, with actual implementation. By proving the feasibility, the pilot hopes to create a precedent and inspire similar projects and activities.

6.3. GENERAL OVERVIEW OF REGULATORY REQUIREMENTS

The regulatory requirements for public engagement in the Belgium multi-use pilot depend on the nature of the project. As a research project, the pilot does not require environmental licenses but must be announced to the authorities. The nearshore part of the pilot is in a Natura 2000 area, so an appropriate evaluation has been delivered to the MUMM. There is no requirement for public hearings or public involvement in the pilot as it is a research project. However, if an upscaled version of the platform were to be developed, a public consultation would be required as part of the environmental assessment process. This would involve engaging with the public and soliciting input and feedback on the proposed project.

6.4. OVERVIEW OF THE CURRENT ENGAGEMENT RESULTS, TOOLS AND METHODS USED

In December 2022, the pilot has organised a workshop focusing on the socio-economic aspects of the pilot.

This workshop (organized under T5.3), allowed to get feedback from the participants on the intermediate results of the business case of the pilot, and discussion about commercialization. The afternoon was dedicated to a co-creation session for imagining the different social impacts of an upscaled pilot (4 scenarios with different multi-use combinations were explored), considering its potential positive and negative implication and possible mitigation measures of the negative impacts. This participative session showed which impacts are the most salient for local stakeholders, and which ones should be mitigated (in case of negative impact) or optimised (in case of positive impact).

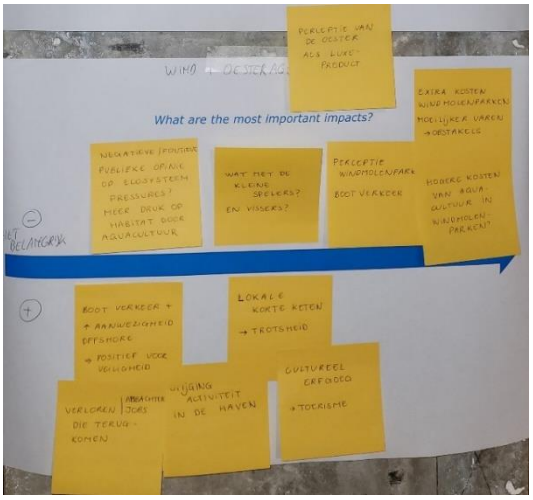

Figure 6: Example of participative impact ranking exercise from the Belgian Pilot workshop

20 external participants attended it, along with the pilot partners, with representatives from the following target groups of stakeholders:

- **Research:** Flemish Marine institute, Flanders Research Institute for Agriculture, Fisheries and Food.
- **Business:** Antwerp Science Park, Ostend Science Park, BLUeBridge/Blue Cluster (Flemish spearhead cluster for blue economy), DEME (infrastructure engineering), Otary (wind farm operator), IMDC (environmental consultant).
- **Public organization at different levels:** Ostend Municipality, Federal Public Service for Health, Food chain safety and Environment.
- **Fisheries:** Visaktua (local trade magazine), OVIS (funding organization for innovative fishery)
- **Tourism:** Nieuwpoort leisure sailing port, Ostend Tourism Office, MeetInOostende (local event planner), Festival Ostend at Anchor (largest maritime festival at the North Sea, taking place in June).

The workshop has been facilitated with in-person co-creation techniques (post-it rounds, ranking exercise). The workshop was facilitated by the pilot partners themselves, after they attended a training session delivered by the WP5 partner ACTeon.

Figure 7: The Belgian Pilot team receiving the Blue Innovation Swell Award 2022

The Belgium Pilot partners kept their coastal activities open to the public where the general public, particularly the local inhabitants, had an opportunity to get informed about the concept of offshore aquaculture, multi-use and UNITED pilot. Many of the locals got to witness the pilot demonstration activities. Moreover, several independent stakeholder meetings took place in person over the course of 2020 – 2023.

The Belgium pilot was also presented at over 10 events (listed in Table 5 below) and in December 2022, the Belgian Pilot was presented at the Blue Innovation Award event in Antwerp (Belgium) and won the Blue Innovation Swell Award 2022.

Table 5: List of events the Belgian Pilot has organized or has been presented to

2022, presentation	**Blue Innovation Award**, winner of the Blue Innovation Swell 2022 (15 Dec 2022), Havenhuis, Antwerp, Belgium. **Nathalie Van Caster (JDN Group).** Belgische demonstratieproject H2020 UNITED.
2022, Workshop Belgian pilot	**Belgian pilot socio-economic workshop. Target audience: all (broad audience, science, government, NGO's, industry).**
2022, presentation	**EAS conference**. Rimini, Italy (27 – 30 September 2022). **Annelies M. Declercq**, Jessica Knoop T.R.H. Kerkhove, A.B.K. Pribadi, A. Norro, A. Soete, B. Groenendaal, B. Stechele, D. Delbare, D. Vuylsteke, D. Vandercammen, E. Lataire, E. Pinto da Silva, F. Kerckhof, F. Maes, F. Leroy, J. Vanaverbeke, K. Allewerelt, L. Pilgrim, N. Nevejan, N. Van Caster, N. Van Oostende, P. Bossier, S. Debels, S. Degraer, S. Devriese, S. Petit, W. Versluys, O. De Clerck Flat oyster and seaweed aquaculture and offshore oyster restoration in the Belgian pilot of the H2020 UNITED project.
2022, two posters and Lab stand	**Blue Opportunity Day (3i University Network) @Ostend Science Park, Ostend, Belgium (6 July 2022)** Network event. Annelies Declercq built up and manned the stand of the Lab of Aquaculture and Artemia Reference Center, and presented the brand new Lab poster and the UNITED project. Collaboration with the UGent Phycology Group and BLUEGent. Please see this link.
2022, presentation	**UN Ocean Conference, Lisbon (30 June 2022).** **Annelies Declercq** and **Thomas Kerkhove**. Nature restoration as an integral part of ocean multi-use: the case of native flat oysters in Belgian offshore wind farms (project UNITED). Marine Protected Areas, Source-to-sea Concepts and Multi-use of Marine Space | Ecologic Institute
2022, presentation	**Blue sessions, The Blue Cluster, Ghent, Belgium (3 June 2022)** **Nathalie Van Caster**, **Thomas Kerkhove**, Simon Petit, **Annelies Declercq**. Belgian Pilot: Offshore wind, oyster restoration and seaweed cultivation in the Belgian part of the North Sea https://www.blauwecluster.be/sites/default/files/3._united_belgian_pilot.pdf
2022, presentation	**European Maritime Day (19-20 May 2022)** **Jessica Knoop,** Annelies Declercq. Belgian Pilot: Offshore wind, oyster restoration and seaweed cultivation in the Belgian part of the North Sea. https://prod5.assets-cdn.io/event/7979/assets/8346681747-d42ecb86f0.pdf

	Third UNITED webinar (17 May 2022)
2022, presentation	**Annelies M. Declercq & Jessica Knoop.** Belgian Pilot: Offshore wind, oyster restoration and seaweed cultivation in the Belgian part of the North Sea
2021, presentation	EATiP online conference (24 November 2021)
	Nevejan N. and Declercq A. The multi-use concept within UNITED – Case report piloting offshore wind and aquaculture multi-use in the North Sea.
	https://eatip.eu/wp-content/uploads/2021/10/6-UNITED-PRESENTATION_EATiP_final-sans-video.pdf
2021, poster	NORA4 online conference (23-25 November 2021)
	A.M. Declercq, T.R.H. Kerkhove, B. Stechele, A.B.K. Pribadi, B. Groenendaal, D. Vandercammen, E. Pinto da Silva, E. Lataire, E. Lemey, F. Maes, G.V. Fernandez, J. Vanaverbeke, J. Knoop, L. Pilgrim, O. De Clerck, S. Delerue-Ricard, S. Petit, S. Devriese, S.M. Dambalasa, S. Debels, S. Degraer, W. Voorend, W. Versluys, P. Bossier and N. Nevejan. H2020 UNITED: Is scour protection suitable for flat oyster restoration in Belgium? Abstract book p.48. NORA 4 Online - Reconnecting across Europe - ABSTRACTS (noraeurope.eu)
2021, presentation	Second UNITED webinar (27 October 2021)
	A.M. Declercq, Jessica Knoop and Nancy Nevejan, Belgian pilot: wind energy – flat oyster aquaculture & restoration – seaweed cultivation.
	https://www.h2020united.eu/images/10-21-Registration-A4-agenda-v2.pdf
2021, presentation	Aquaculture Europe (14 April 2021)
	Strothotte E, Jaeger M, Lukiç I, Drigkopoulou I, Hoekstra R, Lago M, Mashkina O, van Hoof L, Degraer S, Brouwers E, Nevejan N, Søerensen H, Ziemba A, de Korte E, Santjer R, El Serafy G, **Declercq AM**. Multi-use platforms in marine space – a viable approach for the European maritime industry and local ecosystems?
2020, presentation	NORA3 online conference (4 November 2020)
	Declercq A.M., B. Stechele, A.B.K. Pribadi, B. Groenendaal, D. Delbare, D. Vandercammen, E. Lataire, E. Lemey, F. Maes, G. V. Fernandez; J. Vanaverbeke, J. Knoop, L. Pilgrim, O. De Clerck, S. Delerue-Ricard, S. Petit, S. M. Dambalasa, S. Debels, S. Degraer, T.R.H. Kerkhove, W. Voorend, W. Versluys, P. Bossier and N. Nevejan. UNITED Project – The Flat Oyster Restoration Envisaged in the Belgian Pilot.
2020, organising committee	First Belgian Flat Oyster Day, webinar (24 November 2020 – 71 participants)
2020, presentation	Vlaams Aquacultuur Symposium, webinar 2020 (30 October 2020)
	A.M. Declercq, N. Nevejan, B. Stechele (2020) UNITED – De Belgische piloot : windenergie, aquacultuur en restauratie van platte oesters en zeewierkweek in België
2020, presentation	First UNITED webinar (3 June 2020)
	A.M. Declercq* and Brecht Stechele* Belgian pilot: Offshore wind, flat oyster aquaculture & restoration and seaweed cultivation. The UNITED Project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement no 862915. * presenting authors

6.5. RECOMMENDATIONS FOR THE PILOT

The stakeholder engagement process in the Belgian pilot has demonstrated the added-value of having in-person events: while there was a limited participation of external stakeholder in the pilot during the covid restriction, the organization of an in-person workshop in Ostend in 2022 revealed great interest and a positive state of mind from the participants towards multi-use. A high level of quality in the discussion was achieved and the results will enrich significantly the economic and social assessment of the pilot.

Social acceptance could also benefit from stakeholder engagement activities in the pilot: the local stakeholders are already quite positive about multi-use, but under certain conditions. Creating time and space with these stakeholders to discuss those conditions and build acceptability would be a way to gain their trust and encourage partnerships and initiatives after UNITED.

Given the positive attitude of local stakeholders towards this pilot, a way forward could be to offer further training and lessons learned to a few motivated engineering companies, to enhance their participation in UNITED and encourage them to develop their multi-use skills and expertise.

For future multi-use projects, the pilot recommends gathering a small group of stakeholders from the beginning of the process, with which different aspects of the pilot can be discussed. To ensure its lasting commitment, this core group would need to receive a compensation for its participation, through funding, trainings, knowledge, etc.

References and further reading

Websites :

https://www.h2020united.eu/pilots/2-uncategorised/42-offshore-wind-and-flat-oyster-aquaculture-restoration-in-belgium

https://www.ugent.be/bw/asae/en/research/aquaculture/research/projects/united.htm

Publications : https://www.h2020united.eu/publications

7. GREEK PILOT

The Greek pilot site, known as PATROKLOS, is located in Palaia Fokaia, Attiki and is situated within the Cape Sounion region at the southern end of the Attica peninsula. Cape Sounion was a strategically important location during ancient times due to its location on the main maritime route and proximity to the city of Athens and the Lavreotiki silver mines. The area, which is now protected under NATURA 2000, is a characteristic example of the Mediterranean landscape and includes an area that has been designated a National Park since 1971. It is also considered an important archaeological site, with 68% of the area being public. The site is threatened by human activities such as crop cultivation, pasturing, and residential development, as well as fires. It is protected by the Treaty of Barcelona. The current operator of the site is KASTELORIZO AQUACULTURE, a company involved in the production, marketing, and exploitation of fish farms, as well as the distribution of seafood products in Greece and abroad. The site also includes the islet of Patroklos, which has a popular coastline and can only be accessed by private boats. Patroklos has been designated as a protected ancient area due to the presence of fortification remnants and a shipwreck. KASTELORIZO AQUACULTURE SA operates a fish-farming unit, on floating facilities. KASTELORIZO provides the aquaculture unit that shares the same marine space with the touristic diving activities of Planet Blue SA. The two companies perform a number of co-existence scenarios that are facilitated with the use of WINGS' monitoring and management platform, AQUAWINGS, that is deployed to ensure best multi-use of aquaculture and tourist activities and the minimization of environmental impact.

7.1. Baseline stakeholder ecosystem account in the pilot site

7.1.1. STAKEHOLDER IDENTIFICATION PROCESS

The baseline stakeholder ecosystem assessment was conducted in March 2020. All relevant stakeholders were identified, and some pre-existing knowledge of local stakeholders was determined to be present mainly because the fish farm and the diving tours have been in place for years already.

- **Local authorities:** identified to be mainly neutral towards the existing development given that all the permits have been put in place already.
- **Diving clubs:** in the area and in other localities (for the engagement and making a wider 'diving trail' in the region) – some engagement took place prior to the project and these were mean to be enhanced during the pilot implementation.
- **Fish farm operator and the restaurant** serving the farmed fish: the entity is actively involved in the project as a partner.
- **Local social NGOs and representatives of the local public:** some engagement was in place already before the project due to the environmental and social concerns by the public. The outreach and informational material planned to put in place in the UNITED project we meant to improve the awareness and relations with this target group.
- **Tourism agencies** and other entities involved in the tourism activities like the local info centre, hotels, and other. Minor involvement that was meant to be enhanced during the project.

7.1.2. ENGAGEMENT RATIONAL

The main goal of stakeholder engagement in the Greek pilot project is to increase participation in diving tours and promote sustainable aquaculture practices through tourism. This will not only enhance the tourism offering, but also raise awareness about the benefits of sustainable practices in the aquaculture industry.

7.1.3. PRE-EXISTING CONNECTIONS AND INVOLVEMENTS

Some pre-existing connections and involvements were in place at the Greek site mainly because the fish farm and the diving tours have been in place for years already. Some pre-existing engagement issues were identified mainly due to the negative perceptions by the locals and NGOs about the fish aquaculture. The outreach and information material produced in the project was meant to improve these during the duration of the project. The summary of pre-existing stakeholder connections and involvements at the Greek pilot site is provided the table below.

Table 6 Summary of the pre-existing stakeholder connections and involvements at the Greek pilot site

Key general target groups of the project	Pre-existing involvement yes/no	Explanation of involvement activities
Regulators and policy-makers	yes	The engagement took place prior to the project in order to put all the permits in place for the farm and the diving activity.
Research organisations	yes	Both the aquaculture farm and the diving company has some pre-existing involvement with the research representatives. Mainly for the environmental monitoring and expansion of the sustainable tourism practice in the region.

Classification societies	no	n/a
Insurance companies	no	n/a
Funding bodies	no	n/a
NGOs and other reps of the local communities	yes	Some interaction had already taken place prior to the UNITED project mainly due to the negative perceptions about the aquaculture farming in the region. For example, there is an ongoing engagement with ENALEIA which works on the removal of plastics from the marine environment, among other.
Commercial Businesses	yes	Yes, two commercial businesses are a part of the project 1)Planet Blue (diving center) and 2)Kastelorizo aquaculture farm and restaurant operator. Moreover, involvement with some other diving centers, and retail stores, and tourism agencies was in place prior to the project.
Business support – consultancies	yes	Mainly for the environmental monitoring

7.2. MISSION AND AIM OF THE STAKEHOLDER ENGAGEMENT IN THE GREEK PILOT

The main objective of stakeholder and public engagement in the Greek pilot project is to improve the image of sustainable aquaculture and expand diving activities centered around aquaculture to a wider audience. This includes implementing an outreach campaign and producing informational materials to generate interest and change perceptions about aquaculture. Participants in the diving tours around the fish farm will have the opportunity to see how nature and human activities can coexist sustainably. The integration of sustainable food sources with sustainable tourism and recreation practices requires local support and can bring many social, economic, and environmental benefits to the community.

7.3. GENERAL OVERVIEW OF REGULATORY REQUIREMENTS

In general, it is important to ensure compliance with all relevant regulatory requirements for public engagement in order to avoid any potential issues or delays in the project. Based on the information provided by the pilot leads, it appears that the general regulatory requirements for the pilot project included engaging with authorities to obtain licenses for the two human activities taking place at the pilot site. These have been put in place prior to the UNITED project. There are no additional regulatory requirements for public engagement, specific to the multi-use in the pilot.

7.4. OVERVIEW OF THE CURRENT ENGAGEMENT RESULTS, TOOLS AND METHODS USED

Once the impacts of the COVID-19 pandemic decreased and the weather permitted, the Greek pilot launched its outreach and stakeholder engagement campaign. The pandemic had a significant impact on the pilot's ability to conduct diving tours, demonstrations, and other in-person stakeholder activities at the pilot site. In addition to being subject to travel and gathering restrictions, the demonstrations and training sessions at the pilot site are also dependent on the weather conditions. In-person contact is essential for effective interactions with stakeholders such as local public officials, dive centers, restaurants, farm operators, and outreach partners, as the pilot

activities take place in a coastal area and are closely linked to other local activities and uses. The table below provides an overview of the engagement activities that took place at the pilot site to date.

Table 7 The overview of target groups, engagement tools and methos used and outcomes

Target group	Tools and methods of engagement	Co-creation yes/no	Input taken onboard yes/no	Outcome	Stakeholder engaged (name of the institution)
NGOs and local society	In person meetings, information and demo sessions and outreach campaigns, phone calls	yes	yes	The engagement mainly took place to ensure that the public perceptions about aquaculture improve and to involve as many in the demo diving tours around farms and info sessions to show them first first-hand the synergies between the nature and human activities as well as to let them taste the farmed products. The input was used to improve the diving tour and information provided and the information about the fish taste is transferred to the restaurant serving the fish.	n/a
Outreach partners	In person meetings	yes	yes	Several local entities have been involved in the outreach activities. The informational material about the UNITED, and Greek pilot is now available in all major local public places.	local hotels, info centers, grocery stores, bus station, diving senter, diving and sailing shop, etc.
Fish restaurant and farm operator	In person meetings, phone calls	yes	yes	Fish restaurant was involved in the demo and outreach campaign. Those joining the demo and information session had an opportunity to win a dinner at the restaurant and taste the farmed fish. The campaign raise the visibility of the restaurant, and local knowledge about fish farming.	
Diving centers	In person meetings and joint trainings	yes		Several diving centers have been engaged for the transferability trainings. The aim is to roll-out the concept of synergetic aquaculture and diving in other islands.	Diving centers in the region and in other islands and localities

Organised events

During the summer, the UNITED project held an outreach campaign at the Greek pilot site to raise awareness about the project and invite local members of the public and tourists to participate in diving tours. The campaign included a variety of marketing efforts, such as the "QR code underwater hunt," in which participants could win a

dinner for two at a local restaurant. The goal of the campaign was to engage as many people as possible in the diving activity and showcase the link between marine life and human activities. As part of the campaign, information was also provided to improve public perception of fish aquaculture. However, the timing of the demonstrations was disrupted by adverse weather conditions. The Greek pilot site experienced unusually strong and persistent north winds of 5-6 Beaufort, which made boat diving impossible.

As a result, the diving center, Planet Blue, worked with the aquaculture farm to find a suitable alternative location for shore-based diving. From August to October 31st, 87 divers (34 unique and 53 repeat) participated in the tours, with 11 of them being foreigners and the rest being Greeks. None of the divers had previously dived at a fish farm. In November and the first 10 days of December, when temperatures were unusually high (18-22 C), an additional 17 unique Greek divers participated in the tours, bringing the total number of divers to 104 (51 unique and 53 repeat).

During the tours, the divers were surveyed about their knowledge of fish farms, shown videos about multi-use, and asked for their opinions on the issue both before and after the tour. The majority of local divers initially held negative views about the healthiness of fish from fish farms, citing factors such as a preference for wild fish, a belief that fish from fish farms contain a lot of antibiotics, and concerns about the healthiness of the methods used. However, after learning more about the aquaculture farm and the negative impacts of unregulated free fishing, all of the divers reported that their opinions improved. The pilot project gained valuable insights that can be shared with other diving centers in Greece that are located near fisheries. Planet Blue plans to provide guidance to these clubs on how to potentially offer specialized diving tours, work with fish farm operators, design optimal dive paths, and educate divers on the issue.

A procedural step by step script for the demo and information session campaign was used:

1) Ask attendees about their knowledge on fish farms, and/or let them fill out the first questionnaire available via the QR code,

2) Explain the multi-use in Greece and elsewhere, and the activities of the pilot site,

3) Show the available videos of the multi-use and other communication material

4) Discuss their "new" opinions on the issue and/or let them fill out the second questionnaire available via the QR code.

As a results of the demo and information session the local attendees express strong concerns about the healthiness of the fish in the fish farm. We attribute that to the following factors which the divers discussed:

(a) locals are closer to the idea of wild (which we call fresh) fish being healthier to eat (we use the term fresh to specify fish that comes from free fishing as opposed to fish originating from fish farms). Considering the geography of the land, fresh fish is easy to reach every corner of the mainland, not to mention the numerous islands where fresh fish is easily available and not very expensive,

(b) locals can distinguish the taste between the two kinds of fish and prefer to spend even double €, but less frequently, in order to enjoy the aroma and the benefits of the fresh fish - fish originating in f/f are blamed to contain large amounts of antibiotics,

(c) locals are not convinced that the methods used are healthy - please note that this is the same story that also follows the red meat. You can see in all the local butcheries, signs promoting the local (Greek) meat, as if it is certain that it is superior to the imported one, meaning that the imported red meat is filled with antibiotics, and the animals were never living in the free to benefit from growing up in an open-air land,

(d) however, all of them mentioned that they had a much worse impression before getting to know what exactly goes on in the aquaculture farm and that they were positively surprised (but not fully convinced),

(e) the positive regard was further increased when we explained the perils of free fishing which in more than a few cases, disrespect the rules, overfish and cause serious trouble to the environment.

7.5. RECOMMENDATIONS FOR THE PILOT

While the Greek pilot has made an important improvement in terms of the local acceptance and awareness levels in the future, it may be helpful to address the concerns that locals have about the healthiness of fish from fish farms and the methods used in fish farming. It may also be useful to consider alternative marketing strategies that are better suited to the local context and target audience.

References and further reading

Web page of the ENALEIA.COM which works together with the Greek pilot PlanetBlue partner on the removal of plastics from the marine environment

8. DUTCH PILOT

North Sea Innovation Lab is an independent test site for research, pilots and the upscaling of innovations in the field of seaweed cultivation, floating solar and other renewable energy innovations, and co-use of wind farms. Within the UNITED project, 2 parcels within this test location has been used in order to deploy seaweed cultivation lines by The Seaweed Company and floating solar panel arrays by Oceans of Energy. These pilot deployments were set in conditions similar to offshore wind farms located in the same region and are used as proof of concept for the designs and operations to further integrate these activities within offshore wind installations in the near future. North Sea Farmers Offshore Test Site is located 12 kilometers off the coast of The Hague – Scheveningen covering an area of 600 ha/ 6 km^2 12 km offshore (Harbor Scheveningen). At the site the water depth is approx. 18-20 meters and activities reside within an officially demarcated (cardinal buoys & registered in hydrographic cards).

8.1. Baseline stakeholder ecosystem account in the pilot site

8.1.1. STAKEHOLDER IDENTIFICATION PROCESS

The baseline stakeholder ecosystem assessment has been conducted early in the project in conjunction with Task 1.1. wherein a number of key stakeholders have been initially identified in this pilot in the D5.1 stakeholder register. In general, these include the core participants in the Dutch pilot activities and considerations included the project members participating in the project listed below

- Stichting Noordzeeboerderij/North Sea Farm Foundation: non-profit organization aimed at realizing sea-weed industry in The Netherlands
- The Seaweed Company (TSC): commercial seaweed company cultivating certified seaweed
- Oceans of Energy BV (OOE): first company to design, develop and build floating solar systems that can withstand robust, offshore conditions
- TNO: supports with research on floating solar energy offshore and provides modelling outputs
- Ventolines BV: service provider of onshore wind and solar and offshore wind projects
- Vattenfall: Wind farm operator that is interested in impacts of logistics, governance and insurance in mul-ti-use activities in offshore wind farms.
- Governmental permitting and planning agencies related to offshore energy and aquaculture
- Search & rescue, Commercial shipping, Fishing

8.1.2. ENGAGEMENT RATIONAL

Interactions with stakeholder groups for both floating solar and seaweed aquaculture is required in the context of the Dutch pilot. There are 2 primary venues identified, one is through direct communication with ministerial agencies to discuss requirements, permitting, and key results of the project. Secondly, through communities of practice

and most notably the Dutch North Sea Community of Practice (Nordzee CoP - https://www.noordzeeloket.nl/omgeving/community-practice-noordzee/), in which topical meeting are held in order to discuss developments within certain sectors, barriers and solutions arising in the development and deployment of solutions to sector problems or growth, and general discussions on the state of play and future development of the Dutch portion of the North Sea. Within this CoP there are a wide variety of actors, ranging from the Dutch ministries and agencies, such as RWS-Rijkswaterstaatand and LNV-Landbouw, Natuur en Voedselkwaliteit (Department of Waterways and Public Works and Ministry of Agriculture, Nature and Food Quality).

Through the CoP meetings and the structural and regular meetings with the local municipal and provincial leadership as well as ministerial meetings, particularly with the ministry of economic affairs, the direct and developments within the Dutch seaweed and floating solar industries are regularly shared and communicated to various levels of policy and decision making. Additionally, through these join efforts and meetings, multiple actors and entities within these two sectors are able to communicate their difficulties and progress within the Dutch landscape of scaling activities, seeking additional funding and subsidies, overcoming requirements and permitting, among other barriers and challenges. Aggregating needs and presenting a unified from is a key determinant in the participation of pilot partners within these active groups.

8.1.3. PRE-EXISTING CONNECTIONS AND INVOLVEMENTS

A number of pre-existing connections were in place and involvement took place prior to the UNITED pilot. This was mainly in the context of the wind farm development, a strong and active seaweed development group, and key discussions between offshore renewable energy providers. As the current developments are only on a pilot scale and within a development area, specifically designated for such activities and with existing permits for he execution of such activities, there were no issues or significant social or stakeholder hurdles to overcome in the development and deployment of the pilot activities. Additionally, the North Sea CoP and a number of aggregative and stakeholder workshop events have been continually held within the Netherlands for the development of Marine Spatial Plans as well as the stewardship and governance of marine activities and management. This has been underpinned by the development of a number of future plans for the Dutch Exclusive Economic Zone and Marine Spatial planned to coincide with the execution of the UNTIED project.

8.2. MISSION AND AIM OF THE STAKEHOLDER ENGAGEMENT IN THE DUTCH PILOT

In the context of the Dutch Pilot within the UNITED multi-use project, the stakeholder engagement process has several primary objectives. These include fostering a comprehensive understanding of the impacts, including unforeseen ones, by actively involving a diverse range of stakeholders in the assessment and soliciting their feedback. Additionally, it aims to disseminate progress and developments within offshore floating solar and seaweed aquaculture to other SMEs and developers, facilitating a collaborative approach to formulating questions and addressing the needs of policy makers and ministries. Furthermore, the process seeks to enhance social awareness and acceptance of the concept of multi-use. Lastly, it aims to promote the advancement of the two key sectors themselves, with the goal of expanding their potential in the Dutch Exclusive Economic Zone (EEZ) and beyond, while keeping a keen focus on the integration of multiple activities, as it is becoming a requirement in future policies.

8.3. GENERAL OVERVIEW OF REGULATORY REQUIREMENTS

The Dutch pilot is situated at the "North Sea Farmers" Offshore Test Site, where the "North Sea Farmers" already hold a permit for testing innovations related to seaweed cultivation and various forms of multi-use. Consequently, there was no requirement for an additional permit for the activities within the Dutch pilot, as they fell under the existing permit of the "North Sea Farmers." Regarding offshore wind farms (OWF) in the Netherlands, policy mandates are shifting to a position where OWF must incorporate multi-use capabilities. Although the initial wind farms were restricted to other activities, starting with Borssele and followed by Hollandse Kust Zuid in October 2023, new wind farms will now aim to facilitate multi-use as can be seen by these two cases above. This transition typically occurs after the construction phase of an OWF is completed and the operational phase begins. During this operational phase, the OWF becomes open to multi-use, complete with an area passport specifying the permitted multi-use activities at different locations within the OWF. This approach aligns with the North Sea Agreement, and

regular North Sea Consultations are held every month involving all stakeholders, including new users such as the seaweed industry and floating solar companies, to discuss the implementation of this agreement. The policy framework for multi-use is also a topic of discussion within the "multi-use" working group of the North Sea Agreement. Furthermore, it's worth noting that one of the recent tenders for a new OWF included floating solar as part of the tender criteria. Two upcoming OWFs, including one with Oceans of Energy installation, are slated to incorporate this approach.

8.4. OVERVIEW OF THE CURRENT ENGAGEMENT RESULTS, TOOLS AND METHODS USED

Outside of direct communication and collaboration with the relevant ministries, agencies, and other SME groups to support the development, deployment, and operation of activities of the two pilot activities, the primary method of collaboration was the Dutch CoP. Through targeted and thematic events, industry actors related to or interested in topics ranging from the developments of specific sectors to general guidelines and support for offshore activities, the relevant persons related to topics were collaborated with. Through such meetings, the key finding and issues to be resolved from the Dutch pilot were also shared with other actors within the relevant fields and policy or governmental agencies. The Dutch pilot and pilot partners, shared the results of their work with the relevant authorities, and have successfully secured funding and permission to develop future and larger scaled project. One such notable achievement is the development of North Sea Farm 1, a commercial scale seaweed farm development with significant funding from Amazon to take place off the Dutch coast . Project partner North Sea Farmers (NSF), an independent and not-for-profit sector organisation for the European seaweed industry has banded together efforts with pioneering start-ups, research institutes, NGOs and other stakeholders to develop this scaled deployment within offshore wind park through this work.

8.5. RECOMMENDATIONS FOR THE PILOT

The stakeholder engagement process in the Dutch pilot underscores the value of existing networks and communities of practice. The regular and thematic interactions, initiated by outside forces and aggregating a large collective, often 20+ actors per thematic meeting, resulted in high-quality discussions that will substantially enrich the economic and social assessment of the Dutch pilot. Stakeholder engagement activities within the Dutch pilot have the potential to further enhance social acceptance. Local stakeholders already display a favorable disposition towards multi-use, albeit under specific conditions. Allocating time and space for discussions with these stakeholders to address these conditions and cultivate acceptability would help build trust and foster partnerships and initiatives following the UNITED project.

For forthcoming multi-use projects, the Dutch pilot recommends forming a core group of stakeholders at the project's inception if continual or in depth interactions are required in order to better facilitate the collaboration and cooperation between external group and project groups.

9. RECOMMENDATIONS FOR THE ASSESSMENT FRAMEWORK IMPLEMENTATION

Table 8 Key links and recommendations for the ASSESSMENT FRAMEWORK IMPLEMENTATION

Pilot location	Recommendation for characteristics that may need to be prioritized for monitoring due to lack of information and/or possible impacts
Germany	Completion of the investigation of the social impacts of the pilot, to enrich the prediction stage (box 2) of the assessment framework.

	Continuation of the process with stakeholders (permitting authorities, potential business partners, politicians) to keep on building trust and partnerships and secure the decision stage (box 4) of the assessment framework.
Belgium	Regular information and contacts with the stakeholders involved in the socio-economic workshop or other events related to the pilot. Investigation of the conditions under which each stakeholder would be favourable to an upscale scenario of the pilot, in order to secure the decision stage (box 4) of the assessment framework. Development of local partnerships and knowledge transfer activities to secure its implementation through the dynamic of the local economy.
Denmark	Investigation of the attendee satisfaction with the tour and possible recommendations for improvement. Further investigation of the social and economic impacts that the tours to the wind farm have on the local community.
Netherlands	Further integration of external discussions into the outputs of UNITED. Making use of the wider group outreach and collection of ideas, solutions, and key points for resolution in the short and medium term and translating this to outputs within the UNITED project. Due to the existing structure and frameworks in the Netherlands, the overall activity is quite advanced, particularly when considering multi-use as a topic for integration into off-shore planning and operations.
Greece	Investigation of the social impacts of the pilot, to complete the prediction stage (box 2) of the assessment framework and elaborate mitigation measures of the multiuse scenario to increase the local acceptability of the pilot. Development of regular contacts with a group of local stakeholders from different backgrounds and institutions, that can constitute a group of reviewers at the reporting stage (box 3) of the assessment framework.

10. SUMMARY & NEXT STEPS

Despite being hurdled by COVID pandemic, the project has managed to reach a substantial number of stakeholders, many of them crucial for the implementation in pilots. Over 40 stakeholders have been closely engaged in the pilot sites, with many of the engagements reaching the collaboration level (see table 2) and thus contributing to the better exploitation and uptake of the project results.

The close contact with the local authorities has been established in the NL, DE and BE pilots. Continuous consultations, awareness raising and solutioning have resulted in each of the pilots receiving their operational permits. In the case of Germany, the extensive involvement of the authorities and continuous exchanges have contributed to the co-creation of a new permitting process that was never applied before. The permitting process done in the German pilot will be the guidance for the future multi-use initiatives in Germany.

Most of the pilots have the multi-use sector representatives represented as partners in the project e.g. Oceans of Energy, The Seaweed Company and The North Sea Farmers in the NL pilot or ParkWind in BE pilot. However, in pilots where this is not the case (e.g. Germany) extensive measures have been taken to bring relevant industrial stakeholders onboard. For example, the DE pilot has seen extensive engagement with the operators or the close by wind farm as well as other wind farm in the region and beyond (e.g. Vattenfall, DNV-GL) to discuss the feasibility or multi-use in their wind farms contexts.

Each of the pilots had to have close exchange with insurance companies, to negotiate the insurance premiums and discuss the terms of the new multi-use activity. Improved understanding and capacity on the side of the

insurance agencies is expected pave the way for the future multi-use activities and potentially commercial undertakings in the future.

Most of the pilots had engaged **the local community representatives** especially for the purpose of awareness raising and outreach. For example, in Germany local school have benefited from multiple lessons on the topic of multi-use, while in Denmark and Germany, local municipalities, tourism operators, museums and information centres have been involved in the outreach and exploitation activities.

The table 9 provides a general overview of the engagement activities that have taken place in pilots to date based on the engagement levels specified in D5.2. It is however, important to note that the achieved level does not completely depend on the activities that have taken place within the project but also on the pre-existing levels in each of the sites. Namely, while some of the UNITED pilots have started their activities and engagement from scratch (e.g. DE and BE pilots), some other have had pre-existing activities running for years (e.g. DK pilot), while some already have well established national and local collaboration platforms (e.g. The Dutch North Sea Community of Practice) enabling them a higher level of engagement and better overall knowledge of the stakeholder environment. For this reason, initial scoping that took place under the 5.2 was important to understand the status, gaps and the needs in terms of stakeholder engagement in each of the pilots.

Thus, the table 9 clarifies where the engagement activities may need to intensify in the coming period to reach the planned level of engagement. The dedicated recommendations have been thus specified for each of the pilots, aiming to improve the engagement levels in the framework of UNITED and beyond. Nevertheless, while the 'empower' in general presents the highest level of engagement – this level may not be reachable completely in all the pilots in the framework of the UNITED project. The engagement level reached depends on many factors, such as, pre-existing level of engagement, capacities of those leading the pilot, engagement needs and priorities, as well as the overall engagement culture in the pilot location.

Table 10 Overview of the level of engagement achieved to date in each of the case study sites

PILOTS	Inform	Consult	Involve	Collaborate	Empower
Germany					
Denmark					
The Netherlands					
Belgium					
Greece					
Total UNITED					

Legend

Activities took place and the expected results have been achieved. There are not specific recommendations for the improvement for the future engagement in the pilot.

Activities took place and some expected results have been achieved. There are specific recommendations for the improvement for the future engagement in the pilot.

Some activities took place and limited expected results have been achieved. There are specific recommendations for the improvement for the future engagement in the pilot.