Challenges for impact assessment in Offshore Wind Energy Development

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EnvSoOff Project

What are the key challenges for Impact Assessment in the offshore wind sector?
Market Status 2022

offshore wind represents currently 7.1% of global wind power installation
There is a significant expansion in the annual additions of new offshore wind installations.
115 of the world’s countries are deemed to have technically extractable offshore wind potential -- just over 71,000 GW. Only around 20,000 GW of that total is in shallower waters suited to fixed offshore wind turbines; the rest is suited to floating offshore wind.

https://globalwindatlas.info/en
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Predictions made by GWEC show increasing capacity for OWE

GWEC Market Intelligence expects more than 380 GW of new offshore wind capacity to be added over the next decade

*Compound Annual Growth Rate.*
Source: GWEC Market Intelligence, July 2013

https://gwec.net/gwecs-global-offshore-wind-report-2023
To achieve net zero emissions by 2050, expansion of renewable must be faster.

https://www.iea.org/reports/world-energy-outlook-2023
TABLE 2.1  Key performance indicators for the power sector: Planned Energy Scenario and 1.5°C Scenario in 2030 and 2050

<table>
<thead>
<tr>
<th></th>
<th>Historical</th>
<th>2030</th>
<th>1.5°C Scenario</th>
<th>2050</th>
<th>1.5°C Scenario</th>
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<tr>
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<td>2020</td>
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| Total generation (TWh) | Global 26,991 | 36,119 | 40,140        | 52,436 | 89,878
|                     | G20 22,616 | 29,560 | 32,408        | 41,867 | 66,273 |
| Total installed capacity (GW) | Global 7,694 | 11,670 | 14,462        | 19,748 | 35,339
|                     | G20 6,495 | 9,575 | 11,746        | 15,734 | 26,098 |
| RE total installed capacity (GW) | Global 2,813 | 6,773 | 11,174        | 15,835 | 33,216
|                     | G20 2,435 | 5,959 | 9,359         | 13,144 | 24,868 |
| RE share in generation (%) | Global 28% | 46%   | 68%           | 73%   | 91%
|                     | G20 28% | 48%   | 69%           | 74%   | 91%
| VRE share in generation (%) | Global 9% | 27%   | 46%           | 53%   | 70%
|                     | G20 10% | 31%   | 50%           | 59%   | 76%
| RE share in installed capacity (%) | Global 37% | 58%   | 77%           | 80%   | 94%
|                     | G20 37% | 62%   | 80%           | 84%   | 95%

Under the 1.5°C Scenario, the global installed **offshore wind capacity would reach almost 500 GW in 2030**, a fourteen-fold growth over 2020 levels. (…)

By 2050, offshore power plants of almost 2 500 GW in combined capacity would need to be installed globally.
Challenges for impact assessment in Offshore Wind Energy Development

Closing the offshore wind gap by 2050

Accelerating the expansion founds many barriers – we should
The progress is notable - IRENA data indicates that 2023 set a new benchmark in renewable power deployment, adding 473 GW to the global energy mix, 87% of total additions.
Still, IRENA identifies bottlenecks for renewable energy expansion – all of them relevant for offshore wind energy.
“Globally, offshore wind projects typically take up to **nine years** to move from the early development stage to full commissioning. The bulk of this time is spent in the permitting and consenting stage (...)

Climate change is a threat of the utmost importance, but we have other critical threats to life on Earth.

<table>
<thead>
<tr>
<th>TRIPLE PLANETARY CRISIS</th>
<th>CLIMATE CHANGE</th>
<th>BIODIVERSITY LOSS</th>
<th>POLLUTION</th>
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**OUR OCEAN**

The planet’s largest ecosystem is endangered.

### Challenges for impact assessment in Offshore Wind Energy Development

#### Progress assessment for the 17 Goals based on assessed targets, 2023 or latest data (percentage)

<table>
<thead>
<tr>
<th>Goal</th>
<th>On track or target met</th>
<th>Fair progress, but acceleration needed</th>
<th>Stagnation or regression</th>
<th>Insufficient data</th>
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- On track or target met
- Fair progress, but acceleration needed
- Stagnation or regression
- Insufficient data

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...and Impact Assessment has the purpose of bringing the multiple significant crises for supporting decision-making and actions for a just energy transition.

| Progress assessment for the 17 Goals based on assessed targets, 2023 or latest data (percentage) |
|---------------------------------|---------------------------------|
| G1                              | G2                              |
| G3                              | G4                              |
| G5                              | G6                              |
| G7                              | G8                              |
| G9                              | G10                             |
| G11                             | G12                             |
| G13                             | G14                             |
| G15                             | G16                             |
| G17                             |                                  |

- On track or target met
- Fair progress, but acceleration needed
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- Insufficient data
Exploring three IA challenges in OWE

1. Streamlining EIA
2. EIA as part of a sustainability-based planning system
3. Cumulative impacts
1. Streamlining EIA – how to do it?

**Problems:**

1. Limited public participation

2. Limited baseline
   
   + extensive monitoring requirements

3. Cumulative impacts not (well) addressed

4. New screening rules and exclusion of IA from decision-making


Enabling actions to speed up permitting protocols for offshore wind projects

Below is a list of some of the key solutions discussed by the CFOR, IRENA and GWEC to speed up the permitting process for offshore wind:

(1) Having dedicated centralised authorities and single focal points who can work with offshore wind developers to streamline the siting and permitting process. For example, in the Philippines, a 2021 executive order has prompted the creation of a task group to implement the Energy Virtual One-Stop Shop, an online platform to co-ordinate data and information for all renewable energy project applications.

(2) Implementing different channels to promote active dialogue for shared understanding of priorities during the consenting and construction stages of wind projects. An example of this are the offshore wind projects that were being planned in Korea with developers organised public-private working groups. The latter’s views were considered in the decision-making process (Park et al., 2022).

(3) Introducing legislation mandating maximum lead times for permitting with additional discretionary time agreements. European Commission has tabled a new legislative proposal on renewables permitting within its REPowerEU plan. The proposal keeps the existing permitting deadlines - two years for normal new projects and one year for repowered projects. The legislation also clarifies which permits and procedures must be delivered within these deadlines (WindEurope, 2022).

Energy sector recommendations:
1. One-Stop Shop
2. Dialogue for shared understanding of priorities
3. Maximum lead times for permitting
More recommendations:

Implement an emergency clearing house mechanism for legal disputes to prevent extended delays to critical infrastructure projects.

Accelerate energy infrastructure (offshore and onshore grid) permitting and deployment.

Invest in more staff and digital resources for the various authorities which make decisions during the permitting process of a renewable energy and infrastructure project.

Build digitised, searchable databases for land registration and the siting of renewable energy projects.

Align land and ocean use guidance at national and subnational level, prioritising projects which support energy security, DNSH principles, biodiversity and the green economy.

https://www.irena.org/Publications/2023/Sep/Enabling-frameworks-for-offshore-wind-scale-up
(...) The UK has been exerting efforts to shorten the permitting time. Announced in June 2023, the Offshore Wind Environmental Improvement Package (OWEIP) aims to support the accelerated deployment of offshore wind by **reducing consenting time from up to four years to one year**.

The concept of a **One-Stop-Shop (OSS)** – a single contact point for a smooth and administratively lean process from consenting through to decommissioning – has long been used in mature European markets like Denmark, the UK and the Netherlands. The OSS for project permitting not only speeds up the consenting process, but also reduces uncertainties and delays.
Environmental licensing for offshore wind farms: Guidelines and policy implications for new markets

Rafael Monteiro de Vasconcelos, Lara Luana Cirilo Silva, Mario Orestes Aguirre González, Andressa Medeiros Santiso, David Cassimiro de Melo

In Brazil, processes for granting marine areas for OWE are under discussion, but in the opposite direction, the legislative is reviewing EIA regulation proposing concerning issues. The federal environmental agency (IBAMA) is on strike due to the low number of civil servants, poor working conditions, and low salaries.

Guidelines and good practices in environmental licensing for the development of OWP

1. Establishment of a national offshore wind energy production target
2. Mapping of marine offshore wind zones
3. Adoption of a “one-stop-shop” procedure
4. Maritime land concession regimes: Open-doors and Tenders
5. Standard procedure guide in environmental licensing for offshore wind farms
6. Development of Environmental Studies
7. Public, authorities and stakeholders’ consultation
8. Supply Chain Development Statement

Fig. 9. Guidelines in environmental licensing for OWP in new and emerging markets.
2. EIA and sustainability-based planning

![Figure 4.1. MSP status around the world by April 2022. Source: IOC-UNESCO and MSP survey, 2022.](https://unesdoc.unesco.org/ark:/48223/pf000038197)
2. EIA and sustainability-based planning

What happens before project-level EIA is essential

1. Marine Spatial Planning can play a crucial role in managing the multiple marine uses and resources
2. Sustainability-based planning can favor better project proposals
3. Early engagement of stakeholders in the MSP can mitigate potential future conflict

But MSP / planning:
1. May not be there
2. May be not mandatory – limited role in management and decision-making

https://unesdoc.unesco.org/ark:/48223/pf0000381921
Australia selection areas beyond winds:

1. Potential low conflict (lower marine uses)
2. Existing infrastructure
3. Proximity to areas of high electricity demand
4. Skilled workforce
5. Known industry interest in developing projects in the area


Map of proposed area

Map of proposed area - Indian Ocean off the Bunbury region, WA

Map of proposed area - Bunbury

The Offshore Renewable Energy Process

**AT THIS STAGE**

- The Government proposes an area for future offshore wind development. This area is informed by data and information from government agencies.
- You will be able to make online submissions on the suitability of the proposed area. This is your first opportunity to provide feedback.
- After considering all feedback, the Minister for Climate Change and Energy may decide to declare all or some of the area.
- If an area is declared, feasibility studies and further engagement would then begin.

**AT THIS STAGE**

- Developers apply for feasibility licenses, which are assessed against merit criteria.
- Feasibility licence holders develop specific project proposals in more detail.
- Developers will seek environmental approvals required to undertake activities over multiple years of a feasibility licence.
- Prior to undertaking activities, developers require a management plan approved by the independent Offshore Infrastructure Regulator.
- Developers will consult with persons, organisations, communities, and groups that may be impacted by proposed activities, to develop their management plans.
- For approval, management plans must address any feedback from those impacted by activities.

**AT THIS STAGE**

- Developers who have completed feasibility studies and met other approvals apply for commercial licences, which are assessed against merit criteria.
- Turbines are installed, wind farms are operated and maintained.
- Developers are responsible for decommissioning their projects at the end of their lifespans.

**WE ARE HERE**

**STAGE 1**
Initial Consultation and Regional Zoning
6 - 9 MONTHS

- Area proposal
- Public consultation
- Feedback assessment and area declaration
- Opportunity for feedback

**Construction of offshore wind projects CANNOT begin in this stage.**

**STAGE 2**
Project Proposals, Feasibility Studies and Approvals
2 - 7 YEARS

- Feasibility licences
- Environmental impact assessments and other approvals
- Management Plans
- Opportunity for feedback

**Construction of offshore wind projects CANNOT begin in this stage.**

**STAGE 3**
Project Delivery
UP TO 40 YEARS

- Commercial licences
- Wind farm construction and operation
- Decommissioning
- Opportunity for feedback

**Construction of offshore wind projects MAY begin, IF all approvals have been received.**
3. Cumulative impacts

The marine ecosystem is highly connected – cumulative impact assessment is even more relevant.

Social impacts must be properly addressed.

The MSP when informed by the assessment of cumulative impacts derived from multiple pressures of several projects in an area, may influence several tiered decisions, including the permitting process (World Bank Group, 2021).

CIA integrated into MSP is a key approach to support the adoption of an ecosystem approach for sustainable use of the marine environment (Halpern et al. 2008b; Bergström et al. 2019), supporting strategic decision-making based on identifying areas with high and low concerns related to cumulative impacts from pressures on a given area, especially considering seascape connectivity (Jonsson et al. 2021), limiting the additional pressures on specific areas of concern and providing more transparency in planning decisions (Hammar et al. 2020).
3. Cumulative impacts

In UK – Willsteed et al. (2018) show relatively low performance of nine EIS from offshore wind farms from round 3.

![Graph showing variance in scores between Environmental Statements](image)

**Fig. 5.** Variance in scores between Environmental Statements evaluated (n = 9). The four components of each bar correlate with the attribute categories presented in Fig. 4. The horizontal black line indicates the expected height of the bar if an Environmental Statement scored 3 for each attribute (‘strong’).

Netherlands has a national ongoing Framework for assessing cumulative impacts - separate from SEA and EIA


Framework for Assessing Ecological and Cumulative Effects

The Framework for Assessing Ecological and Cumulative Effects focuses on possible cumulative effects on the populations of species to be protected during the construction and operation of offshore wind farms in the period leading up to 2030. The site decisions for the various wind farms also look at whether site-specific effects can be expected. That also involves determining which mitigation measures can be taken to prevent any significant negative effects. These are effects that would cause a structural decline in the populations of species to be protected and would affect the natural resilience of the species. The Framework for Assessing Ecological and Cumulative Effects describes the research method and the results in further detail. Possible measures are also described here but the choices in this respect will be made in the site decisions.

KEC documents and publications

The Framework for Assessing Ecological and Cumulative effects 4.0 (2021 - 2022) consists of:
Final reflection

1. EIA streamline, the existing planning system and attention to the overall (cumulative) outcomes are high importance challenges

2. From all this, we can say that IA needs adequate data, a team, time and timing, and a governance arrangement capable of accommodating different stakeholder demands.

3. Effective IA depends on the decision-making system’s appetite for technical inputs on broader sustainability concerns – must go from carbon-centered energy transition to a broader just transformation vision.

4. How prepared is IA for next-Generation renewable energy megaprojects? Political moves shows we must advance in demonstrating IA effectiveness
Acknowledgements

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References


IRENA. 2023. World energy transitions outlook 2022: 1.5°C Pathway.


Let’s continue the conversation!
Post questions and comments in the IAIA24 app.

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