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Version 5

WP2	Deliverable 2.6

MUSES Project

Title: Multi-use concept in European Sea Basins
MUSES WP2 Final Report

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MUSES (Multi-Use) in European Seas project

MUSES Deliverable

2.6: Multi-use concept in European Sea Basins

MUSES WP2 Final Report

30 April 2018

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Sea Basin Reports can be obtained upon request from the MUSES Coordinator, WP2 Leader or Sea Basin Leaders. The Comparative Analysis Report can be obtained upon request from the MUSES Coordinator or WP2 Leader.

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All MUSES Partners contributed to the analysis of specific combinations and/or countries.

LIST OF ACRONYMS

AF – Analytical Framework
AP – Action Plan
AQ – Aquaculture
BE – Belgium
BG – Bulgaria
BS – Black Sea
BSR – Batic Sea
ISMAR - CNR –Institute of Marine Sciences - National Research Council
CY – Cyprus
DABI – Drivers, Barriers, Added values and Impacts
DK – Denmark
DE – Germany
DGE – Diractorate-General Environment
DGMARE – Directorate-General for Maritime Affairs and Fisheries
DGPC – Directorate-General for Cultural Heritage
EA – Eastern Atlantic
EE – Estonia
EMFF/ EC-EFF - European Maritime and Fishery Fund
ES – Spain
EU – European Union
FI – Finland
FLAG – Fisheries Local Action Groups
FR – France
GR – Grece
HR – Croatia
IT – Italy
LV – Latvia
LT – Lithuania
MED – Mediterranean Sea
MMO – Marine Management Organisation
MU – Multi-use
MSP – Maritime Spatial Planning
MT – Malta
NGO – Non-Governmental Organisation
NL – The Netherlands
NS – North Sea
O&G – Oil and Gas
OREDP – Offshore Renewable Development Plan
OW – Offshore Wind
PL – Poland
PP – Project Partner
PT – Portugal
R&D – Research and Development
RI – Republic of Ireland
RO – Romania
RTF – Rigs-To-Reef
SE – Sweden
SI – Slovenia
UCH – Underwater Cultural Heritage
UK – The United Kingdom
WP – Work Package

1. Introduction

This document presents the approach and outcomes of work carried out for the MUSES project under Work Package 2 (WP2) dedicated to the comparative analysis of the multi-use (MU) concept state of development among the five European Sea Basins: the North-Eastern Atlantic (EA), the North Sea (NS), the Baltic Sea (BSR), the Mediterranean Sea (Med) and the Black Sea (BS).

The overall goal of the MUSES project is to develop and propose an Action Plan (AP) which will facilitate the implementation of the MU concept in European Seas, based on innovation and Blue Growth potential. Work in WP2 focused on the examination of the theoretical understanding and practical experience of MU in European Seas. The work comprised of the following steps: (i) identification of MUs (the type of combinations and where geographicaly they occur), (ii) identification of the most important real and perceived barriers and drivers as well as impacts and added values of these MUs, and (iii) depiction of similarities and differences through comparative analysis of MU specificities in various EU seas and oceans.

An analytical framework (AF) (Zaucha et. al., 2017) was developed at the beining of the project to provide the project consortium with the practical research tools necessary to examine the theoretical understanding and practical experience related to MU. The AF postulates guidance for the process of information and data gathering at different levels (from a single country to a sea basin) as well as to structure the stakeholder engagement in order to ensure the needed degree of homogeneity to the analysis for different Sea Basins. This framework structure was also utilised and adapted to develop the Case Study Methodology (WP 3), which maximised the degree of commonality between the two scales of analysis (Sea Basin scale and local scale as represented by the case studies). The AF was modified and adapted throughout the implementation of the Sea Basin activities under WP2 to meet emerging needs. The amendments that have been made to the original AF methodology are presented in chapter 2 of this report.

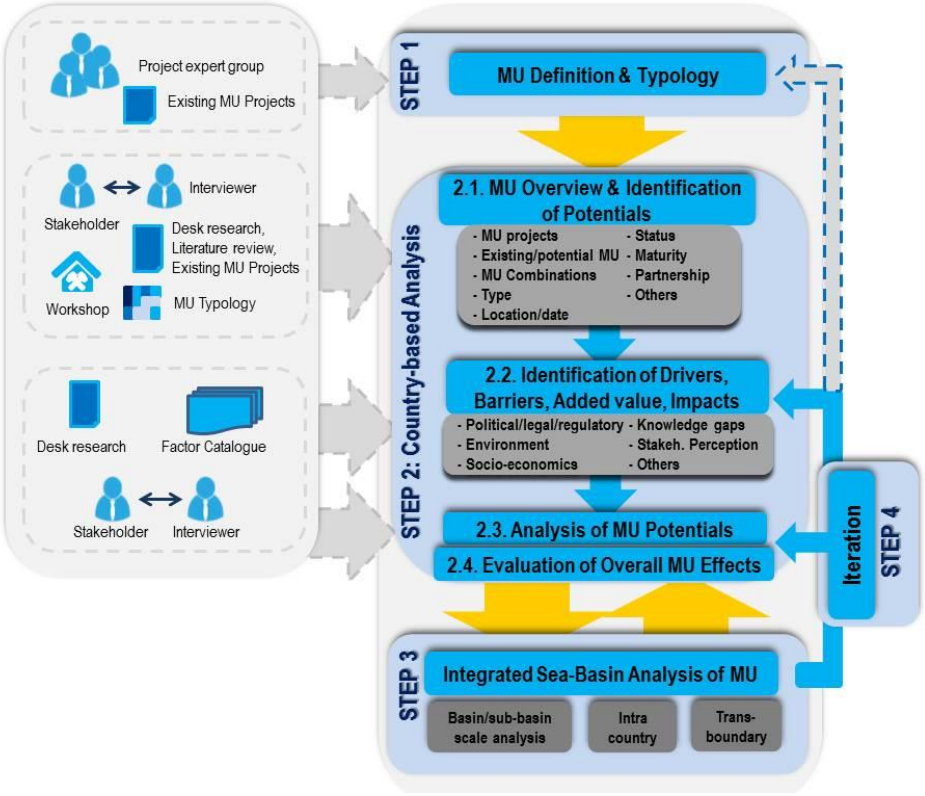

Figure 1. Graphical flow chart of the operational methodology and methods used for data collection and analysis. Source: own elaboration by ISMAR

2. Methodology

Four steps have been defined in the AF used for the MUSES project Sea Basin Analysis, they are summarized in Table 1 and described below, including information on amendments in the AF, where applicable.

Table 1. The MUSES project's methodology for analysis of MUs under WP2 - Analytical Framework.

STEP 1: MU Definition & Typology	
STEP 2: Country Based Analysis Final output : country fiches*, summarising findings related to each country in a common, structured way. The original AF has been further developed at this step: To facilitate the collection of information gathered from interviews with stakeholders in a more unified manner, a template in an Excel sheet was developed. The information in this sheet was compiled on the sea basin level based on desk research and interviews performed in each country adjacent to the given sea basin.	
Step 2.1: MU overview and identification of potentials (country-based)	Identification of MU combinations. Examination on how and to what extent the idea of MUs has been framed so far in key policy documents at the national and sea-basin levels, and and how key stakehdolders (policy makers, regulators) responsible for the development and management of the sea space perceive the idea of MUs.
Step 2.2: Identification of MU drivers,	For each of the MUs identified in step 2.1 DABIs (Drivers/barriers/added values/impacts to MU) have been established by the MUSES consortium/partners based on their expert knowledge and desk research. Identified DABIs were categorised and compiled into

barriers, added values, impacts (country-based)	a catalog that is presented in Annex 1 of this report. All MUs that have been identified in the course of WP2 are presented in Table 2.
Step 2.3: Analysis of MU potentials (country-based)	The drivers and barriers for MU development identified in step 2.2 were evaluated by applying a scoring system. For the purpose of interviews, DABIs were divided into several categories: policy/legal/institutional, social and economic, environmental, technological. Stakeholders were asked to define additional (to those identified in step 2.1) drivers and barriers. Drivers and barriers were then scored by stakeholders according to their knowledge. The original AF has been further developed in this activity. It is important to highlight that some of the interviewed stakeholders were not familiar with the MU concept so their knowledge was sometimes insufficient to valuate drivers or barriers. Where it was not possible for stakeholders to give a score, the score was given by the project partner (sea basin leader) based on reflections of the stakeholder and the project partner's own expert knowledge. In cases where it was not possible to allocate the score to the given DABI, they were left blank. As a result of this step, the most relevant MU combinations at the sea basin level were selected.
Step 2.4: Evaluation of overall MU effects (country-based)	The added value (positive effects) and the impacts (negative effects) related to MU development were analysed. The original AF has been developed further here, as the engagement process with stakeholders revealed that in some cases the lack of current knowledge made it difficult for stakeholders or MUSES partners to valuate (score) added values and impacts. As a result, in some cases the added values and impacts highlighted by stakeholders based on their experience were added to the DABIs description of MUs analysed in a given country without the scores.
STEP 3: Integrated sea basin analysis of MU	The country fiches were synthesized at the sea basin/sub-basin scale to address opportunities and challenges for future MU development. Five Sea Basin Reports were compiled, each has a section with a description of general physical conditions, an overview and analysis on the macro-regional and country level of the governance and legislation system. In each of the sea basins, the three most relevant MU combinations were described in detail (including DABI presentation). The three most relevant combinations were selected based on the stakeholders' preferences: they were either scored highly or, in cases where it was impossible to score, analysis was based on stakeholders' demonstrated highest level of interest.
STEP 4: Iterative analysis	Results obtained from the stakeholders'/MUSES partners' scores (steps 2.3 and 2.4) and from the scaled MU analysis (Step 3) were analysed and compared in order to identify knowledge gaps, identify new elements that need to be considered when analysing MU concept or improve existing ones and compare results within basin/sea-basin and trans-boundary scales. Additionally, it has been decided to extend the comparative analysis with the analysis of the stakeholders interviewed during the working process of WP2, thus introducing the most relevant groups/actors for each MU's concept development. The aim of this analysis was to present stakeholders' perceptions on the most important categories of drivers and barriers for the MUs in their country, as well as to identify stakeholders' perceptions on the most relevant actors behind the different categories of drivers and barriers. Results obtained from the overall process have been used to fine tune the AF as indicated above in this table.

* Country fiches are country overviews, these are internal project documents supporting the elaboration of deliverables. A template for the country fiche is presented in Annex 1.

STEP 1 MU Definition & Typology

The definition of MU has been considered and recorded in the AF. At an early stage of the project, the MU combinations were also compiled from a total of 24 cases analysed in past projects. At the workshop in Poole (see step 2.3), stakeholders were given the opportunity to compare the definition of MU to their personal understanding of MU and add comments and engage in discussions with other stakeholders as well as the MUSES project team about the definition. As a result, the MUSES project defined MU as:

The joint use of resources in close geographic proximity. This can involve either a single user or multiple users performing multiple uses. It is an umbrella term that covers a multitude of use combinations and represents a radical change from the concept of exclusive resource rights to the inclusive sharing of resources by one or more users.

- A **user** is understood as the individual, group or entity that intentionally benefits from a given resource. If a business creates a separate legal entity to exploit an additional resource, this entity is then considered another user.
- A **use** is understood as a distinct and intentional activity through which a direct (e.g. profit) or indirect (e.g. nature conservation) benefit is drawn by one or more users. For the purpose of this definition, a clear distinction is made between different types of uses.
- A **resource** is understood as a good or service that represents a value to one or more users. Such a resource can be biotic (e.g. fish stocks) or abiotic (e.g. ocean space) and can be exploited through either direct (e.g. fishing) or indirect (e.g. nature conservation) uses.

In the course of MUSES project, MUs have been categorized by MUSES partners to two types: 'hard' and 'soft'. They have been classified in these two distinctive groups as both tourism and energy have been found to be the main driving sectors for MU. The tourism sector is mainly a driver for 'soft' combinations, present mainly in the southern Europe. Tourism growth is seen as an opportunity for other sectors to diversify and have alternative source of revenue. The 'hard' MU solutions involve energy sectors and the use of fixed (or floating in a single place) offshore structures (Lukic et al, 2018).

Step 2.1 MU overview and identification of potentials (country-based)

Five European sea basins were analysed: The North-Eastern Atlantic (EA), the North Sea (NS), the Baltic Sea (BSR), the Mediterranean Sea (Med) and the Black Sea (BS) (Fig 2). In total, 23 EU countries in these five sea basins have been analysed (for countries analysed, see Table 3, where standardized country codes were used). 19 MU combinations were identified during the desk research, also based on past and ongoing projects on MU (Lukic et al, 2017). These are presented in Table 2.

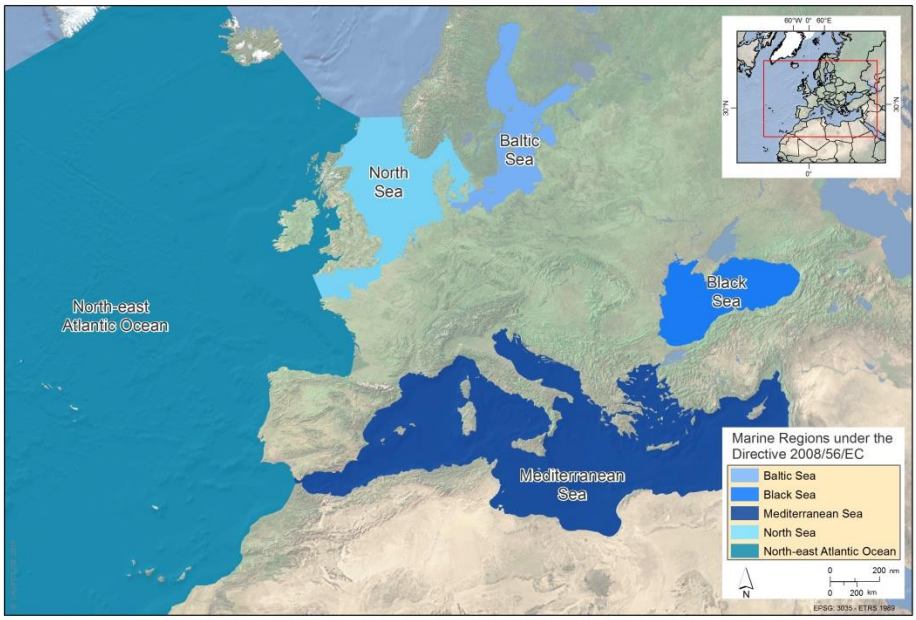

Figure 2. Sea basins analysed for the MUSES project (drawing on Zaucha et al., 2017)

Step 2.2 Identification of MU drivers, barriers, added values, impacts (country-based)

The next step was to define general DABIs for each of the MU combinations. The analytical framework and its operative details consider the following definitions:

- DRIVERS = factors promoting / supporting / facilitating / strengthening MU development.
- BARRIERS = factors hindering / preventing / negatively affecting MU.
- ADDED VALUES = the pros or the benefits or positive effects/impacts of establishing or strengthening MU
- IMPACTS (NEGATIVE IMPACTS) = the consequences or negative effects/impacts of establishing or strengthening MU.

Drivers and barriers have been further defined in the AF and divided into "real" and "perceived" in order to differentiate between the sources of their origin.

Perceived (or soft or societal/cultural) drivers are those related to a stakeholder's mindset. They result from stakeholder's perception or understanding of a certain document, process, risk, situation or actor (including persons or entities).
Examples of perceived drivers include, but are not limited to:

- A high awareness level in the general public of understanding the need to use sea space sparingly,
- Existence of MU concept in the various non-binding documents, reports and expertise,

- Prominent position in societal debates of the issues and problems that can result from MU application (e.g. eutrophication, conflicts between various sectors, etc.),
- Demand for a MU approach from various sea users (that is not proven by an evidence, for instance a market study), their readiness to accept such solutions and even curiosity to explore them (e.g. be engaged in eco-friendly tourism instead of mass tourism), e.g. consumer sophistication,
- MU considered as an important part of corporate social responsibility (CSR).

Real drivers are ones that actually support a MU approach as the result of conscious decisions at various decision making levels, including private enterprises.
Examples of real drivers include, but are not limited to:

- Legislation supporting MU,
- Financing incentives in support of the MU development,
- Highlighting MU benefits over their costs,
- Administrative requirements granting access to marine space with a preference towards MU,
- Existence of "know-how" on MU implementation,
- A sufficient level of technological readiness (TRL) supporting MU,
- Presence of MU and MU related targets in legally binding programmes and policies,
- Important economic role of sectors suitable for MU.

Real barriers are the barriers that do actually hinder MU. Examples of real barriers include, but are not limited to:

- Environmental and safety restrictions required by law, or compulsory standard requirements,
- Insurance issues/policies, e.g. resulting in high insurance costs,
- High costs of infrastructure or combined operations,
- Other more attractive investment opportunities for investors,
- Lack of incentives, i.e. financial (offshore wind investment tax credit), planning (e.g. plans or strategies providing good practices and promoting IMTA) and regulatory incentives (e.g. streamlined application processing in case of more efficient space use),
- Barriers related to technical and economic feasibility e.g. insufficient level of TRL,
- Barriers related to politics, including political targets and goals.

Perceived barriers are the barriers related to a stakeholder's mindset. They result from stakeholders' perception or understanding of a certain document, process, risk, situation or actor (including persons or entities).

Examples of perceived barriers include, but are not limited to:

- Interpretation of directives, laws, regulations, guidelines, and standards,
- Stereotyping potential partners/sectors as ideologically driven, incompetent or old-fashioned,

- Tradition, e.g. traditional fishing or aquaculture practices and equipment are to be preserved and do not allow for combination with other sectors. Hence, there is a lack of tradition for cooperation between the different sectors involved,
- Controversies prominent in public debate (e.g. controversies about aquaculture impact on the environment have arisen in Venice and Po Delta coastal lagoons when clam producers imported a Philippine species that have rapidly spread around the lagoons. However, the risk of a noticeable increase in the nutrient concentration due to this new species is in actual fact very low),
- A lack of knowledge due to the immaturity of the concept (e.g. the MU concept might be perceived as exclusive/limited to the offshore wind farms and aquaculture only),
- Fear of undermining existing policies or breaching the law,
- A lack of trust and/or transparency.

Step 2.3 and Step 2.4 Analysis of MU potentials (country-based) and evaluation of overall MU effects (country-based)

In the next steps, data collection was carried out at a country-level. Data gathered during desk research and interviews with stakeholders was collected in the form of country fiches, accompanied with excel sheets summarising stakeholder interviews.

An important milestone in the collection of data on MUs was the MUSES project workshop 'Multi-use for Sustainable Blue Growth' organized in Poole (UK) on 17th May 2017, held back to back with the European Maritime Day Conference on 18 & 19 May 2017, also in Poole. The objectives of the workshop were as follows:

- Identification of the MU combinations in the five EU Sea Basins:
- Examination of DABIs for identified MUs on the sea basin level;
- Verification of the MU definition developed by the MUSES project partners
- Clarification with stakeholders on their roles and degree of influence in the decision-making process;
- Identification of other potential stakeholders;
- Ensuring good collaboration with attendees and their continued involvement in the MUSES project.

A total of 26 stakeholders from all five European Sea basins attended the Poole workshop and represented a diverse range of institutions and sectors (Charts 1 - 3).

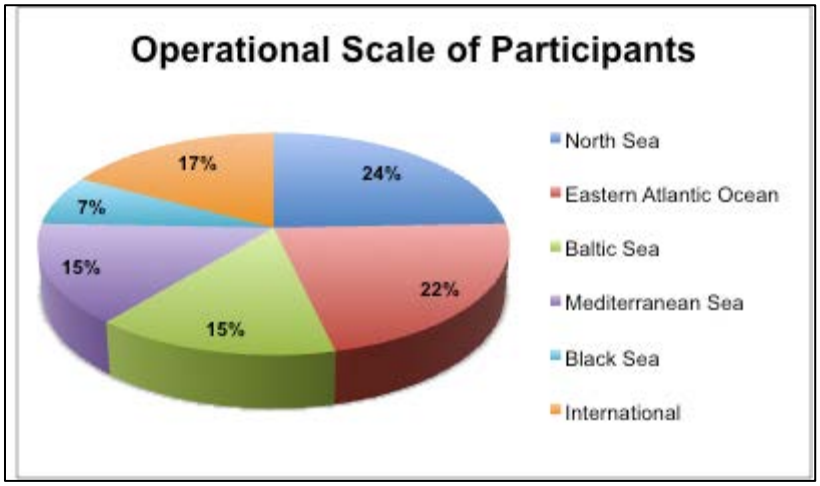

Chart 1. Working scale of stakeholders that participated in the Poole workshop

An equal number of invitations for representatives from international institutions were sent for all sea basins. Nevertheless, disparity appeared due to the multi-scale involvement of some participants whose roles spanned across different sea basins, while also having a priority role at the national scale (illustrated in chart 2). Thus, the distribution of participants appeared to be more intense in the North Sea and Eastern Atlantic Ocean, and with a lesser number of participants involved in the Baltic, Mediterranean and Black Sea.

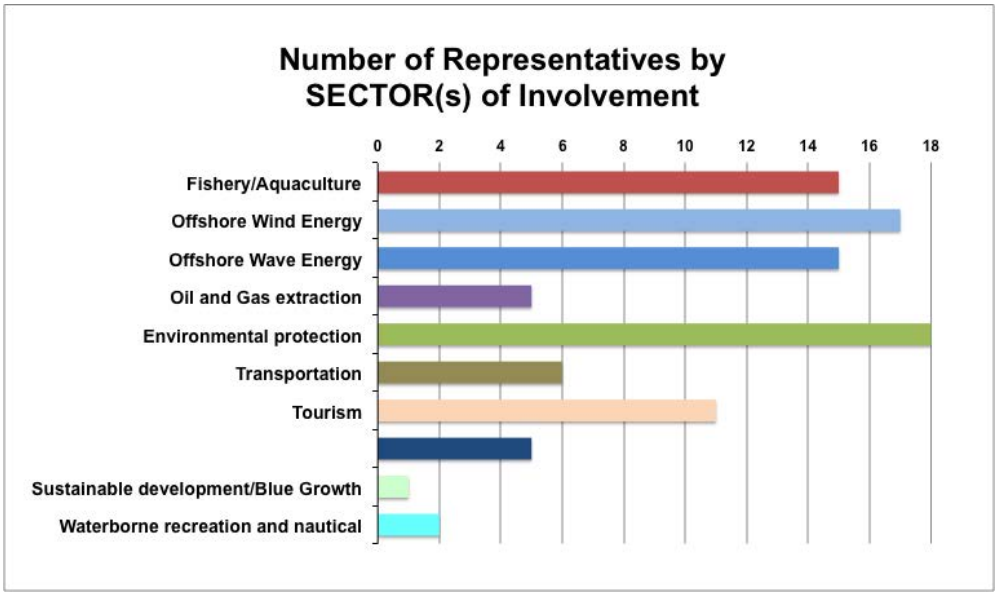

Chart 3. Sector of involvement of participants at the Poole workshop

Different sectors were represented at the workshop in Poole. Nonetheless, a disparity in number of attendees and sector of involvement appeared due to the multi-sectoral involvement of some participants, whose sector of interest extend to more then one sector (chart 3).

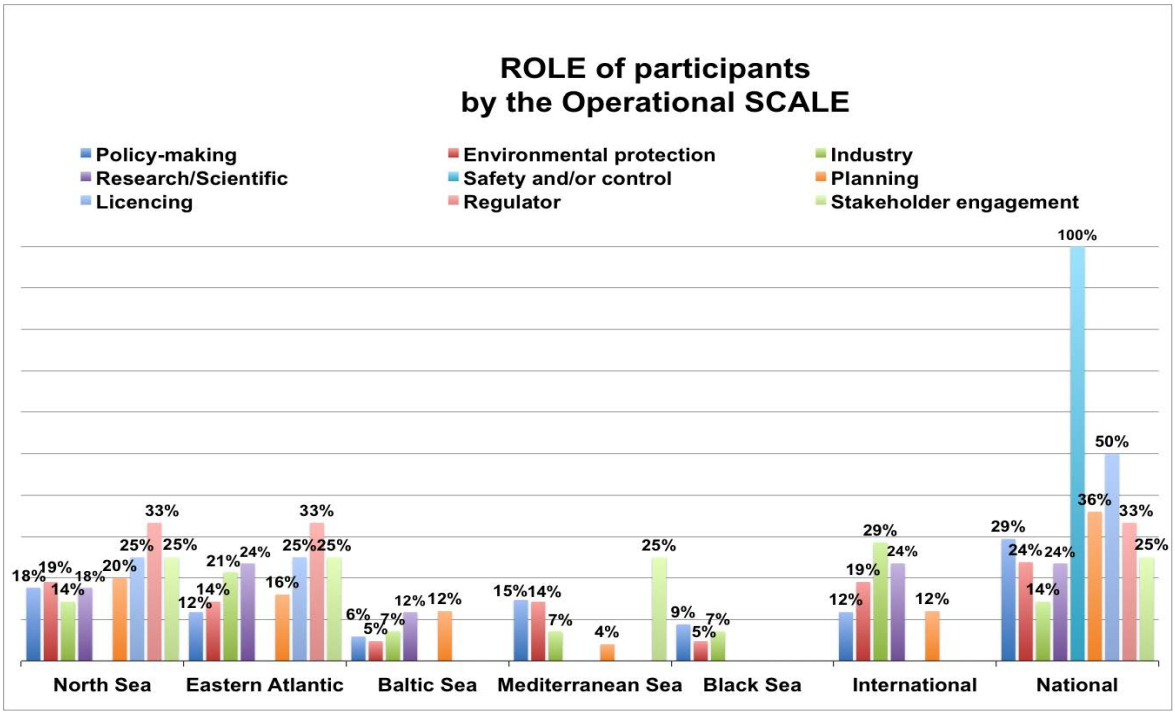

Chart 3. Role of the participants of the Poole workshop by operational scale

The Poole workshop enabled the MUSES project to:

- Verify the initial MU definition and MU combinations and identify new ones, verify initial and identify new DABIs elements for a number of combinations,
- Identify other stakeholders to be approached via interviews,
- Understand stakeholders' perception of the MU concept,
- Identify further case studies and test trials on MU across the EU.

The main findings of the Poole workshop were:

- For MU to be successful, as a minimum two out of three players need have to have a desire to achieve MU: for example, either both sectors or one sector and regulator must have an aspiration for the MU. This finding was later confirmed by the comparative analysis undertaken among sea basins as presented in chapter 4.1.
- There is a strong need and desire among stakeholders for collaboration and enhancement of the MU potentials.

STEP 3: Integrated sea basin analysis of MU

Results of the country-based data collection were aggregated and presented at the Sea Basin level (step 3). The Sea Basin Reports (SBRs) present an overview of the profile and a state of the art in MU practices across the sea basin, including intra-country and trans-boundary aspects. They take into consideration the environmental, spatial, economic and social benefit perspectives, highlighting the challenges for MU development and deployment across regulatory, operational, environmental, health and safety, social and legal aspects. This covers both real and perceived

barriers and opportunities. SBRs provide a thorough description of the three most relevant combinations in the given sea basin, and include additional information on other relevant MU combinantions, in a more general way.

STEP 4 Iterative analysis

The final step was a comparative analysis among the sea basins and a revision of the AF based on Partner findings during the practical application of the AF. Outcomes of the comparative analysis are presented in the following chapters. Outcomes of the AF revisions are presented in Table 1 above.

3. Description of work undertaken in each sea basin

3.1. Analysed MU combinations

Table 2 presents the list of initial MU cominations across all SBs. A totlal of 19 MUs were identified. For the majority of these MU combinations, general DABIs were identified. A list of Initial MU combintations and their DABIs served as the supporting tools for stakeholder intervieviews at the country level. The MU combinations' identification as well as the compilation of general DABIs' was based on a literature overview (at the national and international levels) and an in-depth analysis of past and ongoing projects related to the MU concept. The list of these projects has been presented in the MUSES deliverable titled 'Stakeholders profile report' (Lukic at al, 2017). Both identified MUs and DABIs were presented and discussed with stakeholders at the Poole workshop.

Table 2. Initial MU combinations identified by the MUSES project experts

MU combination name
Underwater Cultural Heritage & Tourism & Environmental Protection
Shipping Terminals & Renewable & Aquaculture & Tourism
Fisheries & Tourism & Environmental Protection
Aquaculture & Environmental Protection
Offshore Wind & Tourism
Offshore Wind & Aquaculture
Tidal Energy & Environmental Protection
Offshore Wind & Wave
Offshore Wind & Shipping Terminals
Tidal lagoon + Conservation + Mariculture + Aquaculture + Recreation + Education/Public Outreach
Tide & Wave
Aquaculture & Tourism
Offshore Wind & Environmental Protection
Oil&Gas & Renewables
Oil&Gas & Tourism & Aquaculture
Offshore Wind & Fisheries
Wave & Aquaculture
Aquaculture & Environmental Protection
Environmental Protection & Tourism

Further desk research (e.g. analysis of scientific papers, projects' reports, etc.), supplemented with information collected during the Poole workshop and interviews with stakeholders, allowed for the identification of 14 MU combinations that were subject to an in-depth analysis at the country level. These MU combinations are presented in Table 3. The analysis of MU combinations were as a first step examined at the country level (identification of MU concept 'existance' in the national legislation of 23 EU countries). Further, the governance systems occurring at each of the sea basins (international dimension) were analysed in order to identify potential drivers of the MU concepts at the macro-regional scale (sea basin scale).

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Table 3. MU Combinations analysed in the MUSES project

	ATLANTIC					MEDITERRANEAN SEA								BLACK SEA		BALTIC SEA								NORTH SEA					
	UK	RI	PT	ES	FR	ES	FR	IT	SI	HR	GR	MT	CY	RO	BG	FI	EE	LV	LT	PL	SE	DK	DE	DE	DK	NL	BE	UK	FR
1 OW & Aquaculture*																													
2 OW & Tourism	E																											E	
3 OW & Fisheries																								E					
4 Aquaculture & Tourism			E					E																					
5 Fisheries & Tourism & Environmental Protection **			E		E	E	E	E																					
6 UCH & Tourism & Environmental Protection ***			E	E				E								E					E								
7 Tide & Wave																													
8 OW & Wave																													
9 OW & Environmental Protection																													
10 OW & Shipping terminal																													
11 Wave & Aquaculture	E																												
12 O&G & Renewables																													
13 O&G & Tourism & Aquaculture																													
14 Aquaculture & Environmental Protection				E	E																				E		E	E	

** In case of FR (MED) OW devices were tested, ** In case of EE this MU involves only Tourism & Environmental Protection, *** In case of BG and RO this MU involves only UCH &Tourism*

LEGEND:

- Existing (ongoing MU in the real environment is indicated with E letter), including pilot/test trials in the real environment, past and ongoing ones – blue
- Potential with at least one of the uses already in place – orange
- Potential with none of the uses already in place – yellow.
- MUs which were evaluated during desk research but were not suggested by stakeholders – purple.

The process of categorising MUs into the four categories in the table above was challenging due to the complexity of identified cases. The 'Existing' category includes cases of trial/pilot cases in the real environment that are ongoing or have been discontinued. In Table 3 above, E denotes those cases that are still ongoing. MUs in the category 'existing' are constituting a separate group providing real evidences on how the MU concept works in practice, they are in opposition to the other two categories, which are essentially hypothetical MU combinations more or less probable. It was difficult to estimate the probability/potential for these MUs to occur (e.g. time horizon). Therefore, after many discussions among the MUSES partners, it had been decided to base the categorisation of these two on the existence of at least one use in the combination.

For each sea basin, the findings from desk research and the interviews were compiled in the report. SBRs present in detail the three most relevant combinations in the given sea basin. Additionally, other relevant MU combinations were described in a more general way. The SBRs present an overview of the profile and state of art of MU practices across the sea basin, including intra-country and trans-boundary aspects. They take into consideration the environmental, spatial, economic and social benefit perspectives, highlighting the challenges for MU development and deployment, across regulatory, operational, environmental, health and safety, social and legal aspects. The most relevant combinations in each of the sea basin (Table 4) were selected based on the stakeholders' preferences: they were either scored highly or, in cases where it was impossible to score, analysis was based on stakeholders' demonstrated highest level of interest.

Table 4. MUs selected as the most relevant in the sea basins analysis (blue numbers indicate the number of countries within the sea basin in which the given MU exists, orange numbers indicate the number of countries in which the given MU has potential as one use is already in place).

	MU name	EA	NS	BSR	MED	BS
MU1	Offshore Wind & Aquaculture	1/2	3/1	1/3	1/1	-
MU2	Offshore Wind & Tourism	1/1	1	3/2	-	-
MU3	Offshore Wind & Fisheries	1	4	1	-	-
MU4	Aquaculture & Tourism	3/1	-	1	3/3	2
MU5	Fisheries & Tourism & Environmental Protection	3	-	1	5/3	2
MU6	Underwater Cultural Heritage & Tourism & Environmental Protection	3	-	4/2	1/4	2

Out of 14 MUs analysed at the country and sea basin level, 8 MUs (Table 5) were selected for a more in-depth comparative analysis. The first six MU combinations on the list in Table 5 are the ones that were indicated as the most relevant in five analysed sea basins, while the last two MUs on the list have been indicated as other combinations important for the respective sea basin and were 'advocated' by the MUSES project partners as the MUs that require greater attention in this analysis as well as in the Action Plan.

Table 5. List of compared MUs in European sea basins.

MU1	Offshore Wind & Aquaculture
MU2	Offshore Wind & Tourism
MU3	Offshore Wind & Fisheries
MU4	Aquaculture & Tourism
MU5	Fisheries & Tourism & Environmental Protection
MU6	Underwater Cultural Heritage & Tourism & Environmental Protection
MU7	Tide & Wave
MU8	Offshore Wind & Wave

Out of eight in-depth analysed MUs, the most frequent (in terms of appearance as existing in EU countries, see table 3) have been the three related to tourism (MU2, MU4 & MU6). The combination of Fisheries and Tourism and Environmental Protection has been tested or established in 10 countries and within three sea basins in which tourism is a driving force for blue growth. Also, the combination of Underwater Cultural Heritage and Tourism and Environmental Protection has often occured (10 countries) in four out of five sea basins. The third most frequent MU is Aquaculture and Tourism – existing (according to the MUSES categorisation) in six member states of Southern Europe located in the Mediterranean and East Atlantic Sea basins. Thus, in the policy supporting MU, tourism as a MU driver should be properly considered. The fourth MU in terms of practical deployment is Offshore Wind and Aquaculture, that has been tested or exists in six countries (though in some cases energy is mainly a supplement to existing aquaculture with no ambition to produce energy for sale). However, some new attempts seem extremely interesting. For instance, in France, three pilot sites for floating offshore wind parks were identified, composed of three to six turbines (about 6-8 MW capacity per turbine; QUADRAN, 2017). They are planned to be operational in 2020, although testing of the floating offshore wind energy devices has already occurred at various stages in the area (De Boer and van der Hem, 2016). The wind farm will be the primary use. The potential combination of the wind farm with multitrophic aquaculture (seaweed, mussels, finfish) is considered as a feasible MU by desk research and according to stakeholders' input. In the UK, the testing of such a combination (shellfish aquaculture and OW farm) has already been performed (trial). The activity involved seabed ranching/cultivation, namely the growth and subsequent harvesting of mussel spats collected from the wild and placed in the OW farm (North Hoyle OWF, Liverpool Bay, Wales, NE Atlantic) (Shellfish Association of Great Britain, 2012; Syvret et al., 2013).

However, in terms of future development, the picture looks quite different. The biggest expectations are formulated by stakeholders towards **(1)** Offshore Wind and Aquaculture as well as **(2)** Underwater Cultural Heritage and Tourism and Environmental Protection. Both MU combinations exist or have development potential (with one use already in place) in 13 and 16 countries respectively (Table 4). Both of these MU combinations have been prioritised in four sea basins, however the first type of MU is not so prominent in the Black Sea and the second one in the North Sea basin. This can be explained at least partially by the physical characteristics of these sea basins and their policy specificities in terms of blue growth. Wind energy is not a priority in the Black Sea, whereas in the North Sea underwater cultural heritage is not regarded as a development driver (i.e. the following sectors take a lead in blue economy: commercial fisheries, oil and gas production, shipping and maritime transport, tourism and offshore renewable energy development). Although not considered as one of the most relevant MUs in the Mediterranean, potentialities for the UCH combination were identified (especially in Spain, Italy, Greece, Malta and Cyprus). The Mediterranean is rich in shipwrecks, airplane wrecks, but also sunk ports, temples, cities, etc. of ancient times, where recreational activities (mostly diving) take place to some extent. Several initiatives for the further exploitation of UCH are ongoing, such as announced plans for the creation of UCH parks to be combined with tourism activities (mostly diving) and environmental assets (see relevant ministerial decisions over the creation of underwater museums in specific areas of Greek seas) or pilot projects exploring the opportunity for the development of international nautical routes.

There is a notable difference between these two combinations. The second one is more established whereas the first one is only planned or regarded as promising. Thus, policy support and measures assisting the combination

of Offshore Wind and Aquaculture seem more necessary if this MU is to turn into a reality. There is a need to support not only technological readiness but also proper programming for MU dedicated to wind energy and aquaculture, and finally there is a need to reconsider administrative procedures (towards a uniformed single procedure for both uses instead of separated ones for each use). From an economic point of view, solutions for covering/sharing the transaction costs of developers of establishing such a MU are worthy to be investigated in depth. Whereas the policy support related to Fisheries and Tourism and Environmental Protection can be much simpler because traditional sea uses are already in place and therefore actions should target the dissemination of good practices, know-how transfer and reduce administrative barriers.

It is not the intention of the MUSES project to quantify the economic analysis of factors identified as DABIs for MUs. However, when comparing the two most promising combinations, one can gain the impression that they are not equal in terms of economic benefits. Tourism related to UCH seems to play a minor role for a tourism industry, whereas renewable energy and healthy food supply are among key economic challenges for future development in the EU. From a local economic development perspective, it is not only a matter of absolute economic value, but relative economic importance depending on the socio-economic conditions. Therefore, also from this point of view, particular attention should be paid to the combination of Offshore Wind and Aquaculture.

The UK seems the unquestionable EU leader in terms of combining various forms of marine renewable energy production. This can be partially explained by the UK sea space specificity e.g. vast areas with high waves and strong tides, but also by the UK policy commitment towards renewable energy as such. The UK experience in combining various forms of marine energy should be considered as important for the entirety of Western Europe (in terms of numerous spill-overs).

3.2.Interviews with stakeholders

In total, 195 stakeholders were interviewed. Interviews were either conducted personally or via emails or phone calls. Of these, 37 stakeholders in the Eastern Atlantic (EA) provided their opinion on the relevant DABIs for the MUs identified in this sea basin (for the countries ES, FR, PT, RI, UK). 38 stakeholders were interviewed from the North Sea (NS) basin (for UK, DK, DE, NL, BE). In the Baltic Sea region, a total number of 48 stakeholders were interviewed for 8 countries (SE, DE, DK, FI, EE, LV, LT, PL). The panel of interviewed stakeholders for the Mediterranean Sea (MED) consisted of 53 respondents. In the Black Sea (BS), 19 stakeholders were interviewed for the EU countries in this sea basin (BG, RO). Outcomes from the interview were collected at the sea basin level in excel files (one per sea basin, a template of the file is provided in Annex 2).

A number of MU combinations explored in the MUSES project are characterised by a diverse range of individuals, groups and organisations with common and/or competing interests operating at a variety of spatial scales. A stakeholder can be any institution or individual who shared experience/ knowledge about the MUs relevant in sea basins, either presenting single use, MU or cross-sector activity (MSP and general maritime activities). Chart 4.1 presents the share of interviewed stakeholders in respective categories for each MU selected as the most relevant in the sea basins analysis.

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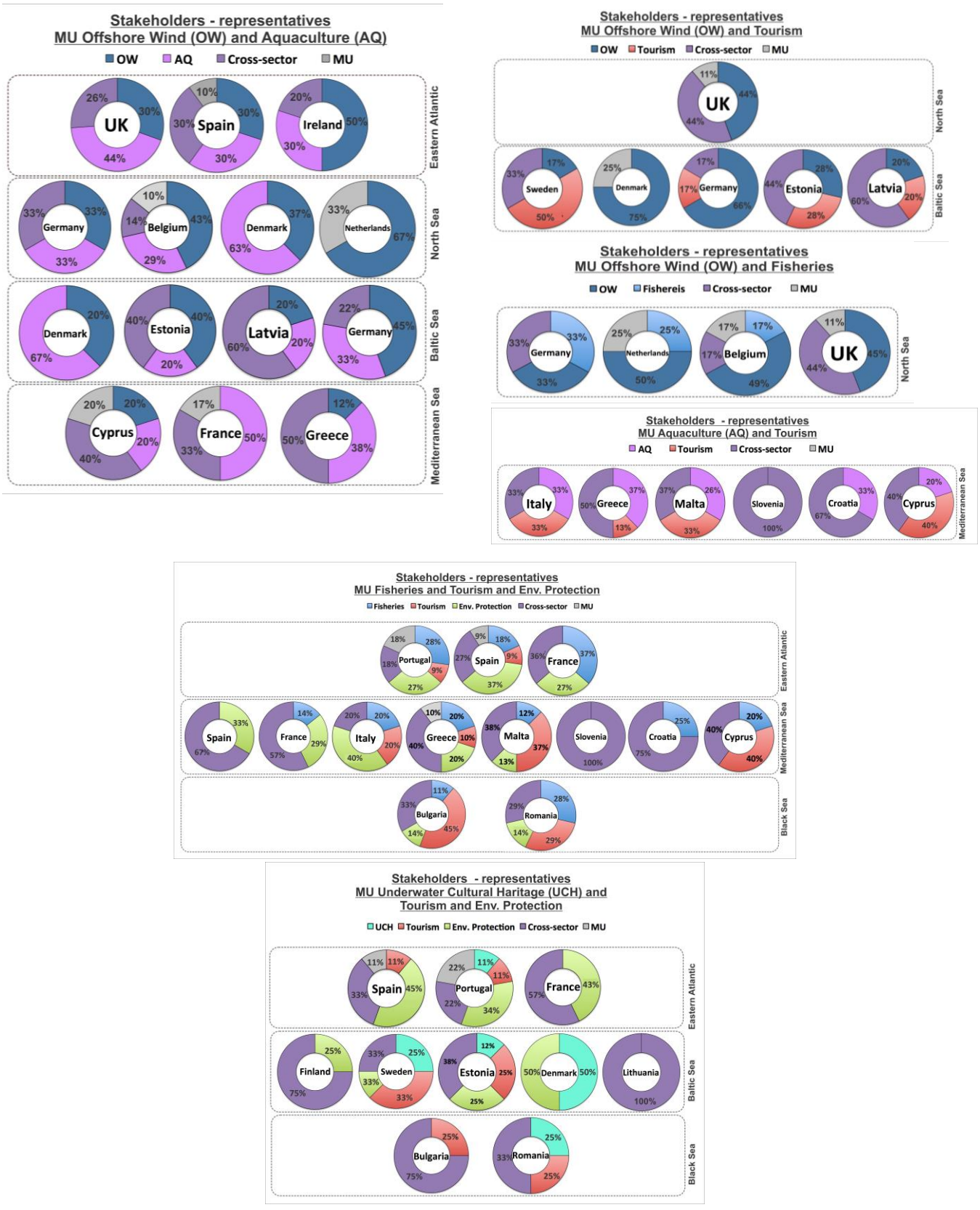

Chart 4.1 Share of interviewed stakeholders in respective categories for analysed MUs

4. Overview of outcomes and findings

4.1. Outcomes from comparative analysis of MU combinations at the sea basin level

International, EU and national legislation and strategies have been analysed in order to identify if and how these acts address the MU concept. Table 6 provides an overview of EU countries where MU has been addressed in national strategic and legal documents. It is important to note that despite the impressive number of legal acts which have been analysed in the MUSES project, apart from the Maritime Spatial Planning Directive (MSP Directive), there is no other EU Directive or international convention in which the MU concept has been explicitly promoted.

Table 6. Overview of the existence of MU in national strategic and legal documents

	EA	NS	BSR	MED	BS
MU in national legislation	UK	NL, BE, UK, DE, DK[11]	DE, DK[11]	IT[8], SI, GR[12], MT[12], CY[12]	
MU at an individual administrative decision level	UK	BE, UK	DK, SE, DE[13]	,IT[8], GR[12], MT[12], CY[12]	
Economic incentives for MU	UK[1], PT[1], ES[1], RI[1]	BE[6], UK[1] FR[2]		FR, IT[8], SI, HR, GR[12], MT[12], CY[12]	
MU at a MSP level - explicit reference of MU in National Marine Plans	RI[12], UK[3]	DE, NL, BE, UK[3]	SE[10]	GR[9], MT[9], CY[9]	
MU in strategic documents	UK[3], PT[5], RI[4],FR[7]	DE, UK[3], FR[7]	DK, DE, SE[10]	FR[7] , IT[8], SI, HR, GR[12], MT[12], CY[12]	

NOTES:

[1] not direct to MU but available from general and sectoral policies

[2] available for R&D

[3] concepts of co-location and co-existence appear in strategic documents

[4] stated in sector and research policies

[5] specific sector regulation mention possibility of combination

[6] not explicit policy-driven incentive; companies are active in driving Multi-use in BE North Sea. The Colruyt group sees it as an opportunity for branding OW and producing local aquaculture

[7] National Strategy for Sea and Coast, Technical notes of the Ministry of Ecological and Solidarity Transition

[8] pesca-tourism

[9] no MSP but there is implicit mentioning of no prohibited coexistence in sectoral plans/laws

[10] Swedish MSP Roadmap Marine Spatial Planning

[11] DK Act on MSP

[12] Not as MU but other terms (Co location/Co existence)

[13] Applicable only to the State of Mecklenburg-West Pomerania, in the Baltic Sea

The analysis reveals an interesting picture: the the UK key policy documents address the MU concept most comprehensively (as co-location, joined use, co-existence of activities). The Mediterranean and Black Sea countries

are slower than Northern Europe in implementing MSP Directive – this may be the reason for no reference to MU in MSP related documents/plans in many of the countires there. Economic incentives for MU are missing entirely in the Black Sea and the Baltic Sea (despite verbal support to this concept in regional strategic documents). MU is also missing in the majority of the Baltic Sea region and Eastern Atlantic countries. The UK Marine Policy Statement (HM Government, 2011) clearly states that the process of MSP should recognize that the demand for space will continue to increase, and as such, MSP should achieve integration between different objectives, and enable the co-existence of compatible activities. It also mentions that a key principle in MSP will be to 'promote compatibility and reduce conflict' of activities. The Marine Policy Statement also explicitly mentions that Marine Plans could 'encourage co-existence of multiple uses'. Co-existence of marine activities is frequently mentioned in the body of the UK Marine Policy Statement as to be promoted by decision makers, including key maritime sectors such as fisheries and aquaculture. Specific examples of such co-existence are also provided for other maritime sectors such as offshore renewable energy and commercial fisheries. This approach is generally followed in the maritime spatial plans for England, Scotland (Scottish National Marine Plan, 2015), Wales (Welsh National Marine Plan, 2015) and the Marine Plan for Northern Ireland – in progres. For instance, co-existence is central in the English East Inshore and Offshore Marine Plan (MMO, 2014): the Plans set forward a key policy with reference to co-existence and provides overarching definitions of the two terms, making the distinction between 'co-location' and 'co-existence'.

In certain cases, although national legislation and MSP plans may not address MUs, sectoral strategic documents can make explicit reference to combination of certain activities, for instance, the Ocean Energy Forum's Strategic Roadmap (2016); the Irish Offshore Renewable Development Plan (OREDP) (DCCAE, 2014) (for wave, tide and wind energy), etc.

In Mediterranean countries MU development follows a different approach compared to the UK. A more careful examination reveals that the countries in this sea basin indeed support MU at various administrative levels and with various procedures. There is a clear focus on some combinations related to the tourism sector, fisheries and environment protection. This means to a large extent: pescatourism (Italy, France, Slovenia, Croatia, Greece), leisure boating and marine recreation (France, Cyprus, Greece) and fisheries combined with environment protection (Cyprus). In particular, economic incentives from the European Maritime and Fishery Fund (EMFF, 2018), bringing together Fisheries Local Action Groups (FLAGs), is a major instrument for the development of pilot projects (EMFF,2018). Malta's focus on MU is on aquaculture, which is also an important MU concern in Greece and Slovenia. In some other Mediterranean countries at the initial stage of their MSP implementation, this process can favour MU development (e.g. Spain), but it is too early to assess its practical importance. For instance, the recently approved French National Sea and Seashore Strategy Framework (early 2017) includes a set of priority actions including stimulation of the blue economy and innovation, the development of synergies among existing and novel uses of the sea, and preservation and sustainable use of the marine environment and its resources (SNML, 2017). Moreover in relation to offshore wind energy, France provides a set of technical notes providing guidelines on the co-existence of other uses in proximity to offshore wind energy parks (NOR : TRAT1721160N, 2017).

The key finding from the comparative analysis among sea basins is that in order to be successful, two out of three players need have to have a desire to achieve MU: for example, either both sectors (e.g. offshore wind and aquaculture) or one sector and regulator must have an aspiration for the MU. The second option prevails in practice. The set up of two sectors can initiate MU if the micro-economic benefits drive the co-operation.

An example is pescatourism, which is very poular in the Meditarenean region and has been developing as a private initiative of the fisheries sector, only slightly facilitated by the legal arrangements. One sector and regulator might start the MU in a situation of positive macroeconomic balance (externalities included). For instance, in the countries with clear renewably energy targets or policies and strong environmental protection measures, there is support for both types of sectors. Public authorithies are willing to pay for their external benefits, i.e. good environmental status or clean energy (reduction of greenhouse gas emissions). All these create favourable conditions for MU if the combination of two sectors offers clear economic benefits to investors. An additional factor can be limited sea space or general desire to plan sea space sparingly. In such cases, spatial order is also seen as a positive externality and the policies, e.g. maritime spatial planning, are adjusted accordingly to incentivise MU in legal and administrative terms. An example is evident in the UK where coexistence is strongly emphasised in key MSP strategic documents.

The analysis performed by the MUSES project has also revealed **key barriers** hindering MU development in EU countries related to national legislation or decisions taken by relevant public authorities. They have been identified in the course of desktop research and analysis of interviews with stakeholders. In examining these barriers, one can notice that much more barriers have been revealed in the countries with advanced MSP processes than in those only at the initial stage of MSP implementation. However, this should be interpreted with caution. It seems that the planning process works as a vehicle for revealing MU barriers and therefore they have been identified more easily in the MSP leading countries and they have also been widely discussed in various documents and reports therein. In the other countries, it is more appropriate to search for barriers through screening stakeholders' opinions. In relation to the Table 3 finding on openness of the Mediterranean countries towards MU, one can expect that they might face new barriers in the future when extending their MU approach to other sectors than tourism and environmental protection. However, those "future" barriers can be identified mainly through investigating stakeholders' mind, i.e. the stakeholders who are aware of MU international experiences. This means transposition of experience from the countries in which MU has been more widely applied (like the UK).

Key barriers hindering MU development in EU countries related to national legislation or decisions taken by relevant public authorities can be grouped into two categories:

- The first group is related to shortcomings in the existing legislation and regulatory framework. 'Siloed', sectoral thinking is frequently mentioned here as well as a lack of MU-friendly legislative frameworks and complicated, troublesome, time consuming administrative procedures (e.g. separate permits or environmental reports for each of the combined uses). This is the most frequently quoted barrier by interviewees during the MUSES stakeholders' engagement process.
- The second group is related to policy issues and results of already made administrative decisions (preferences towards some sectors). For instance, development of sectors that have MU drivers that might contradict the national priorities as is the case with aquaculture and targets of nitrogen and phosphorous for Germany. On the same token, an environmental policy or other policies might be seen as a constraint since for instance many countries do not consider mussel or seaweed farms as ecological measures (reducing eutrophication). Also, defence policy might pose a constraint. In some countries, some uses are excluded (e.g. mussel farming in Belgium or wind turbines in territorial waters in Poland) that makes MU development less probable in those countries' seas. In general, policy support for MU is missing in many countries. In some countries, there are even some restrictions on keeping a minimum distance between two or more

uses in the same area. Another example is the exclusion of certain uses by the already issued decisions and permits (e.g. unprotected cables laid on the seabed in wind farms might exclude fisheries there).

The desk research performed by MUSES also allows for more in depth reflection on the most frequently quoted barriers related to insufficient legislative framework:

- At the EU level, the MU concept has been included in the MSP Directive framework. In article 5, coexistence is mentioned and one part of the preamble reads: 'Maritime spatial planning also aims at identifying and encouraging multi-purpose uses, in accordance with the relevant national policies and legislation'. However, it seems that those ideals may not be put into practice by the decision makers responsible for MSP.
- At the sea basin (macro-regional) level, the MU concept is addressed only indirectly (with some exceptions such as Adriatic Sea). Sea basin documents are usually treated as a 'soft law', but even at the recommendation level MU appears mainly as a plea to use sea space sparingly or to consider the co-existence of various sectors (e.g. environmental protection and some other activities). A more complex approach is very rare. In particular, macro-regional strategies of the EU do not pursue the MU concept sufficiently.
- At the national level the situation varies. It depends on national governance systems, national priorities and awareness of the general public with regard to the management of the sea space. There is no uniform approach among countries sharing the same sea basin. The Baltic Sea can serve as an example: in Germany fishing is not allowed within offshore wind farm areas wheras in Poland it has been considered as a viable planning option from the very beginning. The Polish maritime spatial plan encourages MUs in terms of aquaculture, oil and gas extraction for aquaculture and offshore renewable energy, wheras such concrete statements are missing in maritime spatial plans of other Baltic Sea countries. Despite those striking differences in many Baltic Sea Region research centers, the scientific work is pretty advanced in terms of analyzing MU deployment (Buck et al.; Zaucha 2018). In other sea basins one can find similarities rather in ambivalence towards MU than in pursuing MU in a conscious way.

To summarise, properly addressing of the barrier of insufficient legal framework would require actions at different policy making levels including EU, national legislation and sea basins covering programmes and strategies.

Based on the comparative analysis of the sea basins, one may conclude that in the majority of EU countries, the necessary preconditions for development of hard MUs are missing. Although some sectors (representing the given sea uses) have been identified (either through desk research or through interviews) as the MU concept's drivers, those sectors are related mainly to traditional sea uses such as tourism, fisheries, environmental protection and aquaculture to some extent (e.g. for sea food production), and they facilitate soft MU combinations. Newly emerged blue sectors such as the energy sector or novel aquaculture for environmental protection have managed to acquire MU related experience only in a few countries. In fact, due to physical conditions, at the current stage of their technological maturity they might be developed only in some sea basins. Therefore, MU extension to those sectors and to those sea basins would require policy support and intervention for the enhancement of MU related technology or pilot facilities acting as MU showcases (good practice can be taken from France and the UK - support of floating OW). However, a key problem hindering MU development is not the hesitance of the sectors to explore

MU but rather limited policy will of regulators to enhance the MU concept in practice. MU is mainly hampered by administrative barriers that make MU location more complicated and time consuming in relation to single sectors. This makes MU more expensive in comparison to the single sector solution. Thus, development of MUs becomes less attractive for private investors despite some unquestionable economic benefits MU offers for developers themselves and for entire societies (e.g.Buck et al. 2017). One should underline that regardless of the fact that immediate direct benefits to any of involved sectors might not be present, if social benefits (to a society-at-large or to local communities) on a long term are large, the policy should consider pushing forward the MU concept for sustainable development for future generations. Moreover, despite the fact that it was not specifically addressed by the MUSES research and interviews, the MU concept (in particular hard MU combinations) offers high potential for innovation and entrepreneurship (e.g. diversification of tourism, eco labelling, new technologies, new methods, systems approach, etc.).

4.2. Outcomes from comparative analysis of the MU combinations among sea basins

The most frequent (in total in 23 countries, Table 3) combinations are with Offshore Wind and they appear in all sea basins except the Black Sea. The next is the combination of Fisheries and Tourism and Environmental Protection, which was regarded as the most relevant combination in four sea basins. Also, MU including Underwater Cultural Heritage and Tourism and Environmental Protection was considered among the most relevant combinations in four sea basins. The conclusion is that in the future one should pay particular attention to combinations related to offshore energy and tourism in combination with fisheries, environment protection, underwater cultural heritage and aquaculture. Assistance should be tailored to the maturity level of the supported combinations and the size of barriers hindering their development. Also, sea basin specificities must be taken into consideration (e.g. physical conditions or environmental threats). The support must be adjusted to macro-regional needs (e.g. the priortites specified in the macro-regional strategies). For casting support measures, it is also important to understand the reasons behind stakeholders' prioritisation of some uses by macro-regional experts. For instance, in the Mediterranean Sea basin, combinations related to tourism were prioritised as the most relevant due to their prelevance and importance for almost all countries in the given sea basin. Whereas combinations related to offshore wind were indicated as the most relevant due to the high probability of France to become an EU leader in terms of multitrophic aquaculture combined with floating wind turbines that might offer a breakthrough for this MU in the EU. A similar situation exists in the East Atlantic Sea basin, in which offshore energy combinations were chosen due to UK leadership in this field (relevance for the UK and Spain) and two others were prioritised due to their importance for all sea basin countries except the UK.

Two combinations that were not captured in the eight combinations selected for comparative analysis deserve particular attention. Both are connected to environmental protection. Thus, this sea use might also deserve specific attention in terms of its ability to enhance MU besides tourism and wind energy. Aquaculture and Environmental Protection exists in eight countries and is expected to be developed or considered as promising in more (based on expert opinion) (Table 3). This means it has been regarded as promising and relevant in more EU member states than the top rated (in terms of future development) combination of Offshore Wind & Aquaculture. The deployment of this combination in some sea basins (e.g. the Baltic Sea) is dependent on changes in environmental policy that currently pays more attention to reducing nutrient loads to the sea than to extracting nutrients from the sea (while novel aquaculture is an ecological measure to extact nutrients from the sea). Another interesting combination is Offshore

Wind and Environmental Protection. It is non-existent so far but it scores very high in terms of its potential (in eight member states it has been considered as promising, i.e. having high potential). The main problem with this combination is the need for more solid information and evidence on the impact of wind energy on the environment. One can find here some synergies (e.g. artificial reefs, places of refuge for some marine species) but also some negative impacts (e.g. noise pollution, or blockage of some migration routes of avifauna). This combination seems more prospective in the western BSR and North Sea due to the advancement in the offshore wind energy development in these areas. Both combinations discussed above were not included as the most relevant MU by stakeholders at the sea basin level and therefore they have not been selected for in depth examination.

Another potential MU refers to the re-use of O&G decommissioned platforms in terms of re-purposing the infrastructure as a tourism attraction site (including marinas, recreational diving or fishing), supportive/logistic infrastructure for wind renewable energy development or as artificial reefs into a Rigs-To-Reef (RTR) concept. In particular, the RTR concept is feasible to enhance biodiversity and support commercial fisheries and tourism activities (e.g. diving and recreational fishing; AOGHS, 2017). Worldwide, until 2025, more than 6500 O&G rigs will be decommissioned, disclosing an unprecedented potential for the creation of large underwater reefs (Macreadie et al., 2011). In the Mediterranean Sea there is an existing example of the AGIP drilling platform Paguro, that sank after a fire in 1965 about 12 nm off coasts of the Emilia-Romagna Region (Northern Adriatic Sea; (Barbanti et al., 2017), and acts as artificial reef attracting about 4000 divers annually, therefore creating an economically valuable attraction site for the region (Ponti et al.,2002).

Knowledge gaps

Knowledge gaps that might hinder the success of the MUs implementation, which have been identified in different sea basins, can be grouped into three main categories:

(i) Technology constraints:
These gaps are particularly related to offshore energy infrastructures (especially wave and tide) as well as to offshore aquaculture techniques.

(ii) Economy of MU - costs and benefits for both uses as well as for the society:
Starting from regulations and procedures (e.g. licensing), through efficient incentives and fair insurance schemes, ending with socio-economic benefits and threats (e.g. health, security and safety aspects, conditions and demands of local/regional markets etc.) - the whole life cycle of the MUs (from planning to decommissioning) is actually not well recognized (there are hardly any economic data that one could use for a standardized feasibility assessment of a given MU).

(iii) Environmental impacts:
Knowledge of impacts is highly related to the implementation status of the MU. Direct and cumulative MUs impacts on the marine environment are to a large extent uncertain as well as the ecosystem response to the MU operations in certain sea areas.

Additionally, the lack of a tailored stakeholder communication and engagement strategies accompanying processes of schemes, plans, and project consultations was underlined by stakeholders (especially from the Eastern Atlantic Sea basin) as the important factor that may negatively influence the development of the MUs.

Overcoming these knowledge gaps does not necessarily require transnational co-operation, however – as underlined especially in the Mediterranean Sea basin - intergovernmental discussion would support national identification of bests practices and enable the sharing of experience (and resources) in joint environmental and socio-economic feasibility studies, particularly in the case of O&G decommissioning practices. Also, transnational cooperation aimed at recognizing (and standardising) the economic life cycle of MUs would be more efficient than individual country/local efforts.

While comparing the **drivers** for different types of MU, one can notice very striking similarities:

a) For the majority of MUs, existing drivers prevail over perceived drivers. This highlights the need to strengthen outreach and promotion of the MU concept in order to reinforce existing drivers with the perceived ones.
b) For the majority of combinations, the important existing drivers have been identified. Some exceptions are related to the combinations being at an early stage of their conceptual and technical development.
c) It is worth noticing the importance of EU policies as a key existing driver. This driver can be strengthened further in the future resulting in a spill-over towards national policies.
d) Macroregional strategies can play an important role for perceived drivers. However, in many cases this driver is weak at the moment.

The mix of relevant (suitable) drivers differs for various MUs. In fact, some MUs do not need extensive policy support or external financing among their drivers and they might appear as a result of pure economic drivers, i.e. market decisions of investors (those related to tourism with the notable exception of MU2 – Offshore Wind and Aquaculture and MU5 – Fisheries and Tourism and Environmental Protection). Conversely, for some other drivers (mainly those related to the renewable energy) external support (funding policy support, legislation) plays an important role. Thus, the list of drivers should always be analysed while having MU specifically in mind if one plans to strengthen a given combination. External public support should be designed/tailored only after collating drivers with barriers that might serve as a source of information on the real efficiency of the drivers.

Comparing the **barriers** for different types of MU lead to the following conclusions:

a) For the combination of wind farms with well established sectors (aquaculture, tourism, fisheries), one of the key problem lies with insufficient legislation, administrative procedures neglecting the MU specificity (designed from a sectoral perspective) and a lack of integrated policies. Also, a lack of MSPs is important in this case, with the reasoning being a silod type of policy design.
b) Development of those combinations might also be hampered due to the sea safety regulations and high cost related to securing safety of a MU. An unclear insurance policy framework has been frequently referred to as well.
c) In the case of aquaculture, insufficient technology might create a real problem (offshore locations, harsh conditions, etc.).
d) For some combinations - in particular MU1 – Offshore Wind and Aquaculture and MU3 – Offshore Wind and Fisheries - timing of planning and programming might also create a problem. Some decisions enabling a MU approach must be made at an early stage of development of the offshore wind farms. Otherwise, the combinations become unfeasible.

e) For the combinations relating to tourism (MU4-6), the key problem is the economic viability of such combinations. If the demand is sufficient, it seems that those combinations will expand with or without very targeted support in terms of legislation and technology.

f) For combinations related to various types of renewable energy generation (MU7 & 8), a key barrier today is in technological progress and in the leasing and planning regime. However, other new barriers may well emerge after overcoming these initial barriers.

Added values of MUs identified in the course of MUSES project reflect the status of the MU concept employment in the sea basins. For existing MUs (being it trials/pilots), it is difficult to provide sufficient evidence to assess/ verify actual added values and impacts of the MU as such. Therefore, added values and impacts identified in sea basins reflect stakeholders' or MUSES project partners' perception of MUs rather than the MUs actual performance. An important observation is that added values and impacts seem to be much more connected to MU combinations as one 'entity' in contrast to barriers and drivers (these often are connected to only one of the uses in the combination). This indicates the actual acceptance of the MU concept and reveals a huge belief that in the global bio-economy, the MU concept offers much more than a narrow-gauge individual sectoral perspective. Added values depicted from the analysis refer to two main domains: economy and knowledge (understood as learning and education).

Added values in the domain of the economy:

- from an investor's perspective: increased income through diversification of offers and creation /expansion of new markets, labelling of local products, reduction of costs due to synergies, transfer of technologies, expansion to other uses (MU starting with two uses may be expanded to other uses), increased social acceptance.
- from a regional/local economic development perspective: indirect spin-off effects (e.g. development of local ports), fostering local actions towards renewable energy goals, local products development, restocking of marine resources (local fisheries), upgrading the environmental status of the marine environment (better environment, better income), enhancing structural support for new SMEs and specialised job creation.

Added values in the domain of knowledge:

- from a sectoral perspective: a better understanding of needs and expectations leading to R&D inspirations and innovations,
- from a governance perspective: smoothing processes (e.g. conflict resolution, planning the space versus using the space: planning demands foresight, decisions demand evidences), building social awareness on UN and EU sustainable development goals (spreading knowledge, building acceptance to efficient use of scarce marine resources, education, increasing local community understanding and engagement).

Given that the MU concept is in its infancy stage throughout Europe, it is difficult to subjectively asses the **impacts** of the given MU combinations (be it positive or negative), the impacts depicted from the analysis actually reflect identified knowledge gaps (see above). Actually, the majority of impacts defined by stakeholders are human and environmental potential risks rather than actual influence of MU performance. The analysis highlighted that further research is needed to understand negative implications of MU combinations in particular focusing on new impacts generated by the integration of two or more sectors.

4.3. Outcomes from analysis of stakeholders' perception of MUs and the actors behind the drivers and barriers

Presenting different stakeholders' perception and knowledge required clear criteria for placing them into a relevant category. The criteria used in the MUSES project analysis are presented in Table 7, they were developed based on the experiences gathered during the elaboration of stakeholders' profiles and from the workshop in Poole (there we found that one person had knowledge on more than one aspect/sector/use). The approach taken to present different stakeholders was through categorization on: sector/use, cross-sector and MU perspective. This implied that one stakeholder could be counted/presented as a representative of one or more category.

Table 7: Stakeholder categories and criteria used in the MUSES project in the analysis of stakeholders' perception

Categories	Counting
Category 1: Stakeholder is considered to present one use/sector if the person was able to discuss only one use	1 stakeholder = 1 use perception
Category 2: Stakeholder is considered to present more than one use/sector if the person was able to discuss more than one use	1 stakeholder = 'n' use perceptions
Category 3: Stakeholder is considered to present knowledge about the MU perspective if directly involved in previous projects concerning the given MU or in implementation of the given existing* MU Stakeholder cannot represent 2 uses and MU at the same time. Either 2 single uses or MU perspective.	1 stakeholder = 1 MU
Category 4: Cross-sector stakeholders can be any institution that has cross-sector experience (MSP or general maritime field)	1 stakeholder = 1 cross-sector
Category 5: Cross-sector stakeholders can have cross-sector perceptions and perceptions of one or more single uses. This category refers to stakeholders who were able to discuss all MUs. If PPs consider a stakeholder from the cross-sector (e.g. MSP) has relevance also for the single use, the stakeholder will be counted as representative of the cross-sector category and for a number of single uses of relevance.	1 stakeholder = 1 cross-sector + 'n' uses

* Term 'existing' in the MUSES terminology defines existing MUs including pilot/test trials in the real environment, past and on-going ones

** Cross-sectors categorization refers to organizations working in a general maritime field or field applicable to all MU combinations relevant in the Mediterranean Sea basin (MSP planner or any other organizations/individuals working in a general maritime field, e.g. maritime strategies, general research and innovation, etc.).

An overview of the stakeholder categories, which were important knowledge sources for analysed MUs, identified as the most relevant at the sea basin level, is presented in Table 8. The analysis also identified and suggests groups of stakeholders that should be further approached in order to get a better understanding of the MU concept from different stakeholder groups – these groups are also presented in the Table 8.

Table 8. MUSES knowledge source categories of stakeholders and stakeholder groups to be more involved for understanding MUs

MU combinations	Stakeholders groups identified as important knowledge sources	Stakeholders groups to be involved more
MU1 Offshore Wind and Aquaculture	MU: - Spain (EA) - Belgium, Netherland (NS) - Cyprus, France (Med)	MU: Practitioners from the existing/tested sites from UK (EA), Denmark (BSR and NS), Germany (NS)

	Cross-sector: - All SBs (EA, NS, BSR, MED) - Countries where OW is still in planning/developing phase (Latvia and Estonia) Single uses: OW sector - Eastern Atlantic and North Sea Aquaculture - Mediterranean sea	Cross-sector: Belgium and Denmark (NS, BSR) Single use: OW – Mediterranean Sea (Cyprus and France)
MU2 Offshore Wind and Tourism	MU: - UK (NS) - DK (BSR) Cross-sector: - UK (NS) - Countries where the MU may be seen in "planning" stage (LV, EE) Single uses: - OW - North Sea (UK), Baltic Sea (DE, DK) - Tourism – Baltic (SE)	MU: Practitioners from the existing/tested sites in the Baltic Sea (i.e. Sweden and Germany) Cross-sector actors from Denmark Single uses: Tourism – Denmark and Germany (BSR)
MU3 Offshore Wind and Fishery	MU: - Belgium, Netherland, UK Cross-sector: Single uses: OW sector – North Sea (UK, NL, BE)	MU: Practitioners from the existing/tested sites in Germany Cross-sector: Netherland Single uses: Fisheries - UK
MU4 Aquaculture and Tourism	MU: - None Cross-sector: - All countries - Dominant in HR, SI, GR Single uses: - Aquaculture - Cyprus, Italy, Croatia and Malta Tourism - Cyprus, Italy, and Malta.	MU: Practitioners from the existing/tested sites in the Mediterranean (i.e. IT, GR, MT) Single uses: Tourism – Slovenia and Croatia
MU5 Fishery and Tourism and Environmental Protection	MU: - Eastern Atlantic - Portugal and Spain. Cross-sector: - Dominant for Mediterranean Sea Single uses: - In Eastern Atlantic and Black sea	MU: Practitioners from the existing/tested sites in the Mediterranean and Black Sea Single uses: Tourism – Mediterranean and Eastern Atlantic Fisheries – Mediterranean (ES, FR, SI) and Black sea (BG)
MU6 Under Water Heritage and Tourism and Environmental Protection	MU: - Eastern Atlantic - Portugal and Spain Cross-sector: Dominant in all SBs (exception only DK) Single use: Env. Protection – Eastern Atlantic and Baltic Tourism – Black sea UCH – Baltic Sea	MU: Practitioners from the existing/tested sites in the Baltic and Black Sea Single uses: Tourism – Eastern Atlantic and Baltic Sea (FI, DE) UCH – Baltic Sea (FI, SE, EE, DK) and Black sea (BG, RO)

** Practitioners are persons having experience with MU (either existing ongoing ones or past pilot/test trials).*

It may be concluded that, according to stakeholders' perceptions, the most important actors that can positively impact/influence MU development for all identified categories of drivers and barriers are regulators. The policy makers and responsible ministries were the stakeholder-types suggested to be supporting and problem solving for the MU concept and able to attract more uses to 'the game'. Funding organisations (programmes) and technology (R&D) development initiatives are expected to provide direction and guidance (both independently and collectively) for the MU concept and contribute to a better understanding of regional objectives. Development initiatives focused on MU, in order to successfully operate, should be supported by a strong institutional framework that establishes cooperation between different sectors and stakeholders. The MU concept by nature implies multi-jurisdictional solutions (procedures, schemes, etc.) that affect and engaged a multitude of stakeholders from different sectors (often separated by sectoral strategies, etc.).

According to stakeholders' perceptions, policy makers (relevant ministries) are the most important national actors to promote MU development and boost communication by spreading information and bringing together sectors relevant for the MU combinations. For MUs involving offshore wind, the actors behind driving socio economic factors (e.g. improvement of the local economy, acceptance and awareness about the function and benefits of the OWF) in the countries where MU exists in the testing or operational phase (UK, Belgium, Denmark and Germany) are offshore wind developers, municipal authorities, coastal and energy authorities, consultancies and research communities. For MU involving aquaculture, the actors behind driving socio-economic factors in countries where MU exists in the testing or operational scale (DE, BE, DK (NS, BSR), UK (EA), CY, ES, FR (EA), PT), high-level authorities (responsible ministries and national authorities) and EU level actors (EFF) were recognized as the most relevant.

5. Conclusions and recommendations

Conclusions and recommendations presented here are based on the MUSES project work on the analysis of the status of the MU concept deployment in five European sea basins. They are presented in the following order:

i) conclusions and recommendations concerning the MUSES project methodology;
ii) conclusions and recommendations concerning drivers and barriers of MUs analysed in depth during the course of the MUSES project;
iii) conclusions on stakeholders' perceptions of MUs and related drivers and barriers;
iv) conclusions and recommendations towards future research on the MU concept's deployment.

i) Conclusions and recommendations concerning the MUSES project methodology

The methodology employed by the project worked well, as illustrated by the depth of information generated in the conclusions. The strong points of the methodology are as follows:

- It has allowed for the identification of the most important MUs at the sea basin level together with their key drivers and barriers .
- The most important advantage of this methodology was its focus on stakeholder engagement. This in turn has allowed for the realistic verification of the findings retrieved either from desk research and/or in the course of in-depth interviews.
- Thanks to all these, the project was able to deliver meaningful policy relevant conclusions.

The methodology was time and labour intensive. However, one can hardly find an alternative to that if stakeholders' concerns should be fairly taken into consideration. Due to the novelty of the MU concept, the methodology assumed an intensive iterative approach, e.g. repetition of some research segments after acquiring more experience by the researcher themselves. This had positive and negative consequences. On one hand, it allowed for interesting learning experiences and the gradual building up of knowledge on the MU concept, but on the other hand, interactions required time which was very limited for such a short project with demanding deadlines.

However, the methodology also revealed some limitations:

1. Since the methodology was dependent on stakeholders' input, sometimes it was challenging to get a hold of certain stakholders, since some of them were not responsive for several reasons.
2. The method inolved a certain degree of subjectivity. The outcomes were influenced e.g. by the order of interviews and by the nature of informants. In some countries, the interviewed stakeholders demonstrated very visionary and future oriented attitudes, whereas some others were very conservative. The methodology did not allow in easy way to cope with that problem. As already indicated, many of the interviewed stakeholders were not familiar with the MU concept so their knowledge was often not sufficient to valuate drivers or barriers. As the result, in some sea basins some MU combinations have not been considered as a viable and important option by stakeholders (e.g. tourism and nature protection in the Mediterranean sea basin). Only joint discussion of the research team allowed for the detection of such mistakes post factum.

3. An important drawback was related to difficulties in finding common denominators among sea basins. Some countries, being more progressive in terms of MU deployment, demonstrated quite different MU patterns than the rest of the region. It was really difficult to come up with relevant conclusions at the sea basin level in such situations.
4. Given the fact that in most of the countries the MU concept is in a pre-mature stage, the method applied has appeared too comprehensive when it comes to the valuation of added values and impacts by stakeholders.

ii) Conclusions and recommendations concerning drivers and barriers of MUs analysed in depth in the MUSES project

The comparative analysis of the MUs and their drivers and barriers among five EU sea basins might lead to the following conclusions.

1) To be successful, MU deployment requires as a minimum two out of three players willing to establish MU: either both sectors or one sector and the regulator. The second option prevails in practice. The set up of two sectors can initiate MU if the micro-economic benefits drive the co-operation, one sector and the associated regulator might start the MU is in a situation of positive macroeconomic balance (externalities included).
2) There are three sectors that can be considered as MU drivers: tourism, offshore wind energy and environmental protection. They act in different way as they are soft and hard MUs respectively, but their presence might enhance MU appearance.
3) It is important to differentiate between soft and hard MUs. The soft and hard MUs are characterised by different dynamics. They should be analysed separately. Soft combinations can be more easily reproduced – where applicable – in various local sites, wheras hard users face important barriers in terms of minimum investment size and legal arrangements, therefore they must be examined in relation to the ambitions of various public policies.
4) Each sea basin has its peculiarities concerning MU implementation. The tourism sector is a major driver in southern Europe, while the wind energy sector is considered as having important potential in the north and western part.
5) Some countries have particularly advanced MU implementation within certain combinations. This is relevant for existing but also for planned MUs. It may be worth tracking future progress on MU progress in the UK, France, and in Scandinavian countries, particularly Denmark. One of the reasons can be sophisticated consumers (e.g. Danish sea gardens) or sophisticated investors not afraid of technological risks (e.g. floating wind energy platforms). It is important to secure such leadership in the future and extent it to the other member states. In the Meditarenean sea basin, pescatourism has a wide number of experiences and therefore requires special attention there. Thus it is important to follow-up scaling up (in terms of distribution in the basin and the effectiveness) of fishery-tourism initiatives both in the Meditarenean and Black Sea basins who share many characteristics in terms of MU development.
6) Public support to MU development should take into consideration the above findings. Thus, it should be adjusted to the sea basin needs and endowments but also it should take care of the emerging MU and emulated at the national and regional levels.
7) The forms of public support should be adjusted to the stage of maturity of a given MU. At each stage, a different mix of support measures should be offered in line with the key barriers identified for a given MU.

8) Drivers differ among MU combinations. However, for all combinations there is a need to strengthen relevant EU policies and EU macro-regional strategies in their role as MU supporters and promoters.
9) Equally important is to put some effort into MU outreach. This will allow the reinforcement of the existing drivers with the perceived drivers that in general are lagging behind.
10) For combinations related to tourism, the economic drivers seem sufficient. For other combinations, the MU deployment would require dedicated financial incentives. This is because of their high transactional costs that can be treated as a real barrier.
11) In terms of barriers the picture is complex.
    - The combination of the offshore wind sector with other existing sectors faces numerous barriers related to legal and administrative problems and safety risks, but also to economic constraints and in some cases to technological maturity.
    - The combination of tourism with other sectors is hampered mainly due to economic reasons, while admistrative barriers are aslo important.
    - The combination of various forms of energy generation is limited/hampered by insufficient technological maturity.
12) In order to identify possible progress in the development of a given MU, not only peculiarities of sea basins and countries should be considered. There is a need to define dependencies between barriers and drivers in order to better understand the relationships, to define enabling factors and to better design policy support/instruments. It seems that the MUs that have strong drivers behind them also face important barriers. In almost all cases, barriers seem stronger than drivers. This calls for policy support for the development of the MU concept.
13) However, it would be wise to differentiate such type of actions. For MUs with few barriers (e.g. those related to tourism), perhaps focus should be on the reinforcement of drivers. For other MUs, both barriers and drivers should be addressed.
14) There is a need to support not only technological readiness but also proper programming for MU dedicated to wind energy and aquaculture. Also covering the transaction costs of developers for establishing such a MU are worthy to be considered.
15) There is a need to reconsider administrative procedures in order to smooth MU deployment (unified licencing and permitting processes)
16) The policy support related to Fisheries and Tourism and Environmental Protection can be focused on dissemination of good practices, transfer of know-how and reduced administrative barriers
17) The support must be adjusted to macro-regional needs and specificity.
18) MSP seems to play an important role as a driver for many MUs. It goes without saying that the MU concept should be supported under MSP.
19) The potential added values of MUs (recognised by all groups/categories of stakeholders) cannot be proved without well-thought-out and properly programmed field experiments involving both sectors and regulators.
20) Only based on the above proposed field experiments, the impacts of MU can be properly and subjectively addressed.

iii) Conclusions on stakeholders' perceptions of MUs and related drivers and barriers

Stakeholders' perception analysis supports an understanding of how the main drivers and barriers and challenges may be overpassed in MU development, based on the stakeholders'' knowlegde and experience. It also enables a preliminary identification of stakeholders (individuals and institutions) that may be impacted by the MU, or are influential for fostering its development. The analysis also identifies who are the most important actors relevant to take action in terms of different categories of drivers and barriers (i.e. legal, economic, environmental). On a general leve,l one may conclude that:

- Stakeholders representing single a use were the most important knowledge sources for the MU combinations in relation with the OW and aquaculture.
- Representatives of the MUs in combination with environmental protection and UCH were mostly cross-sector stakeholders.
- Representatives of the sea basins differ from the level of development of the MU or single sector (i.e. distribution of representatives and involved stakeholders from the OW sector from Northern European seas was higher than in the Mediterranean sea).

It may be concluded that the common driver for most of the analysed MU combinations is related to policy, legal and administrative aspects. While differences in driving forces for MU development exist in relation with the uses combined. Yet, for 'hard', more industrial and technology demanding uses, economical and technology factors appear to be relevant for fostering the development of the MU concept. For 'soft' uses that are not strictly related to the one place but rather to the larger area (e.g. fisheries), the importance of social, environmental and economic factors is greater.

It is worth noting that the stakeholders' views may differ from what is detected during the desk research: the way that individuals understand systems reflects each individual's perception over the development of new concepts like MU. Thus, it is sometimes difficult to understand the rationality of stakeholders' opinions on the drivers and barriers of the MU.

Important to note is that the driving sector may differ within the SB for a given MU (i.e. example of Baltic Sea for the MUs which involve OW and UCH, that differ moving from the western Baltic where combinations with OW are more rendered and the eastern Baltic where existing MU combinations are the ones related with UCH and environmental protection .

In terms of the actors who may take action and drive development of MUs, the most nominated actors for driving MU are national authorities and relevant sectoral related ministries. While the above mentioned difference in 'hard' and 'soft' uses makes for significant differences between groups of actors who should foster MU development on the national and sea basin level. In the case of the energy and aquaculture sectors, developers and researchers play an important role in terms of securing technologies capable to be combined. National and local level authorities are considered as responsible for the fisheries, tourism, UCH and environmental protection related MUs. It seems that stakeholders from the soft uses (i.e. fisheries, tourism, UCH) must be closely attached to the community and have a sense of belonging to the community. Hence, local level stakeholders (community) have high expectations on the role and involvement of national agencies in assisting the community (economically, socially and in environmental aspects). Stakeholders' perceptions of soft MU combinations development

(i.e. MU5, MU6) may indicate the change from a widespread top-down governance method towards a more decentralised approach.

It may be concluded that, according to stakeholders, the most important actors that can positively impact/influence MU development for all identified categories of drivers and barriers are regulators. The policy makers and responsible ministries were the stakeholder-types suggested to be supporting and problem solving for the MU concept and able to attract more uses to 'the game'. Funding organisations (programmes) and technology (R&D) development initiatives are expected to provide direction and guidance for MU concept and contribute to a better understanding of regional objectives, both independently and collectively (i.e. research oganisations and ministries in the common attempt/ actions /programmes). Development initiatives focused on MU, in order to successfully operate, should be supported by a strong institutional framework that systematizes a cooperation between different sectors and stakeholders. The MU concept by nature implies multi-jurisdictional solutions (procedures, schemes, etc.) that affect and engage a multitude of stakeholders from different sectors (often separated by sectoral strategies, etc.).

According to stakeholders' perceptions, policy makers (relevant ministries) are the most important national actors to promote MU development and boost communication by spreading information and bringing together sectors relevant for the MU combinations. Concerning MUs involving Offhore Wind, developers, municipal authorities, coastal and energy authorities, consultancies and research communities are the actors behind driving socio-economic factors (e.g. improvement of the local economy, acceptance and awareness about the function and benefits of the OW farms) in the countries where MU exists in the testing or operational phase (UK, Belgium, Denmark and Germany). Concerning MU involving aquaculture, high-level authorities (responsible ministries and national authorities) and EU level actors (EFF) were recognized as the most relevant actors behind driving socio-economic factors in countries where MU exists in the testing or operational scales (DE, BE, DK (NS, BSR), UK (EA), ES, FR (EA), PT).

Based on the findings from stakeholder perception analysis, the following conclusions/recommendations can be drawn:

- An effective mechanism to identify and enforce existing regulations supporting MU combinations is needed. Considering that the structure of the interviewed stakeholders for some MU combinations was homogenous, it may be stated that there exists a need for awareness and training actions to be undertaken for the delivery of the expected outcomes.
- Support from regulators from different scales (international, EU, regional sea and national) is expected including promotion of the MU concept benefits. These benefits should be identified in the course of advanced R&D projects.
- A stakeholder engagement and MU awareness strategy must be established to properly deal with the social and authority acceptance of the concept. It is deemed necessary to propose some group discussions and some kind of negotiation process between the stakeholders from the uses compatible for combining.
- Stakeholders should be given the opportunity to obtain knowledge and understanding of the MU, which may require the engagement of specific stakeholders and to be given the opportunity to be educated on the topic.

iv) Conclusions and recommendations towards future research on the MU concept's deployment

As far as future research is concerned, one should continue examinations in following fields:

1. Interplay between single uses and genuine MU barriers
2. Differences between hard and soft MUs
3. Governance delivery in terms of MU (e.g. why the UK government delivers on MU and other governments do not as much)
4. MU incentives (economic, legal, societal initiatives supporting MU),
5. Role of MU in fostering economies of agglomeration,
6. Impact of MU on sea-land interactions,
7. MU cumulative economic, social and environmental impacts,
8. Inclusion of MU under sectoral policies (not only under MSP)
9. Pilot testing of the policies, incentives and governance patterns suitable for MU.

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Annex 1 MUSES Drivers and Barriers for analysed MU combinations

Annex 2 MUSES Country Fiche Template

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Drivers

MU1: Offshore Wind and Aquaculture

Existing
Legislation, policy, strategy in place – promoting, indicating the MU EU: Blue Growth policy, Renewable energy policy, Climate policy, Fishery policy (Aquaculture strategies at countries level) NS and EA: National and sub-national Plans promote co-location of marine/maritime activities (UK Marine Policy Statement; England South, South East Plans, Welsh NMP, Scottish NMP; NL Gebieds agenda 2050 and the National Water plan (2015-2021), Regional development policies (e.g. MED -Occitania Region , BSR/LV – coastal area as the priority development area)
Funding opportunities in place Innovation, fostering MU development through advanced R&D (e.g. MED -Pelagos Project Cluster; national operational programmes dedicated to R&D)
Economic and social factors EA/UK: Successful MU trials in OW Farms (e.g. North Hoyle WF) Spatial efficiency Availability of skilled labour force NS and MED: Energy sector being a major player initiating investments, offering possibilities for combinations with other uses NS: aquaculture developer initiatives in BE (e.g. the Coluryt aquaculture group within the Parkwind OWF) MED: regional initiatives like French Maritime Competitiveness Cluster (a "label of excellence") Demand for seafood products
Perceived
Legislation, policy, strategy in place – promoting, indicating the MU Macro-regional strategies can stimulate MU development (some of them mentioning MU, co-existence, rarely MU is mentioned in the action plans accompanying strategies, none of them have dedicated funding)
Funding opportunities in place EA/UK: Stakeholders mentioned that funds provided for offshore energy constitute a driver for relevant MU combinations.
Economic and social factors BSR/SE Reducing eutrophication with some type of aquaculture (could be good for the OW developer) NS: Increased economic potential for both users through cooperation's and sharing of resources. Shared deployment of ships and personnel can potentially reduce O&M costs

MU2 Offshore Wind and Tourism

Existing
Legislation, policy, strategy in place – promoting, indicating the MU EU: Blue Growth policy, Renewable energy policy, Climate policy, National Tourism Agencies (e.g. Visit Scotland) considering multi-sectoral co-operation and engaging in multi-sectoral approach to blue growth
Funding opportunities in place NS/UK Considerable funds allocated for integration of tourism with OW in rural areas BSR/LV: Availability of funding mechanism promoting OW energy (*should be specified*)
Economic and social factors Existing examples of MU – onshore visitor centres, visits to the OWF (Sheringham Shoal, Scroby Sands) NS and MED: Energy sector being a major player initiating investments, offering possibilities for combinations with other uses BSR/PL: Intensive touristic use of the coast *(to my mind this is a driver in most of the sea basins).*
Perceived
Legislation, policy, strategy in place – promoting, indicating the MU Macro-regional strategies can stimulate MU development (some of them mentioning MU, co-existence, rarely MU is mentioned in the action plans accompanying strategies, none of them have dedicated funding) – this is in fact a proposal to the Action Plan (WP4)
Funding opportunities in place
Economic and social factors BSR: Demand for this type of tourism, opportunity for fishermen to broaden their activity

MU3 Offshore Wind and Fisheries

Existing
Legislation, policy, strategy in place – promoting, indicating the MU EU: Blue Growth policy, Renewable energy policy, Climate policy, Fishery policy
Funding opportunities in place
Economic and social factors NS/BE: existing investigation of possibilities of fishery of lobster and octopus in the OWF. NS and MED: Energy sector being a major player initiating investments, offering possibilities for combinations with other uses
Perceived
Legislation, policy, strategy in place – promoting, indicating the MU Macro-regional strategies can stimulate MU development (some of them mentioning MU, co-existence, rarely MU is mentioned in the action plans accompanying strategies, none of them has dedicated funding) – this is in fact a proposal to the Action Plan (WP4)
Funding opportunities in place
Economic and social factors

MU4 Aquaculture and Tourism (MED)

Existing
Legislation, policy, strategy in place – promoting, indicating the MU
Funding opportunities in place
Economic and social factors Increasing sustainable fish consumption Wide interest in sustainable and local-based tourism Demand for alternative tourism activities
Perceived
Legislation, policy, strategy in place – promoting, indicating the MU Macro-regional strategies can stimulate MU development (some of them mentioning MU, co-existence, rarely MU is mentioned in the action plans accompanying strategies, none of them have dedicated funding) – this is in fact a proposal to the Action Plan (WP4) Existence of MU practices between the two sectors has a long history of interactions – *could be an existing driver if details on this practice would be given.*
Funding opportunities in place
Economic and social factors Need for diversification of income sources by the fisheries sector

MU5 Fisheries and Tourism and Environmental Protection

Existing
Legislation, policy, strategy in place – promoting, indicating the MU EA: Legislation focused on pescatourism and the integration of sectors, combination of uses recommended by strategic plan / management plan BS: clear legislation for both sectors, clear responsibilities, full commitment of central government (Ministry of Environment)
Funding opportunities in place EA/FR: National/Regional/Local funding schemes BS: Funds allocated for implementation of the Municipal Development Plan, Budget funds specifically allocated for management and development of DDBR (Danube reserve)
Economic and social factors BS: Existing fishing ports and a fishing market, fishing and tourism are significant activities in coastal areas Increasing demand for fish products Demand for alternative tourism activities
Perceived
Legislation, policy, strategy in place – promoting, indicating the MU
Funding opportunities in place Dedicated regional funds for the tourism sector exist (e.g. Veneto Region), aimed at the development of business networks. Networks are understood as production chains.
Economic and social factors

MU6 Underwater Cultural Heritage and Tourism and Environmental Protection

Existing
Legislation, policy, strategy in place – promoting, indicating the MU BSR/FI: The regional planning process that had set as one of its goals to develop recreational and touristic use of Kymenlaakso sea areas
Funding opportunities in place EU funding for tourism and env. prot. – *separated, so alignment of funding* could be proposal to the Action Plan (WP4)
Economic and social factors Demand for alternative tourism activities
Perceived
Legislation, policy, strategy in place – promoting, indicating the MU UNESCO Convention on the Protection of the Underwater Cultural Heritage – could be driver if it would address explicitly any MU involving UCH – this is in fact a proposal to the Action Plan (WP4)
Funding opportunities in place
Economic and social factors National Heritage Board gets information about state of UCH from diving clubs - *This is happening in some countries and it should be explored if this can be a driver for the expansion of such activities in other countries.*

MU7 Tidal and Wave

Existing
Legislation, policy, strategy in place – promoting, indicating the MU Policy and institutional context frequently promote development and investment in offshore marine renewables (e.g. Ocean Energy Strategic Roadmap, 2016; Marine Scotland, 2015; OREDP, 2014; Welsh Government 'Taking Wales forward' statement) The Crown Estate ('TCE') (competent seabed authority) agreed seabed rights for six wave and tidal current demonstration zones, with the aim of accelerating technology development and commercialization (Wales: n=2; Scotland: n=2; England: n=2 zones)
Funding opportunities in place Innovation, fostering MU development through advanced R&D (e.g. Innovate UK; SEIA RoI, etc.) – *see also above* Input from past and ongoing projects, e.g. Pelamis/EMEC, Orkney, Scotland; AMETS, Ireland; 'Pembrokshire Demonstration Zone' and 'Wave Hub' site in Pembrokeshire, Wales Offshore renewables developers progressively becoming more engaged in relevant research projects (e.g. MARIBE project; Aquatera and Columbus project)
Economic and social factors
Perceived
Legislation, policy, strategy in place – promoting, indicating the MU
Funding opportunities in place
Economic and social factors MU to reduce operational, maintenance and investment costs Electricity supply - Access to grid especially for rural communities (e.g. Orkney, Scotland, North Sea / NE Atlantic; Wales, NE Atlantic)

MU8 Offshore Wind and Wave

Existing
Legislation, policy, strategy in place – promoting, indicating the MU Policy and institutional contexts frequently promote development and investment in offshore marine renewables (e.g. Ocean Energy Strategic Roadmap, 2016; Marine Scotland, 2015; OREDP, 2014; Welsh Government 'Taking Wales forward' statement)
Funding opportunities in place Innovation, fostering MU development through advanced R&D (e.g. Innovate UK; SEIA RoI, etc.) Input from past and ongoing projects, e.g. Pelamis/EMEC, Orkney, Scotland; AMETS, Ireland; 'Pembrokshire Demonstration Zone' and 'Wave Hub' site in Pembrokeshire, Wales Offshore renewables developers progressively becoming more engaged in relevant research projects (e.g. MARIBE project; Aquatera and Columbus project)
Economic and social factors From developers' perspectives, co-location of OW and wave energy is the ideal MU, considered more '*credible*' than other activities co-located. e.g. the case of 'Floating Power Plant'; and. (i) substantially reducing cost of energy, (ii) having a higher generating capacity per unit of space, (iii) reducing hours of zero (0) power output, forecast error and variability; (iv) Lower transmission infrastructure capacity (compared to an equivalently-sized single OW farm)
Perceived
Legislation, policy, strategy in place – promoting, indicating the MU
Funding opportunities in place
Economic and social factors MU reduced operational, maintenance and investment costs From the industry viewpoint, there exist a strong need to reduce project costs and co-location could contribute towards that. Access to grid, energy provision for rural communities with small access to grid

Barriers

MU1 Offshore Wind and Aquaculture

	Barriers related to policies, strategies, regulations Policy making in not consistent within countries (different levels have different powers) No regulatory framework for MU, complicated separate regulatory frameworks for each of the uses Lack or unclear insurance policy framework (constructions, health and safety issues) Lack of political encouragement (environmental incentives as well as legal and planning incentives) to promote co-localization of OW with other activities Lack of binding MSPs (in some countries like Latvia the OW licencing process can not start before the MSP is adopted) Binding MSP – in some countries commercial aquaculture is excluded by MSP (BE, mussels)
	Barriers related to administrative procedures Separated and often complicated (complex) licencing procedures for each use, lack of clear administrative procedures for MU (permissions, licences, insurance)
	Barriers related to research gaps/ technology/techniques Lack of pilots providing evidences of MU feasibility (e.g. in the Baltic) Lack of technology adapted to the eastern Baltic conditions (e.g. lower salinity, ice etc.) Direct physical connection of aquaculture systems to existing OWFs is not possible unless it was designed for the increased load. Risks related to adding a 'new use' imposed on wind farm infrastructure are largely unknown Offshore aquaculture requires special engineering solutions Aquaculture technologies for harsh sea conditions (strong currents, wind, ice etc.) are not yet ready (developed and tested) Safety issues related with MU operation and maintenance not recognised in depth. Different levels of maturity between the (two) sectors
	Barriers related to economic aspects (e.g. high costs of OWF and aquaculture in offshore sea areas) Unclear drivers/benefits for combining existing OWF with new aquaculture ventures; difficulties in estimating risk costs for adding 'new use' to the existing OWF Lack of funds to scale up High labour costs decreasing profitability of aquaculture at open seas
	Barriers reflecting stakeholders' perception or expert (MUSES partner) judgement/assessment MU concept is new for investors Lack of tradition of cooperation between these two uses

MU2 Offshore Wind and Tourism

Table 18. Barriers for MU2 Offshore Wind and Tourism

	Barriers related to policies, strategies, regulations No regulatory framework for MU, complicated regulatory frameworks for OW Unclear insurance implications for both OW and tourism operators (e.g. Increased risk of collision with OW structure) Lack of political encouragement (environmental incentives as well as legal and planning incentives) to promote co-localization of OW with other activities Lack of binding MSPs (in some countries like Latvia the OW licencing process can not start before the MSP is adopted)
	Barriers related to administrative procedures Separated and often complicated (complex) licencing procedures for each use, lack of clear administrative procedures for MU (permissions, licences, insurance)
	Barriers related to research gaps/ technology/techniques No business cases nor pilot studies exploring potential of this opportunity more in detail (Baltic) Risks related to adding 'new use' imposed on wind farm infrastructure are largely unknown Safety issues related with MU operation and maintenance not recognised in depth.
	Barriers related to economic aspects Unclear drivers/benefits for combining existing OWF with touristic activities; difficulties in estimating

	risk costs Distance of the OW from the shore driving up costs (fuel consumption and working hours) Boat size limitation, consequently number of tourists boarded
	Barriers reflecting stakeholders' perception or expert (MUSES partner) judgement/assessment MU concept is new for investors No collaboration platforms for MU nor interest exists (Baltic)

MU3 Offshore Wind and Fisheries

	Barriers related to policies, strategies, regulations No regulatory framework for MU, complicated regulatory frameworks for OW Lack or unclear insurance policy framework (constructions, health and safety issues) Lack of binding MSPs (in some countries like Latvia the OWE licencing process can not start before the MSP is adopted) Currently no sailing is allowed in near distance of wind farms in the Belgian North Sea Area while om Dutch North Sea vessels are allowed to pass but not fish
	Barriers related to administrative procedures Lack of clear administrative procedures for MU (permissions, licences, insurance)
	Barriers related to research gaps/ technology/techniques Risks related to adding 'new use' imposed on wind farm infrastructure are largely unknown Safety issues related with MU operation and maintenance not recognised in depth.
	Barriers related to economic aspects (e.g. high costs of OWF in offshore sea areas) Complexity for determination of liability for accident and damage of the OW infrastructure Monitoring of vessels: managing the entrance and exit of vessels becomes a complex task when some fishing vessels are allowed and other are not (how to monitor and how much it would costs). Insurance companies do not want to insure damages caused by fishing vessels, because it is very difficult to estimate such risk
	Barriers reflecting stakeholders' perception or expert (MUSES partner) judgement/assessment MU concept is new for investors Certain fishing methods (i.e. dredging) might damage cables connecting turbines (missing data for different depths and methods, based on precautionary principle) Higher risk for maintenance works due to lost fishing equipment (e.g. fishing gears)

MU4 Aquaculture and Tourism (MED)

	Barriers related to policies, strategies, regulations National and EU law have strict rules on hosting public on board. Regulatory framework clearly defines "Pescatourism", but there is no implementing decree for this MU.
	Barriers related to administrative procedures Lack of specific guidelines/license/regulatory aspects.
	Barriers related to research gaps/ technology/techniques Lack of economic models for environmental accounting of natural capital generated by protected areas.
	Barriers related to economic aspects Lack of financial support for adaptation of boats (still to be précised: boats to be used for what?) MU capacity: it is a niche tourism and cannot become a mass tourism attraction
	Barriers reflecting stakeholders' perception or expert (MUSES partner) judgement/assessment Concurrence from other tourism sectors, and also between regions in the MED

MU5 Fisheries and Tourism and Environmental Protection

	Barriers related to policies, strategies, regulations Bulgaria (BS): Long-lasting problems with regulation of local estates (ownership of private property); lack of initiative of local government to solve this problem
	Barriers related to administrative procedures
	Barriers related to research gaps/ technology/techniques Lack of knowledge about possibilities and benefits of MU (EA) Lack of economic models for environmental accounting of natural capital generated by protected areas.
	Barriers related to economic aspects MU capacity: it is a niche tourism and cannot become a mass tourism attraction MU capacity from environmental protection sector perspective (mass tourism may have negative impact on environment) Economic benefits from MU are limited by weather conditions and fishery regulation (fishing ban periods) Limited area for development of tourism (BS) Limited expertise (soft skills) of fishers Other uses may have negative impact on environment on which this MU is dependant
	Barriers reflecting stakeholders' perception or expert (MUSES partner) judgement/assessment Concurrence from other tourism sectors, and also between regions in the MED Mentality of fishers, lack of ideas for organized economic business (Portugal, EA, also MED)

MU6 Underwater Cultural Heritage and Tourism and Environmental Protection

	Barriers related to policies, strategies, regulations In Romania (BS) there is a strict low on shipwreck protection (Strict control by border police, legislation requires wrongdoers to be sanctioned if they enter shipwrecks) In the Baltic Defense Forces are still operating – other sea uses are of lower priority.
	Barriers related to administrative procedures Permitting is fragmented in the coast. Competences are split in different administrations (EA, Spain)
	Barriers related to research gaps/ technology/techniques Natural deterioration of the archaeological material (UCH may 'vanish') Sharing of experience with relevant initiatives in countries advanced in this field such as Finland is not facilitated enough (Baltic)
	Barriers related to economic aspects Tourists target group of this MU may be limited to the ones having specialized skills/permissions In the Baltic economic benefits from MU are limited by weather conditions (e.g. seasonality of diving activities) Lack of funds to start such initiatives (UCH centers or museums are often underfunded) indicated in the Baltic and the Mediterranean Sea basin but one may assume that this refers to all sea basins. New professional profiles and higher specialization of sectors required for this combination (EA, Baltic)
	Barriers reflecting stakeholders' perception or expert (MUSES partner) judgement/assessment Risk of reduction in the budgets dedicated to the protection of natural and cultural heritage Low awareness about possibilities of this combination

MU7 Tidal and Wave

	Barriers related to policies, strategies, regulations Difficulty in licensing different activities as MU
	Barriers related to administrative procedures According to developers, it is not always possible to co-locate activities under the current leasing scheme of TCE (unless demonstration zones) (leasing and planning regime)
	Barriers related to research gaps/ technology/techniques Infrastructure requirements for users differ Different levels of maturity between the two industries
	Barriers related to economic aspects
	Barriers reflecting stakeholders' perception or expert (MUSES partner) judgement/assessment No experience in implementing MU from regulators perspective - this may complicate licensing Funds usually available per either wave or tide developer, developers may compete for same funds - no convergence potential

MU8 Offshore Wind and Wave

	Barriers related to policies, strategies, regulations
	Barriers related to administrative procedures According to developers, it is not always possible to co-locate activities under the current leasing scheme of TCE (unless demonstration zones) (leasing and planning regime)
	Barriers related to research gaps/ technology/techniques Different levels of maturity between the two industries No large-scale analyses and data time-series; available data location-specific. Moving from pilot arrays to commercial arrays is hard. A track record of deployed arrays is needed.
	Barriers related to economic aspects (e.g. high costs of OWF in offshore areas) Deep offshore technology still at relatively early stage of development, facing great challenges especially due to the high design, installation and maintenance expenses; other technologies currently being financially more attractive e.g. fixed-foundation offshore wind For hybrid developments, funding mechanisms are not currently dedicated to hybrid technologies
	Barriers reflecting stakeholders' perception or expert (MUSES partner) judgement/assessment Sources of funding for wave and OW development projects might come from the same funding schemes. As such, developers might compete for the same source of subsidies/funds.

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THE STRUCTURE OF THE COUNTRY REPORT
- name of the country -

Table of Contents

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1. Introduction

Please briefly describe the MU status in the country: do they exist or not, which law/regulation enables MU development, which sectors are the most active in MU development?

2. Methodology

Please present:

(i) The scope of your desk research (what have you studied, including lists of acts and regulations); in case you have been screening existing and finalised projects in the given country, please fill in the below Table 1 (projects are in columns, add as many columns as needed).

(ii) Planned and finally interviewed stakeholders (use Table 2, add as many rows as needed), under the table please provide justification for why some interviews where not conducted (if relevant). IMPORTANT: please remember to fill in the excel sheet (WP2 JOINT SHEET) where you indicate attributes to the SH (geographical scale of relevance, geographical scale and lever of power)

(iii) In your own opinion, to what extent the stakeholders selected match the MUs described in the report?

(iv) The level of anonymity required by stakeholders

(v) Please present in Annex 1 to this report the questionnaire you have used in the interview if it differs from the MUSES template

Table 1. Investigated projects

	Project A	Project B
Project title		
Leader and involved actors		
Type of project (public/ commercial/research)		
Start		
End		
Aim		
MU combination/ resources used		
Scope		
Demonstration/pilot activities		
Location		
Other information (anything you find important for this project and is not mentioned above)[1]		

Table 2. Stakeholders overview (planned and interviewed)

Stakeholder (Name of organization)	Short description (role and competence)	Relevance for MU[2]	Selection method (i.e. nominated by other SH, identified in previous project or in Poole WS, other)	Indicate the form of interview (i.e. tel., personal talk, other-specify)	In case interview was conducted, please describe here why
…					

[1] E.g have they started jointly or was it one in place already and the other use was developed later on?

[2] Describe the role of the stakeholder with regard to MU. Explain if the stakeholder has one or more roles (e.g. MSP regulator, scientific institution supporting MSP, body preparing maritime spatial plans, body responsible for energy policy in the region, etc.)

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3. Legal framework and administrative procedures important for MU

- Explain how relevant legislation and policy in place (e.g. MSP, sectorial strategies, incentives in place, etc.) supports the development of the MU.
- For countries in which MU exists, explain the role(s) of relevant involved authorities and describe the process (what is needed, who issues permissions, who decides, etc.).
- Explain whether there is cross-sector cooperation related to MU in a given country and please identify barriers/drivers of such cooperation.

4. MU combination in a country

Please provide a short description (1 or 2 sentences) on what the MU identified consists of. The same MU can slightly differ within a country or different SB, as well as due to possible differences in understanding of MU by stakeholders.

Please shortly describe which MU exists, are most expected to appear etc. and present the overview in the table below using following colours:

- **Existing (and finalized) MU** - green colour
- **Planned/more likely to occur** - orange colour
- **Proposed by stakeholder/ wish list** - yellow colour

Table 3. Overview table of the MU combinations (and sub-combination) in the country, their description and status. Note: in the last row you put the MU which was additionally identified. Add as many rows as the number of MUs you identified).

MU	Description	Status
OW & Wave		
OW & Env. Pro.	e.g. Three to four floating offshore wind turbines of xMW were combined with artificial reefs to enhance biodiversity.	
OW & Shipping terminal		
OW & Fisheries		
OW & Tourism		
OW & Aquacul.		
OW & Desalination		
OW & Aquacul. & Tourism		
Wave & Aquacul.		
O&G & Renewables		
O&G & Tourism & Aquacul.		
Fisheries & Tourism & Env. Pro.		
Aquacul. & Tourism		
Aquacul. & Env. Pro.		
UCH & Tourism & Env. Pro.		
Other		

Describe the existing (and finalized) MU practices in the country reflecting on following points:

- existence of operational MU examples (y/n)
- type of MU (sectoral selection list)
- MU commencement (date)
- legal basis of MU – administrative obligation/private contract/research project (selection list)
- level of maturity of MU - commercial or pilot/demonstration (selection list)
- is MU cooperation subsidized - country/EU level (selection list)

- ownership status of MU partners – private / public (selection list)
- advantages from MU (specify)
- possibility of extension (specify)
- exact location (coordinates)
- MU partners (specify)
- contact/info details (project name, website, etc.)
- other info

Describe the planned and potential MUs in the country reflecting on following points:

- MU potential and added value
- presence of MU in public discussion
- presence of sectoral conflicts on a co-location basis
- expected future conflicts on a co-location basis
- key actors and their attitude
- possible needs for MU to increase benefits (specify)
- possible needs for MU to reduce losses (specify)
- possible needs for MU to mitigate conflicts (specify)
- drivers necessary to stimulate MU (specify)
- barriers preventing MU development (specify)
- solutions for MU (suggested development directions)
- benefits/advantages from MU

Please indicate:

- the three most relevant knowledge gaps (concerning e.g. environmental impacts, technology, others),
- the three most relevant good practices of interest for other countries.
- topics related to MUs that cannot be solved at the national level and require transnational co-operation.

Consideration on environmental aspects of MUs:

- environmental conditions/nature components vulnerable to intensification of sea use / new sea use
- MU types with expected positive environmental impact
- MU types with expected neutral environmental impact
- MU types with expected negative environmental impact

Can be presented in the form of a table, rows can be added to reflect on all variables considered:

Environmental conditions/nature components	Impact of MU		
	Positive	Neutral	Negative
	Insert MU type	*Insert MU type*	*Insert MU type*
	Insert MU type	*Insert MU type*	*Insert MU type*
	Insert MU type	*Insert MU type*	*Insert MU type*

Consideration of socio-economic aspects of the MU concept

- social groups / aspects vulnerable to intensification of sea use / new sea use
- MU types with expected positive socio-economic impact
- MU types with expected neutral socio-economic impact
- MU types with expected negative socio-economic impact

Can be presented in the form of a table, rows can be added to reflect on all variables considered:

Social groups / aspects vulnerable	Impact of MU		
	Positive	Neutral	Negative
	Insert MU type	*Insert MU type*	*Insert MU type*
	Insert MU type	*Insert MU type*	*Insert MU type*
	Insert MU type	*Insert MU type*	*Insert MU type*

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5. DABIs for identified MUs

Please note that this chapter should reflect both: desk research and opinions of stakeholders.

5.1. Existing or finalised MU

Please present DABIs for each MU in the Table 4. A short written description is expected – please read the notes below.

Important notes for presenting/describing DABIs:

- The drivers and, barriers with highest score should be elaborated first but without revealing scores here–e.g. the strongest barrier is legislative ... Another relevant barrier... Lastly, barrier related to...
- For each factor (DABI), please indicate the geographical scale of relevance of each barrier, driver, negative and positive impact (Local (specify where) National, Se Basin, EU, global,)
- For each driver, describe actors behind it with an indication of their power (control, influence, other)
- For each barrier, describe actors behind it with an indication of their power (control, influence, other)
- Share your own remarks and observation important for the interpretation of the results (your way of integrating several answers and opinions, key inconsistencies encountered, problems with scoring etc.)
- If necessary, a more holistic description of the same research findings i.e. description of main drivers or barriers as such and actors behind them or description of main the actors in the country and the drivers and barriers related to them

Table 4. DABIs of the existing and finalised MU combinations (please add as many rows as needed)

MU combination 1			
Drivers		Geographical scale of relevance	Actor behind
D.1. D.1.1.			
D.2. D.2.1.			
Barriers			
B.1. B.1.1.			
B.2. B.2.1.			
Added Values			
V.1. V1.1.			
V.2. V.2.1.			
Impacts			

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I.1. I.1.1.			
I.2. I.2.1.			
MU combination 2			
Drivers		Geographical scale of relevance	Actor behind
D.1. D.1.1.			
D.2. D.2.1.			
Barriers			
B.1. B.1.1.			
B.2. B.2.1.			
Added Values			
V.1. V1.1.			
V.2. V.2.1.			
Impacts			
I.1. I.1.1.			
I.2. I.2.1.			

5.2. Planned / more likely to occur MU

Please list all MUs and provide the following information for each: location, who (name of organization) is planning and at which stage the planned process is/ why it is 'more likely to occur'. Please read notes below.

Please present each MU in the Table 5.

Important notes for presenting/describing DABIs:

- The drivers and barriers with highest score should be elaborated first but without revealing scores here–e.g. the strongest barrier is legislative ... Another relevant barrier... Lastly, barrier related to...
- For each factor (DABI), please indicate geographical scale of relevance of each barrier, driver, negative and positive impact (Local (specify where) National, Se Basin, EU, global,)
- For each driver, describe actors behind it with an indication of their power (control, influence, other)
- For each barrier, describe actors behind it with an indication of their power (control, influence, other)
- Share your own remarks and observations important for the interpretation of the results (your way of integrating several answers and opinions, key inconsistencies encountered, problems with scoring etc.)

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If necessary, a more holistic description of the same research findings i.e. description of main drivers or barriers as such, and actors behind them or a description of the main actors in the country and drivers and barriers related to them.

Table 5. DABIs of the planned/ more likely to occur MU combinations (please add as many rows as needed)

MU combination 1			
Planned by: (name of organisation)	Potential location:		Stage of development:
1. 2. 3.	1. 2. 3.		
Drivers		Geographical scale of relevance	Actor behind
D.1. D.1.1.			
D.2. D.2.1.			
Barriers			
B.1. B.1.1.			
B.2. B.2.1.			
Added Values			
V.1. V1.1.			
V.2. V.2.1.			
Impacts			
I.1. I.1.1.			
I.2. I.2.1.			
MU combination 2			
Planned by: (name of organisation)	Potential location:		Stage of development:
1. 2. 3.	1. 2. 3.		
Drivers		Geographical scale of relevance	Actor behind
D.1. D.1.1.			
D.2. D.2.1.			
Barriers			
B.1. B.1.1.			
B.2.			

B.2.1.			
Added Values			
V.1. V1.1.			
V.2. V.2.1.			
Impacts			
I.1. I.1.1.			
I.2. I.2.1.			

5.3. Proposed by stakeholders/wished by them:

Please indicate for each MU who proposed the MU (name of organization) and the potential location (if known). Please read notes below.

Please present DABIs for each MU in the Table 6.

Important notes for presenting/describing DABIs:

- The drivers and barriers with highest score should be elaborated first but without revealing scores here–e.g. the strongest barrier is legislative ... Another relevant barrier... Lastly, barrier related to...
- For each factor (DABI), please indicate the geographical scale of relevance of each barrier, driver, negative and positive impact (Local (specify where) National, Se Basin, EU, global,)
- For each driver, describe actors behind it with an indication of their power (control, influence, other)
- For each barrier, describe actors behind it with an indication of their power (control, influence, other)
- Share your own remarks and observations important for the interpretation of the results (your way of integrating several answers and opinions, key inconsistencies encountered, problems with scoring etc.)

If necessary, a more holistic description of the same research findings i.e. description of main drivers or barriers as such, and actors behind them or a description of the main actors in the country and drivers and barriers related to them

Table 6. DABIs of MU proposed by stakeholders/ wished by them (please add as many rows as needed)

MU combination 1			
Proposed by: (name of organisation)	Potential location:		Stage of development:
1. 2. 3.	1. 2. 3.		
Drivers		Geographical scale of relevance	Actor behind
D.1. D.1.1.			

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D.2. D.2.1.			
Barriers			
B.1. B.1.1.			
B.2. B.2.1.			
Added Values			
V.1. V1.1.			
V.2. V.2.1.			
Impacts			
I.1. I.1.1.			
I.2. I.2.1.			

MU combination 2		
Proposed by: (name of organisation)	Potential location:	Stage of development:
1. 2. 3.	1. 2. 3.	

Drivers		Geographical scale of relevance	Actor behind
D.1. D.1.1.			
D.2. D.2.1.			
Barriers			
B.1. B.1.1.			
B.2. B.2.1.			
Added Values			
V.1. V1.1.			
V.2. V.2.1.			
Impacts			
I.1. I.1.1.			
I.2. I.2.1.			

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6. Conclusions

- The current stage of development of the MUs in your country in brief,
- Readiness and preparedness of stakeholders to discuss the concept of MU,
- Relevance of the MUs concept in light of the key strategic documents and stakeholders' consciousness.
- A section on the best potential MU combinations for the future (national level)
- Key solution that might enhance MUs in the future if you obtained such suggestions from the interviews.

7. References used

References should back up the report. Please list the literature and reports examined in the Harvard reference standard (http://www.citethisforme.com/harvard-referencing). If agreed at the sea basin level, the reference to key strategic documents (especially if in the original national language) should be shortly commented in the reference list, on their content and (potential) relation to the MU/sector involved in the MU combination.