Market Deployment Strategies for Offshore Wind in Maine

Prepared for the Maine Governor's Energy Office and the Maine Offshore Wind Roadmap

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1 EXECUTIVE SUMMARY

Supported by a $2.166 million grant from the US Economic Development Administration, the Governor's Energy Office is leading the development of an Offshore Wind Roadmap (the "Roadmap") to grow Maine's economy and improve its economic resilience through the development of an offshore wind industry. The Roadmap is being overseen by an advisory committee and four working groups that include nearly 100 representatives with a range of perspectives and subject area expertise. Their efforts are helping to advise and develop components of the Roadmap, including impacts and opportunities related to renewable energy markets, fisheries, environment and wildlife, infrastructure, and workforce development.

This Market Deployment Strategies for Offshore Wind in Maine report aims to inform the Roadmap about potential strategies the State of Maine can consider to participate in growing the regional and global offshore wind market. Offshore wind development has the potential to bring significant benefits to Maine, economic and beyond, by providing job opportunities, reducing greenhouse gas (GHG) emissions, and growing prosperity in Maine's coastal communities.

Maine's market trends for offshore wind are driven to some extent by policy initiatives and other key factors like the unique nature of the Gulf of Maine's ecosystem and existing uses and the progress of emerging technologies. Maine can leverage these factors and others discussed in this report to become a leader in offshore wind technology, workforce development, and economic expansion. The strategies presented in this report are intended to accelerate and maximize the effectiveness and reliability of offshore wind energy development in the Gulf of Maine. DNV's market strategy prioritizations are informed by discussions with various stakeholders and a thorough review of similar efforts in other states. The strategies described herein include work currently in progress, new and expanded initiatives that would require additional resources to implement, and approaches to optimize competitive bidding processes and ensure that Maine receives the best value for ratepayers while supporting environmental and economic development goals. This report does not include commitments from any agency or entity and is meant to provide information on potential strategies to facilitate growth and development in offshore wind.

1.1 Objectives and scope of research

This report's objective is to identify a set of market strategies that will enable the cost-effective deployment of offshore wind energy in Maine with the goal of reducing dependence on fossil fuels and providing affordable, local energy sources for Maine. This includes reviewing energy procurement options that produce competitive prices for ratepayers. DNV relied on a wide range of data including input from policy makers, higher education researchers, technical specialists with hands-on experience with offshore wind, and the Energy Markets and Strategies Working Group to develop this list of strategies. We note that these strategies can inform and complement those identified through the Maine Offshore Wind Roadmap process, including recommendations made by other working groups.

The market strategies we assessed are organized into three main categories: policy-related strategies, infrastructure development strategies, and financing strategies. In prioritizing market strategies, our analysis considered approaches that maximize local content, support local port development and local job creation, and advance key initiatives set forth under Maine's climate action plan, *Maine Won't Wait*. The market strategies included here are

intentionally high level to give the State a general framework within which to work and make decisions about future endeavors. The content of this report is intended to inform and complement the objectives, strategies, and recommendations advanced in the Maine Offshore Wind Roadmap.

DNV initially identified 34 market strategies for the analysis covering a broad range of topics. With this list in hand, DNV sought feedback from the Maine Offshore Wind Roadmap Energy Markets and Strategies Working Group. Using a polling platform, we were able to gather information on how favorably strategies were viewed and collect additional thoughts or comments on implementing each of them.

Once we had gathered working group feedback, we refined our list, conducted further research, and performed a market impact assessment to determine the positive and negative market impacts of the strategies. Positive impacts were viewed as a benefit and negative impacts were viewed as a cost. The impact of each market strategy was reviewed for key social, economic, and environmental areas of interest (AOIs). These are further discussed in Section 3.4.

In addition, DNV interviewed several representatives from peer jurisdictions and the development community to gain further insight into the challenges and best practices of creating offshore wind policy, developing and permitting infrastructure, and fostering industry collaboration. Each of these data points was used to identify a prioritized set of strategies for the State of Maine.

1.2 Findings and recommendations

Following the impact assessment, DNV used the cost and impacts ratings along with the feedback received from the working group to develop a prioritized subset of the market strategies for initial focus. Our identified market strategies and their purposes are presented in Table 1-1. We deemed other market strategies to have potential value if pursued but also drawbacks that need further consideration, such as implementation costs, lack of stakeholder support, or uncertain legal constructs. These moderately-rated market strategies could be pursued in the future, but this analysis indicates that the state will receive the most value by prioritizing the market strategies listed below.

These market strategies will be applicable with varying degrees of emphasis and urgency as Maine progresses through the stages of offshore wind energy development. For instance, establishing tax credits before large-scale commercial deployment starts would enable the simultaneous construction of multiple projects, allow manufacturers to establish a role in Maine's markets, and maximize near-term economic benefits. To the extent that the timing of implementing a market strategy is important and/or immediate, this report will call attention to it in the sections below.

Section 5 of this report provides further detail describing the market strategies, their potential costs and benefits, and information on how each market strategy could be implemented along with examples from other states or jurisdictions. Throughout Section 5, DNV highlights the progress Maine has made in developing and implementing several of the market strategies and discusses ways to build upon that work to enhance and expedite offshore wind development in the region.

As part of the Maine Offshore Wind Initiative and the Maine Offshore Wind Roadmap, DNV completed a Wind Energy Needs Assessment that developed projections of how offshore wind in the Gulf of Maine can contribute to achieving both Maine and New England's long-term renewable energy needs. The full report with all scenarios and methodology is available on the Maine Offshore Wind initiative website. In Section 6 of this report, DNV used the results of the Diverse Portfolio scenario from the Wind Energy Needs Assessment to further prioritize the identified strategies.

Table 1-1. DNV Identified strategies for Maine to consider

	Market Strategy	Purpose
Policy	P-1. Pursue an offshore wind RPS requirement	Determine the best way to add to the RPS a requirement for offshore wind and an appropriate procurement mechanism.
	P-3. Establish a small business support program for offshore wind development	Establish a small business support program that enables citizens and/or local governments to invest in both workforce and renewable energy development within Maine.
	P-4. Create a state-level entity focused on supply chain and workforce development	Establish a state organization or collaborative group committed to the development of the offshore wind supply chain in Maine by building on the ongoing work of the roadmap supply chain and working group.
	P-5. Continue to engage local institutions on research, training, and demonstration projects	Work with local universities and other relevant institutions on research and development activities to reduce deployment costs, assess local impacts, expand demonstration projects, and address supply chain or technology-related issues.
	P-6. Foster local government partnerships	Work with local municipalities or government officials to identify and address specific citizen and stakeholder concerns or needs.
	P-7. Engage in local direct communications with affected communities	Seek to continuously engage affected communities in an ongoing consultation process to provide clarity for all stakeholders regarding the future development and operation of the offshore electricity grid.
Infrastructure	I-2. Engage with others on a regional development strategy	Ensure that transmission needs are met through a regional planning approach and that there is regional collaboration around opportunities to enhance supply chain resources and port development in New England.
	I-3. Ensure public policy goals are considered in transmission planning	Ensure that state policy goals are being addressed in regional transmission planning activities and encourage innovative approaches to development.
	I-4. Invest in addressing the infrastructure needs of strategically located ports	Ensure that Maine has adequate port infrastructure for supporting the construction and operations of offshore wind resources.
	I-6. Work with BOEM to set clear permitting expectations for developers	Develop a set of clear guidelines describing what developers are responsible for when planning projects in the Gulf of Maine and how those requirements align with the federal permitting process.
Finance	F-2. Foster cluster-based development[1]	Focus workforce development funds on offshore wind businesses oriented to enhance Maine's position as an offshore wind leader.

[1] Cluster-based development is a market strategy for economic development that involves businesses in close proximity to one another supporting an industry, similar to Silicon Valley

	Market Strategy	Purpose
	F-4. Explore using funds from offshore wind projects to support impacted ocean users	Determine how to allocate a portion of the funds from these projects to provide support to maritime industries, fisheries and coastal communities adversely impacted by these projects; additional engagement is needed with impacted uses to develop.
	F-5. Continue to support and advocate for enhanced OSW federal tax credits	Support and advocate for continued extensions of the PTC and ITC (extended via the Inflation Reduction Act) to help in the financing of offshore wind that will benefit Maine.

2 INTRODUCTION

This report covers the assessment performed by DNV to determine an optimized set of offshore wind market development strategies for the State of Maine to consider. The primary goals of this assessment are as follows:

- Clearly define the critical factors that will influence offshore wind-related infrastructure investments.
- Use peer research to investigate and identify approaches and strategies that others have used or are using to develop their own offshore wind markets.
- Develop an inventory of beneficial and detracting criteria from which to assess the impacts of potential market strategies.
- Determine the scale of impacts and costs of each of the possible market enhancement strategies identified.
- Identify a priority set of market strategies that will foster the development of the Maine offshore wind market and accelerate investment.

The recommendations provided in this report are based on stakeholder feedback, interviews with peer jurisdictions and others involved in the development of offshore wind projects, and DNV's analysis of the potential costs and impacts associated with each of the market strategies.

Recent federal legislation, including the Infrastructure Investment and Jobs Act (IIJA) signed by President Biden on November 15, 2021, and the Inflation Reduction Act of 2022 (IRA), signed August 16, 2022, include additional provisions affecting offshore wind development. For example, the IRA directs federal funding across a broad range of sectors, and includes provisions related to several aspects of offshore wind development, including expanded offshore wind tax credits, changes and expansions to the offshore wind leasing process, and additional investments in transmission planning.[62] As the provisions in these recent legislative acts continue to be developed and implemented, their impacts should be considered alongside the market strategies and analysis presented throughout this report.

2.1 Report structure

The remainder of this report is structured as follows:

- **Section 3 Methodologies** provides details on the methodological approach for the market deployment strategy assessment.
- **Section 4 Findings from Peer Research and Interviews** covers the initial desktop research that was performed to develop an initial list of market strategies for the state and working group to consider.
- **Section 5 Impact of Strategies Under Consideration** summarizes the market strategies being considered, the results of the impact analysis, possible approaches to implement the market strategies, and an indication of the prioritization for each market strategy.
- **Section 6 Implications of Maine's Wind Energy Needs Assessment** provides additional considerations for the prioritized market strategies in the context of DNV's projections of offshore wind development in the Gulf of Maine from the Wind Energy Needs Assessment.

2.2 GEO's role

The GEO is the sponsor of this work and selected DNV to conduct this assessment of potential market strategies for the state to consider. GEO worked with DNV and members of the Maine Offshore Wind Roadmap Energy Markets and Strategies working group to develop the approach, facilitate meetings between stakeholders and DNV, and prepare this report. The information in this report was prepared by DNV and does not constitute an endorsement or recommendation by GEO, the State of Maine, or the Energy Markets and Strategies working group.

3 METHODOLOGY

In this section, we describe how DNV devised a prioritized list of market strategies for Maine to consider. Our approach was based on industry information-gathering (peer benchmarking) about how other states and international regions are developing their own offshore wind markets. Once we had developed a list of market strategies relevant to Maine from the benchmarking research, we shared it with the Energy Markets and Strategies Working Group to gather their feedback and conducted a high-level impact assessment. DNV then conducted an impact assessment to evaluate each market strategy's potential impacts or benefits across a range of criteria and determine the potential scale of costs associated with implementing the market strategies. This analysis also considered feedback from the working group and information collected during DNV's socioeconomic assessment of potential impacts of offshore wind development that included over 60 in-depth stakeholder interviews. DNV then set up a framework incorporating all of these results to determine which market strategies to prioritize. Each step is described in more detail below.

3.1 Peer research

The first step in identifying possible market strategies was to research the strategies adopted by peer jurisdictions. This involved investigating what other states or government organizations are doing to facilitate offshore wind market development in their jurisdictions and compiling a list of key policies and actions that Maine could consider pursuing as well. This research was designed to help understand what Maine's peers are doing to address challenges similar to Maine's. It also helped DNV identify industry leaders with whom Maine may partner to accomplish compatible goals. This research included:

- Preparing a list of potential topics or factors to consider, including infrastructure, policies, financing mechanisms, supply chain, workforce development, permitting, and investment
- Identifying regions, states, and government bodies embarking on similar efforts
- Compiling and evaluating publicly available information sources
- Utilizing the information captured in the previous step to draw comparisons across approaches to addressing those key issues identified initially

After initial research, DNV reviewed results with GEO and the working group and discussed gaps that are critical to future development. These gaps laid the framework for primary research goals and candidates for peer interviews. Table 3-1 highlights the peer groups whose publicly available reports we reviewed as part of this research.

Table 3-1 Peer groups whose reports DNV reviewed

US state, country, or region		
California	New York (NYSERDA)	Ireland / EirGRid
Connecticut	North Carolina / South Carolina	Netherlands: Borssele Wind Farm Zone
Hawaii	Oregon	Paimpol, France
Maryland / Delaware	Rhode Island	Portugal: WindFloat Atlantic
Massachusetts	Virginia	United Kingdom: Hornsea Project One
New Jersey	Washington	United Kingdom: National Grid ESO

3.2 Stakeholder feedback

As mentioned above, this high-level research review and assessment was not the only factor that helped us determine which market strategies to consider. Another key aspect of the prioritization process was energy markets stakeholder feedback given the focus of this report; however, the work of other studies and the state's broader engagement work should be considered and incorporated into the state's overall deployment strategies. DNV engaged stakeholders throughout this process to ensure that the market strategies identified reflect stakeholders' interests and experience as well as the long-term priorities of the State of Maine, its citizens, and business groups. This was done through both the regular working group meetings as well as an online polling platform designed for gathering input from large groups of stakeholders. Within this polling platform, DNV provided 38 potential market strategies along with a brief description of each. Working group members were then able to assign ratings according to how favorably they viewed the potential market strategies and provide feedback or suggestions. After reviewing the information obtained through the survey, DNV refined and consolidated the list of market strategies to develop this report.

In addition, DNV collected stakeholder feedback through in-depth interviews as part of the socioeconomic analysis. The feedback obtained from over 60 interviews helped establish the criteria by which the impacts of each market strategy should be assessed. These became known as the Areas of Interest and are further discussed in section 3.4. The information gathered during these stakeholder interviews was also used to inform and determine the set of market strategies presented here that best support offshore wind development in the Gulf of Maine.

3.3 Peer interviews

DNV conducted interviews with representatives of peer organizations and an offshore wind developer to gain deeper insight into successful offshore wind market development activities and learn more about the challenges these other entities face or have faced in the development of their markets.

This activity was intended to supplement the desktop benchmarking research and yield additional insights into the identified market strategies. After considering several potentially valuable interviewees, DNV settled on 4 that had the greatest level of exposure and experience with topics that were of particular interest to Maine. The topics we covered included renewable portfolio standards (RPS) and procurement mechanisms, environmental permitting, transmission system planning, and regional collaboration opportunities. To protect the privacy of the interviewees, in this report we name only the states where these individuals have experience. These states include New Jersey, New York, and Massachusetts. The offshore wind developer we interviewed also had familiarity with permitting requirements for projects being developed off the New England seacoast.

While the subjects covered in many of these conversations overlapped, each conversation was designed to focus on specific topics. For example:

- New Jersey – The conversation focused on RPS and procurement mechanisms as well as transmission development
- New York – The focus was on RPS and procurement, transmission planning, and regional collaboration
- Massachusetts – This conversation focused on permitting, transmission development, and regional collaboration
- Offshore wind developer – The focus was on permitting requirements and interactions between state, federal, and private developers

DNV incorporated the insights gained through these conversations into the implementation options for the market strategies under consideration. Other key items to consider are noted in Section 3.2.

3.4 Market strategy impact assessment

DNV completed the market strategy impact assessment to understand the relative impacts of pursuing each identified market strategy, as part of determining the best options for the State of Maine to pursue when considering market mechanisms. Along with the impact assessment, DNV considered the potential scale of expected costs for each market strategy. We used these impact and cost metrics to complete a simple cost/benefit analysis for each market strategy that would help in the prioritization process.

DNV's impact analysis involved a screening of the market strategies against key social, environmental, and economic areas of interest (AOIs) and an assessment of the potential effects on each of those. The AOIs were derived from the work completed as part of the socioeconomic assessment. Table 3-2 provides a listing of the AOIs assessed for each market strategy.

Table 3-2. Areas of interest used for impact assessment

Area of interest	Why? (desired outcome)
Economic Development - Supply Chain	Maximize local job creation
Economic Development - Workforce Development	Maximize local job creation
Social cost of carbon	Minimize the negative impacts of climate change
Air quality	Minimize the negative impacts of energy generation on health
Energy Cost Burden	Achieve a total energy burden of 6% or less for households earning 80% of the median income of less[2]
Fisheries	Minimize negative impacts of OSW development on Fisheries
Port Development - Job Creation	Maximize local job creation
Port Development - Infrastructure Investment	Attract investment in local infrastructure
OSW Industry Advancement - Deployment Costs (LCOE)	Lower deployment costs
OSW Industry Advancement - R&D/Innovation	Increase local and exportable expertise
Tourism and recreation	Produce additional tourism opportunities while mitigating impacts on cultural characteristics
Ecological Impacts	Minimize impacts on sea life while seeking opportunities to enhance fish habitat

[2] Researchers estimate that housing costs should be no more than 30% of household income, and household energy costs should be no more than 20% of housing costs. This means that affordable household energy costs should be no more than 6% of total household income. For decades, researchers have used the thresholds of 6% as a high burden and 10% as a severe burden [49].

Area of interest	Why? (desired outcome)
Electricity export	Maximize local benefits from the sale of electricity outside of Maine
Community Involvement	Create and maintain open communication channels by incorporating local knowledge and decision-makers
Equitable sharing of benefits	Ensure State expenditures fairly benefit citizens
Investment / Finance	Attract financiers and project developers
Permitting	Attract financiers and project developers
Transmission Access - Capacity	Achieve viable project development

Leveraging past cost/benefit and impact analysis frameworks created by DNV and guidelines established by policy organizations, DNV set up a strategic planning framework for this impact assessment. The framework was designed to help DNV analyze and compare different strategies side by side and according to different metrics such as the total number of AOIs affected by a market strategy.

The framework was structured using a simple rating system. DNV rated the impacts of each market strategy using stakeholder feedback and desktop research. If the market strategy had a negative impact on an AOI, it would be given a score of -1. If it had a positive impact (benefit), it would be rated on a scale of 1-3, with 1 being an indirect positive impact, 2 being a moderate direct impact, and 3 being a high direct impact. If the strategy had no impact on an AOI, then it would be scored as 0. Each market strategy could then be viewed by the sum of its impact scores and the count of AOIs impacted.

Along with this impact assessment, DNV also considered the costs of implementing each market strategy. Similar to the impact assessment, the costs were rated on a scale of 1-3 with the lowest-cost items getting a 3 (low costs = high score). Costs were assessed based on fiscal impacts. Market strategies that have likely no fiscal impact and can likely be managed with existing resources or are federally funded would be considered low-cost (thereby receiving a high score). A market strategy deemed likely to have a high fiscal impact would be considered high-cost (and therefore receive a low score). These high-cost items require annual state appropriations to match any additional private contributions. They may also require several agencies (Department of Revenue, Treasurer, Energy) to set up and maintain a program (for example, see market strategy 5.3.1 - Establish public-private partnerships).

The scale of potential costs and the scale of impacts were then used to identify which market strategies should be considered from a cost vs. impact standpoint. The figure below shows how the priority scores were determined. The basic formula we used was:

Average Impact Rating x Cost Rating = Overall Rating

Market strategies that received an overall score of 6 or higher were considered most favorable, while those that received a score of 2 or less were considered not favorable. This composite scoring method offers the State and ratepayers a simple summary and means of ranking of the strategies relative to potential impacts, co-benefits, costs. Figure 3-1 shows the market strategy scoring matrix that was used.

Figure 3-1. Market strategy scoring matrix and results

			Cost		
			Low	Med	High
		Scoring	3	2	1
Impact	High	3		Policy: P-3, P-4 Finance F-2 Infrastructure: I-2, I-4, I-6	Policy: P-2
	Med	2	Policy: P-1, P-5, P-6, P-7 Finance: F-4, F-5 Infrastructure: I-3	Policy: P-8 Finance: F-1, F-3 Infrastructure: I-1, I-5, I-7	strategies not recommended
	Low	1		strategies not recommended	strategies not recommended

4 FINDINGS FROM PEER RESEARCH

This section covers the finding from the research that was conducted on peer jurisdictions. Along with the many reports and documents published by peer jurisdictions relating to the work done to prepare for offshore wind development in their geographic areas, DNV also reviewed several recent reports issued by Maine to understand recent activities that may be relevant to the offshore wind study and recognizing that Maine has already identified a series of renewable energy development-related strategies to pursue.

4.1 Maine climate and energy policies impacting offshore wind strategies

DNV reviewed several recent policy publications to identify prior work that aligns with offshore wind development strategies. These included the *Maine Won't Wait* climate action plan released by the Maine Climate Council in 2020 [36] and the *Renewable Energy Goals Market Assessment* (REGMA) study led by the GEO [37].

DNV found that the goals associated with *Maine Won't Wait* that are most relevant to offshore wind development include:

- Goal: Foster Economic Opportunity and Prosperity (specifically: leverage Maine's strengths and reverse workforce trends by supporting good-paying jobs that attract new workers and families, growing the economy, protecting key economic sectors most at risk from climate change, and fostering innovation in new business sectors that drive climate solutions.

- Goal: Advance Equity through Maine's Climate Response (specifically: the costs of Maine's inaction on climate change will be acutely borne by vulnerable communities, which should be given foremost consideration for opportunities and support from climate action; the benefits of climate-related job growth also require attention to support opportunities in communities and among workers in the greatest economic distress; continuous engagement with diverse groups of Maine people and communities, especially those most impacted by climate and climate actions, is required for the development of fair and effective programs and policies)

DNV found that the strategies associated with *Maine Won't Wait* that are most relevant to offshore wind development include:

- Strategy C: Reduce Carbon Emissions
  - Ensure adequate affordable clean-energy supply. Achieve by 2030 an electricity grid where 80% of Maine's usage comes from renewable generation, and set achievable targets for cost-effective deployment of technologies such as offshore wind, distributed generation, and energy storage, and outline the policies, including opportunities for pilot initiatives, necessary to achieve these results.
  - Initiate a stakeholder process to transform Maine's electric power sector.
  - Accelerate emissions reductions of industrial uses and processes (e.g., may create opportunities for hydrogen production from wind or other value streams).
- Strategy D: Grow Maine's Clean Energy Economy, Clean Energy Jobs in Maine:
  - Launch a workforce initiative by 2022 that establishes ongoing coordination between industry, educational, and training organizations.
  - Establish programs and partnerships by 2022 for cleantech innovation support. The plan recommends that Maine commit to increasing its current clean-energy workforce while establishing new supply chains for Maine-based manufacturers to create sustained, good-paying skilled-labor jobs across the state.
- Strategy E: Protect Maine's Environment and Working Lands and Waters

  - Develop policies by 2022 to ensure renewable energy project siting is streamlined and transparent while seeking to minimize impacts on natural and working lands and engage key stakeholders.
  - Expand outreach to offer information and technical assistance – Launch the Coastal and Marine Information Exchange by 2024.

- Strategy F: Build Healthy and Resilient Communities and Strategy (specifically CLEAN-ENERGY SITING: Maine should continue to work to achieve its ambitious renewable energy goals while balancing the protection of our natural resources, seeking siting that has the least impact on prime agricultural lands, and fishing and marine industries.)

- Strategy G: Invest in Climate Ready Infrastructure:

  - Raise Awareness About Climate-Change Impacts and Opportunities – Launch a multifaceted, ongoing communications effort in 2021 based on the Climate Action Plan to raise public awareness and understanding about climate change in Maine, the state's climate response actions, and climate-related programs and opportunities.

- Strategy H: Engage with Maine People and communities (specifically: Increase Public Education Offerings Related to Climate and Energy; Partnerships with business groups, nonprofits, tribal governments, municipalities, and community groups will help spread key messages. Multiple forms of communication, consumer education, and ongoing efforts will be necessary to support the state's goals.)

In addition, the following financing and funding options identified in the *Maine Won't Wait* plan are relevant to the offshore wind development strategies:

- Support targeted career technical education (CTE) and other career-training programs within Maine's community colleges and universities
- Revenue bonding: Long-term capital support for long-term state climate infrastructure projects could also be identified through revenue-bonding activities for state and local needs
- Maine green bank or green fund: The recently formed Maine Clean Energy and Sustainability Accelerator can leverage significant, low-cost private-sector capital to finance energy efficiency and clean-energy projects in households and businesses in Maine and over the longer-term climate initiatives and infrastructure.

The *Renewable Energy Goals Market Assessment* study included a key finding focusing on regional coordination. The report finds:

- Regional coordination can help lower the costs of meeting Maine's Renewable Portfolio Standard (RPS) - Coordinating resource and transmission development with neighboring regions may enable RPS compliance at a lower cost for Maine. Coordination among the New England states on transmission planning may enable Maine to share the costs of significant transmission investments with its neighbors while supporting the efforts of all six states to meet increasingly aggressive clean energy targets.

With these in mind, the sections below describe strategies that others are undertaking to enhance the market for offshore wind development that Maine may consider.

4.2 Energy Policy strategies

In general, Maine can support the growth of the offshore wind industry (both fixed-bottom and floating turbines) throughout New England and beyond. This may be achieved by designing policies to stimulate investment in infrastructure upgrades as well as supply chain and workforce improvements. Ideally, policies will drive an expansion of local capacity to support work

along the Atlantic Coast leveraging Maine port-based infrastructure, supply chain companies, and workforce—many of which already have expertise in oceanic fields such as transportation and vessel navigation.

Locally, Maine's existing maritime heritage and workforce can support the onshore assembly of floating wind foundations and the transport, via Maine barges and vessels, of the constructed structures to installation locations. By supporting this industry, land-based construction in Maine could promote the installation of floating offshore wind farms elsewhere by eliminating the need for the much larger and specifically designed foreign vessels that are currently required for fixed-bottom turbine installation. Another opportunity for Maine may be in the local modular fabrication and/or assembly of floating offshore wind components, which would allow the state to strike a balance between providing local content and having parts manufactured in other places where costs are more competitive.

Besides encouraging workforce and supply chain improvement, policymaking can also help reduce the levelized cost of energy (LCOE) for floating wind by supporting infrastructure upgrades and relevant workforce development. Because LCOE is sensitive to the industrialization of technologies and the scale at which they may be developed, any policymaking that would encourage the local development of this industry should be considered. Overall strategic early-phase public investment can greatly accelerate the development of regional supply chains and other efficiency improvements.

The following is a list of the key themes to consider when determining policy-related strategies to pursue:

- Mandates are primary drivers of investment and development, and the state should require some level of OSW supply in the RPS.
- Policies can be designed to support local or US suppliers and greatly benefit from knowing the local market and mapping possible local suppliers of components.
- Community and stakeholder engagement is necessary for successful program development.
- Focusing strategically on individual port development contributes broadly to economic development.
- Provide training and workforce development support for small businesses.
- Broaden the definition of "qualified offshore wind project[3]" to not only electricity generation but also transmission to allow for some flexibility in the development process.

4.3 Energy Financing strategies

Financing strategies help attract financiers and developers to the market and allow the state to participate in programs that lower costs or make funding more accessible. They may also encourage public investment through public-private partnerships or other mechanisms that can spur and accelerate concurrent private capital investments. Financing strategies may also involve de-risking the investment environment. For example, setting clear expectations for developers and financiers offers them a greater understanding of the conditions under which they are making investments, as well as greater awareness of the potential risks.

From a technology standpoint, floating wind turbines are relatively new to the market and thus carry technology-related risks. Any perceived risk or uncertainty tends to exacerbate costs. Maine may assist in reducing these types of risks by pursuing financing strategies that aim to support pilot projects to prove the viability of floating technology.

Other key themes to consider when determining which financing-related strategies to pursue:

- Seek to leverage public-private partnerships when possible.

[3] States like New Jersey have incorporated a definition for "qualified offshore wind projects" into state statute to mean "a wind turbine electric generation facility in the Atlantic Ocean and connected to the electrical transmission system in this State and includes the associated transmission-related interconnection facilities." The expansion of this definition is intended to produce more competitive solicitations for open access offshore wind transmission facilities designed to expedite the development of offshore wind.

- Explore financial assistance programs or loan funds for workforce development.
- Encourage competitive bidding in project development and procurement options.
- Utilize multiple contracts (shared) across purchasers, securing and financing loans in private sectors.
- Regularly track, measure, and communicate to stakeholders the economic impacts and other benefits realized through these investments.

4.4 Energy Infrastructure development strategies

Infrastructure development strategies can be designed to accomplish numerous complementary goals. These include reducing development costs and LCOE, increasing transmission capacity, increasing access to construction or operations vessels, expanding research and development, enhancing the supply chain, and more.

By deploying floating wind technology in Maine, the State can influence the long-term LCOE. Specific cost reductions could be gained through locally manufactured and supplied materials needed for platforms and sub-structures. Access to a suitable infrastructure of ports for hull component manufacturing, assembly, and storage and hull and turbine integration, operations, and maintenance are all critical to achieving the industrialization needed to lower the cost of developing larger wind farms.

Regarding transmission, if there is insufficient grid capacity available near an offshore wind farm, grid infrastructure upgrades will be needed. As offshore wind projects proceed in the United States, there will also need to be upgrades to transmission and distribution line capacities as well as substations and related infrastructure. Regarding vessel access, a specialized wind turbine installation vessel (WTIV) is not required, as the floating structure is assembled at the port and then towed by long-haul tugs from the port to the offshore site. Other specialized vessel types may be needed, however, for offshore wind projects that are not widely accessible, including cable-lay vessels (CLA) and service operation vessels (SOV).

For R&D, over 40 different floating-type concepts are under development today (see DNV's State of the Offshore Wind Industry report[46]). This is good for innovation and technology development but limits possible production. Once the industry gains more experience and confidence in particular concepts, large-scale production of foundations will be enabled. Further research is needed to reduce costs for shared anchor or mooring line solutions between turbines.

Finally, regarding the supply chain, recent efforts in the Northeast have created a somewhat fragmented market featuring duplicated efforts and potential or actual supply chain inefficiencies. As a result, much of the potential for supply chain economic development in the region has gone unexplored, with most development efforts concentrated in Europe. This research suggests that a collaborative development approach, a sharing of resources, and a leveraging of region-specific and unique local expertise can work to generate a diverse, resilient industry that will enable the region to compete on a global scale more effectively.

Other key themes to consider when considering infrastructure-related strategies to pursue:

- Port investment is an opportunity for continued offshore wind development and high-quality jobs.
- Consider transmission development options to create a coordinated approach to distribute costs instead of putting the costs solely on developers.
- Pay attention to state-level and federal siting requirements and permitting policies. Overlap and misalignments between requirements can create confusion for developers.
- Participate in multi-state, joint agency working groups to develop solutions for mitigating environmental and incumbent ocean user impacts.

- Set clear guidelines on what developers are responsible for (types of surveys, third-party oversight, stakeholder engagement, etc.).
- Encourage scale and healthy competition in the region.
- Pursue additional demonstration projects.
- Adopt a transparent process and clearly communicate the reasoning behind decisions about the development, design, and operations of an offshore electricity grid.

4.5 Insights from peer interviews

DNV conducted a series of interviews with representatives from peer jurisdictions to get their perspectives on pursuing certain market strategies in their states, which include New Jersey, New York, and Massachusetts. We also interviewed an offshore wind developer. The topics that were covered included procurement and RPS requirements; environmental permitting; transmission development; and regional collaboration opportunities. Below we summarize the key feedback we received.

4.5.1 Procurement and RPS requirements

Maine is considering including a requirement for offshore wind energy within the RPS along with guidance about which procurement mechanisms are best to adopt (ORECs, PPA, feed-in-tariff[4], etc., details below). Peers from other states that have undergone similar efforts noted the following:

- In New Jersey, the Offshore Wind Energy Development Act (OWEDA) of 2010 featured ORECs; this mechanism follows a simple, clean process and so far has been easy to work with. The procedure sets a price from the beginning and there are no contract negotiations. The mechanism is also designed to help manage and share risks, allowing for adjustments based on system upgrade costs.
- Each state will have its own interests to accommodate concerning procurement. In New York, the REC program is preferred because it can be aligned with zero emissions credits and offers an opportunity to work within the wholesale markets; New York is interested in pursuing a market-driven process. The OREC program in New York was designed to work within the NYISO framework and create the right market signals. Other mechanisms such as feed-in-tariffs do not harness a competitive desire; they are a prescribed value.
- The Massachusetts approach is a combination of RECs and purchase agreements; with purchase agreements, there can be less volatility on pricing (compared to RECs). Long-term contracts can provide hedging and be more palatable for utilities.
- Be aware that states' RPS requirements may not align with internal processes. It can take a good amount of time for any renewables project to collaborate with different agencies on issues like permitting, and the process may not align with the timeline for the state's goals.

4.5.2 Environmental permitting

Environmental permitting and the impacts of offshore wind on ocean habitats and resources are a concern for Maine and every other state pursuing offshore wind development. From the research into strategies used in other states in conjunction with the peer interviews, DNV noted the following items for Maine to consider:

- Permitting needs and impact assessments will be completed for all components of the offshore wind energy systems including the turbines, cables, substations (offshore and onshore) and there will be overlap between federal and state requirements (e.g., cable go through Federal waters into State waters). There tend to be a lot of gray areas concerning

[4] Feed-in tariffs (FITs) are a policy mechanism used to encourage deployment of renewable electricity technologies. A FIT program typically guarantees that customers who own a FIT-eligible renewable electricity generation facility, such as a roof-top solar photovoltaic system, will receive a set price from their utility for all of the electricity they generate and provide to the grid

jurisdictional rights, especially around coastal zone management issues. The process for submitting documents to BOEM and then coordination with the state could be made clearer.

- The State should explore ways to participate in or utilize the Fast 41 process. This is a permit management platform from the Federal Improvement Steering Council (FIPC) that lets the development team and all agencies involved follow timelines and durations of permitting approvals. It holds everyone accountable [53].
- When it comes to near-shore or onshore permitting, developers may need to work with local municipalities to get permits approved. This is another potential area of risk. New Jersey passed a law that allows developers to petition the BPU and have them take over decision-making authority if coordination with the municipalities is causing delays.
- There are procedural issues and substantive issues. With procedural issues, some can be worked out between parties (e.g., drawing from the same information [aligned with the State MEPA or similar]). With substantive issues, such as endangered species, there is no magic bullet, and it's difficult for states to move the needle on federal requirements.

4.5.3 Transmission development

Maine is exploring different strategies related to transmission development. Some notable feedback on this topic from the peer interviews included:

- Interconnections are a big issue. New Jersey uses more of a market-based approach that lets development teams determine where infrastructure will go, although the State requires developers to document why a location is preferred and what are the environmental and other implications.
- There was general agreement that there is no way states can reach their offshore wind deployment goals using only a radial system design; there will need to be a broader strategy for the east coast. New York has adopted a radial+ approach that requires additional connection ports on the turbines so that in the future they can be connected to a mesh network.
- It will be important for Maine to understand how to preserve optionality. Closely consider the loads and determine whether onshore or near-shore options pose the bigger challenge; also look closely at the system needs.
- Constraints in the onshore grid can be an issue if not identified early. The ISO-NE cluster study was done in phases and information on substation constraints was not available when needed. This led to one project needing to change its cable plans late in the process and add a cable spanning two states' waters. [60]
- State agencies may have the ability to invest in studies and stakeholder processes that provide developers more of a line of sight for long-term OSW needs (e.g., 2040 and 2050); for HVDC there will have to be policy mechanisms put in place for these systems to compete economically with near-shore infrastructure.

4.5.4 Regional collaboration

Regional collaboration is another area of interest for Maine given the geography of the area and the interests of the other New England states in pursuing offshore wind projects to help meet their GHG emissions reduction goals, but as some of the peers noted, some areas of offshore wind development are better suited for collaboration than others.

- If there is to be regional collaboration on issues such as transmission development, it is important to have a decision-making framework in place that everyone agrees on. Different projects may benefit states in different ways.
- Fishing and environmental topics such as wildlife issues are areas where there needs to be better regional collaboration; where it gets more difficult is around the supply chain. There is lots of interaction between states anyway on development issues, try and capture where there are win-win situations.
- BOEM has an interest in states pursuing jobs creation, equity, and environmental justice more aggressively. States and BOEM should be sharing lessons learned and best practices related to these topics.
- NYSERDA recently published a document called: Guiding principles for stakeholder engagement[20]. This speaks to more active principles of engagement efforts rather than tactics (e.g., what does it mean when we say collaborative

design or what is the purpose of working with youth on how OSW is an important tool in combatting climate change). Use these opportunities to build the next generation of constituencies.

- It has been reported by other states, that there has been a lot of emphasis on fisheries, but not enough on tribes. Everyone should acknowledge that there will be different conversations with different communities. Make it easy for tribes to engage in the process. For example, use online platforms for information sharing and meetings [61].

Along these lines, many interviewees mentioned the importance of stakeholder engagement. One interviewee noted that it's tricky to strike a balance between keeping stakeholder groups informed, collecting adequate feedback, and managing stakeholder fatigue. For example, when groups have specific asks with commercial fishermen, they will note areas to be avoided. The industry needs to be clearer that not all requests can be accommodated and the reasons why. Frustration stems from perceptions of expressing concerns to the industry but then not seeing any action in response. The industry needs to do a better job of communicating back to groups why something can or can't be done.

Lastly, it was noted that U.S. Secretary of the Interior Haaland recently signaled that the glide path for the announcement of the Maine leasing areas is scheduled for 2024 and that Maine should use the time now to deconflict and build the social infrastructure needed for these projects to succeed.

5 IMPACTS OF MARKET STRATEGIES UNDER CONSIDERATION

This section provides the results of the impact assessment along with potential implementation options for each market strategy as well as some examples from other states. Prioritizing the deployment strategies required an analysis of the potential impacts of each market strategy being considered. DNV's impact analysis involved assessing the effects of market strategies on those key social, environmental and economic areas AOIs described in Section 3.4. The AOIs positively affected are noted for each market strategy below. DNV also considered the cost of implementing each market strategy. As previously discussed, the potential costs were rated (high, medium, low) depending on the current financial and staffing resources available to the state. These costs were then weighed against the effects on each AOI (i.e., benefits) to determine an overall rating for each market strategy.

How to interpret the overall ratings for each market strategy

Each market strategy below includes an Overall rating box, color-coded as follows:

- **Green** indicates market strategies that DNV ranks as higher priority based on this assessment
- **Yellow** indicates market strategies that need further consideration

The ratings box also contains symbols indicating how favorably the market strategy was viewed by the working group (through previously conducted polling) and the estimated potential costs and relative impacts of each market strategy on the AOIs. In this way, the reader can readily see how the market strategy scores overall as well as how it's potentially viewed by stakeholders against its value in terms of impacts. The symbols used are:

⊕ Viewed Favorably / High Relative Impact

⊖ Neutral Favorability Rating / Moderate Relative Impacts

⊗ Needs further consideration / Low Relative Impact

In any case, a market strategy could receive an overall rating as higher priority (green box), but could be flagged for further consideration based on the working group feedback, costs, or impacts rating. This means that the market strategy is valuable to pursue but may require further input from stakeholders or analysis.

Below is a summary of the impact analysis for each identified market strategy. These are organized into three categories: Policy, Infrastructure, and Financing.

5.1 Policies

The following table provides a summary of the policy market strategies assessed along with the feedback received from the working group, potential costs, relative benefits, and DNV's prioritization. Further detail is provided on each of the policy market strategies below.

Table 5-1. Policy market strategies assessment summary

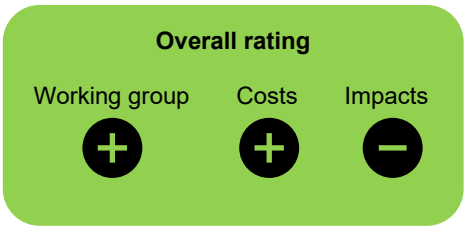
Market Strategy	W.G. Input*	Potential Costs	Relative Impacts	Priority
P-1. Pursue an offshore wind RPS requirement	+	+	−	+
P-2. Provide programs and resources to maximize economic development opportunities	−	✖	+	−
P-3. Small business support for offshore wind development	−	−	+	+
P-4. Create a state-level entity focused on supply chain and workforce development	−	−	+	+
P-5. Continue to engage local institutions on research, training, and demonstration projects	+	+	−	+
P-6. Foster local government partnerships	−	+	−	+
P-7. Engage in local direct communications with affected communities	+	+	−	+
P-8. Pursue mechanisms that enable local community access to offshore wind energy resources	−	−	−	−

*This input does not necessarily represent the feelings of the entire working group and only reflects the input of a sub-set of members who provided feedback during the polling

Table Legend: + Favorable − Neutral ✖ Low favorability

5.1.1 P-1. Pursue offshore wind RPS requirement

Summary



The objective of this market strategy is to determine which RPS compliance requirement and procurement mechanisms are best suited for Maine to support the cost-effective and responsible deployment of offshore wind.

The RPS as currently written for Maine establishes that 80% of Maine's electricity must be from renewable resources by 2030 with a goal of 100% renewable resources by 2050. This market strategy would determine the best way to add to the RPS a requirement for a specific level of renewable electricity that must be produced by offshore wind resources along with a structure for procuring those resources. These types of mandates are considered primary drivers of investment and development and several other states have set requirements for offshore wind including MA, NY, CT, and NJ. It is assumed that the RPS requirement would be fulfilled through a Load Serving Entity (LSE) Compliance Obligation.

Costs and benefits

This market strategy is viewed as a key driver of offshore wind development. It was supported by working group participants and will likely have a minimal fiscal impact on the State of Maine.

Costs

DNV assumes that the current system used by the state to track renewable energy credits will be sufficient. Costs associated with implementing this market strategy may include additional staff and resources needed to implement, oversee, and promote the program(s). Because Maine currently has an established RPS requirement, DNV assumes that the costs of expanding the RPS to include an offshore wind carve out can be absorbed or accommodated within an agency's existing budget.[19]

Besides the implementation costs, this action could negatively impact some areas of interest. Requiring some level of offshore wind in the RPS could have a negative impact on energy cost burdens if the cost of developing that resource exceeds the cost of developing other renewable resources with comparable value. The development of offshore wind will also have impacts on fisheries and other ocean ecosystems. These impacts will need to be assessed and mitigated if necessary.

Benefits

This market strategy contributes in a positive way to many of the areas of interest that offshore wind development could impact. Table 5-2 lists the various positive contributions this action would have.

Table 5-2. Pursuing an offshore wind RPR requirement: AOIs, outcomes, and positive contributions

Area of Interest	Desired Outcome	Contribution by this Action
Economic Development – Supply Chain	Maximize Local Job Creation	Creating an organized pipeline of offshore wind solicitations will increase investments in domestic supply chain services (this should be coordinated with market strategy 5.2.2, Engage with others on a regional development strategy).[21]
Economic Development – Workforce Development	Maximize Local Job Creation	Offshore wind development at scale will provide considerable economic development opportunities for Maine and create a wide array of jobs, ranging from construction, supply chain, to plant operations, engineering, and finance-oriented jobs.
Social Cost of Carbon	Minimize the negative impacts of climate change	Offshore wind is anticipated to be a key contributor to Maine reaching its renewable energy and greenhouse gas emissions reductions goals. This market strategy provides a regulatory means to meet those goals.

Area of Interest	Desired Outcome	Contribution by this Action
Air Quality	Minimize the negative impacts of energy generation on health	Offshore wind presents a significant public health opportunity by replacing electricity generated by fossil-fuel energy and avoiding the associated air pollutants that adversely affect air quality.
Tourism and Recreation	Produce additional tourism opportunities while mitigating impacts on cultural characteristics	With offshore wind development comes new “curiosity trips” along the coast, and excitement about innovation
Investment and Finance	Attract financiers and project developers	Procurements that provide long-term contracts are necessary for offshore wind projects to be financed and constructed [21].

Maine’s Prior Procurement Practices

In 2019 the Maine Legislature expanded Maine’s Renewable Portfolio Standard to require 80% renewable electricity by 2030. To support achievement of this requirement, the legislation directed the PUC to solicit competitive contracts with renewable resources that will result in a specified number of kilowatt hours of new renewable energy. The legislation is not prescriptive and allowed the PUC to issue an RFP for either energy, capacity, and/or RECs. The PUC is able to select bids that are most aligned with the public interest and cost effective for ratepayers. This has resulted, to date, in the PUC largely selecting contracts for energy that allow the developer to sell all kilowatt hours produced by a renewable project at a highly competitive price to Maine’s transmission and distribution utilities. Under most of these contracts, utilities purchase all energy output of the projects, while the capacity value and RECs are typically retained by the developer.

Procurement Options for Maine

The deployment of offshore wind is dependent on first establishing an appropriate procurement method. Without the mechanism in place to purchase offshore wind, it will be difficult for Maine to implement several of the other strategies referenced in this report. DNV reviewed state-initiated procurement processes of other eastern seaboard states as the basis for the options discussed below. Based on the research, the states that have procured OSW, or are in the process of procuring it, have generally begun with either a procurement law or executive authority followed by a procurement law. Drawing on the experience from other states, the following illustrate different options that Maine can choose in establishing and implementing an offshore wind procurement strategy. One item to note is that Maine does not have special REC carve-outs for any renewable technology at this time.

Power Purchase Agreements

Using this option, the power generator would receive a fixed rate for the electricity supplied as well as the RECs. This is sometimes known as a bundled PPA. The fixed rate is determined through a competitive bidding process or auction and is not determined or subject to changes in the wholesale market commodity price. This structure provides a hedge against fluctuations in commodity electricity prices, thereby reducing the risk and costs of financing. Under this option, an RFP is issued to procure bids from qualified offshore wind project developers. Participating utilities would seek predetermined-sized projects capable of providing a predetermined volume of energy, capacity, and/or offshore wind RECs. The utilities would then either resell the offshore wind project’s energy and capacity to their customers or sell the offshore wind project’s energy

and capacity into the wholesale markets while retaining the project's offshore wind RECs for compliance purposes and/or selling them to other state LSEs.

Alternatively, the legislature could direct the entities with RPS requirements to purchase their needed RECs from the Maine project as part of the OSW procurement, rather than buying RECs from other sources. The legislature or state agencies could provide some assurance to ratepayers' electricity costs by setting the price at the time of the RFP (or in the procurement bill) on a fixed price schedule rather than a fluctuating future market price. A pre-set price would avoid the problem of the developer overpricing energy due to not knowing the future price of RECs (risk of forecast error). For that reason, having a contracted REC price, even if not covering all MWh of generation nor the whole PPA period, can be helpful in reducing the PPA energy price.

The use of a PPA does require careful structuring of the contractual agreement to ensure that PPA purchasing requirements are not imputed as debt on the utility's ledger, which would reduce the utility's creditworthiness and potentially require the utility to raise offsetting equity. This can be addressed in the requirements of the RFP and in the contract between the developer and the utility.

Offshore Wind Renewable Energy Credits.

Another option is the use of RPS and REC mechanisms in parallel with the price. States like Massachusetts, as well as Rhode Island and Connecticut, have used a PPA for their utilities to buy offshore wind electricity along with RECs from developers (under conditions set by the state), while others have created a newer mechanism called Offshore wind Renewable Energy Credits (ORECs). ORECs are the clean energy attributes from an offshore wind project that can be sold to the market. Under these types of arrangements, the project developer sells the RECs it generates to an LSE to meet compliance obligations or a central clearinghouse where the RECs can be obtained by the LSEs. The electricity and capacity would be sold separately by the developer in the wholesale power markets. There are some variations of these arrangements that can affect the level of risk borne by different participants. For example, there is a Market-based OREC that sets a "strike price" (the revenue needed to build and operate the project); the REC price is based on the difference between actual revenue received by the generator and the strike price (this is the structure used in Maryland).

Another option would be an Index-based OREC wherein the strike price is set but the REC price is based on a reference price derived from an index or composite price comprising average energy and capacity values over a period of time (this is the approach New York has taken). The first option is somewhat more complicated to administer as it requires the generator to report sales. It may also introduce risks in competitive supply markets where the incentive to maximize energy and capacity sales from offshore wind may be decreased when market prices are low. The alternative is somewhat simpler to administer and provides adequate hedging which lowers the cost of finance.

Contract for Difference is another structure used in the UK that is similar to Indices-based ORECs in certain aspects; however, Contracts for Difference are not allowed in the U.S. in jurisdictions where the generator has to clear a capacity auction in a federally regulated wholesale market. Other options that may be considered by Maine include a Fixed Price REC similar to current Tier 1 fixed-price REC procurements, a split-PPA, or forward-looking ORECs. These options could help mitigate some of the identified costs associated with implementation options, such as energy cost burdens and administrative costs. Forward-looking ORECs can reduce upfront costs and allow for upcoming plans to include the budgetary components of this strategy. Options like Feed-in-Tariffs can act as an alternative to Contracts for Difference, and encourage renewable technologies above-market pricing schemes.

Procurement Options Assessment

Research conducted by Delaware and New York identified the following factors to consider when selecting a preferred procurement mechanism [55][56]:

- The Fixed REC structure is relatively simple to implement; the process and associated solicitation and contract documents are well-established. Continued use of a Fixed REC contract may not incentivize developers to develop and build offshore wind in Maine, especially if there are more attractive incentives available in other regions.
- Bundled PPA for offshore wind would likely require action by the PUC to ensure procurements are initiated by utilities to meet targets and goals. As discussed above, a bundled PPA with a utility would provide a project with a strong energy hedge with a creditworthy party, thus providing an optimal means of facilitating financing of new renewable generation and increasing the likelihood that contracted projects would be built.
- Market ORECs tend to be more complex administratively but could help Maine meets its renewable energy goals by incentivizing developers to enter the Maine market. By "locking in" the value of energy as well as offshore wind RECs for the contract term, this option could also reduce the risk that a contracted project would not be able to obtain financing due to a reduction in market energy prices following a contract award.
- Index ORECs will have many of the implementation needs similar to Market ORECs, with no major impediments to launching a near-term offshore wind procurement, although further specifics would have to be developed regarding the formula for the Reference Price. This approach hedges commodity revenue risk by reference to a market price index (or composite of indices) rather than the generator's actual commodity revenue.
- In reviewing the PPA and OREC methods used in other states, PPAs contracted with utilities were found to be the most common way of purchasing wind projects.
- Because Maine already has an RPS requirement, an offshore wind project could use the existing RPS requirement and REC mechanism rather than creating a new mechanism.

Regional Procurement

If it is Maine's goal to develop offshore wind projects, it may consider joining other states to develop effective procurement mechanisms to overcome the major barriers associated with such projects, including high capital costs, lack of infrastructure (e.g., transmission, ports) and regulatory issues. A multi-state approach would require states to work together in pursuing the development of one or more offshore wind projects. Research suggests there are several potential benefits to regional procurement including [57]:

- It would standardize solicitation documents which would support a streamlined procurement process
- A single procurement could result in a shorter development period for multi-regional projects.
- The states would jointly negotiate a PPA with an offshore wind developer which would allow them to be in stronger negotiating position
- The states could leverage their position over the developer's selection of equipment suppliers and construction firms, possibly ensuring that the supply chain remains locally sourced.

Examples from other states

At least 21 states and Washington, D.C., have credit multipliers, carve-outs, or both for certain energy technologies in their RPS policies. The following examples highlight the variation in implementation in the northeast [19].

In **Massachusetts**, the Energy Diversity Act, Chapter 188, signed by Governor Baker in August 2016, directed the Massachusetts Electric Distribution Companies (EDCs) to jointly and competitively solicit proposals for 1,600 megawatts (MW) of offshore wind energy generation through multiple solicitations. This Act required the state's distribution utilities to sign long-term contracts for offshore wind energy generation via a PPA. Under the PPA structure, the developer receives a predetermined payment for its generation, regardless of the price that generation sells for in the wholesale market. This structure provides revenue certainty for the developer resulting in lower-cost financing. Rhode Island and Connecticut have used a similar approach.

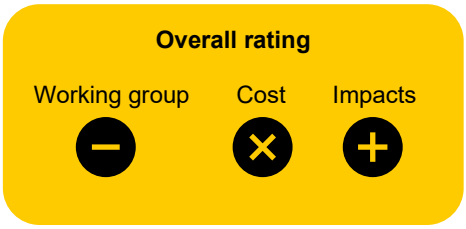
ORECs emerged in **New Jersey** and were subsequently adopted and implemented in Maryland and New York. New Jersey began crafting an OREC mechanism in the late 2000s to support the implementation of the Governor's Energy Master Plan, and later, the Offshore Wind Economic Development Act (New Jersey Legislature 2010). The creation of an OREC procurement mechanism was subsequently adopted in Maryland, with HB226, the Maryland Offshore Wind Energy Act of 2013 (Maryland General Assembly 2013). HB226 distinguished ORECs from RECs, noting that ORECs would include energy, capacity, ancillary services, and environmental attributes.[5]

In **New York**, NYSERDA solicited bids for both Index ORECs and Fixed-Premium ORECs, but ultimately selected the Index OREC approach based on the "strong index OREC prices" that were submitted and the "reasonable and efficient hedge against energy and capacity market uncertainty that the structure provides, leading to more viable projects from an execution standpoint in the long run." [50]

5.1.2 P-2. Provide programs and resources to maximize local economic development opportunities

Summary

As a policy and through legislation, Maine would support local economic development by budgeting for and creating programs that support small or local businesses that may participate in the offshore wind industry development. This may entail creating a special office for offshore wind development whose goal is to seek out potential participants and provide resources that help build the local OSW supply chain in Maine.



Costs and benefits

This market strategy received mostly neutral ratings from both the working group feedback and the impact assessment; however, also has potentially high costs associated with it, and it is therefore recommended that further consideration be given to this initiative before pursuing. These types of strategies may also be pursued by other working groups as well as part of their review and strategy development process.

Costs

The fiscal impact of implementing this market strategy varies depending on the amount and sources of the funding. States are funding workforce development activities through state and federal tax preferences, federal and private grants, and state appropriations. As noted in the section above, states are committing between $2 million and $5 million each year to fund workforce development in offshore wind.

Benefits

This market strategy contributes in a positive way to many of the areas of interest that offshore wind development could impact. Table 5-3 below lists the various positive contributions this action would have.

[5] NREL, Comparing Offshore Wind Energy Procurement and Project Revenue Sources Across the US States, June 2020

Table 5-3. Providing programs and resources to maximize economic development opportunities: AOIs, outcomes, and positive contributions

Benefits by Area of Interest	Desired Outcome	Contribution by this Action
Economic Development – Supply Chain	Maximize local job creation	Maximizing economic development includes resourcing from stakeholders all along the supply chain.
Economic Development – Workforce Development	Maximize local job creation	Incentivizing growth in local infrastructure, operational, and manufacturing industries will promote economic growth at a regional level.
Port Development – Job Creation	Maximize local job creation	Funding additional programs that enable local businesses to support the OSW industry will necessitate local job growth
Port Development – Infrastructure Investment	Attract investment in local infrastructure	Investing in local infrastructure funding mechanisms will expand local workforce development opportunities
Equitable Sharing of Benefits	Ensure state expenditures fairly benefit citizens	Providing workforce training and development programs all along the supply chain will allow for equitable access to beneficial programs
Investment/Finance	Attract financiers and project developers	Initial project funding will further attract additional financing partners and investors

Possible implementation options

There are several implementation options for this market strategy, including:

- **Create programs to provide grants or other financial support** for community benefits programs that are funded through OSW development fees or similar. This is different from other options in that it would be funded through development fees as opposed to other state funding sources. Offshore wind auctions for leased areas can allow for innovative financing; auctions with lease stipulations can increase price bidding and discovery, as well as boost local economic development, supply chain, and workforce development.
- **Support local economic development programs by providing funding opportunities and resources that help build the local OSW supply chain** (may include activities such as developing a mapping of local components suppliers, creating innovation hubs, and targeting investments).
- **Identify and develop locally those elements of supply chain offering the greatest benefits for Maine** and then seek to provide funding programs or financial support to offshore wind workforce development programs focusing on those elements to scale resources and build capacity.

Examples from other states

To capture the benefits of the offshore wind industry, states are committing resources toward workforce development in the offshore wind industry. Some examples include:

The governor of **Virginia** announced in 2019 that the 2020 budget would include $733 million in funding for clean energy and environmental initiative. As part of that $40 million would be invested in upgrades to the Portsmouth (VA) Marine Terminal to support the local offshore wind supply chain and $10 million would go to a revolving loan fund to help local governments and residents invest in renewable energy projects. In addition, the state would also create an Office of Offshore Wind to drive statewide policy that supports offshore wind, work with stakeholders and coordinate economic development opportunities.

New York has announced the availability of $20 million for an Offshore Wind Training Institute.

Massachusetts has awarded 15 grants (six in 2019 and nine in 2020) for over $2 million to colleges, labor unions, businesses, and community organizations to establish or expand workforce training and development programs that support the state's emerging offshore wind industry. In addition, the state also issued offshore wind business and workforce development grants in 2018 to local emerging and minority-owned businesses to help them prepare for the development of two offshore wind projects that are being developed by US Wind, Inc. (a 250 MW project) and Skipjack Offshore Energy, LLC (Orsted) (a 120 MW project).

Maryland set aside $2.8 million to fund training centers to "ensure Maryland has a ready and able workforce capable of contributing to the construction, installation, and operations & maintenance of an offshore wind energy project."

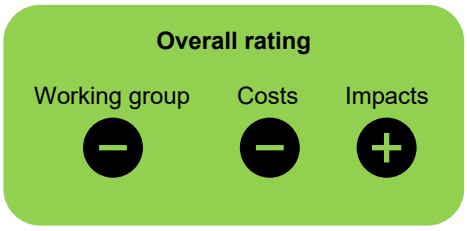
New Jersey will provide $4.5 million to support offshore wind workforce development projects. These funds will support investments made by the Wind Innovation and New Development (WIND) Institute based upon a stakeholder prepared blueprint for a training center.

Carolina Long Bay, an offshore area off the coasts of North Carolina and South Carolina, will allow offshore developers to bid on 2 leased areas through an offshore wind energy auction. Stipulations in the auction allow for building out supply chains within the US and encouraging investment in energy workforce training. This could result in 1.3 gigawatts of offshore wind energy potential and secure local resources and workforce development [54]

The Real Jobs Rhode Island provided a $2 million grant to create WindWinRI to design and implement career pathways training system to meet the needs of the offshore wind industry in Rhode Island.

5.1.3 P-3. Small business support for offshore wind development

Summary



This market strategy is intended to establish a small business support program that enables citizens and/or local governments to invest in both workforce and renewable energy development within Maine. Under this market strategy, Maine would set up a trust or loan fund to help small, women- and minority-owned businesses in Maine access capital and position their businesses to participate in the offshore wind industry development, primarily focusing on workforce development and supply chain opportunities. This is distinguished from the prior market strategy (P-2) in that its focus is on small businesses while P-2 is focused on more broadly supporting economic development.

Costs and benefits

While this market strategy received generally neutral feedback from working group respondents, this market strategy is believed to have wide-ranging benefits relating to economic development, job creation, community, equity, and investment. Moderate costs are associated with this type of program, but it is still recommended that the state consider this type of strategy.

Costs

Initial funding, or capitalization, of a revolving loan fund usually comes from a combination of public sources, such as the local, state, and federal governments, and private ones like financial institutions and philanthropic organizations. Funding acquired for capitalization is usually the equivalent of a grant – it does not need to be paid back. State and local governments often use one or a combination of the following to capitalize an RLF: tax set-asides, general obligation bonds, direct appropriations from the state legislature, federal funds and grants,[6] annual dues from participating counties or municipalities, and funds directed from the state lottery. As noted above, the funding commitment varies widely by state with the low end near $2.8 million (Maryland) to $750 million (Massachusetts). Additionally, securing state funding and other grants can be used strategically to capture additional funding opportunities such as federal grants.

Benefits

This market strategy contributes in a positive way to many of the areas of interest that offshore wind development could impact. Table 5-4 below lists the various positive contributions this action would have.

Table 5-4. Establishing a small business support program: AOIs, outcomes, and positive contributions

Benefits by Area of Interest	Desired Outcome	Contribution by this Action
Economic Development - Supply Chain	Maximize Local Job Creation	Initial funding partnerships will have cascading effects on the development of local jobs
Economic Development – Workforce Development	Maximize Local Job Creation	Initial funding partnerships will have cascading effects on workforce education and training
Social Cost of Carbon	Minimize the negative impacts of climate change	This market strategy is expected to indirectly improve climate change-related costs
Port Development – Job Creation	Create jobs by developing existing port infrastructure	Investment in businesses will support further job creation
Community Involvement	Create and maintain open communication channels by incorporating local knowledge and decision-makers	Engages and supports disadvantaged members of the community to create benefits for their business and local community.

[6] States like Massachusetts are using funds received through the American Rescue Plan to help fund grants, loans, and equity investments for renewable energy projects.

Benefits by Area of Interest	Desired Outcome	Contribution by this Action
Equitable Sharing of Benefits	Ensure benefits of offshore wind development are shared across all members of a community	Benefits of finance and investment, as well as job opportunities, would be shared across a diverse set of business owners and other stakeholders
Investment/Finance	Attract financiers and project developers	Provide financing for and investment in small businesses, creating an attractive environment for investors.

Possible implementation options

There are many options for creating a small business support program, however, the following were noted as potential approaches for the state to consider:

- **Establish a small business support program** to invest in the workforce and renewable energy supply chain development in Maine, focusing a portion of the program specifically on investment in small women- and minority-owned businesses. Additional support could also be provided to economically distressed communities. This market strategy could utilize private and/or public funding to help ensure that the process of maximizing local job creation from offshore wind development is equitable.
- **Develop legislation or regulatory requirements** that specify offshore wind projects devote a specified percentage of monetary contribution to fund programs that support small and/ or women- and minority-owned businesses in the offshore wind industry in Maine.
- **Create a small business development fund** to allow businesses to expand operations and workforce and contribute to the OSW development as well as O&M of the turbines. Similar models have been used in MA, MD, & NJ (see also market strategy 5.1.3). Along these lines, Maine can capitalize on the Maine Jobs & Recovery Plan to direct funds towards energy efficiency initiatives across the state, including workforce development and small business funding.

Examples from other states

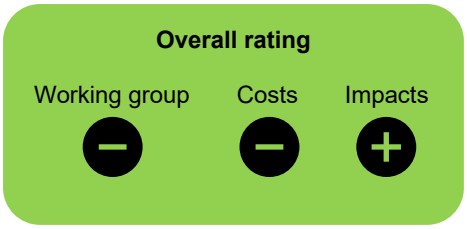
In **Massachusetts**, Commonwealth Corporation, a quasi-public agency, was established to administer and deliver a wide range of publicly and privately funded programs. In the building industry sector, the organization forms partnerships that aim to address the skill needs of specific employers in an industry and create new or expanded capacity in education and training programs for demand occupations. The Workforce Training Fund Program was established to help address business productivity and competitiveness by providing resources to Massachusetts businesses to fund training for current and newly hired employees (see https://commcorp.org/header_program/workforce-training-fund-program/)

Ørsted, the developer for Ocean Wind 1 and 2 off the coast of New Jersey has promised $23 million for small, women, minority, and veteran-owned businesses to accelerate and support their entrance and advancement in the offshore wind industry.

5.1.4 P-4. Create a state-level entity focused on supply chain and workforce development

Summary

Under this scenario, Maine could establish a state organization or collaborative group committed to the development of the offshore wind supply chain. Other jurisdictions, such as Massachusetts (MassCEC) and New York (NYSERDA), have similar efforts underway, focused on accelerating offshore wind development within their jurisdictions, with activities that include building a directory of local and global supply chain partners.



Costs and benefits

This action received favorable feedback from those that responded to the working group poll on the draft list of market strategies. It is also seen as having wide-ranging positive impacts across the various areas of interest and although it would likely to be associated with moderate levels of investment, it is prioritized for the state to consider this market strategy.

Costs

Costs associated with establishing a new agency, department, and/or program to oversee a domestic supply chain and workforce for offshore wind will include administrative, programmatic, and capital costs. Additional funding for programs, training centers, academic institutions, start-up and manufacturing centers can be funded through a variety of state and/or federal mechanisms. States that have implemented similar strategies have invested between $2 million and $700 million in establishing a state economic development agency dedicated supply chain and workforce development.

Benefits

This market strategy contributes in a positive way to many of the areas of interest that offshore wind development could impact. Table 5-5 below lists the various positive contributions this action would have.

Table 5-5. Creating a state-level entity focused on supply chain and workforce development: AOIs, outcomes, and positive contributions

Benefits by Area of Interest	Desired Outcome	Contribution by this Action
Economic Development - Supply Chain	Maximize local job creation	State-sponsored agencies encourage local job growth through expanding clean energy roles and connecting stakeholders along the supply chain
Economic Development - Workforce Development	Maximize local job creation	OSW accelerators require full-time staffing and coordination to oversee development, expansion, and cross-collaboration efforts
Social cost of carbon	Minimize the negative impacts of climate change	State funding and grants can be utilized through state-level entities and directed towards clean energy

Benefits by Area of Interest	Desired Outcome	Contribution by this Action
		goals, including reduced emissions and decarbonization
Port Development - Job Creation	Maximize local job creation	Municipal coordination can decrease development timelines and streamline workforce development through port infrastructure and development
Port Development - Infrastructure Investment	Attract investment in local infrastructure	Input from state-level agencies will attract investors through lower risk financing options
OSW Industry Advancement - Deployment Costs (LCOE)	Lower deployment costs	Efforts from state entities can better access funding opportunities to streamline deployment costs and coordinate operations to reduce costs
OSW Industry Advancement - R&D/Innovation	Increase local and exportable expertise	A central hub for coordinating OSW and other clean energy efforts will increase local expertise among key stakeholders
Equitable sharing of benefits	Ensure State expenditures fairly benefit citizens	State-level goals may require equitable access to benefits generated from energy projects and dedicated workforces can ensure these goals are met

Possible implementation options

This market strategy would require legislative action to create and define the scope of such an organization. The Governor's Energy Office would continue to oversee energy policy and analysis for the state of Maine, while this entity would focus more on being a convenor of resources, creating effective partnerships among private industry, government, and academia that benefit the state of Maine and advance renewable energy production.

As part of the Maine Offshore Wind Initiative, and in collaboration with Business Network of Offshore Wind (BNOW), Maine developed and maintains the Maine Offshore Wind Supply Chain Connect where companies can express interest in participating in supply chain development for the industry [51].

Examples from other states

In **New York**, The New York State Energy Research and Development Authority, known as NYSERDA, promotes energy efficiency and the use of renewable energy sources. These efforts of this organization are aimed at developing a less polluting and more reliable and affordable energy system for all New Yorkers. Collectively, NYSERDA's efforts aim to reduce greenhouse gas emissions, accelerate economic growth, and reduce customer energy bills.

NYSERDA works with stakeholders throughout New York including residents, business owners, developers, community leaders, local government officials, university researchers, utility representatives, investors, and entrepreneurs. NYSERDA partners with them to develop, invest, and foster the conditions that:

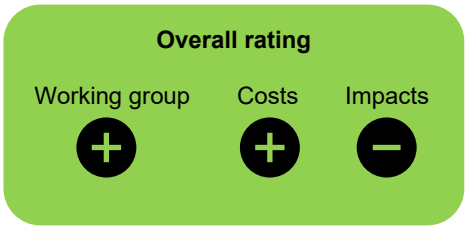
- Attract the private sector capital investment needed to expand New York's clean energy economy
- Overcome barriers to using clean energy at a large scale in New York
- Enable New York's communities and residents to benefit from energy efficiency and renewable energy[7]

In **Massachusetts**, The Mass Clean Energy Center was created in 2009 as a quasi-public agency as authorized under Massachusetts State Legislation. According to their website, MassCEC is a state economic development agency dedicated to accelerating the growth of the clean energy sector across the Commonwealth to spur job creation, deliver statewide environmental benefits, and secure long-term economic growth for the people of Massachusetts. MassCEC works to increase the adoption of clean energy while driving down costs and delivering financial, environmental, and economic development benefits to energy users and utility customers across the state. MassCEC funds programs that incentivize clean energy technology installations, provide financing for early-stage companies and technology development as well as investments in training programs to build a clean energy workforce [22].

5.1.5 P-5. Continue to engage with local institutions on research, training, and demonstration projects

Summary

Under this market strategy, Maine would continue to work with local universities and other relevant institutions[8] on research and development activities to reduce deployment costs, assess local impacts, expand demonstration projects, and address supply chain or technology-related issues. This may also include engaging with local institutions or organizations to develop workforce training programs.



Costs and benefits

This market strategy was seen as favorable overall by the working group and was noted as a key strength of Maine. This is considered a low-cost item for the state, but still helping to support economic development activities and lower the cost of offshore wind technologies.

Costs

To date, Maine's ongoing activities have been funded through federal grants, state and local funds, and private investments. Ongoing efforts to engage with these institutions are likely to be minor and can be absorbed within existing budgeted resources.

Benefits

[7] For more information, see https://www.nyserda.ny.gov.

[8] In 2019, the Governor's Energy Office launched a Maine Offshore Wind Initiative dedicated to the growth of this new industry through strategic planning, research, and coordination with groups from Maine. The state is also working closely with neighboring states and the federal government to evaluate regional opportunities in offshore wind energy in the Gulf of Maine. In 2021, Maine joined the National Offshore Wind Research and Development Consortium (NOWRDC) which supports and promotes offshore wind R&D activities.

This market strategy contributes in a positive way to many of the areas of interest that offshore wind development could impact. Table 5-6 below lists the various positive contributions this action would have.

Table 5-6. Continued engagement with local institutions on research, training, and demonstration projects: AOIs, outcomes, and positive contributions

Benefits by Area of Interest	Desired Outcome	Contribution by this Action
Social Cost of Carbon	Minimize the negative impacts of climate change	Finance the research and deployment of new technology may help reduce the environmental impacts of offshore wind deployment
Economic Development - Supply Chain	Maximize local job creation	Provide continuous opportunities for job creation through research, training, and demonstration
OSW Industry Advancement – Deployment Costs (LCOE)	Lower deployment costs	Research on components and enhancement of the local manufacturing, assembly, and construction skills will contribute to lower project costs
Economic Development - Workforce Development	Maximize local job creation	Finances and creates programs to train for jobs related to the deployment of offshore wind
OSW Industry Advancement - R&D/Innovation	Increase local and exportable expertise	Creates partnerships to finance and advance research and development

Possible implementation options

This market strategy continues to build off the work being done under the Maine Offshore Wind Initiative. In alignment with the offshore wind road-mapping activities, this work will continue to be dedicated to the growth of the industry but with particular emphasis on research and coordination with groups from Maine to improve manufacturing, logistics, permitting, and innovation. As noted in the U.S. DOE Offshore Wind Energy Strategies Report [23], expanding domestic testing and demonstration facilities for both components and full-scale systems would enable domestic suppliers to refine and validate new products leading to more cost-competitive offshore wind energy.

As such, the State would continue to work with offshore wind Initiative partners including the University of Maine, the NOWRDC, and the Business Network for Offshore Wind to identify research needs, identify funding opportunities, and continue to pursue demonstration or pilot projects. Through these actions, the State will support the creation of jobs and job training programs.

Examples from other states

DOE supports such R&D activities directly, through its National Laboratories, and through external collaborations via other research entities, such as the National Offshore Wind R&D Consortium. A variety of projects are in progress to reduce cost and risk, increase wind power plant value, and adapt offshore wind energy systems to regional conditions such as deep water, hurricanes, or surface ice loading. Several DOE-funded projects have developed widely used engineering modeling

and analysis tools that are seen as seminal design tools to reduce costs and design the next generation of offshore wind technologies. For example, ARPA-E's ATLANTIS program in floating offshore wind applies the discipline of control co-design to reduce the size of the massive and expensive floating platforms by incorporating automatic control technologies[9].

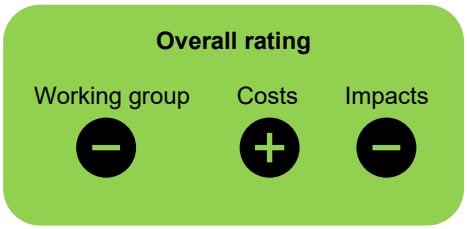
The **State of New York** through the New York State Energy Research and Development Authority (NYSERDA) is working with the developers through the aforementioned National Offshore Wind Research and Development Consortium. The Consortium is a nationally focused, independent, not-for-profit organization initially funded primarily by the United States Department of Energy (DOE) and the New York State Energy Research and Development Authority (NYSERDA) and led by key offshore wind industry stakeholders and research institutions. The Consortium is dedicated to managing industry-focused research and development of offshore wind to maximize economic benefits for the U.S.

In **Virginia**, the New College Institute has partnered with the Mid-Atlantic Maritime Academy and Centura College to form the Commonwealth of Virginia's Mid-Atlantic Wind Training Alliance. The Mid-Atlantic Wind Alliance is the Commonwealth's first training alliance dedicated to offering a full suite of wind-related training including courses certified by the Global Wind Organization with training locations in Hampton Roads and Martinsville.

5.1.6 P-6. Foster Local Government Partnerships

Summary

The goal of this market strategy would be to work with local municipalities and/or government officials to identify and address specific customer concerns or needs. For offshore wind projects, this action may be useful in working with local authorities to manage and help navigate local permitting requirements.



Costs and benefits

This market strategy received a moderate level of interest from the feedback given by the working group but has many positive effects. In addition, these are also activities the state already performs and is considered to provide good value at a low cost therefore it is prioritized as a market strategy to consider.

Costs

The state of Maine has been coordinating with local governments related to offshore wind planning activities through task forces, working groups, and advisory committees [24]. The costs of continued coordination and work of these groups may be absorbed or accommodated within existing legislatively approved budgets and should not require additional appropriation or expenditure.

Benefits

Fostering local government partnerships contributes in a positive way to many of the areas of interest that offshore wind development could impact. Table 5-7 below lists the various positive contributions this action would have.

Table 5-7. Fostering local government partnerships: AOIs, outcomes, and positive contributions

Benefits by Area of Interest	Desired Outcome	Contribution by this Action
Economic Development - Supply Chain	Maximize local job creation	Initial partnerships will have cascading effects on the development of local jobs

[9] U.S. DOE Offshore Wind Energy Strategy Report (January 2022), page 18

Benefits by Area of Interest	Desired Outcome	Contribution by this Action
Social Cost of Carbon	Minimize the negative impacts of climate change	Input from local government officials can assure that environmental impacts are addressed and mitigated through funding or other mechanisms
Port Development - Infrastructure Investment	Attract investment in local infrastructure	Local municipalities can leverage partnerships to create funding and encourage investment
Tourism and Recreation	Produce additional tourism opportunities while mitigating impacts on cultural characteristics	Partnering with local municipalities will prioritize retaining local culture while sustaining and attracting new tourism opportunities
Community Involvement	Create and maintain open communication channels by incorporating local knowledge and decision-makers	Partnership requires collaboration and input from the community

Possible implementation options

Maine should continue to build upon the work being done by its working groups, advisory committees, task forces, and the Community Resilience Partnership administered by the Governor's Office of Policy Innovation and the Future[48] to foster partnerships and provide grants to communities and other stakeholders to promote the development of offshore wind. Through the creation of local community advisory groups and action committees, the state of Maine can continue to bring together various groups, including community members, contractors, and other invested and/or impacted businesses and organizations to provide recommendations and conduct outreach to mitigate potential concerns and assess business opportunities and community benefits. The formation of advisory groups and committees allows for continued community engagement and project transparency to help foster and develop good relationships between the state and other stakeholders. That State could support the creation of local energy committees that serve to engage with local government leaders to identify and remedy concerns of a community and its members. These committees serve as a liaison between the government entities and municipalities.

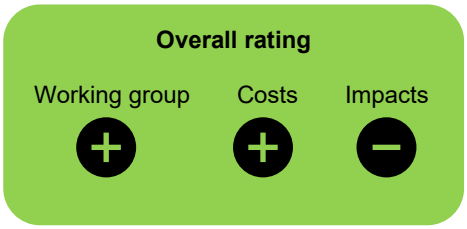
Examples from other states

Vermont – To tackle energy and climate change issues across the state and work with stakeholders to progress energy and climate goals, town energy committees (TEC) were created to bring community members together to advocate for Vermont's transition to clean energy. Organized through a central body known as the Vermont Energy & Climate Action Network (VECAN), which helps connect TECs to resources for training and knowledge-sharing. [3]

New Jersey - The New Jersey Economic Development Authority created the NJ Wind Port Diversity and Local Engagement Advisory Committee to address diversity and equity. This Committee convenes stakeholders from the nearby communities, diverse suppliers, community and commerce organizations, and relevant state agencies to ensure shared community benefits and accessible employment and business opportunities.

5.1.7 P-7. Engage in Local Direct Communications with Affected Communities

Summary



In alignment with the climate communications equity recommendations from the *Maine Won't Wait* plan, the state would seek to continuously engage affected communities in an ongoing consultation process to provide clarity for all stakeholders regarding the future development and operation of the offshore electricity grid. The goal of this work would be to foster a sense of shared ownership and prosperity in the low carbon energy transition and facilitate a sense of inclusion in the process while also managing and addressing potential concerns related to these projects. This market strategy not only applies to coastal communities, but also any community potentially adversely affected by these projects, including economically vulnerable populations, and other often underrepresented or underserved communities. Ideally, this engagement will enable these communities to participate in the decision-making process.

Costs and benefits

This market strategy received favorable ratings based on working group feedback, but its effects are concentrated to a few AOIs, including community involvement and equitable sharing of benefits. This market strategy is considered fairly low costs, however, and because of its value is prioritized for the state to consider.

Costs

Beginning in 2019, the GEO established the Offshore Wind Advisory Committee along with many stakeholder groups that represent a range of key perspectives on offshore wind development in the Gulf of Maine. The purpose of the Advisory Committee is to help GEO ensure that the supporting working groups and broader stakeholder input is fulfilling the objectives of the comprehensive OSW Roadmap for Maine. This market strategy recommends that the state continue these efforts through all phases of offshore wind development, which include planning, permitting, construction and operations. Currently, the Advisory Committee and working groups are supported through a $2.166 million grant from the U.S. Economic Development Administration. Additional funding may be needed to continue these efforts.

Benefits

This market strategy contributes positively to only a few areas of interest that offshore wind development could impact. Table 5-8 lists the various positive contributions this action would have.

Table 5-8. Local direct engagement with affected communities: AOIs, outcomes, and positive contributions

Benefits by Area of Interest	Desired Outcome	Contribution by this Action
Social Cost of Carbon	Minimize the negative impacts of climate change	Continuous collaboration between affected communities and other stakeholders can assure that environmental impacts are addressed and mitigated through funding or other mechanisms
Community Involvement	Create and maintain open communication channels by	Collaborate with the community through a community engagement process

Benefits by Area of Interest	Desired Outcome	Contribution by this Action
	incorporating local knowledge and decision-makers	
Investment / Finance	Attract financiers and project developers	This market strategy helps de-risk investments by directly engaging locally affected communities to ensure that their perspectives are considered and incorporated in offshore wind projects

Possible implementation options

Under this market strategy, the State of Maine would work in tandem with the project developers and other stakeholders to continuously communicate and engage local affected communities throughout all stages of the project. Utilizing best practices from international standards and community engagement protocols, the state would develop relationships and understanding on current and future issues to reduce opposition and potential conflict.

One way the state could use engagement to bring the perspectives of different affected communities into the process and build support for climate solutions such as offshore wind is through the facilitation of experiential discussions of peoples' understanding of climate-related issues and the effects of climate change on their lives. This voice of the customer feedback enables more people to participate and grasp the issues at hand. From there, the state can work with groups on solutions to these issues or concerns including refining the role of renewable energy and more specifically offshore wind in Maine's low carbon future.

The creation of a Community Benefit Agreement (CBA) between government agencies/municipalities and developers that includes both individual and mutual obligations of all parties would further ensure continuous community engagement and can lay the foundation for reducing investment risk. The CBA could be set up to provide monetary compensation and/local benefits for any number of impacts caused by varying stages of offshore deployment.

Examples from other states

In **Rhode Island**, the Block Island Wind Farm developers brought on consultants to continuously engage affected communities throughout the design and development phases of the project. The consultants acted as the liaison between the developers and the community, communicating information between the two groups and gaining the trust of the affected communities. The communication strategies in Block Island were expected to bring on numerous community benefits that were expected to reduce electricity costs and decrease negative climate impacts.

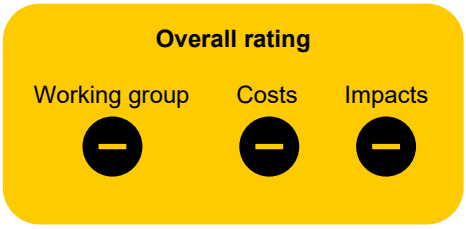
In 2015, **Vineyard Power Cooperative**, a member-owned non-profit utilized an ongoing consultation process which resulted in the creation of a Community Benefit Agreement with Vineyard Wind. The Community Benefit Agreement was signed to provide for the local community by creating jobs as well as an operations and maintenance facility at the community harbor. Vineyard Power Cooperative agreed to provide support for the offshore wind project through legislative advocacy, education, outreach, and permitting and finance guidance. The CBA set forth a mutual obligation for continuous collaboration, discussion, and identification of community and project benefits.[2]

Wind developers in **Scotland** used frequent communication and other collaborative processes to work with the local community and propose alternative solutions when faced with strong opposition to the location of the offshore wind farm

base. Through continuous community involvement and collaboration, the developers were able to address the initial opposition and develop a solution resulting in the creation of dozens of local jobs. [25]

5.1.8 P-8 Pursue mechanisms that enable local community access to offshore wind energy resources

Summary



By pursuing this market strategy, the state would seek to identify a means or program that would allow for residents and businesses more direct access to the electricity produced by offshore wind turbines. Note, under the RPS, communities are included in state-led renewable purchasing, and this market strategy addresses how the state might expand access more directly. This could be organized through a community choice aggregation or similar program; however, the state currently does not have a policy enabling community choice aggregation programs. The other options currently available are the Green Power Programs wherein competitive retail energy suppliers offer end-use customers the option to purchase renewable energy, but these do not always provide consumers assurance that they are purchasing locally produced renewable energy.

Costs and benefits

This market strategy received generally neutral feedback from the working group. While there are generally thought to be positive impacts associated with purchasing locally produced renewable energy including environmental, energy cost, and equity, there is not currently a mechanism in place to implement this in a way that would fully realize those benefits. It is therefore suggested here that this market strategy be given further consideration before pursuing.

Costs

This market strategy would likely entail the state pursuing legislation action authorizing local governments to establish a community choice or other energy purchasing program that provides greater access to locally produced renewable energy. New legislation may require Maine's Public Utility Commission to go through the rulemaking process and adopt rules, regulations, and procedures related to the program. The Commission may be able to implement the requirements within the existing budgeted resource, but the fiscal impact of implementing this market strategy on local governments and small electricity suppliers is undetermined. Under similar programs in other states, local governments are solely responsible and pay for the costs associated with any stranded costs for (1) contracts entered into by the community choice aggregator for electric supply or (2) generation owned by a community choice aggregator [44].

Benefits

Providing residents and small businesses with more direct access to renewable energy contributes in a positive way to several areas of interest that offshore wind development could impact. Table 5-9 below lists the various positive contributions this action would have.

Table 5-9. Local community access to offshore wind resources: AOIs, outcomes, and positive contributions

Benefits by Area of Interest	Desired Outcome	Contribution by this Action
Social cost of carbon	Minimize the negative impacts of climate change	Wind energy credits promote clean energy and reduce the overall impact on the grid

Benefits by Area of Interest	Desired Outcome	Contribution by this Action
Air quality	Minimize the negative impacts of energy generation on health	Wind energy credits reduce carbon emissions associated with fossil fuel energy generation and promote cleaner air quality
Energy Cost Burden	Achieve a total energy burden of 6% or less for households earning 80% of the median income or less	Community choice can help reduce the impact on individual families and promote economies of scale energy resourcing
Community Involvement	Create and maintain open communication channels by incorporating local knowledge and decision-makers	Community choice can serve as a win-win for individual energy users looking for clean energy options and developers interested in pursuing large scale wind projects
Equitable sharing of benefits	Ensure State expenditures fairly benefit citizens	A community-centered organization responsible for organizing community choice will serve as a bottom-up approach for more equitably serving all communities and ensuring equitable access to clean energy

Possible implementation options

This market strategy is based on the idea of creating an offshore wind energy power purchase program wherein local communities would have more direct access to the offshore wind projects and therefore realize the benefits of these projects themselves more directly. The idea behind this is that locally procured renewables offer greater economic, equity, and ecological benefits than regionally developed renewable energy resources where communities have little say in project development. Before this can move forward, however, Maine must create legislation allowing for the creation of community choice programs or work with the local utilities to offer a version of the green power programs associated with offshore wind production.

A key aspect here is identifying a community-centered organization that can lead a procurement process and is responsible for working with developers on offtake agreements. This organization may also help implement other community energy projects that reduce energy demand, increase energy efficiency, and advance the use of clean, efficient, and renewable resources locally for the benefit of their constituents.

Examples from other states

California – Redwood Coast Offshore Wind Project [14]: This project is being implemented by the Redwood Community Energy Authority (RCEA) and a consortium of developers to build a commercial-scale offshore wind project to serve the members of RCEA. The proposed project is 100-150 megawatts of floating offshore wind farm planned to be located more than 20 miles off the coast of Eureka. Humboldt County has a strong ecosystem of local energy, environmental, and economic professionals who played a crucial role in the project. With RCEA leading, the project partners will continue

proactive community and stakeholder outreach and ensure that local offshore wind resources will be developed in a manner that aligns with the community's preferences and also maximizes and prioritizes local community benefits.

5.2 Infrastructure market strategies

The following table provides a summary of the infrastructure market strategies assessed along with the feedback received from the working group, potential costs, relative benefits, and DNV's prioritization. Further detail is provided on each of the infrastructure market strategies below.

Table 5-10. Infrastructure market strategies assessment summary

Market Strategy	W.G. Input*	Potential Cost	Relative Impacts	Priority
I-1. Roadmap infrastructure development	+	−	−	−
I-2. Engage with others on a regional development strategy	+	+	−	+
I-3. Ensure public policy goals are considered in transmission planning	+	+	−	+
I-4. Invest in addressing the infrastructure needs of strategically located ports	+	−	+	+
I-5. Provide support to local shipyards in the development of OSW vessels	+	−	−	−
I-6. Work with BOEM to set clear permitting expectations for developers	+	−	+	+
I-7. Embrace adaptive management strategies for protecting natural resources	−	−	−	−

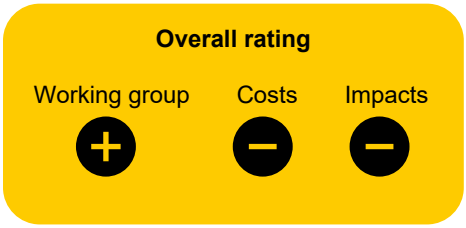
*This input does not necessarily represent the perspectives of the entire working group and only reflects the input of a sub-set of members who provided feedback during the polling.

Table Legend: + Favorable − Neutral ✖ Low favorability

5.2.1 I-1. Roadmap infrastructure development

Summary

Under this market strategy, the State would seek to establish specific goals for deployment or development of infrastructure, including location and number of interconnection points, phasing of development, and cable lay corridors. The roadmap would include best practices encouraging offshore transmission development, reducing impacts to the marine environment and ocean users, regional coordination, and expected timelines.



Costs and benefits

While this market strategy was generally supported by the working group based on the feedback received, it is associated with some moderate costs, and the impacts are more concentrated within certain AOIs. Therefore, some further consideration is recommended for this action.

Costs

State roadmaps are often funded through state appropriations and/or federal grants as was the case with Maine's Offshore Wind Roadmap. The fiscal impact to the state for implementing this market strategy will include administrative and operational costs. Costs will include research, data collection and analysis, planning, outreach and engagement, communication, and coordination. Maine was able to secure a federal grant for $2.2 million for the OSW roadmap and may be able to secure additional federal funding through competitive grants offered in the bipartisan infrastructure bill[47] to build off the existing framework.

Benefits

This market strategy contributes in a positive way to many of the areas of interest that offshore wind development could impact. Table 5-11 below lists the various positive contributions this action would have.

Table 5-11. Developing a roadmap for infrastructure development: AOIs, outcomes, and positive contributions

Benefits by Area of Interest	Desired Outcome	Contribution by this Action
Social Cost of Carbon	Minimize the negative impacts of climate change	Renewable interconnection in Maine is aimed to reduce climate impacts
Port Development – Infrastructure Investment	Attract investment in local infrastructure	Invest in offshore development for long-term timelines and ease of infrastructure updates
Ecological Impacts	Minimize impacts on sea life while seeking opportunities to enhance fish habitat	Infrastructure development is key to minimizing environmental impacts.
Investment / Finance	Attract financiers and project developers	Offshore transmission ownership and financing structures will be developed around incentivizing financing strategies while reducing risks to ratepayers
Transmission Access - Capacity	Achieve viable project development	Incentivize public and private investment through desirable economic growth and workforce development outcomes

Possible implementation options

To optimize transmission connection points and minimize potential impacts, a comprehensive planning and design approach could inform the development strategy. Since transmission needs could likely change over time, an ideal offshore grid is expected to be flexible, with the capability to adjust with future transmission needs. The offshore grid should therefore be

modeled similar to the onshore grid system, with the ability to continuously evolve. Design options that may be explored include:

- Using a sequential approach, where segments of offshore development are conducted successively. Each step in the process is conducted with its own objective function, thus neglecting potential interactions between various elements of the wind farm.
- Using the Multidisciplinary Design Analysis and Optimization (MDAO), all components of offshore wind projects would be jointly optimized with the overall LCOE as a global objective function [39]. MDAO reduces the length of electrical cables and reduces costs associated with support structures, overall optimizing LCOE.

Overarching strategies can be applied to both, including best practices for reducing marine environmental impacts and optimizing connection points. A thorough review of environmental impact statements from prior projects would shed light on lessons learned from similar ventures and help inform project execution. Additionally, a literature review and jurisdictional scan encompassing the most up-to-date research on potential impacts from offshore wind development could better inform infrastructure development going forward. Journal articles, science workshops, and databases provide pathways for the review of best practices.

Examples from other states

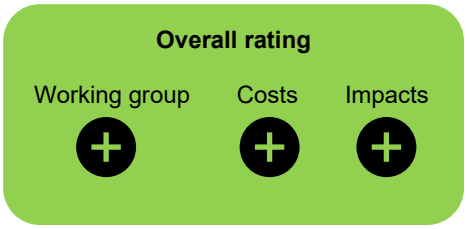
Oregon's Territorial Sea Plan provides a coordinated framework for managing ocean resources and permitting processes. The plan was founded using statewide land use planning goals and consisted of multiple parts to achieve a long-term plan. Elements of the plan include rocky shore management, cable laying across the terminal sea, and marine renewable energy. A coordinated permitting process for the placement of undersea cables allows for input from appropriate state agencies, tribal governments, and local governments.

In **Ireland**, a framework for the offshore electricity transmission system provides clarity for all stakeholders regarding the future development, operation, and ownership of Ireland's offshore electricity grid. The system policy includes a phased transition from the decentralized transmission system to a more centralized model over the next ten years, which is posed to deliver maximum societal benefits. The various phases of the policy will develop offshore transmission system requirements and which agencies are responsible for and allowed to develop transmission systems.

In the **Netherlands**, government-owned TSO (TenneT) holds five offshore wind tenders, with plans to develop a platform at sea for each one. Platforms will connect two wind parks to the national onshore transmission system, with guaranteed cable capacity values and limits. Multiple vendors were awarded contracts to supply monopiles, transition pieces, and inter-array copper cables.

5.2.2 I-2. Engage with others on a regional development strategy

Summary



This market strategy entails both ensuring that infrastructure needs are met through a regional planning approach and that there is regional collaboration where there are opportunities to enhance supply chain resources within New England that can support offshore wind development locally. Infrastructure development may include expanding transmission capacity, where collaborative efforts should focus on ensuring state policies and goals align with transmission improvement plans. To scale supply chain capacity, the pursuit of this market strategy should recognize that there are ongoing interactions between states on supply chain issues and that states will pursue their own interests; however, where there are win-win opportunities, states will seek to leverage those. Implementing this market strategy will likely require interagency

collaboration with overlapping jurisdictions and shared responsibilities to foster coordination, reduce regulatory barriers and combine resources.

Costs and benefits

Versions of this market strategy were viewed favorably based on the working group feedback, although the regional coordination on transmission development more so than scaling of supply chain resources. Both activities were determined to result in many favorable benefits.

Costs

Interstate regional coordination is a central part of state government operations and is typically accounted for in agencies' operational budgets. However, federal funding is available to help promote collaboration among states for the development of offshore wind. For instance, in 2015, the U.S. Department of Energy awarded a grant of nearly $600,000 for Massachusetts, New York, and Rhode Island to come together and identify opportunities to help develop offshore wind in the northeast.[26]

Benefits

This market strategy contributes in a positive way too many of the areas of interest that offshore wind development could impact. Table 5-12 lists the various positive contributions this action would have.

Table 5-12. Engaging with others on a regional development strategy: AOIs, outcomes, and positive contributions

Benefits by Area of Interest	Desired Outcome	Contribution by this Action
Social Cost of Carbon	Minimize the negative impacts of climate change	Ensuring adequate transmission capacity for renewables and increasing local trade, equipment, and components suppliers will have a direct positive impact on climate change.
Energy Cost Burden	Achieve a total energy burden of 6% or less for households earning 80% of the median income of less	Regional collaboration is believed to have an indirect but positive effect on addressing customer utility cost issues
Fisheries	Minimize negative impacts of OSW development on Fisheries	Regional collaboration could help manage impacts on fisheries by agreeing on the general approach and expectations
Port Development – Infrastructure Investment	Attract investment in local infrastructure	Investments in the supply chain are believed to benefit OSW supply ports and lower risk to developers
Electricity Export	Maximize local benefits from the sale of electricity outside of Maine	Regional collaboration will help ensure that if electricity is being exported from the state, the benefits to ME are maximized.

Benefits by Area of Interest	Desired Outcome	Contribution by this Action
Permitting	Attract financiers and project developers	Regional collaboration on permitting requirements amongst states and BOEM can help de-risk projects for developers
Transmission Access - Capacity	Achieve viable project development	Having an adequate capacity for transfer of electricity (or plans for) will de-risk projects for developers.

Possible implementation options

Transmission Access: Under this strategy, Maine would pursue a regional transmission development strategy in collaboration with neighboring states, identifying points of interconnection and layouts for OSW cables, while also coordinating on onshore issues. This aims to address the issue of using the generator interconnection queue process (typically used by RTOs) to determine what transmission should be built and create a more efficient process for large transmission needs to be evaluated.

Pursuing a coordinated approach to offshore transmission infrastructure can avoid many of the problems associated with the traditional approach and can be structured with flexibility to adjust to future system needs. Coordinated approaches to offshore transmission are complex and in the early stages in the United States.[10]

Supply Chain: Under this strategy, the state would collaborate with federal and other state agencies from other New England States to establish a Regional Joint Agency Working Group whose objective would be to encourage scaling of supply chain and resources, and healthy competition in the region.

Examples from other states

In 2015, **Massachusetts, New York, and Rhode Island** decided to explore the potential for mutual action to develop offshore wind at the scale necessary to reduce costs by achieving economies of scale and establishing a regional supply chain. The states agreed to work together to develop a series of analytical reports and a regional roadmap to identify each state's objectives and the objectives of the region to scope out a near-term and long-term pipeline of projects using several possible penetration scenarios.

In 2020, the governors of the coastal **Mid-Atlantic** states of Maryland, North Carolina, and Virginia signed an agreement committing each state to "cooperatively promote, develop, and expand offshore wind energy and the accompanying industry supply chain and workforce". Specifically, the three states agree to form a SMART-POWER Leadership Team with representatives from each signatory jurisdiction that will work to streamline the development of regional offshore wind resources.

In April 2022, the governments of Canada and Nova Scotia agreed to collaborate on establishing a competitive offshore renewable industry. The governments said that they are committed to creating regulatory alignment and certainty in a way that will allow offshore renewable projects to be expedited moving forward in support of the clean energy transition. Therefore, both governments will work together to consider adjustments to the regulatory regime for these projects to proceed as efficiently as possible while ensuring that regulatory reviews remain rigorous and effective. [59]

[10] See the Offshore Wind Transmission Technical Review – Initial Report for further information on transmission design options.

5.2.3 I-3. Ensure public policy goals are considered in transmission planning

Summary

By pursuing this market strategy, Maine would leverage mechanisms that allow for states to sponsor transmission projects and pursue an approach that ensures that state policy goals are being addressed. This is known as a State Voluntary Agreement approach [43]. Under this process, offshore transmission development may be developed independently from generation assets. This process could be designed to encourage innovative approaches to regional transmission planning and development activities through competitive solicitations while meeting policy goals. This market strategy has ties with market strategy 5.1.1 - Pursue offshore wind RPS requirement, and could be connected with market strategy 5.2.2 – Engage others in a regional development approach, so that costs could be shared and Maine ratepayers to bear the full burden of transmission development costs.

Costs and benefits

This market strategy received a neutral rating in the feedback received from the working group and has a low impact rating (mainly because impacts are concentrated to transmission system access and infrastructure development; however, other states such as New York and New Jersey have found this useful.)

Costs

The fiscal impact will be dependent on how the state chooses to implement this market strategy; however, there may be a significant fiscal impact if the state chooses to pursue a State Agreement Approach that would propose and pay for the transmission upgrades to meet its offshore wind goals. In a recent study, the cost estimates to upgrade the existing onshore transmission system were identified to be $627.34 million in the short-term scenario and between $2.16 billion and $3.21 billion for the long-term scenarios[27]. The state may consider working with federal regulators and regional grid operators to find ways to share the costs of building/upgrading offshore transmission, rather than going it alone.[11]

Benefits

This market strategy contributes in a positive way to several of the areas of interest that offshore wind development could impact. Table 5-13 lists the various positive contributions this action would have.

Table 5-13. Ensuring public policy goals are considered in transmission planning: AOIs, outcomes, and positive contributions

Benefits by Area of Interest	Desired Outcome	Contribution by this Action
Social cost of carbon	Minimize the negative impacts of climate change	Including state policy goals as a coordinated upfront effort ensures the state's clean energy goals are met and harmful effects associated with climate change are minimized
OSW Industry Advancement - Deployment Costs (LCOE)	Lower deployment costs	Initial funding due to incorporating state policy and clean energy funding opportunities will encourage

[11] On April 22, 2022, FERC issued a Notice of Proposed Rulemaking [NOPR], pursuant to section 206 of the Federal Power Act, to reform the Commission's electric regional transmission planning and cost allocation requirements. The proposed rules seek to address key challenges in the process for planning new transmission projects and for determining how to fairly allocate their costs. Once the commission has reviewed comments on the proposal, it may issue final rules, most likely by the end of the year. If adopted, this would increase the participation of states in cost allocation processes.

Benefits by Area of Interest	Desired Outcome	Contribution by this Action
		economies of scale and reduce initial start-up costs.
Investment / Finance	Attract financiers and project developers	Clean energy investment opportunities are more attainable under a well-rounded policy approach. Federal funding stipulations related to state policy will meet fewer hurdles
Transmission Access - Capacity	Achieve viable project development	State agency-led planning efforts will incorporate transmission concerns and minimize risk to financiers and investors.

Possible implementation options

The state may consider one or both of the following offshore transmission development options as a way to address public policy goals and encourage innovation in the development process:

- Pursue a State Voluntary Agreement approach whereby the state would propose and pay for the transmission upgrades needed to meet its clean energy goals.
- Use legislative action to create a structure in which developers may leverage RECs to seek project financing

Under the State Voluntary Agreement approach, the state would work with ISO-New England to ensure that the State's public policy goals are incorporated into the transmission grid planning process. Normally regional planning organizations are primarily focused on addressing reliability and economic efficiency concerns, but states may opt to work with the ISO under what is known as a State Agreement Approach [28] to address public policy goals. This type of agreement allows the state to propose and pay for the transmission upgrades needed to meet its clean energy goals. This model, which originated in New Jersey, has been seen as a model for other states as well, including Maine, where the issue has been brought before the Maine PUC under Case 2021-00223.

If pursuing legislative action to issue RECs as part of the transmission system development, Maine may still seek proposals for projects under a competitive bidding process. To oversee this process the state will need to choose a lead agency or could create a state-level body to facilitate planning efforts. This body may explore issues generally beyond the scope of the regional planning activities and take a more holistic approach to electricity system planning. Essentially, transmission planning is one component of the larger planning process which includes generation system, delivery, load management, and beneficial electrification planning.

RECs can provide the necessary framework to lower financial risk to developers and enable developers to seek project financing. The lower risk also reduces costs for ratepayers. RECs associated with these projects could represent the attributes of 1 MWh of transmission transfer capability, in addition to or bundled with the credits associated with electric generation.

Maine is taking steps to improve transmission planning. In October 2020, Governor Mills along with Governors from four Northeast states issued a statement calling for reforms needed to achieve their states' respective goals for clean, affordable, and reliable electricity. The statement calls for reform of the regional electricity market design, transmission planning process, and the governance of the ISO-New England, the independent system operator for the New England power system. Shortly thereafter, NESCOE published a visioning document, expanding the governors' statement. On March 18, 2021, the states convened the fourth and final forum designed to be a dialogue between state policymakers and the public

to address equity and environmental justice concerns. ISO-New England is currently conducting studies on how to transition the New England power grid in response to States' environmental policies. The first phase of The *Future Grid Reliability Study*, which examines the implications of a substantially changed grid, was released in April 2022.

Examples from other states

In **New Jersey**, several steps have been taken to establish the transmission development structure that exists today. These included pursuing what is known as the State Agreement Approach whereby the state requested that the Regional Transmission Organization (i.e., PJM) consider state policy requirements in the transmission expansion and planning process while also ensuring that New Jersey could select from the most efficient and effective options for development through a competitive bidding process. Under the SAA, the NJBPU is the ultimate decision-maker, deciding which, if any, of the proposals proceed to construction.

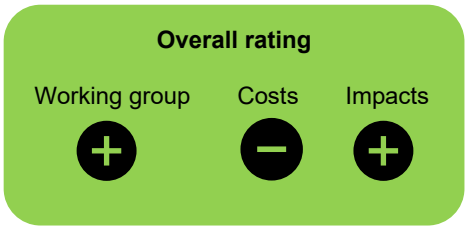
The state also amended the original offshore wind development law to create a more favorable framework for offshore transmission development. The original law, commonly referred to as the Offshore Wind Economic Development Act (OWEDA) defined "qualified offshore wind project" to mean "a wind turbine electricity generation facility in the Atlantic Ocean and connected to the electric transmission system in this State" This includes the associated transmission-related interconnection facilities and equipment. An amendment to this bill was passed to expand this definition to also include open access offshore wind transmission facilities

In alignment with these other efforts, New Jersey also created the New Jersey Energy Master plan which explains how planned transmissions to accommodate the state's offshore wind goals provides the opportunity to decrease ratepayer costs and optimize the delivery of offshore wind into the state's transmission systems as well as benefit environmental outcomes, grid stability, and permitting processes.[29]

5.2.4 I-4. Invest in the infrastructure needs of strategically located ports

Summary

The purpose of this market strategy is to ensure that Maine has adequate port infrastructure for supporting the construction and operations of offshore wind resources. By implementing such a market strategy, the state will be supporting local economic development and addressing their recommendation to "Move forward on port development plans with urgency. [40]"



This market strategy is complementary to the Port Infrastructure Feasibility study performed by the state Department of Transportation which evaluated the feasibility of constructing port infrastructure in the Port of Searsport to support the offshore wind industry. A companion study on broader wind port needs in Maine is also underway and will analyze how other Maine ports, including the Ports of Portland and Eastport, can play important roles supporting the offshore wind industry.

Costs and benefits

This market strategy is generally agreed upon that it should be prioritized and is being studied as part of a project run by the state Department of Transportation. This market strategy received a neutral impact rating primarily because its main benefit is in supporting supply chain and local workforce development.

Costs

Funding for port infrastructure improvements will likely come from state appropriations supplemented by federal funding. The bipartisan infrastructure bill provides $16.7 billion in funding to improve infrastructure at coastal ports, inland ports and waterways, and land ports of entry along U.S. borders. [34] State and local governments can now apply for port infrastructure grants funded through bipartisan legislation to support offshore wind development. New York and Virginia ports recently received between $20-30 million in federal grants to support infrastructure improvements for offshore wind development. [30]

Benefits

This market strategy contributes in a positive way to many of the areas of interest that offshore wind development could impact. Table 5-14 lists the various positive contributions this action would have.

Table 5-14. Investing in addressing the infrastructure needs of strategically located ports: AOIs, outcomes, and positive contributions

Benefits by Area of Interest	Desired Outcome	Contribution by this Action
Economic Development - Supply Chain	Maximize local job creation	Increased port development will require materials and inputs throughout the supply chain, spur economic activity, and increase the local job market
Economic Development - Workforce Development	Maximize local job creation	Expanded port infrastructure will require well-rounded job growth and the development of multifunctional skillsets among the local job pool
Port Development - Job Creation	Maximize local job creation	Local job growth will naturally occur as a result of increased port development
Port Development - Infrastructure Investment	Attract investment in local infrastructure	Consolidated OSW resources will attract investors through large-scale payback periods. Development investors will recognize the benefits of strategically located ports on a shorter timeline
Investment / Finance	Attract financiers and project developers	Ports with multiple value streams will realize greater economic benefits and attract financing partners and investors.

Possible implementation options

Following the port needs assessment study, the state will need to identify a funding source for the port infrastructure upgrades. Other states have used funds from the federal American Rescue Plan Act to support these activities. Existing infrastructure grant financing programs, such as the Department of Transportation Rebuilding American Infrastructure with Sustainability and Equity grants and Maritime Administration Port Infrastructure Development and Small Shipyard Grants could be leveraged to upgrade ports as well [23].

Along with identifying and planning for the upgrades to the ports, other states have also worked to identify other waterfront properties beyond the ports that could be acquired to support construction activities, manufacturing of components, and long-term operations. This may be useful for developers when selecting locations to establish operations.

Examples from other states

New Jersey is building the nation's first purpose-built offshore wind port on the eastern shore of the Delaware River. The Port will be home to multiple factories that will build the necessary components for offshore wind turbines. It will also serve

as a staging and assembly area for the turbines. The construction of Phase One of the project, including dredging, a marshaling site, and an initial manufacturing site, is estimated at approximately $400 million, (excluding the cost of manufacturing facilities).

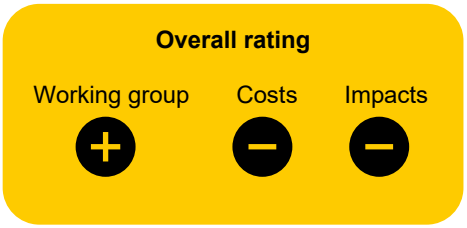
New York is planning to construct infrastructure to develop 33 hectares of a vacant industrial area along the Hudson River immediately south of the existing Port District into an offshore wind tower manufacturing port. The scope encompasses all the necessary infrastructure design and construction to develop tower manufacturing at the port, as well as an access bridge and connector roadway, internal roads, utility site work and infrastructure, upland preparation, berth dredging, and heavy capacity wharf construction. The total cost of the project is estimated to be more than $350 million.

Virginia is partnering with Dominion Energy and Spain-based manufacturer Siemens Gamesa, to build a facility on more than 80 acres at the Portsmouth Marine Terminal with the capacity to finish blades for 100 turbines a year. The total cost of the project is estimated at $200 million with more than $80 million dedicated to buildings and equipment.

The Port of Davisville, located in **Quonset, Rhode Island,** collaborated with private financers to establish a wind port hub for offshore wind projects along the New England and Mid-Atlantic coasts. The town of Quonset launched the Industrial Site Development Initiative to help prepare the land and existing facilities for all phases of OSW deployment, including manufacturing, assembly, production, construction, and more. The initiative makes funding available to business owners, state agencies, and municipalities to assist with the preparation of property development. The creation of this offshore wind port hub will retain the nearly 2,000 existing port jobs while creating an additional 1,000 jobs through the construction of the offshore wind infrastructure development. [5]

5.2.5 I-5. Provide support to local shipyards in the development of OSW construction and maintenance vessels

Summary



Under this market strategy, Maine would seek to identify existing shipyards and assets that could develop, retrofit, and construct marine vessels and capitalize on the broad industry need for vessels that could contribute to support offshore wind project construction activities and operations. This could include expanding fleets of crew transfer vessels, service operations vessels, feed vessels, installation vessels, etc. The ongoing port infrastructure needs assessment study sponsored by MDOT may also cover this topic and identify more specific needs.

Costs and benefits

This market strategy received favorable ratings based on working group feedback but was determined to only have moderate impacts. This is because the impacts, though beneficial, are concentrated toward improving port infrastructure and lowering costs of deployment (i.e., LCOE). It may also have benefits resulting from research and development activities.

Costs

The fiscal impact of implementing this market strategy varies depending on the amount and sources of funding needed to support local shipyards in acquiring resources to expand their operations. As noted in the section below, states are committing between $2 million and $5 million each year to fund workforce development in offshore wind which this may relate to.

In addition to monetary costs, the development of shipyard assets may result in short-term air quality impacts from the construction and retrofitting activities.

Benefits

This market strategy contributes in a positive way to many of the areas of interest that offshore wind development could impact. Table 5-15 below lists the various positive contributions this action would have.

Table 5-15. Supporting local shipyards in the development of OSW construction: AOIs, outcomes, and positive contributions

Benefits by Area of Interest	Desired Outcome	Contribution by this Action
Port Development – Job Creation	Create jobs by developing existing port infrastructure	Port development activities would attract investment and create jobs through construction and retrofit of facilities as well as through business expansion
Port Development – Infrastructure Investment	Attract investment in local infrastructure	Invest in offshore development for long-term timelines and ease of infrastructure updates
OSW Industry Advancement - Deployment Costs (LCOE)	Lower deployment costs	Providing upfront funding will help streamline project development and future efforts
OSW Industry Advancement - R&D/Innovation	Advance and support new research and technology	Public-private partnerships attract and help finance new research and technology used in the retrofit and construction of port infrastructure, helping to support job creation
Investment / Finance	Attract financiers and project developers	Investment in and finance port infrastructure development and retrofits

Possible implementation options

Industry-wide, there is expected to be high demand for offshore wind installation vessels in the coming years. Studies conducted by NREL and Tufts University have estimated that wind turbine installation vehicle demand in the United States could be as high as five vessels per year before 2030[39][41]. Similarly, according to a report issued by Rystad Energy in February 2022, by 2024, the demand for large vessels could outpace supply and operators will have to invest in new vessels or upgrade existing ones to install the super-sized turbines that are expected to become the norm by the end of the decade [42]. Even if these larger vessels are not required for the offshore wind farms in Maine due to the ability to construct many floating system technologies on or near shore and tow them to their desired location, Maine could assess its position and capacity to support the construction of larger vessels for installations along the east coast (and Gulf region) or focus on retrofitting and building smaller vessels to support construction and operations of the more local floating turbines.

Approaches that Maine could consider include:

- Prioritize creating public-private partnerships to help finance the development and retrofit of facilities and land to provide assets for offshore wind projects. The State would work with private investors to spur innovation and capitalize on new technology to ensure infrastructure can support the construction and deployment of OSW.
- Use federal funds (Federal Relief Act, Bipartisan Infrastructure bill) for the research and development of OSW vessel deployment and construction of supporting port infrastructure. The Bipartisan Infrastructure Bill includes funding through the following programs: Port Infrastructure Development Program Grants, Marine Energy Research, Development, and Demonstration, and National Marine Energy Centers, all of which provide opportunities to support development at the state's ports.

Examples from other states

Few examples of other states pursuing this as a strategy have been found, although it has been identified as a need for the industry broadly, and for floating offshore wind projects development more specifically in Hawaii.

In **Massachusetts**, Mayflower Wind, the developer of a deep-water offshore wind project, has entered into an agreement with Gladding-Hearn Shipbuilding/Duclos Corporation of Somerset, MA for the specification, design, and manufacture of an industry-leading, Jones Act-compliant, hybrid battery diesel-electric crew transfer vessel (CTV). The design of this world-class CTV utilizes technologies that will provide significant fuel savings and emissions reductions, including the use of Lithium-Ion battery energy storage to create a hybrid vessel that will be a bridge to full electrification.[8]

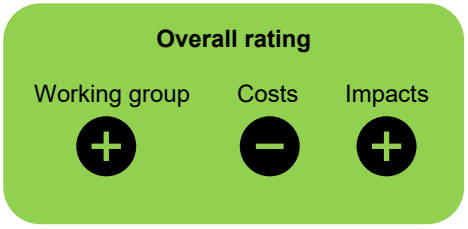
In addition, **Dominion Energy** is building the first U.S. flagged vessel for the offshore wind industry, the 472-foot Charybdis, and offshore wind company Ørsted and Eversource have committed to chartering the ship as they build several offshore wind arrays in the Northeast [35].

Additional information on the current status of vessel development in the U.S. can be found in the U.S. DOE Offshore Wind Market Development Report: 2021 Edition [9].

5.2.6 I-6. Work with BOEM to set clear permitting and development expectations for developers in the Gulf of Maine

Summary

To streamline communication among different parties, the State would develop a set of clear guidelines describing what developers are responsible for when planning projects in the Gulf of Maine and how those requirements align with the federal permitting process. Guidelines include parties responsible for surveys, permitting, third-party oversight, timeline coordination, etc. This may require collaboration with BOEM or other states in the region.



Maine would seek to develop state-specific siting and permitting policies that aim to address issues related to impacts on the marine environment and ocean users. Transparency into requirements and expectations will reduce the risk for developers.

Costs and benefits

By setting clear guidelines and streamlining processes, this market strategy may have a positive impact on marine fisheries and ecosystems, development costs, and climate. It is also supported by the working group and could have a fiscal impact on the state.

Costs

Implementing this market strategy likely includes applied research and sustained dialogue with multiple stakeholders to develop or adapt appropriate offshore wind standards and guidelines for permitting. The fiscal impact to the state will include administrative and operational costs including, but not limited to:

- Developing and implementing a communication and outreach strategy, including the organization of technical and citizen advisory committees to engage the public throughout the process
- Developing background papers on issues including marine renewable energy, and recreational and commercial uses for public review and comment
- Developing regulatory standards for guiding development and protecting ocean resource

Funding for the plan may come from a mix of state, federal, and private funds. In the case of Rhode Island, the Ocean SAMP team requested $6 million to complete the plan and the state initially only provided the effort with $3.2 million from the Rhode Island Renewable Energy Fund. Several months later, additional funds ($2.8 million) were provided by the Rhode Island Economic Development Corporation and the U.S. Department of Energy also contributed funds ($666,050) to fill in data gaps and continue research activity [31].

Benefits

This market strategy contributes in a positive way to many of the areas of interest that offshore wind development could impact. Table 5-16 lists the various positive contributions this action would have.

Table 5-16. Working with BOEM to set clear permitting and development expectations for developers in the Gulf of Maine: AOIs, outcomes, and positive contributions

Benefits by Area of Interest	Desired Outcome	Contribution by this Action
Social Cost of Carbon	Minimize the negative impacts of climate change	Permitting standards and guidelines will increase scrutiny on ecological impacts and reduce harmful effects
Fisheries	Minimize the negative impacts of OSW development on fisheries	Guidelines regarding local fisheries and disruption from OSW activities will minimize impacts on fisheries and wildlife
OSW Industry Advancement – Deployment Costs (LCOE)	Lower deployment costs	Streamlined policies will reduce overhead and administrative costs associated with development
Ecological Impacts	Minimize impacts on sea life while seeking opportunities to enhance fish habitat	Guidelines regarding local fisheries and disruption from OSW activities will minimize impacts on fisheries and wildlife
Investment/Finance	Attract financiers and project developers	Cross-coordination among stakeholders will reduce barriers and risks to financiers
Permitting	Attract financiers and project developers	Additional guidance and procedures for developers will attract investment

Possible implementation options

To navigate jurisdictional issues related to turbines development and cable corridor permitting, the state would coordinate with BOEM. This may be done through existing coordination efforts such as the BOEM Task Force. The state and federal representatives would work closely together on permitting needs and requirements through regular meetings. Items that should be considered when coordinating:

- Developing guidelines that would lay out jurisdictional authority and any permitting policies specific to Maine. This guideline would be for not only developers but permitting authorities as well
- Exploring whether there is a means for state officials or government agencies to participate in or gain access to the Fast 41 platform managed by FIPC. This platform currently allows all federal agencies and development team members to view, track and manage federal permitting approvals.

This market strategy aligns with the Environment and Wildlife Working Group Recommendation to explore the use of Federal Consistency rules to address concerns with offshore wind development in federal water. Within that strategy, the working group proposed to Support efforts of the interagency staff tasked with reviewing if changes are needed to Maine's regulations to effectively review offshore wind development; and consider what implications Maine's current state authorities have for review of cable routes.

In January 2022, energy officials from Maine, New Hampshire and Massachusetts sent a letter to the Bureau of Ocean Energy Management (BOEM) requesting that offshore wind developments in the Gulf of Maine are pursued in a sustainable manner backed by "rigorous scientific research." Additionally, U.S. Senator Angus King (I-Maine) sent a similar letter to BOEM from the Maine, Massachusetts, and New Hampshire Senate delegations. These letters to BOEM highlight the significant potential for offshore wind in the Gulf of Maine, but stress that additional thorough research and stakeholder engagement is needed to assess the impacts on local industries and ecosystems [52] [58].

Examples from other states

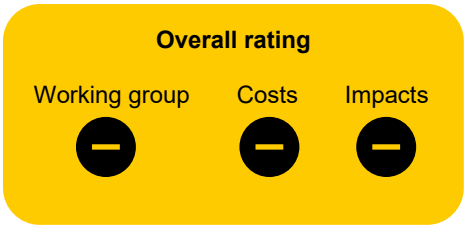
Rhode Island: Ocean Special Area Management Plan (Ocean SAMP) established a thorough and transparent offshore development permitting process. To assure that permitting decisions are well-informed and complementary to the regulatory requirements of relevant agencies, the Ocean SAMP establishes a Joint Agency Working Group (JAWG) composed of all federal and state agencies with a regulatory responsibility towards a proposed project, as well as the Narragansett Indian Tribe. The function of this group is to work collaboratively in determining project-specific requirements to be followed during construction, operations, and decommissioning of a project, including those pertaining to monitoring and mitigation of adverse impacts that the project may cause [31].

Oregon: A coordinated permitting process involved dialogue between appropriate state agencies, tribal governments, and local governments. Oregon's Department of Land Conservation and Development worked with BOEM to finalize the general timeline of leasing processes, permits, and authorizations.

5.2.7 I-7. Embrace adaptive management strategies for protecting natural resources

Summary

Adaptive management (AM) is a systematic approach for improving natural resource management activities; it goes beyond simply tracking and changing approaches where there are failures; it involves predicting how ecological or physical systems will respond to interventions, identifying alternative approaches to achieve desired outcomes, and defining acceptable levels of risks when choosing among alternatives[10]. This is very much a learning-based natural resource management approach used to address uncertainties around mitigating the potential impacts of renewable energy projects.



In pursuing this market strategy, Maine would adopt a progressively adaptive management approach for monitoring and managing the potential impacts of offshore wind projects on ocean resources.

Costs and benefits

This market strategy received neutral marks based on both the working group feedback and when assessing the impacts. This market strategy is mainly intended as a best practice for managing and monitoring adverse environmental impacts of offshore wind development and should be considered by the state, but other more traditional opportunities may be preferred.

Costs

The fiscal impact to the state for implementing this market strategy includes administrative and operational costs. Adaptive management programs in other states are often overseen by a board that is typically made up of participants from state and local governments, private industry, and residents. The costs of establishing and maintaining a board to implement and oversee an adaptive management program for offshore wind will vary depending on the board's size, purpose, and role. Should the state consider establishing a board to implement this market strategy, the Maine Board of Environmental Protection may serve as a reasonable example for potential costs [11].

Benefits

This market strategy contributes in a positive way to many of the areas of interest that offshore wind development could impact. Table 5-17 lists the various positive contributions this action would have.

Table 5-17. Embrace adaptive management strategies for protecting natural resources: AOIs, outcomes, and positive contributions

Benefits by Area of Interest	Desired Outcome	Contribution by this Action
Fisheries	Minimize negative impacts of OSW development on Fisheries	Natural resource habitat effects and planning will reduce harmful effects to local fisheries
OSW Industry Advancement - Deployment Costs (LCOE)	Lower deployment costs	Reducing effects to local ecological habitats will reduce cost barriers to deployment, and encourage production values across the supply chain
OSW Industry Advancement - R&D/Innovation	Increase local and exportable expertise	Each OSW facility is subject to local ecological impacts unique to regional territories and waters. Biological, ecological, and economic impacts will need to be financed and assessed

Benefits by Area of Interest	Desired Outcome	Contribution by this Action
Ecological Impacts	Minimize impacts on sea life while seeking opportunities to enhance fish habitat	Anticipating possible impacts on local wildlife and natural resources will help navigate minimizing negative effects on local habitats
Equitable sharing of benefits	Ensure State expenditures fairly benefit citizens	Incorporating all aspects of the workforce that may be impacted by OSW development will promote equitable benefits. Stakeholders that are indirectly impacted need to be considered in these efforts
Permitting	Attract financiers and project developers	Well-rounded project schemes will attract financing opportunities that are not limited by ecological stipulations. Ensuring environmental protection will promote project investment and development

Possible implementation options

Adaptive management as defined here involves ongoing, real-time learning and knowledge creation, both in a substantive sense and in terms of the adaptive process itself. The DOI guidance on implementing adaptive management describes a series of 9 steps:

1. Stakeholder engagement
2. Identify clear objectives
3. Identify appropriate actions for decision making
4. Model how the system is believed to work
5. Design a monitoring plan
6. Select management actions
7. Track system responses
8. Assess predicted vs. observed changes
9. Iteration (return to step 6)

Operational definition of Adaptive Management, National Research Council-

Adaptive management [is a decision process that] promotes flexible decision making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood.

It is not a 'trial and error' process, but rather emphasizes learning while doing. Adaptive management does not represent an end in itself, but rather a means to more effective decisions and enhanced benefits. Its true measure is in how well it helps meet environmental, social, and economic goals, increases scientific knowledge, and reduces tensions among stakeholders.

An adaptive approach will actively engage stakeholders in all phases of a project over its timeframe to discuss disagreements and uncertainties, facilitate mutual learning and reinforce a commitment to a learning-based management system [10].

If adopted, the state will need to consider who is best situated to facilitate this process and which agency should lead and be responsible for its implementation.

Examples from other states

Oregon's House Bill 3375 includes a progressively adaptive management and development approach to meeting the goal set forth in their 2021 Act to develop floating offshore wind energy. In furtherance of their goal, Oregon will develop, by 2025, 500 megawatts in floating offshore wind energy capacity in federal waters off the southern Oregon coast to power an associated renewable hydrogen production facility [12].

In **New Jersey**, the state Department of Environmental Protection has worked with the Rocky Mountain Institute to develop a guideline for an offshore wind research and monitoring initiative. The goal of this initiative is to create a robust research

and monitoring program to support the responsible implementation of offshore wind projects off the coast of New Jersey [32].

International case studies

- Portugal - Candeeiros wind farm located in the central portion of the country. The Portuguese refer to it as an iterative approach to post-construction bird mortality monitoring.
- Netherlands - AM principles have been used to adjust mandatory monitoring programs within projects for offshore wind farms. The offshore wind farm Luchterduinen includes intensive and regular contact between the competent authority and the wind developer to assess whether adjustment of the monitoring program is needed, based on monitoring results and information from other sources
- Germany - AM principles have been applied to several different projects. For example, the Ellern wind farm in Germany's southwest Rhineland-Palatinate attempted to mitigate the collision mortality of bats by curtailing turbine operation at wind speeds below 6 m/s from April to October.

Several other case studies are also provided in more detail in the IEA Wind Task 34, Adaptive Management White Paper [13].

5.3 Financing and investment market strategies

The following table provides a summary of the financing market strategies assessed along with the feedback received from the working group, potential costs, relative benefits, and DNV's prioritization. Further detail is provided on each of the financing market strategies below.

Table 5-18. Financing strategies assessment summary

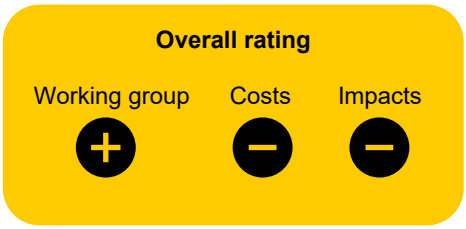
Market Strategy	W.G. Input*	Potential Cost	Relative Impacts	Priority
F-1. Establish public/private financing partnerships	+	−	−	−
F-2. Foster cluster-based development	✗	−	+	+
F-3. Continuously assess and communicate offshore wind benefits	−	−	−	−
F-4. Explore the possibility of using offshore wind tax funds in support of impacted ocean users	−	+	−	+
F-5. Continue to support and advocate for enhanced OSW federal tax credits	+	+	−	+

*This input does not necessarily represent the feelings of the entire working group and only reflects the input of a sub-set of members who provided feedback during the polling

Table Legend: + Favorable − Neutral ✗ Low favorability

5.3.1 F-1. Establish public/private financing partnerships

Summary



In pursuing this market strategy, the state would be seeking to leverage private funding and other resources through partnerships with infrastructure developers. The combination of public and private partnerships could lead to securing substantial funding for offshore wind development, as well as opportunities to finance supply chain and infrastructure expansion. These types of partnerships have become more common in recent years and have been used by peer jurisdictions to build out port infrastructure, transmission, and generation assets. This action should not be viewed as a tool to solve public sector budget limitations, but as a means to more efficiently and cost-effectively deliver projects.

Costs and benefits

This market strategy received positive feedback from those that responded to the working group poll, however, to assess options and enter into these types of partnerships might require an upfront investment. While there are several areas of impact positively impacted by this action, the impacts were determined to be relatively moderate. It was therefore determined that further consideration was needed before pursuing this action.

Costs

There are potential costs associated with pursuing this market strategy as there are several ways states may fund the public portion of the partnership. In some public-private partnerships (PPPs), the public sector pays for construction, improvement, operation, and maintenance of an asset using public funds from state and federal taxes, direct user fees or tolls, borrowed funds (typically bonds or related instruments), or grants from other levels of government. In others, the public sector seeks to attract the private sector to finance part or all of a project with private resources that may come from direct user fees or tolls, funds borrowed from private capital markets (typically bonds or other debt), or private equity. In addition to user fees and the standard financing mechanisms available in general capital markets, other innovative financing tools exist that can facilitate PPP projects (see Figure 5-1).

Figure 5-1. Available tools for PPPs

Federal-Aid Fund Management Tools
- Advance Construction (AC) and Partial Conversion of Advance Construction (PCAC)
- Federal-Aid Matching Strategies
  - Flexible Match
  - Tapered Match
  - Toll Credits (Soft Match)
  - Program Match
  - Third-Party Donations
  - Using Other Federal Funds as Match

Federal Debt Financing Tools
- Grant Anticipation Revenue Vehicles (GARVEEs)
- Private Activity Bonds (PABs)

Federal Credit Assistance Tools
- Transportation Infrastructure Finance and Innovation Act (TIFIA)
- State Infrastructure Banks (SIBs)
- Section 129 Loans

Public-Private Finance Mechanisms
- Pass-Through Tolls / Shadow Tolling
- Availability Payments

Other Innovative Finance Mechanisms
- Non-Federal Bonding and Debt Instruments
- Value Capture Arrangements such as Tax Increment Financing (TIF)

Source: National Conference of State Legislatures. Public-Private Partnerships for Transportation: A Toolkit for Legislators.

Benefits

Developing public-private partnerships contributes in a positive way to several areas of interest that offshore wind development could impact. Table 5-19 below lists the various positive contributions this market strategy could have.

Table 5-19. Establishing public/private financing partnerships: AOIs, outcomes, and positive contributions

Benefits by Area of Interest	Desired Outcome	Contribution by this Action
Economic Development - Supply Chain	Maximize Local Job Creation	Initial funding partnerships will have cascading effects on the development of local jobs
Social Cost of Carbon	Minimize the negative impacts of climate change	Additional funds will help finance efforts to minimize ecological and environmental impacts
Port Development – Infrastructure Investment	Attract investment in local infrastructure	As more public and private funding mechanisms are secured, the risk to additional financiers is minimized
Industry Advancement – Deployment Costs (LCOE)	Lower deployment costs	Providing upfront capital costs will help streamline project development and future efforts
Investment / Finance	Attract financiers and project developers	As more public and private funding mechanisms are secured, the risk to additional financiers is minimized
Transmission Access - Capacity	Achieve viable project development	Funding allocations for infrastructure will include transmission and distribution lines

Possible implementation options

This market strategy combines funding mechanisms from both public and private sources to maximize benefits and capitalize on funding matches. At the state or federal level, funds allocated to support offshore wind projects bolster progress and encourage private investments. Ultimately, private funding is needed to ensure projects become operational.

One option for incentivizing financing is a public funding match to privately funded dollars. A funding match would provide additional resources necessary to project stakeholders and retain an ongoing interest in development. To secure public dollars, actively pursuing federal funding avenues will encourage high-level financing in the industry from federal funds.

Examples from other states

Block Island Wind Farm in Rhode Island and **Coastal Virginia Offshore Wind** both relied heavily on private funding before becoming operational, but federal tax incentives and credits were used to accommodate the new industry as well. Rhode Island utilized funds from the Reinvestment and Recovery Act to support the development of offshore wind projects. Similarly, **Virginia's** state budget included $733 million in funding dedicated to the environment and clean energy, used for establishing offshore wind policy and infrastructure. Other projects, such as Ohio's Icebreaker, face delays and the threat of pulled public funding due to a lack of private investment.

As part of a public-private partnership, the port of **New Bedford, MA** is utilizing financing to retrofit its facilities to help with offshore wind development, construction, and other activities, including education and training. The city worked with developers to help create the New Bedford Marine Commerce Terminal. Vineyard Wind is set to start utilizing the terminal in

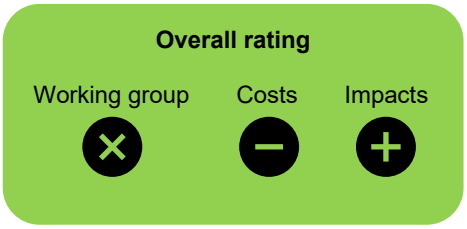
2023. The Massachusetts Clean Energy Center estimated that the terminal would help bring 600-1,000 to the area by serving as the hub for an offshore wind project.

New York State is maximizing infrastructure upgrades by optimizing approximating three dollars of private funding for every one dollar of public funding. The nearly $700 million investment will allow for new offshore wind manufacturing and staging facilities in the state.

Additionally, the state of **Maine** is pursuing floating platform technology developed by the University of Maine to support the Maine Floating Offshore Wind Research Array. The project will partner with New England Aqua Ventus, a joint venture between Diamond Offshore Wind and RWE Renewables, to become operational. Benefits of this PPP include new market development surrounding OSW growth and research opportunities to explore floating platforms.

5.3.2 F-2. Foster cluster-based development

Summary



Cluster development is a market strategy for economic development that involves businesses in close proximity to one another supporting an industry, similar to Silicon Valley and the tech industry, Hollywood and arts and entertainment, or Boston's medical community. This is also a key strategy for DOE in developing the Hydrogen economy [15]. This arrangement has been seen as a key strategy for creating or enhancing local markets. Maine could benefit from cluster-based development leveraging local workforce, skills, and maritime industries to create more cluster-oriented regions to enhance the state's position as an offshore wind leader.

Costs and benefits

This market strategy was viewed unfavorably according to the feedback received from the working group; however, cluster-based development to support supply chain development and attract financing is believed could result in many positive impacts.

Costs

Industrial clusters for offshore wind will likely involve several players including customers, government institutions, universities, professional training institutions, and trade associations. Funding for innovation clusters has been coming from federal grants. In Washington State, innovation clusters are supported by a $15 million CARES Act investment by the U.S. Department of Commerce Economic Development Administration (EDA)[12]. In Connecticut, the Offshore Wind Industry Cluster received a $500,000 EDA grant and is currently competing for a second award which is expected to be between $25 million and $100 million[13].

Benefits

Cluster-based development contributes in a positive way to several areas of interest that offshore wind development could impact. Table 5-20 below lists the various positive contributions this action would have.

[12] Wash. state Dept. of Commerce funds 4 new 'innovation clusters' - GeekWire

[13] Southeastern Connecticut Enterprise Region | U.S. Economic Development Administration (eda.gov)

Table 5-20. Fostering cluster-based development: AOIs, outcomes, and positive contributions

Benefits by Area of Interest	Desired Outcome	Contribution by this Action
Economic Development - Supply Chain	Maximize local job creation	Stakeholders along the supply chain can capitalize on cluster-based development to reduce costs through economies of scale
Economic Development - Workforce Development	Maximize local job creation	Cluster-based development encourages economic growth and boosts the local job market. The region would attract skilled workers and enhance regional OSW capabilities
Social cost of carbon	Minimize the negative impacts of climate change	Clustered OSW operations reduce travel and delivery times, reducing emissions associated with development
Port Development - Job Creation	Maximize local job creation	Pooled resources encourage investment in growing local OSW industries and creating jobs. Port development for multiple projects increases economies of scale associated with job creation and growth
Port Development - Infrastructure Investment	Attract investment in local infrastructure	Regional clusters encourage investment and reduce risk to financiers. Establishing a regional OSW hub reinforces commitment to developing port infrastructure
OSW Industry Advancement - Deployment Costs (LCOE)	Lower deployment costs	Combining OSW efforts reduces costs along the supply chain, including start-up, deployment, and operational expenses
OSW Industry Advancement - R&D/Innovation	Increase local and exportable expertise	Similar to Silicon Valley, a regional cluster of OSW activities would foster innovation and growth and attract a skilled workforce. Multiple OSW projects increase job security, attracting experts to the region
Investment / Finance	Attract financiers and project developers	Cluster-based development inherently reduces operational and start-up costs, reducing risk to financiers and encouraging investment in the area

Possible implementation options

For Maine, the state would seek to engage the business community in and around strategically located ports to take advantage of the existing resources, knowledge of ocean resources management, and capacity to create the infrastructure

needed to support offshore wind development. To implement this market strategy the state would work collaboratively with partners located around the ports to enhance ports service, provide construction and materials support, training, and research. Ideally, these activities would lead to a competitive advantage for local ports over others that may offer support services for offshore wind development and operations.

The MDOT Ports Needs Assessment study should provide a solid basis from which to identify ports of interest, the current resources and infrastructure available, and what gaps exist.

Examples from other states

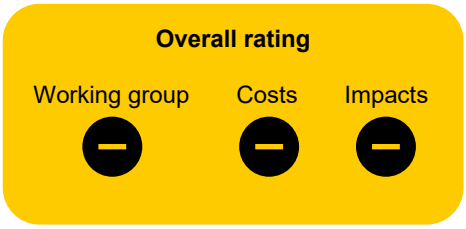
In **Massachusetts**, the New Bedford Ocean Cluster was designed to address, collaborate, and create economic opportunities for the New Bedford area through Aquaculture, Commercial Fishing, Innovation and Technology, and Offshore Renewable Energy. Its mission is to create a New Bedford maritime business network by serving both as a clearinghouse for business-to-business interaction and the leading convener of the maritime businesses, leveraging the networks, the port's unique infrastructure, and maritime know-how to attract investment and support the formation and growth of ocean economy businesses; Make the Port of New Bedford the first port of call of the offshore wind industry in the United States; Become the model for other ports to facilitate commercial collaboration between port industries and companies; Develop strategies to create more value for the community from our natural ocean resources including fish, wind, and aquaculture [16].

In **Washington State**, the Washington Maritime Blue organization seeks to create an organized cluster of competitive companies and partners to drive sustainable economic development for the maritime industry. This formal cluster organization is intended to drive the implementation of the Washington Maritime Blue strategies designed to create an attractive business environment through marketing, networking, research and development, workforce development, and financing [17].

5.3.3 F-3. Continuously assess and communicate offshore wind project benefits

Summary

Under this market strategy, Maine could build off the analysis done for the roadmap to determine the full spectrum of benefits estimated to be achieved by offshore wind projects and leverage this analysis to attract additional public and/or private financing.



Costs and benefits

Efforts are already underway to estimate the economic effects of offshore wind development in the state of Maine and it is anticipated that efforts to monitor the impacts will continue as jobs, energy savings, and meeting the renewable energy goals will continue. While the metrics could be expanded, adopting this as a formal market strategy is not needed with the other efforts underway.

Costs

In June 2019, Governor Janet Mills created the Maine Offshore Wind Initiative. The initiative was charged with promoting compatibility between potential future and existing uses in the Gulf of Maine, specifically addressing any impact on Maine's commercial fishing and maritime industries when considering offshore wind sites. The Initiative is exploring economic, social, and environmental impacts of offshore wind development and is communicating information through the Advisory Committee, Working Groups, webinars, press releases, and a dedicated website. This market strategy recommends

continuing these efforts through all phases of deployment. The ongoing fiscal impact to the state to continue outreach and communication to stakeholders should be minimal and can be done within existing resources.

Benefits

It is recognized that there are several benefits to pursuing this market strategy regardless of the recommendation, as noted in Table 5-21.

Table 5-21. Continuous outreach and education: AOIs, outcomes, and positive contributions

Benefits by Area of Interest	Desired Outcome	Contribution by this Action
Economic Development - Supply Chain	Maximize local job creation	Communicating benefits continuously will generate interest in the OSW industry and encourage stakeholders along the supply chain to expand operations
Social Cost of Carbon	Minimize the negative impacts of climate change	Communicating the linkage between clean energy development and reducing emissions can further climate change goals and spread awareness
Port Development - Job Creation	Create jobs by developing existing port infrastructure	Project reassessment encourages ongoing process improvements in port development and infrastructure, spreads awareness, and leads to job growth
Tourism and Recreation	Produce additional tourism opportunities while mitigating impacts on cultural characteristics	
Investment/Finance	Attract financiers and project developers	Periodic reassessments will include project benefits important to investor decision-making. Benefits may not be realized until various stages are complete

Possible implementation options

Continue to engage outside contractors to monitor, assess and provide information back to the state on the status and impacts of activities to date. This information should be gathered, analyzed, and reported on an annual basis to ensure that activities are on track and trends are in line with expectations.

Examples from other states

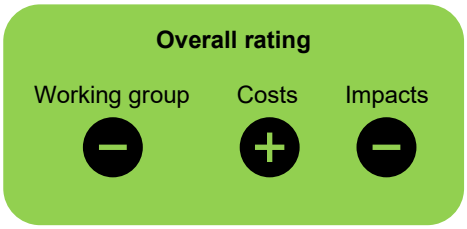
In **New Jersey**, the state has estimated that the Atlantic Shores Offshore Wind and Ocean Wind II projects will generate $3.5 billion in economic benefits and power 1.15 million homes with clean energy. They are estimated to create 7,000 full and/or part-time jobs across the development, construction, and operational phases of the projects, which yields approximately 56,000 Full-Time Equivalent job years.

In **New York**, it has been communicated that the Empire Wind 2 and Beacon Wind, in combination with Empire Wind 1 and Sunrise Wind, will bring tremendous economic benefit to the state. The state estimated that the projects will bring a combined economic impact of $12.1 billion to upstate, downstate, and Long Island, and power more than 2.4 million New York homes. They also communicate those investments of $730 million in combined private and public funds in long-term port facilities and cutting-edge technologies support more than 6,800 jobs in project development, component manufacturing, installation, and operations and maintenance. They also note that these projects will deliver significant economic benefits to disadvantaged communities and support the responsible retirement of aging fossil-fuel power plants near key environmental justice communities.

5.3.4 F-4. Explore the possibility of using funds collected from offshore wind projects to support impacted ocean users

Summary

Under this market strategy, as offshore wind projects are developed, Maine would consider allocating a portion of the funds and/or fees collected from these projects to provide support to maritime industries and ocean users such as coastal or other impacted communities, fisheries, and wildlife protection. This could be set up to align with and fund the programs established under market strategy 5.1.2 or 5.1.3 In addition, using such funds to foster collaborative or other proactive engagements between the broad spectrum of ocean users and project developers will help the offshore wind industry integrate into Maine's ocean economy.



Costs and benefits

The feedback gathered from the working group was generally neutral; however, it's believed this market strategy could result in multiple positive impacts in several areas of interest at a relatively low cost, and therefore should be further explored to more closely examine the details.

Costs

States use funds from large scale projects or investments to help pay for a wide variety of services and capital projects, including transportation, education, care for persons with mental illness and developmental disabilities, assistance to low-income families, and environmental projects. Providing resources to impacted communities using funds generated by offshore wind projects may require legislative authorization.

Benefits

This market strategy contributes in a positive way to several areas of interest that offshore wind development could impact. Table 5-22 below lists the various positive contributions this action would have.

Table 5-22. Continuous outreach and education: AOIs, outcomes, and positive contributions

Benefits by Area of Interest	Desired Outcome	Contribution by this Action
Energy Cost Burden	Achieve a total energy burden of 6% or less for households earning 80% of the median income of less	This market strategy could be used to help offset the energy costs of more vulnerable communities by providing additional economic relief or aid.

Benefits by Area of Interest	Desired Outcome	Contribution by this Action
Fisheries	Minimize negative impacts of OSW development on Fisheries	This market strategy could be used to offset potential impacts on commercial fisheries
Tourism and Recreation	Produce additional tourism opportunities while mitigating impacts on cultural characteristics	This market strategy could be used to enhance the cultural characteristics of local communities
Ecological Impacts	Minimize impacts on sea life while seeking opportunities to enhance fish habitat	Funds could be used to enhance fisheries and habitats preserving ocean resources
Investment/Finance	Attract financiers and project developers	Indirectly, this may create more support for wind projects and therefore a more favorable opportunity for investment

Possible implementation options

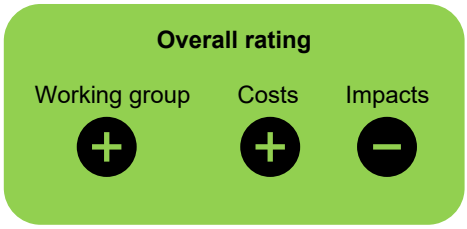
It should be noted that the state has signed the multi-state Governor's letter to President Biden [45] urging the federal government to lead in managing natural resource impacts and developing mitigation frameworks for adverse impacts on marine resources, fisheries, habitats, and local cultures and has further begun to collaborate on a fisheries compensation framework with BOEM. The outcomes of this process may influence state-level activities relating to this market strategy.

Examples from other states

Examples of U.S. states leveraging funds generated from renewable energy assets was not found.

5.3.5 F-5. Continue to support/advocate for enhanced federal OSW tax credits

Summary



This market strategy involves supporting and advocating for continued federal tax credits for offshore wind that will benefit Maine. The IRA, signed in August 2022, includes provisions that extend existing investment tax credits (ITCs) and production tax credits (PTCs) applicable to offshore wind, while also proposing new and expanded tax credit opportunities for future clean energy development [62]. This market strategy recognizes these recent achievements and supports additional advocacy for additional tax credits to benefit offshore wind.

Costs and benefits

This market strategy was viewed favorably according to the feedback received from the working group, but when considering the impacts, the market strategy's effects are mostly concentrated within investment-related areas of interest and therefore it receives a neutral rating. This market strategy is considered low cost though, so it is recommended that the state advocate for longer-term ITCs.

Costs

Federal and state governments on the east coast are currently working together to create a strong foundation for offshore wind energy. Maine has been coordinating with federal agencies and congressional staff on offshore wind permitting, financing, and deployment. This market strategy recommends that Maine continue to engage the federal government in offshore wind development, recognizing the extensions and changes contained within IRA, and continuing to advocate for tax credit solutions that increase investment. Ongoing coordination will have no fiscal impact and likely can be done within existing appropriations.

Benefits

The continued federal tax credits contribute in a positive way to several areas of interest that offshore wind development could impact. Table 5-23 below lists the various positive contributions this action would have.

Table 5-23. Supporting/advocating for OSW production tax credit: AOIs, outcomes, and positive contributions

Benefits by Area of Interest	Desired Outcome	Contribution by this Action
Social Cost of Carbon	Minimize the negative impacts of climate change	Additional funding will help finance mitigation efforts
Port Development – Infrastructure Investment	Attract investment in local infrastructure	The reduction in cost will result in additional interest and financing options among interested stakeholders
OSW Industry Advancement – Deployment Costs (LCOE)	Lower deployment costs	The tax credit will reduce overall costs related to development
Investment / Finance	Attract financiers and project developers	The reduction in cost will result in additional interest and financing options among interested stakeholders

Possible implementation options

Federal investment tax credits, production tax credits, and loan guarantees are powerful mechanisms that can be specifically dedicated toward supporting floating technology development. ITCs have historically been more favorable than PTCs for offshore wind because these projects are capital-intensive and incur heavy upfront costs and have a long development timeline. Development efforts typically benefit more from the up-front tax credit.

In addition to the federal tax credits, developers also have the option to pursue loan guarantees offered through the US DOE. Loan guarantees have played an important role in deploying and lowering the costs of utility-scale solar PV projects over the past 10-15 years. With the passage of recent legislation, DOE now has $3 billion in funding available through Title XVII of their loan guarantee program to support the deployment of offshore wind. The Title XVII Program has some flexibility in the debt products available, offering senior, secured debt through direct loans or loan guarantees. DOE can act as a sole lender or co-lender with other financial institutions. This option does not necessarily require action by the state.

As the details surrounding the tax credit changes under IRA become clearer, it will be important to monitor their impacts throughout the industry. This action is viewed as a long-term market strategy to implement, continuing to advocate for extensions such as those included in IRA. The state could also advocate for tax credits or loan guarantees for floating

technologies specifically given that it is an early-stage technology. One other approach the state may consider is exploring the possibility of state-level tax incentive options in addition to the federal tax credit program similar to the approach used in New Jersey.

Examples from other states

New Jersey has developed an offshore wind tax credit program that awards up to 5 compliance years, with each award equal to 20% of the total tax credit value. Businesses investing $50M in wind energy and supplying 150 jobs will be eligible for applications. They can receive up to 100% of the total credit amount annually over five years. They also have the option to sell the tax credit for at least 75% of the credit amount.

6 IMPLICATIONS OF MAINE'S WIND ENERGY NEEDS ASSESSMENT

As part of the Maine Offshore Wind Initiative and the Maine Offshore Wind Roadmap, DNV completed a Wind Energy Needs Assessment that developed projections of how offshore wind in the Gulf of Maine can contribute to achieving both Maine and New England's long-term renewable energy needs. This analysis builds on the targets set in statute and prior analyses conducted in the state, including the Renewable Energy Goals Market Assessment (REGMA) and the Maine Climate Council. This analysis projected electricity demand through 2050 for Maine, and for two New England scenarios, a base-case demand and a decarbonization demand. For each demand projection, DNV developed three supply scenarios that varied constraints on onshore development to estimate the amount of renewable energy development, including offshore wind in the Gulf of Maine, that could be developed to meet Maine and regional demand needs.

The full report with all scenarios and methodology is available on the Maine Offshore Wind initiative website, but for the purposes of this report, the results of the Diverse Portfolio scenario are included in Table 6-1. This scenario assumes the development of 3,000 MW of additional onshore wind and/or solar generation located in Maine and estimates additional offshore wind development to meet Maine and New England demand. Table 6-1 shows the projections for Maine and for two New England scenarios: a base decarbonization demand and a high decarbonization demand.

Table 6-1. DNV Diverse Portfolio projections of additional renewable capacity by resource (MW)

Resource	Maine			New England – base decarbonization demand			New England – high decarbonization demand		
	2030	2040	2050	2030	2040	2050	2030	2040	2050
Solar PV (MW)	1,100	2,250	2,250	1,100	2,250	2,250	1,100	2,250	2,250
Onshore wind (MW)	51	1,500	1,500	51	1,500	1,500	51	1,500	1,500
Offshore wind (MW)	155	305	2,086	155	305	3,312	155	1,619	11,216

The findings that underpin this report identified a total of 17 strategic priorities, that are seen as important potential mechanisms to realize Maine's wind potential. This section outlines the market strategies that are likely necessary to achieve the OSW deployment goals identified in the Maine and New England scenarios. Collaboration among state governments across several strategies can contribute to the timely and cost-effective scaling of the emerging offshore wind industry along the US East Coast. Therefore, most market strategies identified in this section apply to both Maine and New England but with varying degrees of applicability and urgency through the stages of offshore wind development.

The implementation timeline/prioritization of the of the market strategies below, are recommendations observed from other states and federal guidance and supported through stakeholder interviews and market assessments. Using the Diverse Portfolio projections developed in the Wind Energy Needs Assessment for Maine and New England, we identified key activities needed to meet the goals and selected market strategies for Maine to consider for three scenarios. State and local officials will need to use professional judgement on the timing of each market strategy as they will be dependent on legislative action, funding, political acceptability, and other competing priorities.

6.1 Maine Diverse Portfolio scenario

With vast offshore wind generation potential in the Gulf of Maine, the State of Maine's primary challenge is to create an environment that fosters the development of a floating offshore wind industry in Maine. The Maine-only scenario estimates that the state has the potential to generate approximately 2,086 MW by 2050 and to achieve that, the following market strategies should be prioritized:

P1. Pursue an offshore wind RPS requirement. The chief obstacle to offshore wind development in the Maine-only scenario is financing, and secure financing depends on establishing a procurement process for a project's power. The procurement process should be timed to enable contracts to be in place early in the project development process and should be coordinated with the timing of the federal offshore wind area leasing process.

P-3. Establish a small business support program for offshore wind development. The quantity and types of components that are required to build offshore wind energy projects provide an opportunity for Maine to leverage its existing strengths to support the supply chain. Small and local businesses are looking to share a piece of this economic opportunity. This market strategy allows Maine to help revitalize communities and local economies by establishing programs that ensure small businesses have the opportunity to participate in projects.

P-4. Create a state-level entity focused on supply chain and workforce development. In addition to market strategy P-3, having a state agency focused on supply chain and workforce development will be important to accelerating OSW development in Maine. This market strategy will complement market strategy P-3 by helping the State develop a local supply chain and grow the industry.

P-5. Continue to engage with local institutions on research, training, and demonstration projects. Research, development, demonstration, and deployment of new-and improved components and systems are needed to achieve efficiencies in manufacturing and installation and improve the performance of offshore wind turbine systems. Maine will benefit from this relatively low-cost market strategy by creating jobs and training programs while reducing financial risks and uncertainties of project development.

P-7. Engage in direct communications with affected communities. All strategic prioririties require prioritizing and integrating the concerns of impacted stakeholders. This is an ongoing priority to understanding complex challenges and impacts. Maine should continue to engage in an ongoing consultation process to provide clarity for all stakeholders in futre development.

I-4. Invest in addressing the infrastructure needs of strategically located ports. While some project-specific staging ports are already being developed, further expansion of port facilities is needed to meet the expected growth of the offshore wind energy industry and the demanding requirements of handling, transporting, erecting, and servicing offshore wind power plants. Investing in supply chain development, including customized offshore wind ports and vessels to establish a logistics network and attract further investment.

I-6. Work with BOEM to set clear permitting expectations for developers. Improving the permitting process by increasing transparency and streamlining processes will give developers the confidence to invest in the state and region. This market strategy may accelerate identification of additional wind energy sites, facilitate safe, equitable ocean co-use, and help build trust with impacted communities.

F-5. Support/advocate for enhanced OSW federal tax credits. To increase demand and and grow the domestic supply chain at lower cost, it will likely be necessary to continue and expand federal tax incentives through all phases.

6.2 New England Diverse Portfolio Base decarbonization demand scenario

This scenario assumes a lower decarbonization demand projection for New England and predicts that the region will look to the Gulf of Maine for deployment of offshore wind between 2040 and 2050, up to an estimated 3,312 MW by 2050. It is important to note that while this is the base demand, it is still an aggressive emissions-reduction scenario that involves large increases in electricity demand. To that end, many of the Maine-only market strategies likely apply in addition to a few market strategies that will position the state to lead in OSW development. Market strategies to consider in this scenario include:

P-4. Create a state-level entity focused on supply chain and workforce development. Having a state agency focused on supply chain and workforce development will be important to accelerating OSW development in Maine. This market strategy will help the state to develop a local supply chain and grow the industry. In this scenario, this market strategy could help position the state to attract investments in the local supply chain that could create new job opportunities.

P-7. Engage in communications with affected communities. The public may have concerns about developing OSW for New England and question how it benefits Mainers. Concerns may include the landing of transmission lines, port development, housing availability and costs, and electricity costs. The state could create a process that engages local communities and consider local concerns in OSW development. This market strategy will help build trust and political capital among affected communities and other stakeholders.

I-2. Engage with others on a regional development strategy. This market strategy will benefit Maine by ensuring that infrastructure needs are met through regional planning efforts and facilitate coordination to support offshore wind development locally. Pursuing this market strategy in the New England scenarios ensures that Maine has a seat at the table for transmission planning and supply chain growth.

I-3. Ensure public policy goals are considered in transmission planning. This market strategy aligns with market strategy I-2 by ensuring that Maine's public policy goals are incorporated into transmission planning and grid development. State agency-led planning efforts is vital to increasing certainty and minimizing risk to investors.

I-4. Invest in addressing the infrastructure needs of strategically located ports. While some project-specific staging ports are already being developed, further expansion of port facilities is needed to meet the expected growth of the offshore wind energy industry and the demanding requirements of handling, transporting, erecting, and servicing offshore wind power plants. Investing in supply chain development, including customized offshore wind ports and vessels to establish a logistics network and attract further investment the state and region.

I-6. Work with BOEM to set clear permitting expectations for developers. In the New England scenarios, the state could work with BOEM to set clear guidelines and state specific permitting policies that encourage BOEM to create more leases nearer Maine. This market strategy could help Maine by potentially accelerating identification of additional wind energy sites which could increase the odds of the state getting more potential bidders and investors.

F-5. Support/advocate for enhanced OSW federal tax credits. One way Maine could attract new investment, construction and development into OSW as identified in market strategies I-3 and I-4, is through the continuation and expansion of federal incentives. This market strategy involves continuing support for federal incentives like extending tax credits or creating new tax credits for offshore wind supply chain, port, and vessel investments.

6.3 New England Diverse Portfolio High decarbonization demand scenario

This scenario assumes a high decarbonization demand for New England and predicts that the region will look to deploy offshore wind in the Gulf of Maine between 2030 and 2040, sooner than the base demand scenario. By 2050, the projections for this scenario show deployment of 11,216 megawatts (MW) of offshore wind, which would mark a significant increase from the 3,312 MW of offshore wind energy projected for the base case. This scenario would likely create tens of thousands of jobs in a range of occupations and would spur additional investments in supply chain development, port revitalization, vessel construction, wind power plant operations, and onshore assembly facilities. Therefore, the market strategies that best position Maine in this scenario are as follows:

P-7. Engage in communications with affected communities. The public may have concerns about developing OSW for New England and question how it benefits Mainers. Concerns may include the landing of transmission lines, port development, housing availability and costs, and electricity costs. The state could create a process that engages local communities and consider local concerns in OSW development. This market strategy will help build trust and political capital among affected communities and other stakeholders.

F-2. Foster cluster-based development. Investing in a local workforce, manufacturing, infrastructure, and other maritime business networks will enhance the state's position as an offshore wind leader.

F-5. Support/advocate for enhanced federal OSW tax credits. One way Maine could attract new investment, construction and development into OSW as identified in market strategies I-3 and I-4, is through the continuation and expansion of federal incentives. This market strategy involves continuing support for federal incentives like extending tax credits or creating new tax credits for offshore wind supply chain, port, and vessel investments.

I-2. Engage with others on a regional development strategy. This market strategy will benefit Maine by ensuring that infrastructure needs are met through regional planning efforts and facilitate coordination to support offshore wind development locally. Pursuing this market strategy in the New England scenarios ensures that Maine has a seat at the table for transmission planning and supply chain growth.

I-3. Ensure public policy goals are considered in transmission planning. This market strategy aligns with market strategy I-2 by ensuring that Maine's public policy goals are incorporated into transmission planning and grid development. State agency-led planning efforts is vital to increasing certainty and minimizing risk to investors.

I-4. Invest in addressing the infrastructure needs of strategically located ports. Investing in supply chain development, including customized offshore wind ports and vessels to establish a logistics network and attract further investment. While this market strategy helps Maine secure a first-mover advantage to accelerate industry development, it will also be important to coordinate among states in the New England decarb scenario to help avoid over- or underbuilding total port infrastructure needs or selecting suboptimal locations for critical ports.

I-5. Provide support to local shipyards in the development of OSW wind construction and maintenance vessels. It is expected that there will be high demand for offshore wind installation vessels in the high demand New England scenario. This market strategy will position the state to attract investment, create jobs and be competitive in a regional market.

I-6. Work with BOEM to set clear permitting expectations for developers. In the New England scenarios, the state could work with BOEM to set clear guidelines and state specific permitting policies that encourage BOEM to create more leases closer to Maine. This market strategy could help Maine by potentially accelerating identification of additional wind energy sites which could increase the odds of the state getting more potential bidders and investors.

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