Best Practice Guidance in Multi-Use Issues and Licensing Procedures

Short Background Study

Produced by the European MSP Platform under the Assistance Mechanism for the Implementation of Maritime Spatial Planning – June 2021

EUROPEAN COMMISSION

European Climate, Infrastructure and Environment Executive Agency
Unit D.3 – Sustainable Blue Economy

E-mail: CINEA-EMFAF-CONTRACTS@ec.europa.eu

European Commission
B-1049 Brussels

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Written by Emilie RICLET, Frédérick HERPERS and Christophe LE VISAGE

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INTRODUCTION

Objective

The Paris Climate Agreement and the European Green Deal set a target to achieve net-zero carbon by 2050 in order to limit global warming to 1.5°C. This requires drastic and immediate measures by Member States and for this purpose the EU policy provides milestones and guidance on how they should be implemented in a coordinated and sustainable way. The Member States also increasingly apply energy transition in marine areas and the blue economy sectors are undergoing decarbonisation. Estimates of the required contribution from offshore renewable energy (about 350 GW by 2050 i.e., a 25-fold increase compared to today) indicate a significant need for windfarms or ocean energy devices with high power outputs. This need for increased numbers of Offshore Wind Farms ("OWF") might create a challenge in some sea basins, in particular those which have limited space, existing offshore infrastructure and such like, those with unfavourable morphological conditions for establishing fixed-bottom windfarms, hence requiring other technologies. Considering the ever-increasing areas of offshore windfarms, which will continue to expand, and growing demands for space from other sectors (e.g., food production & environmental), various approaches for the multi-use of sea space are being developed and the inclusion of multi-use in MSP is now considered by various Member States.

This technical study is based on desk research, using scientific literature and online project reports. It takes stock of the accessible work already done and gives an overview of the multi-use of sea space in the European Union, as well as the information necessary for planners and decision makers to consider the development of multi-use space. This study is based on the statements that 1) the demand on maritime and coastal space is increasing for the development of the blue economy and that 2) some new activities require a permanent allocation of space. This study aims to answer the following questions:

- What is the concept of Multi-Use and what activities does it encompass?
- What are the practical applications and expected benefits of Multi-Use in the European Union?
- What are the main challenges for MU licencing procedures?
- How can the development of MU be supported further in the European Union?

Context

For a long time, maritime activities used maritime space in a diffused way, with a concentration of activities limited to coastal zones; most traditional activities are mobile (navigation, fishing) and thus do not use space permanently. Therefore, maritime space was considered infinite and impossible to saturate. With the development and improvement of technologies, maritime activities have increasingly grown, always moving further away from the coast, and activities that used to be land-based are now developing at sea, such as energy and food production, aggregates and oil and gas extraction, power and communication networks, more and more of which result in the permanent occupation of space.

The development of activities at sea is also subject to numerous constraints and faces key challenges:

(i) **environmental requirements** and the need to ensure the environmental sustainability of the activity through environmental impact assessments including in the EU Strategic Environmental Assessment and Environmental Impact Assessment directives[1], Marine Strategy Framework Directive[2] and NATURA 2000[3] directives;

[1] Directive 2001/42/EC and directive 2011/92/EU
[2] Directive 2008/56/EC

(ii) **social acceptance** which can induce significant delays on the development of some projects – such as energy production – and which can be very case-specific[4];

(iii) **safety** of the lives and property at sea and **risk assessments** that need to be provided for planning and licensing;

(iv) **co-existence with other uses of the sea** which depends on the geographical location of the project and can be a cause of conflicts;

(v) environmental management can be difficult and costly as good **knowledge** (studies) and **monitoring** are sometimes lacking;

(vi) activities may also be limited by **legal constraints related to** other uses at sea as an activity may not be compatible with the priorities of a given maritime area (e.g., environmental restoration);

(vii) the development of activities is driven by **business model viability**, especially for renewable energy production projects. The development of maritime infrastructure can be extremely expensive, especially when they are far from the coast.

Considering these elements, and as a consequence of this "maritimisation" of activities, maritime, especially coastal, space is becoming a scarce resource, increasingly subject to competition. Some activities have been promoted at EU and national levels recently (e.g., aquaculture[5], offshore renewables[6]) and need to develop alongside more "historic" activities (fishing, shipping, etc.) which might be required to adapt to those new developments quickly.

The Blue Economy, the potential of which was identified in 2012 by the European Commission[7] and reaffirmed in May 2021 with the adoption of a new approach for a sustainable blue economy in the EU[8], is an asset for the EU and its Member States and generates around €750 billion in turnover and €218 billion in gross value added per year (figures for 2018[9]). Three key components were identified by the European Commission to ensure legal certainty, security and to share knowledge of the blue economy:

- Maritime Spatial Planning, implemented through the directive 2014/89/EU, aims to ensure the sustainable and efficient management of maritime activities;
- Integrated Maritime Surveillance, developed through the development of Common Information Surveillance Environment (CISE), aims to facilitate data exchange between authorities;
- Marine knowledge, improved through the European Marine Observation and Data Network (EMODNET) aims to help industries, public authorities, and researchers to access data and provides a better understanding of the sea.

These initiatives support the EU Integrated Maritime Policy (IMP) which "*seeks to provide a more coherent approach to maritime issues, with increased coordination between different policy areas*"[10]. Member States play a crucial role in the implementation of the IMP as EU directives are translated into national legislation (Maritime Spatial Planning Directive, Maritime Strategy Framework Directive, etc). The Green Deal and the EU offshore renewable energy strategy also set objectives in terms of Marine Renewable Energy (MRE) generation which are essential to achieve

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[3] Directive 92 /43 /EEC
[4] European Commission, DG Maritime Affaires and Fisheries, Recommendations for positive interactions between offshore wind farms and fisheries, Short Background Study, May 2020.
[5] COM(2021) 236 final
[6] COM(2020) 741 final
[7] European Commission, Blue Growth opportunities for marine and maritime sustainable growth, September 2012.
[8] COM(2021) 240 final
[9] European Commission, Blue Economy Report 2020.
[10] European Commission website, Maritime Affaires, Integrated Maritime Policy https://ec.europa.eu/maritimeaffairs/policy

the EU's carbon-neutral objectives and require Member States to implement strategies at both the national and sea basin levels.

More generally, in addition to European objectives, Member States have to fulfil broader national needs resulting from policy requirements such as:

- energy transition: renewable energy development, including OWF and other devices, decarbonisation of industry, carbon capture, use of subsea storage technologies, etc;
- economic development: the development of traditional and new maritime activities in the framework of blue economy ;
- increased demand for resources and space: offshore wind infrastructure, including sea farming, installation of pipelines and cables, more shipping lanes, and emerging sectors;

The development of maritime activities to achieve national, European, and international objectives for energy supply and food production is likely to increase the already existing competition for maritime space. It is also going to increase the pressure on the marine ecosystems that are already suffering from anthropogenic pressures, especially in near-shore zones. The implementation of Multi-Use at sea targets many issues and challenges faced by maritime activities and can help to achieve the objectives of several EU policies such as; the Maritime Integrated Policy that aims, inter alia, to take account of the inter-connections between industries and human activities centred on the sea and to "address the challenges that emerge from the growing and competing uses of the sea[11]"; as well as the EU Green Deal, that supports the development of offshore wind energy (through the EU offshore renewable energy strategy[12]), which requires a more efficient use of maritime space.

Therefore, it should be considered that multi-use aims to promote synergies between developing maritime activities.

1. MULTI-USE OF THE SEA: CONCEPT AND STATE OF PLAY IN THE EUROPEAN UNION

1.1. Multi use concept

Maritime activities have always coexisted in the "open ocean" space and for a long time they developed independently of each other, with limited coordination or integration. Historic activities, such as fisheries and shipping, have always coexisted with other activities at sea, however, with the advent of the leisure and coastal tourism sectors, this has increased. The search for energy resources moved to the sea with the establishment of offshore platforms for the exploitation of oil and gas. The production of renewable energy also started on land and is now shifting to the sea. These activities are using the same maritime space, as shipping and fisheries, as well as oyster farming and recreational activities. This *de facto* "multi-use" of marine space has long been ignored; but both the exciting prospects it offers, and the risks associated with 'informal cohabitation', require the development of a coherent and explicit framework.

The MUSES Project (2016-2018) provides a comprehensive definition of Multi-Use (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 combinations of uses and represents a radical change from the concept of exclusive resource rights to the inclusive sharing of resources by one or more users*"[13]. This definition now widely used across the EU, focuses mainly on the notion of resources, defined 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*

[11] COM(2007) 575 Final
[12] COM(2020) 741 final
[13] MUSES Project, *Final report*, April 2018

(e.g., ocean space) and can be exploited through either direct (e.g., fishing) or indirect (e.g., nature conservation) uses"[14].

MU is therefore based on the conscious will to share resources and space between two or more activities, to benefit all users. As a result, the degree of connectivity between the activities involved can vary, as described in the typology established by Shupp *et al*[15] in the scope of the MUSES project:

1) Multi-purpose/functional dimension: the uses occur at the same time and share the same maritime space and main services/infrastructure.

2) Symbiotic use: the uses share the same maritime space at the same time and have peripheral infrastructure or services in common.

3) Coexistence/co-location: the uses take place in the same maritime space at the same time.

4) Subsequent use/repurposing: the uses occur subsequently in the same maritime space.

The base for the definition of these four types of multi-uses is the differentiated associations between the temporal, spatial, provision, and functional dimensions. The multi-purpose/functional dimension is the highest degree of integration between activities.

1.2. Multi-use projects in the European Union

Since 2010, the European Union has funded more than ten Multi-Use projects under its research and innovation programmes. The first wave of projects was launched under the 7th Framework Programme (FP7) Ocean of Tomorrow calls, which aimed to foster a better understanding of the marine environment and its climatic and non-climatic stressors and to promote the sustainable use of marine resources. Since 2016, a second wave of MU projects has received funding under the Horizon 2020 programme targeting research and innovation on food security, clean energy, green transport, climate action and resource efficiency, as well as cross-thematic marine and maritime research. It has included calls for Blue Growth Projects, that included projects aimed at developing synergies between different sectors. Both programmes included specific considerations for Multi-Use.

As illustrated in figure 1 below, most of the MU projects between 2010 and 2015 were focused on multi-purpose platforms dealing, in particular, with the production of marine renewable energies.

[14] *Ibid*.
[15] Schupp MF, Bocci M, Depellegrin D, Kafas A, Kyriazi Z, Lukic I, Schultz-Zehden A, Krause G, Onyango V and Buck BH, *Toward a Common Understanding of Ocean Multi-Use*, 2019, Front. Mar. Sci. 6:165.

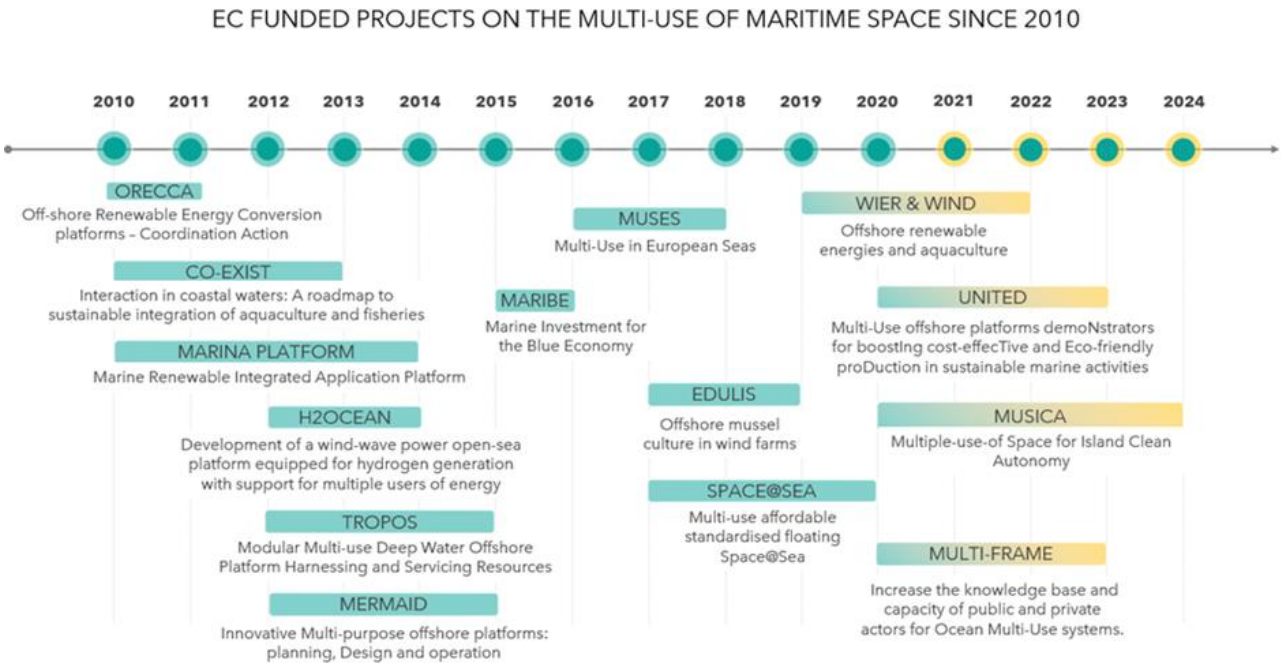


Figure 1 - MU projects by the European Commission (@SML)

Firstly, the ORECCA project aimed specifically at overcoming the fragmentation of knowledge on marine renewable energies in order to provide a roadmap for research and development activities in the EU. These projects mainly focused on technological, economical, and environmental considerations, providing designs and modelling for future multi-purpose platforms that could combine MRE and other uses, such as transport and aquaculture. Subsequent projects funded under the H2020 programme opened up investigations of other activities, even though they remained mostly focused on marine renewable energy, especially offshore wind.

Most of the EU funded multi-use projects focused on pilot projects (or "case studies"), as represented in figure 2[16]. In addition to these cases studies, some projects focused on whole sea basins, such as ORECCA which assessed marine renewable resources in each European sea basin. The MUSES project also conducted an analysis[17] of MU in each sea basin. However, a greater concentration of MU pilot projects can be observed in the North Sea (Netherlands, Belgium, Germany, Scotland) and the Baltic Sea (Denmark, Sweden). In the Mediterranean, it appears that most of the pilot projects/study cases are in West Mediterranean.

This density of MU pilot projects in the North and Baltic seas could be related to the already high level of occupation of maritime space and the relatively higher level of technological and industrial maturity, but also to the concentration of initiatives to develop OWF and marine renewable energies within these sea basins (especially when looking at more recent "second-wave" projects that exclusively focus on MU with OWF).

[16] Nota Bene: This figure illustrates MU cases study or pilot projects considered in the EU funded projects describes in figure 1. Other national and European pilot projects may not have been listed in this figure.
[17] MUSES Project, *Multi-use concept in European Sea Basins*, WP2 Final report, 2018

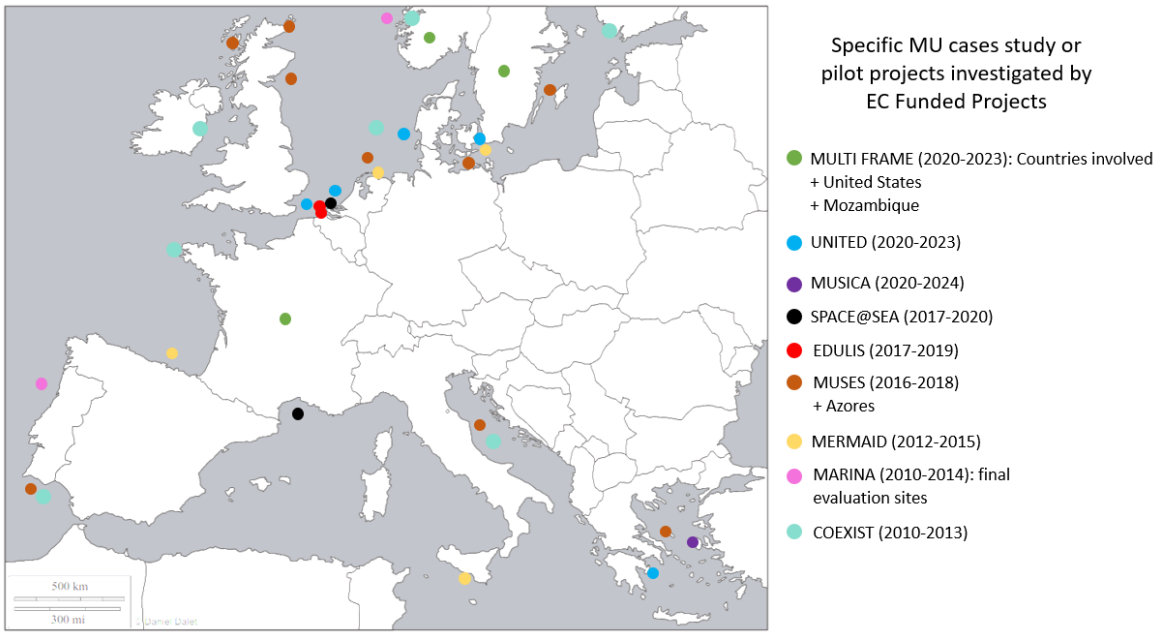


Figure 2 - Location of MU study cases and pilot projects in the European (@SML)

1.3. Multi-Use at sea, existing and studied combinations.

From the different MU case scenarios that were studied and developed in the European Union, two types of MU implementation were identified[18]:

- Multi-use of space and related geographical, human, biological resources which is mainly based on the geographical proximity of uses and the desire to share benefits between several stakeholders. For example, developing tourism activities in offshore wind farms;
- Multi-use of technical resources through the development of Multi-Use Platforms (MUP), where a combination of activities (integrated or co-located) can benefit from each other in terms of infrastructure, services, maintenance, etc. This allows a high integration of uses as it looks for synergies between activities.

The differences between soft and hard multi-use[19] were also distinguished:

- Soft multi-use for a mobile and 'temporary' use of the sea which doesn't need large infrastructure (e.g. tourism and recreational activities);

- Hard multi-use that implies the development of major long-term/permanent installations (e.g., platforms for offshore wind and wave energy).

Furthermore, two scenarios can be observed regarding MU development stages:

- Activities can be **added**: a new MU activity is created in addition to an existing or "historic" one. For example, a tourism activity is created alongside fisheries, which is already developed in the Mediterranean under the name "pescatourism". Or, as developed under the EDULIS project (2017-2019), offshore wind farm infrastructure can be used to develop aquaculture such as mussels farming;
- Activities are jointly **developed for** multi-use purposes, from the project design phase. This scenario implies even more added value through a closer association and integration

[18] Ibid.
[19] M. Bocci, S.J. Sangiuliano, A. Sarretta, J.O. Ansong, B. Buchanan, A. Kafas, and al., Multi-use of the sea: A wide array of opportunities from site-specific cases across Europe. PLoS ONE 14(4), 2019

of uses. The TROPOS project in 2012 explored different types of floating modular multi-use platform system.

Many use combinations have been studied under the framework of European projects as case studies or pilot projects as figure 3 shows. Most use combinations include offshore wind energy infrastructure which are mainly associated with other types of energy production (tidal energy, hydrogen, etc) or aquaculture (seaweed culture, mussels farming, etc). Therefore, it seems that energy projects have been a driver in the development of multi-use at sea and can be considered a powerful approach to deal with constraints related to integration with other activities at sea. It also contributes to the improved acceptance of renewable energy projects and the increasing scarcity of marine space in some areas. Also, many techniques and configurations of multi-use offshore platforms have been proposed by European projects, mostly with the objective of harvesting food and energy supply[20].

Multi-use combinations at sea studied by European Projects	**Energy production**	*Offshore wind energy*	*Solar energy*	*Tidal energy*	*Hydrogen generation*	**Aquaculture**	*Oyster farming*	*Mussel farming*	*Fish farming*	*Seaweed culture*	Marine biomass production	Fisheries	**Environment**	*Protection*	*Restoration*	*Monitoring*	Underwater cultural heritage	Tourism	Scuba diving	Desalination	Refueling station	Floating shipping terminal
Energy production																						
Offshore wind energy			■	■			■	■		■	■	■			■			■		■	■	
Solar energy		■		■						■										■	■	
Tidal energy		■	■		■				■	■				■		■				■	■	■
Hydrogen generation				■																		
Aquaculture																						
Oyster farming		■								■					■							
Mussel farming		■								■												
Fish farming				■															■			■
Seaweed culture		■	■	■			■	■														
Marine biomass production		■																				
Fisheries		■																■				
Environment																						
Protection				■																		
Restoration		■					■															
Monitoring				■																		
Underwater cultural heritage																		■				
Tourism		■										■					■					
Scuba diving									■													
Desalination		■	■	■																	■	
Refueling station		■	■	■																■		
Floating shipping terminal				■					■													

Figure 3 – Multi-use combinations at sea studied by European projects (@SML)

[20] W.M. Nassar, O. Anaya-Lara, K. H. Ahmed, D. Campos-Gaona and M. Elgenedy, *Assessment of Multi-Use Offshore Platforms: Structure Classification and Design Challenges, Sustainability*, 2020, 12, 1860;

2. MULTI-USE AT SEA: LESSONS LEARNT

2.1. Multi-use strengths and opportunities

The outputs of all the EU-funded projects referred to above have made it possible to highlight the many advantages multi-use of the maritime space provides from different perspectives:

- MU of activities allows the **optimisation of maritime space and resource use**. Maritime space is becoming a scarce resource in certain areas since activities are increasingly developing, and more activities use space in a static / permeant way and occupy dedicated locations, including in some cases traditional ones (e.g. fish aggregating devices, offshore terminals, fish cages);
- MU provides **economic benefits** for all users and reduced costs through sharing of infrastructure, operations, workforce, etc. Infrastructure at sea can be particularly expensive. MU between different energy projects increases the economic viability of those projects, as it raises the energy production per square nautical mile. Economic benefits can also be provided by activity co-existence/integration for complementary income for local communities (e.g., aquaculture, monitoring and observation, aquaculture and tourism);
- MU allows better control of the **cumulative environmental impacts** of activities, through an integrated assessment of cumulative impacts, and to reduce them through the implementation of the circular economy (e.g., reusing heat from energy production or conversion for aquaculture). Therefore, it provides a global approach to address impacts on marine ecosystems through the Life Cycle Analysis and limits the maritime and coastal space becoming more artificial. Most of the projects have included environmental impacts of multi-use combinations at sea, especially multi-use platforms which are fixed infrastructures;
- MU promotes **innovation**, especially regarding energy production, not only for co-located activities, but also to create synergies within their respective value chain;
- MU enhances the **acceptability of projects**, avoiding exclusivity of use; the share of maritime space between two activities is more likely to be accepted by both the population and the users concerned;
- MU **reduces conflicts** between activities in the maritime space as highlighted by the European Commission Technical Study *Addressing conflicting spatial demands in MSP* of 2018, which identified multi-use as a mitigation solution to prevent and reduce spatial conflicts at sea.

2.2. Multi-use challenges and further improvements

From the SWOT analysis of multiuse presented in figure 4, it is clear there are many weaknesses and threats to the development of MU in maritime areas related to legal and regulatory obstacles[21]. Although these issues have not been formally studied in EU funded projects, some possible obstacles have been identified from these projects:

- Within all countries, **policy making, and governance/decision making schemes that have been historically developed in silos, and thus may be inconsistent** between different sectors, which is an obstacle to the integration of governance required by MU strategies, plans or projects. For instance, many sectoral regulations include exclusive allocation of space to one sector. For example, the historic development of specialised ports focused on a single activity (e.g., cargo ports, fishing ports, etc.) to develop one value

[21] This report focuses on licensing issues; however, other types of existing obstacles are not listed here (research, governance, technical issues, etc).

chain. This may become an obstacle to the development of multi-use (e.g., restrictions to grid connections for marine energy production within fishing ports);

- There is a **lack of "continuity of legislation" from land to sea** while some activities can occupy various spaces at the same time (e.g., offshore energy production infrastructure may occupy land, territorial sea and EEZ, simultaneously). Various legal frameworks, and administrative procedures, apply to each type of area, without being seamless. This is why the MSP Directive explicitly calls on Member States to take into account land-sea interactions in their maritime spatial plans[22];
- There is no regulatory framework for multi-use at sea, instead there are **separated regulations** that are tailored to each sector, which creates potential inconsistency and complexity in licencing. MU projects must then consider each sectoral regulation under different frameworks:
- Existing licensing procedures for activities at sea are often complex and independent for each sector, which can create difficulties for coordination (steps, schedule). It reveals a **lack of a common framework** in terms of environmental/risk assessment of multisectoral project, and of monitoring activities.
- Different authorities are often in charge of licensing different activities. There are therefore **no clear and unified administrative procedures** for MU licencing;
- **Legislation can be inadequate** for the development of multi-use projects at sea (e.g., one infrastructure can only be licensed under one legislation);
- MU development can be hindered because of unclear insurance implications, due to the lack of **commercial insurance available and undeveloped policy framework for risk management and risk sharing in the context of multi-use activity, which is still mainly sectoral.** The lack of insurance specificities for multi-use (health and safety issues, liability, financial guarantees, etc) can result in possible conflicts, especially between commercial and business regulations and maritime regulations. This absence of a multi-use insurance product is particularly notable and problematic regarding fishing activities in offshore wind farms[23] and often results in the exclusion of fishing activities from the OWF and the loss of fishing ground[24]. In Germany, it was suggested that the German competent authority in charge of licencing procedures requires mutually agreed co-existence plans from both sectors before licence submission[25];
- Regulations have not yet been developed for the maritime space, to allow activities that are currently land-based (e.g., production or transformation units, airports, offshore terminals…). New uses of the sea could be anticipated in the framework of multi-use infrastructure regulation;
- Whilst Maritime Spatial Planning is not yet fully implemented, spatial plans are often still sectoral, overlapping or mutually exclusive;

In addition, further needs have been identified for the development of multi-use at sea, as listed in figure 4 below. MU implementation is still often limited to co-existence of uses (tourism and OWF, tourism and aquaculture, aquaculture and OWF, tourism and maritime cultural heritage, etc.). The development of highly integrated multi-use at sea (multi-use platforms especially) seems to face obstacles of different natures, hindering the process of licencing. These obstacles are described in the following part.

[22] Directive 2014/89/EU, Article 1.
[23] European Parliament, Committee on Fisheries, Working document on the impact on the fishing sector of offshore windfarms and other renewable energy systems, November 2020
[24] Van Hoey, G., Bastardie, F., Birchenough, S., De Backer, A., Gill, A., de Koning, S., Hodgson, S., Mangi Chai, S., Steenbergen, J., Termeer, E., van den Burg, S., Hintzen, N., Overview of the effects of offshore wind farms on fisheries and aquaculture, Publications Office of the European Union, Luxembourg, 2021, p. 99.
[25] M.F. Schupp and al, *Fishing within offshore wind farms in the North Sea: Stakeholder perspectives for multi-use from Scotland and Germany*, Journal of Environmental Management, Volume 279, 1 February 2021

STRENGTHS	WEAKNESSES
- Reduced conflicts - Best use of limited space - Minimise need for develop hard infrastructure - Better assessment and control of cumulative impacts - Better control of risks (common contingency plan) - Better exploitation of resources (circular economy) - Reduction of capital and operating costs (infrastructures, networks, fleet…) - Reduction of management costs	- Inconsistent sectoral regulations - Overlapping of sectoral plans with different timescales - Lack of anticipation and long-term vision resulting in limited opportunities for coordinated developments - Lack of MU planning (MSP) - MU projects may not be sustainable if cumulative impacts are not well considered and then managed. - Lack of dedicated instruments to support MU projects
- Development of MSP, framework for integrated planning and multiuse - More stringent regulation of cumulative impacts - Synergies between projects/sectors - Keep industrial/impacting activities away from natural/protected areas - Include MU of marine areas into ICZM approaches - Development of offshore multi-use platforms technically and economically possible - Support extension of networks and infrastructures offshore	- Privatisation of public space - Complex governance of shared areas - Uncontrolled/systemic impacts and risks - Excessive administrative burden - Legal or administrative obstacles to integration of regulations due to sectoral uncoordinated maritime policies (e.g., ports, fisheries, etc.).
OPPORTUNITIES	THREATS

Figure 4: analysis of multi-use expected and identified strengths, weaknesses, opportunities, and threats (@SML)

3. GUIDANCE FOR MULTI-USE LICENCING AND DEVELOPMENT

As described above, many MU related projects have flourished in the EU sea basins, providing a major contribution to the state of knowledge on MU. The ongoing projects (MULTIFRAME, UNITED, MUSICA, etc), will be able to capitalise on previous outputs to further develop Multi-Use opportunities in Europe.

However, it is still difficult to assess the state of existing MU, with a lack of in situ experience and data on multi-use platforms[26]. Many insights have been provided on the opportunities of MU in specific geographical locations for specific use combinations, but most of the analysis on the subject remains as research. Projects which are focusing on multi-use platforms are limited to considering the modelling and design of structures to draft recommendations for environmental impact assessment and business models, etc.

These obstacles can be overcome through a range of policy and regulatory provisions presented in this section. Special considerations for project developers regarding licensing procedures are presented below. Guidelines for EU Member States are also provided.

Figure 5 - Example of multi-use management of a wind farm: diving, scientific studies, aquaculture, fishing, tourism (Source: Lacroix and Pioch, 2011, p. 133).

[26] S.W.K. van den Burg, Maximilian Felix Schupp, Daniel Depellegrin, Andrea Barbanti, Sandy Kerr, *Development of multi-use platforms at sea: Barriers to realising Blue Growth,* Ocean Engineering 217, 2020

Multi-use licencing is subject to prerequisites that must be fulfilled, as required by national and European legislation and to ensure the viability of the project at different scales.

Project Design

- **Economic viability,** that needs to be ensured for all the activities involved in the MU project.

Project Development

- **Safety and risk assessment**: additional risks may be generated while multiple activities are being combined for simultaneous functioning. It means that not only is a risk assessment needed for individual activities, but it needs to consider them in combination. The risks are also more likely to differ depending on the stage of MU[27] (planning, constructions phase, operations, etc). It includes safety of lives and property by assessing risks and hazards;

Marine environment

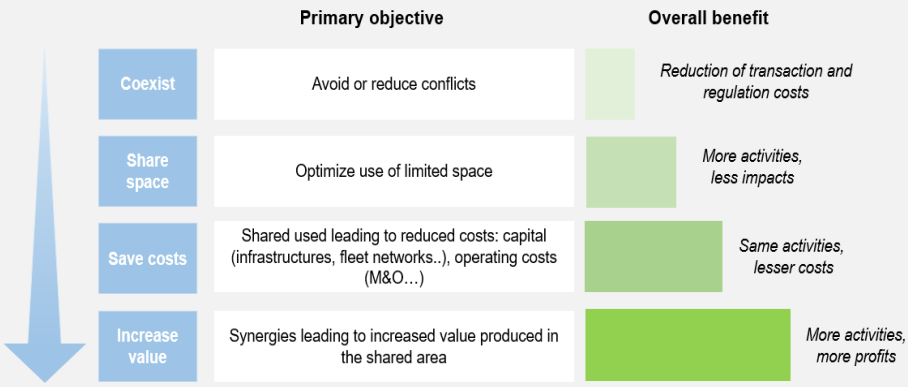
- **Environmental Assessment**: Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA) are at the core of EU Environmental policy. They have been transposed at national level, as the Marine Strategy Framework Directive (Directive 2008/56/EC) for effective implementation at national level. Regarding the sustainability and the reduction of cumulative impacts, MU should be considered and assessed from the planning stage in a strategic approach (SEA). The screening procedure, left to the discretion of Member States, aims to decide whether an EIA is needed for the development of a project. Again, EIA needs to take into account the cumulative impacts of the joint activities proposed by MU on the marine environment;

Society/local communities

- **Public consultation**: public consultation has been encouraged through the Aarhus convention of 1998, which gives rights to the public (individuals and associations) to access information and participate in decision making regarding the environment. It is now a mandatory process for Member States as it is included in several EU legislations such as MSPD, EIA, SEA, etc. MU projects fall under this category as MU platforms at sea can represent consequent infrastructure and operations at sea and they also involve two or more activities with multiple users;

National European International context

- **Legal and regulatory framework**: the European Union, has set various objectives in terms of marine renewable energy (Directive 2009/28/EC, offshore renewable energy strategy[28]), maritime spatial planning (Directive 2014/89/EU), and environmental protection (Directive 2008/56/EC, Birds and Habitats directive[29], Biodiversity Strategy[30]), that require each Member State to establish/adapt their legislation. Also, international agreements (e.g., Paris Climate Agreement) call for national measures to be implemented. Thus, MU projects form part of a more global strategy, contributing to the achievement of several objectives at national, European and international level.



The project design needs to consider the degree of multi-use integration that is going to be targeted as illustrated in figure 6.

Figure 6 – Degree of multi-use integration (@SML)

[27] L. van Hoof, S. van den Burg, J.L.Banach, C. Röckmann, M. Goossen, *Can multi-use of the sea be safe? A framework for risk assessment of multi-use at sea*, Ocean and Coastal Management, vol. 184, 2020
[28] COM(2020) 741 final
[29] DIRECTIVE 92 /43 /EEC and DIRECTIVE 2009/147/EC
[30] COM(2020) 380 final

3.1. Recommendations for multi-use and licencing procedures at sea

At the **policy level**, the lack of a legal and regulatory framework is a major obstacle for the development of multi-use at sea. It is the first component for any licencing framework. While the concept of multi-use is now well documented in the academic and research field, it remains relatively new for public authorities.

- Multi-use (MU) could be an explicit policy objective, with appropriate indicators (proportion of MU projects, areas where maritime projects should include multiuse);
- MU approach can be supported by encouraging project developers who want to develop their activity at sea (energy production, aquaculture, etc) to include MU from the point of project design. Public authorities also have a role to play by creating opportunities for the joint development of activities (e.g., national calls). These considerations were notably raised by the Dutch Parliament in the context of the Offshore Wind Energy Roadmap 2030[31].

From a **strategic** point of view, the MU approach can present real opportunities.

- The development of multi-use requires, and will benefit from, cooperation between maritime sectors and integrated governance to identify areas and sectors where MU could bring benefits;
- Multi-use projects allow the development of new techniques and support innovation; they can also help to sustain territorial projects by extending the benefits of multi-use, not only to the users but to the whole society. The ongoing MUSICA project (2020-2024) illustrates this idea as it aims to develop new energy production systems through multi-use platforms, but also to support the autonomy of islands in Greece, by providing potable water (desalination system) and renewable energy for local consumption;
- MU approach represents opportunities for any territory, especially those with limited maritime space, as it opens opportunities to develop the blue economy such as with smart floating structures combining at the same time energy production and port facilities.

At the **planning** level, the establishment of maritime spatial plans at national level is an opportunity to identify the best-suited locations for MU projects, especially for new projects that could be developed simultaneously. Belgium, for instance, can be considered as one of the first countries in the EU to have implemented operational multi-use spatial planning[32]. The MU approach needs to be considered more in current maritime spatial plans to strengthen the integration of uses at sea as MSP and MU target the same objectives (better use of the maritime space, reduction of conflict, reduction of the environmental impacts of activities, etc). Maritime planners are recommended to:

- Identify predefined areas for multi-use (MUA: "multi-use areas", similar to Marine Protected Areas – MPA - model) which are suitable for the development of MU (e.g., with power or communication networks, etc);
- Make MU mandatory in some areas and for some activities in order to boost MU projects and bring visibility to the market;
- Identify the possible benefits of MU in planning scenarios in the framework of strategic environmental and social assessment, in order to set the optimum definition in value creation, use of space and reduced cumulative impacts.

[31] Letter from the President of the House of Representatives: https://english.rvo.nl/sites/default/files/2018/03/Letter-Parliament-Offshore-Wind-Energy-2030.pdf
[32] NorthSEE Report annexes, Annex 2: National marine planning and licensing frameworks in North Sea countries and links to offshore renewable developments, April 2018

Licensing procedures can vary from one country to another, as well as national legislation. The development of multiple uses at sea can be supported by the establishment of legal and regulatory frameworks and their harmonisation at the regional level. It can then contribute to supporting Blue Economy visions and to meet several objectives at the same time. Member Stares are recommended to:

- Create a shared/common environmental assessment framework to avoid multiplication of independent EIAs and address cumulative impacts issues;
- Make licensing procedures consistent with explicit definition of responsibilities within the area of the project;
- Streamline the licensing process, for example by designating a dedicated licensing body responsible for the whole process, from applications to execution of licenses[33];
- Define adequate integrated governance schemes (public participation, consultation, etc).

Finally, MU can be at the core of **monitoring and data collection**. Data collection and monitoring have rarely been considered in a systematic way within previous MU studies. However, infrastructure at sea (multi-use platforms, offshore wind farms, etc.) present opportunities for data collection systems, not only for environmental monitoring as frequently suggested, but also for activity monitoring in the framework of Integrated Maritime Surveillance. The PLOCAN Project developed in the Canary Islands illustrates the relevance of offshore infrastructure for energy production, combined with research and innovation purposes. Member States could consider:

- Combining the monitoring plans for MU projects with an optimisation of the capacity to support integrated maritime surveillance.

3.2. Outlook and proposed guidelines

Level of intervention	Guidelines	To be addressed by
Policy level	Encouraging project holders to include MU from the project design (e.g., national calls)	EU Member states
	Creating opportunities for the joint development of activities (e.g., national calls).	EU Member states
Strategic level	Promoting MU in national strategies (e.g. renewable energy strategy)	EU Member states
	Promote multi-use for research and innovation purposes.	Member states Research and academic
Planning level	Identifying predefined areas for multi-use (e.g., creation of Multi-Use Areas – MUA)	Member states Maritime planners
	Identifying the possible benefits of MU in planning scenarios.	Member states Maritime planners
	Making MU mandatory in some areas and for some activities.	Member states Maritime planners

[33] e.g. the UK Marine Management Organisation (MMO).

Licencing procedures	Creating shared/common environmental assessment framework	Member states Maritime planners
	Making consistent licensing procedures for MU.	Member states
	Promoting simplification of licensing process (e.g., designating one licensing body).	Member states
	Defining adequate integrated governance schemes.	Member states Project holders

Multi-use could easily be implemented through short-term actions, while other recommendations need further improvement, as presented below in figure 7, which highlights the requirement for MU integration at strategic and policy level:

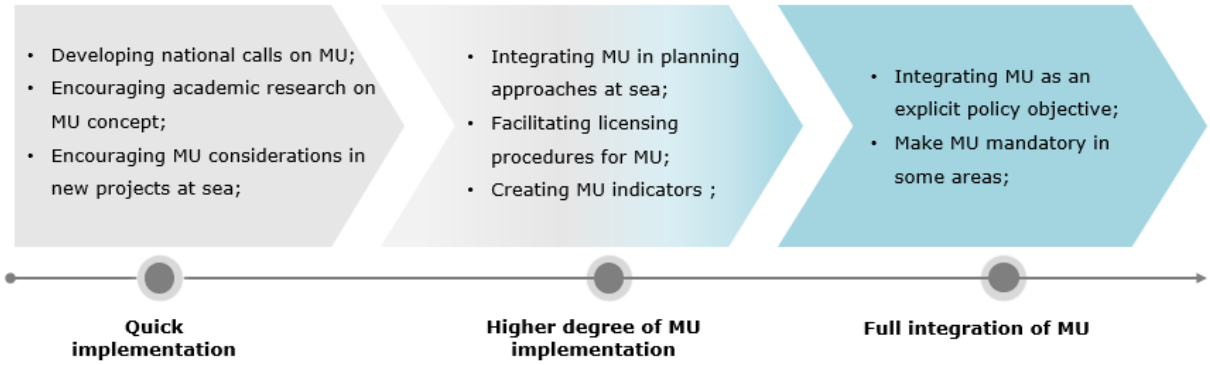


Figure 7 – Multi-use implementation (@SML)

The development of MU at sea presents a real opportunity to support the achievement of several European and national objectives and national commitments. Although a number of projects have been launched and the concept of multi-use has been a research topic over the last 10 years, particularly promoted by the European Commission, it has not been fully grasped by the public authorities and the private sector and as a result it is not mainstreamed in practice and regulation. While the North Sea and Baltic Sea seem to be more advanced on the subject, many obstacles and challenges need to be overcome in all sea basins. Thus, Member States need to contribute to the dissemination of knowledge regarding MU and encourage its implementation through public calls for proposals and support research and development for the private sector.

On the other hand, many obstacles are hindering the development of operational multi-use at sea and the transition from pilot projects to implementation on a large scale. The numerous recommendations formulated by the projects developed in Europe should now be implemented by Member States through the adoption of measures to overcome the obstacles related to licensing. More than a concept, multi-use should be seen as both an opportunity for Member states to achieve their strategic objectives and fulfil EU requirements, and a strong enabler/catalyst to support a sustainable and resilient blue economy. Member States should develop a secure and integrated legal framework to support coastal communities and the private sector to invest in such projects, which can benefit from the support of several EU funds.

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