

CASE STUDY BRIEF: SWEDEN

Building synergies in Swedish waters with offshore wind



List of Contents

Page 2 Introduction to the Swedish case study

Page 2 Background and Drivers of Multi Use (MU) on the Swedish West Coast

Page 4 Marine Spatial Management Structures in Sweden

Page 5 Multi-use scenario

Page 5 Vision for MU in Sweden

Page 6 Description of the MU development scenario

Page 7 Key actors

Page 9 Coexistence or Multi-Use?

Page 10 Risks, constraints, benefits and opportunities

Page 10 Key constraints and risks

Page 12 Key opportunities and benefits

Page 12 Workshop outcomes

Page 14 Action steps

Page 15 Support mechanisms and enabling conditions

Page 15 Viability of the scenario



Introduction to the Swedish case study

This case study explores the possibility of unlocking multi-use in a Natura 2000 conservation area on the Swedish West Coast, by also integrating offshore wind energy production and seaweed farming.

Background and Drivers of Multi Use (MU) on the Swedish West Coast

The need for clean energy in Sweden is expected to double in the next decade. The Swedish government has therefore established the goal of increasing renewable energy production in the next decade notably by constructing offshore wind farms with a production capacity of 120 TWh per year. Most of this energy capacity is currently planned to be developed on The Swedish West Coast, which borders the Skagerrak and the Kattegat connecting the North Sea to the Baltic Sea along the coast of Norway, Sweden, and Denmark (see Figure 1). Several wind farm companies are presently in the middle of extensive permitting processes, waiting for a go-ahead to start constructing offshore parks in the area. As new potential users of marine space, proposals that have been developed over the past few years have tended to include plans for coexistence or the integration of multiple uses into the wind farm areas.

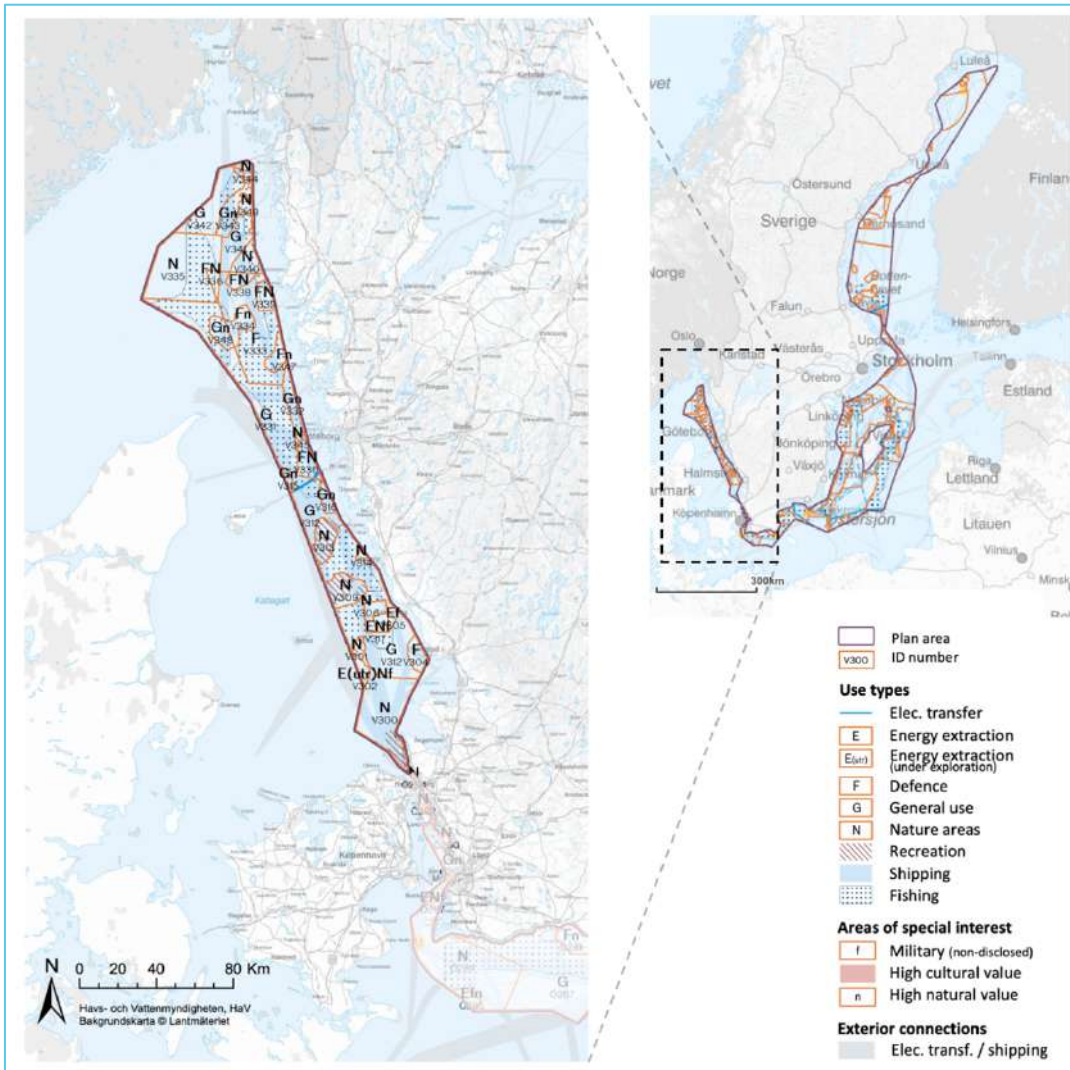


Figure 1 – Marine Spatial Plans for Sweden and the West Coast or Västerhavet¹

As a part in complying with the new European Maritime Spatial Planning (MSP) regulation, the Swedish Agency for Marine and Water Management (Havs och Vattenmyndigheten, or HaV) developed a maritime spatial plan for each of the Swedish maritime territories; plans that were approved by the Swedish parliament in February 2022 and include a notable emphasis on co-existence (“same-existence”). The main difference between the proposed coexistence and what has become termed multi-use (MU) in European MSP policy is that the former is usually limited to the description of two or more activities operating in the same area at the same time, whereas MU adds the additional characteristics that these activities are coordinated such that synergies occur notably through shared services and core infrastructure (Schupp et al., 2019). The marine spatial plans for Sweden and the West Coast are presented in Figure 1.

¹ Map available at: <https://www.havochvatten.se/vagledning-foreskrifter-och-lagar/vagledning/havsplaner.html>

The Skagerrak and Kattegat, seas that together are referred to as Västerhavet, Västskusten or the West Coast, feature rare ecosystems and habitats and are the only maritime territories in Sweden with high salinity. Much of the West Coast coastline is listed an area of outstanding natural beauty where outdoor life and tourism are strategic priorities. It is also an area vital to commercial fishing activities, with the sector focusing on several different species of fish as well as shellfish. Maritime traffic along the coastline is also extensive as Sweden’s main ports in Gothenburg and Lysekil are located there, and given that a significant part of the traffic to and from the Baltic Sea passes in the vicinity. In addition to likely future offshore wind developments on the West Coast, additional competition for marine space will likely come from growth of the aquaculture sector, notably of seaweed farming, which is a burgeoning and rapidly growing sector on the West Coast. Thus the overlapping sectors, uses, and needs for marine space in this area require careful planning to minimize impact, foster fruitful competition, and enable sustainable development at sea.

Marine Spatial Management Structures in Sweden

The organization and jurisdiction of different authorities with power over marine space along Swedish coastlines are described in the Marine plans for the Gulf of Bothnia, the Baltic Sea, and the West Coast (Figure 2a). Different authorities such as regions and municipalities are responsible for licensing and managing activities according to whether these are in (i) inner water, (ii) territorial waters, (iii) Contiguous zones, or (iv) the EEZ (Figure 2b). The complexity of licensing processes for activities that require sea space utilization has been noted as a barrier to new types of sea space utilization, e.g. seaweed farming (Franzen et al. Submitted), and will be an important part of the challenges in developing MU in Sweden.

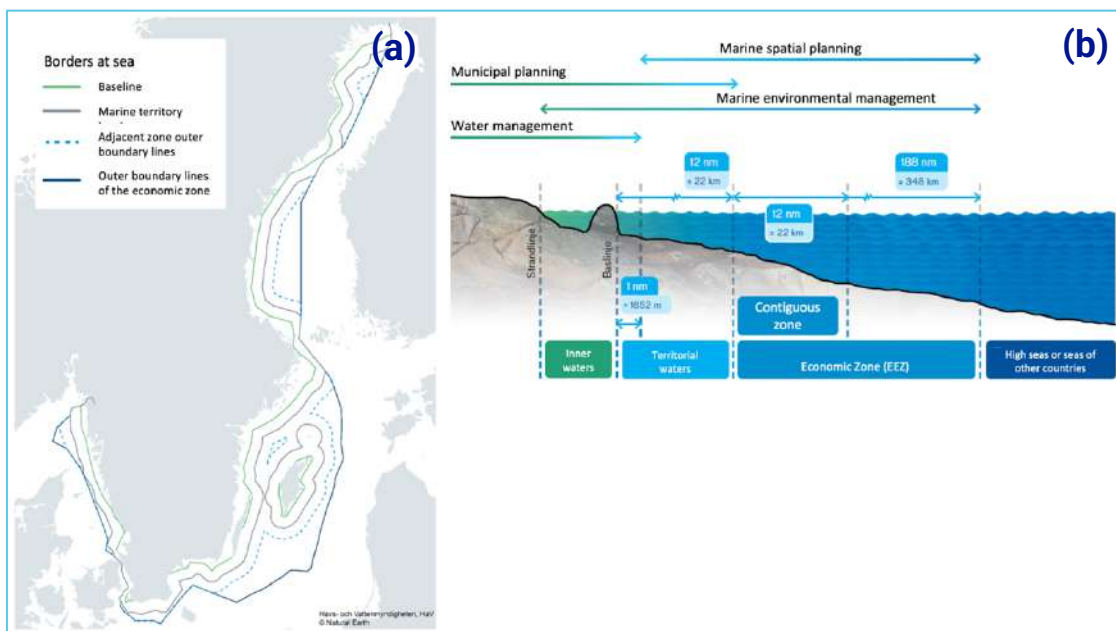


Figure 2 - Map (a) and cross section (b) of maritime administrative boundaries in Sweden²

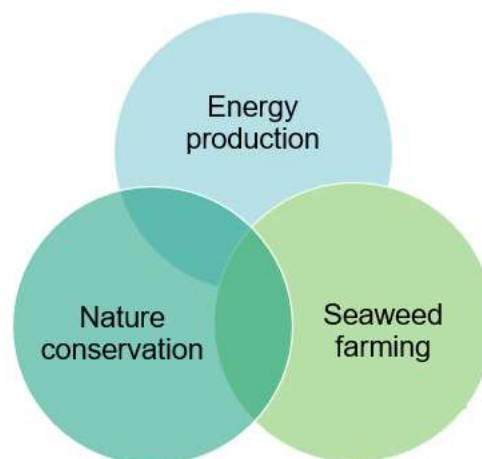
² Source: Havs- och vattenmyndighetens 2015. Förslag till inriktning för havs- planeringen med avgränsning av miljöbedömningen, Havs- och vattenmyndighetens samrådshandling. Dnr 3779-14.

Multi-use scenario

Vision for MU in Sweden

This case study aims to support the development of offshore wind energy production in combination with seaweed farming, within the confines of a very busy part of the Swedish West Coast, possibly within the confines of a Natura 2000 area. It is hoped that by following developments around this case study through 2022 and 2023, this project should provide insights into the compatibility of the MU concept within Sweden, with a notable focus on stakeholder perspectives on both MU and coexistence. This should point to key challenges in MU implementation here in Sweden, highlight possible changes that are needed, and enhance the ability of stakeholders to engage in MU in the coming years.

In an ideal world, the vision for MU on the west coast would be for the development of a centralized, streamlined, and low-cost MSP process to plan, enable and grant permits for MU activities. The process should be authentically inclusive, characterized by transparency across the decision-making process, and be anchored in the needs and wishes of existing and new sea users to ensure that workable compromise can be attained. In this way, MU could pave the way for more sustainable development and use of marine space in Sweden. Anticipated benefits include reduced pressure on wildlife, regional job creation, seafood production, and reduced resistance to OWFs along the Swedish coastline.



<https://www.havochvatten.se/download/18.5108de4514f6f2a66f22a9bf/1441089449180/rapport-2015-00-havsplanering-inriktning.pdf>

Description of the MU development scenario

As an initial step toward acknowledging the future need for coexistence in the marine spatial plans published in 2022, two areas featuring multiple users are included in the plans for the Skagerrak and Kattegat, highlighted in Figure 3. These overlapping use areas are the location for the present MU scenario case study. The maritime space that stretches offshore between Varberg and Halmstad features extensive fishing areas, several nature areas which also include tourism areas, and commercial shipping lanes. Specifically offshore from Halmstad, there are two zoned areas (ID numbers V302 and V317) marked with overlapping use types. V302, which is located WSW of Halmstad, is identified as combining an area where energy production is being explored $E_{(utr)}$, within a nature area (N), and the whole also being a special interest area listed as military non-disclosed (f). V317 is nestled between shipping lanes and is specified as an area of overlap of two other zones: V305 which combines energy extraction (E) within a special interest area listed as military non-disclosed (f), and V306 which is a nature area.

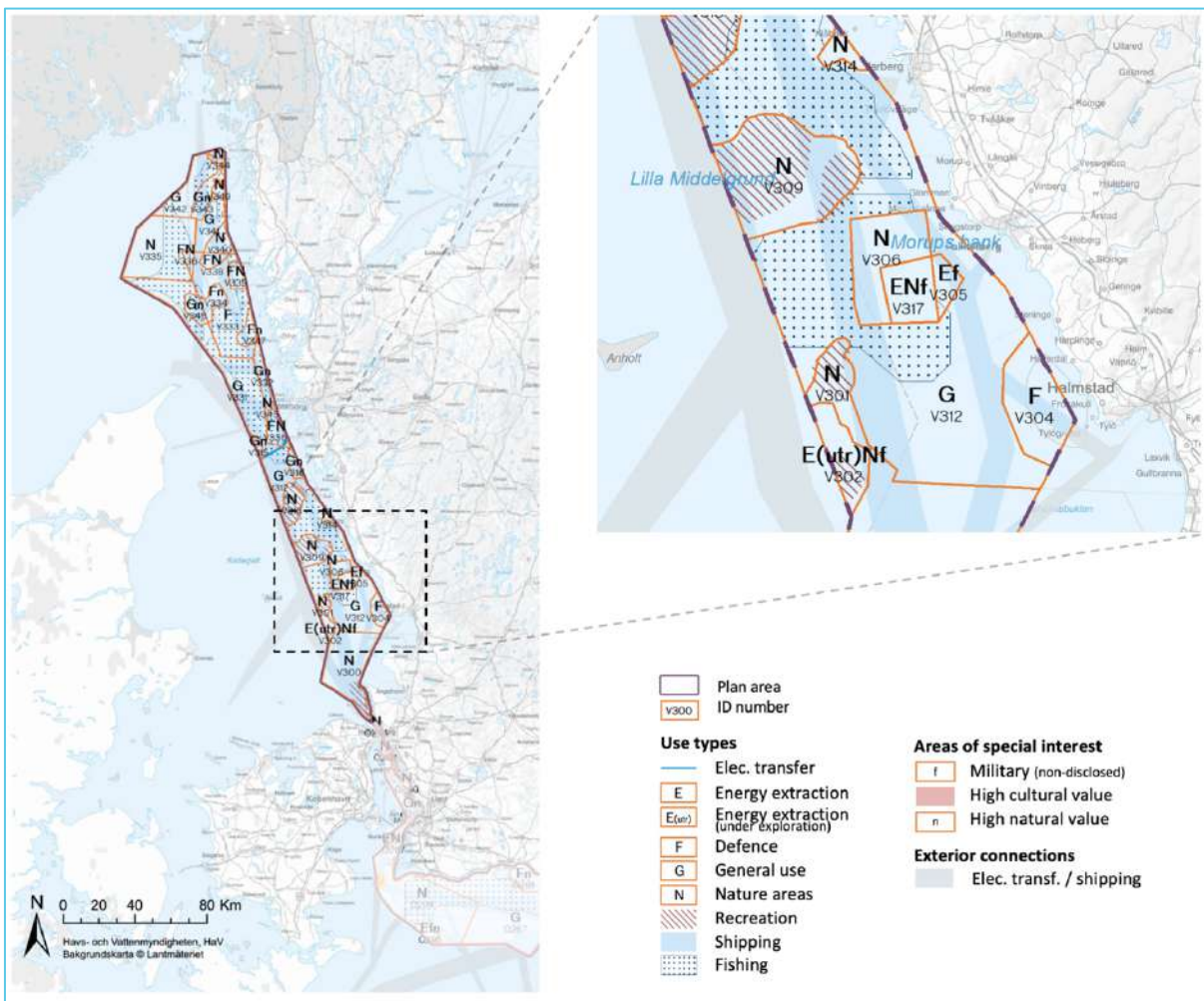


Figure 3 – Marine Spatial Plans for Sweden and the West Coast of Västerhavet³

³ Map source: <https://www.havochvatten.se/vagledning-foreskrifter-och-lagar/vagledning/havsplaner.html>



The proposed plans for building wind farms in combination with seaweed farms in a nature area, all within proximity to fishing areas, shipping lanes, and military special interest areas are explored in this case study. Letters of intent to explore co-existence have been signed notably by a seaweed production company located on the West Coast and one of the wind energy companies that are pending decisions for their planned offshore installations.

The scenario remains in a planning phase, with proposals for the development of OWE submitted to relevant authorities. The process however remains at a stand-still in 2023 as a result of opposition to OWE farms and the aesthetic impact they will have on the seascape visible from shore. Though the proposed OWE farms are located beyond zones of municipal jurisdiction, the lack of progress is largely down to the coastal municipalities using their right to veto to block the licenses for cables to connect the OWE farms to the Swedish grid. Until all necessary licenses are acquired, progress cannot be made.

Key actors

The groups of stakeholders described below are key groups with a particular interest or role to play in the development of MU in the present case and in Sweden more generally. A wide range of additional actors could be included in future MU developments, depending on the case, e.g. special interest groups working with wildlife conservation, birds, tourism, heritage, etc., though these are not central to the MU process yet and so are not included here as key actors.

County Administrative Boards (Länsstyrelserna) – These are the regional government bodies (21 counties in Sweden) that issue permits and licenses for a range of activities and act as the supervising authorities notably for use of marine space. They are key decision makers and regulating bodies.

Municipalities (kommuner) – These are local government bodies (290 municipalities in Sweden) responsible for a large proportion of local services and planning.

Other authorities – A number of other government agencies and authorities may be involved in MU developments in Sweden, notably HaV (Swedish Agency for Marine and Water Management, SwAM), Energimyndigheten (Swedish Energy Agency), Jordbruksverket (The Swedish Board of Agriculture), etc.

Politicians – of course politicians could be an important force for the future of coexistence and MU developments in Sweden and at a European level.

Military – the Swedish west coast has a number of areas designated as of military interest, residence due to shipwrecks or unexploded ordinance.

Offshore wind energy (OWE) sector - Energy companies with offshore energy ambitions such as Vattenfall, OX2, Hexicon, Eolus and Svensk Vindenergi recognise the importance of coexistence and the potential of MU to unlock more energy production from busy coastal areas.

Fisheries sector – The fisheries sector in Sweden is an important employer and seen as a strategic priority for the food security role it contributes. Fisheries are however struggling more than ever with marine space competition and fish stock decline.

Aquaculture sector – Low trophic aquaculture is seen as a strategic priority in Sweden to meet seafood production targets. Currently, a seaweed farming company called Nordic Seafarm is engaged in dialogue with OWE companies to test integrating seaweed production in and amongst turbines.

Tourism sector – are specific opportunities offered by instances of MU or coexistence

Citizens – citizens are not directly involved in MU developments, however through the democratic process they could have a role to play in supporting or blocking MU or coexistence

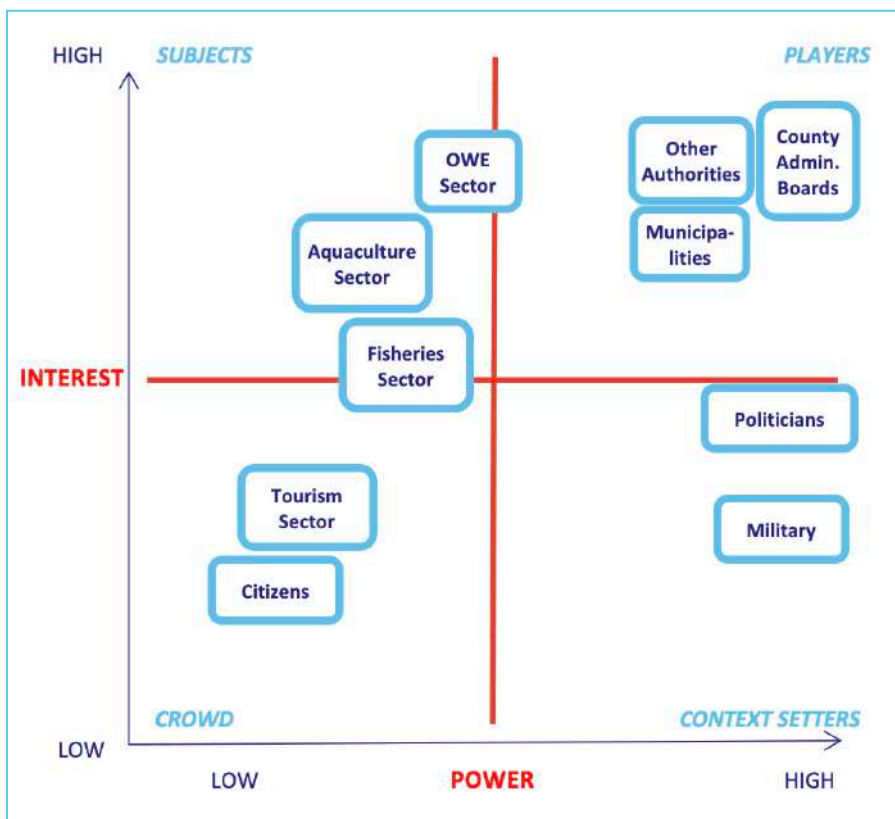


Figure 4 – Stakeholder power vs interest

Above is a classic stakeholder analysis (figure 4), in which each key actor group is plotted on a quadrant according to their relative power in terms of MU-related development and decision situations and their relative interest in MU. From the plot one can see 4 main groups of actors:

- The **key players** (high power and high interest) consist of the authorities who have the principal decision-making roles e.g. issuing permits and supporting the development of MU-related policy. Naturally, the local and regional governments and other authorities fall into this group.



- The **context setters** (high power, low interest) are privileged actors in the sense that they may be able to influence decision-making without necessarily being involved or interested in MU developments. Context setters in this case include politicians and the military.
- The **subjects** (low power, high interest) are the various sectors engaged in- or prospecting for marine space utilization, including fishers, aquaculture practitioners, and offshore wind energy companies. Depending on their situation, they may have varying degrees of power over MU developments (financial, lobbying, or other) but all are moderately to highly interested in the potential of MU and/or coexistence.
- Lastly, the **crowd** (low power, low interest) consists of actor groups that are neither directly involved in nor may have much interest in the present case's MU or coexistence potential, e.g. the general public or tourist sector.

Coexistence or Multi-Use?

The term “multi-use” does not yet have an equivalent recognized translation in Swedish, and though most in Sweden speak English fluently, the concept has yet to become widely known. Coexistence (or same-existence) is however established and well-understood in Sweden, and is widely referred to in conversations about MSP and most recently subject of a report published by HaV (2023). The nuances between MU and coexistence as described by Schupp et al. (2019) were not something most case study stakeholders had given much thought to at the outset of the project. The status quo in Sweden was less developed, with tolerance between maritime space users being the aim of ongoing discussions in view perhaps of attempting some forms of coexistence through MSP. However, during the project and notably following the MUAA the nuances became clear and the potential of MU as an inclusive and transparent process is now quite apparent to many.

Risks, constraints, benefits, and opportunities

The method that was followed for data collection was the same across the project:

1. In-depth semi-structured interviews were conducted in the summer and fall of 2022 with case study stakeholders and were organized according to PESTEL categories (Politics and governance, Economic, Social, Technological, Environment, and Legal/regulatory aspects).
2. Analysis of interviews was done using NVivo and validated by means of a workshop in January 2022. The workshop sought to validate results and further engage in constructive discussions about how to progress with the case, with coexistence in Sweden, and what steps could be taken to aim long-term for a marine spatial planning process that integrates key aspects of the MU concept.

As the OWF project combined with seaweed farming was still in a planning phase in the summer of 2022 (and remains so in early 2023), the interviews tended to focus more on the constraining factors and risks that were slowing or blocking the development of MU and coexistence. Perceived benefits and opportunities were typically less numerically predominant. That said, stakeholders were overwhelmingly favorable to both coexistence ("same-existence") and MU, seeing benefits as far outweighing the costs, and that none of the challenges were likely to be insurmountable.

Key constraints and risks

In terms of **politics and governance**, three main **constraints** were identified. First, there is a lack of space for dialogue between actors from different sectors. Even though HaV and Energimyndigheten are mediating discussions between the fishing industry and the wind industry with the goal of finding solutions for the co-existence (HaV, 2023), this is not the same as providing a **platform for conversations about MU** between all relevant actors. Second, there is a lack of political direction when it comes to prioritizing uses/societal benefits and when it comes to co-existence and/or MU. And third, the working processes of Swedish authorities are very streamlined which prevents holistic planning, e.g., each actor must have their own permits, and cannot have joint permits by multiple actors (e.g. for wind and seaweed aquaculture in the same place).

These are closely tied to the **legal and regulatory** constraints pointed to by interviewees. First, it is not possible to apply for a permit where two actors apply together, therefore having real MU with several users who share staff, infrastructure or other resources is problematic. Some possible workarounds have been identified but are largely considered unworkable due to cost or additional complexity resulting from the solution in question. For instance, it could be possible for different actors to create a common daughter company through which to apply for combined activities in a single space, as the current system requires each entity to apply for a separate license (and a combined daughter company means it would all be treated in one process). Alternatively, one actor would have to perform all uses while holding the permit and then rent out the use of a certain space



or hire another company to perform a certain use. Neither of these proposed solutions has been tried in practice to date, though in theory, they are ways of working around the existing rules to legally enable MU.

Second, if two companies apply for permits in the same space these permits will not necessarily be handled at an even pace. There is therefore no way to guarantee the actors that they can start using the area at the same time, adding further challenges to the co-design of infrastructure, and sharing of resources. Third, municipalities have what is called a **municipal veto**. This veto might be used to prevent development in the municipality. As of today, 20 out of 21 municipalities have used this veto to prevent cabling over the municipal ground for offshore wind farms. In practice, this means that no wind infrastructure can be constructed unless connected via Lysekil municipality.

Combined the political and legal constraints mentioned above lead to a lot of uncertainty and confusion, which itself forms a landscape in which dialogue has been stifled and tension has arisen. Several **conflicts** have emerged between key industries and users. This history/tradition sometimes impacts the will and or possibility of finding common ground and solutions.

Other constraints also recurred during the interviews. In Sweden, something called the precautionary principal rules when it comes to **environmental** questions, i.e. that if the environmental risks of an activity are unknown, the activity should not be performed. This becomes a problem when effects cannot be known until trials are made. When applying for an environmental permit for offshore wind today the actor needs to evaluate and describe the accumulated effects of the new wind farm and other wind farms in the vicinity. This includes wind farms in Denmark and Germany which together with Swedish development might affect migration patterns of eels, birds, and mussel larvae. However, since the accumulated effects are unknown, new development is challenging. Similarly, about **safety**, regulations put a constraint on who and what might be done inside an offshore wind farm or in a coexistence scenario no matter which sector may be in operation. The precautionary principle prevails here too, notably with insurance companies and licensing bodies.

Beyond the aforementioned constraints, there are also some possible **risks** that loom large and could become an issue in the near future. The first to mention is that there is **strong political support for offshore wind power development**, and this might stifle debate about co-existence or interfere with the perceived fairness of MU processes. The ambitions for offshore renewable energy production are effectively already in contradiction with other government-set targets e.g. for seafood provision, and thus different targets could end up undermining one another. Furthermore, owing to the strong political support for offshore wind energy, there are now discussions also about how to overcome the municipal veto which is being used to prevent cabling today. Discussions of removing the veto are ongoing as are other ways of finding a workaround to the veto, though this would set a **risky precedent of undermining a key democratic aspect** of the permit process. Furthermore, there is concern that an accelerated process shortcutting the veto could also **overlook cultural heritage and social values**.

In addition, an **economic risk** was highlighted. The uncertainties around the licensing process mean that MU developments are perceived as high risk and that the majority of this risk will likely be placed



squarely on the shoulders of OWF actors who face the greatest initial costs. Further, a number of **environmental risks** were also mentioned. Construction of wind power farms with piling might greatly impact several species and habitats such as the porpoise, several species of birds, eel, and other species associated with cold seep habitats. How piling can be conducted within a Natura 2000 area is a potentially significant challenge to overcome. The construction of a lot of hard substrates (wind farm bases) leads to a change of habitat which might impact several species.

Key opportunities and benefits

As mentioned earlier, the perceived benefits and opportunities of MU and coexistence featured less heavily in the interviews than constraints and risks. This is likely due to the way the interviews were framed, but also likely because of the status quo in Sweden with developments being cumbersome and complex, high risk and generally at a stand still. That said, stakeholders were overwhelmingly favorable to coexistence and multiuse, seeing benefits as far outweighing the costs, and that none of the challenges were likely to be insurmountable.

Some of the key **benefits** that were expressed are indeed overarching and important. For instance, all agreed that developing MU could create job opportunities, more renewable energy and local food production, and as a whole catalyze a new period of **growth for all maritime and related/supporting activities**. Wind power development and especially multi use contributes to the **blue economy** and would create new jobs as well as provide resources needed in the country and perhaps also for export purposes. In summary, **MU would help to optimize the socioeconomic value of ocean space**, an end that all stakeholders agreed was necessary and worth the effort to achieve.

Key **opportunities** were identified also in terms of MU principles might help politicians and institutions to start thinking non-linear and more holistically when it comes to **participative and transparent MSP processes**. A future legal system needs to be able to handle holistic solutions for sustainable resource valorization and utilization. This might be an opportunity to review the needs of actors and adjust the Swedish legal and permit system to better be able to see to the needs of actors who operate or wish to operate in a more holistic manner. On the flip side of the coin, the **existing system's problems may hide opportunity in disguise**, such as the municipal veto acting as a bargaining chip, thus motivating bigger companies (e.g. OWE companies) to develop solutions with low environmental impact and high societal value in order to sway public opinion. New opportunities were also seen in MU as a safe and balanced way to create **synergies as motivations** companies to start working together, e.g. co-benefiting from shared infrastructure, resources, additional income, shared risk, etc.

Workshop outcomes

Participants communicated that MU is still far off in Sweden, the focus in the short term is to unlock the basic ability to make coexistence function. Clear ways to do this on the horizon, but progress is slow. Nevertheless, it was agreed that MU, as a concept is powerful and attractive, and useful positive concepts, can help to motivate and guide actors, organizing them around the common

values that MU has the potential to be beneficial to society as a whole (although it may indeed involve tradeoffs and costs to some parties). Given the MSP and permitting landscape is so encumbered in Sweden, many stakeholders expressed there is a need to start over, to rebuild the system from the ground up with primary ownership of permitting to secure a more streamlined and lower-risk process. Lessons need to be learned from abroad on how their MSP handles MU, and how licensing and marine activities can be enabled and supported. Specifically, HaV, as well as the regional (Lansstyrelserna) and local (kommuner) government bodies, could stand to gain much from a MU approach to planning future marine space utilization.



Figure 5 - Group photo taken after lunch on the second day with around half of the in-person participants of day 2.

The blockage and main hurdle to proposed coexistence and MU are unique to the Swedish situation. Municipalities are using their vetos to block development of OWE. The only way to overcome the veto is through a top-down government exception being granted. As such the process forward for this case is quite clear, and specifically requires political will. In future cases of MU development however, the MUAA could play an important role in facilitating new MU development processes.

Action steps

Table 1. Overview table:

Solution/Action	Key action and <i>responsible actor</i>	Level of urgency
POLITICS & GOVERNANCE:		
Platform for MU	There is an urgent need for a platform/network for marine space users, planners and regulators to communicate. Should be organized by a neutral party (e.g. <i>universities or research institutes</i>) and eventually become the responsibility of e.g. <i>HaV</i>	●
Network for MU	As an interim solution, a mailing list was created and will be hosted by <i>KTH</i> for exchanges amongst actors regarding developments relating to MU and coexistence in Sweden	●
LEGAL & REGULATORY:		
Licensing solutions for MU	There is a need to streamline licensing processes. <i>All authorities</i>	●
Municipal veto	<i>The government</i> should explore why municipal vetos are being used to block OWF, mediate dialogues to find workable compromises so government targets can be met	●
ENVIRONMENT:		
Swedish precautionary principle	The use of a precautionary approach hinders innovation and increases risk of licensing or permitting complications. Better guidelines needed for authorities.	●
Environmental effects	More research needed to understand long-term environmental impacts (both positive and negative) through monitoring programs	●

1. Action for better communication in the short/medium-term

Participants expressed a desire for a mailing list to be set up amongst all participants to keep in touch and use this mailing list to share developments and information about the progress of the case and others. *KTH* agreed to take responsibility for organizing the mailing list until at least the end of 2023.

2. Action for better long-term communication: a community of practice through research?

Stakeholders agreed that a community of practice would be immensely beneficial to the Swedish situation regarding MU, and also acknowledged the potential benefits of the MUAA in the future. When discussing who should take ownership of arranging this, participants suggested a pilot should



be run as a research project. SEI and KTH agreed to take the lead with this, with follow-up meetings in the coming weeks to reach out to MU/coexistence researchers in Sweden and aim for an application in the Spring. In the future ownership could be taken by HaV.

3. Inclusivity and authentic contributions to transparent decision-making: this must become a trademark of 21st-century MSP.

The current encumbered system needs to change, and any new system must by design be streamlined and low-cost for the end user, participative and authentically inclusive by engaging actively with stakeholders or affected parties, and transparent in terms of how inputs were utilized and balanced for decision making. The system should also strategically mitigate or minimize risk (e.g. support insurance companies to provide liability cover in MU settings, update safety codes and standards, etc.). In terms of permitting, there is a need for systems to cater for MU-enabling permits (e.g. applied for by multiple entities for multiple activities).

4. Monitor environmental effects of MU activities.

The impacts of human activities on marine environments are still woefully understudied and underfunded. Long-term support mechanisms are needed for monitoring of environmental effects of MU (marine activities generally). There is a need to monitor long-term effects notably on biodiversity, marine toxicity, and plastic pollution, waterborne emissions, to name a few.

Support mechanisms and enabling conditions

Given the relatively early stage of development of MU and the present focus on less intricate coexistence in Sweden, as well as the complexities of overlapping spatial jurisdictions of different decision-making authorities, it is difficult to specifically pinpoint solutions that might enable MU at this stage. All stakeholders however agreed that more dialogue is necessary for MU to progress, and there should be some sort of platform for users to express needs and wishes, and discuss coexistence and practicalities. Furthermore, given the challenges with licensing and the high risk thus associated with marine development endeavors, a more streamlined and unified system is needed in Sweden to support the blue economy and MU of marine space.

Viability of the scenario

In the present form, the depicted MU scenario is quite likely to be granted at some point in the coming years, if the issue of MU is subject to more effective leadership and governance, combined with clear communication fora to authentically include stakeholders and moderate compromise between actors.



Inprint:

Title: CASE STUDY BRIEF : SWEDEN

Authors:

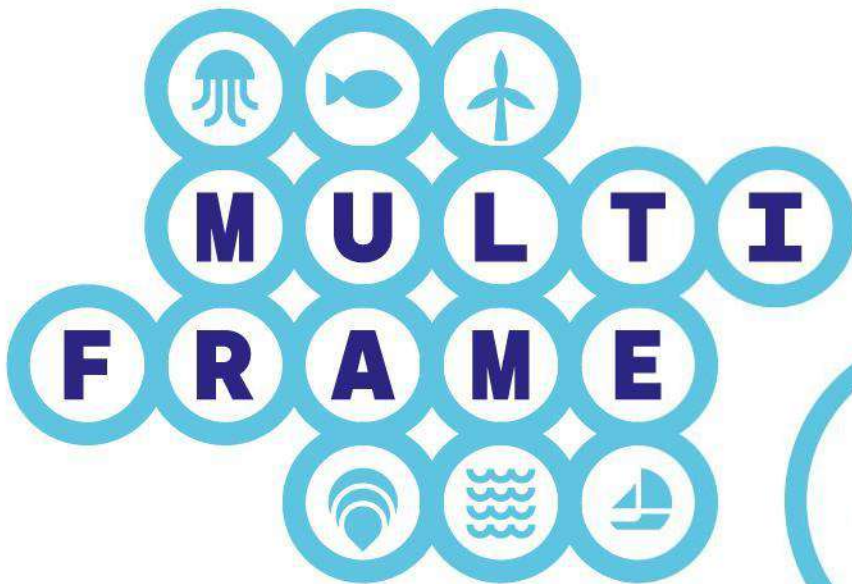
- (1) Jean-Baptiste Thomas
- (2) Elea Juell-Skielse
- (3) Fredrik Gröndahl

(4) Funding: the Swedish Research Council, Formas (2019-02391)

ISBN 978-91-8040-642-0

Date published: June 2023 @MULTI-FRAME project.

Suggested citation: *Thomas J.B., Juell-Skielse E., Gröndahl, F. **Multi-Use Case Study Brief: Sweden.** Multi-frame Project. KTH Stockholm. 2023.*



**MULTI
FRAME**

