Workshop III: Towards a Future-Proof North Sea

From offshore energy infrastructure to efficient and secure multi-use

Workshop III report

Introduction

On 3 March 2026, stakeholders from across industry, research, and policy gathered in Brussels for the third workshop in the SWiM (Solar and Wind in the Belgian Marine Zone) series, titled *"Towards a Future-Proof North Sea: From Energy-Driven Multi-Use in Wind Farms to North Sea Basin Planning."*

This workshop marked an important step in an ongoing process aimed at rethinking how offshore space in the North Sea can be used more efficiently, sustainably, and strategically.

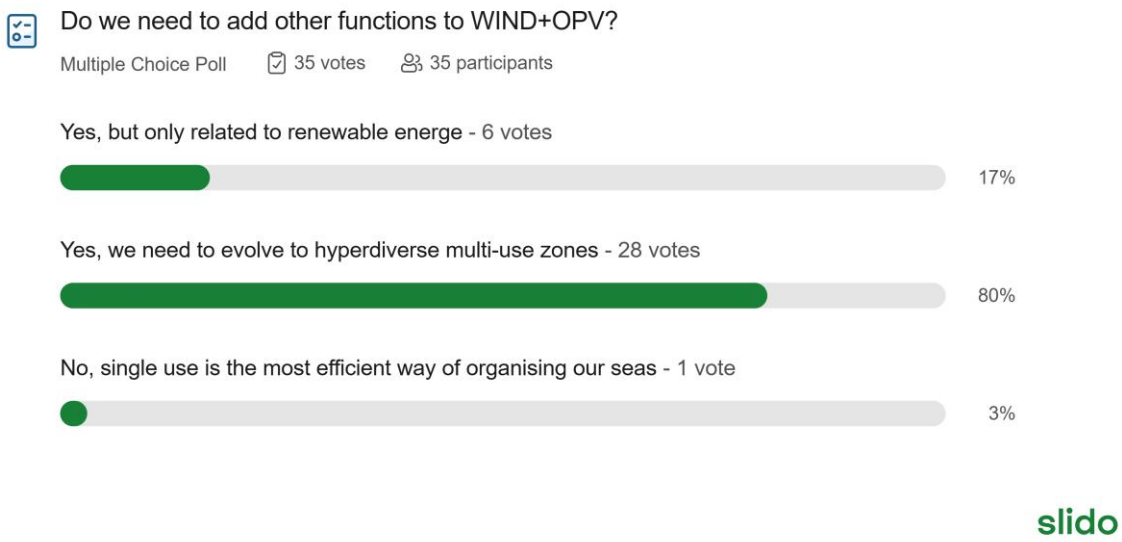
Interestingly, this SWiM worksop was organized as a 'zoom-in' session (in the morning), followed by a 'zoom out' session (in the afternoon) organised by North Sea Energy.

Context and ambition

The SWiM project, funded by the Belgian Energy Transition Fund and coordinated by KU Leuven, explores how offshore renewable energy systems—particularly offshore wind and floating solar (OPV)—can be integrated within Belgium's Exclusive Economic Zone. Earlier workshops in the series addressed key challenges such as permitting, tendering frameworks, technical integration, and the role of hybrid energy systems.

Building on these foundations, Workshop III moved beyond a purely energy-focused perspective. It introduced a broader ambition: transforming offshore wind farms into multi-use platforms that can simultaneously support energy production, food systems, ecosystem restoration, and maritime security.

This shift reflects a growing recognition that the North Sea is not only an energy hub, but also a shared and limited space, where multiple societal objectives must be balanced and integrated.



From efficiency to system robustness

A central theme throughout the workshop was the concept of **system robustness**. While offshore wind remains a cornerstone of Europe's energy transition, it alone cannot deliver the flexibility, resilience, and multifunctionality required for the future.

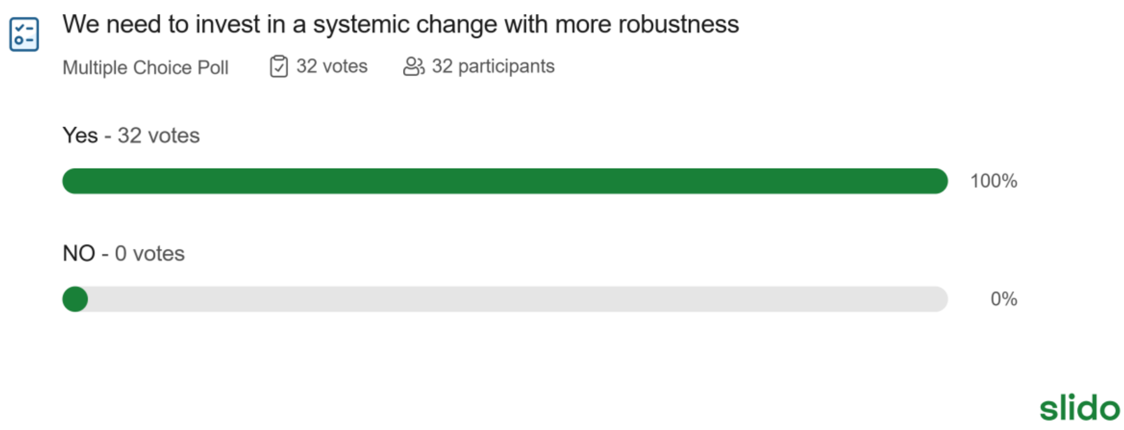
As highlighted in the SWiM discussions, there is a fundamental tension between:

- **Short-term efficiency**, focused on optimizing single-use energy production, and
- **Long-term robustness**, which requires diversification, integration, and adaptability across sectors.

In this context, Offshore Floating Photovoltaics (OPV) are not yet a large-scale economic solution, but they play a crucial strategic role. Pilot-scale integration within existing wind farms offers a pathway to:

- increase infrastructure efficiency,
- test hybrid energy systems,
- and build the knowledge base needed for future deployment.

More importantly, the discussion expanded beyond energy. Multi-use is no longer seen merely as "sharing space," but increasingly as **creating measurable ecosystem and societal value**.



“Through disciplined system thinking, streamlined governance, and evidence-based investment, Belgium can shape a sustainable, resilient and technically robust North Sea energy ecosystem.”

Offshore infrastructure as a multi-use platform

The SWiM session focused on the practical implications of multi-use within offshore energy zones. It explored how existing and future wind farms could host additional activities such as:

- **Aquaculture and sea ranching**, contributing to food security,
- **Nature restoration**, including reef-building and biodiversity enhancement,
- **Security functions**, strengthening the protection of critical maritime infrastructure.

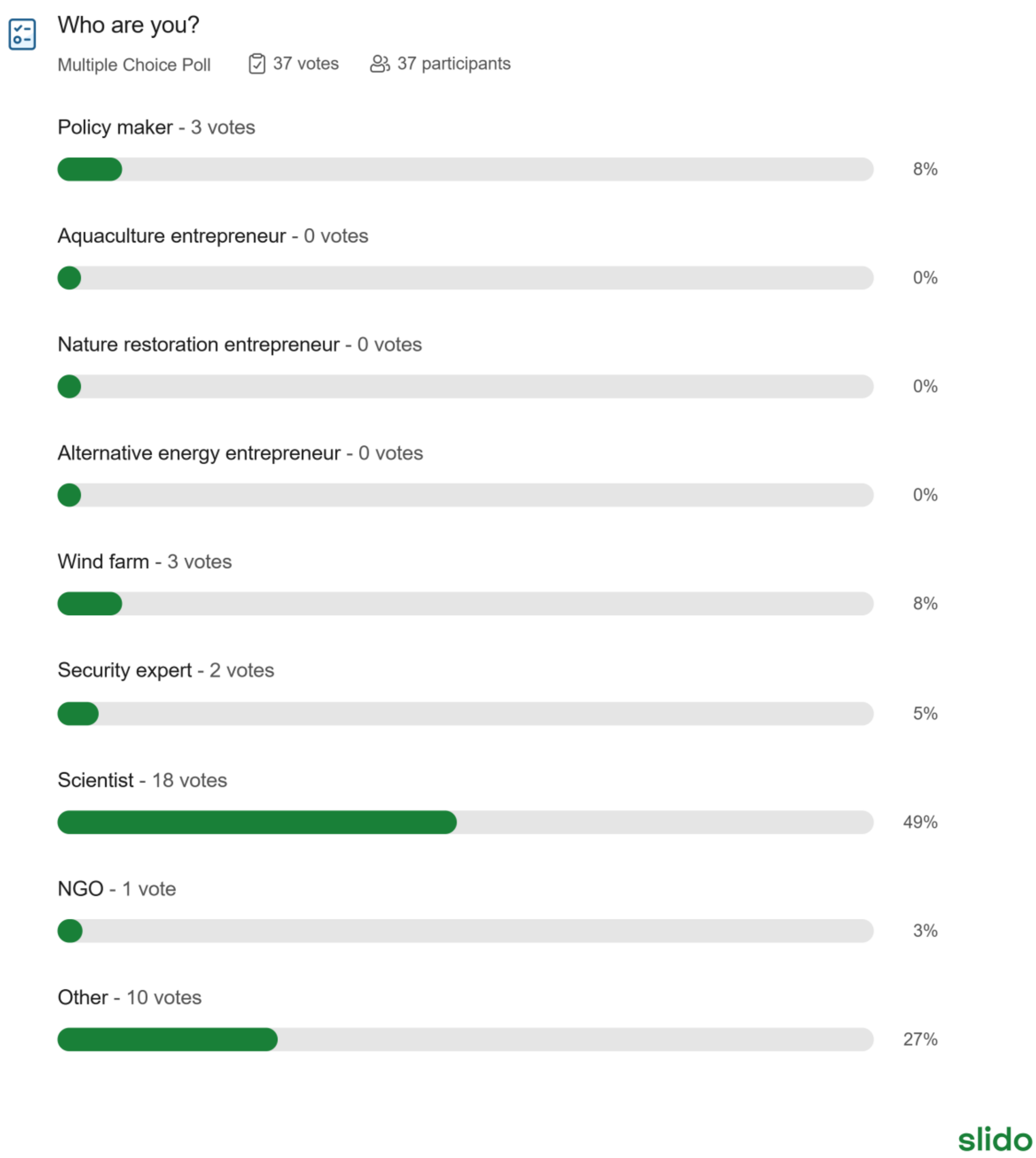
Speakers highlighted that achieving this vision requires moving from co-location to **co-design**. Offshore systems must be intentionally designed to accommodate multiple functions, taking into account technical constraints, environmental interactions, and operational safety.

The session also emphasized the importance of:

- integrated planning and regulatory flexibility,
- collaboration between public and private actors,
- and room for experimentation through pilot projects.

A key message was clear: **multi-use must be embedded from the design phase onward**, rather than added as an afterthought.

Composition of expert group



Expert group composition for Workshop III

Interactive workshop setup

Following the introductory presentations, participants engaged in an interactive “world café” format structured around three thematic discussion tables:

1. Aquaculture in offshore energy

2. Nature restoration in offshore energy
3. Protection of critical maritime infrastructure

Aquaculture in offshore energy

Executive Summary

The discussions on aquaculture across three expert groups reveal a shared recognition that integrating food production into offshore wind farms is both a strategic opportunity and a complex systemic challenge. While aquaculture can contribute to food security, biodiversity enhancement, and more efficient use of marine space, its implementation is constrained by operational risks, regulatory barriers, and uncertain business cases.

A clear gradient of feasibility emerges. Low-impact interventions such as reef creation and bottom-based cultivation are broadly perceived as the most viable entry points, as they align with existing ecological processes and introduce limited interference with wind farm operations. In contrast, more intensive systems—such as floating longlines, feeding systems, or active fish farming—are considered significantly higher risk due to their operational demands, spatial conflicts, and potential interference with maintenance and safety procedures.

A key insight across all groups is that the success of aquaculture integration depends less on individual technologies and more on system-level design. Wind farms are currently optimized for energy production alone, and any additional use is perceived as an external risk. However, if aquaculture is embedded from the outset—through co-design, adapted infrastructure, and aligned logistics—it can evolve from an “add-on” into a complementary function within a broader marine system.

The discussions also highlight a fundamental transition in thinking: from isolated pilots toward a holistic “maripark” concept. In such a system, energy production, food production, nature restoration, and logistics are integrated into a single spatial and operational framework. However, there is tension between the urgency to start piloting immediately and the need to design this long-term vision coherently.

Finally, the economic and regulatory context remains uncertain. Without clear incentives, subsidies, or political commitment to offshore food production, large-scale aquaculture is unlikely to materialize. As with terrestrial agriculture, participants argue that sustained public support will be necessary to unlock the sector’s potential.

Full Report

The three discussions converge on the idea that aquaculture in offshore wind farms should be understood as an active intervention in marine ecosystems, rather than a purely extractive activity. Participants repeatedly emphasized that even relatively passive approaches—such as reef creation—constitute a form of aquaculture, as they deliberately shape ecological conditions to enhance biomass production. In this sense, the boundary between nature restoration and food production becomes blurred, with spillover effects playing a central role. Artificial reefs, for instance, can increase local biodiversity and fish abundance, which may then be harvested either within or outside the wind farm.

Time, however, is a critical factor in these nature-based approaches. The development of fully functional reef systems is expected to take decades, often exceeding the operational lifespan of wind farms themselves. This temporal mismatch raises questions about long-term planning, especially in light of decommissioning requirements that may remove the very structures supporting these ecosystems. While some participants suggested accelerating ecological development through pre-seeding or engineered substrates, regulatory constraints and uncertainties about removal obligations remain significant barriers.

From a technical perspective, the discussions consistently differentiate between categories of aquaculture based on their level of intervention and associated risk. Bottom-based systems, such as cages placed on or near the seabed, are generally perceived as low-risk. They are less exposed to wave action, less likely to interfere with vessel movements, and easier to integrate within existing spatial constraints. Moreover, if displaced or damaged, their impacts on wind farm infrastructure are limited. In contrast, surface or floating systems introduce multiple layers of complexity. They are more vulnerable to environmental forces, create obstacles for navigation, and require frequent maintenance, all of which increase the likelihood of conflicts with wind farm operations.

Feeding-based systems and active fish farming are viewed as particularly intrusive. Beyond their technical requirements, they introduce ecological uncertainties related to nutrient inputs, behavioral conditioning of fish, and potential environmental impacts. Even when feeding is minimized—used merely as an attractant rather than a primary food source—it remains a point of concern. As a result, such systems are often positioned at the high-risk end of the spectrum, both operationally and environmentally.

A recurring theme is the importance of spatial dynamics and seabed conditions. The North Sea, for example, is characterized by mobile sand dunes that can bury infrastructure within months. This makes fixed installations on sandy substrates inherently risky, unless carefully sited or designed for mobility. In contrast, areas with hard substrates, such as scour protection around turbines or designated gravel beds, are seen as more suitable for aquaculture deployment. These zones not only provide stability but also align with existing ecological enhancement efforts.

The question of location—inside the wind farm, at its periphery, or outside it entirely—remains contested. Some participants argue that placing aquaculture systems within the wind farm maximizes synergies and protection from other uses, such as fishing. Others suggest that the safety zones surrounding wind farms may offer a more practical compromise, reducing operational conflicts while still benefiting from restricted access. In all cases, minimizing vessel traffic within turbine arrays is a priority, given the safety risks and logistical constraints.

Operational integration emerges as one of the most challenging aspects. Wind farm operators highlight that their activities are tightly scheduled, weather-dependent, and optimized for efficiency. Introducing aquaculture adds complexity, requiring additional inspections, maintenance routines, and potentially new types of vessels. The idea of shared logistics—such as multi-purpose vessels or offshore hubs—holds promise but is difficult to implement in practice. Differences in timing, regulatory requirements, and operational needs often limit the feasibility of combining activities.

Nevertheless, the concept of a multifunctional offshore infrastructure gains traction throughout the discussions. Participants envision a future in which wind farms are part of a larger marine system that includes aquaculture, floating solar, accommodation platforms, and even offshore ports. In this vision, a central “maripark” acts as a hub for logistics, energy distribution, and resource management, enabling more efficient and integrated operations. Such a system could also address current regulatory bottlenecks, for example by allowing fish to be landed and processed offshore under controlled conditions.

Despite this long-term vision, there is a strong sense of urgency to begin experimentation. Belgium's current marine spatial plan, which allows for pilot projects up to high technology readiness levels, is seen as a unique opportunity to test business models and technical solutions in real conditions. At the same time, participants acknowledge that pilots alone are insufficient if they are not embedded in a broader strategic framework. The challenge is therefore to balance short-term experimentation with long-term system design.

The role of policy and governance is touched upon throughout the discussions. While multi-use is legally possible in several countries, it is rarely incentivized, and the economic case for aquaculture remains weak. Wind farm operators, in particular, emphasize that any additional activity must either provide clear benefits or be supported through subsidies or regulatory mandates. The idea of making aquaculture "mandatory" within wind farms is explored as a thought experiment, revealing both resistance and potential pathways for integration. If such requirements are defined early in the tendering process, they can be incorporated into business models and design choices, reducing uncertainty and conflict.

More fundamentally, participants point to the need for a political decision on food production at sea. If Europe is serious about increasing its food autonomy, offshore aquaculture will require the same level of support as terrestrial agriculture. Without long-term subsidies and a stable policy framework, the sector is unlikely to scale, regardless of its technical feasibility.

In conclusion, the integration of aquaculture into offshore wind farms is not primarily a technological challenge, but a systemic one. It requires rethinking how marine space is allocated, how infrastructures are designed, and how different sectors interact. The pathway forward lies in combining low-risk, nature-based solutions with targeted pilots, while simultaneously developing a coherent vision for multifunctional marine systems. Only through this dual approach—incremental learning and holistic design—can aquaculture become a viable component of the offshore energy landscape.

Nature restoration in offshore multi-use systems

Executive Summary

The discussions on nature restoration highlighted both the potential and the limitations of integrating ecological objectives into offshore multi-use systems. Across all groups, participants agreed that offshore infrastructure—particularly wind farms—offers clear opportunities to enhance ecosystem value. However, there was a strong consensus that such interventions should not be confused with true nature restoration.

A central theme was the need to distinguish between active restoration, which aims to rebuild historically present ecosystems under suitable conditions, and nature-inclusive design, which seeks to improve ecological performance within artificial systems. While both approaches are valuable, they serve different purposes and should be framed accordingly, both scientifically and politically. Mislabeling nature-inclusive design as restoration risks undermining credibility and may lead to accusations of greenwashing.

The discussions also revealed a shift in perspective: multi-use is no longer seen merely as a tool for spatial efficiency, but increasingly as a potential mechanism to support ecosystem functioning. Yet, this ambition must be grounded in ecological reality. Interventions need to be site-specific, based on sound scientific understanding, and aligned with broader system-level dynamics across the North Sea.

Several key challenges remain unresolved. There is no shared vision of what a future North Sea ecosystem should look like, nor agreement on which ecological baseline should guide restoration efforts. At the same time, regulatory frameworks—particularly those governing decommissioning—create uncertainty about the long-term value of ecological interventions within offshore infrastructure. The temporal mismatch between ecosystem development and infrastructure lifecycles raises fundamental questions about effectiveness.

Ultimately, the discussions converged on the need for a combined approach: protecting and restoring ecosystems in the most suitable locations, while simultaneously embedding nature-inclusive design into offshore developments. Only by aligning these strategies within a broader, long-term vision can offshore multi-use systems contribute meaningfully to a healthier North Sea ecosystem.

Full Report

The discussions on nature restoration within offshore multi-use systems revolved around a fundamental question: can offshore energy infrastructures evolve from purely technical installations into platforms that actively contribute to ecosystem recovery, or should their role remain limited to efficient spatial use? While perspectives differed in nuance, there was broad agreement that offshore infrastructure can play a positive ecological role, provided that expectations are clearly defined and grounded in ecological reality.

A crucial starting point in the debate was the recognition that the term “nature restoration” is often used too broadly. Participants consistently emphasized the need to differentiate between active restoration, nature creation and nature-inclusive design. Active restoration refers to the deliberate re-establishment of ecosystems that historically existed but have disappeared due to human pressures, such as oyster reefs in the North Sea. These efforts require suitable environmental conditions and are typically implemented in dedicated areas, where the objective is to enable ecosystems to become self-sustaining over time. In contrast, nature-inclusive design focuses on enhancing ecological value within the context of existing or planned infrastructure. It leverages the presence of structures such as wind turbines and scour protection to support biodiversity and ecosystem services, without necessarily aiming to recreate historical ecosystems.

This distinction is not merely semantic, but has important implications for policy, funding, and societal acceptance. Several participants stressed that presenting nature-inclusive design as restoration could undermine trust and lead to greenwashing concerns. At the same time, there was a shared recognition that dismissing such efforts altogether would mean missing a significant opportunity. Offshore infrastructure is being deployed at scale, and it inevitably alters the marine environment. The question, therefore, is not whether to intervene, but how to do so in a way that maximizes ecological value.

In this context, the discussion moved beyond the notion of biodiversity as a simple metric. Participants argued that the focus should instead be on ecosystem functioning. Healthy ecosystems provide services such as water filtration, habitat formation, and support for food webs, and these functions are ultimately more relevant than the mere presence of additional species. Oyster reefs were frequently cited as an example, not because of the species itself, but because of the critical functions it performs, including filtering water and creating habitat for a wide range of organisms.

At the same time, it became clear that ecological interventions cannot be designed in isolation. The North Sea is a highly dynamic and interconnected system, and local interventions may have far-reaching effects. Participants emphasized that decisions should be based on site-specific conditions, including substrate type, hydrodynamics, and existing ecological values. For example, the restoration of oyster reefs is only feasible in areas where suitable substrates are present or can be introduced. In sandy environments where such conditions are absent, adding hard structures may create new habitats, but this would not constitute restoration in a strict sense.

This led to a broader reflection on the concept of ecological baselines. There is currently no consensus on whether restoration efforts should aim to recreate historical ecosystems, maintain current conditions, or move towards new, future-oriented systems that are resilient under changing environmental pressures. Some participants advocated for a pragmatic approach, focusing on locations where restoration has the highest chance of success, rather than attempting to replicate historical distributions. Others highlighted the importance of maintaining a clear distinction between restoration and enhancement, particularly in regulatory contexts.

Offshore wind farms played a central role in the discussions, both as a source of impact and as an opportunity. On the one hand, their construction and presence introduce disturbances and artificial elements into the marine environment. From a regulatory perspective, any ecological measures associated with them may therefore be considered mitigation rather than restoration. On the other hand, wind farms also create conditions that can be beneficial for marine life. By excluding activities such as bottom trawling, they effectively function as de facto protected areas. Observations from existing wind farms indicate increased fish biomass, larger individuals, and the return of marine mammals, suggesting that reduced human pressure alone can have significant positive effects.

However, participants cautioned against overestimating these passive benefits. While some species may recover naturally when disturbances are removed, others depend on specific environmental conditions that are no longer present. The disappearance of oyster reefs, for instance, is closely linked to the loss of hard substrates due to historical fishing practices. Without active intervention to reintroduce such substrates and initiate reef formation, recovery could take centuries. This highlights the need for a balanced approach that combines passive protection with targeted, active measures where necessary.

The design of offshore infrastructure emerged as a key area of opportunity. By integrating ecological considerations from the outset, it is possible to enhance the value of structures that are already being installed. Scour protection, for example, can serve as a foundation for reef development if appropriately designed. More broadly, participants suggested that infrastructure could be tailored to support specific ecosystem services, such as water filtration or habitat creation, depending on local needs. At the same time, there was recognition that current efforts are often too limited in scale. Enhancing individual turbine foundations may create localized benefits, but meaningful ecological impact likely requires interventions at a much larger spatial scale.

One of the most challenging aspects discussed was the issue of decommissioning. Existing regulations typically require the complete removal of offshore infrastructure at the end of its operational life. This creates a fundamental tension, as ecological systems often take decades to develop, only to be disrupted or removed after 20 to 30 years. Participants questioned whether it is worthwhile to invest in ecological enhancements under such conditions, or whether policy frameworks should evolve to allow for partial decommissioning or the preservation of valuable habitats. While no consensus was reached, it was widely acknowledged that current regulations do not yet align with the ambition of creating long-term ecological value.

Finally, the discussions highlighted the importance of considering trade-offs and interactions with other uses. The combination of aquaculture, energy production, and nature restoration introduces additional complexity, as each activity can influence ecosystem dynamics in different ways. While some forms of aquaculture may support restoration objectives, others could introduce pressures that counteract ecological gains. Similarly, decisions about spatial allocation and prioritization will inevitably involve trade-offs between competing objectives.

In conclusion, the discussions made clear that offshore multi-use systems hold significant potential to contribute to a more nature-positive North Sea, but only if approached with clarity, realism, and coordination. Nature restoration and nature-inclusive design should be seen as complementary strategies, each with its own role to play. Their successful implementation will depend on site-specific knowledge, adaptive policy frameworks, and a shared long-term vision for the marine environment.

Protection of critical maritime infrastructure

Executive Summary

The discussions on security reveal a clear transition from traditional, reactive protection approaches toward an integrated "security by design" paradigm within offshore energy infrastructure. Floating solar (OPV), offshore wind farms, and broader marine assets are increasingly viewed not only as energy generators but also as potential nodes for situational awareness, monitoring, and operational support. There is broad consensus that such infrastructures can significantly enhance maritime domain awareness by providing additional "eyes and ears" at sea through sensors, cameras, and acoustic systems, extending well beyond territorial waters.

At the same time, several structural tensions emerge. Data sharing between private operators and public authorities remains fragmented, often occurring on a request basis and constrained by legal, organizational, and governance barriers. Furthermore, the push toward automation and reduced human presence offshore introduces a paradox: while improving safety, it may also reduce direct observational capacity. Economic considerations further complicate the picture, as preventive investments in security infrastructure are often deprioritized due to uncertain risk perception and cost-benefit trade-offs.

Technological innovation offers promising pathways, including distributed acoustic sensing (DAS) via fiber optics, embedded sensors in PV modules, and the use of offshore infrastructure as energy hubs for autonomous security systems. However, these concepts remain constrained by cost, scalability, and technical feasibility, placing many of them still in experimental or early deployment stages.

Finally, governance complexity and fragmented international frameworks present a major challenge. Differences in national responsibilities, civil-military coordination, and regulatory regimes hinder the development of a coherent security approach. Nevertheless, there is a growing recognition that offshore critical infrastructure is inherently a target, and that integrated, collaborative, and decentralized security strategies are essential to mitigate evolving risks.

Full Report

The discussions on maritime security are grounded in the recognition that offshore energy infrastructure can play a fundamentally expanded role beyond its traditional function. Offshore wind farms and emerging floating solar installations are increasingly considered as strategic assets capable of supporting maritime situational awareness. By integrating sensors, cameras, radar systems, and acoustic technologies, these infrastructures can evolve into distributed monitoring networks across the sea. This is particularly relevant in a context where current surveillance capabilities are perceived as insufficient, with participants explicitly referring to the loss of “eyes at sea.”

The added value of this approach extends beyond passive monitoring. Offshore infrastructures could also serve as operational support platforms, enabling use cases such as intermediate hubs for medical evacuation, drone operations, or patrol missions. These concepts illustrate a broader shift toward multi-functional marine systems, where energy production, security, and logistics become increasingly interconnected. The presence of infrastructure itself is seen as an enabler: once assets are installed offshore, they create opportunities to host additional capabilities at relatively lower marginal cost.

However, the realization of this potential is constrained by several systemic challenges. A key issue concerns data governance and sharing. While offshore operators already collect significant amounts of operational data, this information is typically not shared proactively with defense or security actors. Instead, exchanges occur on a case-by-case basis, often upon request. This limits the effectiveness and timeliness of responses. Legal constraints, including privacy regulations and liability concerns, further complicate data sharing. Moreover, institutional fragmentation—both within and across countries—creates additional barriers. Different national models for maritime security, varying roles of coast guards, navies, and police forces, and limited interoperability all contribute to a fragmented security landscape.

Another important dimension relates to the role of private sector actors. Offshore energy developers generally perceive their primary responsibility as energy production, with security positioned as a secondary or facilitating function. As a result, there is limited willingness to invest in dedicated security measures that do not directly support core operations. In some cases, it is even considered economically rational to accept the risk of incidents rather than invest heavily in preventive infrastructure. This reflects a broader pattern of reactive risk management, where significant changes are only expected following major incidents.

From a technological perspective, several innovative approaches are being explored. Distributed Acoustic Sensing (DAS), using fiber optic cables, is highlighted as a promising method for detecting underwater activity, including vessel movements or potential threats to subsea infrastructure. Additionally, the integration of sensors directly into infrastructure components—such as embedding optical fibers within photovoltaic modules—offers opportunities to enhance monitoring without requiring additional standalone systems. Another emerging concept is the use of offshore energy infrastructure as autonomous power sources for security applications, such as drones or remote sensor networks, particularly in areas where grid connectivity is limited or absent.

Despite these innovations, important technical and economic constraints remain. Offshore photovoltaic systems, for instance, are still in a relatively early stage of development and face cost disadvantages compared to onshore alternatives. Their deployment is closely tied to grid connectivity and proximity to existing infrastructure, limiting their flexibility as standalone security assets. Similarly, concepts such as using infrastructure as physical protection—so-called “crumple zones” to mitigate vessel collisions—raise significant concerns regarding effectiveness, cost, regulatory compliance, and unintended consequences. The potential for damage to both the protective infrastructure and the vessel itself complicates the viability of such approaches.

A further paradox arises from the increasing automation of offshore systems. While reducing human presence enhances safety and operational efficiency, it may also lead to a reduction in direct human oversight and situational awareness. This reinforces the need for reliable, robust, and integrated sensing technologies to compensate for the absence of personnel.

Finally, the discussions emphasize that offshore critical infrastructure must be considered inherently vulnerable and a potential target. In this context, security is no longer optional but a core design consideration. The notion that well-protected infrastructure may act as a deterrent—similar to security systems in residential environments—is widely acknowledged. At the same time, participants caution against excessive centralization, which could create single points of failure and increase overall system vulnerability.

In conclusion, the integration of security into offshore energy systems presents significant opportunities but also substantial challenges. It requires not only technological innovation but also new governance models, clearer regulatory frameworks, and a shift in economic and operational thinking. Achieving effective “security by design” will depend on the ability to align these dimensions into a coherent and collaborative approach.

OVERALL CONCLUSION

From energy integration towards full multi-use systems

The workshop convened a diverse group of stakeholders from offshore wind, nature conservation, security, aquaculture, policy, and research to explore how the North Sea can evolve towards a more integrated, multi-use system. Building on earlier discussions around nature enhancement and security, the sessions collectively examined how offshore wind farms can transition from single-use energy sites to multifunctional marine spaces that also support biodiversity, safety, and food production. A central premise throughout the workshop was that such co-use will increasingly become necessary, requiring a shift in governance, design practices, and stakeholder collaboration.

Across the three discussion themes, several common insights emerged. First, there is broad agreement that moving towards multi-use is inevitable, but it requires early integration in the design phase of future wind farms rather than retrofitting existing sites. Second, risk management—whether ecological, operational, or security-related—remains a key concern, particularly for wind farm operators, and strongly influences the feasibility of different co-use options. Third, participants emphasized the need for systemic thinking: combining functions such as energy production, nature restoration, food systems, and security within a single, coordinated framework rather than treating them as separate add-ons.

The discussions on nature highlighted the potential of offshore wind farms to act as catalysts for biodiversity recovery, particularly through the development of artificial reefs and habitat-enhancing structures. These interventions were generally perceived as low-risk and aligned with existing environmental objectives, although their long-term effectiveness and compatibility with decommissioning requirements require further consideration.

In the security discussions, participants explored how additional infrastructure—such as monitoring systems, vessels, or even aquaculture installations—could contribute to surveillance and protection of offshore assets. While synergies were identified, concerns remain around increased complexity, liability, and the need for clear responsibilities and regulatory frameworks.

The aquaculture discussions focused on the opportunities and constraints of integrating food production into offshore wind zones. Nature-inclusive approaches, such as reef restoration and low-impact bottom culture, were seen as the most feasible starting points due to their relatively low operational risk and potential co-benefits for biodiversity. More intensive systems, including floating or feeding-based aquaculture, were considered higher risk and more challenging to implement without significant redesign of infrastructure and logistics. A recurring theme was that economic viability remains uncertain, and that policy support, incentives, and long-term vision—potentially in the form of a “maripark” concept—are essential to move from pilots to scalable solutions.

Overall, the main outcome of the workshop is a shared recognition that the transition towards multi-use offshore systems is both necessary and complex. It will require coordinated action across sectors, supportive policy frameworks, and a phased approach starting with low-risk pilots while working towards more integrated, large-scale concepts in the longer term.

BLUE CLUSTER

SWiM

Solar and Wind Energy in the Belgian Marine Zone

Write in one word what is robustness in the future at sea for you?

Wordcloud Poll 31 responses 29 participants

Collaboration
Healthy North Sea
Regeneratieve aquaculture
Sustainable ecosystems
Resilient
Sustainability
Long term thinking
Compatibility
Winning
Resilience
Stakeholder engagement
Futureproof
Energy security
Knowledge
Safety
Demonstrated
Adaptability
Demonstrations
Risk aware
Holistic
Healthy ecosystems

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