Maine Offshore Wind Roadmap

Energy Markets and Strategies Working Group

Final Recommendations

Version July 8, 2022

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Introduction to the Energy Markets and Strategies working group

The Offshore Wind Roadmap: Charting a Course for Maine is an 18-month, participatory initiative led by the Governor's Energy Office (GEO) to create an economic development plan for the offshore wind industry in Maine. The Roadmap is supported by a $2.166 million grant from the U.S. Economic Development Administration. GEO's objective for the Roadmap is to identify how to foster an offshore wind industry that works for Maine's people, Maine's economy, and Maine's heritage.

The Roadmap is being developed by an expert advisory committee and working groups with broad public input, focusing on energy markets, ports and infrastructure, socioeconomic impacts, manufacturing and supply chains, workforce development, and ocean and environmental compatibility.

This document presents the final working group recommendations of the Maine Offshore Wind Roadmap Energy Markets and Strategies Working Group (EWG, or the working group). The working group consists of public and private sector representatives with diverse experience including in energy regulation and policymaking, the renewable energy industry, environmental and consumer advocacy, utility planning and operations, social sciences, finance, and academia. The working group has developed these recommendations through the course of seventeen public meetings since August 2021.

Areas of interest for the working group include renewable energy targets, energy market and trend analysis, analyses of costs and benefits of offshore wind, cost effective development of offshore wind, interconnection and transmission, storage, and related R&D. Working group discussions have been informed by multiple studies developed in consultation with the working group by globally experienced technical consultants to provide data and analysis supporting the working group's deliberations. Working group meetings have also featured presentations and discussions with energy experts and offshore wind industry representatives from around the world, government officials from Maine and beyond, and other groups and members of the public.

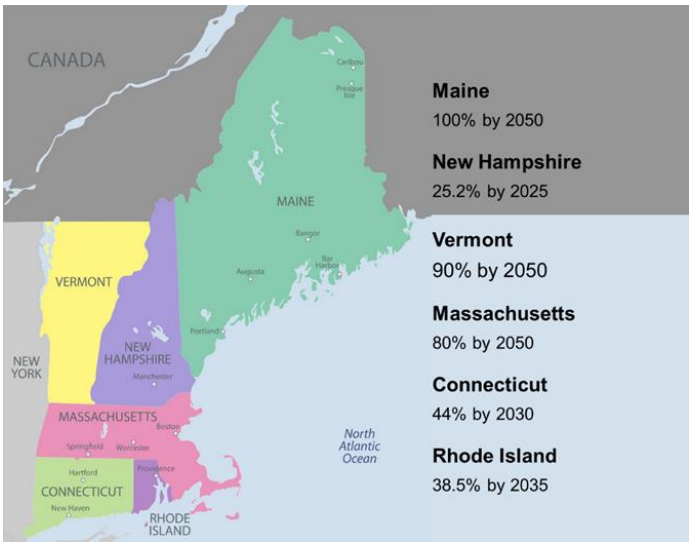
Context for the Energy Markets and Strategies working group recommendations

These final working group recommendations reflect the Working Group's discussions on offshore wind and its role in delivering carbon reduction and achieving Maine's renewable energy goals in a cost-effective manner; all in the context of a regional transition away from fossil fuels.

Maine and New England's climate objectives

Maine law, enacted with bipartisan support, requires that 80% of electricity used in the state come from renewable sources by 2030, with a goal of 100% by 2050.[1] Other New England states have established similar requirements – see Figure 1.[2] Maine has also enacted, again with bipartisan support, greenhouse gas emission reduction requirements of 45% below 1990 levels by 2030 and 80% by 2050.[3]

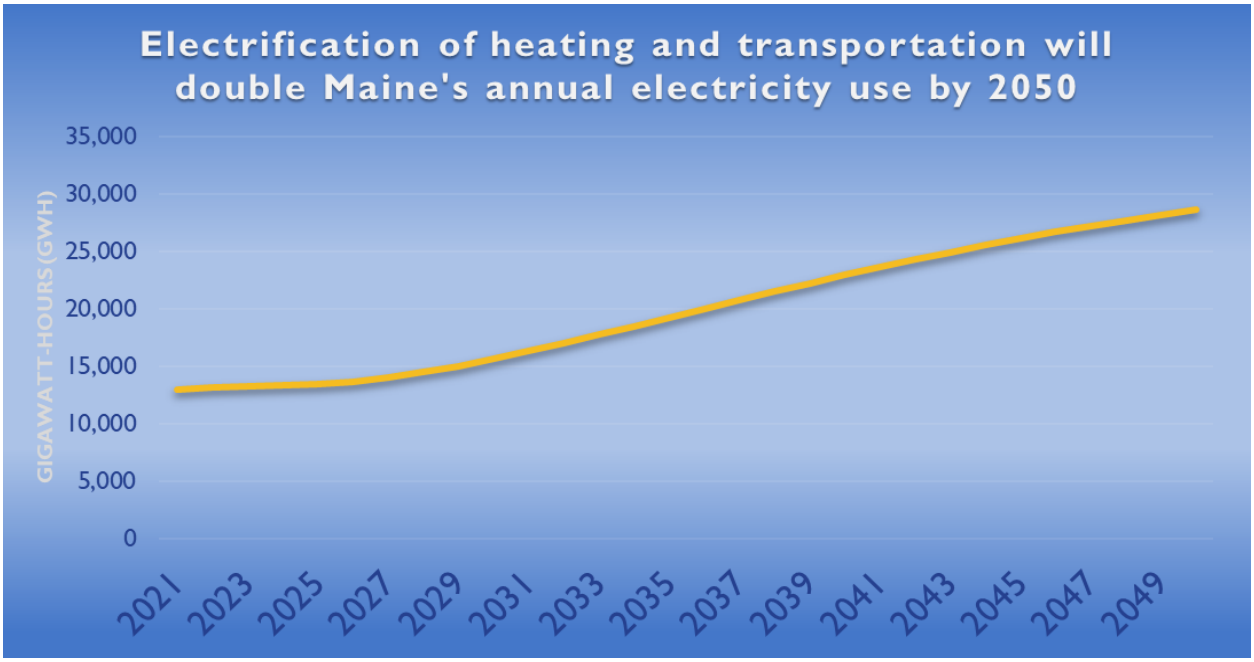
Figure 1 - New England states' Renewable Portfolio Standards. Source: DNV.



Maine Won't Wait, the four-year climate action plan released by the Maine Climate Council in December 2020, states "sectors with high greenhouse gas emissions, such as transportation and heating, must shift their energy sources from fossil fuels to electricity and low-carbon fuels to achieve Maine's climate goals."[4] This strategy, often referred to as "beneficial" or "strategic electrification," can both enable decarbonization and lower overall consumer energy cost.[5] Analyses conducted for the Maine Climate Council suggests electricity demand in Maine will approximately double by 2050 as a result of beneficial electrification needed to meet Maine's 2030 greenhouse gas reduction targets – see Figure 2.[6]

[1] 35-A MRSA §3210.
[2] https://www.iso-ne.com/static-assets/documents/2021/03/2021_reo.pdf
[3] 38 MRSA §576
[4] https://www.maine.gov/climateplan/sites/maine.gov.climateplan/files/inline-files/MaineWontWait_December2020_printable_12.1.20.pdf
[5] See e.g. https://www.raponline.org/be/
[6] https://www.maine.gov/energy/sites/maine.gov.energy/files/inline-files/GEO_State%20of%20Maine%20Renewable%20Energy%20Goals%20Market%20Assessment_Final_March%202021_1.pdf#page=26

Figure 2 - Electric load growth projections prepared for the Maine Climate Council. Source: Synapse Energy Economics.



Regional energy needs and opportunities

As illustrated in Figure 1, all six New England states have enacted renewable energy requirements. Similarly, the diffusion of new, proven electric technologies (e.g., air-source heat pumps) and commitments to beneficial electrification are expected to drive significant additional electrical demand across the region. Maine has historically accounted for roughly 10% of New England's electricity demand. As other New England states pursue beneficial electrification and increased renewable penetration, the federal waters of the Gulf of Maine are likely be of interest for offshore wind development to serve energy needs both inside and outside Maine. Multiple independent expert analyses forecast significant offshore wind installation is needed to meet New England's decarbonized energy needs in an economic manner. The forecast offshore capacity needed ranges from 19 GW (DNV),[7] 22 GW (E3)[8], and 43 GW (Brattle).[9] The offshore wind capacity is in addition to significant increases in New England solar and onshore wind capacity. These analyses show that under any likely decarbonization scenario, Gulf of Maine offshore wind is needed. This presents potential opportunities for regional collaboration in multiple areas, including transmission infrastructure, supply chain, and potentially joint procurement.

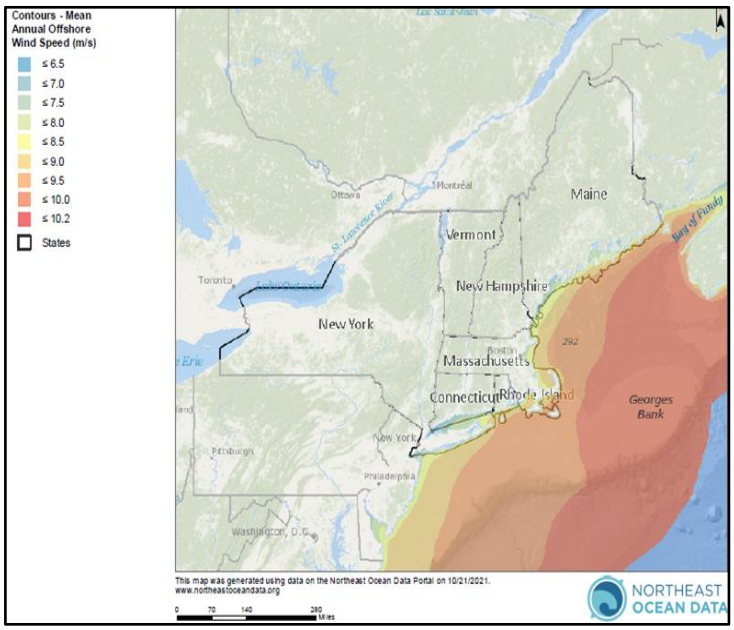
[7] DNV Maine Offshore Wind Energy Needs Assessment (forthcoming).

[8] https://www.ethree.com/wp-content/uploads/2020/11/E3-EFI_Report-New-England-Reliability-Under-Deep-Decarbonization_Full-Report_November_2020.pdf

[9] https://www.brattle.com/insights-events/publications/brattle-study-achieving-new-englands-ambitious-2050-greenhouse-gas-reduction-goals-will-require-keeping-the-foot-on-the-clean-energy-deployment-accelerator/

Previous studies, including the State of Maine Renewable Energy Goals Market Assessment, have identified the potential for regional collaboration on transmission to lower costs and increase benefits.[10] An initial transmission analysis conducted by DNV for the working group identified transmission planning and coordination opportunities, as well as potential challenges, related to the advancement of offshore wind.[11]

Figure 3 - The Gulf of Maine has some of the highest and most consistent offshore wind speeds, and therefore energy potential, in the United States. Source: Northeast Ocean Data Portal.



The economic opportunity of cost-effective renewable energy

Offshore wind not only will provide cost-competitive, predictably priced clean power to New England but could be a major economic driver for Maine, creating high quality, good-paying jobs across the state. Maine has the 7th highest offshore wind energy potential in the United States, with more than 156 gigawatts of potential energy from offshore wind – see Figure 3.[12]

In addition to the robust volume of available energy, offshore wind has significantly higher production during winter months.[13] The New England region relies heavily on natural gas for both power generation and building heating – a dynamic that too often, including again in 2022, leads to severe price spikes when supply constraints mean critical gas must be purchased at global market prices during the coldest winter periods and generally at the highest prices, and the power supply must increasingly rely on oil and coal-fueled generators.[14] This volatility, exacerbated by factors including global conflicts and supply chain challenges, is a key driver of significantly rising electricity prices in Maine and New England.[15] Furthermore, it is widely anticipated that the continued progress toward beneficial electrification, particularly of heating, will drive a transition to New England's highest periods of electricity usage occurring in the winter, rather than the summer. Offshore wind is therefore uniquely positioned to help

[10] https://www.maine.gov/energy/sites/maine.gov.energy/files/inline-files/GEO_State%20of%20Maine%20Renewable%20Energy%20Goals%20Market%20Assessment_Final_March%202021_1.pdf

[11] https://www.maine.gov/energy/sites/maine.gov.energy/files/inline-files/Maine%20OSW%20DNV%20Offshore%20Wind%20Transmission%20Technical%20Review%20Initial%20Report.pdf

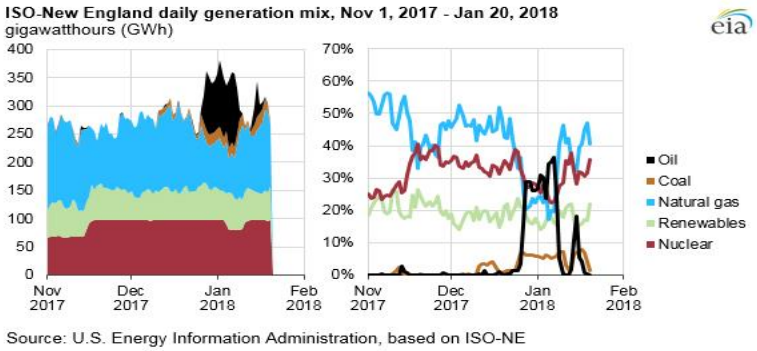
[12] https://www.maine.gov/energy/sites/maine.gov.energy/files/inline-files/Maine%20OSW%20DNV%20Task%201%20-%20State%20of%20the%20OSW%20Industry_Final.pdf

[13] https://www.iso-ne.com/static-assets/documents/2018/12/2018_iso-ne_offshore_wind_assessment_mass_cec_production_estimates_12_17_2018_public.pdf

[14] https://www.eia.gov/todayinenergy/detail.php?id=51158

[15] See e.g. https://www.maine.gov/tools/whatsnew/index.php?topic=puc-pressreleases&id=6040934&v=article088

Figure 4 - Winter cold snaps result in the highest fossil fuel usage for power generation in New England, as oil and coal-fired power plants are called upon to meet demand that would typically be served with natural gas generation. Source: EIA.

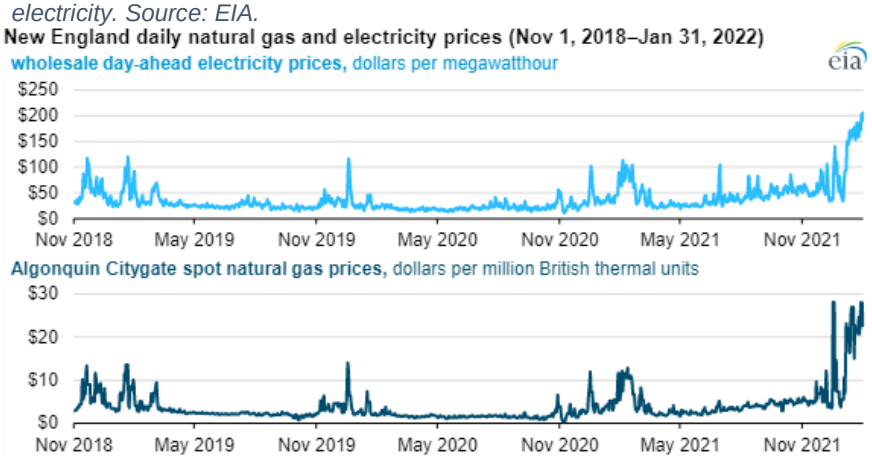


achieve Maine's climate goals in concert with other renewable energy technologies while insulating consumers from volatile energy costs. Finally, as with other renewables, offshore wind has low operating costs; with the bulk of the cost coming from recovering upfront capital cost. Thus, offshore wind offers long-term price stability and predictability, favored by consumers and business, as opposed to volatility in prices from gas, coal and oil commodity-based generation.

The New England electricity generation fleet has seen substantial capacity loss from plant retirements in recent years, and more can be anticipated in the coming years, particularly within the natural gas and oil fleet.[16] Offshore wind should play a key role in filling the gaps as older generation retires, avoiding new investments in fossil fuel generation that are contrary to carbon reduction objectives.

Offshore wind costs have fallen dramatically over the last decade, and with increasing global deployment of both fixed and floating foundations, costs are forecasted to continue to drop considerably in the coming years. Multiple offshore wind cost forecasts, including those of the U.S. National Renewable Energy Laboratory, predict the Levelized Cost of Electricity[17] from floating offshore wind in the Gulf of Maine will drop significantly by the end of the decade.[18,19]

Figure 5 - Natural gas and New England wholesale electricity prices are strongly correlated due to the region's reliance on natural gas-fired generators for electricity. Source: EIA.



[16] https://www.iso-ne.com/about/what-we-do/in-depth/power-plant-retirements

[17] Levelized Cost of Energy, or LCOE, refers to estimates of the revenue required to build and operate a generator over a specified cost recovery period, according to the EIA. It is useful for comparing the expected costs of generation but does not account for related infrastructure and externalities such as transmission lines, carbon costs or environmental harm, additional pipeline capacity for gas power or costs of backup or standby generation. In the case of fossil fuel technologies LCOE is heavily influenced by expectations about future fuel prices. The following graphic illustrates projected global LCOE values for a variety of electricity generation technologies (source: DNV).

[18] https://www.maine.gov/energy/sites/maine.gov.energy/files/inline-files/Maine%20OSW%20DNV%20Task%201%20-%20State%20of%20the%20OSW%20Industry_Final.pdf

[19] See also e.g. https://www.bloomberg.com/news/articles/2021-06-23/building-new-renewables-cheaper-than-running-fossil-fuel-plants

The federal government has established the nation's first offshore wind goal of 30 gigawatts to be deployed by 2030, anticipating the creation of nearly 80,000 jobs. To achieve this objective, the Bureau of Ocean Energy Management (BOEM), the federal agency responsible for managing the development of offshore energy resources in federal waters, released an offshore wind leasing schedule that calls for offshore wind lease sales in seven areas, including the Gulf of Maine in 2024 – see Figure 6.

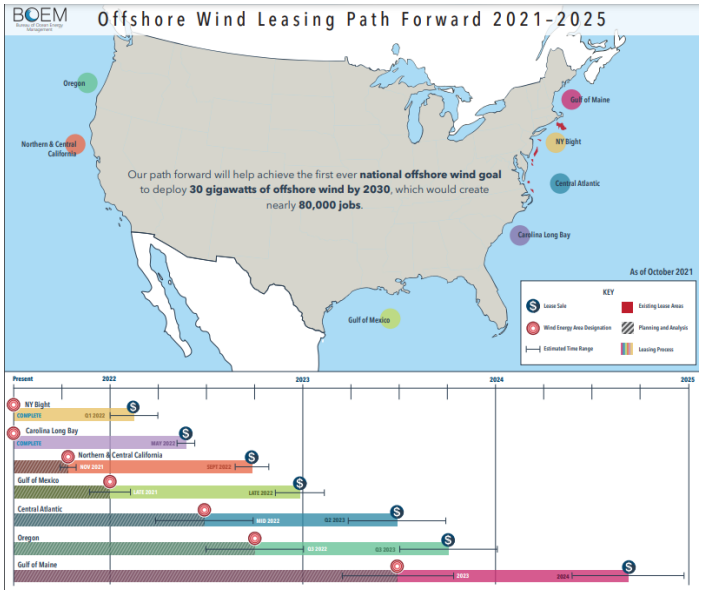
Summary of recommendations

The working group's recommendations strive to establish the necessary commitments Maine must make in order to lay the foundation for an offshore wind industry that delivers cost-effective renewable energy to support achievement of the state's climate and clean energy goals, while accounting for the interconnected nature of the New England region and the fundamental importance of sustainable energy costs and avoidance and minimization of negative impacts.

Impact on people

The recommendations provided by the working group are intended to broadly benefit all Maine people by leveraging the opportunity to establish a thriving offshore wind industry that supports achievement of renewable energy goals and reduces Maine's reliance on expensive, volatile fossil fuels, helping to meet the challenge of climate change while delivering jobs, economic benefits, and needed investments in Maine's infrastructure and workforce. Maine has communities who have seen fewer investment opportunities to date – in particular, communities that are rural or lower income or are comprised of historically marginalized groups. These communities could benefit from Maine's thoughtful and responsible participation in the offshore wind industry. Creating a process that is transparent, fair, and equitable informs each of the working group's recommendations.

Figure 6 - The Bureau of Ocean Energy Management's offshore wind leasing schedule calls for an offshore wind lease sale in the Gulf of Maine in 2024. Source: BOEM.



Recommendation One: Establish state commitments necessary to build offshore wind industry certainty and meet increasing electricity needs

The state should establish and initiate a competitive procurement process to achieve a commercial floating offshore wind capacity or production target equal to a meaningful percentage of Maine's forecasted electricity needs by 2050, with substantial nearer-term commitments to capacity by 2030. The procurement process should solicit phased-in incremental installed and operating capacity between 2030 and 2050 to take advantage of falling costs and increased electricity demand.

The Governor's Energy Office should continue to work with stakeholders, and in coordination with other state entities, to determine Maine's optimal procurement mechanism, including identifying best practices from other jurisdictions and pursuing joint efforts with neighboring states. In addition, regional efforts to enable clean energy deployment through regional market reforms have the potential to influence the pace and scale of deployment. The first procurement tranche should open no later than 2026, or within one year of any federal water offshore lease grants. The procurement should be conducted by the Maine Public Utilities Commission, preferably in coordination with other states, and take place on a competitive basis with sufficient specificity and prescription to attract highly qualified bidders that can deliver offshore wind at the lowest possible long-term cost while preserving the Commission's discretion to consider both changes to electricity rates price stability when evaluating bids. Consideration should also be given to the creation of economic benefits consistent with prior renewable energy solicitations that have produced low-cost economically beneficial contracts[20]. The Commission should coordinate with the Governor's Energy Office and the Office of the Public Advocate, including to engage expert support where necessary, in developing and conducting the procurement process.[21]

Context and Rationale

Maine's electricity demand will approximately double by 2050[22], and most of Maine's existing gas-fired combined cycle generation was commissioned near the beginning of the millennium will need to be replaced during that period. This will require substantial new renewable energy resources, of which offshore wind is an important component, particularly as costs decline over the long term. Simultaneously, New England's renewable electricity needs will also expand substantially, and the Gulf of Maine will be an attractive resource.

A procurement mandate is a primary driver of investment and has been implemented in several other states.[23] A predictable, established competitive procurement provides the certainty needed to attract cost-effective offshore wind development. Therefore, the working group views this recommendation as foundational to the achievement of a thriving, responsible offshore wind industry. Furthermore, a predictable and stable policy and regulatory environment is key to attracting necessary investments, given the extended time periods for (i) Federal Bureau of Ocean Energy Management seabed leasing; (ii) necessary port, transmission, other infrastructure and supply chain investments and related permitting and siting; and (iii) site evaluation (seabed conditions, wind, aquatic and fishery impact), permitting, and stakeholder consultation.

[20] Examples from past Commission procurements include but are not limited to: benefits to the Maine economy in the form of capital investments, employment, contributions to host communities, tases, and avoidance of emissions.

[21] See e.g. https://www.maine.gov/tools/whatsnew/index.php?topic=puc-pressreleases&id=3329595&v=article088

[22] https://www.maine.gov/energy/sites/maine.gov.energy/files/inline-files/GEO_State%20of%20Maine%20Renewable%20Energy%20Goals%20Market%20Assessment_Final_March%202021_1.pdf#page=26

[23] DNV Optimized OSW Deployment Strategies report (forthcoming).

Supporting Actions

- Identify preferred procurement methods to facilitate offtake, such as Offshore Renewable Energy Credits (ORECs) or long-term Power Purchase Agreements (PPAs).
- Other jurisdictions that have pursued offshore wind procurements have employed a variety of structures, with varying mechanisms designed to balance risk allocation, drive competition, and reduce costs. The Governor's Energy Office should continue to work with stakeholders to refine Maine's approach, including pursuing opportunities to participate in joint efforts with other New England state
- The working group has discussed innovative mechanisms to ensure cost controls in competitive procurements. One concept that warrants further consideration could be conducting a procurement bounded by a certain cost cap, with as many eligible projects (or other procured attributes, such as energy or RECs) selected as possible without exceeding the established cap.
- Consider pursuing a floating offshore wind carve-out for RPS requirements to support establishment and initiation of a procurement process to achieve the corresponding floating offshore wind capacity or production.
    - Given water depths and seabed topography, floating offshore wind is anticipated to be required for future offshore wind projects in federal waters in the Gulf of Maine.[24]
    - Maine's floating offshore wind procurement should be phased over time to take advantage of the declining costs and lower the average cost to Maine's consumers and businesses.
    -

Recommendation Two: Pursue multiple avenues to continue driving floating offshore wind cost reductions and achieve cost-effective deployment

Maine should continue to pursue a broad range of efforts to achieve long-term cost-effective, responsible floating offshore wind deployment in the Gulf of Maine, including leveraging federal funding, conducting robust competitive processes, and driving investments in necessary infrastructure and workforce development.

Context and Rationale

Globally, the LCOE of floating offshore wind has decreased substantially over the past decade due to improvements in technology, increasing efficiency, and knowledge gained from pilot projects in Europe.[25] Global floating technology costs are declining, at a similar scale to other technologies, based on investments in research and development from the public sector and commercially scaling the technology.

[24] https://www.maine.gov/energy/sites/maine.gov.energy/files/inline-files/Maine%20OSW%20DNV%20Task%201%20-%20State%20of%20the%20OSW%20Industry_Final.pdf
[25] https://www.maine.gov/energy/sites/maine.gov.energy/files/inline-files/Maine%20OSW%20DNV%20Task%201%20-%20State%20of%20the%20OSW%20Industry_Final.pdf

The benefits of supporting development of the industry are likely to be substantial; however, a proactive strategy to reduce the cost of procurements would be beneficial, particularly around the initial procurement phase. This is particularly important given that Maine and New England are experiencing unusually high electricity prices primarily due to fossil fuel price volatility. Achieving beneficial electrification necessary to meet decarbonization objectives requires a careful balance between managing electricity cost levels and volatility while transitioning electricity generation to renewable resources. To be sure, many of the drivers for cost reductions will come from outside Maine, particularly as other markets move aggressively to deploy floating offshore wind at scale. However, Maine must also consider specific actions to support this effort.

Supporting Actions

- Actively pursue – and encourage industry to pursue – federal funding, tax credits, and other mechanisms. Investment Tax Credits, Production Tax Credits and federal loan guarantees are potentially powerful mechanisms. The Infrastructure Investment and Jobs Act (IIJA) contains $18 billion in funding for energy innovation, $4.5 billion for grid infrastructure, and $2.25 billion for port infrastructure for offshore wind.
- Maine should encourage its federal congressional delegation to develop and support federal funding, extension of tax credits beyond 2026, and loan guarantee opportunities that are specifically geared toward innovative floating technology, given that the technology is at an earlier phase of development than fixed bottom systems, and floating technology will be critical to meeting the country's offshore wind goals.
- Consider additional funding mechanisms to reduce ratepayer costs for offshore wind projects and related infrastructure, such as financing, insurance, through state mechanisms such as bonds. There is a strong argument that this support will spur economic activity and provides numerous benefits to future generations.
- Consider and pursue opportunities to lower offshore wind deployment costs through targeted investments in workforce development and other aspects of the offshore wind supply chain that will create economic benefits in both the short- and long-term.
- Facilitate direct power purchase arrangements with business, institutional, and governmental entities. Examine ways to streamline these opportunities to take advantage of the substantial interest of business to procure clean energy.
- Establish or strengthen authority within the PUC to allow for Power Purchase Agreements, enabling joint procurements with other states or entities[26].
    - There are tried and true ways that the PUC currently employs to conduct a procurement to ensure competitiveness and bring more companies and technologies to the table. For instance, it must not dictate a specific trademarked floating foundation technology.
- Work regionally and internationally to help achieve economies of scale as quickly as possible. Many of the drivers for cost reductions will come from outside Maine, particularly as other markets move aggressively to deploy floating offshore wind at scale, which Maine can help to facilitate.

Recommendation Three: Continue Maine's pursuit of research and development to achieve cost-effective, responsible offshore wind deployment

Maine has a long and robust history of innovation, research, and development on which to build. Continued efforts will help ensure projected cost declines for floating offshore wind are realized and ensure responsible development of floating offshore wind and local supply chains.

Context and Rationale

Maine has initiated a number of partnerships to support offshore wind, including a recent Memorandum of Understanding with the United Kingdom, membership in the National Offshore Wind Research & Development Consortium, Business Network of Offshore Wind Supply Chain Portal, the Regional Wildlife Science Entity, and more. These efforts should begin expediently and be maintained continuously. Partnerships could include private funding matched by public dollars and/or sharing of environmental or production data.

In October 2021 the Governor's Energy Office applied to BOEM to lease a 15.2-square-mile area nearly 30 miles offshore in the Gulf of Maine for the nation's first floating offshore wind research site in federal waters. The State hopes to deploy a small-scale research array of 12 or fewer wind turbines on innovative floating hulls designed at the University of Maine. This project is a public-private partnership with New England Aqua Ventus, a joint venture of Diamond Offshore Wind and RWE. The research array will foster leading research into how floating offshore wind interacts with Maine's marine environment, fishing industry, shipping and navigation routes, and more.

Supporting Actions

- Continue to support current efforts for the state-led Research Array to advance the nation's first floating offshore wind research site, establishing Maine as a leader. The Research Array will provide critical data on how floating offshore wind interacts with the Gulf of Maine's marine environment (e.g., fishing industry, shipping, and navigation routes) while advancing Maine's offshore wind economy and informing responsible growth in the United States and beyond.
- Establish a Center of Excellence in Maine focused on innovation including floating wind that can be a conduit for research dollars and source of cost-saving innovations.
    - Establishing Maine as a hub for testing and refining new technologies may be beneficial, with further consideration of specific target technologies and other considerations needed.
- Cultivate new and expanded public-private partnerships to accelerate research and development in support of the offshore wind industry.
- Explore additional innovative concepts, such as hydrogen production, that support state climate objectives and expand Maine's clean energy economy.
- The IIJA contains $9.5 billion for hydrogen initiatives, including establishment of hydrogen hubs across the country to accelerate progress, reduce technology cost, and ramp up use of hydrogen as a clean energy carrier. The state should evaluate and consider pursuing such opportunities.

Recommendation Four: Continue to accelerate regional collaboration in support of offshore wind industry development.

Maine is one of multiple states with a stake in both the federal waters of the Gulf of Maine and the regional electricity grid. New England states have opportunities to collaborate to achieve mutual benefits as the transition to renewable energy continues, and Maine should prioritize identifying and pursuing these opportunities.

The continued acceleration of renewable energy generation deployment and pursuit of beneficial electrification in Maine and neighboring states will have significant impacts for both the regional transmission and local distribution networks as well as the existing and future generation fleet. The state is therefore best positioned to achieve its own objectives, as well as facilitate and potentially benefit from achievement of other New England states' complimentary objectives, by actively pursuing and engaging in regional collaborative efforts with neighboring states, federal agencies, international partners, and others in this area.

Context and Rationale

All six New England states participate in the ISO-New England electricity market and are thus closely linked from an energy perspective. Recent studies completed on behalf of other states in New England demonstrate the likelihood of significant offshore wind deployment to achieve energy policy and decarbonization objectives, including both fixed foundation resources in southern New England as well as floating resources including the Gulf of Maine.[27]

Interest in the Gulf of Maine spans multiple states. Effective collaboration between states, and between relevant state agencies or actors as appropriate, can support cost-effective deployment that accounts for the interests of multiple states, lowers development risks, and increases overall benefits across the region. Maine should seek to keep pace with other states, leading in strategic areas and collaborating where possible without falling behind or taking unnecessary risks.

Maine's efforts in pursuit of regional collaboration should include building upon existing efforts through the New England States' Committee on Electricity (NESCOE) to advance reforms to coordinate regional electricity markets and state laws, as well as transmission analysis and development in furtherance of state policy objectives. Maine should pursue other venues as well, considering new opportunities where appropriate, such as coordinating procurement or transmission to reduce costs.

Supporting Actions

- Regional coordination is an essential component of offshore wind's development in the Gulf of Maine. As such, Maine should work to actively and continuously advance specific strategies to achieve regional collaboration around renewable energy.
- Explore specific and immediate opportunities to work collaboratively with other states on topics related to offshore wind deployment, including opportunities to maximize regional economic benefits from OSW, joint procurement, & joint analysis.

[27] See e.g. https://www.mass.gov/doc/energy-pathways-for-deep-decarbonization-report/download, https://portal.ct.gov/-/media/DEEP/energy/IRP/2020-IRP/2020-Connecticut-Integrated-Resources-Plan-10-7-2021.pdf, https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/offshore-wind-deployment-report.pdf

        - These conversations might lead to a memorandum of understanding or another output. One example of such an MOU is between Maryland, Virginia, and North Carolina.[28]
        - Maine should continue to monitor and engage with processes assessing alternative procurement methods and market structures actively being discussed in other NE states, such as those identified in ISO-New England's Pathways study.[29]
- GEO can take a first step by coordinating with other relevant agencies to identify opportunities.
- Existing transmission studies require additional attention to Gulf of Maine issues.
    - The Department of Energy Wind Energy Technologies Office is funding an East Coast feasibility study, led by the National Renewable Energy Laboratory, in which the Governor's Energy Office is participating as a technical review committee member.[30]
    - ISO New England is working with states to develop and complete a 2050 transmission study.[31]
- Maine should help to ensure planning for the Gulf of Maine is fully incorporated into those studies and others as appropriate.
- Onshore grid updates will likely be required to provide grid reliability for the injection of significant new renewable energy, including offshore wind in the Gulf of Maine as well as southern New England.
- There are ongoing studies at ISO-New England to examine grid upgrades necessary to support the integration of wind as well as other onshore resources through 2050. Maine should actively seek to participate in these studies and planning processes.
- Maine should pursue a regional approach for transmission development related to OSW deployment in the Gulf of Maine. Due to the scale of anticipated generation and needs, this approach may be more efficient than the traditional generator interconnection queue process.[32]
- The Maine PUC should be given explicit authority and direction to work with other states conducting offshore wind solicitations to increase opportunities for collaboration through coordinated purchases that span more than one state.
- Maine should prioritize workforce and infrastructure development with eye toward regional collaboration with southern New England partners.

Recommendation Five: Develop and prioritize a clear and efficient process and rules for siting, permitting, and mitigating potential adverse impacts

Stable and robust permitting requirements, and the processes for establishing such requirements, are fundamental to fostering a favorable environment for investment.

[28] https://files.nc.gov/governor/documents/files/SMART-POWER-MOU_FINAL.pdf
[29] https://www.iso-ne.com/static-assets/documents/2022/02/pathways-study-report.pdf
[30] https://www.nrel.gov/wind/atlantic-offshore-wind-transmission-study.html
[31] https://www.iso-ne.com/system-planning/transmission-planning/longer-term-transmission-studies/
[32] DNV Optimized OSW Deployment Strategies report (forthcoming).

Context and Rationale

Offshore wind development takes significant time and financial private sector investment. To attract that capital requires a permitting process that balances (i) certainty and transparency, (ii) timely and adequate public and stakeholder input and (iii) confidence in the finality of duly-made regulatory decisions consistent with all applicable standards. Achieving the right balance is key to achieving the predictable conditions desirable for all stakeholders to secure responsible development of an offshore wind industry that works for Maine.

Supporting Actions

- Encourage the state to set clear requirements and achievable expectations for developers, signal stable conditions for investment, and highlight the importance of building and sustaining public support and mitigating areas of potential conflict.
- Explore 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.
- Continue to monitor best practices and lessons learned from other jurisdictions.

Recommendation Six: Develop an offshore wind transmission development strategy that prioritizes cost-effectiveness and market deliverability as well as minimizing impacts

Maine should collaborate with other New England states to explore coordinated approaches to offshore wind transmission.

Context and Rationale

Transmission strategies have cross-cutting implications for many of the other recommendations. Technical consultants are preparing transmission analyses that should inform consideration of this topic, including reviews of best practices from other jurisdictions and high-level analyses of potential topologies for the Gulf of Maine. The EWG also encourages consideration of the forthcoming analysis of Socioeconomic impacts of offshore wind development. Finally, the fisheries and environment and wildlife working groups have incorporated potential impacts of transmission development in their respective recommendations.

Supporting Actions

- One aspect to consider closely is how to maximize the utility and effectiveness of existing landing points. Considerations should be taken for coordinated offshore transmission to take advantage of all available interconnection capacity, including consideration of long-term interconnection needs.
- Maine should engage with other New England states in a regional process to solicit detailed information regarding the potential benefits and considerations related to a coordinated transmission approach. Such a process could build on lessons learned from southern New England while ensuring the Gulf of Maine is appropriately included in longer-term transmission planning.
- Maine should consider approaches to plan for offshore transmission projects that allow for innovative, competitive, and regional action to meet transmission needs while meeting state

policy goals. These could include a State Voluntary Agreement approach or legislative action to allow developers to leverage RECs to secure project financing.

- The state should consider increasing staffing and engagement to participate in regional transmission planning with the goal of reducing costs and increasing renewable energy for Maine.
- This should include efforts to engage with FERC's ongoing long term transmission planning initiatives, and providing input to these processes on behalf of the State.

Recommendation Seven: Identify areas of further analysis needed and incorporate Socioeconomic considerations to inform decision making

Context and Rationale

EWG members have discussed gaps in knowledge keeping more robust action at bay. The state should consider the extent to which future studies could be performed.

Supporting Actions

- Forthcoming analysis of socioeconomic impacts of offshore wind development will inform the work of the Advisory Committee and the Roadmap upon delivery.
- The initial recommendations of the Maine Climate Council Equity Subcommittee's final interim report contain valuable information that can inform the Roadmap's equity considerations
- A load matching analysis, studying how the seasonal and average hourly dispatch of floating offshore wind in the Gulf of Maine interacts with the State's existing and future demand load profile, considering impacts on cost and reliability.

Recommendation Eight: Foster responsible offshore wind development by creating mechanisms to achieve state goals through leasing activity

Context and Rationale

Currently, there is no direct mechanism for federal seabed lease revenue to be returned to states for coastal resilience, infrastructure, local workforce, or other priorities. Multi-factor bidding presents an opportunity for rate relief and to fund state policy goals in areas adjacent to development activities.

Supporting Actions

- Support and advocate for federal efforts to establish offshore wind revenue sharing models.
    - The Reinvesting in Shoreline Economies and Ecosystems (RISEE) Act, bipartisan legislation cosponsored by Senator Angus King, would redirect a portion of federal seabed lease sale revenue for coastal infrastructure and resiliency projects in adjacent states.
- Provide recommendations to BOEM for future lease stipulations for future leases in the Gulf of Maine that would provide significant investment throughout the state, from supply chain, economic development to potentially supporting research and development that could be considered in a multi-factor bidding process.