Comparison of Regulatory Frameworks and Procurement Processes in the U.S. and The Netherlands

Regulatory frameworks differ substantially from country to country, and Hogan Lovells regularly updates a description of these frameworks. The 2022 edition of their report presents the processes used by 14 countries; see https://brochures.hoganlovells.com/?pid=MjM237874&v=3.1

In the U.S. regulatory framework, the Bureau of Ocean and Energy Management (BOEM) identifies, vets, refines, and then auctions wind energy areas to developers. The winner of an auction can then conduct site characterization studies to assess the metocean, seabed, habitat, artifacts, and other elements that are needed for permitting and approval process, as well as for the design of wind farm, obtaining financing, and other essential activities. State-associated energy organizations develop requests for proposals (RFPs) for specific levels of procurement, and developers who have lease areas can bid into response to these tenders. These state-associated organizations define the quantitative and qualitative criteria to be used in the evaluation of bids. The quantitative cost/benefit assessment is primarily the purchase price for the electricity (e.g. in $/MWh). Qualitative aspects include: short and long-term local employment; commitment to diversity, equity, and inclusion; supply-chain and workforce development; port and infrastructure investment; research and development initiatives and partnerships; benefits to low-income regions; siting, energy storage, and others; this list is derived from the 2021 RFP from the Massachusetts Department of Energy Resources to procure up to 1600 MW of offshore wind energy; see https://macleanenergy.files.wordpress.com/2021/05/83c3-rfp-and-appendices-final.pdf
Every state sets their own RFPs and evaluation metrics. Solicitations from New York are presented at: https://www.nyserda.ny.gov/All-Programs/Offshore-Wind/Focus-Areas/Offshore-Wind-Solicitations

The management of offshore wind energy in The Netherlands occurs at a national level, and their process and metrics are very different than those used in the U.S. The Netherlands contracts out much of the site characterization work for a potential wind farm in advance of the tender for that farm, and the full results of these investigations (including geotechnical studies) are shared with potential developers and the general public. A primary benefit of this is to de-risk the site to enable more competitive bids by developers. Another benefit of a public characterization of the seabed is that it is available by all to assess the feasibility of design choices and to enable innovation.

Some examples and discussion of the above is given below.

Several years ago, Wilfried Breuer from TenneT (Transmission System Operator extensively involved in The Netherlands) gave an excellent presentation at the Massachusetts Statehouse in which he described the merits of the approach taken by The Netherlands. By conducting site characterization prior to the tendering process, he said that The Netherlands was able to get more competitive bids such as the 7.27 Euro cent per kwh at the Borselle 1 & 2 (752 MW) wind farm contract in 2016 to Orsted (DONG at that time) that then led to future subsidy free projects. NYSERDA tried to follow the approach taken by The Netherlands by biding into the December 2016 BOEM auction of a 79,350-acre site with the intent of contracting out site characterization work and then bidding out this region for development. NYSERDA was outbid by Equinor; see https://www.offshorewind.biz/2016/12/16/new-york-auction-resumes-today-3-bidders-still-in-after-price-climbs-to-usd-25-5m/
https://www.equinor.com/news/archive/statoil-wins-offshore-wind-lease-new-york

Wilfried also expressed that a key motivation for the approach for site characterization taken by The Netherlands was to create a comprehensive understanding and public data on wind farm locations. A very recent example of this process is presented in the link below for a 45-million Euro tender for geotechnical surveys of the future Nederwiek Offshore Wind Farm https://www.offshorewind.biz/2023/03/30/rvo-opens-eur-45-5-million-tender-for-geotechnical-surveys-at-nederwiek-offshore-wind-farm-zone/

The cost of these studies is born by the developer who wins the permit for offshore wind energy development by reimbursing the Netherlands Enterprise Agency that funded the initial site characterization. These studies are not only geotechnical surveys, but also for environmental impact assessments. For example, Ecowende (winner of the Hollandse Kust West Site VI) was required to pay 63.5 million Euros for the characterization of the wind farm that won a permit for; see https://english.rvo.nl/news/shell-and-eneco-receive-permit-hollandse-kust-west-site-vi-offshore-wind-farm

The motivation and characteristics of the process used in The Netherlands is presented in the following report.
https://www.rvo.nl/sites/default/files/2021/10/Dutch%20Offshore%20Wind%20Guide%202022.pdf

While developers of U.S. wind farms are required to submit the results of geo surveys to BOEM, this information is not necessarily of the density or of the format needed to create a good public understanding of the relevant engineering properties of our seabed. There are at two significantly negative consequences to the U.S. process:

1. The data being collected in much of the survey work is not available for the education of the future engineers and scientists, or of current U.S. industry, to lead the development of the U.S. offshore wind resource. For example, in my instruction during on the design of offshore wind energy foundations, I refer students to publications from the Netherland Enterprise Agency (RVO) about the characteristics of their seabed because there is not equivalent information about the U.S. seabed in the public domain. Results from the investigations commissioned by the RVO for the Borselle wind farms are available at: https://offshorewind.rvo.nl/cms/view/78f1a154-5b56-4ab0-a70f-d746a610179e/studies-borssele These provide quite detailed data such as the 384-page Geotechnical Report/Investigation Data on Borselle 3. https://offshorewind.rvo.nl/file/download/caa2bbe8-00f6-420a-a19f-5297a07c761f/1456928467sdb_report_data_seafloor%20in%20situ%20test%20locations_wfs%20iii_160302_fugro.pdf

2. The longer that the U.S. maintains a process in which developers (primarily European) learn much more about our seabed and other conditions than do U.S. industry, the more difficult it will be for the nascent U.S. industry to compete.

An example of these concerns was demonstrated in the procurement for Empire Wind 1. The state of New York did not go with the lowest cost bid from developers but rather with one that they anticipated would provide near- and long-term benefits to the state through the development of New York based manufacturing infrastructure for the construction and delivery of concrete gravity-base structure (GBS) foundations.

Equinor, and Co-Developer British Petroleum, switched to the use of foreign-built steel monopiles for Empire Wind 1 over locally produced concrete GBFs because of "weak horizontal layers" in the seabed that would have required extensive and expensive dredging and preparation work; see https://www.wind-watch.org/news/2021/09/01/equinor-considers-driving-huge-pilings-into-li-seabed-for-wind-turbines/
The above news article is based on Equinor's July's 2021 Construction and Operation Plan that is available at
https://www.boem.gov/sites/default/files/documents/renewable-energy/Public_EOW%20COP_v3.4_Volume%201_Redacted.pdf

Because of my previous experience in the design and assessment of concrete GBS foundations for oil and gas platforms (subject of PhD work and a few consulting jobs) and the much greater durability they provided in comparison to steel monopiles (subject of two projects that I led for BOEM), I was interested in how extensive the problem was of weak horizonal layers in the seabed. While at the Foundation Ex conference in Bristol UK in May of 2022, I was in conversation with someone who was familiar with the Empire Wind 1 geotechnical conditions. I asked them how extensive the problem was with weak soils, and they responded by saying that this was proprietary information that they could not share.

The experience on Empire Wind 1 demonstrates the advantages of the regulatory framework in The Netherlands. If the geotechnical conditions at the Empire Wind 1 site were known prior to auction, then it would have avoided the situation where New York had the impression that they were going to have a concrete GBS industry develop in their state by going with a higher bid price. If the fully collected data from geotechnical and geophysical studies (along with appropriate metadata requirements) were in the public domain, then a broader array of people and organizations (including new industry players, innovators, governmental bodies, and the academic community) could contribute to the holistic design of offshore wind farms that move beyond a 25-year LCoE economic model and more fully embrace nature-inclusive design and other benefits of holistic design. As mentioned in the synopsis on the MOCEAN site of key takeaways from the RWU/TNC symposium, The Netherlands gives 50% of the merit points in the review of bids from developers to the effects on the Ecology which further encourages nature-inclusive design). As it stands, the longer that existing industry players have privileged information about the properties of our seabed, the more difficult it will be for the nascent U.S. industry to compete and for the national to educate the next generation of scientists and engineers to be leaders in the development of our nation's offshore wind energy resource. If U.S. government took responsibility for contracting out geotechnical and other studies as soon as possible, then this would speed up the development process and our ability to meet our climate goals.