Federal Offshore Wind Permitting: Identifying Barriers to Timely Approval

A thesis submitted by

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Abstract

As a nascent industry in America, there are many challenges to the timely deployment of offshore wind projects. Among these is the complexity of permitting a project undergoes during its development, including the federal approvals all projects in the Outer Continental Shelf must obtain before they can construct and operate. Though the permitting schedules published by the Bureau of Ocean Energy Management state that the review and approval of a project's Construction and Operations plan nominally takes two years, in practice this permitting phase lasts nearly twice as long. This thesis contributes to the understanding of the bottlenecks that offshore wind projects face during the Construction and Operations Plan phase of federal permitting. This research uses two case study projects, Vineyard Wind and New England Wind, to examine the factors involved in the permitting delays experienced during this federal permitting phase. To provide additional insights into these occurrences, members of the private and public sector who worked on these projects were interviewed.

Acknowledgments

There are many people whose feedback and support were instrumental to the completion of my thesis. I would like to extend my gratitude to my thesis advisor, Penn Loh, and reader, Sumeeta Srinivasan, for your guidance during this process. Additionally, to all the interviewees who participated in my thesis work: thank you for taking the time to speak with me during this very turbulent time for the offshore wind industry; I greatly appreciated both your insights into the offshore wind federal permitting process as well as your perspectives on the current state of the industry. Lastly, I want to thank my family and friends for their love and support, including my various study buddies who sat with me in silent video chat for hours on end as we kept each other productive and accountable.

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List of Acronyms

BOEM: Bureau of Ocean Energy Management
BSSE: Bureau of Safety and Environmental Enforcement
COP: Construction and Operations Plan
CRMC: Coastal Resources Management Council
CZM: Coastal Zone Management (Massachusetts Office of)
CZMA: Coastal Zone Management Act
DEIS: Draft Environmental Impact Statement
DOE: Department of Energy
DOI: Department of the Interior
EEZ: Exclusive Economic Zone
EFH: Essential Fish Habitat
EIS: Environmental Impact Statement
EPA: Environmental Protection Agency
ESA: Endangered Species Act
FEIS: Final Environmental Impact Statement
FERC : Federal Energy Regulatory Commission
FPISC: Federal Permitting Improvement Steering Coucil
GW: gigawatt
IHA: Incidental Harassment Authorization
IPCC: Intergovernmental Panel on Climate Change

IRA: Inflation Reduction Act
ITA: Incidental Take Authorization
LCOE: Levelized cost of electricity
LOA: Letter of Authorization (for MMPA ITA)
kW: kilowatt
kWh: kilowatt-hour
MMPA: Marine Mammal Protection Act
MOU: Memorandum of Understanding
NEPA: National Environmental Policy Act
NHPA: National Historic Preservation Act
nm: nautical mile
NMFS: National Marine Fisheries Service
NOA: Notice of Availability (of a DEIS)
NOAA: National Oceanic and Atmospheric Administration
NOI: Notice of Intent (to file an EIS)
NREL: National Renewable Energy Laboratory
OCS: Outer Continental Shelf
OSW: Offshore wind
ROD: Record of Decision
SAP: Site Assessment Plan
SEIS: Supplemental Environmental Impact Statement
SHPO: State Historic Preservation Officers
THPS: Tribal Historic Preservation Officers
TWh: terawatt-hour
USACE: United States Army Corps of Engineers

Chapter 1. Introduction

Researchers and policymakers have recognized that the development of offshore wind (OSW) in the United States will be critical to meeting the nation's decarbonization goals. In 2021, the Biden administration cemented this importance by setting a national target of deploying 30 GW of OSW power by 2030.[1] It is likely that much of this OSW development will occur off the North Atlantic coast: a study conducted by the U.S. Department of Energy has shown that the Outer Continental Shelf (OCS) in this area offers some of the best wind power resources in the nation due to its high wind speeds, shallow depths, and proximity to major electric load centers.[2] Accordingly, many coastal states extending from New England to the Mid-Atlantic have set renewable energy goals that incorporate OSW energy procurements. To date however, only one 30 MW OSW project in state waters and two projects in federal waters totaling 144 MW have gone into operation at full capacity.[3] As of the end of 2024, there were just three projects comprising 4,097 MW currently under construction in the OCS, which brings the total near-term OSW capacity in the U.S. to less than 15% of the federal 2030 target.[4] This is despite the Bureau of Ocean Energy Management (BOEM) having issued 39 commercial leases to OSW project developers since 2010.[5]

Offshore wind projects face numerous challenges to development, including the extensive number of approvals they must receive across local, state, and federal governments. A major impediment to the deployment of OSW generation is the time required for a wind farm to

[1] Jost and Xydis, "Offshore Wind Acceleration in the U.S. Atlantic Coast and the 30 GW by 2030 Target."
[2] Brooks, "Renewable Energy Resource Assessment Information for the United States."
[3] McCoy et al., "Offshore Wind Market Report: 2024 Edition."
[4] McCoy et al.
[5] "Lease and Grant Information."

get from project inception to construction and operation.[6] While individual states and municipalities may have their own regulations and associated timelines for OSW development, all wind farms located in the OCS must go through the same federal approval process regulated by BOEM. According to the nominal leasing and permitting timelines published by BOEM, OSW developers can expect a project to spend about four to nine years obtaining the required federal authorizations to construct and operate their facilities.[7] These arduous timelines are at odds with the aggressive renewable energy targets set by state and federal offices and are furthermore incompatible with the urgency at which we need to decarbonize our energy sector in order to avoid the most catastrophic effects of climate change warned of by scientists.

My interest in this topic arises from my five years of experience working as an engineer for a solar developer in Massachusetts. In this role, I have seen firsthand how solar project timelines are affected by developer decisions, utility delays, local opposition, and the slow pace of government. This latter factor has been of particular interest to me both professionally and personally. While a well-crafted policy may streamline and incentivize clean energy development, the months or years it takes to draft and implement said policies have often caused progress to grind to a halt. I have experienced how a project's viability can be jeopardized by delays, as initial assumptions around cost and incentives for a project no longer hold true with the passage of time. In the face of ever-nearing deadlines to meet the climate targets set by governments as well as those warned of by scientists, I have come to view these delays not only as a hindrance to my professional efficacy but also as a serious impediment to our ability to effectively combat climate change. It was witnessing the role of government in creating policies that could either enable or inhibit renewable energy growth that inspired me to enroll in UEP,

[6] Russell, Bingaman, and Garcia, "Threading a Moving Needle."
[7] Russell, Bingaman, and Garcia.

and through my coursework I have seen parallels in the challenges facing solar development to those of the nascent OSW industry. Offshore wind is an exciting new frontier for renewable energy development, and one that I find particularly compelling due to its jurisdictional complexity, technical innovation, and potential to reconfigure the renewable energy landscape in New England. Offshore wind has the capacity to become the dominant form of renewable energy on the east coast, but the pace of this energy transition has been slower than desired.

This thesis seeks to understand the major factors resulting in the long lead times of the OSW federal permitting process. Even when considering only the approvals that fall under BOEM's jurisdiction, there are many stakeholder groups that provide inputs to the permitting process at different stages, each with the potential to cause delays. These delays may be internal to the permitting process, arising from BOEM or the OSW developer, or there may be external influences that impact timelines such as public comment sessions or political administration changes. Though each OSW project is unique and faces its own specific challenges, analyzing the permitting history of projects that have gone through the BOEM process can yield insights into commonalities that impede project progress. Understanding where delays occur is the first step towards addressing them and making the approval process more efficient to enable faster deployment of OSW energy and to advance climate goals. To that end, the central research question of my thesis is: **What are the factors that contribute to the amount of time for an OSW project to progress through the BOEM permitting process, and how can delays be addressed to allow for more timely OSW development to meet state and federal renewable energy goals?** In support of this central query, I sought to answer the following questions: **(1) Where are the bottlenecks in the BOEM offshore wind permitting process once a Construction and Operations Plan (COP) has been submitted? (2) Which parties or**

processes are primarily responsible for or involved in delays? (3) How much does the stakeholder process influence these timelines?

To answer these questions, I divided this thesis into seven chapters, with Chapters 1 and 2 being the Introduction and Methodology sections respectively. Chapter 3 is the Literature Review which draws upon government reports and academic articles to provide an overview of OSW industry in the U.S. as well as background information on public perceptions and participation in these developments, with specific focus on Environmental Impact Statements (EIS). In Chapter 4: Offshore Wind Regulations, I summarize the key regulations that govern OSW development in the OCS and map out the complex relationship between the federal and state agencies involved in this process to provide clarity on the main entities who can affect project timelines. The BOEM Timeline Analysis presented in Chapter 5 is the initial investigation I conducted on all federally leased OSW projects to determine that of the four BOEM permitting phases, the COP phase takes the longest on average. In Chapter 6: Case Studies, I closely examine the COP timelines for two Massachusetts OSW projects, Vineyard Wind and New England Wind, and interview stakeholders involved in those projects to get a comprehensive understanding of where delays occurred. Finally, Chapter 7 discusses these findings and presents conclusions and recommendations for future study.

Chapter 2. Methodology

2.1 Literature Review

The literature review begins by providing a brief background on the OSW industry within the US to highlight its importance for meeting federal and state climate goals. For this section, I draw upon academic literature, market reports, and government websites to establish a baseline understanding of the industry's technical and economic potential and give an overview of the current OSW developments within the country as well as the industry's progress towards achieving federal and state climate goals. I also touch upon the numerous perceived challenges facing the industry, particularly as they relate to meeting time-constrained OSW deployment targets. In doing so, I reviewed proposals made in academic literature for how technical, regulatory, and other barriers to OSW development may be addressed.

In addition to establishing a background understanding of the OSW industry and its challenges, the literature review discusses public perceptions of OSW and the ways in which public stakeholder engagement has impacted the industry. This section surveys academic papers that analyze frameworks for public participation in renewable energy development and the impacts of stakeholder involvement at different steps of this process, from early engagement with community members during the planning phase to public influence on the EIS process of federal permitting.

2.2 Offshore Wind Regulations

Offshore wind projects require approvals across many agencies at the municipal, state, and federal levels before they can be constructed and operated. This section of the thesis draws upon legal documents and government websites to provide a high-level overview of the laws and regulations that govern renewable energy development in the OCS, with particular focus on the

permitting approvals under BOEM's jurisdiction. In this section, I discuss the role of BOEM and the OSW project developer in the permitting process, the interplay of state and federal agencies, expected timelines for federal approvals, and opportunities for public participation.

2.3 BOEM Permitting Timeline Analysis

Even when just considering the OSW development process under the scope of BOEM, there are four distinct phases each with subprocesses and numerous other agencies involved: planning and analysis, leasing, site assessment, and construction and operations. The first step of analysis I conducted for this thesis was an evaluation of the historic BOEM federal OSW permitting timeline data beginning with the execution of a lease. This goal of this analysis was to identify which phase of federal permitting typically has the longest duration and use this information to select candidate projects for further case study evaluation. Using the BOEM OSW project dashboard and publicly available developer and government reports, I collected data on the start and end dates of the permitting activities for all projects that have received a lease from BOEM and input these into a table (see Appendix A: BOEM Permitting Timelines). From these milestone dates, I calculated the durations of the different permitting activities and identified the average time for each.

Because the 39 leased projects are at different stages in their development process, only a small number of projects had received their full approvals as of late 2024 when this analysis was conducted. However, even considering the different levels of project maturity, the data clearly showed that the longest permitting phase has historically been the Construction and Operations Plan (COP). This phase of BOEM's process involves the submission of the developer's plan detailing their construction and operation activities, the creation of a federal Environmental Impact Statement (EIS), and several opportunities for stakeholder input. At the time of analysis

there were nine commercial projects that received COP approval, which then became the candidates for the more detailed case study analysis: Coastal Virginia Offshore Wind, Revolution Wind, Sunrise Wind, New England Wind 1 & 2, Vineyard Wind, Ocean Wind 1 & 2, Atlantic Shores South, Empire Wind, and South Fork Wind.

2.4 Case Studies

The purpose of the case studies is to examine how the BOEM permitting process has unfolded in real life in order to identify which steps take the longest and the reasons for those durations. BOEM has published documentation stating that the COP phase of permitting nominally lasts about two years, yet the historic project data shows that it takes nearly twice as long. For this section of my thesis, I focused on two of nine candidate projects identified in the previously discussed analysis: Vineyard Wind (3.6 years for COP approval) and New England Wind (4 years for COP approval). I chose these projects because they both make landfall in Massachusetts and they both were developed in part by Avangrid Renewables, removing some project variables that could potentially account for differences in project timelines.

This chapter begins by providing Massachusetts-specific context for OSW development, including a brief history of OSW projects in the state as well as a description of the investments and commitments the state has made in support of the industry. In addition to legal documents and government websites, this portion of the paper references news articles to further contextualize the public and political atmosphere in which the two case study projects were developed.

Next, I expanded on the work I began with the BOEM permitting timeline analysis and created detailed timelines for the Vineyard Wind and New England Wind Construction and Operations Plan activities by collecting data from reports, stakeholder meetings and comments,

publications in the Federal Register, and news articles. Using these detailed timelines, I identified which aspects of the COP permitting activities took the longest and traced the root cause of the deviations from expected timelines. To the extent possible, I ascertained the parties responsible for the delays and whether there were external influences on project timelines. This data is summarized into timelines of each permitting activity to give visual indicators of where bottlenecks exist in this process. To gain further insight into the development of these projects, I also reached out to insiders who were involved in the permitting process of these projects for interviews which supplemented the data I gleaned from the project documentation.

2.5 Interviews

While researching this thesis, I talked with people who have OSW expertise to gain general insight into the OSW industry and help inform my research. This included Tufts faculty, state officials, and members of offshore wind industry groups. I also conducted formal interviews with people directly involved in the Vineyard Wind and New England Wind development and permitting process to gain insights into the two case studies beyond what is available in the public data. I established a list of potential interviewees through searches on LinkedIn and the 'team' pages of relevant agency websites. Project documents from the developer, BOEM, or state agencies often listed project contacts or had signatories, and these names were used as a branch off point for requesting interviews.

Ultimately, I conducted seven semi-structured, open-ended interviews total, targeting individuals who are or were members of the main entities involved in the permitting and development of the OSW projects. These interviews were roughly one hour in length and occurred over Zoom. With the permission of the interviewees, I recorded the Zoom calls to ensure the accuracy of the qualitative information presented in my thesis. The table below shows

the list of interviewees, including the respective titles they had at the time of the project's development. Some of the individuals listed may have since changed titles or left the agency they previously worked at.

Table 1. List of interviewees

Agency	Contact
Vineyard Offshore Offshore Wind Developer	• Geri Edens, Head of Permitting and Environmental Affairs • Jay Borkland, Director of Ports and Supply Chain
BOEM Office of Renewable Energy Programs	• James Bennett, Senior Advisor
Federal Permitting Improvement Steering Coucil (FPISC)	• Christine Harada, Executive Director • Eric Beightel, Executive Director
MA Office of Coastal Zone Management (CZM)	• Todd Callaghan, Coastal and Marine Scientist
RI Coastal Resources Management Council (CRMC)	• Kevin Sloan, Federal Consistency Coordinator

These interviewees provided valuable insights into the federal permitting process, the communication of information and coordination across agencies, and the various regulations that have impacted OSW development. Where applicable, comments made by interviewees were added to the case study and discussion chapters to either provide additional context to events that transpired or to opine on the challenges and potential solutions for improving OSW permitting. Even if an interviewee is not mentioned directly, each person I spoke with helped me in gaining a more nuanced and broadened understanding of the OSW industry that aided the development of this thesis.

Chapter 3. Literature Review

3.1 Technical Potential of Offshore Wind

According to the Department of Energy's (DOE) Renewable Energy Resource Assessment from 2022, the gross resource potential of OSW in the United States is approximately 5,000 GW, which if realized could produce over 19,000 TWh of energy annually.[8] When factoring in the limitations of current technology as well as exclusions for areas of important commercial or ecological activity, the resulting technically feasible capacity of fixed-bottom and floating OSW arrays is 2,100 GW, which could provide just over 7,000 TWh of energy annually.[9] Much of this technical potential is located in the Northeast, where geographic and economic factors make the region particularly suitable for OSW generation.

To begin with, the waters off this coast experience some of the highest wind speeds in the nation, especially compared to the land-based wind resource as shown in Figure 1.[10] The wind speeds off the shores of New England and the Mid-Atlantic are fairly consistent and average between 7-12 m/s at the typical hub height of OSW turbines.[11] These higher, less variable wind speeds mean that a wind turbine operating at sea can produce more power for longer durations, resulting in OSW arrays having less intermittency and higher capacity factors than their land-based counterparts. Because the relationship between the wind speed and the power output of a turbine is cubic, a wind farm located off coast of New England can produce significantly more power than if the same turbine array had been situated in the Great Plains.

[8] Brooks, "Renewable Energy Resource Assessment Information for the United States."
[9] Brooks.
[10] Anstedt, "Advancing Offshore Wind Energy in the United States: U.S. Department of Energy Strategic Contributions Toward 30 Gigawatts and Beyond."
[11] Russell, Bingaman, and Garcia, "Threading a Moving Needle."

Another characteristic of the region that makes it well suited to OSW development is the relatively shallow depth of the waters off the Atlantic coast; in general, the deeper the water, the more expensive it becomes to install OSW turbines.[12] Beyond roughly 1,300 m depth, fixed-bottom wind turbines become cost prohibitive, and the alternative floating turbine technology has not yet reached a commercial scale.[13] The relatively cheaper construction costs coupled with the high power output from elevated wind speeds helps lower the levelized cost of energy (LCOE) for OSW developments in this region. While the meteorological and geographical conditions in the North Atlantic offer technical advantages for OSW electric generation, this is just half of the equation.

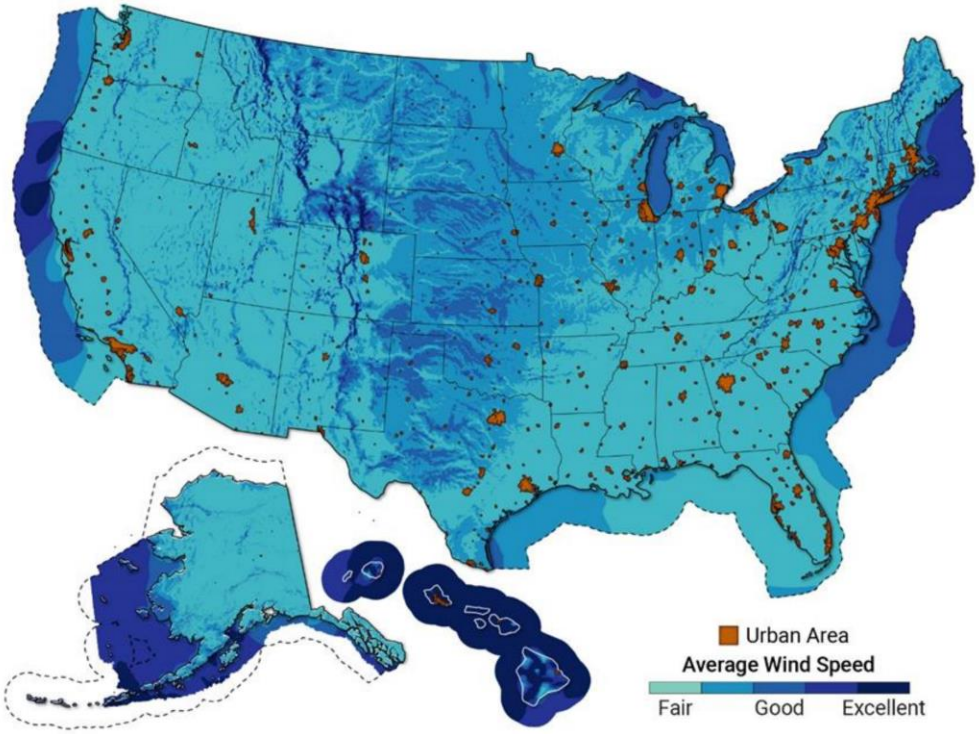

Figure 1. United States wind resource potential and major urban centers.[14]

[12] Jost and Xydis, "Offshore Wind Acceleration in the U.S. Atlantic Coast and the 30 GW by 2030 Target."
[13] Lopez et al., "Offshore Wind Energy Technical Potential for the Contiguous United States."
[14] Anstedt, "Advancing Offshore Wind Energy in the United States: U.S. Department of Energy Strategic Contributions Toward 30 Gigawatts and Beyond."

A critical aspect of renewable energy generation is getting that power to the people who will consume it. Large amounts of electricity are transported through transmission lines, and the further away electric load centers are from the sources of generation, the more expensive the construction of those transmission cables becomes. The high technical potential of OSW in the Atlantic is particularly useful due to the significant energy demand of the region's large coastal cities.[15] The Northeast is the most densely populated region of the United States, and the electricity that could be provided by OSW farms built in this area could help these population centers decarbonize.[16] With major urban centers located along the shoreline, the transmission distances to load centers are minimal once the export cables from OSW arrays make landfall. On the other hand, the urban density of the Northeast also makes it difficult to cite and permit new onshore transmission lines as the capacity of the existing circuits gets taken up by OSW developments that come online.[17] Because of this, state and federal governments are exploring the possibility of building an offshore transmission grid that could be used to link OSW plants to each other and then to the onshore grid at key locations where transmission infrastructure is ideal.[18] According to research funded by the DOE, sharing offshore transmission infrastructure in this way could drive down costs of OSW development, increase grid reliability, and potentially reduce project timelines.[19]

At the same time that the concentrated urban nature of the Northeast provides an outlet for OSW power generation in the Atlantic, this population density also limits the buildable area

[15] Jost and Xydis, "Offshore Wind Acceleration in the U.S. Atlantic Coast and the 30 GW by 2030 Target."
[16] Jost and Xydis.
[17] Anstedt, "Advancing Offshore Wind Energy in the United States: U.S. Department of Energy Strategic Contributions Toward 30 Gigawatts and Beyond."
[18] Pfeifenberger et al., "The Benefit and Urgency of Planned Offshore Transmission."
[19] Office of Energy Efficiency & Renewable Energy, "Atlantic Offshore Wind Transmission Literature Review and Gaps Analysis."

for other types of utility-scale renewable developments on land.[20] For the region to transition to a decarbonized energy system, OSW provides an opportunity to avoid some of the land-use issues that arise with renewable energy developments, though the siting of transmission infrastructure continues to pose a challenge. For these reasons, many states stretching from the Mid-Atlantic to New England have incorporated OSW procurements into their state goals, discussed in depth in the following section. Though the OSW industry will likely continue to expand nationwide in the Pacific and Gulf coasts as well as in the Great Lakes, in the near-term the Atlantic coast is likely to remain the focus for the industry.[21]

3.2 Offshore Wind Climate Targets

With every passing year, the effects of climate change become increasingly evident in the record-breaking temperatures, increased severity of storms, and more frequent flooding experienced by people across the world. According to the most recent assessment by the Intergovernmental Panel on Climate Change (IPCC) which was published in sections between 2021 and 2023, we have already reached a global warming temperature of 1.1˚C above preindustrial levels.[22] Given the lack of immediate and sustained reductions in greenhouse gas emissions globally, we are unlikely to keep temperature rise below the 1.5˚C target set by world leaders in the Paris Agreement.[23] The IPCC uses a 20-year rolling average to represent the global warming temperature, and in their assessment stated with medium confidence that by 2030 in any given year there is will be a roughly 50-50 chance of global temperatures exceeding 1.5˚C.[24]

[20] Brooks, "Renewable Energy Resource Assessment Information for the United States."
[21] Anstedt, "Advancing Offshore Wind Energy in the United States: U.S. Department of Energy Strategic Contributions Toward 30 Gigawatts and Beyond."
[22] Calvin et al., "IPCC, 2023."
[23] Calvin et al.
[24] Calvin et al.

In 2024, for the first time in recorded history, this threshold was breeched.[25] Though this is just one year of data and the 1.5˚C target is largely a political one, absent extreme and immediate international climate mitigation efforts the IPCC scientific models predict that the global average temperature will only continue to rise, potentially exceeding 2˚C warming.[26] Such extreme climate change will have catastrophic effects on the natural environment and human patterns, health, and life. Any hopes of us eventually reducing global warming levels back down below the 1.5˚C threshold will require carbon sequestration and deep decarbonization across all sectors of life, necessitating an overhaul of global energy systems.[27] Leaders worldwide have recognized that an energy transition away from fossil fuel consumption is necessary to protect social, economic, and environmental interests.

In line with this, the Biden administration published an executive order in 2021 that established a target of decarbonizing America's electricity sector by 2035.[28] While the exact mix of solar, wind, geothermal, and other renewable resources fueling this energy transition has not been prescribed by the federal government, OSW has been increasingly recognized as critical for making this energy transition a reality. During his presidency, the Biden administration set a goal for the nation to deploy 30 GW of OSW by 2030, a target that was markedly ambitious given that the global OSW capacity at the time was roughly 35 GW.[29] This target was set not only to advance the United States' energy transition, but also to bolster American manufacturing industries and create tens of thousands jobs in offshore wind and adjacent industries.[30]

[25] Tollefson, "Earth Breaches 1.5 °C Climate Limit for the First Time."
[26] Shukla et al., *Climate Change 2022*.
[27] Shukla et al.
[28] "Executive Order on Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability."
[29] Jost and Xydis, "Offshore Wind Acceleration in the U.S. Atlantic Coast and the 30 GW by 2030 Target."
[30] House, "FACT SHEET."

The Biden administration passed two critical pieces of climate legislation during its tenure: the Bipartisan Infrastructure Law of 2021 and the Inflation Reduction Act (IRA) of 2022. The Bipartisan Infrastructure Law provided billions of dollars in investments for transmission infrastructure, ports, and clean technology research.[31] In addition to direct industry investments, the IRA changed OSW project economics by expanding the tax credits available to renewable energy developers.[32] If an OSW project meets the prevailing wage and apprenticeship requirements laid out in the IRA, it could elect to receive a production tax credit of $1.50/kWh for the electricity it produces.[33] Alternatively, it could instead choose to receive 30% investment tax credit on eligible expenses, which most projects elect to do due to the better financials.[34] That project could then potentially get an additional 10% tax credit if its onshore components are located within an 'energy community', an area defined by either recent coal plan closures, Brownfield sites, or statistically significant unemployment rates coupled with significant fossil fuel related employment.[35] Additionally, developers also have another investment tax credit bonus available to them for an OSW array constructed with components produced in the United States. To get the 'domestic content' credit, the iron and steel used in a project's construction must have been manufactured in the United States and a certain percentage of other components must have also been domestically produced.[36] These tax credits can help lower cost of development, lowering the LCOE for OSW and making the resource more cost competitive with other forms of energy.

[31] U.S. Department of Energy and Bureau of Ocean Energy Managment, "Advancing the Growth of the U.S. Offshore Wind Industry: Federal Funding and Incentives."
[32] Anstedt, "Advancing Offshore Wind Energy in the United States: U.S. Department of Energy Strategic Contributions Toward 30 Gigawatts and Beyond."
[33] Jonah Ury et al., "Pathways to Commercial Liftoff: Offshore Wind."
[34] Jonah Ury et al.
[35] Office of Associate Chief Counsel, "Energy Community Bonus Credit Amounts Under the Inflation Reduction Act of 2022."
[36] Jonah Ury et al., "Pathways to Commercial Liftoff: Offshore Wind."

The renewable energy benefits of the Bipartisan Infrastructure Law and the IRA also extend to supporting industries, as a robust domestic supply chain and improvements and expansion of existing electric and maritime infrastructure is crucial for enabling widespread deployment of OSW resources. Manufacturers of offshore wind components can also take advantage of tax credits through the IRA, which includes the 10% domestic content investment tax credit as well as production credits for producing renewable energy component parts.[37] Additional funding and tax credits have also been made available for the transmission and port infrastructure needed to support OSW deployments.[38] Together, the benefits created by the Bipartisan Infrastructure Law and IRA are expected to advance the deployment of renewable energy and help grow America's OSW industry, though experts say billions of dollars in additional investments will be needed in order to enable the 30 GW targeted OSW capacity.[39]

Though the new Trump administration has been openly hostile towards wind energy, the targets and policies implemented by the Biden administration spurred coastal states to incorporate OSW into their own energy planning efforts and many of the benefits introduced by the IRA will be difficult to legally repeal. The targets set by states range from legislatively mandated procurements to informal planning targets to contract a given amount of OSW capacity by a certain year, with some states having both as shown in Table 2. Most of the states with OSW targets are located along the Atlantic coast, though California, Louisiana, and Oregon have also incorporated future OSW developments into their energy planning. Only east coast states have incorporated mandated OSW procurements in their climate goals, which is reflective

[37] Anstedt, "Advancing Offshore Wind Energy in the United States: U.S. Department of Energy Strategic Contributions Toward 30 Gigawatts and Beyond."
[38] U.S. Department of Energy and Bureau of Ocean Energy Managment, "Advancing the Growth of the U.S. Offshore Wind Industry: Federal Funding and Incentives."
[39] McCoy et al., "Offshore Wind Market Report: 2024 Edition."

of the fact that generally Pacific coast OSW will require floating turbines, a technology that is not yet at commercial scale.[40] According to the latest edition of the Offshore Wind Market Report compiled by the NREL, roughly 12.8 GW of OSW electricity have been contracted to states across 15 power purchase agreements as of May 2024, all of which are located along the east coast.[41]

Table 2. State OSW planning targets and mandated procurements.[42]

State	Planning Targets		Mandated Procurement	
	MW	Year	MW	Year
ME	3,000	2040	3,000	2040
MA	23,000	2050	5,600	2035
RI	1,430	2030	1,430	2030
CT	2,000	2030	2,000	2030
NY	20,000	2050	9,000	2035
NJ	11,000	2040	11,000	2040
MD	8,500	2031	8,500	2031
VA	5,200	2034	5,200	2034
NC	8,000	2040		
CA	25,000	2045		
LA	5,000	2035		
OR	3,000	2030		
Total	**115,130**	**2050**	**45,740**	**2040**

As discussed, the North Atlantic coast is the most favorable region in the United States for developing OSW for a variety of factors. Accordingly, at the federal level nearly all of the leasing activity to date has occurred off the Atlantic coast, though in 2023 BOEM started issuing leases in the Gulf of Mexico and Pacific Ocean.[43] By the end of 2028, BOEM plans to create additional lease areas for sale in the Pacific Ocean, Gulf of Mexico, and the Gulf of Maine as well as off the coast of Hawaii and United States territories, though the timing of these plans are now called into question by the Trump administration's executive order halting all new OSW

[40] Lopez et al., "Offshore Wind Energy Technical Potential for the Contiguous United States."
[41] McCoy et al., "Offshore Wind Market Report: 2024 Edition."
[42] McCoy et al.
[43] "Lease and Grant Information."

lease issuances.[44] As technology evolves and the cost of OSW lowers, it will become more feasible to build OSW arrays in areas of the OCS that were previously prohibitively expensive to develop. Specifically, advancing commercial scale floating turbine technology will unlock large swathes of American waters that are currently technologically inaccessible for OSW generation as shown in the map in Figure 2.[45] As the federal government expands the reach of where OSW farms can be built, OSW will likely have an increased presence in states' climate goals.

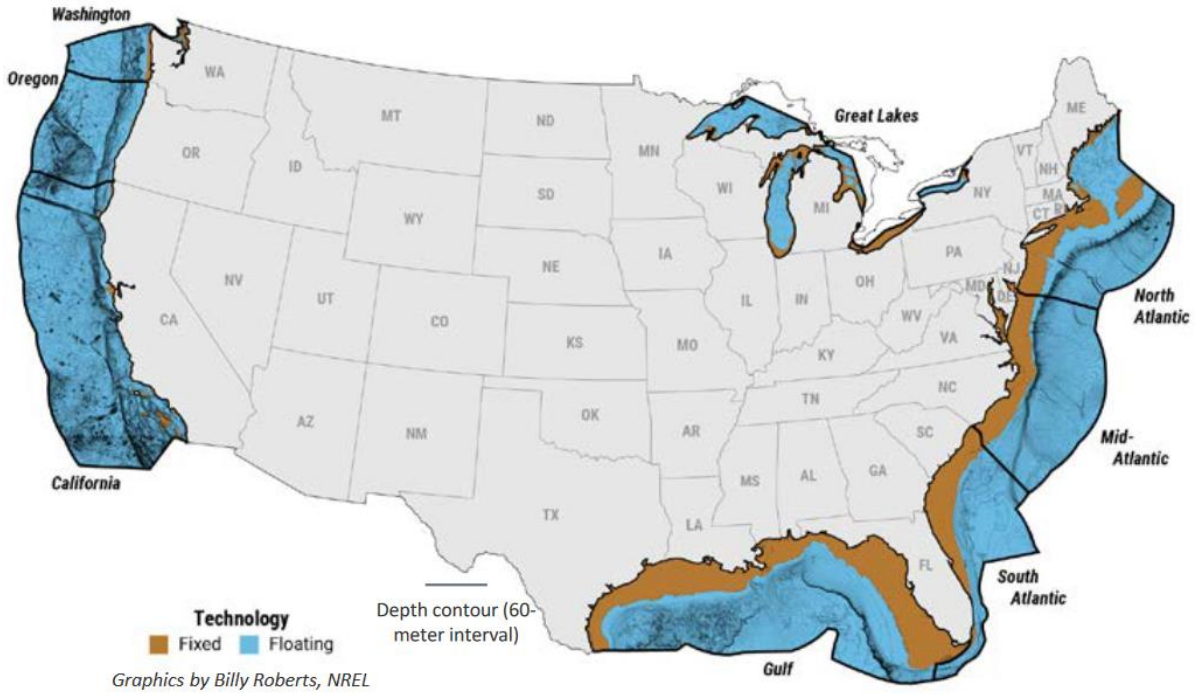

Figure 2. NREL map showing portions of American waters suited to fixed-turbine technology (brown) and floating turbine technology (blue).[46]

3.3 Offshore Wind Development Process

Before an OSW project can be built and start producing clean energy, it must first go through a complex development process that involves the participation of numerous stakeholder groups and the acquisition of permissions at the local, state, and federal levels. Which

[44] "Lease and Grant Information"; Simon, "Here's How Trump's Pause on Wind Projects Could Threaten Jobs and Climate Goals."
[45] Lopez et al., "Offshore Wind Energy Technical Potential for the Contiguous United States."
[46] Lopez et al.

jurisdiction an OSW projects falls under depends on where the array is located and where it makes landfall. Any energy project within three nautical miles (nm) of the nation's coastline is subject to state regulations. The water beyond this but less than 200 nm from shore, known as the OCS, falls under federal jurisdiction with the Bureau of Ocean Energy Management (BOEM) as the primary authority.[47] Depending on where a project is sited, a developer would either need to contact the state or the federal government in order to get the rights to construct and operate their facility at sea.

Only one OSW project to date has avoided the federal leasing and permitting process: the first operational OSW farm in America, Block Island Wind, which is located off the shore of Rhode Island and began operation in 2016.[48] While siting the project in state waters eliminates the need for federal permitting, proximity to land creates other challenges in terms of the impact on local viewsheds and real or perceived impacts on local economic activity.[49] Block Island Wind navigated these challenges by having a robust siting process and by providing cheaper electricity than the diesel generators that had comprised the island's previous energy mix.[50] The Rhode Island project is also comprised of only five turbines totaling 30 MW, whereas conventional OSW farms today are several orders of magnitude larger and typically have a much bigger potential impact on coastal view in comparison.[51] Famously, the defunct Cape Wind project that was to be located in the Nantucket Sound faced years of legal fights and public backlash related to the visual impact and perceived economic and environmental disruption that the project would bring.[52] This project was located outside of state waters, but only barely: the

[47] Russell, Bingaman, and Garcia, "Threading a Moving Needle."
[48] Hokanson, "Avoiding the Doldrums."
[49] Russell, Bingaman, and Garcia, "Threading a Moving Needle."
[50] Hokanson, "Avoiding the Doldrums."
[51] Russell, Bingaman, and Garcia, "Threading a Moving Needle."
[52] Powell, "Revisiting Federalism Concerns in the Offshore Wind Energy Industry in Light of Continued Local Opposition to the Cape Wind Project Note."

closest turbines were just 5 nm from shore, and the array was to be comprised of 130 turbines standing at 440' high.[53] Given the risk that project opposition by coastal residents might cause a project to fail, and thanks to the advancing technology which allows turbines to be installed at greater depths, OSW developers have focused on developing projects further from shore.

All OSW arrays currently in active development are located in the OCS and therefore fall under the federal jurisdiction of BOEM. In order for a developer to construct a wind farm in the OCS, they must first obtain a lease from BOEM, which is issued through a competitive auction process.[54] Once granted, this lease gives a developer exclusive rights to use the specified plot of ocean for commercial activities, though projects must complete additional steps to conduct site assessments of the leased area and obtain full approvals to construct and operate the OSW facility, including going through an environmental review resulting in an Environmental Impact Statement (EIS).[55] The BOEM permitting approval process beginning with the lease assignment as well as the legislation that dictates this procedure is discussed more thoroughly in Section 4.24.1: Federal Regulations and Processes. Even when an OSW project's leased area is subject to federal jurisdiction, there may also be state involvement in the federal permitting process as discussed in Section 4.2: State Involvement in Federal Processes.

Regardless of whether a project is located in state or federal waters, the electric cables from the OSW farm will eventually need to make landfall and connect to a substation in order to transmit the renewable electricity generated to various the load centers where it will be consumed. The laying of subsea cables involves further permitting from BOEM and federal environmental agencies and, once they get closer than 3 nm from shore, the OSW facility must

[53] Powell.
[54] Russell, Bingaman, and Garcia, "Threading a Moving Needle."
[55] Hokanson, "Avoiding the Doldrums."

additionally get state permits to install their cables below the shoreline.[56] Furthermore, the OSW project must get local permits for any electric infrastructure being built on land.

To connect to the grid and export electricity from an OSW facility, the project must also get permission from the electric utility governing the region.[57] Since OSW projects are typically designed at a utility scale, projects connect to the transmission grid which are governed by the Federal Energy Regulatory Commission (FERC) and overseen by regional Independent System Operators (ISOs) or Regional Transmission Operators (RTOs). Within the FERC interconnection process, a project can spend years in the interconnection queue before being studied and getting approval from the ISO/RTO to electrically connect to the grid.[58] Beyond the permissions needed for constructing electric infrastructure and interconnecting to the grid, OSW projects must enter power purchase agreements to sell their electricity and must obtain financing for the development, construction, and operation of the project. Permitting, interconnection, and financing each have their own timelines that operate in parallel and to some extent independently of one another, but all three are needed before a project can be fully operational.

3.4 State of the American Offshore Wind Industry

The OSW industry in America is one that is nascent but rapidly growing. In 2016, there was just one 30 MW OSW project in the nation. As of the end of 2024, the U.S. has fully deployed three OSW projects totaling 174 MW (Block Island Wind, Coastal Virginia Offshore Wind Pilot, South Fork Wind), an almost sixfold increase in OSW capacity in 8 years.[59] The rate of deployment is expected to continue to rapidly increase in the near term. According to the 2024 Offshore Wind Market Report published by the National Renewable Energy Laboratory (NREL),

[56] Newell, "Transmission Impossible."
[57] Newell.
[58] Daniel et al., "National Offshore Wind Energy Grid Interconnection Study Executive Summary."
[59] "Power Hub."

there were 4,097 MW of OSW projects under construction in the Atlantic as of the end of May 2024, which is more than four times the number of MWs under construction the year prior. [60] The OSW Market Report states that three additional projects are expected to enter construction in 2025, and there are upwards of 80 GW of projects across the nation currently in the development pipeline.[61] Of the 39 projects that have leases from BOEM, 11 have obtained full federal approvals as of the end of 2024.[62] While all of the projects currently in advanced stages of development are located in the Atlantic, BOEM has opened up new lease areas shown in Figure 3 in the Gulf of Maine, Gulf of Mexico, mid-Atlantic, and the Oregon coast.

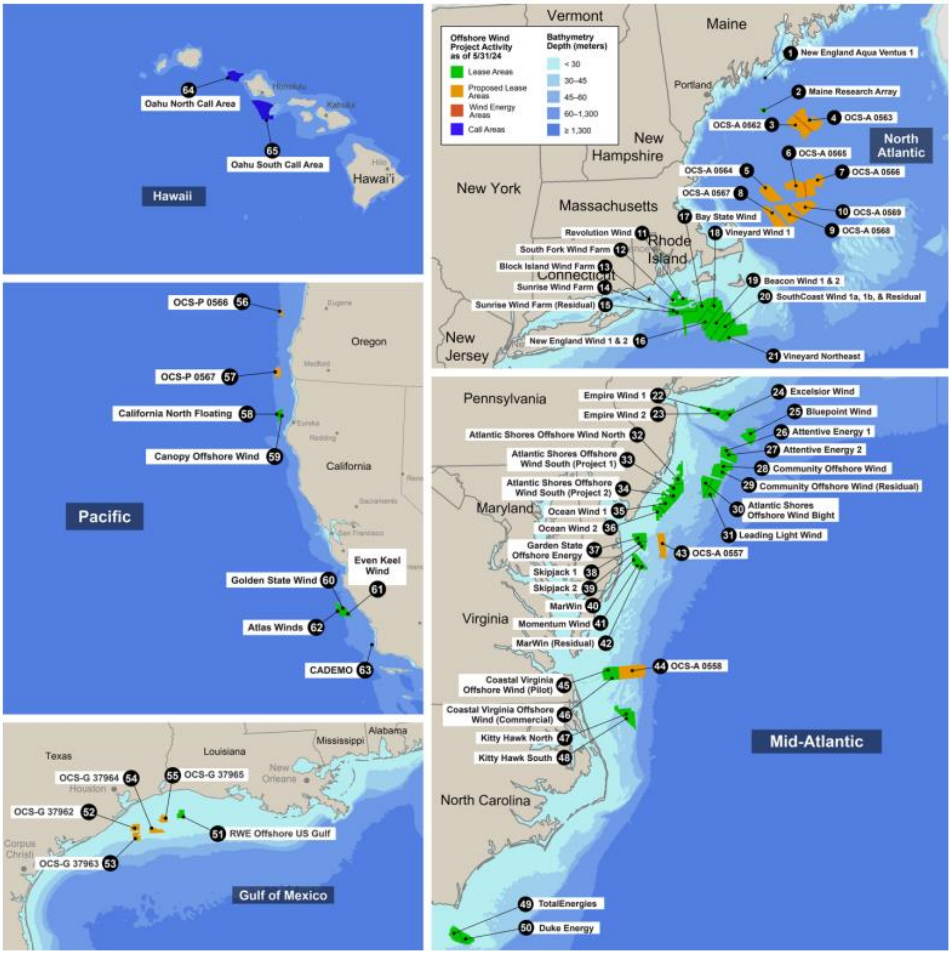

Figure 3. BOEM lease and planning areas for OSW.

[60] McCoy et al., "Offshore Wind Market Report: 2024 Edition."
[61] McCoy et al.
[62] "Power Hub."

While the OSW industry has experienced rapid growth in the last decade, the industry has also faced a number of setbacks in recent years. Most recently, on January 20, 2025 the Trump administration released a memorandum withdrawing all OSW lease areas from consideration and halting all federal OSW permitting activities for an indefinite period of time.[63] Even before this, the OSW industry was facing obstacles to growth. The U.S. Department of Energy (DOE) report Pathways to Commercial Liftoff: Offshore Wind details that in 2023, eight projects cancelled their offtake contracts, citing inflation, supply chain constraints, and schedule delays as reasons for cancelling.[64] In several instances, the projects went on to re-bid their offtake contracts, seeking higher revenues to support the growing costs of development and construction, though some projects including Ocean Wind 1 and 2 ceased development altogether.[65] Compared to 2021, the LCOE for OSW in the Atlantic rose from $85/MWh to $140/MWh, according to the DOE report.[66] These rising costs reflect challenges facing the industry that will need to be overcome in order to sustain growth.

Outside of supply chain constraints and inflation, one of the frequent challenges cited by developers is the permitting complexity and related uncertainty around project timelines.[67] For a given project, a developer may be engaging with a dozen or more agencies across the federal, state, and local levels of government in order to get all of the permissions needed to construct and operate a site. One proposal to reduce some of the long lead time permits required and to improve overall project viability is to consolidate the subsea transmission lines used by OSW projects into an offshore transmission grid.[68] This theoretical 'backbone network' would span the

[63] Simon, "Here's How Trump's Pause on Wind Projects Could Threaten Jobs and Climate Goals."
[64] Jonah Ury et al., "Pathways to Commercial Liftoff: Offshore Wind."
[65] McCoy et al., "Offshore Wind Market Report: 2024 Edition."
[66] Jonah Ury et al., "Pathways to Commercial Liftoff: Offshore Wind."
[67] Hokanson, "Avoiding the Doldrums."
[68] Newell, "Transmission Impossible."

Atlantic coast, linking OSW projects at offshore energy islands, and then make landfall at select locations where there is transmission capacity available.[69] Under this concept, projects would tie in directly to the offshore circuit, eliminating the permits that would have been required to site individual transmission cables extending to shore and across land, which requires federal, state, and municipal permits.[70] Another suggestion is for BOEM to conduct programmatic EIS surveys for sections of the OCS which would evaluate numerous leased areas at once, potentially reducing the length of individual project environmental reviews.[71] While BOEM has started to do this for prospective lease areas, they have yet to do this for the second environmental review which occurs during the COP phase of permitting.

3.5 Stakeholder Involvement in Permitting

Though surveys show that OSW is supported by the majority of the general public, the industry has struggled with issues of negative public perception in coastal communities to the extent that OSW farms have been erroneously blamed for whale deaths.[72] Research on public perceptions of OSW farms has cited that coastal residents worry about the impact OSW projects might have on property values, tourism, and local maritime economic activity, even when studies have shown there to be no or negligible impact.[73] However, research has also shown that when the public is engaged early and meaningfully in the planning process, it can have broad benefits including improved public perceptions.[74] Early engagement is also important to identify potential

[69] Pfeifenberger et al., "The Benefit and Urgency of Planned Offshore Transmission."
[70] Pfeifenberger et al.
[71] Hokanson, "Avoiding the Doldrums."
[72] Diamond et al., "Framing the Wind."
[73] Russell, Bingaman, and Garcia, "Threading a Moving Needle."
[74] Portman, "Involving the Public in the Impact Assessment of Offshore Renewable Energy Facilities."

areas of concern upfront, avoiding project delays that could occur if the issues were to be raised after a project was underway.[75]

BOEM's renewable energy program calls for public participation during the planning, leasing, and final environmental review phase. When BOEM first begins to scope an oceanic area for potential OSW leasing, they publish a Call for Information and Nominations in the Federal Register asking the public to submit comments on aspects of the proposed lease area ranging from geological and ecological conditions to commercial and leisure uses of the area.[76] BOEM collects inputs from stakeholders during the subsequent 45-day comment period, and then uses that information to refine the proposed lease area.[77] Once a lease area has been determined and is going to auction, BOEM conducts a National Environmental Policy Act (NEPA) review, which includes an assessment not only of the physical environment, but also considers sociocultural impacts, equity, and job creation.[78] There are two public comment periods during this NEPA review, the first at the start to help inform the scope of the assessment and the second once a draft EIS (DEIS) is published. A second NEPA review takes place after a project has submitted its COP, which likewise has two public comment periods at the scoping and DEIS. Outside of the federal NEPA reviews that take place during the OSW development cycle, there may be additional opportunities for stakeholder engagement at the state and local levels when it comes to the siting of transmission infrastructure associated with the OSW project.

In the United States, public participation is a major part of the EIS process. When it comes to OSW environmental reviews, research has shown that the marine environment presents unique challenges to public participation because of the distance of the area from affected

[75] Russell, Bingaman, and Garcia, "Threading a Moving Needle."
[76] Hokanson, "Avoiding the Doldrums."
[77] Hokanson.
[78] Portman, "Involving the Public in the Impact Assessment of Offshore Renewable Energy Facilities."

communities, the general public's unfamiliarity of the marine environment and lack of available data on marine geography and resources, and the shared nature of resource ownership.[79] An additional complication is that OSW is a very new industry within the nation, and there are not many operational projects to use as reference points for how wind farms affect the marine environment and local economies. At the same time, these reviews may engender significant public interest due to the newness of the technology coupled with its siting in areas of ecological and economic importance.[80] Typically, media coverage of OSW projects increases during this review process, and the framing of this reporting may also impact public opinion.[81]

Case study research on Cape Wind and Block Island Wind, the first attempts at building OSW in America, has shown that a public participation process conducted well has the potential to garner community support for a project.[82] Some elements of a robust stakeholder process discussed early inclusion of the public in the process, broad-based solicitation of public input, clear communication of purpose and boundary-setting, and transparency of process.[83] In studying the Block Island Wind stakeholder process, researchers found that not only did perceptions of process fairness result in higher approval of the project, but the public participants found positive value in the engagement process itself.[84] Both the Block Island Wind and Cape Wind studies concluded that OSW siting and public engagement should be framed as a social matter involving technical considerations, rather than a scientific matter that requires public input.[85]

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[79] Portman.
[80] Portman.
[81] Diamond et al., "Framing the Wind."
[82] Portman, "Involving the Public in the Impact Assessment of Offshore Renewable Energy Facilities"; Firestone et al., "Faring Well in Offshore Wind Power Siting?"
[83] Portman, "Involving the Public in the Impact Assessment of Offshore Renewable Energy Facilities"; Brunbauer et al., "Effective Stakeholder Engagement for Offshore Wind Energy Development."
[84] Firestone et al., "Faring Well in Offshore Wind Power Siting?"
[85] Portman, "Involving the Public in the Impact Assessment of Offshore Renewable Energy Facilities"; Firestone et al., "Faring Well in Offshore Wind Power Siting?"

Chapter 4. Offshore Wind Regulations

4.1 Federal Regulations and Processes

BOEM Permitting

BOEM was established in its current form in 2011 and prior to that was a part of the Mineral Management Service. This Bureau, located within the Department of the Interior (DOI), oversees the assessment, development, and production of energy and mineral resources on the OCS.[86] Originally, BOEM's leasing and grant authority was limited to offshore fossil fuel enterprises, for which they were the lead agency in charge of NEPA assessments. With the Energy Policy Act of 2005, BOEM's authority was extended to also oversee renewable energy activities within the OCS.[87] This act led to the establishment of the four phases of the OSW program overseen by BOEM: (1) planning and analysis, (2) leasing, (3) site assessment, and (4) construction and operations.[88] Details of each step of this process along with the nominal timelines are shown in Figure 4.

The planning and analysis stage of BOEM's renewable energy program is used to identify potential areas for OSW leasing activities. As mentioned in the prior chapter, this step involves stakeholder engagement to get technical knowledge and community input on a specified area. The next phase of the process involves a competitive bid for the leased areas refined during planning and analysis stage, and at this time BOEM conducts its first NEPA review of the area.[89]

Once an OSW project has been awarded a lease, it enters the site assessment phase. If a project developer intends to conduct on-site testing of the leased area to inform their design and

[86] Powell, "Revisiting Federalism Concerns in the Offshore Wind Energy Industry in Light of Continued Local Opposition to the Cape Wind Project Note."
[87] "BOEM Governing Statutes."
[88] Jost and Xydis, "Offshore Wind Acceleration in the U.S. Atlantic Coast and the 30 GW by 2030 Target."
[89] Rigano and Delle Fave, "Offshore Wind."

construction plan, they must first submit a Site Assessment Plan (SAP) to BOEM for review and approval.[90] This plan details the various site assessment activities that the OSW will undertake in order to characterize their allotment and gain the necessary information to later submit their COP. Assessment activities might include installation of specialized equipment, travel of vessels through important habitats, or use of sonar or other sensing technology which has the potential to impact local economic activities or critical species.[91] For these reasons, BOEM must first review and approve a project's SAP before developers can begin on-site assessments. Once a SAP is approved, the timeline of this phase of permitting is largely controlled by the developer, who has up to five years to complete the activities laid out in the SAP.[92] After the developer has completed the requisite assessments to design their project through its life cycle, the next step is to compile a detailed report incorporating their learnings into their project plan.

Figure 4. The four phases of BOEM OSW activities.[93]

[90] Bureau of Ocean Energy Management, "A Citizen's Guide to the Bureau of Ocean Energy Management's Renewable Energy Authorization Process."
[91] Bureau of Ocean Energy Management.
[92] "Regulatory Framework and Guidelines."
[93] "Regulatory Framework and Guidelines."

The final phase of the BOEM permitting process is the focus of this thesis and begins with the developer submission of a Construction and Operations Plan (COP). The COP is a detailed, several-hundred page report that contains project design specifics, proposed construction activities and environmental impact mitigations, operations and maintenance plans for the project's life, and conceptual decommissioning plans.[94] The COP contains information related to both the direct and indirect impacts the project will have on the environment, including but not limited to marine geology, water quality, threatened and endangered species, marine ecosystems, biological resources, and air quality.[95] Additionally, the COP details socioeconomic considerations such as marine usages, archaeological resources, and job creation.[96]

The COP serves as the basis for informing the NEPA review that also occurs during this phase, resulting in an Environmental Impact Statement (EIS). The EIS process contains several steps, the first of which is the publication of the Notice of Intent (NOI) to prepare an EIS, followed by a Notice of Availability (NOA) of the draft EIS (DEIS), and then finally the release of the final EIS (FEIS).[97] The publication of the NOI and DEIS each triggers a 30-day public comment period wherein the public can provide input on the scoping and contents of the EIS. After with the issuance of the FEIS, BOEM publishes a Record of Decision (ROD) elaborating on the rationale undergirding the EIS.[98] The final step once all environmental reviews have been complete and the developer has made any required revisions is the COP approval, after which a project has official federal approval to begin construction.

[94] Bureau of Ocean Energy Management, "A Citizen's Guide to the Bureau of Ocean Energy Management's Renewable Energy Authorization Process."
[95] Office of Renewable Energy Programs, "Information Guidelines for a Renewable Energy Construction and Operations Plan."
[96] Office of Renewable Energy Programs.
[97] "Regulatory Framework and Guidelines."
[98] Bureau of Ocean Energy Management, "A Citizen's Guide to the Bureau of Ocean Energy Management's Renewable Energy Authorization Process."

Cooperating Federal Agencies and Other Federal Permits

In addition to the lease and permit received from BOEM, OSW facilities are also subject to receiving approvals from the following federal agencies: U.S. Army Corps of Engineers in the Department of the Army, U.S. Fish and Wildlife Service in the DOI, NOAA in the Department of Commerce, the Environmental Protection Agency (EPA), FERC, BSSE, and potentially others depending on specific project circumstances.[99] The interplay between BOEM and these other federal agencies is established through Memoranda of Understanding (MOUs) that describe each entity's role in reviewing renewable energy projects in the OCS.[100] Additionally, OSW projects are subject to numerous federal environmental statutes, including NEPA, the National Historic Preservation Act (NHPA), the Endangered Species Act (ESA), the Magnuson-Stevens Fishery Conservation and Management Act, the Clean Water and Clean Air Acts, and the Migratory Bird Treaty Act, to name a few.[101] Developers must keep track of all legislation they must be in compliance with and all agencies they must receive permits from in order to move to the construction phase.

One of the ways that developers, federal agencies, and members of the public can keep track of the status of these different federal permits is through use of the FAST-41 permitting dashboard, named for Title 41 of the Fixing America's Surface Transportation (FAST) Act. This online tool tracks the applicable federal reviews and authorizations required for a given project, lists the lead and supporting agencies responsible for the reviews, and contains detailed timelines on the original projections, revised targets, and eventual completion dates for each permitting

[99] Hokanson, "Avoiding the Doldrums."
[100] Bureau of Ocean Energy Management, "A Citizen's Guide to the Bureau of Ocean Energy Management's Renewable Energy Authorization Process."
[101] "BOEM Governing Statutes."

activity.[102] Established in 2015, the FAST Act created the Federal Permitting Improvement Steering Council (FPISC) comprising personnel from various government agencies with the objective of improving the transparency and efficiency of infrastructure projects subject to federal review.[103] Offshore wind projects are eligible for FAST-41 since they are multi-billion dollar investments subject to NEPA and other environmental reviews. BOEM is responsible for providing the overall permitting schedule for a given OSW project, and for any changes to the schedule beyond 30 days they must submit a request to the Executive Director of the FAST-41 council and provide justifications for the revised target dates.[104] The FAST-41 dashboard grants visibility into the status and timing of the various permits and consultations described in the MOU between BOEM and other federal agencies. The subsequent consultations and permits described and shown in Figure 5 are those directly applicable to the two case study projects, though additional permitting activities may be required for other OSW projects.

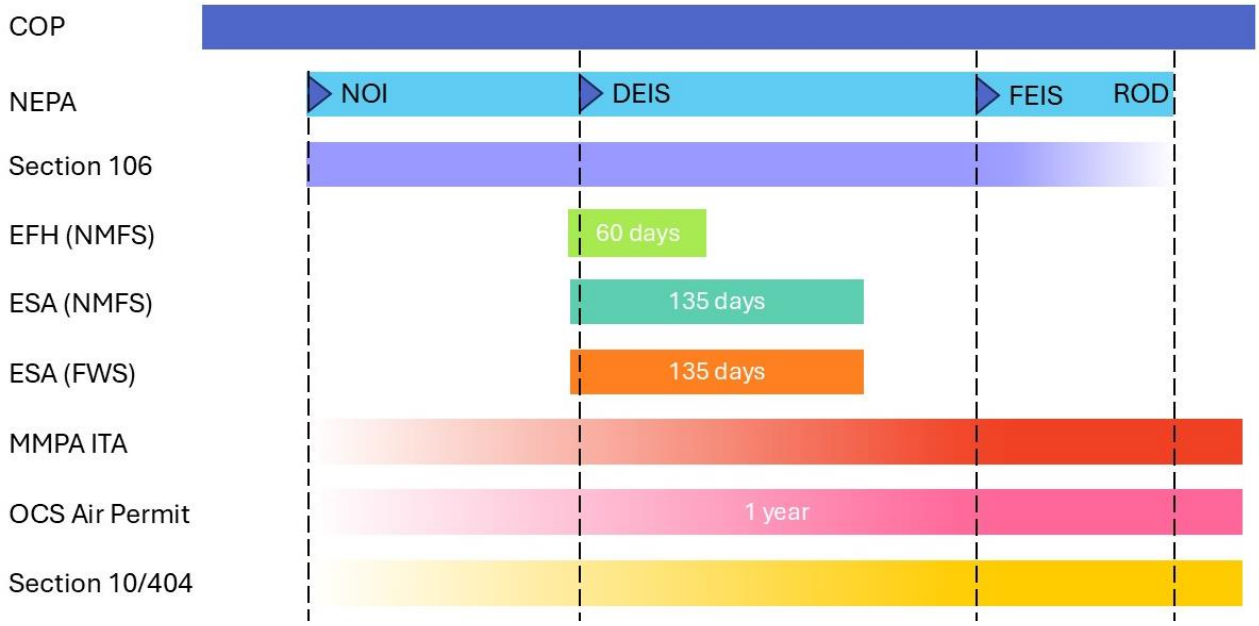


Figure 5. Nominal order of NEPA review and federal cooperating agency permitting actions.

[102] "New England Wind Permitting Dashboard."
[103] "FAST-41."
[104] "42 USC 4370m-2: Permitting Process Improvement."

One of the consultations tracked through the FAST-41 permitting dashboard is the review established by Section 106 of the NHPA, which stipulates that federal agencies must evaluate the impact of their activities on national historic properties.[105] In the case of the OSW projects reviewed by BOEM, these historic properties may include shipwrecks, lighthouses, or other archaeological sites. Though the developer is responsible for providing site surveys, BOEM is the lead agency in charge of the Section 106 consultation and they engage directly with State Historic Preservation Officers (SHPOs) and Tribal Historic Preservation Officers (THPOs) as applicable to determine the potential historical impact of the OSW facility.[106] The NHPA consultation for OSW projects is typically done in tandem with the NEPA review. Throughout the review, the Advisory Council on Historic Preservation federal agency also has the opportunity to engage with the project during the normal public comment periods of the NEPA review.[107] The Section 106 consultation with the SHPOs/THPOs and Advisory Council on Historic Preservation concludes with the FEIS. If adverse impacts are found as a result of the Section 106 review, these agencies may recommend mitigations.

The National Marine Fisheries Service (NMFS), also known as NOAA Fisheries, is the lead agency for several of the reviews tracked in the FAST-41 process. The Marine Mammal Protection Act (MMPA) prohibits the harassment of marine mammals, even when arising from otherwise lawful activities.[108] Offshore wind survey and construction activities have the potential to disrupt marine life unintentionally, and the NMFS is authorized to issue Incidental Take Authorizations (ITAs) to exempt these activities from the MMPA. Developers must get an ITA permit to conduct any activities that may harass marine life in this way, otherwise they could be

[105] "Historic Preservation Activities and Offshore Renewable Energy | BOEM.Gov."
[106] "36 CFR Part 800 -- Protection of Historic Properties."
[107] "Historic Preservation Activities and Offshore Renewable Energy | BOEM.Gov."
[108] "Marine Mammal Protection Act (MMPA)."

held civilly and criminally liable for any violations of the MMPA. The permit issued by the NMFS may be an Incidental Harassment Authorization (IHA), which lasts one year with the option to renew for a year, or a Letter of Authorization (LOA), which is valid for up to five years. There is no specific stage in the COP process where developers must submit an ITA request, but the NMFS website suggests applying for the IHA at least five months before activities occur and for the LOA at least nine months.[109]

The NMFS also oversees OSW project compliance with the Section 305 of the Magnuson-Stevens Fishery Conservation and Management Act, which requires federal agencies to assess the impacts of their actions on Essential Fish Habitats (EFH).[110] BOEM's consultation with NMFS is typically initiated with the DEIS review, though it is also dependent on BOEM's submission of a completed EFH Assessment to NMFS. After receiving the completed EFH Assessment, NMFS has 60 days to review the document package and deem it complete, and then another 90 days to issue recommendations to mitigate EFH impacts as deemed necessary.[111] The resulting document from the Section 305 consultation is an EFH Conservation Recommendation, which BOEM then has 30 days to issue a response on how it will proceed with the recommendations. The EFH Conservation Recommendation must be issued prior to the publication of the FEIS.

The final consultation overseen by NMFS is stipulated by the Endangered Species Act (ESA) of 1973, which protects endangered and threatened species and habitats. While NMFS covers the ESA review for most marine species, they share jurisdiction over sea turtles and Atlantic salmon with the U.S. Fish and Wildlife Service (FWS), meaning that both agencies are

[109] Fisheries, "Incidental Take Authorizations Under the Marine Mammal Protection Act."
[110] "BOEM Governing Statutes."
[111] "Magnuson-Stevens Fishery Conservation and Management Act, Section 305 Essential Fish Habitat (EFH) Consultation."

typically involved in OSW reviews.[112] Section 7(a)(2) of the ESA requires federal agencies to consult with NMFS and FWS if their actions impact a protected species, and for efficiency this consultation typically happens concurrently with the DEIS and MMPA ITA review.[113] To initiate the ESA consultation, BOEM submits a Biological Assessment and an ESA consultation request to each agency, with a target of completing the consultation review in two months. The consultation is expected to last 135 days, and the resulting documentation issued by NMFS and FWS is a Biological Opinion detailing how BOEM's activities affect endangered species and habitats and how these impacts may be mitigated. The ESA consultation must end before BOEM issues the NOA of FEIS and before NMFS renders a decision on the MMPA ITA.

The U.S. Army Corps of Engineers (USACE) is the lead agency responsible for overseeing Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act. These two acts go hand-in-hand, as Section 10 requires USACE authorization for the construction of any structure in navigable water and Section 404 regulates the discharge of dredge or fill material in national waters.[114] Section 10 and Section 404 approval is therefore required for installing turbine foundations, electric cables, and facility platforms during OSW construction. The USACE review is initiated with the developer's submission of the permit application.[115] The USACE final permit decision cannot be rendered until the ESA and EFH consultations are complete and the ROD is published, and the target issuance of the decision is 60 days after the completion of the aforementioned items.[116]

[112] Fisheries, "Laws & Policies."
[113] "Endangered Species Act Consultation (NOAA-NMFS)."
[114] "Section 10 Rivers and Harbors Act of 1899 and Section 404 Clean Water Act."
[115] "Section 10 Rivers and Harbors Act of 1899 and Section 404 Clean Water Act," 10.
[116] "Section 10 Rivers and Harbors Act of 1899 and Section 404 Clean Water Act."

The final permitting activity tracked by the FAST-41 dashboard is the Outer Continental Shelf (OCS) Air Permit issued by the Environmental Protection Agency (EPA). This permit is required if it is expected that the OSW facility survey, construction, or operation will emit hazardous pollution to the air, which may come from vessel engines or platform generators. This permit process is initiated by the developer's application to the EPA, which the EPA has 30 days to deem complete or request additional materials from the developer. From the time the OCS Air Permit application is deemed complete, the EPA has year to issue a permit decision, though the ROD must also be issued prior to the EPA completing this milestone.[117]

4.2 State Involvement in Federal Processes

All active OSW projects under development today are located in federal waters, and therefore coastal states do not have the direct ability to issue permits for the construction and operation of OSW facilities at sea. However, this does not mean states have no influence on the federal permitting process. The Coastal Zone Management Act (CZMA) of 1972 authorizes states to create coastal management plans for the ocean areas under their jurisdiction which are subject to federal approval.[118] The 'federal consistency' provision of the CZMA mandates that any federal activity occurring in the OCS that affects a state's coastal zone be consistent with that state's approved coastal management plan.[119] Offshore wind projects can be seen as having an impact on a state's coastal viewsheds, economic activity with respect to tourism or maritime industries, and ecology.[120] Therefore, federal OSW permitting may become subject to the review and approval of nearby states with coastal management plans. The extent at which the CZMA extends a state's influence over federal OSW permitting does have limits however, as a state's

[117] "Outer Continental Shelf (OCS) Air Permit."
[118] Hokanson, "Avoiding the Doldrums."
[119] "Federal Consistency."
[120] Russell, Bingaman, and Garcia, "Threading a Moving Needle."

rejection can be overruled by the U.S. Secretary of Commerce if they determine that the federal consistency provision is met.[121]

As soon as the export cables from an OSW farm crosses into state waters, however, states have full power to approve or disapprove siting and permits. Though OSW projects receive approval to interconnect to the grid from FERC, projects must get state approval for any sub-sea cables near shore that are required, and they must get local municipal approval for any onshore transmission infrastructure being built.[122] State and local permitting activities are subject to public stakeholder proceedings, and getting all the required local approvals for a project can take an OSW developer years.[123] Because all federal permitting processes are the same and all state and local processes are different in their own way, this thesis focuses only on the common BOEM permit process applicable to all OSW developments.

[121] Powell, "Revisiting Federalism Concerns in the Offshore Wind Energy Industry in Light of Continued Local Opposition to the Cape Wind Project Note."
[122] Newell, "Transmission Impossible."
[123] Russell, Bingaman, and Garcia, "Threading a Moving Needle."

Chapter 5. BOEM Timeline Analysis

The data gathered for this analysis comes from the BOEM website project pages for each of the leased projects, supplemented with dates gathered from the SAP, COP, and EIS as needed when milestone dates were not readily available on the BOEM website.[124] This analysis considers only milestones completed by the end of 2024. At this time, BOEM had issued 39 commercial leases in the OCS to prospective OSW developers, shown in

[124] "Lease and Grant Information."

Table 3.[125] Of these leases, 33 projects are located in the Atlantic Ocean, five projects in the Pacific Ocean, and one in the Gulf of Mexico. Though not all of these projects are in active development, only the lease belonging to the Cape Wind project has been officially relinquished. This project was the first offshore wind facility to obtain a commercial lease from the federal government, and its permitting pathway predates BOEM's current process.

These 39 leases do not necessarily represent distinct projects with their own SAP and COP documentation. Two of the leases have been consolidated in areas where an OSW developer had adjacent lease properties, and at other times a lease was subdivided for the same project split into several phases. In this latter instance, the subdivided leases had identical permitting milestone dates, causing duplicates in the data. This occurred for the Ocean Wind and New England Wind projects. To avoid double-counting and for clarity of data, the second of these split leases along with the consolidated leases were removed from the BOEM timeline tables, resulting in a total of 35 unique project data sets. Key milestone dates for each of these projects were noted for the Site Assessment Plan (SAP) and Construction and Operations Plan (COP) phases in order to determine the permitting long lead times.

[125] "Lease and Grant Information."

Table 3. BOEM leases granted to OSW projects.[126]

Lease Number	Lessee	Year	Region	Lease Status
OCS-A 0478	Cape Wind Associates, LLC	2010	North Atlantic	Relinquished
OCS-A 0482	GSOE I, LLC	2012	Mid-Atlantic	Active
OCS-A 0483	Virginia Electric and Power Company	2013	Mid-Atlantic	Active
OCS-A 0487	Sunrise Wind LLC	2013	North Atlantic	Active
OCS-A 0486	Revolution Wind, LLC	2013	North Atlantic	Active
OCS-A 0489	US Wind Inc.	2014	Mid-Atlantic	Consolidated
OCS-A 0490	US Wind Inc.	2014	Mid-Atlantic	Active
OCS-A 0530	Sunrise Wind LLC	2015	North Atlantic	Consolidated
OCS-A 0500	Bay State Wind LLC	2015	North Atlantic	Active
OCS-A 0501	Vineyard Wind 1 LLC	2015	North Atlantic	Active
OCS-A 0534	Park City Wind LLC	2015	North Atlantic	Active
OCS-A 0498	Ocean Wind LLC	2016	Mid-Atlantic	Active
OCS-A 0499	Atlantic Shores Offshore Wind Project 1, LLC; Atlantic Shores Offshore Wind Project 2, LLC	2016	Mid-Atlantic	Active
OCS-A 0532	Orsted North America Inc.	2016	Mid-Atlantic	Active
OCS-A 0512	Empire Offshore Wind LLC	2017	Mid-Atlantic	Active
OCS-A 0508	Kitty Hawk Wind, LLC	2017	South Atlantic	Active
OCS-A 0519	Skipjack Offshore Energy, LLC	2018	Mid-Atlantic	Active
OCS-A 0520	Beacon Wind LLC	2019	North Atlantic	Active
OCS-A 0521	SouthCoast Wind Energy LLC	2019	North Atlantic	Active
OCS-A 0522	Vineyard Northeast LLC	2019	North Atlantic	Active
OCS-A 0517	South Fork Wind, LLC	2020	North Atlantic	Active
OCS-A 0537	Bluepoint Wind, LLC	2022	Mid-Atlantic	Active
OCS-A 0538	Attentive Energy LLC	2022	Mid-Atlantic	Active
OCS-A 0539	Community Offshore Wind, LLC	2022	Mid-Atlantic	Active
OCS-A 0541	Atlantic Shores Offshore Wind Bight, LLC	2022	Mid-Atlantic	Active

[126] "Lease and Grant Information."

OCS-A 0542	Invenergy Wind Offshore LLC	2022	Mid-Atlantic	Active
OCS-A 0544	Vineyard Mid-Atlantic LLC	2022	Mid-Atlantic	Active
OCS-A 0549	Atlantic Shores Offshore Wind, LLC	2022	Mid-Atlantic	Active
OCS-A 0545	TotalEnergies Carolina Long Bay, LLC	2022	South Atlantic	Active
OCS-A 0546	Cinergy Corp	2022	South Atlantic	Active
OCS-P 0561	RWE Offshore Wind Holdings, LLC	2023	California	Active
OCS-P 0562	California North Floating LLC	2023	California	Active
OCS-P 0563	Equinor Wind US LLC	2023	California	Active
OCS-P 0564	Golden State Wind LLC	2023	California	Active
OCS-P 0565	Invenergy California Offshore LLC	2023	California	Active
OCS-G 37334	RWE Offshore US Gulf, LLC	2023	Gulf of Mexico	Active
OCS-A 0557	Equinor Wind US, LLC	2024	Mid-Atlantic	Active
OCS-A 0558	Virginia Electric and Power Co.	2024	Mid-Atlantic	Active
OCS-A 0561	Commonwealth Wind, LLC	2024	North Atlantic	Active

Site Assessment Plan Phase

For the SAP timeline analysis, the SAP submission date, latest revision date, number of revisions noted on the BOEM project webpage, and approval date were recorded for each project. Additionally, the COP submission date was noted and used to calculate the number of days a project spent in the SAP phase of permitting. The full table of data is presented in Appendix A: BOEM Permitting Timelines, and the summary data showing the time it took for BOEM to approve the SAP and the duration of SAP approval to COP submission is shown below in

Table 4. Projects without a SAP submitted were removed from this list, as were projects where leases were later subdivided for separate project phases.

Of the leased projects, 19 have submitted SAPs that have been approved by BOEM, at an average of 1.2 years for approval with the longest project taking roughly 3.5 years. From the projects with approved SAPs, 16 have also submitted COPs to BOEM, taking an average of 1.5

years to get from SAP approval to the COP filing. This metric represents the amount of time a project has spent during active site assessment, with the longest project taking 3.2 years. There are additionally two projects that have submitted SAP reports that have not yet received approval, and three projects that have received SAP approval but are still in active site assessment.

Table 4. Site Assessment Plan timeline summary for BOEM leased projects.

Lease Number	Lessee	SAP Submitted to Approved (Years)	SAP Approved to COP Submitted (Years)
OCS-A 0483	Virginia Electric and Power Company	3.5	3.2
OCS-A 0486	Revolution Wind, LLC	1.5	2.4
OCS-A 0487	Sunrise Wind LLC	0.6	3.2
OCS-A 0490	US Wind Inc.	2.2	2.4
OCS-A 0498	Ocean Wind LLC	0.7	2.8
OCS-A 0499	Atlantic Shores Offshore Wind Project 1, LLC; Atlantic Shores Offshore Wind Project 2, LLC	1.3	0.0
OCS-A 0500	Bay State Wind LLC	0.4	1.9
OCS-A 0501	Vineyard Wind 1 LLC	1.2	-0.4
OCS-A 0508	Kitty Hawk Wind, LLC	0.6	0.7
OCS-A 0512	Empire Offshore Wind LLC	0.5	1.1
OCS-A 0517	South Fork Wind, LLC	1.5	0.7
OCS-A 0520	Beacon Wind LLC	0.8	1.7
OCS-A 0521	SouthCoast Wind Energy LLC	0.8	0.7
OCS-A 0522	Vineyard Northeast LLC	2.3	0
OCS-A 0534	Park City Wind LLC	1.1	2.1
OCS-A 0538	Attentive Energy LLC	0.9	--
OCS-A 0542	Invenergy Wind Offshore LLC	0.4	--
OCS-A 0544	Vineyard Mid-Atlantic LLC	0.8	--
OCS-A 0549	Atlantic Shores Offshore Wind, LLC	1.3	1.1
	Count	**19**	**16**
	Maximum Duration	**3.5**	**3.2**
	Average Duration	**1.2**	**1.5**

Construction and Operations Plan Phase

To analyze how long it has historically taken leased projects to get through the COP phase, the following milestone dates were tracked: COP submission, COP latest revision, NOI to conduct an EIS, NOA of the DEIS, FEIS publication, ROD issuance, and COP approval. The number of COP revisions listed on the BOEM project webpage were also noted. This

information was collected mainly through the BOEM website project pages and associated public documents published in the Federal Register. Appendix A: BOEM Permitting Timelines contains the full details of EIS and COP milestone dates, and Table 5 below summarizes the information on how long it took for a project to get through the EIS process and from initial COP submission to final BOEM approval. Of the leased projects, 11 have received FEIS reports and nine have received final BOEM permitting approval (including subdivided leases these totals are 13 and 11, respectively). Projects took an average of 2.3 years for the EIS phase, with the longest having a duration of 3 years. The average length of the COP phase overall is 3.6 years, with Empire Wind taking the longest at 4.1 years. One project, Bay State Wind, submitted a COP but has not had an NOI issued; this COP was submitted in 2019 and it appears development activity on the project has ceased.

Table 5. BOEM timelines for EIS publication and COP approval.

Lease Number	Lessee	NOI to FEIS (Years)	COP Submitted to Approved (Years)
OCS-A 0483	Virginia Electric and Power Company	2.2	3.1
OCS-A 0486	Revolution Wind, LLC	2.2	3.7
OCS-A 0487	Sunrise Wind LLC	2.3	3.8
OCS-A 0490	US Wind Inc.	2.1	--
OCS-A 0498	Ocean Wind LLC	2.2	2.6
OCS-A 0499	Atlantic Shores Offshore Wind Project 1, LLC; Atlantic Shores Offshore Wind Project 2, LLC	2.6	3.5
OCS-A 0501	Vineyard Wind 1 LLC	3.0	3.6
OCS-A 0512	Empire Offshore Wind LLC	2.2	4.1
OCS-A 0517	South Fork Wind, LLC	2.8	3.6
OCS-A 0520	Beacon Wind LLC	0.9	--
OCS-A 0534	Park City Wind LLC	2.7	4.0
	Count	**11**	**9**
	Maximum Duration	**3.0**	**4.1**
	Average Duration	**2.3**	**3.6**

Case Study Determination

Though only about half of the projects that have received SAP approval have also received COP approval, from these timelines it is clear that the COP process takes over twice as long as

the SAP, at 3.6 years compared to 1.5 years. The NEPA review is a significant portion of this permitting stage, taking on average two-thirds of the total duration. In comparison to the nominal two years BOEM estimates projects will spend in the COP phase, this project duration data is particularly notable. Since this thesis is centered on identifying the reasons behind long lead times for federal permitting activities, the subsequent case studies focus specifically on dissecting the reasons for long COP durations. The colloquial names of the nine projects that have received COP approval are shown below in Table 6. I chose to use Vineyard Wind and New England Wind for the case studies discussed in Chapter 6, since both projects make landfall in Massachusetts and have the same developer.

Table 6. Case study project candidates with year of lease and COP approval.

Lease Number	Project Name	Lease Effective Year	COP Approval Year
OCS-A 0483	Coastal Virginia Offshore Wind Commercial	2013	2024
OCS-A 0486	Revolution Wind	2013	2023
OCS-A 0487	Sunrise Wind	2013	2024
OCS-A 0501	**Vineyard Wind**	2015	2021
OCS-A 0534	**New England Wind**	2015	2024
OCS-A 0498	Ocean Wind	2016	2023
OCS-A 0499	Atlantic Shores South	2016	2024
OCS-A 0512	Empire Wind	2017	2024
OCS-A 0517	South Fork Wind	2020	2022

Chapter 6. Case Studies

6.1 Massachusetts Context

Massachusetts has positioned itself to become a leader in the American offshore wind industry. The Commonwealth has codified the procurement of 5.6 GW of OSW power in its clean energy goals and has invested millions of dollars into infrastructure projects along the coast to support the nascent industry.[127] Within Massachusetts, there is a network of institutions with missions targeted at promoting the growth of the OSW industry. In addition to state departments that support OSW, the quasi-public economic development agency Massachusetts Clean Energy Center (MassCEC) is dedicated to spurring the growth of the industry through workforce training, supply chain and infrastructure development, and research.[128] Academic and research institutions across the state have pioneered programs dedicated to stimulating the OSW industry in the region; Tufts University established the first graduate program dedicated to OSW supply chains and infrastructure, the University of Massachusetts Amherst is leading the America's first nationwide OSW research center, and the Woods Hole Oceanographic Institution conducts cutting edge research on OSW forecasting and surveying.[129] Furthermore, three of the 11 projects that have received COP approval plan to sell power to the Massachusetts grid, and more projects are underway off the state's south shore may be contracted to the Commonwealth.[130]

While the outlook for offshore wind in Massachusetts today is one of growth, the industry within the state has had a turbulent history. The state's first foray into OSW development began with the Cape Wind project, now infamous for its failure after more than a decade spent in

[127] "Massachusetts - New England for Offshore Wind"; "Massachusetts Offshore Wind Ports & Infrastructure."
[128] "Offshore Wind | MassCEC."
[129] "Offshore Wind Power Opportunities Fuel Aspirations of Tufts Graduate Students"; "First-Ever National Offshore Wind Research Center"; Kakley, "ISO-NE Supporting Woods Hole Oceanographic Institute's Offshore Wind Forecasting Research."
[130] "Massachusetts - New England for Offshore Wind."

development. Before BOEM had legislative authority over OSW projects in the OCS, Cape Wind Associates, LLC endeavored to build an OSW farm in federal waters, a journey that began in 2001 and ultimately was terminated in 2017.[131] The Cape Wind project was to consist of roughly 130 wind turbines located in the Nantucket Sound, situated between the affluent coastal communities of Cape Cod, Martha's Vineyard, and Nantucket just beyond the confines of the state water boundary.[132] Because it was so close to shore—just over 3 miles from the Cape Cod coast and roughly 15 miles from both Martha's Vineyard and Nantucket—the visual impact and effect on recreational activities related to tourism made the project highly controversial.[133]

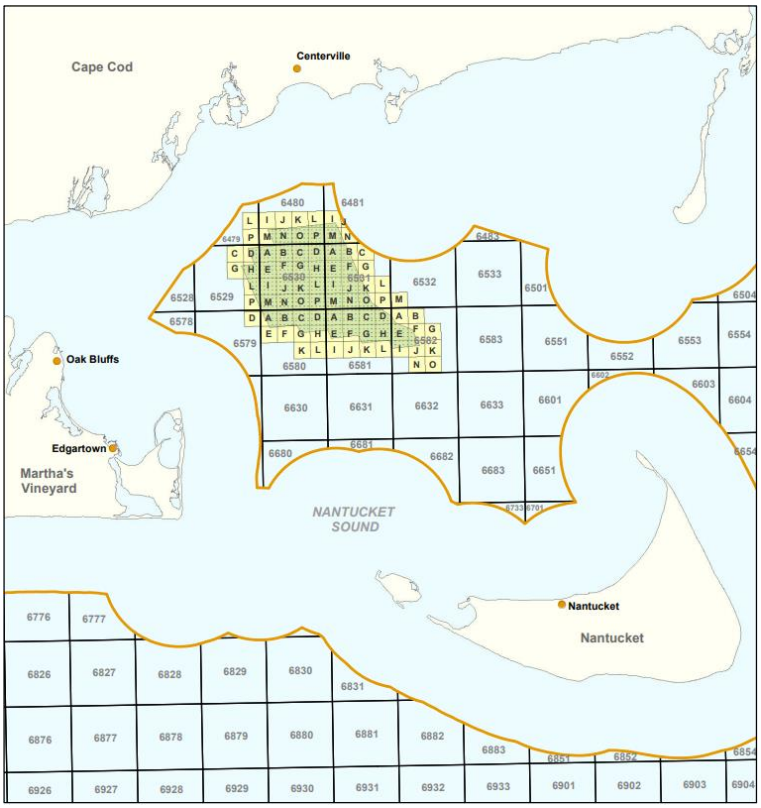


Figure 6. Cape Wind lease area (yellow) and proposed array footprint (green). Federal/state line shown in orange.[134]

[131] Ross, "Environmental Impact Communication."
[132] Powell, "Revisiting Federalism Concerns in the Offshore Wind Energy Industry in Light of Continued Local Opposition to the Cape Wind Project Note."
[133] Powell.
[134] "Cape Wind Archived."

As the first proposed OSW farm in America, Cape Wind brought national attention to Massachusetts. Several public figures, including the Koch brothers and the Kennedy family, became embroiled in the controversy over the project and coastal communities across Cape Cod and the Massachusetts islands became divided over support for the facility.[135] While some environmental groups such as Clean Power Now and Greenpeace championed the project as a source of clean energy to combat climate change, other groups such as the Alliance to Protect Nantucket Sound disparaged the project's impact to marine ecosystems and local industries.[136]

The public furor over the Cape Wind project created numerous obstacles for the developers, including multiple legal challenges that spanned the project's 16 years of federal and state permitting. The Cape Wind developers originally submitted an application for the construction of their facility to the USACE in late 2001, and over the next few years the USACE conducted the NEPA review of the proposed OSW project, releasing their DEIS in 2004.[137] During the extended 90-day public comment period for the DEIS, over 45,000 comments were submitted in person and online.[138] A year after the DEIS was published by USACE, the DOI gained regulatory authority over renewable energy projects in the OCS, transferring responsibility of the NEPA review to BOEM and starting the process anew.[139]

Despite these challenges and delays, the FEIS and ROD were issued in 2009 and 2010 respectively, and Cape Wind became the recipient of the nation's first OSW lease.[140] The project subsequently filed its COP, which was approved by BOEM in April 2011.[141] During this time, overall public opinion in Massachusetts swung in favor of the project, with a study from NOAA

[135] Shanahan et al., "An Angel on the Wind."
[136] Shanahan et al.
[137] Ross, "Environmental Impact Communication."
[138] Ross.
[139] "Cape Wind Archived."
[140] "Cape Wind Archived."
[141] "Cape Wind Archived."

showing that Cape Wind gained a slight majority of proponents in 2009.[142] Despite winning over public support and having received the federal permits required to construct and operate the project, legal challenges from vocal dissidents prevented Cape Wind from proceeding.[143] Ultimately, in December 2017, though Cape Wind had won every legal challenge and retained its federal permit to operate, the expiration of its power purchase agreement in 2015 led the company to relinquish its lease, terminating the project.[144]

The announcement of Cape Wind's cancelled utility contracts in 2015 was a blow to the OSW industry in the state and the region, as evidenced in the price of the lease areas off the coast of Massachusetts: plots of ocean that had once gone for $18.75 per acre two years prior in 2013 were now selling for roughly $1 per acre, with some lease areas up for auction receiving no bids at all.[145] However, this economic indicator of a struggling market soon reversed; the subsequent year Block Island Wind became America's first operational OSW farm and BOEM lease areas saw a dramatic increase in bidding prices, with a New York lease selling for roughly $500 per acre.[146] That same year, Massachusetts passed legislation requiring the state's electric distribution companies to procure 1.6 GW of OSW power by 2027 over the course of at least five competitive solicitations.[147] This law spurred the OSW industry within the state, with three projects off the coast of Massachusetts including Vineyard Wind subsequently bidding for long-term utility contracts during the first solicitation in 2017.[148] Similar legislation and procurement targets across the Northeast likewise stimulated the offshore wind industry, and in 2018 the two

[142] Firestone, Kempton, and Krueger, "Public Acceptance of Offshore Wind Power Projects in the USA."
[143] Ross, "Environmental Impact Communication."
[144] Ross.
[145] "Commercial Wind Leasing Offshore Rhode Island and Massachusetts"; "Vineyard Power and Partner Win Offshore Wind Lease."
[146] World, "Historic, Record-Breaking Offshore Wind Lease Auction."
[147] "Massachusetts Legislature Enacts Significant Energy Bill in Support of Offshore Wind and Hydro Procurement, Storage and Transmission."
[148] Republican, "As Cape Wind Dies, Offshore Wind Picks up Steam in Massachusetts."

lease areas that had previously gone without bids in 2015 sold for a combined cost of $405 million at an average of over $1,000 per acre—three orders of magnitude larger than the prior asking price.[149] When the Biden administration announced in 2021 that the nation would seek to deploy 30 GW of OSW by 2030, this further spurred the industry's growth.[150] Massachusetts subsequently increased its mandated OSW procurement target to 5.6 GW by 2035, more than tripling the previous requirement.[151]

Figure 7. New Bedford Marine Commerce Terminal, used to stage Vineyard Wind 1.[152]

As interest in deploying OSW in the nation and region drove up lease and offtake bidding prices, Massachusetts was making investments into supporting industries in preparation for the acceleration of OSW deployments, with some of these facilities depicted in Figure 8. In 2011, the MassCEC Wind Technology Testing Center in Boston became the largest turbine blade

[149] World, "Historic, Record-Breaking Offshore Wind Lease Auction."
[150] Jost and Xydis, "Offshore Wind Acceleration in the U.S. Atlantic Coast and the 30 GW by 2030 Target."
[151] McCoy et al., "Offshore Wind Market Report: 2024 Edition."
[152] "New Bedford Marine Commerce Terminal (NBMCT)."

testing facility in the world, enabling the certification and commissioning of new wind turbine technologies.[153] Funding from MassCEC also helped build the New Bedford Marine Commerce Terminal, a heavy-lift marshalling port originally intended to stage Cape Wind which now services the Vineyard Wind 1 project.[154] In 2024, work began on a second OSW port in Salem, which will convert a former fossil fuel power plant into a terminal to support the construction and installation of fixed-bottom and floating OSW turbines.[155] The Salem Offshore Wind Terminal is not the only former fossil fuel site to be transformed into a clean energy hub; efforts are ongoing to convert part of the former coal-powered Brayton Point Power Station into a transmission substation capable of receiving the power generated by nearby OSW facilities.[156] The Brayton Point site was also going to be home to a factory that would manufacture OSW export cables, but the company abandoned these plans in 2025 after the Trump administration publicly opposed further OSW developments.[157]

Through its legislation and investments, Massachusetts has affirmed its commitment to transitioning to a cleaner grid largely fueled by OSW and has made steady progress in its procurement targets. Electric distribution companies in Massachusetts have power purchase agreements contracting Vineyard Wind 1's 800 MW capacity.[158] As of September 2024, the Commonwealth selected nearly 2.7 GW of power procurements from New England Wind, SouthCoast Wind, and Vineyard Wind 2.[159] If these contracts are executed, Massachusetts will

[153] "Charlestown Turbine Testing Attracts Energy Companies To Mass."
[154] "New Bedford Marine Commerce Terminal (NBMCT)."
[155] "Healey-Driscoll Administration, City of Salem and Crowley Celebrate Groundbreaking of Second Offshore Wind Terminal."
[156] Medeiros, "SouthCoast Wind's Plans for Somerset Could Involve Two Stations."
[157] "Prysmian Abandons Plans for Offshore Wind Cable Factory in Somerset."
[158] Epsilon Associates, Inc., "Vineyard Wind Draft Construction and Operations Plan Volume I."
[159] "Massachusetts and Rhode Island Announce Largest Offshore Wind Selection in New England History."

have procured almost two-thirds of their targeted 5.6 GW of OSW power, well in advance of the legislative 2035 deadline.

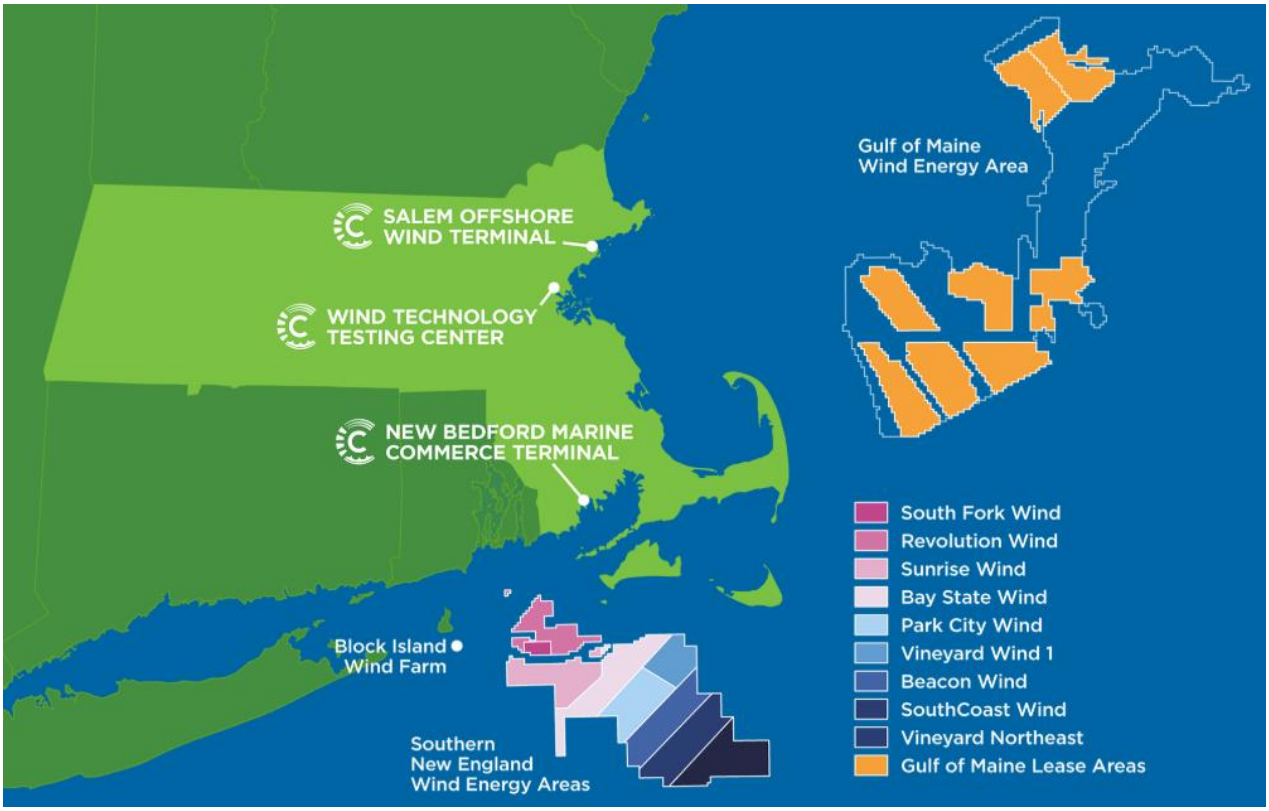


Figure 8. Massachusetts OSW industrial facilities and project lease areas.[160]

Unlike the other projects that have bid into the state's OSW power solicitation, Vineyard Wind 2 does not yet have COP approval and it is unlikely to receive it soon due to the Trump administration's moratorium on OSW permitting.[161] With COP approval granted in December 2024, SouthCoast Wind just barely received approval prior to this disruption in federal permitting, though developers state the project's future is uncertain in light of the Trump administration's opposition to OSW.[162] Both Vineyard Wind 1 and New England Wind are both fully permitted. Though it is still under construction, Vineyard Wind 1 has begun exporting

[160] "Offshore Wind | MassCEC."
[161] "Massachusetts and Rhode Island Announce Largest Offshore Wind Selection in New England History."
[162] Kuffner, "Four-Year Delay for SouthCoast Wind Offshore Wind Farm Floated. What We Know."

power to Massachusetts. The New England Wind project had a single COP encompassing two phases of the project, called Park City Wind and Commonwealth Wind, with the Park City Wind scheduled to begin construction in 2025.[163]

6.2 Vineyard Wind

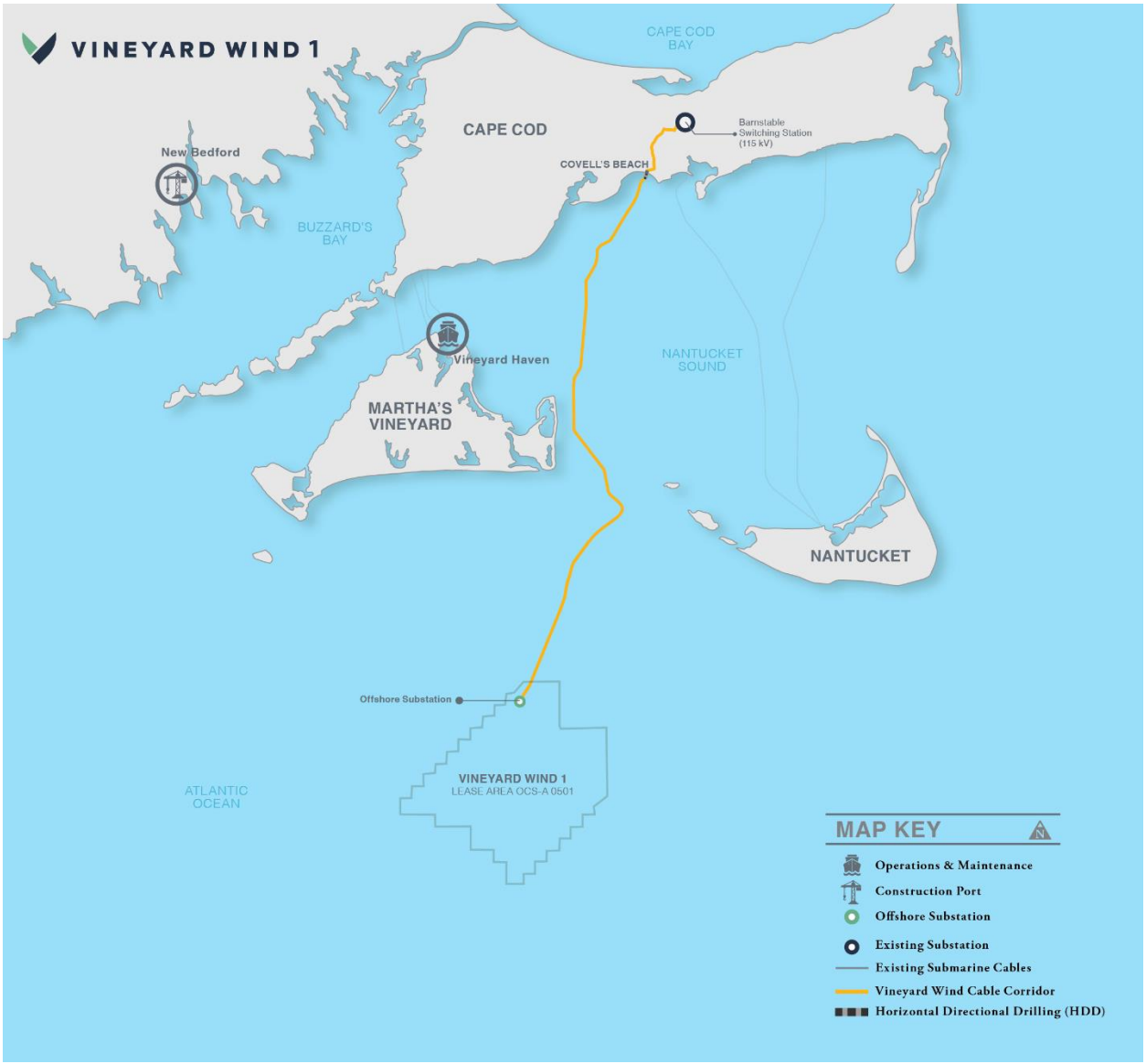


Figure 9. Vineyard Wind lease area, export cable, substation, and construction port.[164]

[163] Epsilon Associates, Inc., "New England Wind Construction and Operations Plan: Volume I Text."
[164] "Vineyard Wind 1," 1.

Vineyard Wind was assigned lease area OCS-A 0501 on April 1, 2015 under the Vineyard Wind, LLC entity, a joint venture owned in a 50-50 split by Avangrid Renewables and Copenhagen Infrastructure Partners.[165] In June 2021, the lease area was subdivided, with the portion of OCS-A 0501 encompassing the project known as Vineyard Wind being reassigned to the entity Vineyard Wind 1, LLC, and the remaining portion of the lease being redesignated as OCS-A 0534. For clarity, the private industry entities responsible for the permitting, development, and construction of the project will be referred to simply as 'Vineyard Wind'.

Vineyard Wind did not opt to participate in the FAST-41 process, though the high-level federal permitting milestones are available on the government permitting website. For each listed action, the original target date and completion date are listed. Unlike projects that participated in the FAST-41 process, the dashboard does not track changes made to the permitting schedule during the project's development or provide explanations for any dates that shifted from the original target. Most of the initial and target completion dates for Vineyard Wind mentioned in the following sections were obtained through the federal infrastructure permitting dashboard, with additional timeline details found in the appendices of the COP and FEIS.

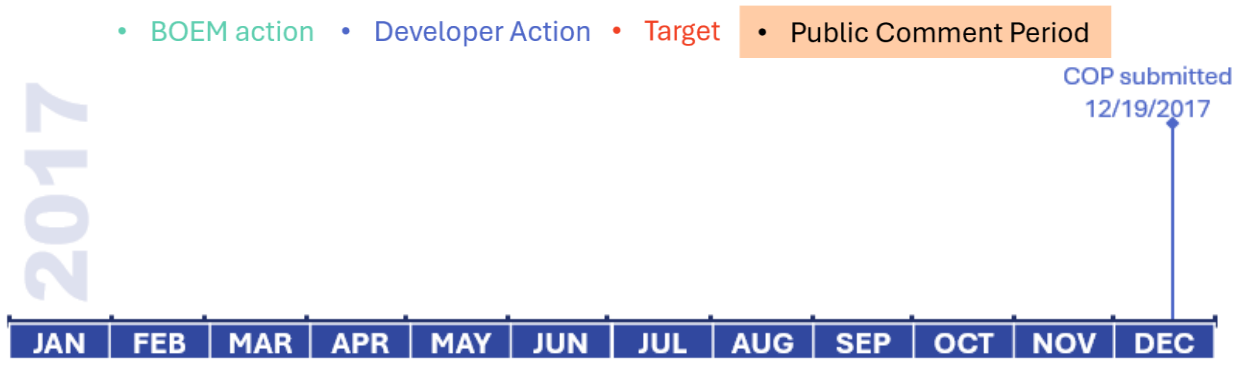
Though schedule changes were not tracked through the federal permitting website, Vineyard Wind was part of an earlier initiative to streamline and shorten environmental reviews, albeit one with less readily available public information. On August 15, 2017, the Trump administration released Executive Order 13807 which directed federal agencies to complete NEPA reviews for major infrastructure projects within two years of issuing the NOI to prepare an EIS, and for all related authorization decisions to be made within 90 days of issuance of the

[165] "Avangrid Renewables and Copenhagen Infrastructure Partners Announce Strategic Transaction to Advance Offshore Wind Development."

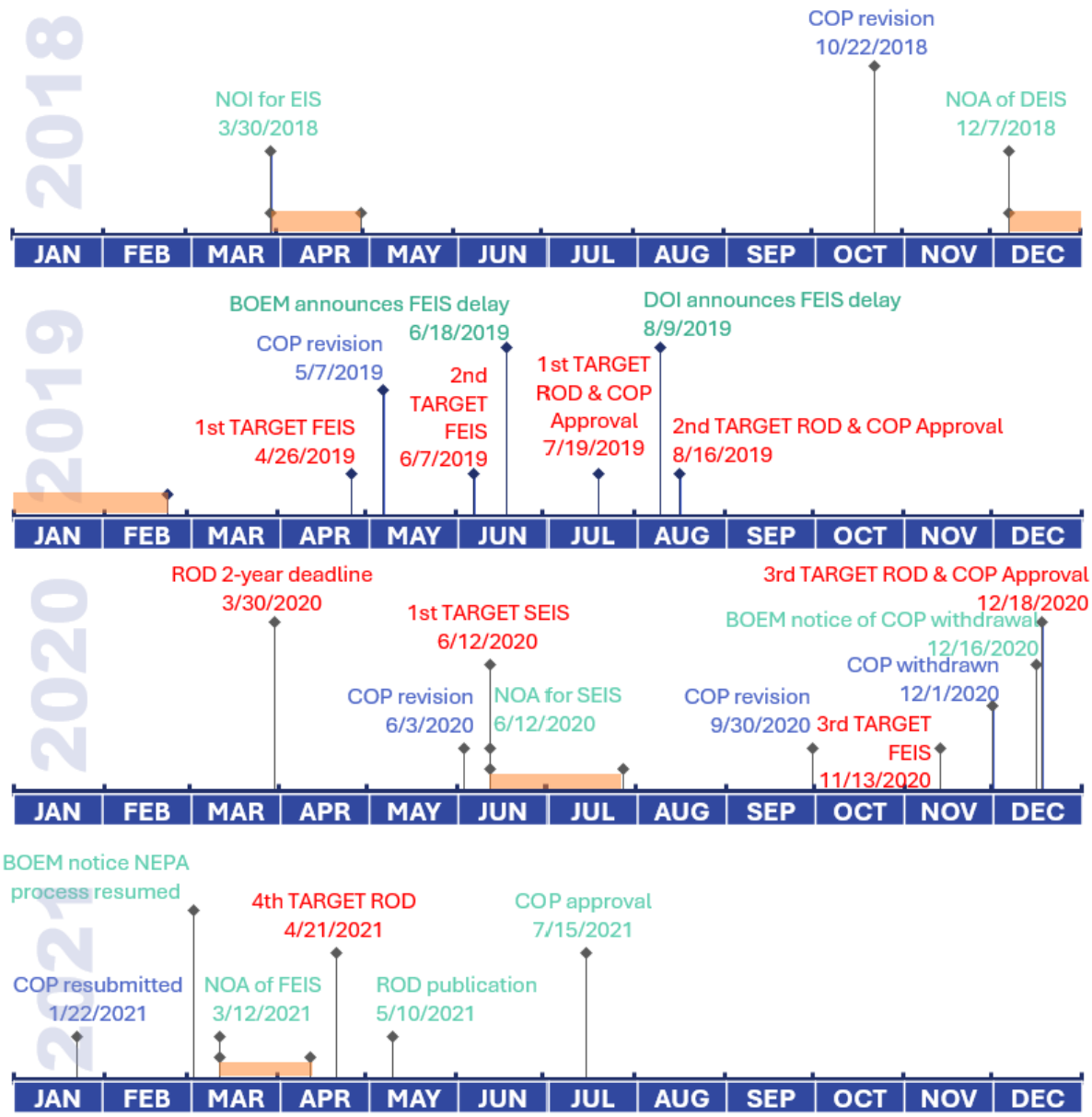
ROD.[166] Under this executive order, federal agencies were to consolidate their decision-making and permitting timetables through the One Federal Decision (OFD) Memorandum of Understanding for Major Infrastructure Projects, which required cooperating agencies to collaborate early to establish the purpose and scope of the NEPA review.[167] Through the OFD process, federal agencies were required to provide a consolidated permitting schedule of each agency's activities and work together to provide updated schedules as needed.

Vineyard Wind was the first private infrastructure project to have its permitting activities tracked through the OFD process, and two OFD timelines for the project are publicly available online.[168] However, the interview with Geri Edens revealed that there were at least two other revised OFD timetables given for the project which are not available online. The OFD executive order was revoked by the Biden administration in January 2021, but at that time Vineyard Wind was nearly complete with its NEPA review.[169] With acknowledgement that further schedule revisions exist but are unknown, the OFD timelines were used to supplement the milestone data on the federal permitting dashboard in the following sections.

Construction and Operations Plan



[166] "One Federal Decision - Fact Sheet."
[167] "One Federal Decision - Fact Sheet."
[168] Viaintermedia.com, "Vineyard Wind Shareholders Affirm Commitment to Deliver Offshore Wind Farm with Revised Schedule."
[169] "Protecting Public Health and the Environment and Restoring Science To Tackle the Climate Crisis."



Vineyard Wind submitted its COP to BOEM on December 19, 2017. Neither the federal permitting dashboard, BOEM project webpage, or OFD timetables list when the COP was deemed complete. The original target date for BOEM to issue a final decision on the COP was July 19, 2019, which would have been just over 1.5 years from the initial COP submission. According to the references listed in Volume 1 the Vineyard Wind FEIS report, the COP was

updated at least four times: in October 2018, May 2019, June 2020, and September 2020.[170] However, the actual number of COP revisions was much higher; in the interview with Geri Edens from Vineyard Offshore, she references the COP being updated more than 20 times prior to approval. Due to the lack of public information on these revisions, it is unclear what impact these changes may have had on the timelines for NEPA review and related permitting activities.

On March 19, 2019, the federal agencies involved in Vineyard Wind's permitting released their projected timelines under the OFD process, which pushed out the expected COP decision date one month to August 16, 2019. In July, Vineyard Wind developers met with BOEM and were informed that there would be a delay to the publication of the FEIS, impacting overall COP timelines, though the Vineyard Wind press release and related articles did not specify the duration of this delay.[171] On August 9, 2019, in an interview with Bloomberg News, DOI Secretary David Bernhardt announced that the agency would be conducting additional environmental reviews to assess the cumulative impact of OSW development in the region, a change that would significantly extend the NEPA timeline for Vineyard Wind.[172] Several Massachusetts representatives criticized this as a political move and accused the Trump administration, which was openly antagonistic towards wind energy, of intentionally delaying permitting.[173]

This supplemental EIS (SEIS) was initially estimated to complete late 2019 or early 2020.[174] In February 2020, BOEM and the cooperating agencies published a revised OFD

[170] Bureau of Ocean Energy Management Office of Renewable Energy Programs, "Vineyard Wind 1 Offshore Wind Energy Project Final Environmental Impact Statement Volume 1," 1.
[171] "Project Update."
[172] "Trump Delay Casts Doubt on First Major U.S. Offshore Wind Farm - Bloomberg."
[173] Noah Asimow, "Delays at Federal Level Plague Vineyard Wind"; Colin A. Young, "Feds Push Vineyard Wind Decision Into 2021"; Storrow, "Bernhardt."
[174] Viaintermedia.com, "Vineyard Wind Shareholders Affirm Commitment to Deliver Offshore Wind Farm with Revised Schedule."

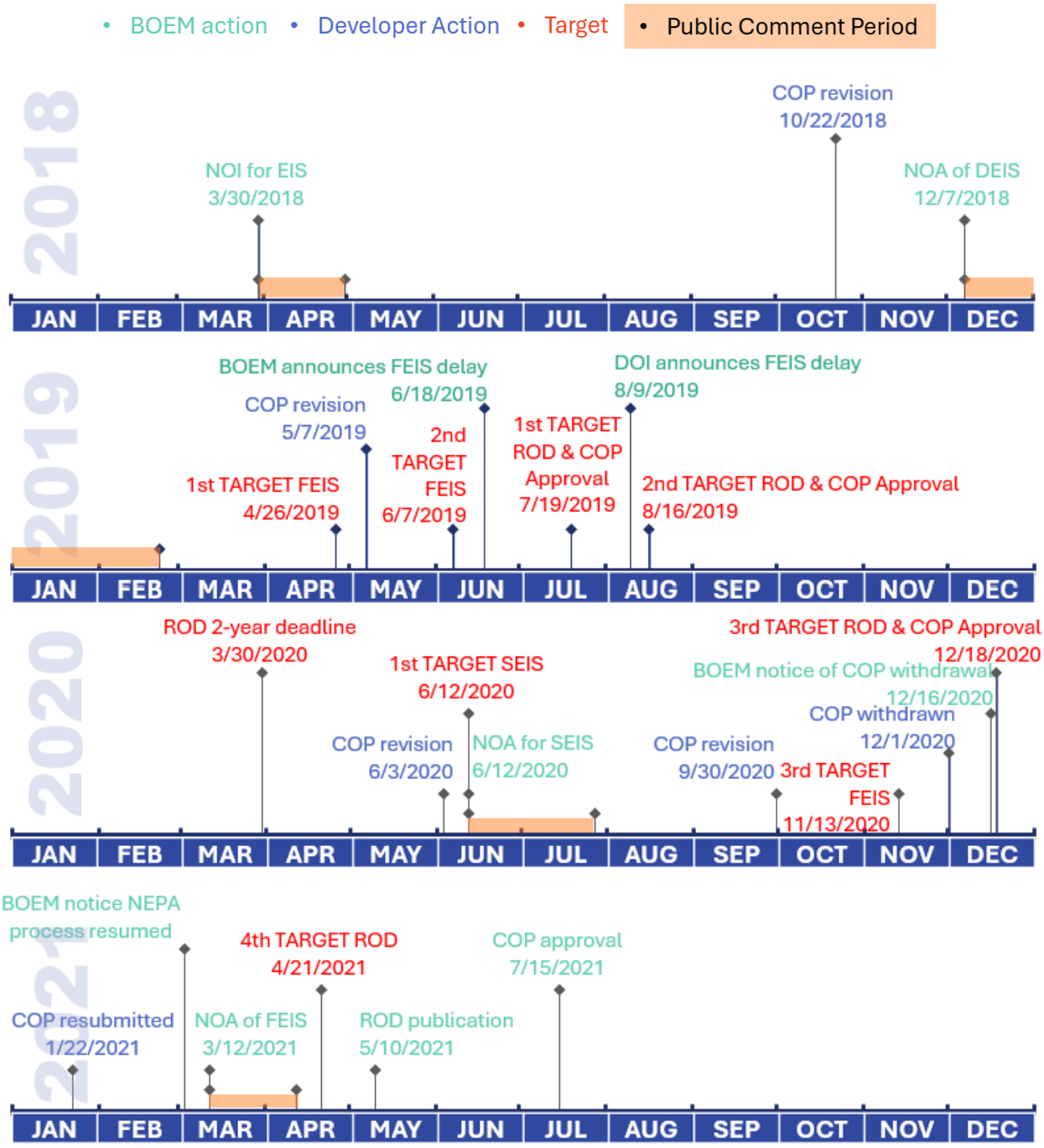
permitting timeline. This schedule update pushed out the estimated COP approval date to December 18, 2020 to reflect the new NEPA timelines incorporating the SEIS review. In November 2020, BOEM announced further delays to the permitting schedule, extending the COP process through January 2021.[175]

Vineyard Wind withdrew its COP from the BOEM review process on December 1, 2020 and BOEM subsequently published a public notice of this withdrawal in the Federal Register. The reason stated for the withdrawal was Vineyard Wind's desire to evaluate the potential impact of using GE Haliade-X wind turbines in their array. This was corroborated by the interview with Geri Edens, where she mentioned that the FEIS was scheduled to be published within a few weeks, after which it would be more difficult to modify the design if necessary. On January 22, 2021, Vineyard Wind sent BOEM a letter rescinding their withdrawal of the COP from consideration after determining that the use of the GE Haliade-X turbines would not result in a change to the project design envelope.[176] BOEM published a notice in the Federal Register on March 3, 2021 stating that the agency would resume review of the COP, including the NEPA analysis. BOEM approved Vineyard Wind's COP on July 15, 2021, two years after the initial targeted completion date and 3.5 years after the COP submittal.

Summary of delays: The COP approval was delayed by the extension of the NEPA process to include a supplemental assessment of the cumulative impacts of OSW development in the region, which took over a year. The final COP decision was also delayed to a lesser extent by the COP withdrawal which occurred right before the FEIS was to be issued, causing roughly three months in additional delay.

[175] Colin A. Young, "Feds Push Vineyard Wind Decision Into 2021."
[176] Bureau of Ocean Energy Management, "Notice To Resume the Preparation of a Final Environmental Impact Statement for the Construction and Operations Plan for Vineyard Wind LLC."

National Environmental Policy Act Review



BOEM published the NOI to prepare an EIS for the Vineyard Wind project on March 30, 2018, beginning a 30-day public comment period during which 152 comments were collected

and five scoping meetings were held in Massachusetts and Rhode Island.[177] As part of the OFD directive, BOEM had two years to complete the NEPA review process, though the target FEIS and ROD dates were set in advance of this deadline on April 26, 2019 and July 19, 2019 respectively.[178] Additionally, under this executive order BOEM and the cooperating agencies met between July and August 2018 in advance of the DEIS publication to concur on the purpose and need of the environmental review as well as the alternatives to be analyzed in the EIS.[179]

The NOA of DEIS was posted to the Federal Register on December 7, 2018, in line with the initial target. This began the public comment period, which was extended from its initial duration due to the government shutdown that occurred from December 12, 2018 to January 25, 2019. BOEM collected 136 comments during this period, which ended February 22, 2019.[180] On March 19, 2019, BOEM released their OFD permitting timeline for Vineyard Wind. Although this is the first publicly available OFD timeline, this document was a revision to the initial schedule. The target FEIS date was updated to June 7, 2019, a 42 delay from the initial target, and the ROD was pushed out 28 days to August 16, 2019. While the OFD timetable lists changes to the schedule, it does not provide the rationale behind those schedule delays.

An article from The Herald News references an announcement BOEM made on June 19, delaying the release of the FEIS by one month but keeping the ROD date unchanged.[181] According to the article, BOEM required more time to process the public comments that had been received on the DEIS. The following month, Vineyard Wind published several press

[177] "Notice of Intent to Prepare an Environmental Impact Statement for Vineyard Wind LLC's Proposed Wind Energy Facility Offshore Massachusetts."
[178] Bureau of Ocean Energy Management, "Vineyard Wind Offshore Wind Facility One Federal Decision Permitting Timeline," March 19, 2019.
[179] Bureau of Ocean Energy Management.
[180] "Notice of Availability of a Draft Environmental Impact Statement for Vineyard Wind LLC's Proposed Wind Energy Facility Offshore Massachusetts."
[181] Bragg, "Feds Delay Vineyard Wind Assessment One Month."

releases saying that BOEM told the developers there would be further delays to the FEIS, though the revised timing was not provided.[182]

On August 8, 2019, the DOI Secretary announced in an interview with Bloomberg News that the agency would be conducting an SEIS to assess the cumulative impacts of OSW developments in the region.[183] While it was clear that this would extend the NEPA timelines and result in a change to the project's schedule, the DOI did not share specific information about the delay duration at this time.[184] Though a revised OFD timeline was shared with the developer on September 18, 2019 according to the interview with Geri Edens, the next publicly available update was from February 7, 2020.[185] This timetable set a new milestone for BOEM to publish the SEIS by June 12, 2020, almost a year after the announcement that the agency would be conducting a supplemental review. BOEM shifted out the projected FEIS date by almost 1.5 years to November 13, 2020, and the ROD date by a similar duration to December 18, 2020.

BOEM published the NOA of the SEIS in the Federal Register on June 12, 2020, beginning a 45-day public comment period with five virtual public meetings. During this time, 13,260 public comments were received, several orders of magnitude more than had been submitted during the previous scoping period.[186] In November 2020, an article from WBUR revealed that BOEM once again revised the Vineyard Wind permitting schedule, delaying the

[182] "Statement on Bureau of Ocean Energy Management Environmental Impact Statement."
[183] "Trump Delay Casts Doubt on First Major U.S. Offshore Wind Farm - Bloomberg."
[184] Viaintermedia.com, "Vineyard Wind Shareholders Affirm Commitment to Deliver Offshore Wind Farm with Revised Schedule."
[185] Bureau of Ocean Energy Management, "Vineyard Wind Offshore Wind Facility One Federal Decision Permitting Timeline," February 7, 2020.
[186] "Notice of Availability of a Supplement to the Draft Environmental Impact Statement for Vineyard Wind LLC's Proposed Wind Energy Facility Offshore Massachusetts and Public Meetings."

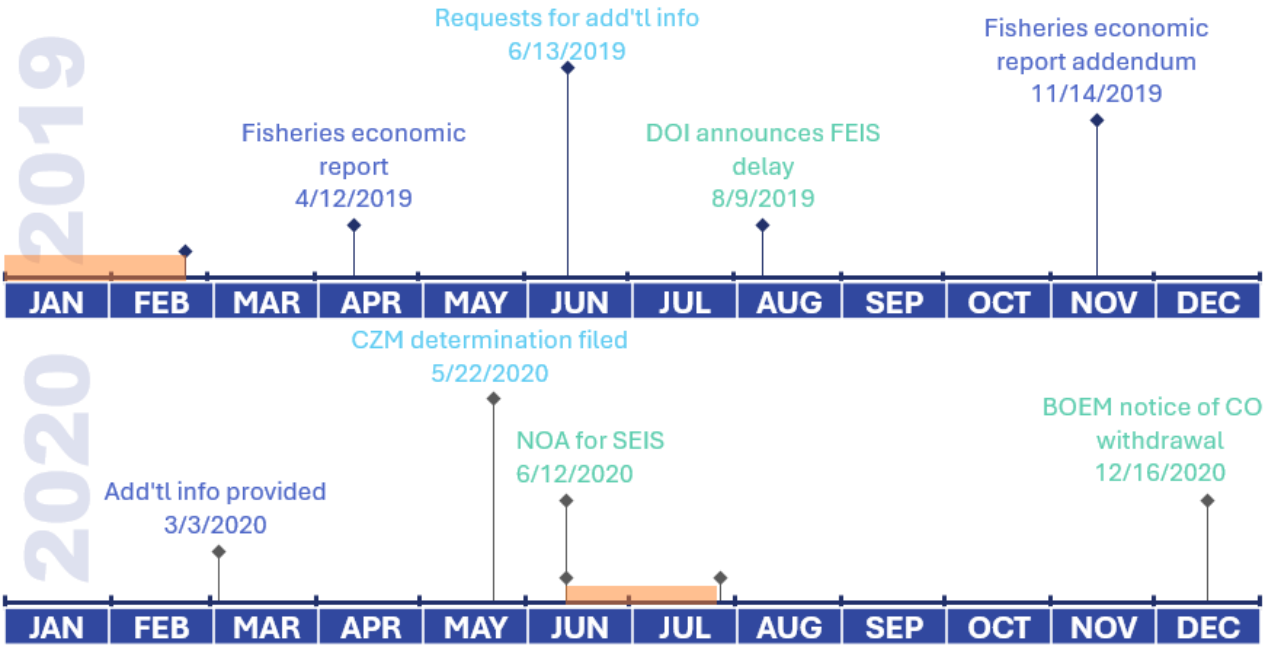
NEPA review further to January 15, 2021.[187] In an email to WBUR News, BOEM cited the need to review the comments submitted on the SEIS as part of the reason for the delay.[188]

Vineyard Wind withdrew its COP from BOEM consideration from December 1, 2020 to January 22, 2021, halting the NEPA review. A month and a half after Vineyard Wind resubmitted the COP, BOEM published a notice in the Federal Register announcing that the agency would resume the NEPA review.[189] A week later on March 12, 2021, BOEM published the NOA of FEIS, roughly 1.8 years from the initial target of publication. This was followed by the issuance of the ROD on May 15, 2021, concluding the NEPA process just over 3 years from the date the project's NOI of EIS was submitted to the Federal Register.

Summary of delays: The NEPA process for Vineyard Wind was extended due to the DOI decision to conduct the SEIS right before the FEIS was expected. BOEM took a year to publish the SEIS, after which many more public comments were received compared to earlier scoping periods. The FEIS was delayed again by BOEM, claiming they needed more time to process comments, and then there was a three month delay when Vineyard Wind withdrew the COP.

Federal Consistency Review – Massachusetts Coastal Zone Management

[187] Colin A. Young, "Feds Push Vineyard Wind Decision Into 2021."
[188] Colin A. Young.
[189] Bureau of Ocean Energy Management, "Notice To Resume the Preparation of a Final Environmental Impact Statement for the Construction and Operations Plan for Vineyard Wind LLC."

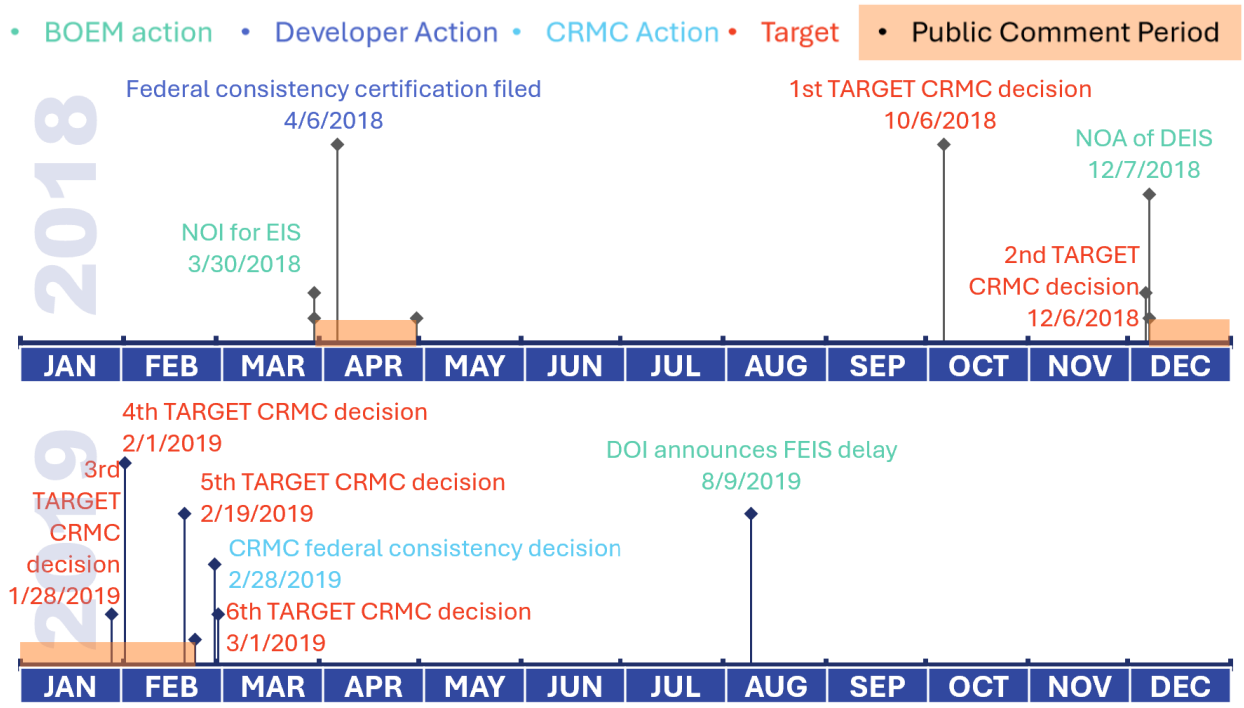


The federal consistency review for states that have Coastal Zone Management plans is not tracked on the federal permitting dashboard or through the OFD directive, though details of this process are available in the FEIS and on state agency websites. Vineyard Wind submitted their joint federal consistency certification to the Massachusetts Office of Coastal Zone Management (CZM) on April 6, 2018. Per regulation, the CZM has six months to complete their review, which puts the original estimated completion date on October 6, 2018. This due date must be extended by a mutual stay agreement between CZM and the developer, elsewise the consistency review is rejected by default. Though there is not public record of these stay agreements, several must have occurred during the federal consistency review process. In June 2019, the Massachusetts CZM requested additional information from Vineyard Wind regarding their turbine layout and plans for fisheries mitigations. From available documentation, it appears Vineyard Wind submitted their response to this request roughly 8.5 months later on March 3, 2020. The Massachusetts CZM issued their federal consistency concurrence on May 22, 2020.[190]

[190] Lisa Berry Engler, "Vineyard Wind 1 Federal Consistency Concurrence," May 22, 2020.

Summary of delays: There is not much available information on the Vineyard Wind CZM review timelines. However, the letter of concurrence states that the agency considered the preliminary SEIS report in its review, so the NEPA delay likely had an impact on the federal consistency review process.

Federal Consistency Review – Rhode Island Coastal Resources Management Council

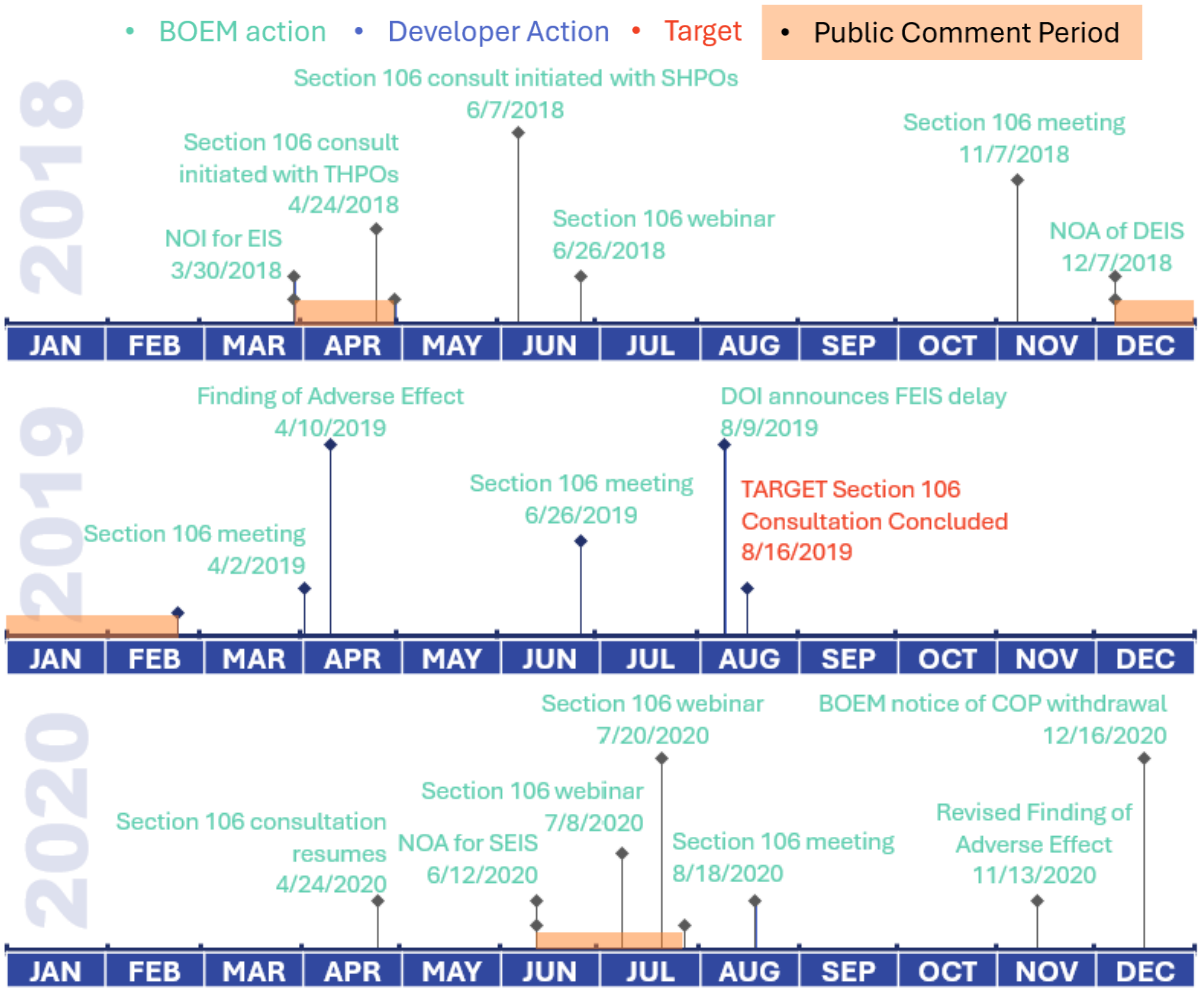


Vineyard Wind submitted the Rhode Island federal consistency certification to the state's Coastal Resources Management Council (CRMC) on April 6, 2018. The original target date for issuing a concurrence determination was October 6, 2018. This deadline was extended five times through stay agreements executed between CRMC and Vinyard Wind. Over the next 10 months, the CRMC met with the project developers numerous times to negotiate a direct compensation

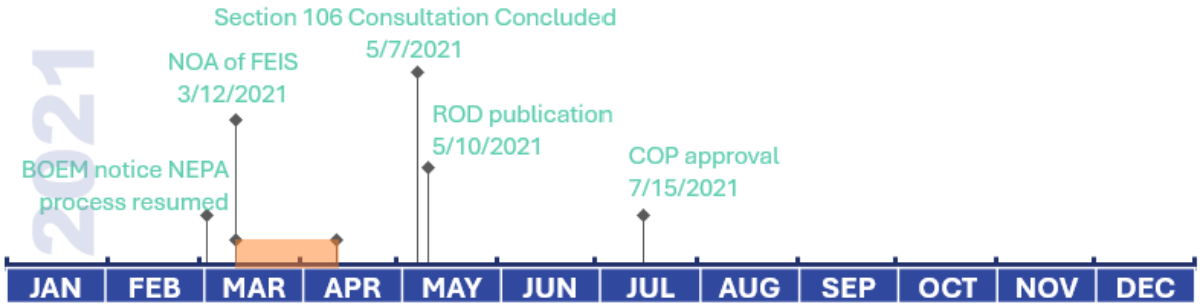
fund and trust for impacted fishermen and fisheries mitigations.[191] The Rhode Island CRMC issued their federal consistency concurrence on February 28, 2019.[192]

Summary of delays: It does not appear that there were any significant delays in the CRMC federal consistency review process.

Section 106 Consultation



[191] Grover J. Fugate, "CRMC Federal Consistency Concurrence Letter with Enclosure," February 28, 2019.
[192] Bureau of Ocean Energy Management Office of Renewable Energy Programs, "Vineyard Wind 1 Offshore Wind Energy Project Final Environmental Impact Statement Volume 1."



The federal permitting dashboard contains minimal details on the NHPA Section 106 consultation and this permitting activity was not included in the OFD schedule. However, Appendix C of the Vineyard Wind FEIS provides a detailed timeline of Section 106 consultation activities, though this report does not reference any delays to the originally projected schedule milestones. The report does not specifically mention the use of the NEPA substitution process to fulfill Section 106 requirements, though it does mention that the public involvement component of the consultation was resolved through the NEPA public comment and meeting periods.

BOEM's Section 106 consultation was initiated with the THPOs April 24, 2018 and with the SHPOs on June 7, 2018. Between June 2018 and June 2019, Appendix C of the FEIS lists four meetings held between BOEM and the Section 106 consulting parties.[193] The next Section 106 activity mentioned in the appendix is a letter sent from BOEM to the SHPOs and THPOs in April 2020 stating that they would resume the Section 106 consultation in the upcoming months, but there was no mention that the consultation had been paused.

There are a few reasons the consultation may have been suspended: several weeks after the last Section 106 meeting was held in June 2019, BOEM announced significant delays in the Vineyard Wind NEPA process. It seems probable that BOEM paused external consultations while determining the new scope of the supplemental review. Additionally, the COVID-19

[193] Bureau of Ocean Energy Management Office of Renewable Energy Programs, "Vineyard Wind 1 Offshore Wind Energy Project Final Environmental Impact Statement Volume II."

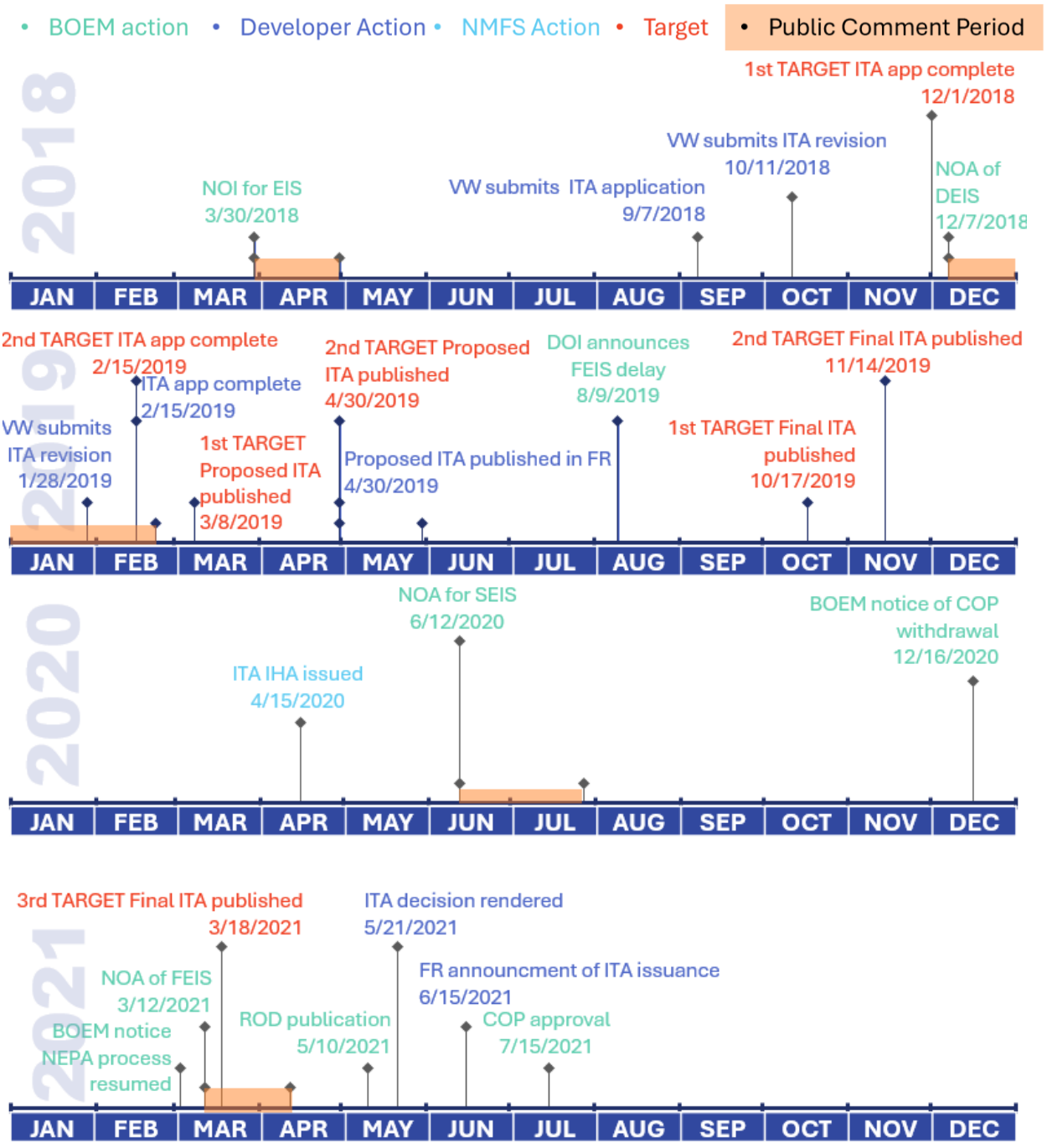
pandemic broke out in early 2020, with the federal government declaring a national pandemic on March 13, 2020. In BOEM's April 2020 letter announcing the resumption of the Section 106 consultation, the agency asks the consulting parties to provide details on how the pandemic may impact their ability to participate in the NHPA process. Prior to this point most of the Section 106 consultation meetings were in person, though afterwards they were held virtually. The appendix mentions three additional meetings held in 2020, and at the time of the FEIS publication on March 12, 2021 the Section 106 consultation was still ongoing.[194]

Per the NHPA regulations, the Memorandum of Agreement must be executed before the ROD is issued for a project and occurs after the FEIS is published. The Section 106 Memorandum of Agreement for Vineyard Wind was dated April 26, 2021.[195] According to the federal permitting dashboard, the Section 106 consultation officially terminated on May 7, 2021, which was 630 days after the initial projected conclusion to the consultation.

Summary of delays: Because this permitting activity was not tracked through the OFD directive or the FAST-41 process, there are minimal details available on the original or modified Section 106 consultation schedule. However, it seems that the NHPA process was paused while the SEIS was under review and that overall NEPA delays extended the Section 106 consultation beyond its initial projected timeframe. Additionally, the COVID-19 pandemic appears to have created some challenges with regards to meeting logistics for the Section 106 consulting parties, though these delays were minimal in light of the overall project timelines.

[194] Bureau of Ocean Energy Management Office of Renewable Energy Programs, "Vineyard Wind 1 Offshore Wind Energy Project Final Environmental Impact Statement Volume 1."
[195] "Memorandum Of Agreement Among The Bureau Of Ocean Energy Management, The Massachusetts State Historic Preservation Officer, Vineyard Wind, Llc, And The Advisory Council On Historic Preservation Regarding The Vineyard Wind 1 Offshore Wind Energy Project, Lease Area Ocs-A 0501, Offshore Massachusetts."

Marine Mammal Protection Act Incidental Take Authorization



Vineyard Wind submitted its initial request to NMFS for an ITA per MMPA regulations on September 7, 2018. The application was determined to be deficient and NMFS requested revisions from Vineyard Wind, resulting in several application iterations. On February 15, 2019

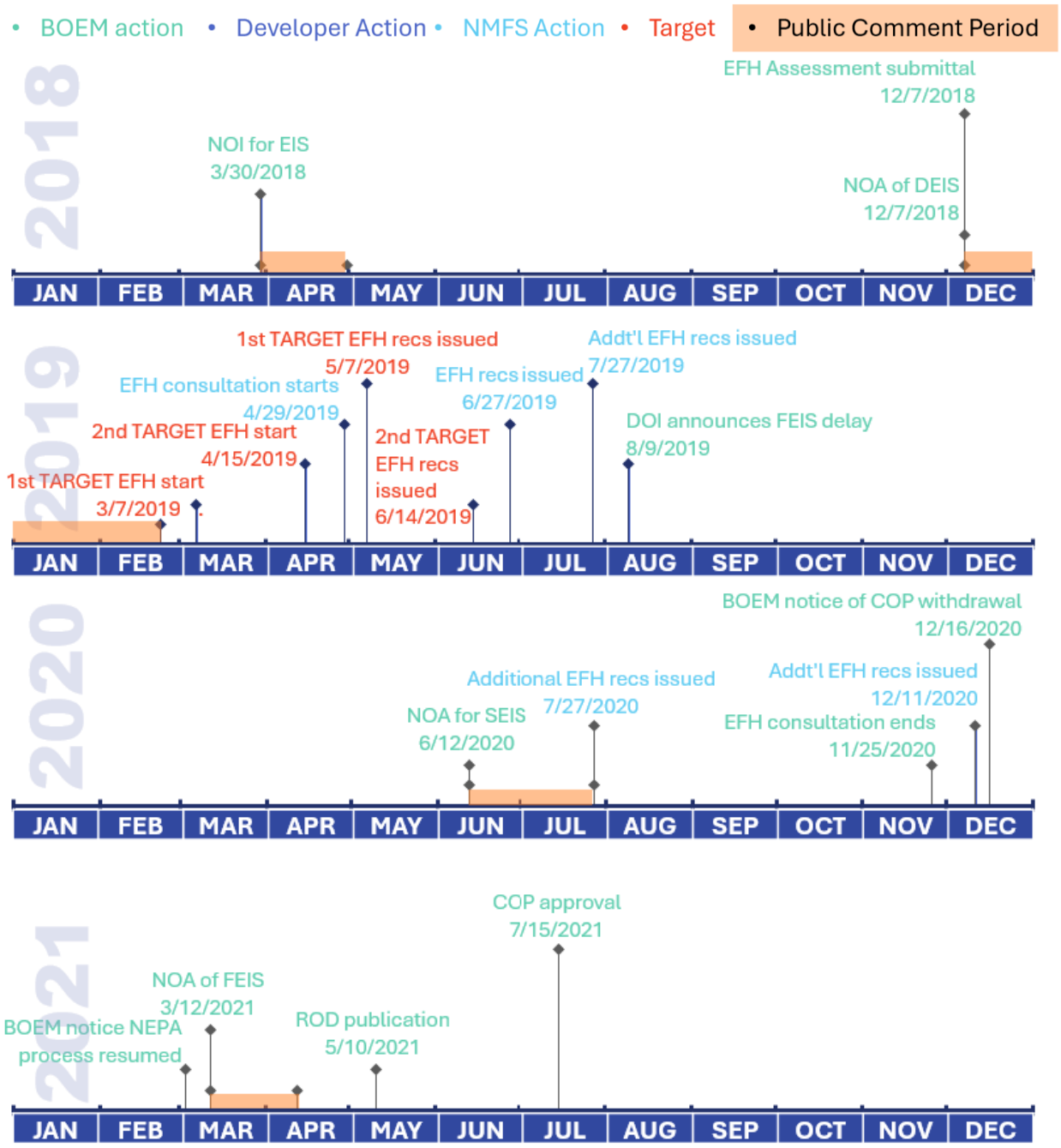
NMFS deemed the application complete. Both the federal permitting dashboard and the OFD permitting timetable list the initial target for the publication of the proposed ITA as March 8, 2019, though this was delayed to April 30, 2019 seemingly to account for the time it took to get a completed application. The publication of the proposed ITA began a 30-day public comment period, though the Federal Register page does not indicate any comments were submitted.[196]

The final ITA ruling cannot be published in the Federal Register until after the ROD is issued for the project. Accordingly, the projected date for this milestone shifted several times from its initial October 2019 projection each time the NEPA review got delayed. According to the OFD permitting table from March 2019, the first delay shifted the final ITA to November 14, 2019. After the announcement of the SEIS review, this deadline was shifted to March 18, 2021. Ultimately, the ROD was issued May 1, 2021 and the ITA decision was subsequently rendered on May 21, 2021, roughly 2.3 years from when the ITA application had been deemed complete. The issuance of the authorization was announced in the Federal Register on June 15, 2021.[197]

Summary of delays: NMFS published the proposed ITA in April 2019, with comments that they did not expect any serious harm to marine life to result from Vineyard Wind's activities, but was delayed in issuing the final proposal due to the ROD being a necessary predecessor for the authorization. Delays in the NEPA process ultimately resulted in the delayed issuance of the ITA permit.

[196] "Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Construction of the Vineyard Wind Offshore Wind Project," April 30, 2019.
[197] "Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Construction of the Vineyard Wind Offshore Wind Project," June 25, 2021.

Section 305 Essential Fish Habitat



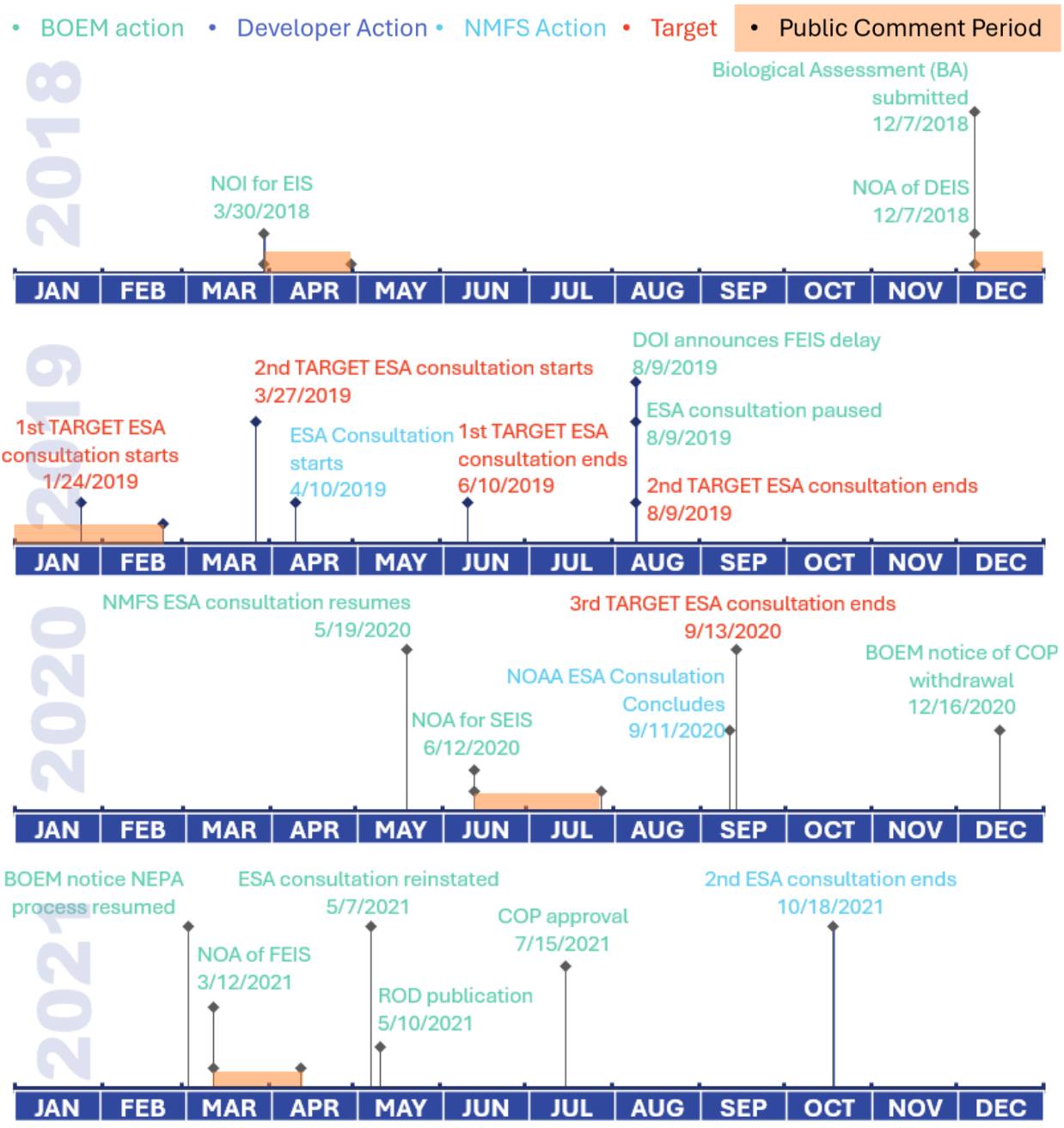
BOEM initiated its EFH Section 305 consultation with the submission of the EFH Assessment to NMFS which was sent at the same time that the agency published the DEIS on December 7, 2018. The initial estimate was that it would take 3 months for NMFS to review the application and deem it complete, with the milestone target set to March 7, 2019. The estimate

for NMFS to issue conservation recommendations was set to 60 days after the start of the consultation, putting the expected completion on May 7, 2019.

The EFH Assessment was deemed complete on April 29, 2019, formally initiating the EFH consultation. A few months later on June 27, 2019, NMFS issued their conservation recommendations in response to the EFH Assessment. According to the federal permitting dashboard, this is when the consultation ended. However, Appendix C of the FEIS report notes that NMFS sent BOEM additional conservation recommendations one year later on July 27, 2020, perhaps due to the publication of the SEIS the month prior. BOEM responded to the additional information NMFS provided on November 25, 2020, which the appendix notes as the formal end to the consultation. However, NMFS once again provided additional conservation recommendations to BOEM on December 11, 2020, which BOEM then incorporated in the FEIS released several months later in March.

Summary of delays: Overall, the EFH consultation proceeded at a timely pace. The federal permitting dashboard notes this activity as taking just over six months to complete. However, including the additional comments later provided by NMFS to BOEM for incorporation into the FEIS, the total duration is closer to two years from the time of the EFH Assessment submission. It seems that additional comments were provided in response to the change in NEPA scope, particularly with the addition of the SEIS.

Endangered Species Act Consultation – NOAA NMFS



The timeline details for this consultation were obtained from the second Biological Opinion issued by NMFS for this project.[198] BOEM submitted the Biological Assessment and the

[198] National Marine Fisheries Service. Greater Atlantic Regional Fisheries Office, "National Marine Fisheries Service Endangered Species Act Section 7 Biological Opinion."

request for the ESA Section 7 consultation to NMFS on December 7, 2018. The initial target date for NMFS to review the application and deem it complete was set to January 24, 2019. This date was not met, and a revised target was set to March 27, 2019. There were deficiencies in the application and BOEM submitted a revised Biological Assessment to the agency in March 2019, though the exact date of the submission is not known. The formal consultation was initiated on April 10, 2019 with NMFS's acceptance of the ESA consultation package.

The initial projected date of the consultation conclusion was set to August 9, 2019, which was 135 days past the initial assumed consultation start date. However on this date, the DOI announced major delays to the NEPA process. In a later Biological Opinion issued by NMFS, the agency states that BOEM fully paused the ESA consultation between August 9, 2019 and May 19, 2020, a duration of 284 days.[199] It does not appear that the target for the consultation conclusion was changed until the revised OFD timetable was published in February 2020, setting the new target to September 13, 2020.[200] Appendix C of the Vineyard Wind FEIS notes that BOEM submitted additional comments on the Biological Assessment to NMFS in May 2020, resuming the consultation.[201]

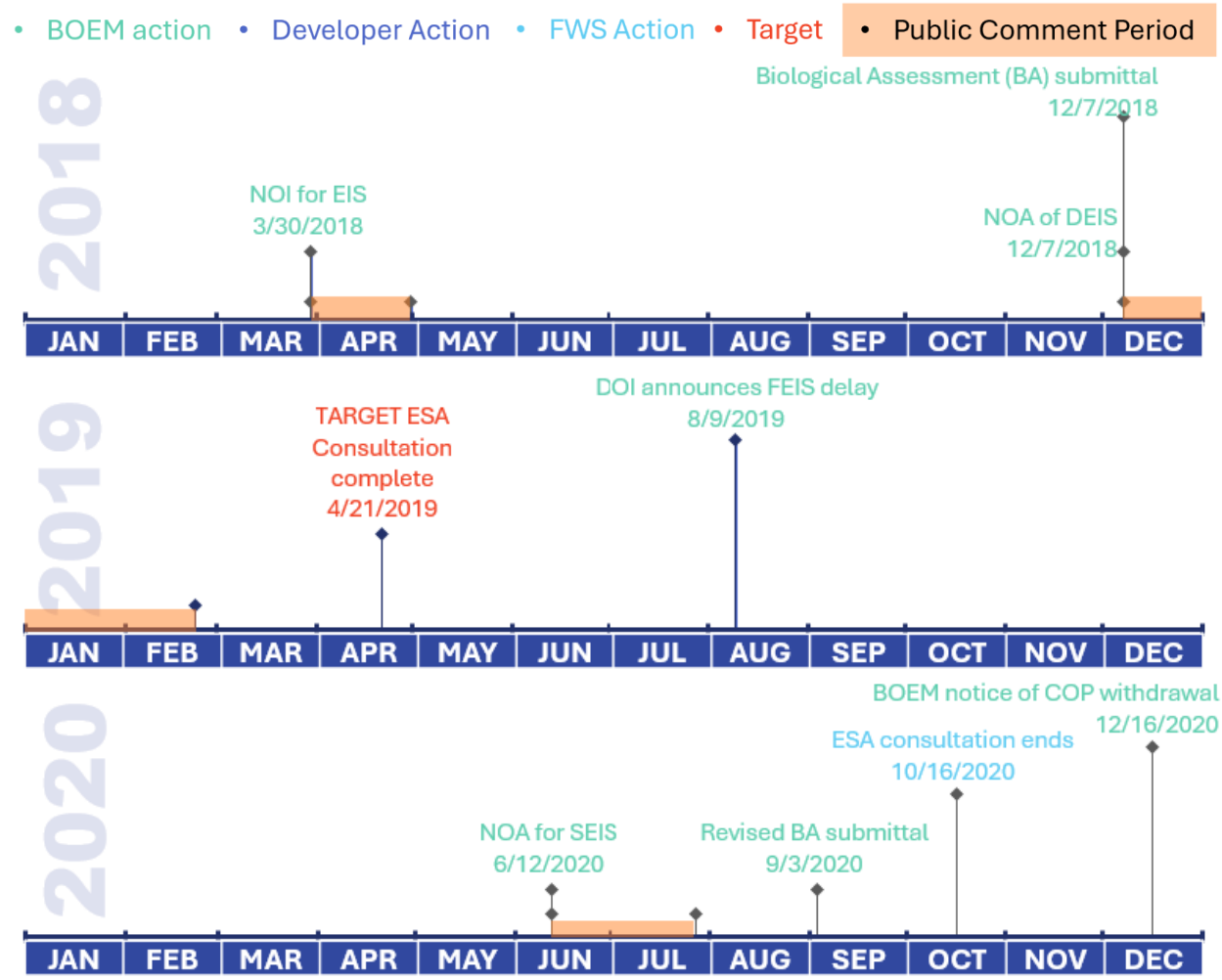
NMFS issued their first Biological Opinion for the Vineyard Wind project on September 11, 2020, formally ending the ESA consultation just under a year and a half from when it had been initiated. However, on May 7, 2021, BOEM reinitiated the consultation with the submission of a supplemental Biological Assessment report due to several conditions of the COP approval that were not considered in the original assessment. Over the next two months BOEM and

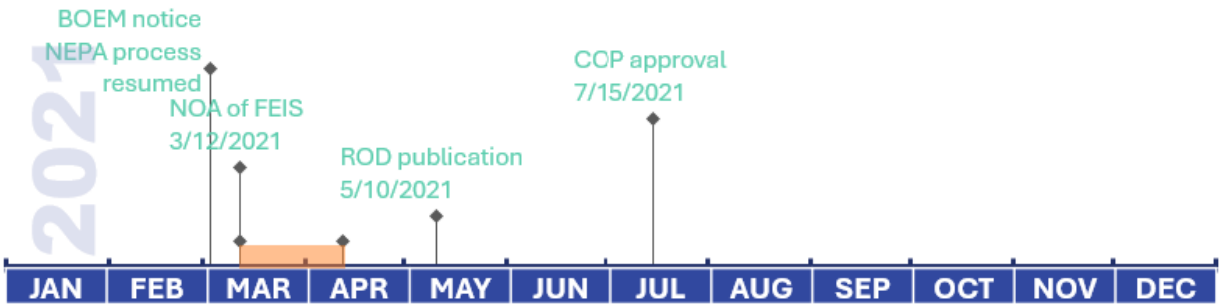
[199] National Marine Fisheries Service. Greater Atlantic Regional Fisheries Office.
[200] Bureau of Ocean Energy Management, "Vineyard Wind Offshore Wind Facility One Federal Decision Permitting Timeline," February 7, 2020.
[201] Bureau of Ocean Energy Management Office of Renewable Energy Programs, "Vineyard Wind 1 Offshore Wind Energy Project Final Environmental Impact Statement Volume II."

NMFS exchanged comments, and eventually the consultation concluded with the publication of the second Biological Opinion on October 28, 2021.

Summary of delays: The second Biological Opinion issued by NMFS lays out a clear timeline for the ESA consultation and states clearly that BOEM halted Section 7 activities for over 9 months between August 2019 and May 2020. This corresponds to the time it took from when BOEM first announced the SEIS to when the supplemental draft was made available.

Endangered Species Act Consultation – FWS





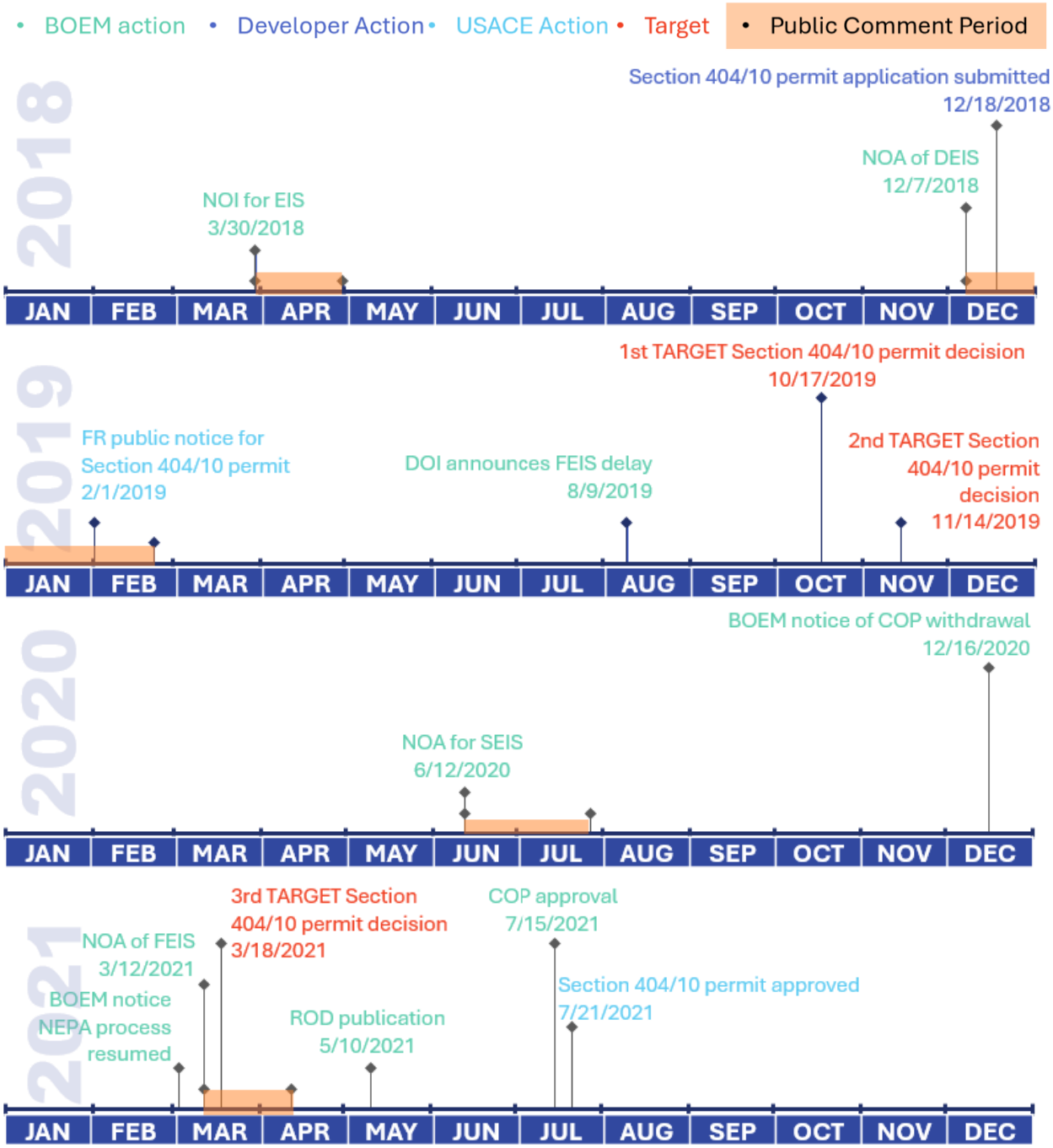
The ESA consultation with FWS was included in the March 2019 OFD permitting schedule with all dates listed as 'to be determined', but was absent from the February 2020 schedule. The milestone completion dates are listed on the federal permitting dashboard, but no changes to the schedule are mentioned. Appendix C of the FEIS lists a brief summary of the consultation activities, which is where the following dates originate.[202] No schedule changes are mentioned across any of the available sources, but the OFD schedule does mention that the agency consultation is supposed to be concluded within 135 days.[203]

BOEM submitted the Biological Assessment to FWS to initiate the ESA Section 7 consultation on December 7, 2018. Per the 135-day target, the initial projected timeline for this ESA consultation was expected to conclude in April 2019. On September 3, 2020, BOEM provided an updated Biological Assessment to reflect changes that had been made to the COP. FWS issued their letter of concurrence on October 16, 2020, concluding the consultation.

Summary of delays: There is little direct information on the original or modified schedule for the FWS ESA consultation. However, inferring from the detailed timeline for the complementary NMFS consultation, it seems BOEM paused consultations between August 2019 and May 2020, extending the overall timelines by close to a year.

[202] Bureau of Ocean Energy Management Office of Renewable Energy Programs.
[203] Bureau of Ocean Energy Management, "Vineyard Wind Offshore Wind Facility One Federal Decision Permitting Timeline," March 19, 2019.

Rivers and Harbors Act Section 10 / Clean Water Act Section 404



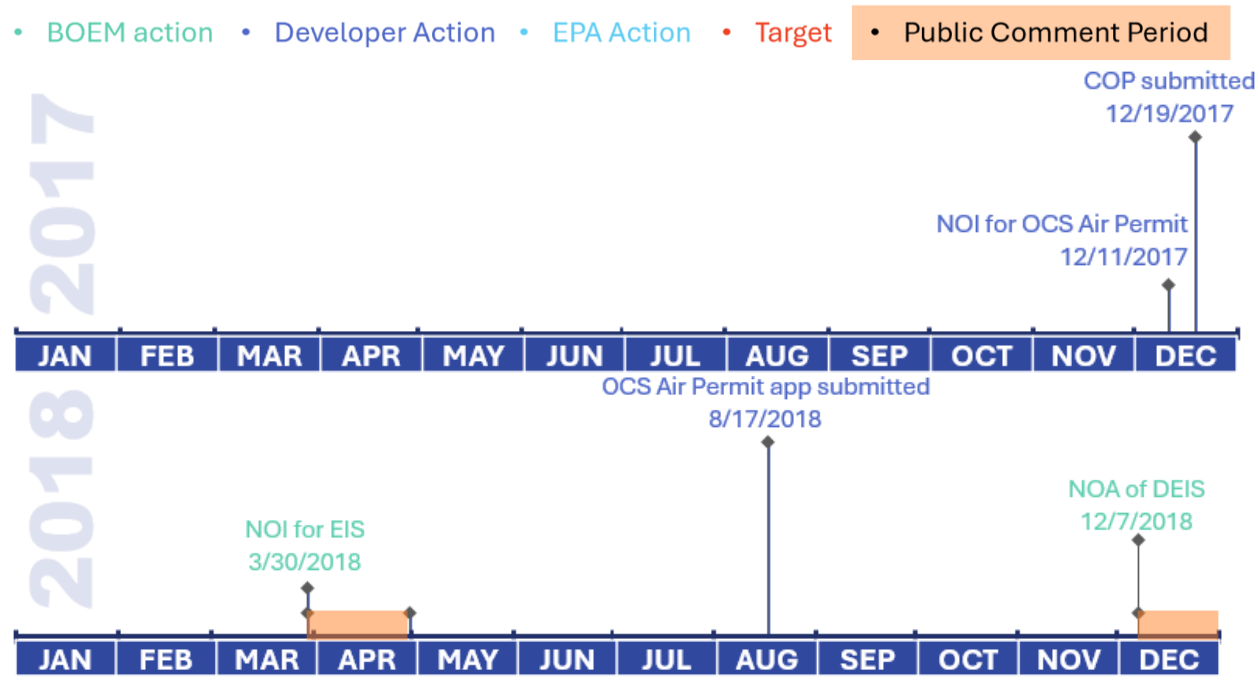
Vineyard Wind submitted an application to USACE for a permit under Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act on December 18, 2018. The public notice for this action was posted by USACE on February 1, 2019. Notably, the

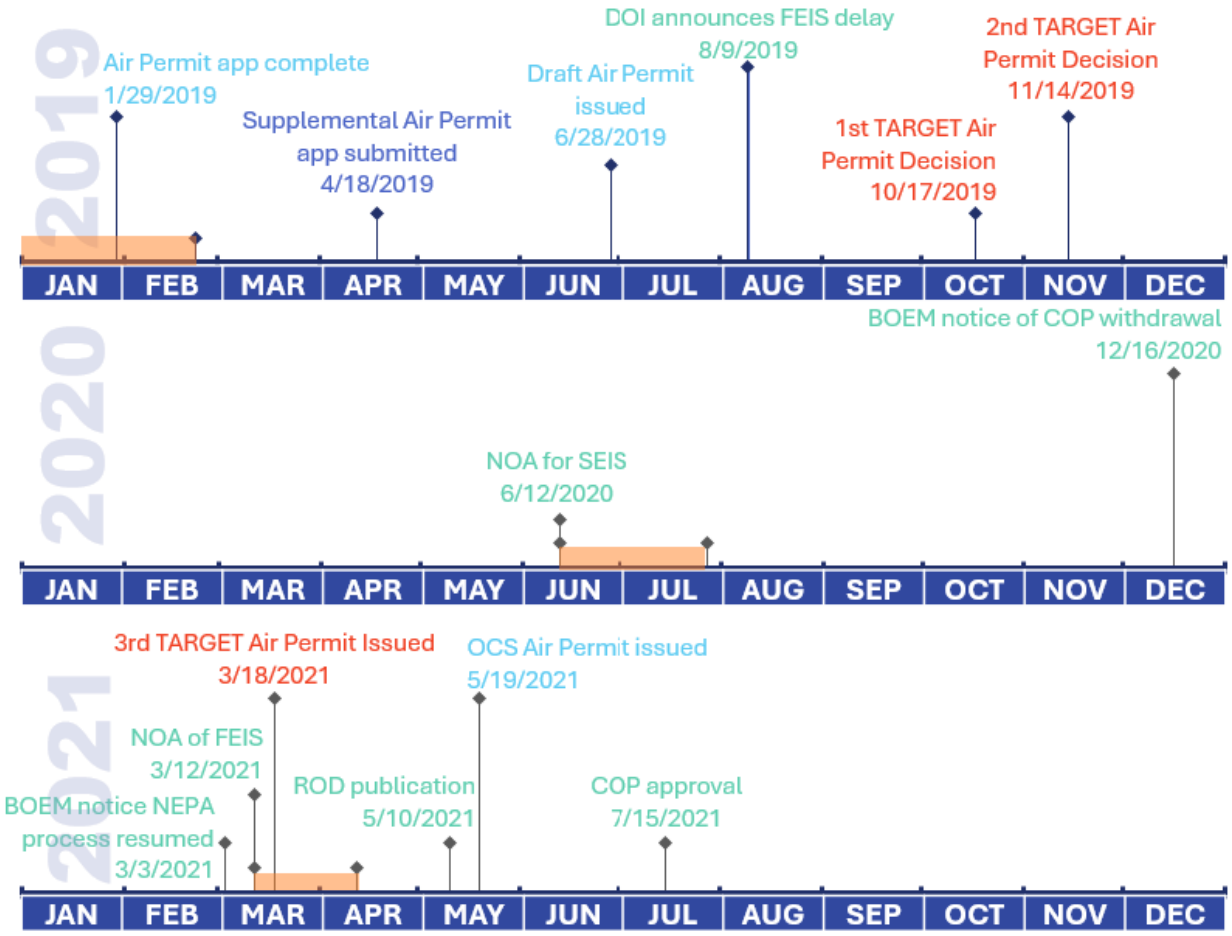
federal government was shut down from late December 2018 to late January 2019, so this represents a timely posting of the public notice.

The Section 10 and Section 404 permit cannot be issued until the ROD is published, and the final permit decision is expected within 90 days of this posting. Accordingly, the initial target permit issuance was set to October 17, 2019 and was later revised to November 14, 2019 when the ROD was initially delayed. After BOEM announced significant delays to the NEPA process in the summer of 2020, this milestone was delayed further to March 18, 2021. The target milestone was delayed a final time when the estimated ROD completion was set to April 2021, and though the ROD was ultimately published in May, USACE met the target date of July 21, 2021 for issuing their permit.

Summary of delays: The USACE permit issuance is dependent on the ROD, and therefore the delays to the NEPA process stemming from the SEIS scoping and publication delayed this permit.

Outer Continental Shelf Air Permit





The federal permitting dashboard does not list the OCS Air Permit as one of the tracked tasks for Vineyard Wind, nor is it mentioned in Appendix C of the FEIS which discusses other cooperating agency actions related to federal permitting. However, it is included in the OFD permitting timetables and it is also mentioned briefly in Section 5 Table 5-1 of the draft COP published in June 2021.[204]

Vineyard Wind submitted their NOI to apply for an OCS Air Permit to the EPA on December 11, 2017. The actual application was filed on August 17, 2018, though it was not deemed complete until January 29, 2019. The EPA published a draft permit for Vineyard Wind on June 28, 2019. The final OCS Air Permit cannot be issued until BOEM concludes their NEPA

[204] Epsilon Associates, Inc., "Vineyard Wind Draft Construction and Operations Plan Volume I."

review. Accordingly, the target OCS Air Permit decision was updated each time BOEM announced a delay to the ROD, with the original target being October 17, 2019. The ROD was published on May 10, 2021 and the EPA issued their permit approval on May 19, 2021.[205]

Summary of delays: Though minimal details are available on the OCS Air Permit schedule, its dependency on the ROD issuance meant that the delays in the overall NEPA process resulted in corresponding delays to the EPA permit decision.

6.3 New England Wind

New England Wind encompasses an area that was originally part of the Vineyard Wind lease designation, OCS-A 0501. The New England Wind SAP and COP were filed under this lease area and name, which was later updated subdivided on June 28, 2021 to separate the two project areas. Parcel OCS-A 0501 remained under joint ownership between Avangrid Renewables and CIP, whereas the new lease area OCS-A 0534 for the New England Wind project area was fully assigned to Avangrid Renewables under the new entity Park City Wind, LLC.[206] This portion of the lease was further subdivided in 2024 to assign each phase of New England Wind its own lease, with the second phase given the new designation OCS-A 0561 under the entity Commonwealth Wind, LLC.[207] These lease areas are shown in Figure 10.

[205] US EPA, "Permit Documents for Vineyard Wind 1, LLC's Wind Energy Development Project (800MW Offshore Windfarm)."
[206] "Avangrid Renewables and Copenhagen Infrastructure Partners Announce Strategic Transaction to Advance Offshore Wind Development."
[207] "Avangrid Renewables and Copenhagen Infrastructure Partners Announce Strategic Transaction to Advance Offshore Wind Development."

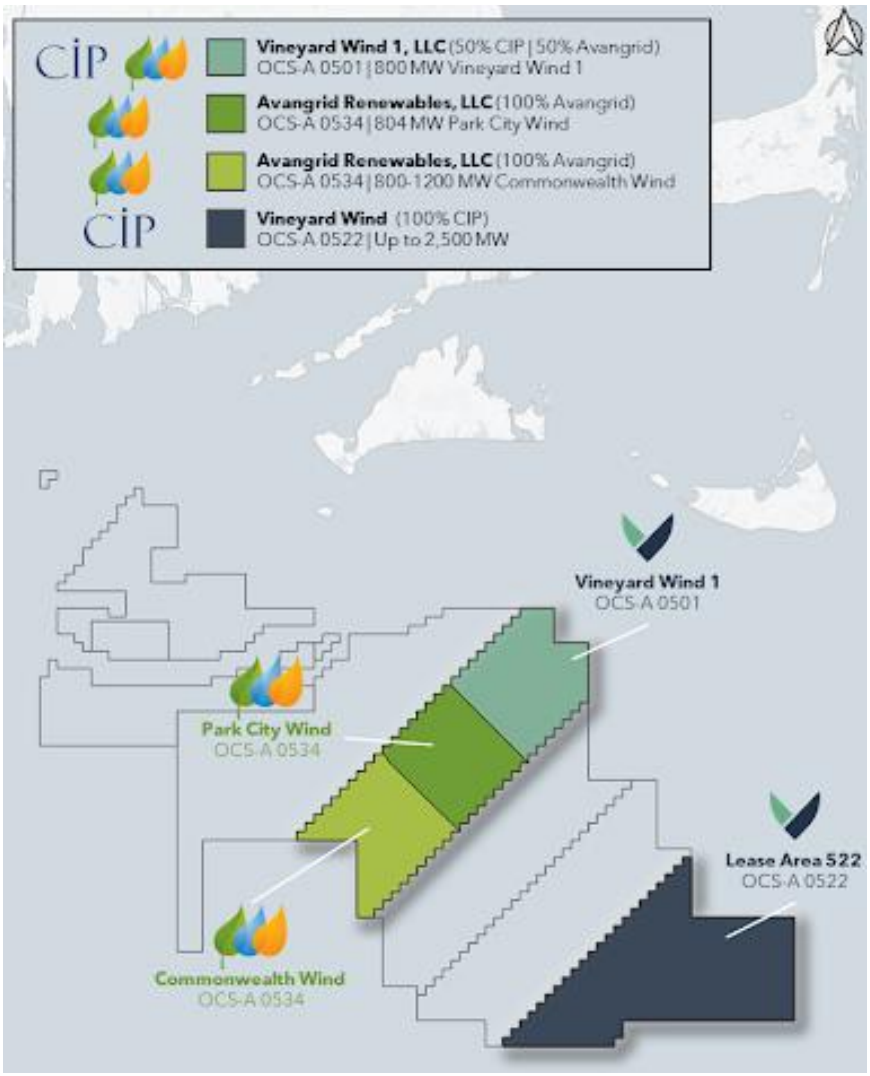


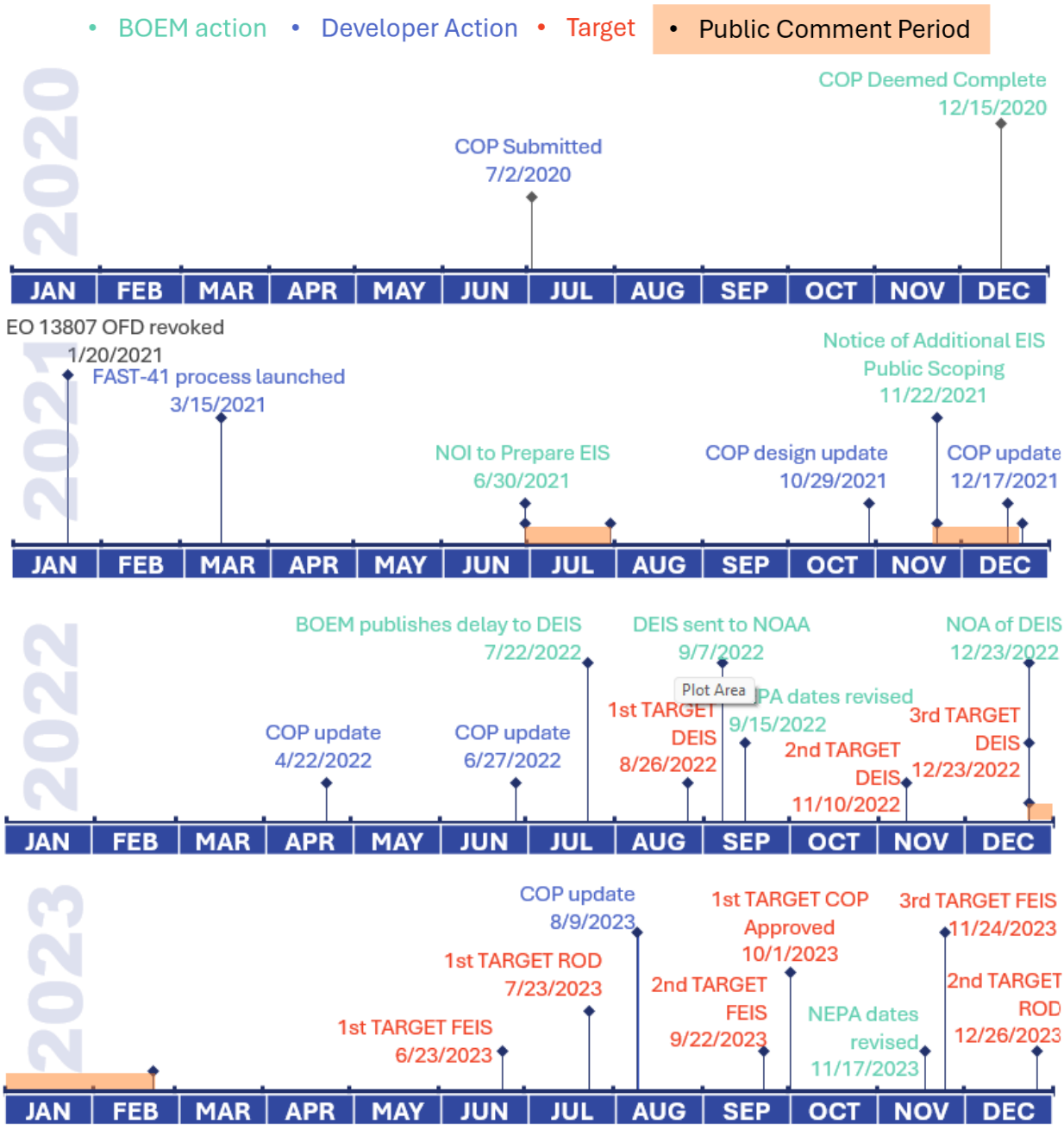
Figure 10. Subdivision of OCS-A 0501 into the New England Wind Phase 1 and Phase 2 lease areas.[208]

The OFD executive order mandating that NEPA reviews be completed within two years was revoked when President Biden was inaugurated, not long after the COP phase for New England Wind began. The project opted into the FAST-41 process in March 2021, several months after the COP had been deemed complete but before most federal permitting activities had begun. The timeline data for this section was compiled primarily from the FAST-41 permitting dashboard, supplemented by publicly available project documents and information

[208] "Avangrid Renewables and Copenhagen Infrastructure Partners Announce Strategic Transaction to Advance Offshore Wind Development."

garnered from interviewees. Though this project is to be implemented in two phases, each with their own legal entity and lease area, the permitting process was conducted for the project as a whole. For clarity, the private industry entities responsible for the permitting, development, and construction of the project will be referred to simply as ‘New England Wind’.

Construction and Operations Plan



New England Wind submitted its COP on July 2, 2020 and BOEM deemed the plan complete 166 days later on December 15, 2020. According to Appendix A of the New England Wind FEIS, the COP was revised five times after its initial filing prior to the issuance of the FEIS.[209] However, the BOEM website only provides explanations for three COP updates, and only the most recent COP documents are available online.[210] The interview with Geri Edens from Vineyard Offshore revealed that the COP was actually updated many times during the course of the project, and other publicly available documents submitted during this permitting phase reference revision dates not included in the FEIS Appendix A document.

A full list of the COP revisions and associated impacts on permitting timelines is not publicly available, though one revision from is repeatedly mentioned as having a material impact on the federal permitting process. The COP was updated on October 29, 2021 to reflect changes made to the New England Wind design envelope.[211] These changes included two alternate pathways for the project's offshore export cables and the elimination of the use of high voltage direct current cables and gravity-based foundations from the project options.[212] Due to the extent of the project alterations, BOEM reopened the public scoping period for the EIS already

[209] Bureau of Ocean Energy Management, "New England Wind Project Final Environmental Impact Statement: Appendices."
[210] "New England Wind 1 and 2."
[211] Lisa Berry Engler, "Re: Docket No. BOEM 2021–0047: Notice of Additional Public Scoping and Name Change for the Vineyard Wind South Project Offshore Massachusetts Environmental Impact Statement," December 22, 2021.
[212] Bureau of Ocean Energy Management, "Summary of Project Updates: New England Wind."

underway, impacting NEPA timelines.[213] On April 22, 2022, New England Wind published an addendum to their COP to provide additional details on these two alternate cable corridors. The version of the COP that served as the basis for the FEIS was dated August 8, 2023, but the COP was revised a final time after the FEIS publication for minor administrative updates.

The initial target date for BOEM to render a decision on New England Wind's COP was October 1, 2023. This target was set to occur 90 days after the projected ROD issuance, which in turn was targeted 30 days after the projected FEIS publication. On April 11, 2023, BOEM submitted a request through the FAST-41 process to extend project deadlines, which was approved by the FPISC Executive Director on May 10, 2023. The target for COP completion was pushed back 176 days from the initial target to March 24, 2024. The rationale BOEM provided for the COP approval delay was that the NEPA review would not be completed on time, and the FEIS and ROD target completion dates were amended at the same time such that the new COP approval remained 90 days after new expected ROD issuance.[214]

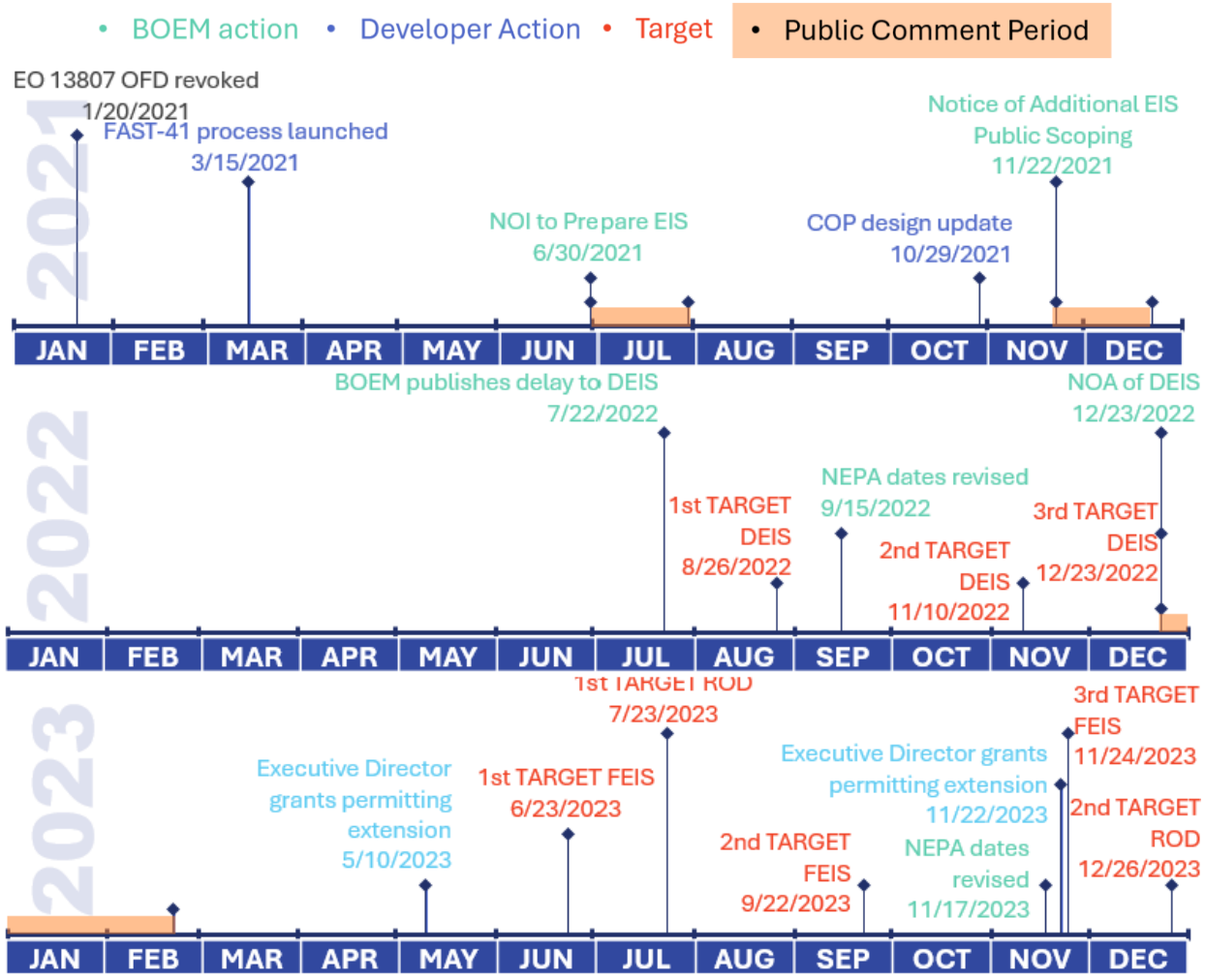
The COP completion date was revised a second time to July 1, 2024 in a letter from BOEM to the Executive Director on December 15, 2023. This additional 98 day delay stems from activities related to the MMPA ITA process. . Due to the dependencies between the ESA consultation, FEIS, and ROD, the COP was likewise delayed 98 days.[215] BOEM was able to meet the second revised target completion date, and the COP was approved on July 1, 2024.

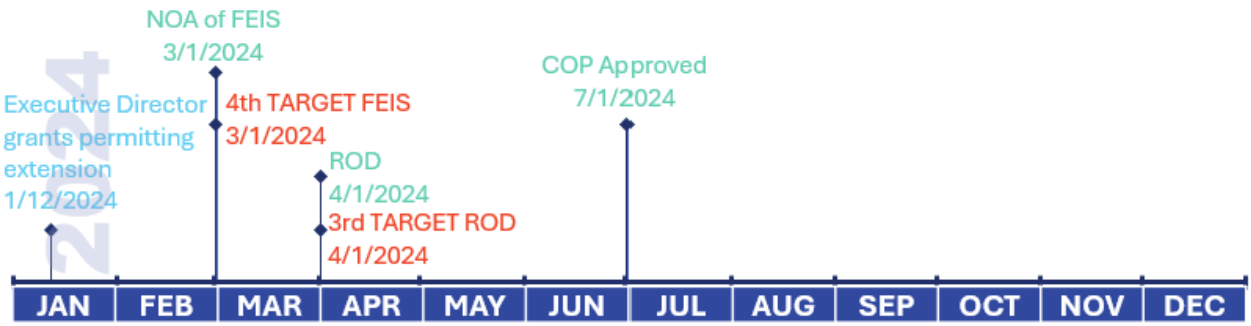
Summary of delays: When BOEM gets ready to file an NOI to prepare an EIS, they consult with other federal agencies and review public comments to determine the scope of the

[213] Bureau of Ocean Energy Management.
[214] Christine Harada, "Executive Director Determination on Request to Extend FAST-41 Final Completion Date by More Than 30 Days," May 10, 2023.
[215] Eric B. Beightel, "Executive Director Determination on Request to Extend FAST-41 Final Completion Date by More Than 30 Days," January 12, 2024.

NEPA review, including the preferred project alternatives to include in the analysis. New England Wind's decision to submit a COP update in October 2021 that included new design alternatives for Phase 2 of the project that weren't included in this initial NEPA scoping process caused the review to begin anew. Since many federal actions depend on the timing of the DEIS, this delayed many permitting actions, pushing out the COP completion date.

National Environmental Policy Act Review





BOEM published its NOI to prepare an EIS in the Federal Register on June 30, 2021, which started the public comment period ending on July 30, 2021 during which 509 comments were submitted.[216] BOEM's initial target was to complete the NEPA review in two years, with a goal of publishing the DEIS on August 26, 2022 and the FEIS in June 23, 2023. The initial target for the issuance of the ROD was July 23, 2023, one month after the expected FEIS publication. The publication of the DEIS in the Federal Register is the trigger for many of the cooperating agencies' actions related to federal permitting, so any delays to the DEIS tend to have a cascading effect on other permitting requirements.

In October 2021, New England Wind notified BOEM that they were evaluating alternate offshore export cable corridors for Phase 2 of their project that were not included in their prior COP submissions. BOEM subsequently published a Notice of Additional Public Scoping for EIS and Name Change on November 22, 2021. The Federal Register post also noted the change in upstream ownership of the project, with Avangrid now the full owner of the project. In the subsequent 30-day public comment period triggered by this notice, 18 comments were submitted by various government agencies, nonprofit organizations, and private associations regarding both the cable corridor and the project ownership restructuring.[217]

[216] "Notice of Intent To Prepare an Environmental Impact Statement for the Vineyard Wind South Project Offshore Massachusetts."
[217] Bureau of Ocean Energy Management, "Environmental Impact Statements; Availability, Etc.: Additional Public Scoping and Name Change for the Vineyard Wind South Project Offshore Massachusetts."

The FAST-41 permitting dashboard tracks the targeted NEPA milestones and additionally provides date-stamped updates on when these milestones are revised, though changes to the tracked milestones are not always accompanied by explanations. According to the FAST-41 modification history, in July 2022 BOEM pushed the DEIS target back by one month, though no explanation of the delay was provided. In September of the same year BOEM issued another one-month delay to the DEIS, which pushed out the FEIS completion to September 2023. BOEM cited the reason for these delays as stemming from their third-party contractor not delivering the DEIS report in time, and in turn this contractor cited needing additional time to compile the report due to New England Wind's addition of alternate cable paths for consideration in the NEPA review.[218] This second revised milestone date of December 23, 2022 was successfully met by BOEM, four months after the initial target completion date and nearly 1.5 years after the NOI was first published.

The NOA of the DEIS in the Federal Register began a 60-day public comment period consisting of three virtual public hearings and during this time 98 comments on the project were submitted by the public.[219] The publication of the DEIS also initiated several cooperating agency reviews of New England Wind, including the ESA, EFH, and Section 106 consultations. Delays to the DEIS naturally pushed out the completion date of the FEIS due to this task initiating the aforementioned cooperating agency consultations and reviews, each of which has their own expected or legislatively required timelines. After the NOA of DEIS was published, further delays to the FEIS could be traced back to cooperating agency reviews.

[218] "New England Wind Permitting Dashboard."
[219] "Notice of Availability of a Draft Environmental Impact Statement for Park City Wind, LLC's Proposed Wind Energy Facility Offshore Massachusetts."

In April 2023, BOEM submitted a request to the FAST-41 Executive Director to extend the completion date for the NEPA review to November 24, 2023, a two-month delay from the prior requested date. In their rationale for requesting this delay, BOEM lists the revisions to the COP adding alternate cable corridors and subsequent discussions on which alternatives should be included in the NEPA review as reasons for the delay. BOEM stated that the changes in design options and corresponding conversations on the scope of NEPA review resulted in a delay to the EFH and ESA consultations, which must be complete prior to the FEIS publication.

BOEM modified the FEIS target completion a final time in December 2023, pushing the completion to March 1, 2024, a 98-day delay from the prior target. This date change was tracked on the FAST-41 permitting dashboard, but BOEM did not submit the formal request for a date modification to the Executive Director in the time window stipulated in the FAST-41 guidelines. BOEM published monthly updates on the status of this milestone, and in those updates pointed to delays in the NMFS ESA consultation and MMPA ITA issuance as reasons for this delay.[220] BOEM successfully hit this third revised target milestone for the NOA of FEIS, which ultimately was issued just over eight months after the initial targeted completion date and nearly 2.7 years after the NOI was published.

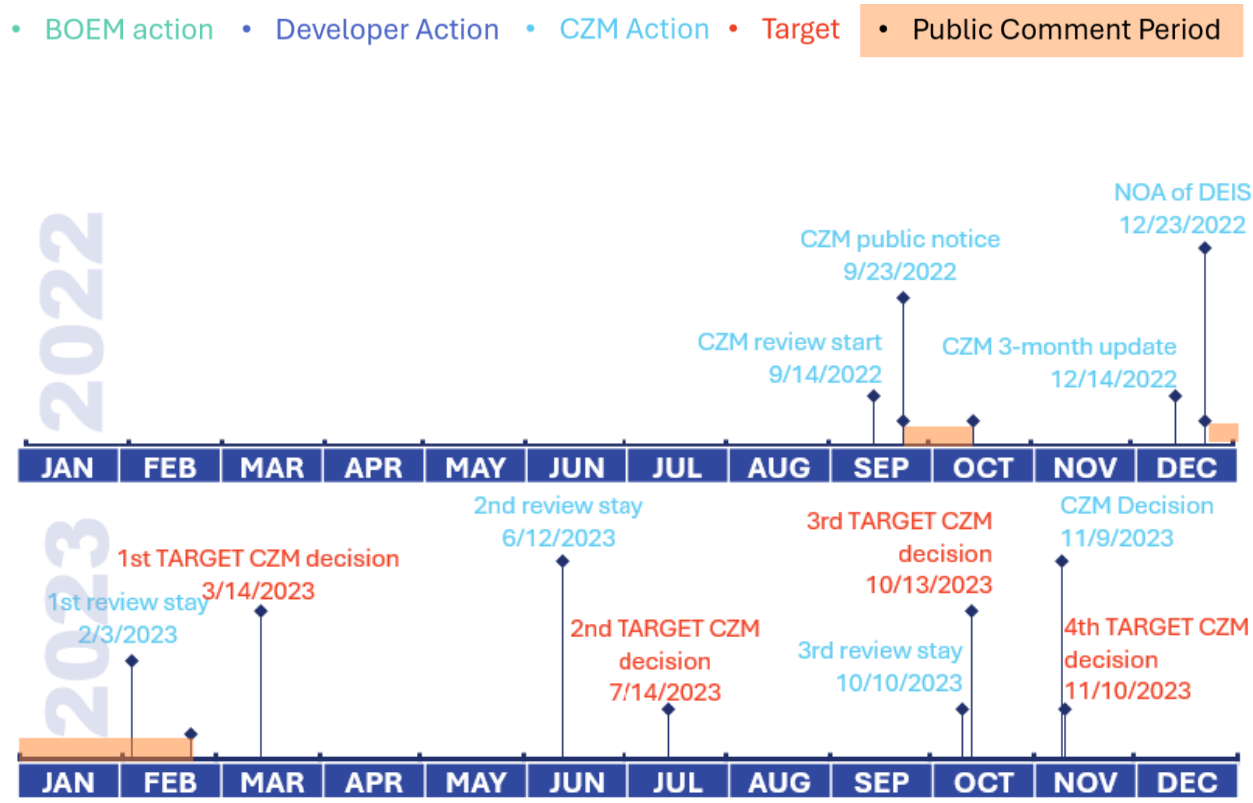
The target ROD date was projected to occur 30 days after issuance of the FEIS, and was therefore delayed any time there was a change to the FEIS completion date. The ROD was ultimately issued on April 1, 2024, concluding the NEPA action.

Summary of delays: Many of the explanations for NEPA timeline delays presented in the FPSIC Executive Director letters and on the FAST-41 dashboard list the October 2021 COP revision as the root cause of delays. This revision expanded the design envelope that had been

[220] Eric B. Beightel, "Executive Director Determination on Request to Extend FAST-41 Final Completion Date by More Than 30 Days," January 12, 2024.

under consideration in the NEPA review, delaying the publication of the DEIS which in turn delayed several cooperating agency permitting actions that were needed for the issuance of the FEIS. Additionally, New England Wind elected to conduct additional acoustic modeling, which contributed to another delay in the NEPA review. Overall, developer decisions were responsible for much of the NEPA delays.

Federal Consistency Review – Massachusetts Coastal Zone Management



Federal consistency reviews are not tracked through the FAST-41 process, though the Massachusetts CZM has a regulated timeline for the review to occur and a formal process to extend these timelines which was summarized in the federal consistency approval letter. New England Wind filed their federal consistency certification with the MA CZM on September 14, 2022, formally beginning the six-month long review process with an initial target completion

date of March 14, 2023. CZM published a public notice of the federal consistency review on September 23, 2022, marking the start of a 21-day public comment period.

As required by the state's regulations, the Massachusetts CZM published a project status update three months after the consistency review began stating that the agency would not issue a consistency determination while state networked agency reviews are ongoing and listed those open reviews.[221] At the five-month mark, CZM determined the reviews would not be complete within the initial six-month window and reached out to New England Wind to agree to a four month long stay period, extending the deadline for a consistency decision to July 14, 2023. In total, the Massachusetts CZM and New England Wind agreed to three stay periods, further pushing out the federal consistency determination deadline to October 13, 2023 and then November 10, 2023. These stay periods are mutually agreed upon; according to an interviewee who works at the MA CZM, if a stay agreement is not reached and the federal consistency review is not satisfied, the agency must then reject the application.

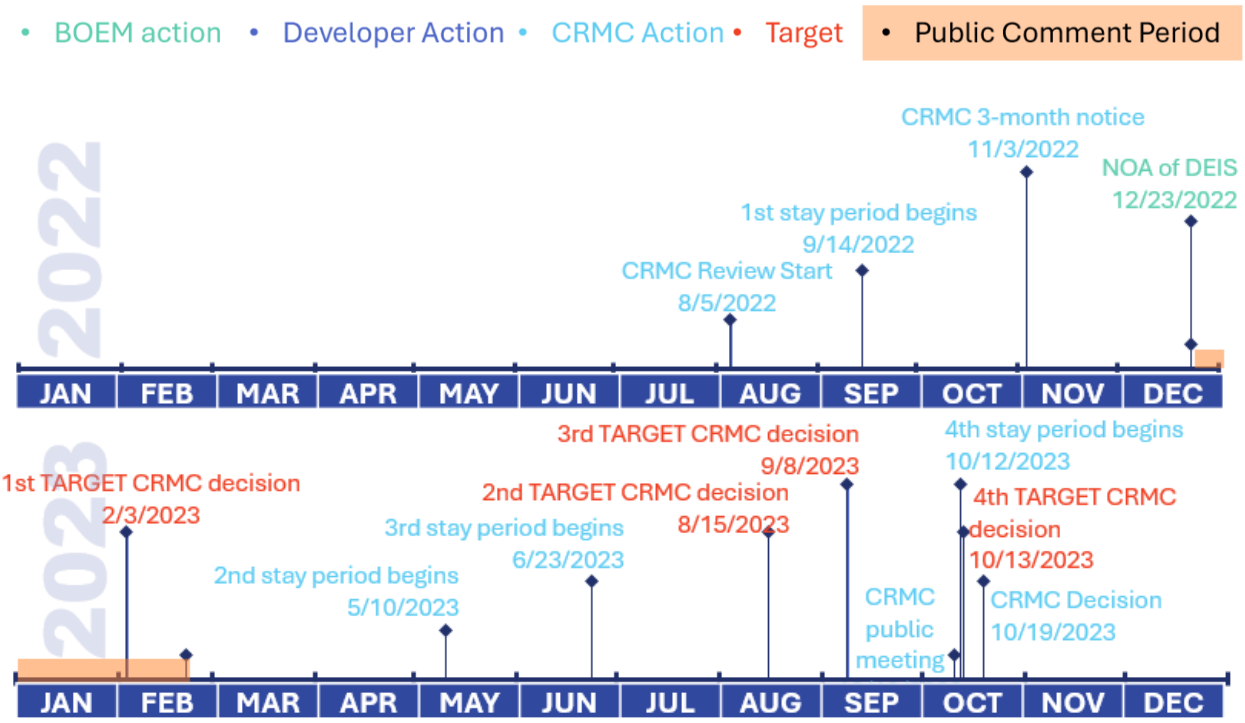
On November 9, 2023, CZM issued their federal consistency decision, nearly 14 months after the process had been initiated. They gave a decision of full concurrence for the COP under review, but conditional concurrence on the USACE Section 10 permit due to an outstanding certification from the Massachusetts Department of Environmental Protection needed for the project's export cables on land.[222]

Summary of delays and impacts: MA CZM's federal consistency review was extended from its initial six-month period to allow time for state licenses, certifications, and permits to be

[221] Lisa Berry Engler, "New England Wind (Park City Wind & Commonwealth Wind) Conditional Federal Consistency Concurrence."
[222] Lisa Berry Engler.

issued for the project. The concurrence was issued in advance of federal agency permitting activities required for the FEIS publication, and therefore did not delay the NEPA process.

Federal Consistency Review – Rhode Island Coastal Resources Management Council



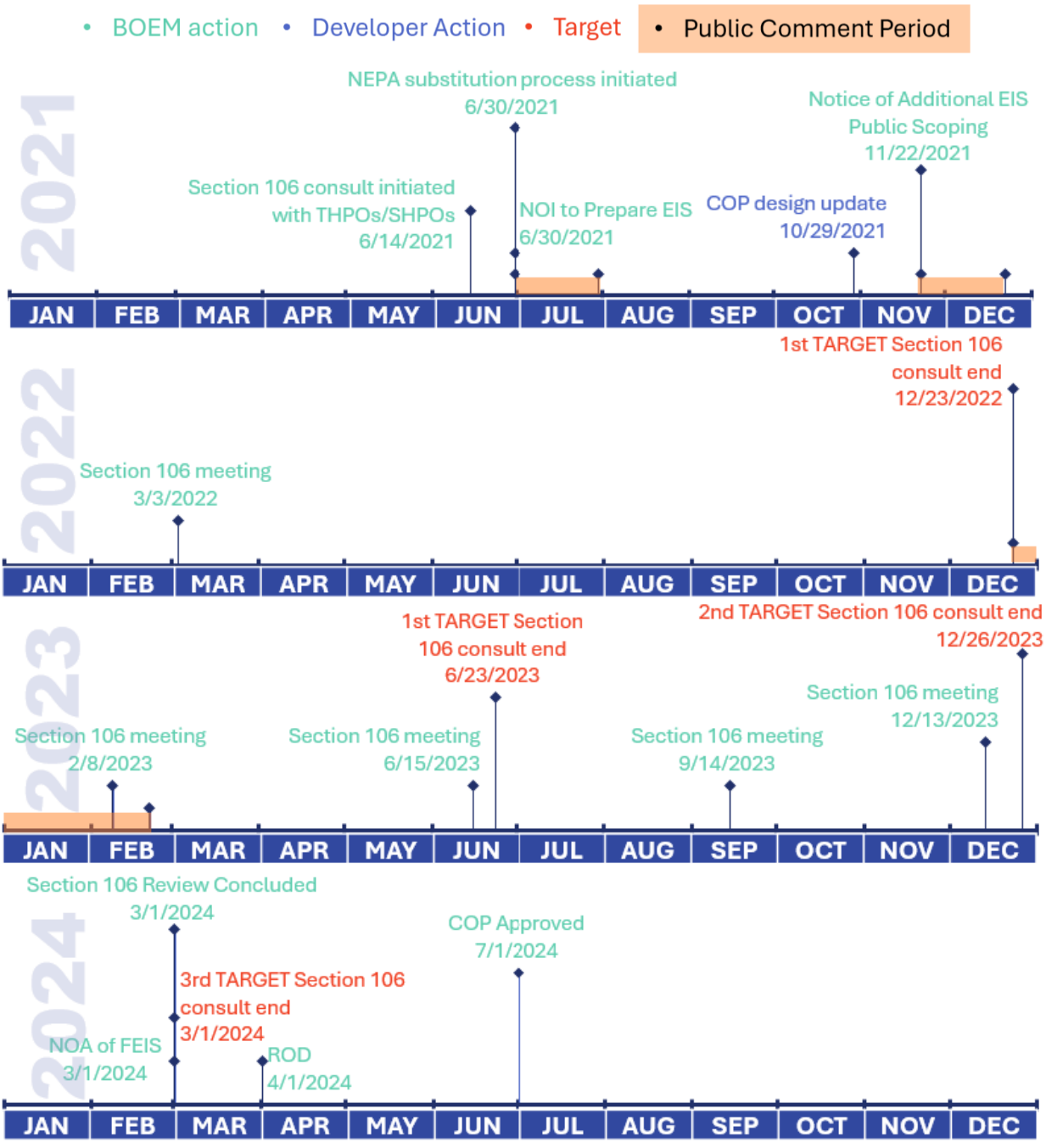
New England Wind submitted the federal consistency certification to Rhode Island CRMC on May 17, 2022, beginning the six-month long CZMA review. The initial expected completion date for the review was February 3, 2023, but this was extended by mutual agreement four times to October 20, 2023. These stays were requested to allow the state sufficient time to analyze the impacts of the proposed OSW development as well as to negotiate the conditions of the agency's concurrence.[223] Rhode Island CRMC's federal consistency concurrence was published October 19, 2023, roughly 14 months after the review was initiated.

Summary of delays: The Rhode Island federal consistency review was extended by mutual agreement to allow sufficient time for a thorough evaluation of the project. This process

[223] Jeffrey M. Willis, "RI CRMC Federal Consistency Decision."

concluded in advance of other activities that are predecessors to the FEIS publication, and therefore did not delay the NEPA process.

Section 106 Consultation



The Section 106 consultation for New England Wind was conducted through the NEPA substitution process, wherein the obligations under the NHPA are incorporated into the EIS

process and documentation instead of a separate Section 106 ruling.[224] BOEM records any mitigations deemed necessary as a result of this consultation directly in the ROD or as a condition of COP approval. The intent of the NEPA substitution process is to both streamline agency reviews of the project as well as have a more integrated approach to incorporating SHPO and THPO concerns into the environmental review, as shown in Figure 11.[225] As part of the NEPA substitution process, the Section 106 consultation is initiated with the NOI to Prepare an EIS and concludes with the ROD. Consequently, the consultation began on June 30, 2021 when BOEM published the NOI for this project and the target completion was set to June 23, 2023.

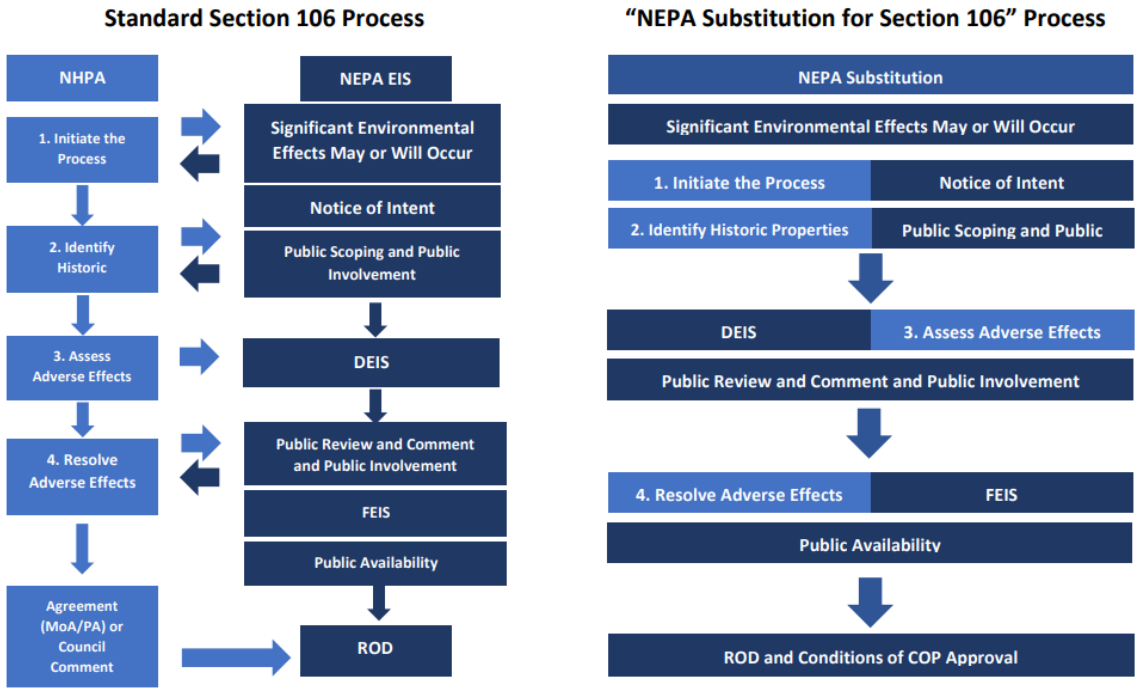


Figure 11. Flowchart of standard Section 106 consultation compared to NEPA substitution process.[226]

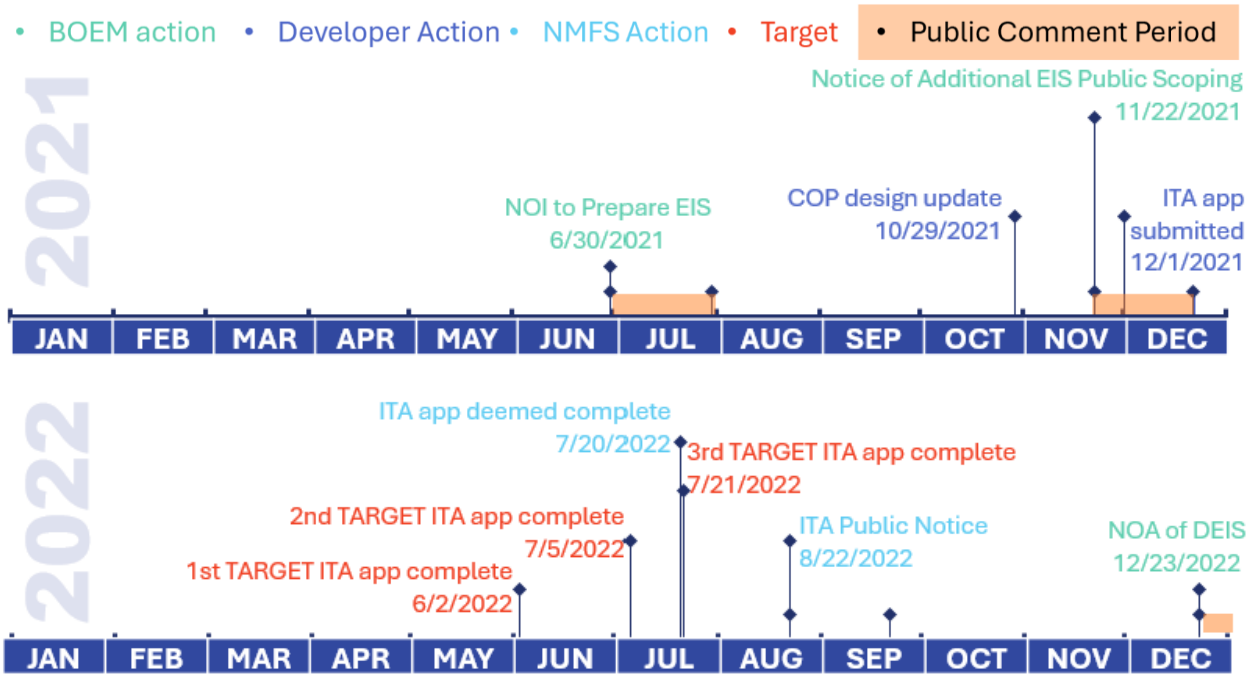
Because the Section 106 consultation concludes with the ROD, each time BOEM updated the targeted milestone date for the ROD they likewise updated the targeted completion for the

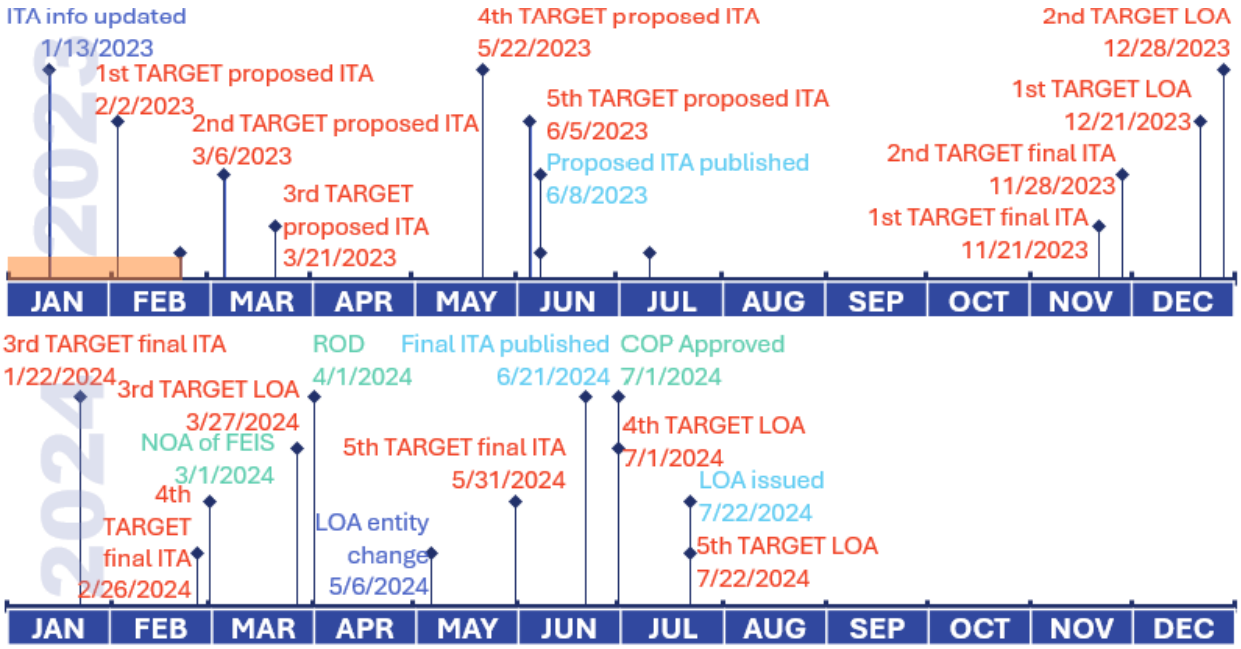
[224] Bureau of Ocean Energy Management, "National Environmental Policy Act (NEPA) Substitution for Section 106 Consulting Party Guide."
[225] Bureau of Ocean Energy Management.
[226] Bureau of Ocean Energy Management.

consultation. However, the consultation feedback also must be incorporated into the FEIS, so delays to the NHPA process likewise can affect the ROD timing. This resulted in the estimated completion date being updated twice, first to December 26, 2023 due to external delays in the NEPA review process and then to March 1, 2024 due to a request from two Tribes to have additional government-to-government consultations in order to finalize the Memorandum of Agreement. The second extension was requested in a letter to the FAST-41 Executive Director, which noted that the consultation extension would not extend the overall permitting timeline. BOEM successfully concluded their Section 106 consultation on March 1, 2024, a month in advance of the ROD issuance and roughly 2.7 years from the consultation initiation.

Summary of delays and impacts: The Section 106 consultation was mainly delayed due to the overall extension of the NEPA process caused by other permitting activities. The final delay was not related to external activities, but it did not impact overall NEPA timelines.

Marine Mammal Protection Act Incidental Take Authorization





New England Wind submitted their application for an ITA in the form of a Letter of Authorization (LOA) on December 1, 2021, and NMFS set an initial target of deeming the application complete within six months of the submission. This milestone was pushed out twice, with NMFS eventually deeming the application complete on July 20, 2022. The agency published a Federal Register notice that the application was complete on August 22, 2022, beginning a 30-day public comment period.[227]

NMFS's to publication of the proposed ITA Regulation in the Federal Register was set to occur within at least eight months of the ITA application completion and no more than one month after the ESA consultation package was completed.[228] Each time the ITA application completion milestone was pushed out, the subsequent MMPA actions were also delayed. Once the application was deemed complete, the proposed ITA publication date was set to March 21, 2023. New England Wind submitted updated information to NMFS regarding the project

[227] "Taking and Importing Marine Mammals; Taking Marine Mammals Incidental to Construction of the New England Wind Offshore Wind Farm, Offshore Massachusetts."
[228] "Marine Mammal Protection Act (MMPA) Incidental Take Authorization (DOC – NOAA/NMFS)."

description and impact in January and March 2023, resulting in extra time needed for the agency to review the changes. As a result, all subsequent milestone dates were pushed out 60 days, setting a new target date of May 22, 2023 for the proposed rule publication.

In April 2023, BOEM wrote to the FAST-41 Executive Director requesting an overall project schedule change, largely due to design changes submitted by New England Wind after the original NEPA scoping.[229] This change pushed out the date for EIS completion and resulted in an additional 30-day delay to the MMPA process schedule. NMFS published the proposed ITA rule in the Federal Register on June 8, 2023. This began another public comment period ending July 10, 2023, during which 41 comments were received.[230]

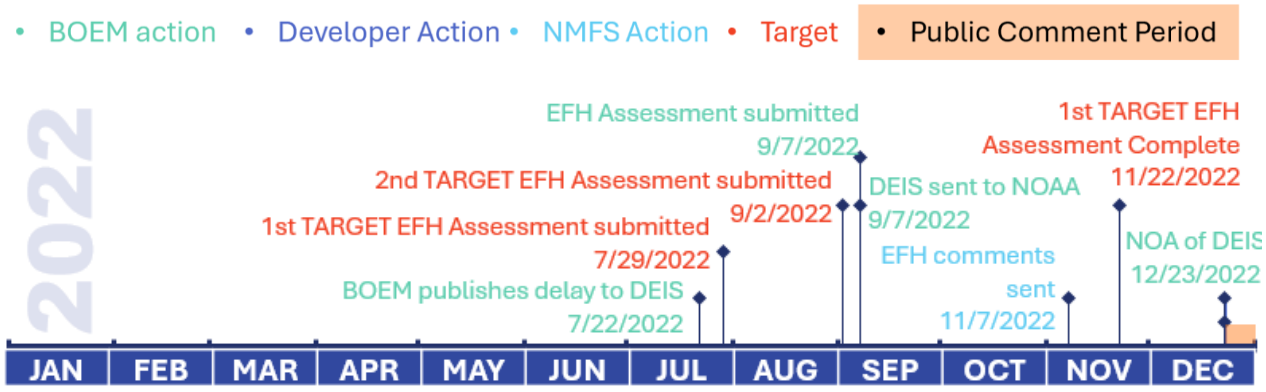
In the proposed rule, NMFS suggested but did not mandate that New England Wind refine some of their acoustic modeling to better represent the impacts of their foundation installation on protected species. From September 2023 to January 2024, New England Wind submitted several updated modeling memos to NMFS and BOEM, the latter of which decided to separately include this new modeling information in a Biological Assessment addendum for their ESA consultation.[231] Because the ESA consultation is part of the NEPA review and BOEM was now waiting for this additional modeling, the FEIS and ROD dates were pushed out. Typically, NMFS will set the schedule such that the estimated final regulations are posted at least 60 days after the ROD is issued. BOEM sent out revised NEPA timelines to the cooperating agencies on November 17, 2023, which NMFS used to set the new final LOA date to May 31, 2024.

[229] Christine Harada, "Executive Director Determination on Request to Extend FAST-41 Final Completion Date by More Than 30 Days," May 10, 2023.
[230] "Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the New England Wind Project Offshore Massachusetts."
[231] Eric B. Beightel, "Executive Director Determination on Request to Extend FAST-41 Final Completion Date by More Than 30 Days," January 12, 2024.

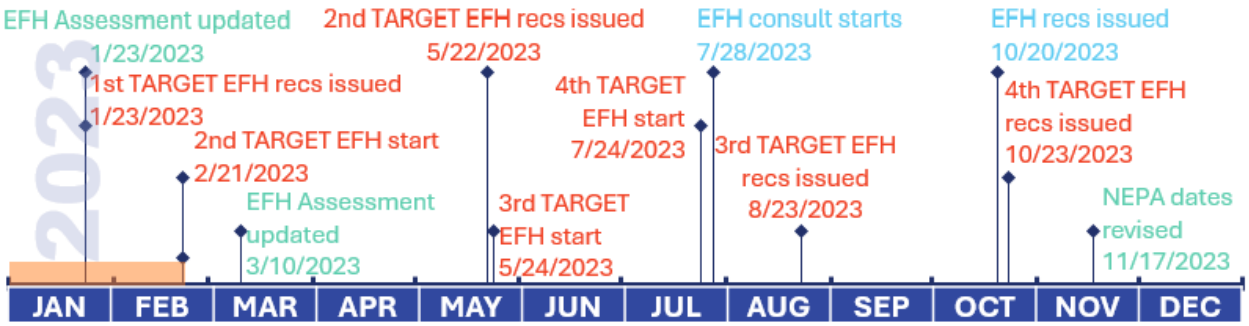
In late April 2024, New England Wind decided to subdivide their lease area for each of the two phases of the project. New England Wind had initially applied for the LOA under a single limited liability company, and on May 6, 2024 they requested that each new project entity be assigned separate LOAs.[232] BOEM finalized the lease segregation on May 15, 2024 and the final ITA regulation milestone date was pushed to June 21, 2024 to allow NMFS time to update the LOA assignment. NMFS met this June deadline, publishing the final rule to the Federal Register.[233] The LOA was issued to New England Wind one month later on July 22, 2024, almost exactly two years after the application was deemed complete.

Summary of delays: The delays to the MMPA ITA process stem largely from developer decisions. First, the addition of alternate cable routes caused an overall delay to the EIS preparation. Later, the choice to refine their acoustic modeling approach led to further delays. Finally, the lease segregation caused several more months of delay.

Section 305 Essential Fish Habitat



[232] "Marine Mammal Protection Act (MMPA) Incidental Take Authorization (DOC – NOAA/NMFS)."
[233] "Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the New England Wind Project, Offshore Massachusetts."



The initial target for BOEM to submit their EFH Assessment submission and request for consultation to NMFS was July 29, 2022. This date was missed due to delays in third-party contractor activities stemming from overall delays to the DEIS, and an alternate milestone date was set.[234] BOEM ultimately submitted the EFH Assessment to NMFS on September 7, 2022, informally beginning the EFH consultation.

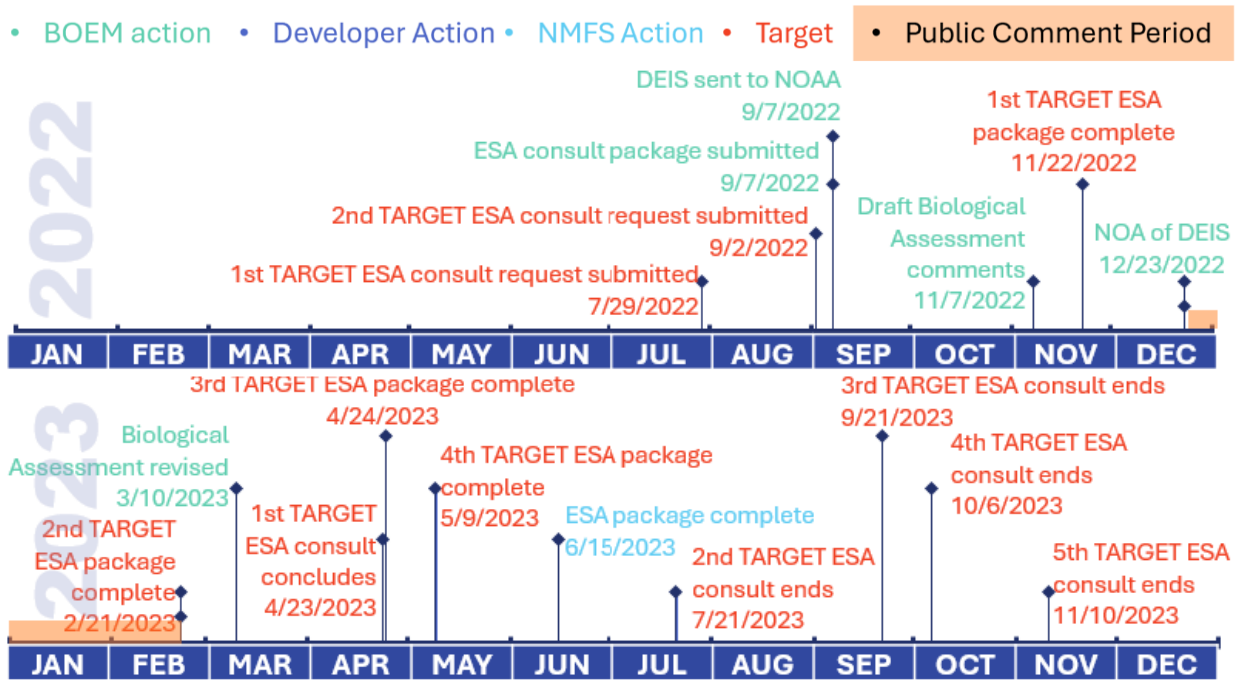
In November 2022, NMFS submitted comments to BOEM requesting revisions to their EFH Assessment. The back-and-forth of comments and assessment revisions continued through March 2023, and in April BOEM and the cooperating agencies met to revise the full project permitting schedule and submit a change request to the FAST-41 executive director. The delays in the EFH consultations were one of the reasons for the shifting NEPA and COP completion dates presented in the letter, though the letter did not specify the alternate EFH completion date.[235] According to the permitting modification history on the FAST-41 dashboard, the expected completion date was pushed to July 24, 2023. NMFS ultimately deemed the EFH consultation package complete on July 28, 2023, officially beginning the Section 305 consultation over 10.5 months after the EFH Assessment was first submitted.

[234] "Magnuson-Stevens Fishery Conservation and Management Act, Section 305 Essential Fish Habitat (EFH) Consultation."
[235] Christine Harada, "Executive Director Determination on Request to Extend FAST-41 Final Completion Date by More Than 30 Days," May 10, 2023.

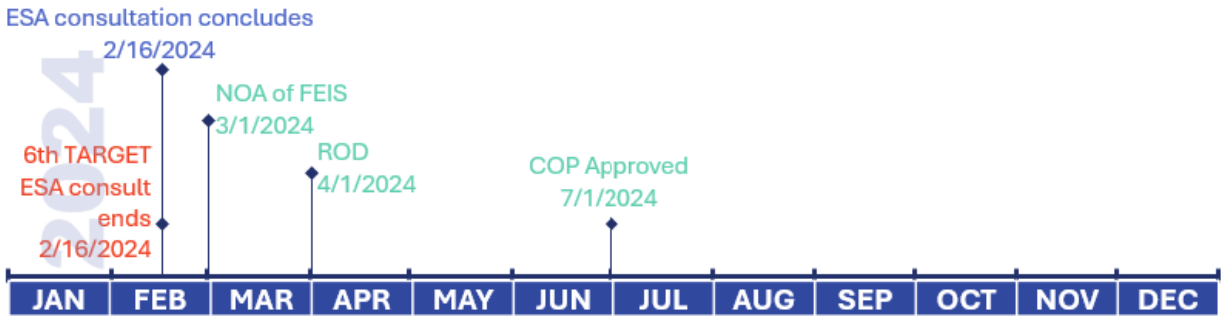
Normally, NMFS must provide an EFH Conservation Recommendation within 60 days of the consultation formally beginning with acceptance of the EFH Assessment.[236] However, due to the number of concurrent OSW projects in federal permitting review, BOEM extended this deadline to 90 days. At the time the EFH Assessment was deemed complete, the target for NMFS to issue an EFH Conservation Recommendation was October 23, 2023. The EFH consultation was formally concluded on October 20, 2023, 84 days after the EFH Assessment was deemed complete.

Summary of delays: BOEM was delayed in submitting their request for an EFH consultation due to the additional EIS scoping that occurred. When they did submit the EFH assessment, there were extensive revisions required before it was deemed complete.

Endangered Species Act Consultation – NOAA NMFS



[236] "Magnuson-Stevens Fishery Conservation and Management Act, Section 305 Essential Fish Habitat (EFH) Consultation."



In order to formally begin the ESA consultation with NMFS as dictated by Section 7 of the Endangered Species Act, BOEM must submit a Biological Assessment and consultation request to the cooperating agency which typically occurs at the same time BOEM presents a preliminary DEIS to the agency for review. Additionally, the proposed MMPA ITA must be available prior to the formal start of the ESA consultation. The original target for BOEM to submit their ESA consultation request package to NMFS was July 29, 2022, matching the initial target for the NMFS EFH consultation start. BOEM did not meet this targeted date for several reasons: there was a third-party contractor delay in receiving the draft Biological Assessment, which in turn stemmed from the delays due to design changes made after the environmental review was initiated.[237] BOEM set a revised target of completing the ESA consultation package by September 2, 2022 and ultimately sent the Biological Assessment five days after.

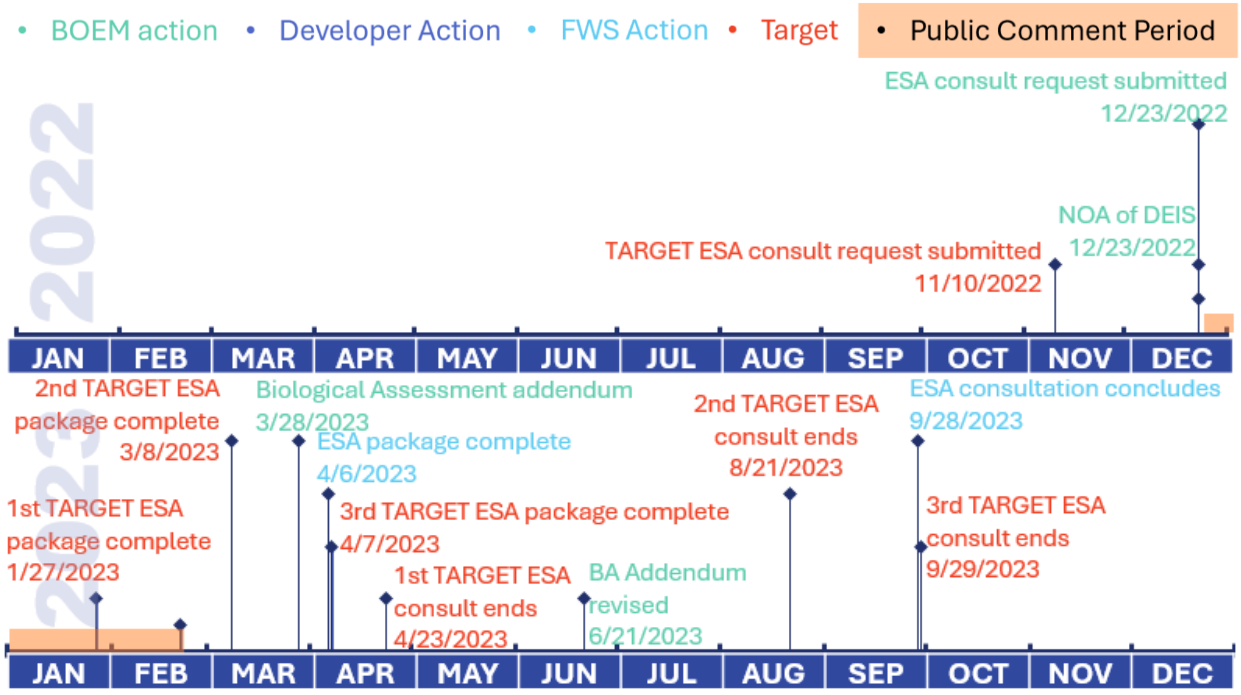
NMFS submitted comments on the Biological Assessment and requests for revisions to BOEM on November 7, 2022. BOEM's initial target in responding to these comments was December 23, 2022, but this was delayed several times and the updated Biological Assessment was not submitted to NMFS until March 10, 2023. In May, BOEM and the cooperating agencies met to reevaluate and reset the overall permitting schedule. NMFS ultimately deemed the ESA package complete on June 15, 2023.

[237] "Endangered Species Act Consultation (NOAA-NMFS)."

The ESA consultation conclusion milestone is set by regulation at least 135 days after the ESA consultation package is deemed complete. After the ESA package was completed, the projected consultation end date was set to November 10, 2023. That December, BOEM and the cooperating agencies met again to revise the permitting timetable and submit those changes to the FAST-41 Executive Director. At this time, the projected ESA consultation conclusion was set to February 16, 2024 to allow time for BOEM and NMFS to consider the new acoustic modeling submissions from New England Wind. NMFS successfully met this final target date, marked by the issuance of the NMFS Biological Opinion.

Summary of delays: Changes to the project design after the NEPA review began led to delays in the start of the ESA consultation with NMFS, and then later developer changes in their acoustic modeling resulted in delays to the consultation conclusion.

Endangered Species Act Consultation – FWS



The FAST-41 permitting dashboard section for the FWS ESA consultation contains fewer details overall than the NMFS action for the same regulation. The original target listed on

the dashboard for BOEM to submit the ESA package to FWS was November 10, 2022, which aligns with one of the revised target NOA of DEIS dates. BOEM actually submitted the Biological Assessment and consultation request one month later. The new ESA consultation completion date was set to March 8, 2023 to reflect changes in the overall NEPA schedule and to provide additional time for review and coordination. In January 2023, the ESA schedule was extended an additional 30 days due to staffing shortages.

On March 28, 2023, BOEM submitted an addendum to the Biological Assessment they previously provided to FWS, stating that updated modeling software and new meteorological information provided by New England Wind changed the probability of adverse impacts to some bird species from not likely to likely.[238] This addendum did not seem to affect the overall ESA consultation timeline, since the application package was deemed complete a week later on April 6, 2023. Another addendum was submitted on June 21, 2023 regarding a bat species that was recently proposed for listing under the federal endangered species list, but this likewise did not seem to result in any impact to the overall permitting activity schedule.[239]

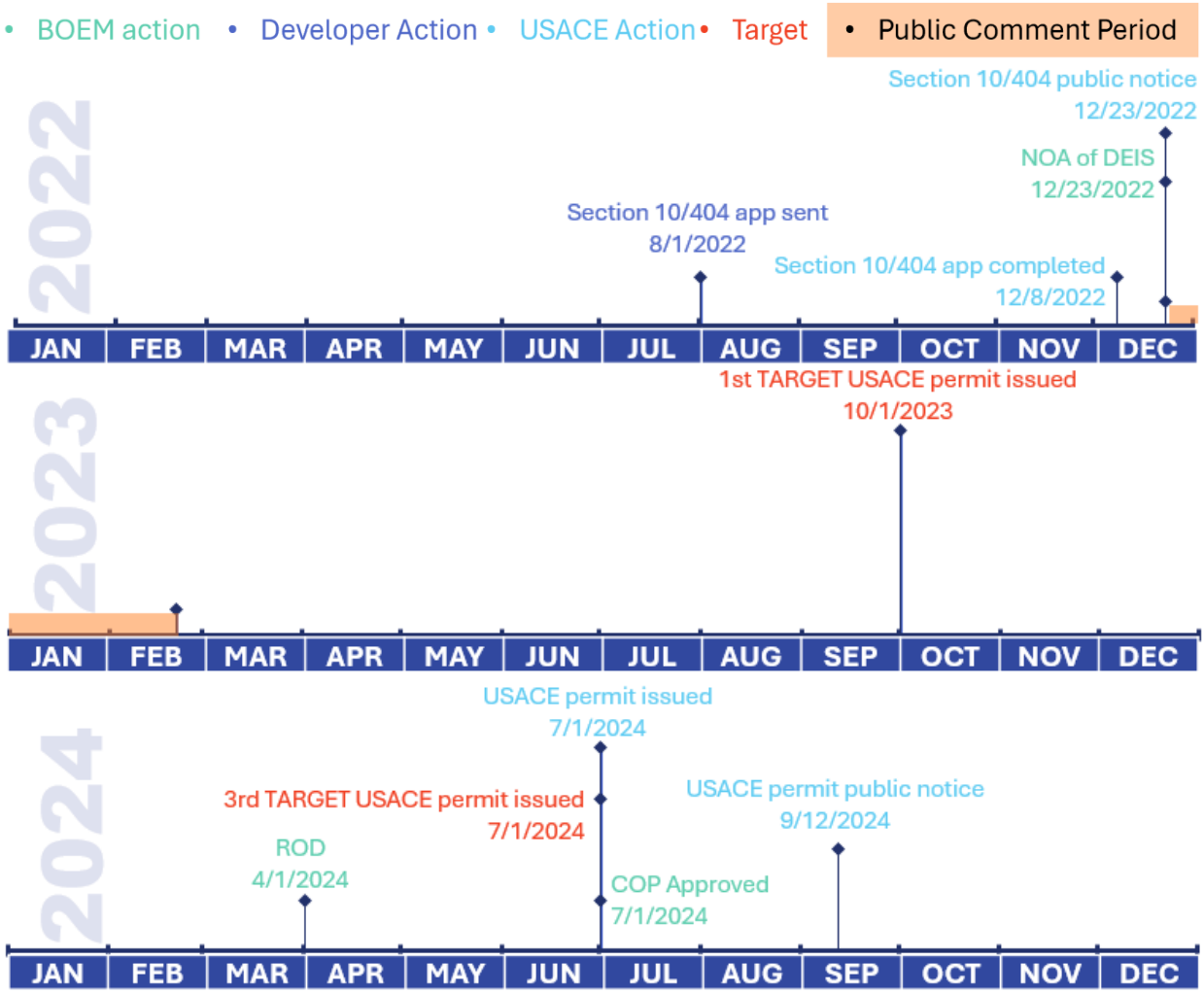
In May 2023, BOEM and the cooperating agencies conducted a comprehensive review of the federal permitting schedule and submitted extension requests to the FAST-41 Executive Director. The alternate consultation completion date was set to August 21, 2023, and BOEM and FWS provided monthly updates on the permitting dashboard regarding progress towards the task completion. According to the permitting dashboard, this target was missed due to a late submission from New England Wind in response to a request for information, and the milestone was pushed out to September 29, 2023. The FWS ESA consultation formally concluded on

[238] U.S. Fish and Wildlife Service, "Addendum to the New England Wind Biological Assessment to USFWS," March 28, 2023.
[239] U.S. Fish and Wildlife Service, "Addendum to the New England Wind Biological Assessment to USFWS," June 21, 2023.

September 28, 2023 with the publication of the agency's Biological Opinion, stating that the proposed OSW actions were not likely to adversely affect the species under consideration.

Summary of delays: BOEM's ESA consultation with FWS was delayed in its start due to delays in receiving developer information, however the formal consultation lasted 175 days, which was roughly in line with expectations.

Rivers and Harbors Act Section 10 / Clean Water Act Section 404



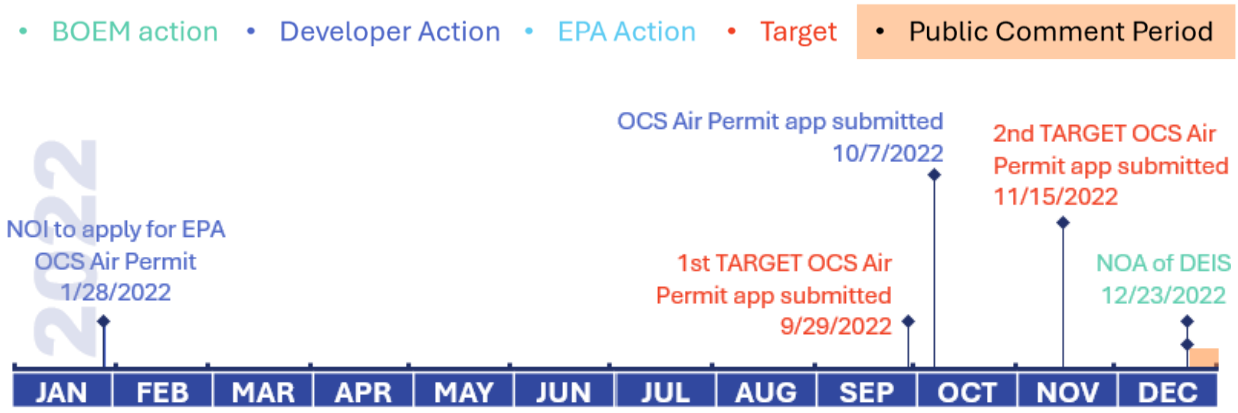
The process for obtaining USACE authorization under Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act begins the pre-construction notification and application, which New England Wind submitted on August 1, 2022. The

application was deemed complete on December 8, 2022 and USACE posted the public notice on December 23, 2022, beginning a 60-day public comment period.

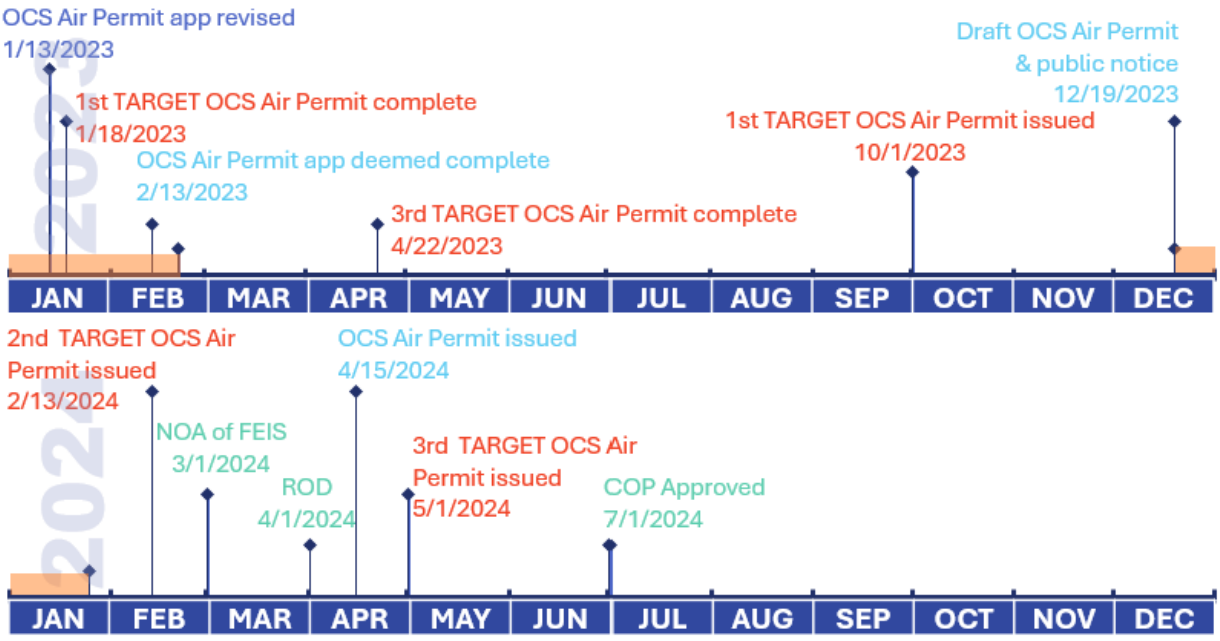
Before USACE can issue a final permit decision, the NEPA review, ESA consultation, and EFH consultation must be completed. Each time the NEPA review was delayed, the Section 10 and Section 404 permit decision date was pushed out to be 90 days after the issuance of the ROD. The ROD was issued on April 4, 2024 and the USACE permit followed 91 days later on July 1, 2024, coinciding with the COP approval. The notice of final decision was published in the Federal Register several months later on September 12, 2024.[240]

Summary of delays: There is very minimal information on the timeline for the USACE Section 10 and Section 404 permits published to the FAST-41 dashboard, in comparison to other cooperating agency actions. While interim milestone timing and delays lack clear explanation, overall it is clear that the biggest impact to timing was this permit's dependency on the NEPA review completion, which experienced several delays totaling over eight months. After the ROD was issued, the USACE permit followed roughly 90 days later as expected.

Outer Continental Shelf Air Permit



[240] "Notice of Final Federal Agency Action on the Authorization for the New England Wind Farm and New England Wind Project."



The FAST-41 permitting tracker for the OCS Air Permit issued by the EPA begins with New England Wind's Notice of Intent to file for the permit which occurred on January 28, 2022. The NOI must be given within 18 months of the actual permit application submittal, which was projected for September 29, 2022 but actually completed a week later on October 7, 2022. According to the FAST-41 website, within 30 days of the OCS Air Permit application being submitted, the EPA must deem the application complete or request additional information from the developer.[241] For New England Wind's OCS Air Permit application, it took four months to address the application deficiencies. New England Wind submitted a final revised OCS Air Permit application on January 13, 2023, which was deemed complete by the EPA on February 13, 2023. In compliance with the one-year statutory deadline, the projected date for permit issuance was set for February 13, 2024. On December 19, 2023, the EPA released a draft version

[241] "Outer Continental Shelf (OCS) Air Permit."

of the permit which began a 38-day public comment period. In response to the public comments, minor revisions were made to the draft permit.[242]

The issuance of the OCS Air Permit is also reliant on the issuance of the ROD. In January 2024, BOEM and the cooperating agencies reevaluated and adjusted the expected permitting timelines, resulting in a delay to the NEPA review that caused delay to the projected OCS Air Permit issuance. In setting milestones, the EPA assumes 30-day lag between publication of the ROD and the final decision for the OCS Air Permit, and subsequently this new milestone date was set to May 1, 2024. The actual OCS Air Permit approval was issued on April 15, 2024.

Summary of delays: To meet its obligations under the Clean Air Act and other statutes, the EPA aligned the issuance of the OCS Air Permit to occur after the ROD publication. This permit was ultimately delayed due to extended NEPA timelines.

[242] U.S. Environmental Protection Agency, "Outer Continental Shelf Air Permit New England Wind 1 Wind Farm Project Park City Wind, LLC."

Chapter 7. Discussion and Conclusion

7.1 Discussion

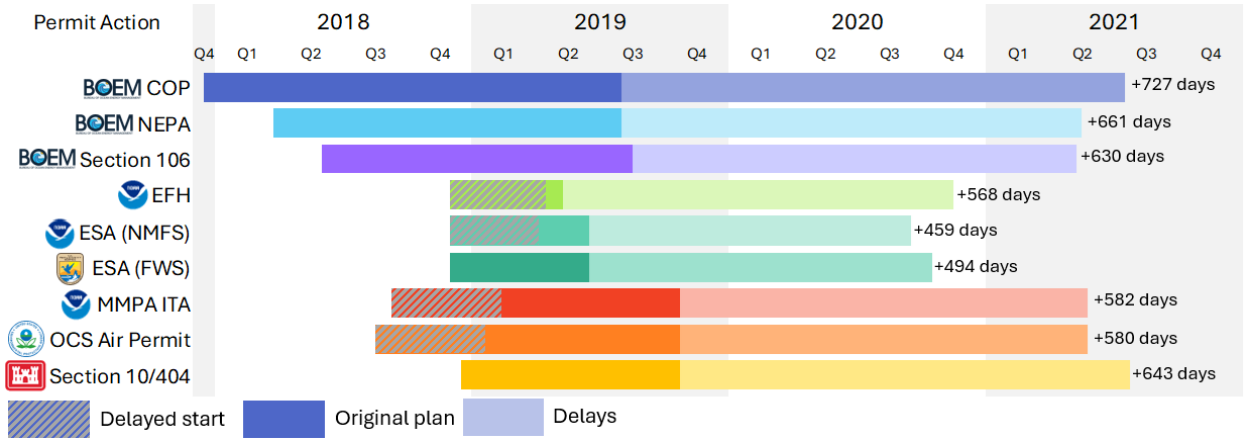


Figure 12. Vineyard Wind overall COP permitting timeline.

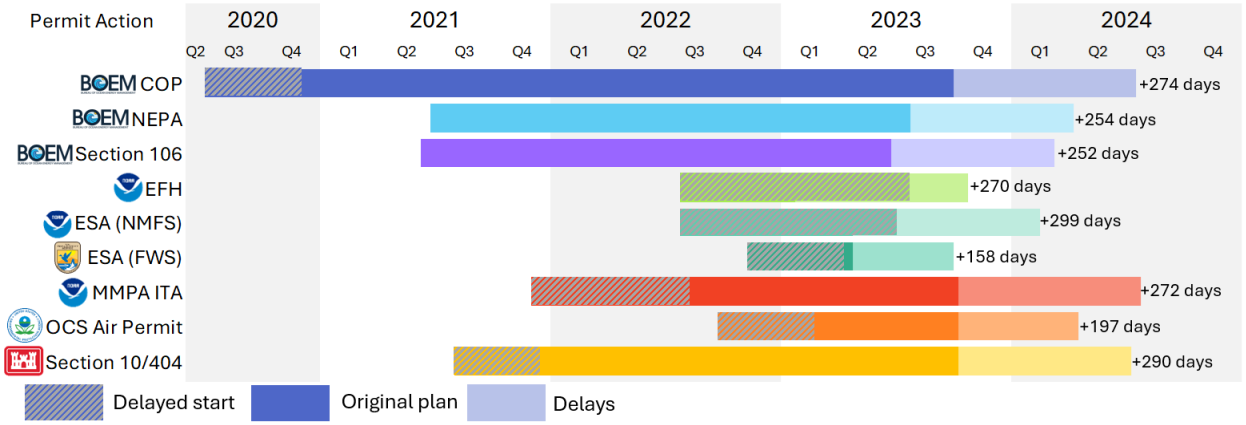


Figure 13. New England Wind overall COP permitting timeline.

Though Vineyard Wind and New England Wind both faced significant delays during their COP permitting phase, the reasons for those delays were quite different. Vineyard Wind was the first OSW project to proceed through the BOEM permitting process, and as such faced unique challenges. Prior to the rise of the OSW industry, BOEM mainly reviewed and permitted fossil fuel infrastructure projects, which are very different in nature than an array of OSW turbines and offshore substations. According to several interviewees, there was a learning curve for all involved when it came to preparing and reviewing the COP. Jim Bennett, who oversaw the

renewables program at BOEM, pointed to the project experiencing unforeseen challenges that led to there being longer than anticipated timelines for permitting tasks. Christine Harada, who served as the FPISC Executive Director from 2021-2023, posited that there were potentially staffing challenges related to the complexity of the permitting work and number of projects being permitted simultaneously. Additionally, she noted that not only was the technology for OSW significantly different from that of the oil and gas industry, but the geology of the Northeast also varies from the national coastline where drilling occurs, adding further complexity to the engineering problems being addressed.

Though Vineyard Wind faced general challenges related to the nascence of the industry, the most significant delay arose from the federal administration's decision to rescope the NEPA review right as it was nearing completion. The month that the FEIS was due to be published, Trump appointee Secretary Bernhardt of the DOI announced the supplemental NEPA review which ultimately ended up delaying the FEIS by nearly two years. During the time that BOEM spent conducting the SEIS, the agency fully paused several of the cooperating agency consultations. Numerous stakeholders and politicians across Massachusetts viewed this as an intentional effort to stonewall the OSW industry, though Secretary Bernhardt maintained this was done out of environmental diligence.[243] While there may be truth to both assertions, present-day circumstances lend more credence to the former opinion. Regardless of the reasons why the SEIS was conducted, it is clear that in changing the scope of the NEPA review, the DOI was directly responsible for the nearly two-year delay in Vineyard Wind's COP process, even though other circumstances may have also extended some timeframes beyond their initial estimates.

[243] Storrow, "Bernhardt."

Unlike Vineyard Wind, many of the delays experienced by New England Wind during the COP phase resulted from the actions of the developer. When tracing the root cause of delays mentioned in the Executive Director's schedule change approvals, the change New England Wind made to their design envelope in October 2021 after the NEPA review had already begun is frequently referenced. Prior to the NOI to prepare an EIS, there are extensive consultations between BOEM, the project developer, and other relevant federal agencies to ensure all necessary project information is received and to determine the scope of the environmental review. The addition of two alternate export cable paths affected the areas under consideration, and updating the scope to incorporate these changes took time which had a cascading effect on all associated activity schedules.

Several months after NMFS issued their MMPA proposed rule for New England Wind in June 2023, the developers elected to refine their acoustic modeling for the foundation installation to better represent the impacts of their construction activities on protected species. BOEM and NMFS subsequently decided to incorporate this data into the ESA Biological Assessment and Biological Opinion, resulting in delays to both processes and the overall NEPA timeline as they waited for updates from New England Wind. Over the course of five months, New England Wind submitted updated modeling reports to BOEM, pushing out the MMPA, ESA, and EIS timelines. Near the end of this period, New England Wind announced that they would be subdividing their lease area for the two phases of the project, which led to further delay. Altogether, the additional modeling and lease segregation resulted in nearly half a year of permitting delays, in addition to the significant delays caused by the early project design change.

Though New England Wind benefited from both the federal government and Avangrid having been through the BOEM OSW permitting process for other projects, the industry is still

very new, with New England Wind being only the eighth project to receive COP approval. With any new industry or regulatory process, it takes time to acclimate to processes and determine the best ways to do things. An additional factor in the New England Wind permitting was the inauguration of the Biden administration, which placed new emphasis on the national OSW industry by setting the ambitious goal of deploying 30 GW by 2030. While a boon in some respects, this newfound focus on OSW permitting brought along increased workloads for BOEM and other agencies as the number of active OSW leases doubled and new development areas were defined. As Christine Harada noted in her interview, this change in priority brought with it an increase in budget and staffing for the agencies involved in OSW permitting. While this increase in resources expanded the federal government's ability to manage the influx of OSW projects, the surge in hiring and onboarding also consumed department resources and time. Though there might have been delays associated with personnel resourcing, overall the biggest project impacts stemmed from developer decisions during permitting.

The central research question of this thesis asked what are the factors that contribute to the amount of time for an OSW project to progress through the BOEM permitting process and how can delays be addressed to allow for more timely OSW development to meet state and federal renewable energy goals. In looking at the two case study projects from Massachusetts, it is clear that there is no singular answer to this question. Instead, there are a variety of factors that can accumulate to cause milestones to extend beyond their initial projections. For Vineyard Wind, the biggest influence on the COP timeline was the federal government's decision to modify the NEPA process as it was nearing its completion. For New England Wind, upfront uncertainty and lack of knowledge on the full project design scope, modeling approach, and lease organization

were the biggest reasons for delay. For both projects, the newness of the industry and challenges around adequate staffing and resources likely had an impact on the efficiency of permitting.

The schedules set out at the beginning of a project are largely stipulated by the estimated time it takes for each agency to complete its permitting action according to the written regulations, but they do not necessarily reflect the complexity of the reviews at hand. The COP itself is upwards of a thousand pages long, and each federal report page count likewise numbers in the hundreds. Some of the baseline assumptions around timing are inadequate to allow a thorough review of materials, such as the six-month regulatory timeline for federal consistency review. For both projects and in both Massachusetts and Rhode Island, numerous review stays were required to meet the obligations. According to Kevin Sloan from the Rhode Island CRMC, stays are always required when it comes to completing the federal consistency review for OSW projects. Another challenge is the time it takes for many of the cooperating agency consultations to formally begin with BOEM, due to numerous iterations of the application materials before they can be deemed complete. Likewise, it can take months for BOEM to deem the COP complete, and additional time to determine there is sufficient information to issue the NOI to prepare an EIS. Due to the interrelated nature of the NEPA review and cooperating agency consultations, delays to one step of this process can affect every aspect of the federal COP permitting phase.

In summary, the bottlenecks during the COP phase of permitting seen across these two projects could be loosely grouped into three categories: impacts resulting from changes in the federal administration, changes to the COP design envelope or project structure, and general challenges arising from the newness of process. Of these, the bottleneck most directly under a developer's control is minimizing changes to the project after a COP has been submitted. In

interviewing OSW developers, they stated that defining a narrow design for a project is difficult to accomplish due to the overall time it takes for a project to get from leasing to construction; in the intervening years, technology and availability of equipment and vessels can drastically change, so the design envelope is set to encompass a broad spectrum of possible options. During the course of the COP, some of these options are eliminated as the design is refined. However, if new options are later added, the review process is lengthened. Since evaluation of each option takes time, the COP process could be shortened by submitting a narrower design envelope to begin with. As Geri Edens and Jay Borkland from the development side of OSW permitting mentioned in their interviews, this scope reduction comes with a tradeoff: while the COP phase may be shortened with fewer options to evaluate, getting the design to this point requires more upfront work before the COP submission.

Relatedly, it can take months after a COP is submitted for BOEM to review it and deem it complete, and then additional time to determine if there is sufficient information to issue an NOI to prepare an EIS. The NOI was published three months after the COP submission for Vineyard Wind, and 11 months after the New England Wind COP was submitted to BOEM. This lag could be reduced by upfront work on the part of the developer to prepare a COP that meets all completeness requirements. Though this also involves moving the timelines around and may not reduce the overall timeframe for COP preparation, this upfront work may reduce the strain on the federal agencies that are balancing the permitting of numerous OSW projects. To that end, since the COP process was initiated, BOEM has produced several guidelines to aid developers in the submission of their plans. The “Information Guidelines for a Renewable Energy Construction and Operations Plan (COP)” document, most recently updated in May 2020, provides details on

the information BOEM looks for when reviewing COP submittals.[244] In August 2023, BOEM released a document referred to as the "NOI checklist" to provide further clarify the minimum information requirements needed to begin the NEPA process.[245] According to several interviewees, these measures helped streamline the COP review process and NEPA scoping.

Increasing the maturity of the COP prior to submission may help make the COP phase more efficient, but there is still a significant time burden on the developer to do all surveying, modeling, and design work upfront. One potential solution to reduce this burden would be for developers to share information, tools, and best practices with each other. As Jim Bennett stated in his interview, developers are reasonably hesitant to do this due to the high capital investments that go into surveying and the proprietary information gathered. However, cooperation between developers may prove worth it if there is shown to be substantial time savings.

Another challenge to the efficiency of OSW permitting is that fewer than a dozen OSW projects have completed the COP phase of permitting. For many developers the COP they submit for a project is the first one they've done, and likewise for many federal agencies these are their first experiences with evaluating OSW impacts. There have been several initiatives to improve agency coordination and streamline reviews over the years. In addition to the guidelines that have been published, the federal FAST-41 permitting dashboard has increased transparency in the BOEM permitting process. Though optional, the FAST-41 process provides additional structure and oversight to federal OSW permitting and creates a framework to hold federal agencies accountable for meeting their deadlines. According to Kevin Sloan from the RI CRMC, this tool has been a valuable resource for keeping track of project progress. The permitting

[244] Office of Renewable Energy Programs, "Information Guidelines for a Renewable Energy Construction and Operations Plan."
[245] Office of Renewable Energy Programs, "FINAL Information Needed for Issuance of a Notice of Intent (NOI) Under the National Environmental Policy Act (NEPA) for a Construction and Operations Plan (COP)."

dashboard is not perfect, however, as certain agencies provide more details than others on their actions and the dates are not always consistent. However, overall it has been successful in increasing coordination of the various permitting tasks required.

The federal reviews and consultations that occur during the permitting of an OSW project are very complex and require adequate staffing and resources to complete in a timely manner, especially as the number of simultaneously active OSW projects increases. It can be expected that as agencies complete more of these reviews, their expertise will grow and learnings from one project could be applied to subsequent ones. Another option for streamlining federal reviews is by conducting a programmatic EIS for a lease region instead of separate reports for each lease area. This is already being done to some extent during the NEPA review that occurs during planning stage of the BOEM process. Considering a broader region may take more time compared to the analysis of a smaller area, but could offer significant time savings when compared to studying all lease divisions individually.

The type of delay that is least controllable from a project standpoint are any changes in the standard OSW permitting process caused by the federal administration. With Vineyard Wind, the DOI Secretary appointed by the Trump administration interceded in permitting right as the NEPA process was set to conclude and imposed a new standard of review on the project that ended up extending its permitting timeline for several years. With New England Wind, the Biden administration's support of offshore wind and setting of a national deployment goal resulted in a dramatic increase in OSW projects under development and associated increased staffing and resources being provided at the federal level. Because of the time it takes for any OSW project to get from lease assignment to construction, any OSW project will span multiple election cycles.

With each new administration that comes into power, they have the potential to dramatically impact the OSW industry as a whole due to the federal jurisdiction over the OCS.

When I began my thesis research in the fall of 2024, the federal government was led by the Biden administration, which outwardly expressed support of the national OSW industry growth. My thesis research questions had been formulated to identify bottlenecks in federal OSW permitting to inform ways in which the process could be made more efficient to reach deployment targets. There is now a clear, singular bottleneck in OSW permitting. On the day the Trump administration was inaugurated in 2025, President Trump signed an executive order that halted all OSW leasing and permitting activities in the OCS. The Trump administration has been forthright in their opposition to OSW industry and openly seeks to impede even projects that have already received their federal approvals.

Despite attempts by the current federal government to stifle the OSW industry, states are continuing to move forward with investments, procurements, reviews of leased projects, and construction for projects in development. In talking with members of the state governments of Massachusetts and Rhode Island, interviewees expressed confidence that despite current obstacles, OSW would remain a key component of the Northeast's energy future and an important source of economic growth for the region.

It is possible that with each new administration, the OSW industry may continue to experience cycles of boom-and-bust in terms of federal support or opposition. A current and continued challenge for the industry will be how to handle periods of slow or no progress at the federal government level. At the project level, developers may deem it financially prudent to spend the time and resources in refining their COP so that when federal permitting resumes, they may present a narrow design scope and potentially streamline NEPA reviews. At the state level,

infrastructure investments in the grid, ports, and supply chains during periods of low federal activity could help prepare states for an increased volume of projects when there is federal support. As is the case with onshore wind and solar, it is likely that in the upcoming years state governments will be the driving force behind renewable energy growth.

7.2 Limitations and Recommendations for Future Research

Offshore wind development is a complex process with many stakeholders across the local, state, and federal level, and this thesis focused only on one narrow facet of a project's development. Though obtaining federal permits is a major, time-consuming process that all OSW projects must go through, there are additional factors not discussed in this thesis that may have a prolongating impact on a project's timeline. Though the federal consistency review covers some of a state's involvement in OSW permitting, it does not include any of the onshore permitting activities that occur during development. The landing of OSW export cables and related transmission infrastructure expansion approved by municipalities is subject to additional stakeholder impact, and opposition at the local level can delay this part of development. Additionally, project interconnection can take many years, and projects will not proceed to construction unless they have financing and offtake agreements in hand. Any one of these activities can delay a project's deployment, and if they are not aligned with the COP approval then federal permitting may not be the biggest bottleneck a project may face. Additional research could focus on the holistic development cycle for an OSW project to analyze where the biggest bottlenecks were across aspects of development.

Additionally, this research considered only two projects in depth. Of the projects that have received COP approval, the time Vineyard Wind took to get through the COP phase was the average across projects, and New England Wind was above average. Each of these projects took

longer than the initial expectations for varied reasons. It would be interesting to compare them to a project that went through this permitting phase in a below average amount of time, such as Ocean Wind which took 2.6 years or Coastal Virginia Offshore Wind which took 3.1 years. The latter project would serve as a good foil for New England Wind, since its COP plan was submitted five months after the New England Wind COP, but both projects had the NOI to prepare an EIS and the DEIS published at nearly the same time. By comparing these two COP phases, additional insights could be gained into which processes work well. As more projects are eventually approved and as developers and agencies become more familiar with permitting OSW projects, research could be conducted on how the process improves over time.

Another limitation of this research was that I was not able to interview as many stakeholders as originally intended. I began my outreach to professionals in the OSW industry in January, and after the presidential inauguration the OSW industry faced upheaval. There were many layoffs at the federal level across agencies involved in OSW permitting, and several potential interviewees from federal agencies replied to my interview requests with statements that they were not able to participate. Ultimately, I was not able to speak to anyone at the federal level who worked on the day-to-day permitting activities for the two case study projects. Furthermore, the federal moratorium on OSW permitting also had a direct impact on private industry members, with many developers in New England announcing layoffs at the same time I was conducting outreach, resulting in difficulties establishing contact with people who worked on these projects. Given the circumstances, I am very grateful for the seven individuals I was able to speak to across the private and public sector, as the information I gained from them was crucial to my understanding of the case study projects and general industry. Future research on

federal OSW permitting would benefit from additional discussions with project managers and lead reviewers at the federal level as well as permitting leads from the developer side.

In the present day there is a clear, singular bottleneck for OSW deployment, with no new projects able to progress through federal permitting while the executive moratorium is in effect. In light of this indefinite pause, and in recognition of the partisan nature of renewable energy in America, an important area of future research will be to examine how the OSW industry can better weather the boom-and-bust nature of federal support or lack thereof. Aspects of this research may include how states and developers can bolster the industry in the face of federal antagonism and could additionally consider how proponents of OSW can appeal to a broad political spectrum in order to gain greater bipartisan support.

7.3 Conclusion

Though Vineyard Wind's delays could be attributed to external influences while New England Wind's delays arose from internal project changes, the timing of those occurrences was crucial to the impacts they had on project timelines. Both projects experienced changes that impacted the NEPA review after it was already underway. Because of the interrelated nature of the federal permitting activities with the NEPA review, rescoping of the EIS led to downstream impacts on each federal agency consultation. In turn, since those consultations feed back into the NEPA review, the overall process became significantly elongated from its initial projection. To the extent possible, it is important to engage with all stakeholders early in order to appropriately scope the NEPA review and minimize project or process changes once the EIS is underway.

As seen in recent months, the federal administration has an outsized ability to completely change the trajectory of the national OSW industry. The next four years will be a testing ground to see how states and developers can navigate challenges from the federal government in order to

deploy projects and advance clean energy goals. Though it may be hampered for the time being, it is expected that the OSW industry will eventually a resurgence, and that stakeholders will once again have to grapple with the challenge of finding ways to streamline the permitting process.

Appendix A: BOEM Permitting Timelines

The following tables depict the permitting timelines for the commercial offshore wind leases in the Atlantic Ocean issued by BOEM. For each leased project, the tables contain the effective lease year and key milestone dates for the BOEM permitting phases. These include the date of submission of the Site Assessment Plan (SAP) and Construction and Operations Plan (COP), the latest revision date of these documents, and the approval date if available. The Environmental Impact Statement (EIS) is a key part of BOEM's COP phase, and thus these tables also note the date of publication of the Notice of Intent (NOI) to prepare an EIS, Notice of Availability (NOA) of the draft EIS (DEIS), final EIS (FEIS) availability, and the Record of Decision approving the project.

For each major phase of BOEM's process (SAP approval, Site Assessment, COP approval, EIS, overall process), the length in years were calculated. Less than half of the leased projects have completed the BOEM permitting process, and the projects who have received COP approval are highlighted in blue. These projects serve the basis of the eligible list of case study candidates.

Lease or Grant Number	Lease or Grant Page	Lessee or Grantee	Status	Lease Effective Year	*Site Assessment Plan Submitted*	*SAP latest revision date*	*SAP number of revisions*	*SAP Approved*
OCS-A 0478	Cape Wind	Cape Wind Associates, LLC	Relinquished	2010	n/a	n/a	n/a	n/a
OCS-A 0482	GSOE I	GSOE I, LLC	Active	2012	n/a	n/a		n/a
OCS-A 0486	Revolution Wind	Revolution Wind, LLC	Active	2013	1-Apr-16	Nov-16	3	12-Oct-17
OCS-A 0483	Coastal Virginia Offshore Wind Commercial	Virginia Electric and Power Company	Active	2013	May-14	Feb-16	3	12-Oct-17
OCS-A 0487	Sunrise Wind	Sunrise Wind LLC	Active	2013	Dec-16	Apr-17	2	29-Jun-17
OCS-A 0489	US Wind	US Wind Inc.	Consolidated	2014	see OCS-A 0487	see OCS-A 0488	see OCS-A 0489	see OCS-A 0490
OCS-A 0490	US Wind (MarWin, Momentum Wind, remainder tbd)	US Wind Inc.	Active	2014	Jan-16	7-Apr-16	3	22-Mar-18
OCS-A 0500	Bay State Wind	Bay State Wind LLC	Active	2015	Dec-16	Apr-17	2	1-May-17
OCS-A 0530	Sunrise Wind LLC	Sunrise Wind LLC	Consolidated	2015	see OCS-A 0487	see OCS-A 0487	see OCS-A 0487	see OCS-A 0487
OCS-A 0501	Vineyard Wind 1	Vineyard Wind 1 LLC	Active	2015	1-Mar-17	22-Nov-17	3	10-May-18
OCS-A 0534	New England Wind 1	Park City Wind LLC	Active	2015	31-Mar-17	27-Nov-17	1	10-May-18
OCS-A 0498	Ocean Wind 1	Ocean Wind LLC	Active	2016	15-Sep-17	Feb-18	3	17-May-18
OCS-A 0532	Ocean Wind 2	Orsted North America Inc.	Active	2016	15-Sep-17	Feb-18	3	17-May-18
OCS-A 0499	Atlantic Shores South	Atlantic Shores Offshore Wind Project 1, LLC; Atlantic Shores Offshore Wind Project 2, LLC	Active	2016	8-Dec-19	8-Dec-19	0	8-Apr-21
OCS-A 0508	Kitty Hawk North	Kitty Hawk Wind, LLC	Active	2017	18-Sep-19	20-Feb-20	5	8-Apr-20
OCS-A 0512	Empire Wind	Empire Offshore Wind LLC	Active	2017	Jun-18	Oct-18	3	21-Nov-18
OCS-A 0519	Skipjack	Skipjack Offshore Energy, LLC	Active	2018	n/a	n/a		n/a
OCS-A 0521	SouthCoast Wind	SouthCoast Wind Energy LLC	Active	2019	29-Jul-19	29-Jul-19	0	26-May-20
OCS-A 0520	Beacon Wind	Beacon Wind LLC	Active	2019	8-Dec-20	8-Dec-20	2	24-Sep-21
OCS-A 0522	Vineyard Northeast	Vineyard Northeast LLC	Active	2019	6-Mar-20	Jan-22		1-Jul-22
OCS-A 0517	South Fork Wind	South Fork Wind, LLC	Active	2020	1-Apr-16	Nov-16	3	12-Oct-17
OCS-A 0549	Atlantic Shores North	Atlantic Shores Offshore Wind, LLC	Active	2022	6-Dec-19	10-Nov-20	4	8-Apr-21
OCS-A 0542	Invenergy Wind	Invenergy Wind Offshore LLC	Active	2022	20-Apr-23	20-Apr-23	0	25-Sep-23
OCS-A 0538	Attentive Energy	Attentive Energy LLC	Active	2022	20-Jan-23	30-Oct-23	1	19-Dec-23
OCS-A 0544	Vineyard Mid-Atlantic LLC	Vineyard Mid-Atlantic LLC	Active	2022	19-Apr-23	19-Apr-23	0	20-Feb-24
OCS-A 0537	Bluepoint Wind	Bluepoint Wind, LLC	Active	2022	28-Mar-23	28-Mar-23	0	n/a
OCS-A 0539	Community Offshore Wind	Community Offshore Wind, LLC	Active	2022	n/a	n/a		n/a
OCS-A 0541	Atlantic Offshore Wind	Atlantic Shores Offshore Wind Bight, LLC	Active	2022	18-Apr-23	n/a		n/a
OCS-A 0545	TotalEnergies Carolina Long Bay, LLC	TotalEnergies Carolina Long Bay, LLC	Active	2022	n/a	n/a		n/a
OCS-A 0546	Cinergy Corp	Cinergy Corp	Active	2022	n/a	n/a		n/a
OCS-A 0561	New England Wind 2	Commonwealth Wind, LLC	Active	2024	31-Mar-17	27-Nov-17	1	10-May-18

Lease or Grant Number	Lease or Grant Page	*Construction and Operations Plan Submitted*	*COP latest revision date*	*COP number of revisions*	*NOI to prepare EIS*	*NOA of draft EIS*	*Final Environmental Impact Statement*	*Record of Decision*	*COP Approved Y/N*	*COP Approved*
OCS-A 0478	Cape Wind	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n	n/a
OCS-A 0482	GSOE I	n/a	n/a		n/a	n/a	n/a	n/a	n	n/a
OCS-A 0486	Revolution Wind	13-Mar-20	1-Mar-23		30-Apr-21	29-Aug-22	21-Jul-23	21-Aug-23	y	17-Nov-23
OCS-A 0483	Coastal Virginia Offshore Wind Commercial	17-Dec-20	8-Sep-23		2-Jul-21	12-Dec-22	29-Sep-23	30-Oct-23	y	28-Jan-24
OCS-A 0487	Sunrise Wind	1-Sep-20	4-Apr-24		31-Aug-21	12-Dec-22	11-Dec-23	26-Mar-24	y	21-Jun-24
OCS-A 0489	US Wind	see OCS-A 0491	see OCS-A 0492	see OCS-A 0493	see OCS-A 0494	see OCS-A 0495	see OCS-A 0496	see OCS-A 0497		see OCS-A 0498
OCS-A 0490	US Wind (MarWin, Momentum Wind, remainder tbd)	11-Aug-20	1-Jul-24	9	6-Jun-22	29-Sep-23	29-Jul-24	5-Sep-24	n	n/a
OCS-A 0500	Bay State Wind	19-Mar-19	n/a		n/a	n/a	n/a	n/a	n	n/a
OCS-A 0530	Sunrise Wind LLC	see OCS-A 0487	see OCS-A 0487	see OCS-A 0487	see OCS-A 0487	see OCS-A 0487	see OCS-A 0487	see OCS-A 0487		see OCS-A 0487
OCS-A 0501	Vineyard Wind 1	Dec-17	30-Sep-20	n/a	13-Mar-18	7-Dec-18	Mar-21	10-May-21	y	15-Jul-21
OCS-A 0534	New England Wind 1	2-Jul-20	28-Feb-24	4	30-Jun-21	23-Dec-22	26-Feb-24	2-Apr-24	y	1-Jul-24
OCS-A 0498	Ocean Wind 1	1-Mar-21	24-Apr-23		30-Mar-21	24-Jun-22	26-May-23	5-Jul-23	y	21-Sep-23
OCS-A 0532	Ocean Wind 2	1-Mar-21	24-Apr-23		30-Mar-21	24-Jun-22	26-May-23	5-Jul-23	y	21-Sep-23
OCS-A 0499	Atlantic Shores South	25-Mar-21	1-May-24	1	30-Sep-21	15-May-23	23-May-24	2-Jul-24	y	1-Oct-24
OCS-A 0508	Kitty Hawk North	10-Dec-20	Sep-22	6	30-Jul-21	n/a	n/a	n/a	n	n/a
OCS-A 0512	Empire Wind	Jan-20	6-Nov-23		24-Jun-21	18-Nov-22	11-Sep-23	21-Nov-23	y	22-Feb-24
OCS-A 0519	Skipjack	n/a	n/a		n/a	n/a	n/a	n/a	n	n/a
OCS-A 0521	SouthCoast Wind	16-Feb-21	19-Sep-23	6	1-Nov-21	13-Feb-23	n/a	n/a	n	n/a
OCS-A 0520	Beacon Wind	5-Jun-23	n/a	n/a	30-Jun-23	2-Feb-24	7-May-24	n/a	n	n/a
OCS-A 0522	Vineyard Northeast	Jul-22	Mar-24	3	25-Mar-24	n/a	n/a	n/a	n	n/a
OCS-A 0517	South Fork Wind	29-Jun-18	7-May-21	4	19-Oct-18	4-Jan-21	16-Aug-21	24-Nov-21	y	18-Jan-22
OCS-A 0549	Atlantic Shores North	29-Apr-22	1-Mar-24	1	15-Mar-24	n/a	n/a	n/a	n	n/a
OCS-A 0542	Invenergy Wind	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n	n/a
OCS-A 0538	Attentive Energy	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n	n/a
OCS-A 0544	Vineyard Mid-Atlantic LLC	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n	n/a
OCS-A 0537	Bluepoint Wind	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n	n/a
OCS-A 0539	Community Offshore Wind	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n	n/a
OCS-A 0541	Atlantic Offshore Wind	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n	n/a
OCS-A 0545	TotalEnergies Carolina Long Bay, LLC	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n	n/a
OCS-A 0546	Cinergy Corp	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n	n/a
OCS-A 0561	New England Wind 2	2-Jul-20	28-Feb-24	4	30-Jun-21	23-Dec-22	26-Feb-24	2-Apr-24	y	1-Jul-24

Lease or Grant Number	Lease or Grant Page	SAP Approval Years	SAP Approved to COP Submitted (Site assessment years)	COP Approval Years	NOI to FEIS Years	SAP to COP in Years (leasing to construction)
OCS-A 0478	Cape Wind					
OCS-A 0482	GSOE I					
OCS-A 0486	Revolution Wind	1.5	2.4	**3.7**	2.2	7.6
OCS-A 0483	Coastal Virginia Offshore Wind Commercial	**3.5**	**3.2**	**3.1**	2.2	9.8
OCS-A 0487	Sunrise Wind	0.6	**3.2**	**3.8**	2.3	7.6
OCS-A 0489	US Wind					
OCS-A 0490	US Wind (MarWin, Momentum Wind, remainder tbd)	2.2	2.4		2.1	
OCS-A 0500	Bay State Wind	0.4	1.9			
OCS-A 0530	Sunrise Wind LLC					
OCS-A 0501	Vineyard Wind 1	1.2	-0.4	**3.6**	3.0	4.4
OCS-A 0534	New England Wind 1	1.1	2.1	**4.0**	2.7	7.3
OCS-A 0498	Ocean Wind 1	0.7	2.8	2.6	2.2	6.0
OCS-A 0532	Ocean Wind 2	0.7	2.8	2.6	2.2	6.0
OCS-A 0499	Atlantic Shores South	1.3	0.0	**3.5**	2.6	4.8
OCS-A 0508	Kitty Hawk North	0.6	0.7			
OCS-A 0512	Empire Wind	0.5	1.1	**4.1**	2.2	5.7
OCS-A 0519	Skipjack					
OCS-A 0521	SouthCoast Wind	0.8	0.7			
OCS-A 0520	Beacon Wind	0.8	1.7		0.85	
OCS-A 0522	Vineyard Northeast	2.3	0			
OCS-A 0517	South Fork Wind	1.5	0.7	**3.6**	2.8	5.8
OCS-A 0549	Atlantic Shores North	1.3	1.1			
OCS-A 0542	Invenergy Wind	0.4				
OCS-A 0538	Attentive Energy	0.9				
OCS-A 0544	Vineyard Mid-Atlantic LLC	0.8				
OCS-A 0537	Bluepoint Wind					
OCS-A 0539	Community Offshore Wind					
OCS-A 0541	Atlantic Offshore Wind					
OCS-A 0545	TotalEnergies Carolina Long Bay, LLC					
OCS-A 0546	Cinergy Corp					
OCS-A 0561	New England Wind 2	1.1	2.1	**4.0**	2.7	7.3

Appendix B: Interview Guides

The following guides contain questions that provided structure for my interviews with people involved in the OSW industry. These guiding questions are written generally but were tailored for the individual I interviewed based on their specific OSW experience.

Interview Guide for General OSW Industry Members

1. What is your current role and how does it relate to OSW?
2. How long have you worked in the OSW industry?
3. How have you seen the OSW industry change in the years you have been working?
4. What policies do you think have been responsible for the growth of the OSW industry?
5. What other policies do you think will be needed to support the growing industry?
6. What do you perceive are the major barriers to OSW deployment?
7. What role do you think the role of industry, government, and stakeholders are in meeting the 30 GW OSW goal by 2030?
8. What do you think is Massachusetts's role in meeting this goal?
9. Who do you view as the key players within the state with respect to advancing OSW?
10. Who else do you think should be involved to progress OSW development within the state?
11. Is there anyone you would recommend I interview for this thesis, and could you provide an introduction?

Interview Guide for Case Study Projects

1. What was your role in relation to the OSW project?
2. During what years did you work in this role?
3. Could you describe your overall experience working on this project?

4. Who were the different teams and stakeholders that you worked with?
5. What were your biggest takeaways from working on this project?
6. Was the project outcome different from your initial expectations for the project?
7. What were the major challenges of working on this project?
    a. Would you categorize these challenges as internal or external to your organization?
    b. How did you/your organization resolve these challenges?
8. What did you perceive as the biggest delay that the project faced?
    a. How did you/your organization handle setbacks when they occurred?
    b. What do you think was the root cause of this delay?
    c. What do you think could have happened differently to avoid or address this delay?
    d. Did you/your organization implement any process changes to mitigate this type of delay from happening again?
    e. Would you recommend any changes to the overall process to prevent this type of delay?
    f. What were the different ramifications of schedule delays?
9. **(for industry personnel)** Were you directly involved in any of the federal permitting processes?
    a. What changes do you think could be implemented at the federal level to expedite permitting?
    b. How often did you consult or meet with members of BOEM?
    c. How was this feedback integrated into your work?

d. How often did you consult or meet with public stakeholders?

e. How was this feedback integrated into your work?

10. **(for government personnel)** Do you see opportunities to improve the federal permitting process?

    a. What changes would you implement in your organization that would accelerate the permitting process?

    b. What changes do you think developers could implement that would accelerate the permitting process?

    c. How do you view the role of public stakeholders in this process?

11. Is there anyone you would recommend I interview for this thesis, and could you provide an introduction?

Bibliography

"36 CFR Part 800 -- Protection of Historic Properties." Accessed February 18, 2025. https://www.ecfr.gov/current/title-36/part-800.

"42 USC 4370m-2: Permitting Process Improvement." Accessed February 18, 2025. https://uscode.house.gov/view.xhtml?req=(title:42%20section:4370m-2%20edition:prelim).

Anstedt, Sheri. "Advancing Offshore Wind Energy in the United States: U.S. Department of Energy Strategic Contributions Toward 30 Gigawatts and Beyond." *U.S. Department of Energy*, March 2023.

BOEM.gov. "Cape Wind Archived." Accessed March 8, 2025. https://www.boem.gov/renewable-energy/studies/cape-wind-archived.

Bragg, Mary Ann. "Feds Delay Vineyard Wind Assessment One Month." The Herald News. Accessed March 4, 2025. https://www.heraldnews.com/story/news/2019/06/18/feds-delay-vineyard-wind-assessment/4880746007/.

Brooks, Adria. "Renewable Energy Resource Assessment Information for the United States," March 15, 2022. https://doi.org/10.2172/1855910.

Brunbauer, Morgan, Kate McClellan Press, Kathryn A. Williams, Brian K. Dresser, Julia Gulka, and Greg Lampman. "Effective Stakeholder Engagement for Offshore Wind Energy Development: The State of New York's Fisheries and Environmental Technical Working Groups." *Marine and Coastal Fisheries* 15, no. 2 (2023): e10236. https://doi.org/10.1002/mcf2.10236.

Bureau of Ocean Energy Management. "A Citizen's Guide to the Bureau of Ocean Energy Management's Renewable Energy Authorization Process," December 16, 2016. https://www.boem.gov/sites/default/files/renewable-energy-program/KW-CG-Broch.pdf.

Bureau of Ocean Energy Management. "BOEM Governing Statutes." Accessed January 12, 2025. https://www.boem.gov/about-boem/regulations-guidance/boem-governing-statutes.

Bureau of Ocean Energy Management. "Commercial Wind Leasing Offshore Rhode Island and Massachusetts." Accessed March 8, 2025. https://www.boem.gov/renewable-energy/state-activities/commercial-wind-leasing-offshore-rhode-island-and-massachusetts.

———. "Environmental Impact Statements; Availability, Etc.: Additional Public Scoping and Name Change for the Vineyard Wind South Project Offshore Massachusetts." Government. Regulations.gov, November 22, 2021. https://www.regulations.gov/document/BOEM-2021-0047-0087/comment.

Bureau of Ocean Energy Management. "Lease and Grant Information." Accessed November 17, 2024. https://www.boem.gov/renewable-energy/lease-and-grant-information.

———. "National Environmental Policy Act (NEPA) Substitution for Section 106 Consulting Party Guide," August 4, 2021. https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/BOEM_NEPASubstitution_ConsultingPartyGuide_Final_revised.pdf.

Bureau of Ocean Energy Management. "New England Wind 1 and 2." Accessed February 20, 2025. https://www.boem.gov/renewable-energy/state-activities/new-england-wind-1-and-2.

———. "New England Wind Project Final Environmental Impact Statement: Appendices." Bureau of Ocean Energy Management, March 2024. https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/Complete%20Volume_II_New_England_Wind_Final_with%20EIS_Appendices.pdf.

———. "Notice To Resume the Preparation of a Final Environmental Impact Statement for the Construction and Operations Plan for Vineyard Wind LLC." Government. Federal Register, March 3, 2021. https://www.federalregister.gov/documents/2021/03/03/2021-04392/notice-to-resume-the-preparation-of-a-final-environmental-impact-statement-for-the-construction-and.

Bureau of Ocean Energy Management. "Regulatory Framework and Guidelines." Accessed January 12, 2025. https://www.boem.gov/renewable-energy/regulatory-framework-and-guidelines.

———. “Summary of Project Updates: New England Wind,” November 2021. https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/NE-Wind%20Summary%20of%20Project%20Changes.pdf.
———. “Vineyard Wind Offshore Wind Facility One Federal Decision Permitting Timeline,” March 19, 2019. https://www.boem.gov/sites/default/files/renewable-energy-program/State-Activities/MA/Vineyard-Wind/Updated-Vineyard-Wind_Permitting-Timetable.pdf.
———. “Vineyard Wind Offshore Wind Facility One Federal Decision Permitting Timeline,” February 7, 2020.
Bureau of Ocean Energy Management Office of Renewable Energy Programs. “Vineyard Wind 1 Offshore Wind Energy Project Final Environmental Impact Statement Volume 1.” U. S. Department of the Interior, March 2021. https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/Vineyard-Wind-1-FEIS-Volume-1.pdf.
———. “Vineyard Wind 1 Offshore Wind Energy Project Final Environmental Impact Statement Volume II.” Department of the Interior, March 2021. https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/Vineyard-Wind-1-FEIS-Volume-2.pdf.
Calvin, Katherine, Dipak Dasgupta, Gerhard Krinner, Aditi Mukherji, Peter W. Thorne, Christopher Trisos, José Romero, et al. “IPCC, 2023: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (Eds.)]. IPCC, Geneva, Switzerland.” First. Intergovernmental Panel on Climate Change (IPCC), July 25, 2023. https://doi.org/10.59327/IPCC/AR6-9789291691647.
“Charlestown Turbine Testing Attracts Energy Companies To Mass.,” June 6, 2013. https://www.wbur.org/news/2013/05/20/charlestown-wind-turbine-testing.
Christine Harada. “Executive Director Determination on Request to Extend FAST-41 Final Completion Date by More Than 30 Days,” May 10, 2023. https://www.permits.performance.gov/sites/permits.dot.gov/files/2023-05/2023-05-10%20New%20England%20Wind%20ED%20Determination_0.pdf.
Colin A. Young. “Feds Push Vineyard Wind Decision Into 2021.” wbur, November 30, 2020. https://www.wbur.org/news/2020/11/30/vineyard-wind-decision-delayed.
Daniel, John P., Shu Liu, Eduardo Ibanez, Ken Pennock, Gregory Reed, and Spencer Hanes. “National Offshore Wind Energy Grid Interconnection Study Executive Summary,” July 30, 2014. https://doi.org/10.2172/1220289.
Diamond, Emily, Nikol Damato, David Bidwell, and Tiffany Smythe. “Framing the Wind: Media Coverage of Offshore Wind in the Northeastern United States.” *Environmental Communication* 0, no. 0 (n.d.): 1–18. https://doi.org/10.1080/17524032.2024.2374927.
Energy.gov. “FAST-41.” Accessed February 18, 2025. https://www.energy.gov/oe/fast-41.
Epsilon Associates, Inc. “New England Wind Construction and Operations Plan: Volume I Text.” Park City Wind, LLC, February 2024. https://www.boem.gov/sites/default/files/documents/renewable-energy/NE%20Wind%20COP%20Volume%20I%20Text%20Feb%202024_PUBLIC.pdf.
———. “Vineyard Wind Draft Construction and Operations Plan Volume I,” June 3, 2020. https://www.boem.gov/sites/default/files/documents/renewable-energy/Vineyard-Wind-COP-Volume-I-Appendix-I-Complete.pdf.
Eric B. Beightel. Government. “Executive Director Determination on Request to Extend FAST-41 Final Completion Date by More Than 30 Days.” Government, January 12, 2024.
Federal Register. “Notice of Availability of a Draft Environmental Impact Statement for Park City Wind, LLC’s Proposed Wind Energy Facility Offshore Massachusetts,” December 23, 2022. https://www.federalregister.gov/documents/2022/12/23/2022-27826/notice-of-availability-of-a-draft-environmental-impact-statement-for-park-city-wind-llcs-proposed.

Federal Register. “Notice of Availability of a Draft Environmental Impact Statement for Vineyard Wind LLC’s Proposed Wind Energy Facility Offshore Massachusetts,” December 7, 2018. https://www.federalregister.gov/documents/2018/12/07/2018-26573/notice-of-availability-of-a-draft-environmental-impact-statement-for-vineyard-wind-llcs-proposed.
Federal Register. “Notice of Availability of a Supplement to the Draft Environmental Impact Statement for Vineyard Wind LLC’s Proposed Wind Energy Facility Offshore Massachusetts and Public Meetings,” June 12, 2020. https://www.federalregister.gov/documents/2020/06/12/2020-12822/notice-of-availability-of-a-supplement-to-the-draft-environmental-impact-statement-for-vineyard-wind.
Federal Register. “Notice of Final Federal Agency Action on the Authorization for the New England Wind Farm and New England Wind Project,” September 12, 2024. https://www.federalregister.gov/documents/2024/09/12/2024-20642/notice-of-final-federal-agency-action-on-the-authorization-for-the-new-england-wind-farm-and-new.
Federal Register. “Notice of Intent To Prepare an Environmental Impact Statement for the Vineyard Wind South Project Offshore Massachusetts,” June 30, 2021. https://www.federalregister.gov/documents/2021/06/30/2021-13994/notice-of-intent-to-prepare-an-environmental-impact-statement-for-the-vineyard-wind-south-project.
Federal Register. “Notice of Intent to Prepare an Environmental Impact Statement for Vineyard Wind LLC’s Proposed Wind Energy Facility Offshore Massachusetts,” March 30, 2018. https://www.federalregister.gov/documents/2018/03/30/2018-06638/notice-of-intent-to-prepare-an-environmental-impact-statement-for-vineyard-wind-llcs-proposed-wind.
Federal Register. “Protecting Public Health and the Environment and Restoring Science To Tackle the Climate Crisis,” January 25, 2021. https://www.federalregister.gov/documents/2021/01/25/2021-01765/protecting-public-health-and-the-environment-and-restoring-science-to-tackle-the-climate-crisis.
Federal Register. “Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Construction of the Vineyard Wind Offshore Wind Project,” April 30, 2019. https://www.federalregister.gov/documents/2019/04/30/2019-08666/takes-of-marine-mammals-incidental-to-specified-activities-taking-marine-mammals-incidental-to.
Federal Register. “Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Construction of the Vineyard Wind Offshore Wind Project,” June 25, 2021. https://www.federalregister.gov/documents/2021/06/25/2021-13501/takes-of-marine-mammals-incidental-to-specified-activities-taking-marine-mammals-incidental-to.
Federal Register. “Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the New England Wind Project Offshore Massachusetts,” June 8, 2023. https://www.federalregister.gov/documents/2023/06/08/2023-11814/takes-of-marine-mammals-incidental-to-specified-activities-taking-marine-mammals-incidental-to-the.
Federal Register. “Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the New England Wind Project, Offshore Massachusetts,” June 21, 2024. https://www.federalregister.gov/documents/2024/06/21/2024-12085/takes-of-marine-mammals-incidental-to-specified-activities-taking-marine-mammals-incidental-to-the.
Federal Register. “Taking and Importing Marine Mammals; Taking Marine Mammals Incidental to Construction of the New England Wind Offshore Wind Farm, Offshore Massachusetts,” August 22, 2022. https://www.federalregister.gov/documents/2022/08/22/2022-18057/taking-and-importing-marine-mammals-taking-marine-mammals-incidental-to-construction-of-the-new.
Firestone, Jeremy, Christine Hirt, David Bidwell, Meryl Gardner, and Joseph Dwyer. “Faring Well in Offshore Wind Power Siting? Trust, Engagement and Process Fairness in the United States.” *Energy Research & Social Science* 62 (April 1, 2020): 101393. https://doi.org/10.1016/j.erss.2019.101393.
Firestone, Jeremy, Willett Kempton, and Andrew Krueger. “Public Acceptance of Offshore Wind Power Projects in the USA.” *Wind Energy* 12, no. 2 (2009): 183–202. https://doi.org/10.1002/we.316.

Fisheries, NOAA. “Incidental Take Authorizations Under the Marine Mammal Protection Act.” NOAA Fisheries, September 23, 2024. National. https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act.

———. “Laws & Policies: Endangered Species Act.” NOAA Fisheries. National. Accessed February 18, 2025. https://www.fisheries.noaa.gov/topic/laws-policies/endangered-species-act.

Grover J. Fugate. “CRMC Federal Consistency Concurrence Letter with Enclosure,” February 28, 2019. http://www.crmc.ri.gov/windenergy/vineyardwind/VW_FedConConcur_20190228.pdf.

“Healey-Driscoll Administration, City of Salem and Crowley Celebrate Groundbreaking of Second Offshore Wind Terminal.” Accessed March 8, 2025. https://www.mass.gov/news/healey-driscoll-administration-city-of-salem-and-crowley-celebrate-groundbreaking-of-second-offshore-wind-terminal.

“Historic Preservation Activities and Offshore Renewable Energy | BOEM.Gov.” Accessed February 18, 2025. https://www.boem.gov/renewable-energy/state-activities/historic-preservation-activities-and-offshore-renewable-energy.

Hokanson, Mitchell. “Avoiding the Doldrums: Evaluating the Need for Change in the Offshore Wind Permitting Process.” *Columbia Journal of Environmental Law* 44, no. 1 (2019): 181–239.

House, The White. “FACT SHEET: Biden Administration Jumpstarts Offshore Wind Energy Projects to Create Jobs.” The White House, March 29, 2021. https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/29/fact-sheet-biden-administration-jumpstarts-offshore-wind-energy-projects-to-create-jobs/.

Jeffrey M. Willis. “RI CRMC Federal Consistency Decision.” Rhode Island Coastal Resources Management Council. Accessed March 17, 2025. http://www.crmc.ri.gov/windenergy/newengland/NEWind_FedConDecision_101923.pdf.

Jonah Ury, Brett Anders, Phillip Beiter, Jocelyn Brown-Saracino, and Patrick Gilman. “Pathways to Commercial Liftoff: Offshore Wind.” *U.S. Department of Energy*, April 2024.

Jost, Katie, and George Xydis. “Offshore Wind Acceleration in the U.S. Atlantic Coast and the 30 GW by 2030 Target.” *Proceedings of the Institution of Civil Engineers - Energy* 176, no. 4 (October 2023): 169–76. https://doi.org/10.1680/jener.22.00045.

Kakley, Matt. “ISO-NE Supporting Woods Hole Oceanographic Institute’s Offshore Wind Forecasting Research.” ISO Newswire, March 17, 2022. https://isonewswire.com/2022/03/17/iso-ne-supporting-woods-hole-oceanographic-institutes-offshore-wind-forecasting-research/.

Kuffner, Alex. “Four-Year Delay for SouthCoast Wind Offshore Wind Farm Floated. What We Know.” Cape Cod Times. Accessed March 8, 2025. https://www.capecodtimes.com/story/news/environment/2025/02/28/southcoast-wind-power-offshore-ma-ri-trump-presidency-renewable-energy/80831045007/.

Lisa Berry Engler. “New England Wind (Park City Wind & Commonwealth Wind) Conditional Federal Consistency Concurrence.” Massachusetts Office of Coastal Zone Management, November 9, 2023. https://www.mass.gov/doc/offshore-wind-park-city-wind-fcr-decision-11-9-23-revised-and-signed-with-attachments/download.

———. “Re: Docket No. BOEM 2021–0047: Notice of Additional Public Scoping and Name Change for the Vineyard Wind South Project Offshore Massachusetts Environmental Impact Statement,” December 22, 2021. https://www.regulations.gov/comment/BOEM-2021-0047-0092.

———. “Vineyard Wind 1 Federal Consistency Concurrence,” May 22, 2020. https://www.mass.gov/doc/offshore-wind-vineyard-wind-boem-usace-action-5-22-20-signed-with-attachments/download.

Lopez, Anthony, Rebecca Green, Travis Williams, Eric Lantz, Grant Buster, and Billy Roberts. “Offshore Wind Energy Technical Potential for the Contiguous United States.” *National Renewable Energy Laboratory*, 2022.

“Marine Mammal Protection Act (MMPA).” Accessed February 18, 2025. https://www.boem.gov/environment/environmental-assessment/marine-mammal-protection-act-mmpa.

"Massachusetts - New England for Offshore Wind," October 10, 2019. https://www.newenglandforoffshorewind.org/states/massachusetts/.
"Massachusetts and Rhode Island Announce Largest Offshore Wind Selection in New England History." Accessed March 8, 2025. https://www.mass.gov/news/massachusetts-and-rhode-island-announce-largest-offshore-wind-selection-in-new-england-history.
"Massachusetts Legislature Enacts Significant Energy Bill in Support of Offshore Wind and Hydro Procurement, Storage and Transmission." Accessed March 8, 2025. http://foleyhoag.com/news-and-insights/blogs/law-and-the-environment/2016/august/massachusetts-legislature-enacts-significant-energy-bill-in-support-of-offshore-wind-and-hydro-procu/.
MassCEC. "Massachusetts Offshore Wind Ports & Infrastructure." Accessed March 8, 2025. https://www.masscec.com/resources/massachusetts-offshore-wind-ports-infrastructure.
MassCEC. "New Bedford Marine Commerce Terminal (NBMCT)." Accessed March 8, 2025. https://www.masscec.com/masscec-focus/offshore-wind/new-bedford-marine-commerce-terminal-nbmct.
McCoy, Angel, Walter Musial, Rob Hammond, Daniel Mulas Hernando, Patrick Duffy, Philipp Beiter, Paula Pérez, Ruth Baranowski, Gage Reber, and Paul Spitsen. "Offshore Wind Market Report: 2024 Edition." *NREL*, n.d.
Medeiros, Dan. "SouthCoast Wind's Plans for Somerset Could Involve Two Stations: 5 Things to Know." Fall River Herald News. Accessed March 8, 2025. https://www.heraldnews.com/story/news/2024/04/05/offshore-wind-company-outlines-plans-for-brayton-point-substation/73212956007/.
"Memorandum Of Agreement Among The Bureau Of Ocean Energy Management, The Massachusetts State Historic Preservation Officer, Vineyard Wind, Llc, And The Advisory Council On Historic Preservation Regarding The Vineyard Wind 1 Offshore Wind Energy Project, Lease Area Ocs-A 0501, Offshore Massachusetts," April 26, 2021. https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/Vineyard%20Wind-1-COP-Section-106-MOA.pdf.
National Marine Fisheries Service. Greater Atlantic Regional Fisheries Office. "National Marine Fisheries Service Endangered Species Act Section 7 Biological Opinion," October 18, 2021. https://doi.org/10.25923/H9HZ-3C72.
Newell, Robert P. "Transmission Impossible: The Case for a Nationwide Permit for Offshore Wind Transmission Lines." *Ecology Law Quarterly* 47, no. 2 (2020): 475–506.
NOAA Office for Coastal Management. "Federal Consistency." Accessed January 12, 2025. https://coast.noaa.gov/czm/consistency/.
Noah Asimow. "Delays at Federal Level Plague Vineyard Wind." Vineyard Gazette, February 11, 2020. https://vineyardgazette.com/news/2020/02/11/more-delays-federal-level-plague-vineyard-wind.
Northeastern University College of Engineering. "First-Ever National Offshore Wind Research Center." Accessed March 8, 2025. https://coe.northeastern.edu/news/northeastern-joins-forces-with-umass-amherst-in-first-ever-national-offshore-wind-research-center/.
Office of Associate Chief Counsel. "Energy Community Bonus Credit Amounts Under the Inflation Reduction Act of 2022." Internal Revenue Service, July 2, 2024. https://www.irs.gov/pub/irs-drop/n-24-30.pdf.
Office of Energy Efficiency & Renewable Energy. "Atlantic Offshore Wind Transmission Literature Review and Gaps Analysis." U.S. Department of Energy, October 1, 2021. https://doi.org/10.2172/1829424.
Office of Renewable Energy Programs. "FINAL Information Needed for Issuance of a Notice of Intent (NOI) Under the National Environmental Policy Act (NEPA) for a Construction and Operations Plan (COP)." *United States Department of the Interior*, August 2023.
———. "Information Guidelines for a Renewable Energy Construction and Operations Plan." *United States Department of the Interior*, May 27, 2020.

"Offshore Wind | MassCEC." Accessed March 8, 2025. https://www.masscec.com/our-focus/offshore-wind.
Offshore Wind Power Hub. "Power Hub," 2024. https://offshorewindpowerhub.org/.
"One Federal Decision - Fact Sheet." United States Department of Transportation, August 15, 2017. https://www.transportation.gov/sites/dot.gov/files/docs/policy-initiatives/320411/ofd-fact-sheet.pdf.
Permitting Dashboard. "Endangered Species Act Consultation (NOAA-NMFS)." Accessed February 18, 2025. https://www.permits.performance.gov/proj/new-england-wind/endangered-species-act-consultation-noaa-nmfs.
Permitting Dashboard. "Magnuson-Stevens Fishery Conservation and Management Act, Section 305 Essential Fish Habitat (EFH) Consultation." Accessed March 4, 2025. https://www.permits.performance.gov/proj/new-england-wind/magnuson-stevens-fishery-conservation-and-management-act-section-305.
Permitting Dashboard. "Outer Continental Shelf (OCS) Air Permit." Accessed February 18, 2025. https://www.permits.performance.gov/proj/new-england-wind/outer-continental-shelf-ocs-air-permit.
Permitting Dashboard. "Section 10 Rivers and Harbors Act of 1899 and Section 404 Clean Water Act." Accessed February 18, 2025. https://www.permits.performance.gov/proj/new-england-wind/section-10-rivers-and-harbors-act-1899-and-section-404-clean-water-act.
Permitting Dashboard Federal Infrastructure Projects. "Marine Mammal Protection Act (MMPA) Incidental Take Authorization (DOC – NOAA/NMFS)." Accessed March 4, 2025. https://www.permits.performance.gov/proj/new-england-wind/marine-mammal-protection-act-mmpa-incidental-take-authorization-doc-noaanmfs.
Permitting Dashboard Federal Infrastructure Projects. "New England Wind Permitting Dashboard." Government. Accessed February 18, 2025. https://www.permits.performance.gov/permitting-project/fast-41-covered-projects/new-england-wind.
Pfeifenberger, Johannes P., Joe DeLosa III, Linquan Bai, Cornelis Plet, Carson Peacock, and Ryan Nelson. "The Benefit and Urgency of Planned Offshore Transmission: Reducing the Costs of and Barriers to Achieving U.S. Clean Energy Goals." The Brattle Group, January 24, 2023. https://cleanpower.org/resources/the-benefit-and-urgency-of-planned-offshore-transmission/.
Portman, Michelle. "Involving the Public in the Impact Assessment of Offshore Renewable Energy Facilities." *Marine Policy* 33, no. 2 (March 1, 2009): 332–38. https://doi.org/10.1016/j.marpol.2008.07.014.
Powell, Timothy H. "Revisiting Federalism Concerns in the Offshore Wind Energy Industry in Light of Continued Local Opposition to the Cape Wind Project Note." *Boston University Law Review* 92, no. 6 (2012): 2023–55.
"Prysmian Abandons Plans for Offshore Wind Cable Factory in Somerset," January 22, 2025. https://www.wbur.org/news/2025/01/22/prysmian-somerset-offshore-wind-cable-factory-canceled.
Republican, Mary C. Serreze | Special to The. "As Cape Wind Dies, Offshore Wind Picks up Steam in Massachusetts." masslive, December 3, 2017. https://www.masslive.com/news/2017/12/cape_wind_opposed_by_bill_koch.html.
Rigano, James P., and Alyse Delle Fave. "Offshore Wind: Government Control and the Regulatory Landscape." *Environmental Claims Journal* 29, no. 1 (January 2, 2017): 80–85. https://doi.org/10.1080/10406026.2017.1278919.
Ross, Donald. "Environmental Impact Communication: Cape Wind EIS, 2001–2015." *Journal of Technical Writing and Communication* 48, no. 2 (April 1, 2018): 222–49. https://doi.org/10.1177/0047281617706910.
Russell, Aaron, Samantha Bingaman, and Hannah-Marie Garcia. "Threading a Moving Needle: The Spatial Dimensions Characterizing US Offshore Wind Policy Drivers." *Energy Policy* 157 (October 1, 2021): 112516. https://doi.org/10.1016/j.enpol.2021.112516.

Shanahan, Elizabeth A., Michael D. Jones, Mark K. McBeth, and Ross R. Lane. “An Angel on the Wind: How Heroic Policy Narratives Shape Policy Realities.” *Policy Studies Journal* 41, no. 3 (2013): 453–83. https://doi.org/10.1111/psj.12025.

Shukla, P. R., Jim Skea, Andy Reisinger, and IPCC, eds. *Climate Change 2022: Mitigation of Climate Change*. Geneva: IPCC, 2022.

Simon, Julia. “Here’s How Trump’s Pause on Wind Projects Could Threaten Jobs and Climate Goals.” *NPR*, January 24, 2025, sec. Climate. https://www.npr.org/2025/01/24/nx-s1-5268913/donald-trump-wind-energy-offshore-executive-order.

Storrow, Benjamin. “Bernhardt: Trump Tried to Boost Offshore Wind, Not Kill It.” E&E News by POLITICO, July 21, 2021. https://www.eenews.net/articles/bernhardt-trump-tried-to-boost-offshore-wind-not-kill-it/.

The Vineyard Gazette - Martha’s Vineyard News. “Vineyard Power and Partner Win Offshore Wind Lease.” Accessed March 8, 2025. https://vineyardgazette.com/news/2015/01/29/vineyard-power-and-partner-win-offshore-wind-lease.

The White House. “Executive Order on Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability,” December 8, 2021. https://www.whitehouse.gov/briefing-room/presidential-actions/2021/12/08/executive-order-on-catalyzing-clean-energy-industries-and-jobs-through-federal-sustainability/.

Tollefson, Jeff. “Earth Breaches 1.5 °C Climate Limit for the First Time: What Does It Mean?” *Nature*, January 10, 2025. https://doi.org/10.1038/d41586-025-00010-9.

“Trump Delay Casts Doubt on First Major U.S. Offshore Wind Farm - Bloomberg.” Accessed March 4, 2025. https://www.bloomberg.com/news/articles/2019-08-09/u-s-is-said-to-extend-review-of-first-major-offshore-wind-farm.

Tufts Now. “Offshore Wind Power Opportunities Fuel Aspirations of Tufts Graduate Students,” June 13, 2022. https://now.tufts.edu/2022/06/13/offshore-wind-power-opportunities-fuel-aspirations-tufts-graduate-students.

U.S. Department of Energy and Bureau of Ocean Energy Managment. “Advancing the Growth of the U.S. Offshore Wind Industry: Federal Funding and Incentives,” April 2024. https://www.energy.gov/sites/default/files/2024-04/DOE-BOEM-Fed-Offshore-wind-v3_w150.updated.pdf.

U.S. Environmental Protection Agency. “Outer Continental Shelf Air Permit New England Wind 1 Wind Farm Project Park City Wind, LLC,” April 15, 2024. https://www.epa.gov/system/files/documents/2024-04/1-8-new1-ocs-air-permit-ocs-r1-07-rtc.pdf.

US EPA, OAR. “Permit Documents for Vineyard Wind 1, LLC’s Wind Energy Development Project (800MW Offshore Windfarm).” Other Policies and Guidance, June 14, 2021. Massachusetts. https://www.epa.gov/caa-permitting/permit-documents-vineyard-wind-1-llcs-wind-energy-development-project-800mw-offshore.

U.S. Fish and Wildlife Service. “Addendum to the New England Wind Biological Assessment to USFWS,” March 28, 2023. https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/NE_BA_addendum_FWS.pdf.

———. “Addendum to the New England Wind Biological Assessment to USFWS,” June 21, 2023. https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/Addendum%20to%20the%20New%20England%20Wind%20Biological%20Assessment%20to%20USFWS.pdf.

Viaintermedia.com. “Vineyard Wind Shareholders Affirm Commitment to Deliver Offshore Wind Farm with Revised Schedule.” Renewable Energy Magazine. Vineyard Wind Shareholders Affirm Commitment to Deliver Offshore Wind Farm with Revised Schedule, August 14, 2019. https://www.renewableenergymagazine.com/wind/vineyard-wind-shareholders-affirm-commitment-to-deliver-20190814.

Vineyard Wind. “Avangrid Renewables and Copenhagen Infrastructure Partners Announce Strategic Transaction to Advance Offshore Wind Development,” September 21, 2021.

https://www.vineyardwind.com/press-releases/2021/9/21/avangrid-renewables-and-copenhagen-infrastructure-partnersannounce-strategic-transaction-to-advance-offshore-wind-development.
Vineyard Wind. “Project Update: Ongoing Discussions with U.S. Bureau of Ocean Energy Management,” July 18, 2019. https://www.vineyardwind.com/press-releases/2019/7/18/project-update-ongoing-discussions-with-us-bureau-of-ocean-energy-management.
Vineyard Wind. “Statement on Bureau of Ocean Energy Management Environmental Impact Statement,” July 10, 2019. https://www.vineyardwind.com/press-releases/2019/7/10/statement-on-bureau-of-ocean-energy-management-environmental-impact-statement.
Vineyard Wind. “Vineyard Wind 1.” Accessed March 17, 2025. https://www.vineyardwind.com/vineyardwind-1.
World, Renewable Energy. “Historic, Record-Breaking Offshore Wind Lease Auction.” Factor This™, January 10, 2019. https://www.renewableenergyworld.com/wind-power/offshore/historic-recordbreaking-offshore-wind-lease-auction/.