

Insights for offshore energy transition: the role of strategic environmental assessments

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1. INTRODUCTION

In 2022, the larger worldwide installed capacity of offshore wind energy are located in Asia-Pacific (34 GW) including China (around 30 GW) and in Europe (30 GW) from mostly United Kingdom with 46% of these amount (GWEC, 2023). Other countries such as Brazil, Philippines, India and South Africa proved to have a relevant technical potential for deploying new offshore wind projects (ESMAP, 2019). Brazil presents an estimated potential of 700GW for offshore wind development (EPE, 2020). Although this promising capacity, there is currently a lack of regulatory framework governing offshore wind projects, and consequently, no projects have been initiated. Several proposals have been submitted to the national environmental agency – Ibama - showing a significant interest in the exploration and development of offshore wind projects in the country¹.

The impact assessments of O&G projects played an important role in developing knowledge and experience in assessing the impacts of offshore projects on marine environment (Vilardo et al., 2020; Vilardo and La Rovere, 2018). Although the impact assessments for O&G projects have been meeting with several shortcomings, the federal environmental agency and other agents have used innovative approaches, such as multi project assessment and platform for sharing monitoring information², seeking to improve the efficiency and efficacy of impact assessment-based decision making (Vilardo and La Rovere, 2018). One developed approach is the application of a specific type of Strategic Environmental Assessment (SEA) named Environmental Assessment of Sedimentary Area (EASA). This tool was created a ministerial ordinance in 2012 to inform strategically new bidding rounds of areas for O&G exploration (Vilardo et al., 2020).

In this context, this study aims at investigating the following question: what can we learn from a strategic instrument applied to the O&G sector in Brazil for further strategic IA regulations of offshore wind projects? For this, we reviewed the application of Environmental Assessment of Sedimentary Area (EASA) developed in Brazil to support O&G decision making. Two sedimentary basins were assessed, and the studies provided recommendations about areas suitable for receiving new projects.

¹ Available at: https://www.gov.br/ibama/pt-br/assuntos/laf/consultas/arquivos/20240129_Mapa_eolicas_offshore_Ibama.pdf

² Mention to the “Programa de Monitoramento de Praias” with the shared information here: <https://simba.petrobras.com.br/simba/web/>

2. THE CASE OF ENVIRONMENTAL ASSESSMENT OF SEDIMENTARY AREA IN BRAZIL

2.1. General context and cases description

In Brazil, there is no federal regulation for applying SEA for policies, plans or programs (Sánchez, 2017), despite the considerable number of SEAs conducted since the 1990s (Montaño et al., 2021). However, due to a number of conflicts arising from offering leases in environmentally sensitive and biodiverse offshore areas, and consequent litigation, the federal government weaved an arrangement between the ministries of Mines and Energy and Environment, establishing a procedure for conducting strategic-level assessment prior to bidding. As defined by Interministerial Ordinance 198/2012, EASA is a "multidisciplinary study with regional scope, aimed primarily at supporting the classification of areas for the granting of exploratory blocks for oil and natural gas, as well as producing regional environmental information to support the environmental licensing of specific projects."

Currently, only two EAAS reports are publicly available: the study of the *Solimões* terrestrial sedimentary basin and the study of the *Sergipe-Alagoas* and *Jacuípe* maritime sedimentary basins. These reports, prepared by different consultants, have a similar structure. Both present hydrodynamic transport and oil dispersion modeling, discussion of scenarios and development strategies, classification of areas regarding suitability, and guidelines and recommendations for activity development. The methodological approach of both studies was guided by (Partidario, 2012) and it was not possible to consult the terms of reference of the studies.

One of the most valuable recommendations provided by EASA reports are the areas classification into four categories:

- granted areas (areas already in use);
- suitable areas (areas considered to be adequate to receive new projects);
- unsuitable areas (areas featuring highly relevant environmental and social values to be conserved)
- areas under moratorium (areas where more investigation and studies need to be conducted to evaluate the suitability for new projects).

The classification of suitability of areas is not applicable for activities such as transportation, port infrastructure, terminals, and support vessels. In the study of *Sergipe-Alagoas* and *Jacuípe*, the suitability classification was based on environmental indicators related to (i) the occurrence of marine manatee, a species with high vulnerability; (ii) areas of mud bottoms, due to their importance in aggregating benthic organisms and consequent concentration of the seven-bearded shrimp; (iii) reef environments, as they are fragile, rare ecosystems with high diversity; (iv) marine conservation units, as their management plans do not explicitly foresee mineral exploration, resulting in incompatibility with O&G activities; and (v) oil shoreline contact time of less than 20 hours, based on oil dispersion modeling to enable possible containment of oil shoreline contact. In the study of the *Solimões* basin, an evaluation of unsuitability areas was conducted based on the distribution of conservation units, indigenous lands, isolated indigenous peoples, and proximity to rivers, lakes, and floodplains of the region. For the definition of moratorium areas, the surroundings of traditionally occupied

lands and areas with priority for the creation of conservation units were considered. Areas not classified in the previous categories were considered suitable.

The study of the *Sergipe-Alagoas* and *Jacuípe* sedimentary basins presents strategic objectives related to the production and development of the O&G industry, guided by the classification of the suitability of the areas. In this study, most of areas are suitable for receiving new projects (Table 1). Moreover, the study contains twelve recommendations for environmental licensing. Of this twelve, five have broad application, i.e., to various types of enterprises: "Periodic impact assessment", "Conducting pre-meetings with the technical team involved in the preparation of the environmental study before issuing Terms of Reference for the studies", "Involvement of local actors in the licensing process", "Broad availability of data associated with licensing processes", and "Presentation of technological alternatives for drilling, production, and flow", this latter already included - in a generic manner - in the minimum content of an EIS according to CONAMA Resolution No. 1/1986. Other recommendations included "Standardization of minimum environmental project methods" and joint action between companies in the implementation of environmental programs ("Development of regional socio-environmental projects"). There are recommendations for "Conducting integrated environmental studies by region", "Conducting regional characterization and monitoring campaigns", and "Development of environmental diagnoses targeting local sensitivities".

The study of the *Solimões* basin contains 39 recommendations, with eighteen of general application, two related to seismic research, six applicable to exploratory drilling, eight related to the production phase, four related to transportation, and one applicable to the decommissioning phase. General recommendations are related to considerations of impacts on affected communities, possible interference with threatened and endemic species, and respective mitigating measures and monitoring actions. In the case of this terrestrial basin, the environmental licensing of exploration and production activities is the responsibility of the state environmental agency.

2.1. SEA analysis

There are several ways to evaluate SEA reports and process by using perceptions interview's, evaluation criteria among others methods and tools (Arce-Ruiz et al., 2019; Therivel and González, 2019). IAIA have been discussing best practices and good quality of SEA assessments since early 2000 and proposed a set of performance criteria (IAIA, 2002). In this study we used these criteria to evaluate the published content and context of application of the two EASA already published (Table 1).

The main benefits of EASA of O&G sector are related to the **public participation** at the strategic level of the decision making. Anticipate the public engagement and keep it as a continuum process during all IA process is already recognized as a good practice (IFC, 2012). The scenarios of energy demand and respective impacts are fundamental for discussing the implications of the strategic objective. This proactive analysis can further benefit other offshore developments, such as wind projects. The discussion of **technological alternatives** can also benefit further projects in the sedimentary basin, especially as presented in the Solimões EASA, the study of infrastructure to support the O&G production flow.

One of the main shortcomings of the EASA is the **no influence on the decision** of new O&G projects. The reasons are related to the delay in the effective implementation and utilization of the instrument, the time lag between conducting studies and holding bidding rounds and the non-alignment between sector planning based on exploration rounds, with blocks offered in different basins, and application of the instrument in sedimentary basins. Therefore, in practice, we see the bidding rounds have consistently been presenting blocks with interferences with areas under study for the creation of conservation units, protected areas, or near the coast and environmentally sensitive regions.

Moreover, the EASA reports do not present an **integrated baseline of ecosystem** to be affected and social relevant matters. This integrated analysis is fundamental for assessing the complexity of marine impacts, especially considering ecosystem services methods and tools (Watson, 2024). Besides that, **no cumulative impact assessment was conducted** for evaluating the synergistic and additive impacts resulted from several O&G and other related projects in the sedimentary basin analyzed.

In the case of O&G planning, offering of blocks without a systematic prior environmental assessment represents a risk to the business of the bidding companies themselves - greater difficulty for environmental licensing or project financing in sensitive areas. The absence of prior environmental assessments may influence the investment risk assessments made by companies and deter some from participating in auctions, reducing competitiveness.

Table 1. Analysis of Environmental Assessment of Sedimentary Area studies according to SEA performance criteria (IAIA, 2002)

IAIA SEA performance criteria		<i>Solimões sedimentary basin</i>	<i>Sergipe-Alagoas/Jacuípe sedimentary basin</i>
Is integrated	Ensures an appropriate environmental assessment of all strategic decisions relevant for the achievement of sustainable development		
	Addresses the interrelationships of biophysical, social and economic aspects		
	Is tiered to policies in relevant sectors and (transboundary) regions and, where appropriate, to project EIA and decision making		
Is sustainability-led	Facilitates identification of development options and alternative proposals that are more sustainable		
Is focused	Provides sufficient, reliable and usable information for development planning and decision making		
	Concentrates on key issues of sustainable development		
	Is customized to the characteristics of the decision-making process		
	Is cost- and time-effective		
Is accountable	Is the responsibility of the leading agencies for the strategic decision to be taken		
	Is carried out with professionalism, rigor, fairness, impartiality and balance		
	Is subject to independent checks and verification		
	Documents and justifies how sustainability issues were taken into account in decision making		
Is participative	Informs and involves interested and affected public and government bodies throughout the decision-making process		
	Explicitly addresses their inputs and concerns in documentation and decision making		
	Has clear, easily understood information requirements and ensures sufficient access to all relevant information		
Is iterative	Ensures availability of the assessment results early enough to influence the decision-making process and inspire future planning		
	Provides sufficient information on the actual impacts of implementing a strategic decision, to judge whether this decision should be amended and to provide a basis for future decisions		

Legend	Positive	Neutral	Negative	N/A
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3. LESSONS FOR NEW OFFSHORE WIND IA REGULATIONS

Although one of the reports analyzed was related to a terrestrial basin and the main driver for elaboration of EASA is from the O&G industry, the evaluation of SEA practice could benefit general aspects of regional planning of offshore wind regulations. New strategic IA regulations for offshore wind should consider the following lessons from analyzing SEA of O&G practice in Brazil.

Firstly, from the main benefits that arose from the EASA experience:

- *Promote public participation during all stages of decision-making to comprehensively consider social impacts and avoid further uncertainties in the project assessment.*

The engagement of affected communities is fundamental for planning the energy transition and low carbon initiatives (Carley and Konisky, 2020; Levenda et al., 2021). Public engagement and documented consultation in the case of analyzed studies was one of the main benefits of developing strategic assessment in the O&G planning. Therefore, for including public opinion in energy transition and decrease future risks for investors, the offshore wind energy planning in Brazil should conduct a strategic and systematic assessment of future impacts of alternatives.

- *Consideration of alternatives to achieve the strategic objective.*

Technological alternative assessments and areas classification can inform both, project assessments and Marine Spatial Planning. The latter is still under development in Brazil and SEA can help in mainstreaming sustainable-related objectives and consequently, improve the considerations of social and environmental aspects in the context of planning multiple marine activities.

Moreover, lessons from the main shortcomings from the EASA experience:

- *Good timing for influence tiered decisions and horizontal integration between sectoral and marine programs, plans and policies.*

This is the most important shortcoming in the strategic assessment conducted in the O&G sector. Therefore, the same problem can happen for offshore wind energy in case of the same dealignment between auction rounds and areas assessments occur. Therefore, the time and costs of regional assessment should be considered when planning the offer of new offshore wind projects.

- *Consideration of cumulative impacts.*

No mention to cumulative impacts were found in the documents analyzed. Moreover, no integrated analysis of marine impacts on ecosystems and communities was presented. Therefore, improvements on the current practice are require when developing regulations for offshore wind planning. These integrated approaches and consideration of cumulative impacts are mandatory given the complexity of marine impacts and trade-offs involved (Watson et al., 2024), as already shown by previous offshore wind assessments practice (Willstead et al., 2018).

ACKNOWLEDGEMENTS

We gratefully acknowledge the support of the RCGI – Research Centre for Greenhouse Gas Innovation, hosted by the University of São Paulo (USP) and sponsored by FAPESP – São Paulo Research Foundation (2020/15230-5; 2014/50279-4) and TotalEnergies EP Brasil, and the strategic importance of the support given by ANP (Brazil’s National Oil, Natural Gas and Biofuels Agency) through the R&DI levy regulation.

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