

## **Respondent Information**

### **1. Please provide the name of your organization and your contact information.**

Mayflower Wind Energy LLC

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### **2. Please briefly describe your organization and your interest in the Commonwealth's OSW procurements.**

Mayflower Wind Energy LLC ("Mayflower") is a joint venture of EDPR Offshore North America LLC and Shell New Energies US LLC. Mayflower is the lease holder of BOEM Lease OCS-A 0521, and is well positioned to participate in the Commonwealth's OSW procurements. EDPR and Shell formed Mayflower for the purpose of developing offshore wind projects to support the Commonwealth's OSW procurements.

## **Necessity**

### **3. Are additional OSW procurements for long-term Power Purchase Agreements that are above and beyond those authorized by Section 83C necessary to support the development of OSW?**

Yes. The initial 800 MW PPA award was the first step in establishing a commercially sustainable offshore wind industry in the United States. The commitment of Massachusetts, and the other states in the region following the lead of the Commonwealth, generated record interest in federal leases as seen in BOEM's most recent auction. However, generating the necessary investment in local manufacturing and support services by supply chain firms will require building a sizable, long term visible pipeline of projects. Additionally, developers need the ability to lock in long term contracts in order to commit the large amounts of capital necessary to design, build and operate these projects. Other markets have shown that once the industry is established, the early risks associated with permitting and construction have been managed, and operational performance has been measured, the market is able to move from one supported by long term PPAs mandated by States to a more merchant structure. The US market for OSW is not at this point. However, evidence of successful cost reduction achieved because of large and predictable procurement tenders can be found in the mature European markets. For example, the recent development of the Borssele Wind Farm Zone located in the Netherlands demonstrated the cost reductions that can be achieved as the industry becomes more established. See generally, <https://www.businessgreen.com/bg/news/3001124/shell-prepares-to-set-sail-with-offshore-wind-investment-as-consortium-secures-dutch-contract>

It also seems very likely that further procurements above and beyond those authorized by Section 83C will be needed for Massachusetts to meet the emissions reduction mandate of the Global Warming Solutions Act. Massachusetts (and New England generally) has reduced GHG emissions from electricity generation by a very substantial degree as its fleet of power plants has moved away from oil and coal fuel towards natural gas. Further reductions will begin to displace natural gas, the now-dominant fuel of New England electricity generation fleet. Displacing natural gas will result from

bringing online significant quantities of high capacity factor, zero emissions power that is often peak-coincident. That is a job that OSW can play if procured in significant quantities.

**a. What are the advantages and disadvantages of longer and shorter term (i.e. 10 years, 25 years) periods for Power Purchase Agreements to developers, ratepayers, or others?**

The tenor of PPAs has major implications in terms of the ultimate cost of the projects and the allocation of risk. Longer term PPAs with financially sound counterparties enable developers to obtain favorable financing terms for their projects and accept a lower rate of return, both of which reduces costs and benefits ratepayers. The ability for the ratepayers to lock in stable pricing for the renewable electricity for up to 25 years ensures low and predictable power prices and retains the economic benefits in the out years with the ratepayers as carbon costs become a more significant factor in energy market pricing.

Viewed through this frame, a long-term contract with an offshore wind farm, given the capacity factor of these facilities and their peak coincidence with high winter load, when the regional system is most dependent on carbon generation, is an effective hedge for the consumer against rising carbon cost.

It is also important to view these contracts as a de-facto hedge against volatile natural gas prices given the intertwined nature of the New England electricity and gas markets. This hedge would provide real value by reducing customer exposure to the dominant risk factor in the broad regional energy and commodity markets.

Also see the answer to question 4 below.

**b. Are there advantages or disadvantages in soliciting OSW in a stand-alone procurement – or could it compete in a broader renewable or clean energy procurement?**

Yes, there are advantages in soliciting OSW in stand-alone procurements. OSW is a nascent industry in the US. As such, strong market signals are required in order to stimulate the appropriate investment in the overall value chain needed to drive success in this area. The most effective way the Commonwealth can assure this industry emerges and grows in the region is to provide very clear procurement plans, including size of procurements, timing, and contractual structure. This reduces risks for investors which drives costs down for consumers in the state. The very first solicitation resulted in a net positive ratepayer impact over the term of the contract. See generally, <https://commonwealthmagazine.org/energy/offshore-wind-prices-look-competitive/> Continued clear procurement plans should support the growth of the industry, drive prices down further and generate more significant ratepayer benefits in terms of lower electricity costs along with environmental benefits through carbon reduction.

**4. Are the opportunities to participate and earn revenue in the wholesale markets (e.g. Energy, Capacity, and Ancillary Services) and renewable energy certificate payments sufficient to support the development of new OSW projects? Why or why not? Are there recommended changes to the wholesale market structure or renewable energy portfolio standard that would impact your answer?**

There will be a time when OSW will be economic to develop without long term PPAs supported by the Commonwealth – but that time has not yet arrived. Onshore renewable projects are now developed based on wholesale market revenues combined with federal tax benefits and market-based PPAs, primarily with firms acquiring the renewable credits, to meet their sustainability goals. We expect this to be the case with OSW as well, once the industry is established. In the next several years however, given the economic size of OSW projects and the complexity of development given the

current lack of OSW infrastructure, state sponsored solicitations are the most efficient way to support the industry.

The high yearly capacity factor and the peak coincidence of OSW in New England provide great value to the ISONE system and will be an important capacity resource. However, the complexity and nature of the design of the ISO-NE Forward Capacity Market (including the CASPR mechanism) means that OSW, with a contract arranged through a state organized process, may not be compensated under ISO-NE Forward Capacity for the capacity it provides to customers and the regional wholesale electric system.

We would suggest that the PPAs could include a provision that gives the owners an incentive to maximize capacity market revenues, carefully crafting such a provision as an incentive, not a mandate, to avoid an issue with the Supreme Court's interpretation of the Federal Power Act in the Hughes v. Talen case. For example, bidders could state an assumed baseline of anticipated market revenues in their bids and if they can earn market revenues above the baseline they would share the benefits. This would help harmonize the participation of the project in the wholesale markets and give OSW developers and operators a financial incentive to advocate for rule changes that would benefit customers by maximizing payments from the markets for project attributes.

#### **5. Are there other forms of financing mechanisms, such as Offshore Renewable Energy Certificates (ORECS), that could support OSW?**

The existing Massachusetts model of bundled PPAs, signed by the Local Distribution Companies with project developers is a national model. As the New York State Energy Research and Development Authority stated in 2015:

Long-term, bundled PPAs with creditworthy entities can reduce costs and provide a long-term stable energy hedge to volatile energy prices for ratepayers. Financial modeling suggests that PPAs can reduce the levelized cost of energy for a representative project by \$11-12/MWh relative to current policies. Such cost reductions could enable substantially greater deployment than current policies (70-120% more over 10 years in modeled scenarios) for the same ratepayer investment in incremental costs. Bundled PPAs achieve these cost reductions by providing long-term, predictable revenue streams to project developers, which reduces financing costs.

Large-Scale Renewable Energy Development in New York: Options and Assessment, Final Report, NYSERDA Report 15-12, New York State Energy Research and Development Authority, Doreen M. Harris Program Manager, June 1, 2015 at p. 4.

Political and related constraints have prevented New York from adopting this model. It was these constraints that led New York to continue down the path of REC-only contracts – a journey that led to the creation of the OREC construct.

It is not surprising that NYSERDA and other decisionmakers, stakeholders and market participants are comfortable with the bundled PPA model. It is a time-tested device that has been utilized by utilities and (in restructured markets) Commercial and Industrial customers buying on the wholesale market for decades. As NYSERDA observed it is a device that provides a hedge for

customers and reduces financing for developers, lowering the cost of projects offered on a competitive basis.

None of this is to say that the newly designed and launched OREC construct can and will not work – but it is a new device that evolved out of an inability to adopt the time-tested bundled PPA model in place here in Massachusetts. Under this set of facts it is clear that Massachusetts should continue to rely on bundled PPAs.

**7. Would additional OSW procurement(s) incremental to procurements under Section 83C have any specific wholesale market impacts on other low/no emission resources?**

The introduction of new OSW projects in a significant and regular manner to the ISO-NE system generally, and Massachusetts in particular, can be a catalytic force for related zero emissions technologies, like energy storage or targeted transmission. While OSW is generally a peak-coincident technology there will inevitably be hours during the year when OSW facilities will be generating at a level that exceeds the needs of local (zonal) load. This reality creates an opportunity to display rapidly commercializing energy storage in the area where the OSW facilities are interconnected – it also creates the opportunity to move this zero-emissions power to other load in lower cost and appropriately permitted manner via targeted transmission upgrades.

Also OSW production that exceeds current load requirements could be curtailed, and then treated as a high quality spinning reserve product, taking advantage of OSW facilities having the flexibility to rapidly turn up and down.

**8. What are the potential pricing and compliance impacts of additional OSW procurement(s) on Renewable Energy Certificate and Clean Energy Certificate markets?**

It is important to recall that Massachusetts was seeking to lower compliance cost for the Renewable Portfolio Standard and other clean energy policies when it first deployed PPAs pursuant to Section 83 added by the Green Communities Act. That provision blazed the trail for further tranches of procurements and PPAs as the Legislature added new authority through Sections 83A, 83B, 83C and 83D.

The logic behind Section 83 is sound – that competitive procurements of long term PPAs would provide the least-cost path to acquisition of clean renewable energy on behalf of the electricity customers of Massachusetts. And, as noted in the NYSERDA report quoted above, this mechanism has become widely recognized as the best tool for this job.

Now that Massachusetts has moved forward with clean energy and climate policies that are consistent with the need to reduce emissions (as mandated by the Global Warming Solutions Act) and replace retiring fossil generation with new clean energy resources there is an enhanced need for these PPAs as the tool for meeting these mandates in a least-cost manner.

**9. Will additional OSW procurement(s) have specific seasonal market impacts?**

The question of the continuing and rising need for winter peaking generation dominates much of our regional energy dialogue.

An ISO-NE analysis, relying on data gleaned from the MassCEC sponsored wind-observing LIDAR facility documented in a compelling way how OSW deployment would have provided significant benefits to the markets and customers during “cold snaps” those signature moments of seasonal need when competition for natural gas between heating and electric generation is most intense.

[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](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)

That analysis found that if a full 1,600 MWs of OSW had been in operation during one fifteen day (December 24, 2017 – January 8, 2018) cold snap the avoided production cost from marginal fossil fuel-fired generation resources would have been roughly \$80 to \$85 Million. This kind of cost reduction is exactly the kind of “seasonal market impact” that will greatly benefit the electricity customers of New England (of which roughly half are found in Massachusetts) who ultimately foot the bill. Additionally, the estimated avoided CO2 emission (short tons) would have been 11% of actual New England CO2 emissions.

#### **10. Is an additional 1600MW of solicitation(s) the appropriate target? Why or why not?**

More than 1600 MWs of additional OSW will need to be procured, for the following reasons:

- There is an overriding need to send a strong market signal that will bring forward a sustainable new industry – this is a critical opportunity to continue to march forward to build a new pillar industry for the economy of Massachusetts to rest upon,
- Maximizing procurements will spur further competition, driving down the cost of OSW, and
- As the recent report from the Commission on the Future of Transportation in the Commonwealth concluded, “accelerating conversion of cars and light duty trucks to electricity or other zero emission technologies is a key strategy” for decarbonizing the transportation sector, a strategy that will require significant new clean generation resources. <https://www.mass.gov/orgs/commission-on-the-future-of-transportation> - and supplying this load as well as from the electrification of other sectors (like heating and industrial processes).

### **Transmission**

#### **11. What are the advantages and disadvantages of requiring a coordinated OSW transmission network? a. If there are advantages, what would be required to accomplish this?**

We would suggest putting aside for the moment the debate over a potential coordinated OSW offshore transmission network and instead focus on what is needed on the land side to accommodate the substantial new generation that will be coming into key coastal areas. A major investment in transmission infrastructure in SEMA, and perhaps in adjoining seams and zones, would create great value for regional customers by providing deeper access to the developing OSW resource.

#### **b. Are there changes to the solicitation process that could accomplish this?**

Focusing on landside transmission infrastructure would not require any change to the solicitation process.

#### **c. Could state or regional support for a transmission system to support further offshore wind development be sufficient to finance further offshore wind development?**

The European experience shows us that when OSW is mature, and a public entity is willing and able to pay for all transmission costs then it is possible to think about OSW being developed on a merchant

basis – but the day when all those elements are in place may never come, and if it does it will be far in the future.

### **Other Factors that Impact Cost and Price**

#### **12. What, if any, impact will the expiration of the federal Investment Tax Credit have on future pricing for additional OSW procurement(s)?**

It is reasonable to assume that there will be a short-term pressure to increase prices offered in OSW procurements in 2019 and the next few years as the expiration of the ITC plays out. However, the continuing march of technological progress, the maturation of the supply chain and the forces of competition will continue to push the cost (and therefore the price) of OSW projects downward in future procurements.

#### **14. What restrictions on price shall there be on any additional OSW procurements, if any? Should each successional procurement be required to reflect a price decrease?**

Artificial price controls and restrictions are not an effective way to address the legitimate desire to ensure that procured projects are cost-effective. Broad and deep procurements that bring as many participants into the process as possible to maximize competition is clearly the best and most systematic way to drive down the cost and price of OSW facilities.

#### **15. With pending retirements in New England should there be a particular focus on specific development areas and/or transmission interconnection points to relieve future reliability constraints?**

The most pertinent retirement from the existing power plant fleet is obviously the upcoming closure of the Pilgrim nuclear power station. That large scale source of zero carbon electricity, located in the SEMA price zone, will need to be replaced – and its retirement will create “headroom” on the transmission system in and around the area where OSW development is most focused. But there needs to be a continuing effort to look beyond the horizon and contemplate what land-side transmission infrastructure will be needed to continue the momentum of OSW development.

### **Economic Development and Supply Chain**

#### **16. Will requiring the Distribution Companies to undertake an additional OSW solicitation of up to 1600 MW impact the development of offshore wind supply chain services in the Commonwealth? If so, what potential economic benefits to the Commonwealth may result if OSW supply chain services are located in MA?**

As discussed above the European experience teaches us that the key factor in driving OSW supply chain and manufacturing is the deployment of projects. The prior analytical work commissioned by the MassCEC provides an excellent road map to the potential economic benefits of OSW to the Commonwealth.

#### **17. Are there certain services or products in the OSW supply chain that are more likely to locate in the Commonwealth than others?**

We do not offer an answer to this question, referring to prior MassCEC analysis.

**18. Are there actions, outside of additional OSW procurement(s), that the Commonwealth should consider to secure OSW supply chain services are located in MA? Please explain.**

The strongest message the Commonwealth can provide to the supply chain is that there will be an ongoing, scheduled procurement plan for offshore projects. New Jersey recently announced an offshore wind tax credit that they will implement to help support the industry. This is a mechanism the Commonwealth could consider as well.

### **Regional Coordination**

**19. Should Massachusetts coordinate with other states in any future solicitations of OSW?**

Informal coordination is always a good thing. There is a track record of that working, as with Rhode Island selecting a project that was submitted to the Massachusetts 83C procurement. However formal joint procurements have not been successful likely due to, at least in part, the bureaucratic and administrative complexity.

**20. What are the advantages or disadvantages to coordinating?**

See the answer to 19 above.