Conference Issues Paper

Maritime Spatial Planning for Blue Growth:

How to plan for a sustainable Blue Economy

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Final Version

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1. Introduction

Blue Growth has become a major policy objective for the EC, Member States and a broad range of maritime actors alike. It has contributed to jobs and growth, supported innovation and research, and promoted a collaborative and inclusive approach[1]. However, there are still many challenges facing the development of our maritime economies:

- *Synergies versus tensions* – How can we foster synergies between maritime economic activities rather than tensions?
- *Ensuring space for future demands* – How can we anticipate future demands and ensure that the right space is available for them?
- *Ecosystem-based approaches* – Meeting environmental ambitions and objectives while promoting maritime economic development is often complex.
- *Stakeholder engagement* – How to ensure that maritime economic development is inclusive and transparent enough?
- *Local, regional and cross-border governance* – Maritime economic activities often rely strongly on local planning, good local governance and increased cross-border cooperation. At the same time, effective marine strategies and management usually require coordination at regional sea level.

Maritime Spatial Planning (MSP) can help to address the above challenges by creating a framework for evidence-based and inclusive maritime spatial plans. MSP reconciles economic needs with other dimensions and demands, including the protection of the environment, the supply of ecosystem services, the interactions between activities and processes occurring at sea and onshore, and cross-border cooperation. Moreover, MSP processes raise awareness for the innovation potential of the sea and its role in general for the economy as well as the environment. Planning decisions of today are not only designed to minimize conflicts between current demands, but also ensure that space is available to meet future demands.

The conference, "Maritime Spatial Planning for Blue Growth: How to plan for a sustainable Blue Economy," to be held 11-12 October 2017 in Brussels, Belgium, will provide a forum for discussion and exchange, offering concrete examples and guidelines on how to apply MSP as a tool to support sustainable maritime economic development ('Blue Growth'). In particular, the conference aims to:

- Assess future spatial needs of a wide range of maritime sectors;
- Discuss how the MSP process can facilitate a better understanding of the needs across maritime sectors stakeholders and ecosystems;
- Share best practices on how MSP can really support the Blue Economy;
- Discuss approaches and experiences towards synergies, co-location, etc.;
- Discuss approaches and experiences of conflict resolution and addressing spatial tensions;

This issues paper provides relevant background material for the conference by presenting the key draft findings of the Technical Study on Maritime Spatial Planning for Blue Growth up to the end of August 2017, which is under development by the European MSP Platform on behalf of the European Commission.

[1] Joint Roadmap to accelerate Maritime/Marine Spatial Planning processes worldwide – 2nd International Conference on Marine/Maritime Spatial Planning, 15-17 March 2017, Paris UNESCO. Conference conclusions.

The overall objective of the study is to provide MSP authorities and experts with practical tools and methods, which help them to design MSP processes in such way that they deliver sustainable growth for their maritime economies. To this end, the study delivers guidance around the following three dimensions important within such processes:

1) How to develop visions, which provide the framework for subsequent MSP processes?

2) Roundtable Discussion Fiches on the possible spatial requirements for current and future maritime activities.

3) Suggestions for possible type of indicators, which may assist MSP authorities to check, whether their MSP processes meet their given objectives

Even though these three strands of work are presented in separate formats, they are closely interlinked to each other. Vision processes (Task 1) provide the basis to derive to jointly agreed 'SMART' objectives towards which a MSP process should lead to and which are the basis for any kind of related indicator system (Task 3). Understanding the current and especially future spatial demands of the various maritime activities and the various planning horizons related to them, is a key pre-requisite for planners to ensure that planning decisions of today can cater for the blue economy and environment to tomorrow (Task 2). By analysing future developments and identifying the anticipated evolution of key maritime sectors in the course of a given timeframe, a shared vision could be developed as part of an MSP process. MSP is one approach to linking a desired future to present conditions, by analysing the spatial implications of future sector trends and defining specific and achievable objectives. As MSP is an adaptive process, tracking progress and periodic evaluation is necessary to ensure appropriate adaptation to changes resulting from either internal and/or external forces.

This issues paper highlights the main findings from the Technical Study tasks on developing visions (Task 1) and analysing current and future potential spatial demands of key maritime sectors (Task 2). Initial findings regarding a third task on developing indicators are not explicitly presented, but rather are incorporated as relevant to the other two tasks. The final results of the study and the conference will be made available at the MSP Platform (http://www.msp-platform.eu/).

2. How to Plan Today to Accommodate Tomorrow's Blue Economy?

Maritime Spatial Planning is not only concerned with minimising conflicts between ongoing activities in a given maritime space, but is actually designed to avoid such conflicts to happen and develop synergies, in the first instance by anticipating future developments. Vision processes are of key importance in that regard as they lead to an agreed upon perspective towards which kind of future maritime spatial plans shall lead to.

Visions can be developed through a variety of Forward-Looking Processes (FLPs), which refers to any kind of forward-looking document or process, be it visions, scenarios, forecasts, strategies, action plans or roadmaps. Thus FLPs can take many forms and serve a range of purposes, depending on who is initiating the FLP, who is involved in the process, for which purpose the FLP is drawn up and how it is expected to be used. This determines the nature of the process and subsequently influences the development of different typology of results.

Several FLPs that are currently ongoing in European Member States are part of statutory national MSP processes. In addition, there are also several on-going transnational MSP projects that are working on FLPs with emphasis on transnational sectors, such as shipping or energy. The material presented below is based on an analysis of FLPs that have been developed as part of MSP processes, as well as those that have been developed in other contexts and may be of specific relevance for MSP.

2.1 Defining Forward Looking Processes (FLPs)

FLPs usually start with some type of investigation of future trends, using methods designed to analyse possible and/or desirable future conditions, depending on which forward-looking approach is applied. This analysis is then used for the development of a FLP intended for use on its own or as part of another FLP (i.e. scenario as part of a strategy). Different formats of FLPs are defined in Figure 1.

Scenarios[2][3]	Consistent and coherent descriptions of alternative hypothetical futures intended to explore how current and alternative development paths might affect the future, and consider assumptions about the drivers of change and the impact they have.
Forecast[4]	An estimate of a variable of interest at some specified future date based on past and present data and most commonly by analysis of trends.
Vision	Preferred evolution of given developments in the course of a given timeframe, which has been agreed on in general lines, either only among those developing the vision, or together with stakeholders. In some cases, a vision is seen as the preferred agreed scenario, which implies that scenarios must have been developed and discussed prior to the actual adoption of the vision.
Strategy	Shows the various actions, usually in broad terms, necessary to reach defined goals and / or a vision. Preferably, it can also contain the specific objectives, responsible bodies, and sometimes even timelines and indicators for tracking progress.
Roadmap	A roadmap define the steps needed to implement a process, it is usually underlined by milestones and concrete timelines.
Action plan	Usually defined as complementary to a strategy and a roadmap, an action plan proposes clear actions and responsible actors for the implementation of the roadmap or strategy.

Figure 1. A definition of six different FLP formats

The structure of, and interrelation between, these formats varies depending on the purpose of the overall process. For example, one document can be called a strategy, but can also include a vision and scenarios. As part of the same process, an action plan could also be developed as an extension to the strategy, to better support its implementation.

2.2 Differences between FLP and MSP

MSP is a spatially-oriented, medium term process (revised and adapted normally every 5 years), whereas FLPs are not necessarily spatial and usually have a long term character (beyond 10 years). MSP objectives could also be developed taking into consideration shorter time frames, as well as a system of indicators for tracking progress towards the specific goals and an overall vision for the maritime space. Figure 2 summarizes the key differences between FLPs and MSP.

Characteristic	MSP	FLP
Extent of detail	Fairly detailed	Relatively undetailed
Regulatory setting	Statutory	Usually not statutory

[2] ABPmer & ICF International, (2016). Future Trends in the Celtic Seas, Scenarios Report, ABPmer Report No. R.2584d. A report produced by ABPmer & ICF International for Celtic Seas Partnership, August 2016.

[3] Alcamo, J. (2001). Scenarios as tools for international environmental assessments. Expert corner's report, Prospects and Scenarios No. 5. EEA, Copenhagen.

[4] Armstrong J Scott, ed. (2001). Principles of Forecasting: A Handbook for Researchers and Practitioners. Norwell, Massachusetts: Kluwer Academic Publishers. ISBN 0-7923-7930-6.

Time-span	Up to 5-10 years	Usually beyond 10 years
Techniques	Data based, analytical and quantitative and spatial techniques	Mainly methods involving imagination and tacit knowledge
Spatial nature	Spatial	Not necessarily spatial
Holistic nature	Normally Cross-sectoral/holistic	Not necessarily cross sectoral

Figure 2. Summary of differences between MSP and FLP

An FLP could include scenarios that concentrate on spatial implications of possible changes and illustrate the concrete consequences of future sea use trends. This spatial representation does not need to be accurately detailed, since it is developed to visualise the desired direction of how the marine space would be used in the future under different conditions. These types of scenario or the forecasts are usually of more use in an actual MSP process.

2.3 When is it useful to develop an FLP in addition to MSP?

Drawing up an FLP that contains a common and shared vision for a given sea area (be it at national or sea-basin wide scale) can have several advantages.

1. It can help communicate the benefits of an MSP process, stimulate public debate and stakeholder dialogues, increase awareness of future trends and ensure commitment towards objectives for reaching a desired future.
2. An FLP can also clarify the need for a forward-looking MSP and provide cross-sectoral perspectives on issues often regarded individually.
3. Additionally, an FLP is also useful for identifying priorities for the use of maritime space and the action necessary to for achieve them, and can help achieve cross-sectoral and multi-level (and potentially transnational) cooperation among different actors on marine and maritime issues.

Therefore, an FLP process is highly interlinked with ‘planning for Blue Growth’.

In order to serve their full function, the elaboration of an FLP usually involves a broad range of stakeholders, which requires substantial time for drafting, discussion and finalisation. Development of an FLP for MSP is especially useful if:

- the ownership of the sea space is divided among ministries;
- MSP is a totally new process and there is an aim to invest in stakeholder capacity building;
- a long term anchor for MSP is needed;
- there is a need to represent uses not present so far in MSP;
- it will help achieve better land-sea integration;
- the MSP process uses a systems approach to planning and considers a large marine ecosystem that crosses jurisdictional boundaries between countries;
- a sea space is influenced by maritime processes in other countries and there is a need to find consensus among countries; and/or
- development requirements of a certain sector require cross border coherence in planning certain aspects (e.g. shipping lanes, underwater cables).

2.4. Providing tools and methods on how to develop FLPs ?

The analysis and assessment of vision processes related to MSP processes so far has not only revealed interesting insights into the range of purposes which such kind of processes can serve as well as providing insights into appropriate methods for how to develop them. It has also shown the challenges faced by those, who have undertaken such a kind of process.

To this end, the handbook for FLP development prepared as part of the forthcoming Technical Study, is designed to provide MSP authorities with a practical set of tools and methods, which shall support in them to overcome these challenges. It will help answer the following questions:

- Which FLP format may be best applied for a given purpose?
- How can FLPs be drawn up in different contexts?
- What information, tools, and resources might be needed for different types of FLPs?
- How can an FLP be effectively linked to maritime policies and spatial management options?

The intention of the handbook is to illustrate a palette of possibilities for working with FLPs, showcasing options and ideas, rather than being prescriptive. Examples of elements of FLPs that are related to MSP will be presented at the conference and as well in the forthcoming Technical Study

Issues for discussion at the conference:

1. *What can we learn from past and ongoing Vision processes implemented? What was the original purpose, for which they have been designed? And have the processes led to these original objectives? What kind of challenges did planners face when developing these visions?*
2. *What tools and instruments have been used to develop these visions? What has worked and what has not worked?*
3. *How to use tools such as scenarios and forecasts in the MSP context?*
4. *How to position these within the global objectives and international agreements, including those related to environment and climate change? How can outputs of these processes be made more useful to industry?*

3. Assessing Future Spatial Demands of the Maritime Economy

A knowledge gap exists regarding how MSP authorities can best consider the Blue Growth potentials and foreseen evolution in various sectors across sea basins, as well as the given assumptions to reach these potentials in MSP processes and resulting plans. To fill this gap, an analysis is in progress on the main future trends and their spatial implications in several relevant Blue economy sectors, which would be advisable for consideration in Member States' on-going national MSP processes. This analysis takes the form of Roundtable Discussion Fiches, which have been made available prior to the conference and which will be included in the forthcoming Technical Study.

Taken together, the Fiches point towards an extraordinary diversity of spatial implications depending on sector characteristics (e.g. linear or place-based), temporal characteristics, water depth, mobility and land-sea interaction. Evidently, expanding and emerging activities have potentially stronger MSP implications than mature (stable) activities, for which space is already carved out. Furthermore, the ability to forecast developments differs significantly between sectors, and so does the level of sophistication and robustness of such prognoses.

The main features and spatial (MSP) implications of each sector fiche are highlighted below.

3.1 Shipping & Ports

Traffic density is an indication of which areas are valuable for shipping. The more heavily an area is trafficked, the wider a shipping lane should be to allow for safe overtaking.

For determining the **width of a shipping route**, it should be assessed what are the biggest vessels that use a particular area. The bigger the ships, the bigger their turning circle. It needs to be ensured that sufficient space is reserved for collision avoidance manoeuvres. Furthermore, water depth in shallow areas limits the accessibility for vessels with a bigger draught. Canals and locks may also restrict the access of bigger ships to certain waterways.

In addition to the traffic density of the commercial ship traffic, other types of navigation, e.g. fishing vessels, vessels servicing fixed installations, and leisure boats should be considered.

It is important to anticipate which ports will be frequently accessed by what kind of ships in the future in order to determine which routes ships will use in the future. Existing and planned **port infrastructure** is a decisive factor. For example, only a small number of ports accommodate very large carriers and cargo is then shipped to other destinations. Additionally, the offer of alternative bunkering technology in a port will influence the direction of traffic flows, once an increased number of vessels will use such technology. Some small ports may even decline in importance in such a competitive environment.

The spatial implications of **autonomous vessels** are difficult to foresee. In the trial phase, testbeds will be established that may be closed for other ships. In the foreseeable future, autonomous and manned vessels will coexist. Some experts say that in the beginning, autonomous vessels may require a separate lane. Others argue that autonomous shipping will require less safety distances, because technology will be more reliable than vessels operated by humans.

In recent years, **extreme weather events** have increased (heavier rain and storms), which also affects shipping. Weather routeing is important (and could even take precedence over regular ship routeing) to ensure that ships are provided with the optimum routes to avoid bad weather[5]. In order to allow weather routeing, space needs to be available to allow ships to temporarily deviate from established shipping lanes. In addition, climate change may trigger an opening of the Arctic route during summer, which may alter sea traffic patterns in some areas.

3.2 Offshore oil & gas

There are three potential options for an increase in oil and gas production for EU Member States, some of which could have implications for MSP, whilst others may not require an increase of the space required by the activity.

An increase in offshore oil/gas production through the **expansion of existing rigs** is an important trend – it would not necessarily imply a spatial growth of the space required by the activity. This option is followed by those EU Member States whose oil and gas production might have reached its upper limits or where the development of new offshore development areas is too expensive to pursue. However, an

[5] IMO Resolution A.528(13)

increase in offshore oil/gas production through the development of **new exploration and drilling sites** (new rigs, offshore) would imply a spatial growth of the space required by the activity. Thus, this option would have MSP implications and would potentially create conflicts with other marine activities. Furthermore, **decommissioning** of installations in the future is to be accounted for. Furthermore, with regards to the socio-ecological systems involved in fisheries management, it is worth highlighting that **extensive and broad expertise in social, economic, environmental and legislative realms is needed** to better integrate fisheries into MSP.

At the same time, having a highly diversified sector in terms of target species as well as variety of gear types and vessels could be interpreted as an advantage for overcoming the potential development barriers that might affect the fisheries sector, which might end up **being impacted differently depending on the species being targeted or the used gear type** (i.e. some gear types are allowed around offshore wind farms and aquaculture farms, while others are forbidden). However, such fragmentation could also make fisheries a weaker party relative to other MSP stakeholders in terms of not having a single voice that would push for their interests and necessities. This might end up displacing fisheries from an area in benefit of other marine sectors that might have more organized structures.

3.3 Fishing

Historically, fishing is a spatial claim with the longest tradition (along with shipping) for all sea areas. As such, it is one of the sectors of concern when designing a MSP plan. Despite many efforts having been placed to include the sector´s needs into MSP plans, when it comes to fisheries, relevant knowledge challenges still remain which makes modern MSP plans not seem to achieve their theoretical integration potential[6]. Some of these challenges lay at the **inventory phase of the activity** (where do fishers fish? Which areas are more valuable? Less? Where are nursery areas located? Etc.), whilst others lay at the **plan development** and **negotiation phase** (5 year plans against several long-term species and life stages temporal dimensions, effects of climatic changed or cumulative human impacts on fisheries, etc.). As Janßen et al (2017)[7] state: “this raises a wider range of integration challenges, starting with techniques to analyze where fishermen actually fish, assessing the drivers for fishermen's behavior, seasonal dynamics and long-term spatial changes of commercial fish species under various anthropogenic pressures along their successive life stages, the effects of spatial competition on fisheries and projections on those spaces that might become important fishing areas in the future, and finally, examining how fisheries could benefit from MSP”.

3.4 Offshore wind

The continued expansion of offshore wind has major implications for MSP. In addition to the need for more space, the general trend is that new technologies allow projects to be carried out in **deeper waters and further away from the shore**. It is estimated that a wind turbine producing 6MW needs approximately 1 km^2 of space in relation to another turbine[8]. At the same time, the continuous energy dependency of the EU will push for the development of alternative energy sources, such as offshore wind energy, and the creation of an offshore grid (hub-based), which will entail technical, economic, legal and spatial implications.

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[6] Holger Janßen, et al. Integration of fisheries into marine spatial planning: Quo vadis?, Estuarine, Coastal and Shelf Science, 2017

[7] Ibid.

[8] DG MARE, Energy sectors and the implementation of the Maritime Spatial Planning Directive. Information for stakeholders and planners, European Commission, 2015, p. 10 https://ec.europa.eu/maritimeaffairs/sites/maritimeaffairs/files/docs/publications/energy-sectors-msp_en.pdf

Further developments of the offshore wind farm industry will have to take into consideration other maritime uses and their stakeholders. **Potential multi-use** examples will need to be investigated in order to minimise the potential cumulative impacts from a social and environmental perspective. As such, some stakeholders are proposing the co-use of offshore wind energy platforms together with aquaculture (especially longlines for algae, etc.) or with conservation and recreational purposes (the use of the platforms as artificial reefs or as FADS- Fish Aggregating Devices). Multi-purpose offshore wind platforms are still in the research phase with no active businesses cases. However, market studies have shown that, if the will of the co-using sectors is there (along with financial support), these solutions might be happening quite soon in some European sea basins.

Many potential implications for offshore energy on other maritime activities exist. Due to the development of offshore wind both in terms of technology and deployment, the sector brings spatial competition vis-a-vis other (mature) maritime activities. Spatial overlap of offshore wind energy with other maritime activities has already been observed in some sea basins, i.e. the North Sea. In the future, **decommissioning** of offshore wind turbines will need to be taken into account as well.

3.5 Coastal and maritime tourism

The expected **continued growth in coastal tourism**, both in terms of nights spent in coastal regions but also in number of tourists, has implications for onshore spatial planning, such as the construction of new infrastructure and ports. This development of the sector, combined with its **diversification**, can have possible implications in the context of MSP as connecting different sectors requires mobility between the MSP sectors, and thus requires **infrastructure on land to enable mobility**, for example, between cruise ships, beaches and underwater cultural heritage. However, co-existence of the coastal tourism sector with other MSP sectors leads to land-sea interactions and consequently water quality issues. Hence, even though space may not be shared by coastal tourism and other MSP sectors, the **environmental impacts of the other sectors may impact coastal tourism**. An example of this are ships that leak oil. This mechanism goes both ways: an example being trash left behind by beach guests entering the water, affecting the water quality. Another 'classic' example is tourism and aquaculture – which has a mix of implications for both sectors.

Linked to the increase of the sector is the **adaptation to climate change**. When coastal cities flood, when coastal deltas change substantially or when the water becomes saltier, tourism is impeded. Coastal defence is of prime importance to counter coastal erosion and to enable tourism. The implications for MSP are that flooding plans need to be considered. The density of (offshore) oil and gas platforms is increasing, especially in some of the most touristic areas in the Mediterranean. However, the two uses coexist and do not necessarily interfere.

Competing activities in the same waters may deter or prevent investments. These activities may also increase waste generation and energy and water consumption, exacerbate the exploitation of biological and other resources and ultimately lead to more pollution and a serious deterioration of marine and coastal ecosystems.

3.6 Marine aquaculture

MSP and its effective spatial management is being recognised as one avenue for advancing sustainable aquaculture development worldwide (Stelzenmüller et al., 2017[9]). It offers a chance for greater recognition of the sector's interests as well as representing an opportunity to minimise conflicts, with

[9] Stelzenmüller et al., (2017), Maritime ecosystem-based management in practice: Lessons learned from the application of a generic spatial planning framework in Europe in Marine Policy 75, p. 174-186

present and future marine activities, as it gives the aquaculture sector the opportunity to engage with other stakeholders in a multi-actor arena (regulators, planners, other local stakeholders including communities), thus allowing a better prospect of developing aquaculture production according to the principles of the Ecosystem Approach to Aquaculture (EAA).

At the same time, MSP could be a means to **improve public perception** about potential environmental impacts, especially those associated with marine fish farming, and on access to and use of coastal resources. In this sense, MSP could help the aquaculture sector by creating clusters of farms, each within a management area (Aquaculture Management Areas – AMAs), which will look at the specificities (social, economic and environmental) of their spatial area and will manage to reduce risks created by the optimisation of farm production.

Despite this, siting criteria for the cultivation of different species still need to be further developed and additional research on optimal sites is recommended. In fact, **inappropriate spatial site selection** is one of the major constraints to the sustainable development and expansion of the industry. In addition, the unprecedented race between different sectors for access to the sea has increased the interest of the sector to gradually expand to more offshore grounds as well as to explore new potential co-location opportunities among various maritime activities (Multi-Use) - e.g. renewable energy, tourism - will help the further development of the sector by creating avenues for a more holistic and equitable approach of the aquaculture sector and MSP.

At the same time, being also strongly related to the land, land-sea interaction is a crucial aspect for the aquaculture development where MSP would definitively provide spatial management solutions to impacts coming from land or coastal areas.

The idea of **sustainable aquaculture areas as hotspots for nutrient reduction** (seaweeds aquaculture) and for fish stock refuge (supporting recruitment in adjacent areas) deserves to be further explored, thus contributing to conservation measures as well as providing marine ecosystem services. This idea could link MSP with economic measures such as compensation schemes (i.e. incentives, PES, etc.).

3.7 Pipelines & cables

The installation of new submarine cables and pipelines might entail MSP implications with various other uses of marine waters, especially at submarine cable hub areas, such as the following:

With regard to marine archaeology, no implications are foreseen as the parties to the UNESCO Convention on Underwater Cultural Heritage (2001) agreed to **exempt cables from that treaty** because of the specific provisions of the United Nations Convention on the Law of the Sea (UNCLOS) and the agreement of the parties that cable laying and maintenance posed no threat to underwater cultural heritage.

The migration of fishing into deeper water has obliged the submarine cable industry to develop techniques for **protection of its systems** in deeper water. There is the potential for whale entanglements with submarine telecommunication cables. Extensive new extraterritorial marine protected areas covering regions could affect trans-Atlantic and trans-Pacific cables (see the Biodiversity Beyond National Jurisdiction (BBNJ) initiative).

Disturbance of the seabed and seabed organisms, re-suspension of contaminants buried in the seabed, visual disturbance, noise and vessel emissions and waste also have environmental implications. During the operating phase, the appearance of electromagnetic fields, thermal radiation and the introduction of artificial hard substrate should be highlighted.

Temporary beach closures could be a consequence of the installation and burial of submarine cable segments on beaches and thus affect coastal tourism.

When new cable routes are being planned, the planners contact the owners of existing cables, identify the planned route, depth and angle proposed and seek comment from the existing cable operators. This technique has worked well to date and to the satisfaction of all parties involved. However, the International Cable Protection Committee (ICPC) has issued some recommendations in order to minimize these potential implications.

3.8 Ocean energy (tidal and wave)

Tidal and wave technologies are place-driven, depending on the resource potential in a given location. Spatial implications are expected to be limited to modest in the short- to medium-term; however, **the situation could drastically change in the longer term**, once breakthroughs would be realised, leading to an upscaling and cost reduction in a way similar to offshore wind – with major spatial implications as a consequence.

Each renewable energy source requires specific installations, which will have different spatial characteristics. This requires **significant preparation of consenting and licensing**. Difficulties arise where insufficient expertise / evidence is available about strategic environmental impacts.

However, in general terms, the geographical proximity of ocean energy installations and the onshore infrastructure would increase the **potential spatial conflicts** with other coastal uses. Especially for tidal energy, taking place mostly in shallow waters where other maritime activities may also occur (coastal fisheries, shipping, conservation, etc.), this could potentially create conflicts. Comprehensive Life Cycle Assessments (LCAs) of ocean energy arrays, which would also include factors such as fluctuation of power output, storage, or grid integration, are still missing. For a number of individual Wind Energy Converter (WEC) types, no LCAs are available so far. The inclusion of the need to provide WEC type LCAs could help minimize MSP conflicts.

Tidal and wave are emerging sectors which rely heavily on other sectors for creating synergies. Offshore wind (including floating wind), and pipelines and cables are the most obvious sectors, also considering the shared use of infrastructure (e.g. vessels). The sector poses relatively limited spatial implications vis-a-vis other maritime activities, with fisheries and conservation being the most obvious ones.

3.9 Marine aggregates and marine mining

Marine aggregates extraction and the marine mining sector´s further development may entail some MSP implications. **Land reclamation** for new development sites as well as **new dredging sites** for obtaining sand and gravel for coastal adaptation to environmental changes (related to beach nourishment, erosion restoration, climate change effects, sea level rise, land-use changes, etc.) may cause conflicts with other marine and coastal uses such as tourism, recreation, coastal fisheries and aquaculture and conservation. The potential impacts of marine aggregates extraction and marine mining onto **biological and archaeological resources** are still unclear, but need to be understood if Europe pursues further developments of these sectors.

In a world where most beach and coastal areas are suffering from an increase in erosion due to morphological changes of their environments together with unprecedented sea level rises and climate change impacts, the need for **beach nourishment** has increased, conflicting with touristic and recreational uses of the beaches. This is why nature-based solutions to beach nourishment are being researched such as **sandscaping** - a potential solution as it is an innovative coastal management concept, which is designed to use natural processes (wind, waves and tide) to distribute marine aggregates to nourish and create new beaches

Working in partnership with industry, regulators and stakeholders are expected to improve the sustainability of the deep-sea mining sector, in particular by reducing the area of seabed licensed dredges year by year.

Issues for discussion at the conference:

1. *What will be the future spatial demands from sectors as varied as shipping, offshore oil, renewable energy, pipelines, fisheries, aquaculture, tourism and marine aggregates ?*
2. *What are the most dynamic and spatially demanding sectors?*
3. *What are the dynamics between 'movable' and 'fixed' spatial demands?*
4. *Which spatial demands require long-term investment?*
5. *What other key insights can be obtained on the basis of the Roundtable Discussion Fiches?*

4. How can synergies between maritime sectors be promoted through MSP?

Maritime spatial planning is sometimes associated with just managing spatial conflicts and tensions. However, a growing interdependency between Blue Economy sectors requires a stronger focus on synergies. New and emerging sectors often depend on mature or growing sectors – when building critical mass. They can make use of shared infrastructure (e.g. multi-purpose platforms or ports), share providers or make use of the same resources. Such synergies do not materialise in an abstract form – they depend much on the precise technical, economic, institutional, environmental – indeed precise geographic circumstances. Some sectors (e.g. cables and pipelines) are rather enablers for others (e.g. offshore wind). Blue Growth promotes an integrated approach, away from more sector-oriented approaches. Maritime spatial planners need to be aware of the potential of such synergies. They can play an essential role in promoting such an integrated approach, and facilitate exchanges between sector stakeholders that would otherwise not take place.

Issues for discussion at the conference:

1. *What experiences have been gained in exploring synergies between maritime sectors?*
2. *How can MSP help to promote an integrated approach, and contribute to synergies when allocating space?*
3. *What are the enabling factors for delivering such synergies through MSP?*
4. *What can we learn from past and existing projects in this domain?*
5. *What MSP tools and instruments are being used for resolving spatial conflicts? Can stakeholder involvement play a role?*