

## **Green Oceans**

As a local group of environmentally concerned citizens, we understand the severity of climate change and recognize the urgency to reduce our dependence on fossil fuels; however, we question the safety and efficacy of offshore wind. Although well-intentioned, the current administration’s plan to develop over 900,000 acres of the continental shelf off the coast of RI and even more along the eastern seaboard (22 million acres total, 8% of the continental shelf<sup>1</sup>) with industrial offshore wind complexes will potentially cause irreversible harm to the environment without mitigating climate change.

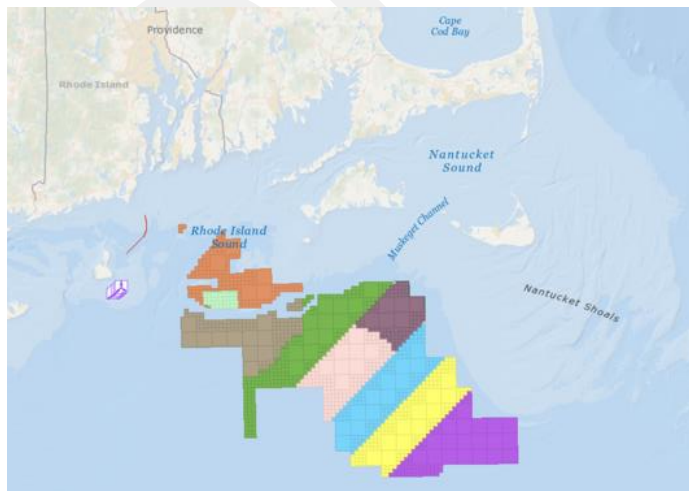
Any effective climate change solution must ensure benefits and weigh these advantages against the cost to biodiversity and the health of the environment, particularly the ocean. Maintaining a healthy ocean and protecting biodiversity is our best defense against climate change. To assume that a particular technology will benefit climate change without proof could lead to irreversible harm. We cannot afford to waste either time or money on empty solutions that will erode the collective determination to preserve our planet. Instead, we need to focus on effective, proven answers that maximize carbon reduction while minimizing environmental damage.

### **How it began:**

Executive Order 14008 spurred the development of offshore wind projects. The order specifies the government’s intention to tackle the climate crisis both at home and abroad in a manner that “protects public health; conserves our lands, waters, and biodiversity; delivers environmental justice; and spurs well-paying union jobs and economic growth...”<sup>2</sup>

### **The Plan:**

The developments off the coast of MA and RI will include ~1000 turbines, 850-1000 ft-tall, covering 1400 square miles.



**Map 1.** Location of the planned developments off the coast of MA and RI.<sup>3</sup>

<sup>1</sup> [NOAA Fisheries and BOEM 2023, North Atlantic Right Whale and Offshore Wind Strategy.](#)

<sup>2</sup> [The White House 2021](#)

<sup>3</sup> [Northeast Ocean Data 2023](#)

**The Revolution Wind project (upper left orange area of the map):** We primarily focus on Revolution Wind, the closest project to the mainland (RI), as a case study. This development will install 69-100 offshore turbines, 873-1000 feet tall, 12.9 miles off the coast of Rhode Island.

**Do the wind developments fulfill the executive order?**

A. **How does the developer (Ørsted) describe the overall impacts?** The Draft Environmental Impact Statement provides a table that lists the overall impacts described below.<sup>4</sup> This table divides impacts into Major Adverse, Moderate Adverse, and Minor Adverse. Even if some benefits might occur in each category, all of the overall impacts are negative. According to the Environmental Impact Statement<sup>5</sup> published on the site for the federal agency permitting the project (BOEM), the overall impacts will be:

Overall **major** adverse impacts on:

- commercial fishing
- recreational fishing
- cultural resources
- demographics
- employment
- economics
- environmental justice
- scientific research and surveys

Overall **moderate** adverse impacts on:

- air quality
- benthic habitat
- finish and essential fish habitat
- marine mammals
- navigation and vessel traffic

Overall **minor** adverse impacts on:

- bats
- birds
- sea turtles
- coastal habitats
- land use and coastal infrastructure
- aviation and air traffic
- recreation and tourism
- water quality
- wetlands

A. **Will the offshore wind projects help combat climate change at home?** In theory, the Revolution Wind project could generate enough electricity to power 350,000

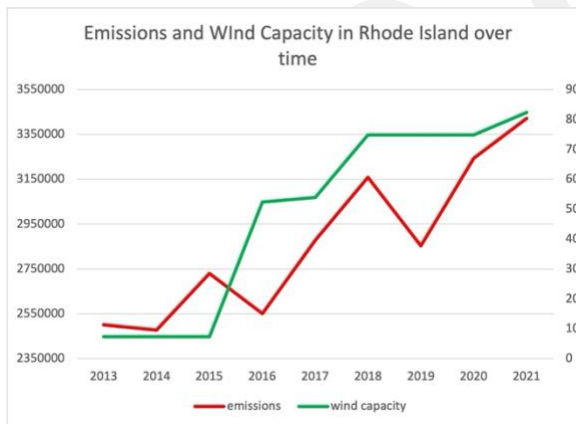
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<sup>4</sup> [BOEM, Revolution Wind Draft Environmental Impact Statement, Table 2.3-1](#)

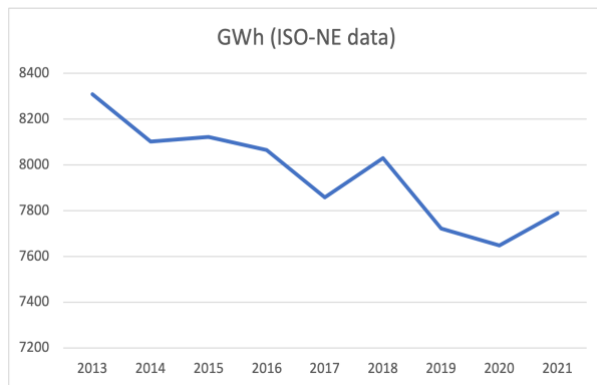
<sup>5</sup> [BOEM, Revolution Wind Draft Environmental Impact Statement, Table 2.3-1](#)

homes. It seems logical to assume that wind power would thereby replace the equivalent amount of fossil-fuel-generated electricity and reduce the associated CO2 emissions, thus addressing climate change. On occasion, the turbines will produce such large quantities of electricity; yet, not continuously, nor predictably. At other times, when the winds don't blow, the turbines will produce very little power. As a result, the grid will still need fossil fuel generators that can produce 100% of our energy needs. Because of the irregular nature of wind, the fossil fuel generators stabilizing the grid will be forced to cycle up and down. This inefficient operating style raises their carbon emissions quite dramatically, much like city driving uses far more gasoline than highway driving. If batteries could capture the turbine-generated electricity during windy conditions, they could stabilize the grid during calm periods, and thereby replace the fossil-fuel generators. However, without adequate battery storage capacity, offshore wind turbines will cause fossil fuel generators to burn less efficiently and will raise carbon dioxide emissions. Real-world data from Rhode Island demonstrates the correlation between adding wind power to the grid and an increase in CO2 emissions (see Figure 1). Despite a decrease in consumption (Figure 2) and an increase in wind capacity, emissions from electricity generation in Rhode Island have increased over time (Figure 1).

**Figure 1.** Installed wind capacity (MW) in RI and CO2 emissions (tons) over time.<sup>6, 7</sup>



**Figure 2.** Electricity consumption (GWh) in RI over time.<sup>8</sup>



Developers themselves admit that these massive complexes will *not* help combat climate change. The Vineyard Wind environmental impact statement states, “Overall, it is anticipated that there would be *no collective impact on global warming as a result of offshore wind projects*, including the Proposed Action...”<sup>9</sup> The Revolution Wind draft environmental impact statement also acknowledges that the full build-out of all projects, in total, will have “*no measurable influence on climate change*”.<sup>10</sup> None of the websites for the projects claim they will help combat climate change or decrease carbon emissions. The purpose and need statements of the environmental

<sup>6</sup> <https://eerscmap.usgs.gov/uswtdb/>

<sup>7</sup> [www.epa.com](http://www.epa.com)

<sup>8</sup> [www.iso-ne.com](http://www.iso-ne.com)

<sup>9</sup> BOEM 2018, Vineyard Wind, FEIS, Volume 2, A-66

<sup>10</sup> BOEM 2022, Revolution Wind DEIS, 3.8-11

impact statements merely assert the projects will allow states to meet their renewable energy mandates.

- B. Will they at least reduce CO2 emissions?** Most people assume, without question, that offshore wind energy production will reduce CO2 emissions by replacing fossil fuel plants. To the best of our knowledge, not a single science-based study exists to support this assumption.<sup>11</sup> Moreover, the real-world data from Rhode Island suggests quite the opposite (see Figures 1 and 2). Without adequate battery backup power, the intermittency of the wind and the load mismatch prevents wind energy from reducing carbon emissions.
- C. If we add enough wind energy to the grid, won't it eventually help?** As more wind energy capacity is added, more load mismatch occurs. This results in a greater net *increase* of CO2 emissions as the electricity generation needed to stabilize the grid runs less efficiently. Germany, which leads the EU's adoption of renewables, has not significantly decreased its dependency on fossil fuels nor reduced its CO2 emissions.<sup>12</sup>
- D. What is load mismatch and why does it matter?** Offshore wind complexes produce a majority of the electricity during the winter months at night, whereas, residents consume most of their electricity during the summer (for air-conditioning) and daylight hours (lighting). The difference between demand and supply creates a load mismatch. Data from RI, the state with the first offshore wind farm, demonstrates the fact that adding offshore wind power to the grid increases CO2 emissions. From 2013 to 2021, wind energy capacity in Rhode Island increased to 82.5 MW (Figure 1) while RI's consumption decreased (Figure 2). However, emissions have increased from 2.5 million tons of CO2 to 3.4 million tons (Figure 3). Without adequate backup battery power to compensate for load mismatch and to stabilize the grid, wind energy will cause backup generation to emit more CO2.<sup>13</sup>
- E. When will we have enough battery backup to make wind energy helpful?** Developing battery backup capacity depends on mining and manufacturing, neither of which can keep up with current demand. Some estimates predict that it could take 1000 years to produce the battery power currently needed to support renewable energy for just two days.<sup>14</sup>
- F. How do wind companies justify their projects?** All wind companies justify their projects based on meeting the state mandates for renewable power. The states have not demanded that we reduce CO2, just that we use "renewable" sources. This allows Ørsted and the other wind companies to push offshore wind without proving actual benefits. Ørsted will not release the calculations of its own emissions or air quality results. It restricts public access to these documents and even exempts these reports from the Freedom of Information Act (FOIA).
- G. Don't we have to do something now, even if we are not sure it will work?** Those of us worried about climate change understand the urgency to mitigate the crisis now,

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<sup>11</sup> Bryce 2020, p. 95.

<sup>12</sup> [Fokuhl 2022](#), *Bloomberg*.

<sup>13</sup> [Wojick 2023](#), *Cfact*.

<sup>14</sup> [Mills 2019](#), *The Manhattan Institute*.

before it is too late. Otherwise, climate change could spiral out of control, sealing our fate forever. This sense of urgency impels many environmentalists to support offshore wind without knowing the extent of the environmental impact, assuming that unmitigated climate change will be worse. However, any action has an opportunity cost. If we throw the majority of our resources into a harmful solution, we will neglect to adopt other, more productive, and less destructive answers.

- H. **What is the lifecycle CO<sub>2</sub> cost of offshore wind projects?** Several academic papers have created models to predict the carbon cost of offshore wind turbines, but none has done a comprehensive cradle-to-grave analysis that incorporates everything from transportation emissions to decommissioning. The draft environmental statement for Revolution Wind will not release its carbon calculations to the public. What they do provide indicates that they only calculate their emissions from sources, such as diesel-powered ships, within a 25-mile radius from known construction activity.
- I. **Will the offshore wind projects help climate change abroad?** Although other sources of electricity generation also require manufacturing and mining, offshore wind turbines have a particularly large carbon footprint. Much of the heavy industrial activity, such as steel production, mining for rare earth metals, and concrete manufacturing will take place overseas, thereby adding to carbon emissions abroad.

**In addition to the billions of dollars earmarked for offshore wind projects, what other initiatives will the Inflation Reduction Act (IRA) fund?**

Although well-intentioned, the Inflation Reduction Act includes incentives for oil and gas production as well as the green energy transition. In particular, the act protects and even promotes oil and gas drilling in our offshore waters. Post-IRA offshore wind leases are now contingent upon the release of 60 million acres of seabed for the purposes of oil and gas drilling over the next ten years.

**Will the wind developments conserve our lands, waters, and biodiversity, as the executive order states?**

- A. **Hasn't Europe already proven offshore wind is safe?** Although the North Sea hosts 2,811 wind turbines with a combined capacity of 11.79 GW<sup>15</sup>, the current US plan to build 30 GW of offshore capacity in the next seven years will almost triple Europe's level of development. Industrializing our continental shelf at this scale may have effects unknown to Europe. The ecosystem in the North Sea does not compare with the Atlantic Ocean in several important respects. The North Sea does not support the migratory species common to the Atlantic Ocean. In particular, the critically endangered North Atlantic right whale does not migrate into the North Sea. Nor does the North Sea experience hurricanes. Perhaps most importantly, the North Sea is not a critical component of the Gulf Stream and the Atlantic Meridional Overturning Circulation (AMOC); currents that cool the planet, stabilize global temperatures, and redistribute nutrients. Concerned European scientists have warned the US not to extrapolate environmental assessments from the North Sea to the continental shelf of the Atlantic coast.<sup>16</sup>

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<sup>15</sup> [Wikipedia 2023](#)

<sup>16</sup> [Dorrell et al. 2022](#), *Frontiers in Marine Science*.\*

- B. If wind farms caused problems, wouldn't we know this by now?** We know that onshore wind farms raise local temperatures<sup>17</sup> and extract moisture from the surrounding soil.<sup>18</sup> One study asserts that globally, this effect could take over a century of renewable replacement to counteract.<sup>19</sup> On land, wind farms not only raise surface temperatures, but also decrease primary productivity by 8.9%.<sup>20</sup> Few conclusive studies have examined the climate impacts of offshore wind, but given the effects on land, offshore wind complexes have the potential to alter surface water temperature through increased atmospheric mixing, a reduction in leeward kinetic energy, and the discharge of thermal plumes. These changes could have consequences on the ocean's primary productivity, weather patterns, and climate systems.
- C. Don't most European scientists support offshore wind power as our best, near-term solution?** Many scientists in Europe worry about the environmental impacts of offshore wind energy but have had trouble voicing their concerns. Professor Josep Lloret Romanach, the chair of the Human Health and Ocean department at the Universitat de Girona in Spain and a scientist concerned about the impact offshore wind will have on human health, writes, "our voice, as independent scientists, is often silenced or omitted."<sup>21</sup> European scientists have published several reports and manifestos expressing their concerns.<sup>22</sup> One such report, signed by 477 European scientists, states, "Those of us who work to increase scientific knowledge and apply it in public policies want to draw attention to the intergenerational responsibility we have as a society and the imperative need not take any steps backward in the protection of biodiversity, not even for the deployment of renewable energies. We must not protect one asset by damaging another."<sup>23</sup> Scientists in Denmark all work for the government (which is the majority owner of Ørsted, the world's largest offshore wind company) and therefore may not receive funding for investigations that focus on the downsides of offshore wind.
- D. Doesn't climate change threaten the health of the ocean more than offshore wind development?** Climate change is increasing the acidity of the ocean, warming surface waters, and slowing down both the Gulf Stream<sup>24</sup> and the Atlantic Meridional Overturning Circulation (AMOC).<sup>25</sup> The downstream consequences of these physical changes include sea level rise, a reduction of polar ice and more extreme weather events. According to the United Nations, the ocean is our best protection against climate change.<sup>26</sup> Projects that harm the ocean, decrease biodiversity, or alter currents will potentially accelerate climate change and thus, are not real solutions. Any effective solution for climate change will need to protect, not harm the ocean.
- E. Doesn't climate change threaten biodiversity more than offshore wind?** If left unchecked, climate change will threaten all aspects of life on this planet. However, a growing number of scientists believe renewable energy developments threaten

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<sup>17</sup> [Harris 2014](#), *Remote Sen.* \*

<sup>18</sup> [Zhou et al. 2012](#), *Climate Dynamics.* \*

<sup>19</sup> [Miller and Keith 2018](#), *J. Joule.* \*

<sup>20</sup> [Tang et al. 2017](#), *Remote Sensing.* \*

<sup>21</sup> Lloret, 2023

<sup>22</sup> <https://aliente.org/manifiesto>

<sup>23</sup> <https://sinexcusa.org/>

<sup>24</sup> [Carrington 2021](#), *The Guardian.*

<sup>25</sup> [Goddard et al. 2015](#), *Nature Communications.* \*

<sup>26</sup> [www.un.org](http://www.un.org)

biodiversity more than climate change.<sup>27</sup> The World Health Organization affirms that biodiversity loss poses a greater risk to human health than climate change alone.<sup>28</sup> Recently, the United Nations also recognized the importance of protecting biodiversity and signed a resolution to this effect.

Wind energy has documented risks to biodiversity.<sup>29</sup> Industrializing the ocean with offshore wind will reduce biodiversity by threatening the survival of endangered species, introducing invasive organisms, and degrading the coastal habitat. Given the health consequences of biodiversity loss, expansive wind farm installations could violate the internationally recognized *Human Right to Health*.<sup>30</sup> We cannot afford to ignore biodiversity loss in evaluating the cost-benefit analysis of offshore wind farm development. The US government has an obligation under international human rights law to protect biodiversity as an important factor in human health.<sup>31</sup>

- F. **Why Coxes Ledge?** Consisting of fragile terminal glacial moraines, Coxes Ledge is one of the most fertile marine habitats in the North Atlantic and is one of the only remaining spawning grounds for Southern New England Cod. Installing wind turbines in this area is tantamount to placing them on top of a coral reef. Because Coxes ledge has relatively shallow depths, it is more economical for Ørsted to install turbines in this area rather than in deeper areas east of this region. The RI Ocean-SAMP designates Coxes Ledge as an area of particular concern. Despite this designation, the CRMC has granted permission for developments to cover almost the entire region of Coxes Ledge. As a result, the entire Fishermen’s Advisory Board has resigned in protest.<sup>32</sup> Our governmental agencies should never have allowed development on top of Coxes Ledge.
- G. **Will the wind complexes decrease air pollution?** Although wind turbines, in theory, should not cause air pollution, the diesel ships used to transport the components and construct the farms require all the developers to pull permits from the EPA for violating air quality standards. Furthermore, during operations, wind turbines release sulfur hexafluoride (SF6), the most potent greenhouse gas in the world. SF6 traps heat 23,500 times more than CO2.<sup>33</sup> Emissions of SF6 may breach the *greenhouse gas regulations* under the *Clean Air Act*.<sup>34</sup> Scotland has outlawed this gas after a serious leak occurred on a substation in June of this year.<sup>35</sup> Substations can contain several tons of SF6. According to the DEIS, Ørsted plans to use turbines containing SF6 in both the gearboxes and the two offshore substations, despite telling *EcoRI* that it will not use SF6 in the Revolution Wind turbines.<sup>36</sup> Although most electrical substations on land also utilize this gas for insulation, SF6 in substations exposed to the harsh offshore elements poses a greater risk of leakage into the environment.

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<sup>27</sup> <https://sinexcusa.org/>

<sup>28</sup> Patil, Kumar, and Bagvandas 2017, *Annals of Tropical Medicine and Public Health*. \*

<sup>29</sup> Voigt, Straka, and Fritze 2019, *Global Ecology and Conservation*. \*

<sup>30</sup> [UN Committee on Economic, Social and Cultural Rights 2000](#)

<sup>31</sup> Hamley 2022, *Review of European, Comparative & International Environmental Law*. \*

<sup>32</sup> <https://turnto10.com/>

<sup>33</sup> McGrath 2019, BBC news.

<sup>34</sup> 42 U.S.C. § 7401 et seq.

<sup>35</sup> Mavrokefalidis 2022, *Energy Live News*.

<sup>36</sup> BOEM 2022, *Revolution Wind COP*, p. 107.

BOEM and Ørsted will not allow the public access to the appendices that explain these threats, the emergency response plans, or the overall emissions calculations.

- H. **Don't wind turbines create artificial reefs that benefit fish?** Artificial reefs can benefit certain species of demersal fish, particularly sea bass, as demonstrated by a study of the Block Island Wind Farm.<sup>37</sup> The jacket-style foundations found in the Block Island wind farm create an artificial reef that may benefit some species, although commercial fishermen no longer find the area around Block Island viable; however, the monopile foundations planned for use in the newer developments do not provide the same described benefits. Monopile foundations promote the growth of invasive filter feeders that can deoxygenate the water, decrease plankton counts, and reduce biodiversity.
- I. **Will Cod survive the wind farms?** Cod, the hallmark fishery of New England and the economic engine that propelled the Northeast into prosperity, will potentially suffer extinction under the current plan to develop the region around Coxes Ledge<sup>38</sup> with Revolution Wind, South Fork Wind, and Sunrise Wind. Underwater sound impairs the reproductive success of the species.<sup>39</sup> NOAA advised BOEM that noise from the construction and operations of turbines could interfere with their communication and result in “population-level impacts on Southern New England Atlantic Cod.”<sup>40</sup> BOEM approved the South Fork project despite warnings from NOAA scientists and went on to accept proposals for the surrounding area. Revolution and Sunrise Wind will also impact Coxes Ledge and will exacerbate the risk to cod.
- J. **Will our environmental laws ensure the protection of endangered species?** Revolution Wind alone will potentially violate the *Endangered Species Act*, the *Marine Mammal Protection Act*, the *Endangered Bald and Golden Eagles Act*, and the *Migratory Bird Treaty Act*,<sup>41</sup> by threatening the existence of fourteen endangered species: four whale species, two turtle species, one fish species, four bird species, two eagle species, and one bat species.<sup>42</sup> The Endangered Species Act and the Marine Mammal Protection Act require agencies both to protect and *to promote the recovery* of the species. Since 2016, NOAA has authorized over 6340 incidental takes of whales for the offshore wind developers' survey work along the East Coast. It has authorized or is in the process of granting permission for offshore wind developers to harm and/or harass over 700,000 marine mammals in total.<sup>43</sup>
- K. **Does losing one species of whale (the North Atlantic right whale) matter in the grand scheme of combatting climate change?** Unchecked, climate change will threaten the existence of all species, including the North Atlantic right whale (NARW). Thus, many people prioritize combatting climate change over protecting a specific species. However, because whales sequester carbon, some scientists consider

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<sup>37</sup> [Wilber, 2022](#), *ICES Journal of Marine Science*. \*

<sup>38</sup> [Dlouhy 2022b](#), *Phys.org*; Chiarella 2021, Letter from NOAA to BOEM; Chiarella 2023, Letter from NOAA to BOEM.

<sup>39</sup> [Zemeckis, Dean, and Cadrin 2014](#), *North American Journal of Fisheries Management*. \*

<sup>40</sup> [Chiarella 2021](#), Letter from NOAA to BOEM.

<sup>41</sup> 16 U.S.C. §§1531-1544; 16 U.S.C. §§ 1361 et seq.; 16 U.S.C. §§ 668-668d; 16 U.S.C. §§ 703 et seq.

<sup>42</sup> [CSA Ocean Sciences, Inc. Revised 2022](#); [Biodiversity Research Institute 2021](#)

<sup>43</sup> [NOAA 2023a](#)



whales to be nature’s solution to climate change.<sup>44</sup> The loss of a single whale, let alone an entire whale species, will increase the carbon footprint of these projects. Offshore wind farms will inevitably drive threatened whale species closer to extinction.<sup>45</sup> The US has designated the area planned for construction as a critical habitat for the North Atlantic right whale. With only 334 members alive today, the North Atlantic right whale faces extinction.<sup>46</sup> The unusual mortality event that began in 2017 has affected 20% of the population.<sup>47</sup> Deaths outpace births. The Endangered Species Act and the Marine Mammal Protection Act require agencies both to protect and *to promote the recovery* of the species. Offshore wind projects violate both principles. In a democratic system, if the public no longer cares to protect endangered marine mammals, we should change the law; and we should not allow agencies, even those with good intentions, to ignore the law.

- L. **Hasn’t NOAA proven that offshore wind seismic surveys are not responsible for the recent spate of whale deaths?** No studies have ever proven a direct link between offshore wind site characterization surveys and whale deaths. Over the past decade, ship strikes and line entanglements have killed dozens of whales. NOAA has been able to perform necropsies on roughly half of the beached whales and of those, they have found that 40% of the whales examined died from ship strikes and entanglements. The findings, however, only demonstrate that 20% of the total (40% of 50%) die from ship strikes and line entanglements. Given the small numbers and the challenges of performing necropsies on quickly decomposing whales, population-level statistics cannot be extrapolated from these findings. In contrast to the claims made by the press, 20% of the total does not represent the majority, thus something other than line entanglements and ship strikes may be harming whales off the Atlantic Coast.

Pre-construction seismic surveys and impact drilling within whale habitats coincided with the onset of unusual mortality events for three whale species: humpbacks<sup>48</sup>, North Atlantic right whales<sup>49</sup>, and minke whales,<sup>50</sup> and continue to correlate with seismic survey activity. Seismic surveys have documented impacts on whale morbidity and mortality.<sup>51</sup> Given the infrequent necropsies, a direct causal link between the high-resolution geophysical surveys and whale deaths remains unknown, however, an absence of evidence does not mean evidence of absence. The fact that NOAA authorized offshore wind companies the legal permission to “take” more than 6340 whales, 83,433 dolphins, 5,568 porpoises, and 6924 seals just for site surveys (not construction and operation) suggests that both NOAA and the companies understand the surveys will harm marine mammals.<sup>52</sup>

- M. **Won’t NOAA protect marine mammals by limiting the number of “takes” granted to the wind developers?** NOAA attempts to protect marine mammals and

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<sup>44</sup> [Chami 2019](#), *International Monetary Fund*.

<sup>45</sup> [Seals Price 2017](#), *NOAA technical report*.

<sup>46</sup> [Walters 2018](#), *The Guardian*.

<sup>47</sup> [NOAA Fisheries 2022c](#)

<sup>48</sup> [NOAA Fisheries 2023a](#)

<sup>49</sup> [NOAA Fisheries 2023b](#)

<sup>50</sup> [NOAA Fisheries 2023c](#)

<sup>51</sup> [Engel 2004](#), *Research Gate*.

<sup>52</sup> [NOAA 2023a](#)

endangered marine species by issuing a limited number of incidental take authorizations (ITAs). These authorizations allow companies to harm or harass marine mammals incidental to their activities. Unfortunately, NOAA must evaluate ITA requests on a case-by-case basis and cannot consider other projects or conduct comprehensive programmatic reviews in their assessments. As a result, NOAA has authorized or is in the final stages of granting offshore wind companies permission to permanently or temporarily injure over 700,000 marine mammals, including over 20,000 whales and 477,039 dolphins.<sup>53</sup> For instance, they have given permission to temporarily injure over 1000 individual North Atlantic right whales, even though only 334 of these critically endangered whales exist today. Current ITAs only represent take authorizations for the beginning of BOEM's plan to industrialize the ocean. The offshore wind companies, by asking for these permissions, and NOAA, by granting them, both implicitly acknowledge that survey activity will injure marine mammals; yet publicly, both continue to deny the possibility that any connection exists.

- N. **How can site characterization seismic surveys harm marine mammals?** As stated above, no direct connection between whale deaths and seismic surveys has been established, but indirect connections may exist. Though offshore wind companies may not use the traditional airguns to collect their high-resolution geophysical maps of the seabed, they do employ high voltage, boomers (3000 V), sparkers (20-200 Hz), and multi-beam echo sounders, side scan sonars (100-500 kHz), shallow and mid penetration sub-bottom profilers, ultra-short baseline positioning equipment, and marine magnetometers. The frequencies they use could, theoretically, harm marine mammals through a process called rectified diffusion. Sound waves in the low to mid-frequency range cause gas bubbles in the bloodstream to enlarge.<sup>54</sup> Large gas bubbles can cause lung damage and brain hemorrhages, much like the "bends." This process could account for the recent spate of whale deaths in the NY and NJ area but has not been studied.
- O. **Once the seismic surveys and construction are complete, won't the marine mammals recover?** Construction poses the greatest risk to marine mammals, however, a NOAA scientist, Sean Hayes, wrote a letter to BOEM voicing concern that operations will harm the North Atlantic right whale for the entire lifespan of the projects. He writes, "oceanographic impacts from installed and operating turbines cannot be mitigated for the 30-year lifespan of the project" and that "Disturbance to right whale foraging could have population-level effects on an already endangered and stressed species."<sup>55</sup> The scientific consensus within NOAA agrees that wind projects will threaten the survival of the species even after the developers have completed construction. BOEM has chosen to ignore NOAA's warning.
- P. **Doesn't climate change threaten bird survival more than offshore wind?** Climate change, if unmitigated, will devastate the population of most species, including birds. Offshore wind will not achieve the gains in carbon reduction necessary to affect this current trajectory, even if we proceed at this unprecedented pace. Thus, the added threat these turbines pose to birds could cause irrevocable harm without a

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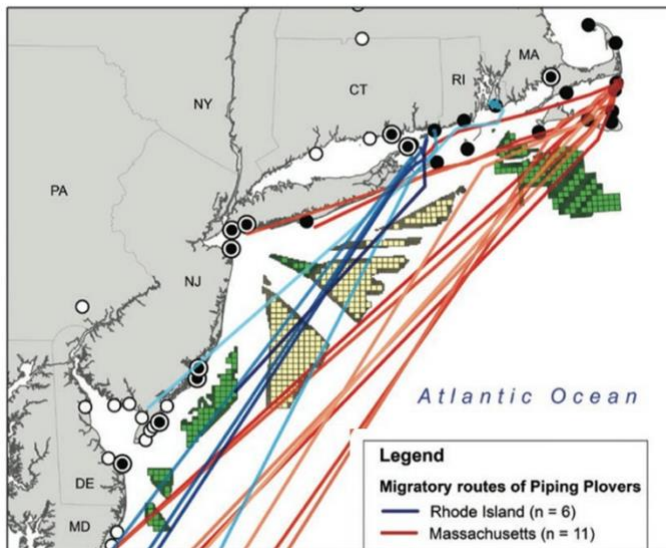
<sup>53</sup> [NOAA 2023a](#)

<sup>54</sup> [Crum and Mao 1996](#), *J. Acoustic Soc. Am.* \*

<sup>55</sup> [Hayes 2022](#), Letter from NMFS to BOEM.

commensurate benefit. The proposed New England wind farms will occupy a site within the migratory Atlantic flyway region and will thereby add additional stress to many endangered bird and eagle species.<sup>56</sup> Four hundred and thirty-two bird species in North America are at risk of extinction. Birds with coastal habitats are particularly vulnerable.<sup>57</sup> RI is home to the Norman Bird Sanctuary, a 325-acre nature preserve overlooking Rhode Island Sound, as well as the adjacent 242-acre Sachuest Point National Wildlife Refuge. Both sanctuaries provide a vital stopover and wintering area for migratory birds. Current methods for assessing an offshore wind farm's risk to birds remain inadequate<sup>58</sup> and underestimate the impact of wind farms on bird mortality.<sup>59</sup>

**Map 2.** Migratory routes of the endangered Piping Plover through wind turbine areas.<sup>60</sup>



Loring et al., 2020, *The Condor*. 122. 1-16. 10.1093/condor/duaa028.

**Q. Why should we worry about wind turbines killing bats?** Given the association between bats and both the coronavirus and rabies, few people lose sleep over bat deaths. However, bats control insect populations. One brown bat can eat 1000 mosquitos per night. They also eat mosquito larvae. Wind turbines kill more bats than previously recognized,<sup>61</sup> particularly during the autumn migratory season. Although bats roost on land, they will fly more than 25 miles offshore during migration.<sup>62</sup> Bats follow the insects attracted to the lights illuminating the turbines at night, drawing the bats directly into the rotating blades. Decreasing bat numbers will allow mosquito populations to rise, and thereby could increase the prevalence of mosquito-borne diseases, including Zika, West Nile, and Eastern Equine Encephalitis viruses.<sup>63</sup> One

<sup>56</sup> [Biodiversity Research Institute 2021, 2022](#)

<sup>57</sup> [Schwemmer et al. 2022, Animal Conservation.](#)\*

<sup>58</sup> [Green et al. 2016, Journal of Applied Ecology.](#)\*

<sup>59</sup> [Skov et al. 2016, Biology Letters.](#)\*

<sup>60</sup> Adapted from [Loring 2020, The Condor.](#)\*

<sup>61</sup> [Voigt et al. 2022, Global Ecology and Conservation.](#)\*

<sup>62</sup> [Hatch et al. 2013, PLoS One.](#)\*

<sup>63</sup> [Elrefaey et al. 2021, Viruses](#)\*; [Ferraguti, Martinez-de la Puente, and Figuerola 2021, Viruses](#)\*; [Armstrong and Andreadis 2022, Journal of Medical Entomology.](#)\*

bat species native to Rhode Island, the northern long-eared bat, is protected under the *Endangered Species Act*. At a time when nations have pledged to decrease pesticides,<sup>64</sup> we cannot allow wind farm developments to reduce bat populations.

- R. **How could offshore wind hurt plankton?** Although unseen, plankton contribute significantly to the health of our planet. Phytoplankton, the trees of the ocean, sequester more CO<sub>2</sub> than all the world's plants. The ocean supports life on this planet by storing 95% of the world's carbon, absorbing 90% of the heat, and generating 50-70% of the oxygen.<sup>65</sup> A climate change remedy that harms the ocean could result in a net increase of atmospheric CO<sub>2</sub> and ultimately an acceleration of global warming. Any type of marine industrialization kills plankton. According to NASA, the highest abundance of phytoplankton occurs in coastal regions, along continental shelves, particularly where currents meet.<sup>66</sup> The coast of New England has some of the highest phytoplankton counts in the world. Recent studies from the North Sea demonstrate that the presence of wind turbines decreases phytoplankton count by as much as 8%,<sup>67</sup> redistributes plankton, and deoxygenates lower-level water.<sup>68</sup> A mere 1% decrease in phytoplankton will cause an increase in CO<sub>2</sub> emissions that outweighs any theoretical benefit from renewable energy sources.<sup>69</sup> The Revolution Wind DEIS calculates that the installation of the cable alone will kill over 8.5 billion zooplankton and 1 billion fish eggs.<sup>70</sup>
- S. **Why are people worried about the undersea electric cables? Don't we already have them?** We do already have a few short undersea electric cables, but not in the areas proposed and not to the same extent. Many of the proposed cables will transmit direct current which emits more heat than traditional alternating currents. The hundreds of miles of high-voltage cables will heat critical benthic habitats by as much as 36 degrees F in the proximate area and will radiate electromagnetic fields (EMFs), which can interfere with fish larvae viability,<sup>71</sup> and disorient migratory species such as sharks,<sup>72</sup> dolphins, and whales,<sup>73</sup> all of whom rely on the earth's magnetic field to navigate. EMF's attract sharks; increased shark abundance may become a threat to RI swimmers.
- T. **Isn't offshore wind clean as well as renewable?** Although wind-generated electricity seems clean, BOEM predicts that the planned developments will house a total of *19 million gallons* of toxic coolants, fuel, oil, and lubricants in the offshore environment.<sup>74</sup> Historically, such toxic oils have the propensity to leak or spill when used in ocean environments and could significantly contaminate the water and threaten vulnerable species and the marine ecosystem. The developers of Revolution Wind will not disclose their emergency response plans for oil spills.

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<sup>64</sup> [Einhorn 2022](#), *The New York Times*.

<sup>65</sup> [Falkowski 2012](#), *Nature*. \*

<sup>66</sup> [NASA 2023](#)

<sup>67</sup> [Slavik et al. 2018](#), *Hydrobiologia*. \*

<sup>68</sup> [Daewel et al. 2022](#), *Communications Earth & Environment*\*; [Helmholtz Association 2022](#)

<sup>69</sup> [Malerba, White, and Marshall 2019](#), *Frontiers in Ecology and the Environment*. \*

<sup>70</sup> [BOEM 2022](#), Revolution Wind DEIS, Vol 1 and 2, p. 3.6-38.

<sup>71</sup> [Kingsford 2002](#), *Bulletin of Marine Science*. \*

<sup>72</sup> [Keller et al. 2021](#), *Curr Biol*. \*

<sup>73</sup> [Nyqvist et al. 2020](#), *Mar Environ Res*. \*

<sup>74</sup> [BOEM 2022](#), *Revolution Wind DEIS Vol 1 and 2*, p. 3.6-50.

In addition to oils and lubricants, the anti-corrosive coating on the wind turbines can leach significant levels of toxic heavy metals (lead and cadmium)<sup>75</sup> and harmful organic compounds into the water that could contaminate the entire food chain in RI Sound. Additionally, leading edge blade erosion will disseminate microplastics and harmful epoxies into the water.<sup>76</sup> The contamination of water in an area essential to fishing may violate the *Clean Water Act* and *Seafood Safety Regulations*.<sup>77</sup>

**U. Should we worry about other contaminants, such as “Forever Chemicals”?**

Many organizations in Rhode Island and Massachusetts have worked tirelessly for decades to improve water quality in coastal waters. The Biden administration shares a concern about water quality and aims to regulate the harmful “forever chemicals,” per- and polyfluoroalkyl substances (PFOAs and PFAs)<sup>78</sup> that notoriously contaminated the water supply in West Virginia and sickened thousands of people. The US Navy has been identified as a source of these “forever” chemicals in Narragansett Bay and the Quonset Point area. The Navy has used PFAS containing firefighting foam at its installations, including Naval Station Newport, which is located on the eastern shore of Narragansett Bay. The use of this foam has resulted in contamination of the groundwater and surface water in the area, including in the bay itself. In 2016, the Rhode Island Department of Health issued a fish consumption advisory for several species of fish caught in Upper Narragansett Bay due to high levels of PFAS. The advisory was later expanded to include more species and a larger area of the bay. Toray Plastics in North Kingston has also been associated with the release of PFOAs. The Newport Naval Education and Training Center on Aquidneck and Gould Island has also released PFOAs into the environment. *Ørsted has not tested any samples for PFOAs either in the North Kingston site or along the cable’s path.*

**V. How might jet plowing hurt our water?** The developers use jet plows to trench down 4-6 feet into the seabed and riverbeds to lay the cables. Although efficient, this process will resuspend sediment laden with the toxins deposited for centuries from RI and MA’s industrialized past. Known toxins include lead, mercury, arsenic, and other heavy metals, DDTs and other pesticides, hexavalent Chromium, Sulfur Dioxide, Benzene, Azo Dyes, PFOAs, and BPAs. All these compounds are known to harm human health. North Kingston, the destination of the submarine cable, has been designated as one of the most contaminated sites in the US.<sup>79</sup> Ørsted plans to trench up the West passage to North Kingston, using jet plows to bury the cables 4-6 feet below the riverbed. This process will create sediment plumes that could resuspend toxic chemicals into the water column. Through bioaccumulation and biomagnification, resuspended toxins could contaminate the marine food web and compromise human and wildlife health. The developers of Revolution Wind and SouthCoast Wind have only used computer modeling and have not conducted field tests to ensure the safety of the jet plowing or trenching process along either the Sakonnet River or the West Passage.

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<sup>75</sup> [Reese et al. 2020](#), *Chemosphere*.\*

<sup>76</sup> [Solberg 2021](#)

<sup>77</sup> 33 U.S.C §§ 1251 et seq.; 21 C.F.R. § 123

<sup>78</sup> [Friedman 2023](#), *The New York Times*.

<sup>79</sup> [Carini 2023](#), *EcoRI*.

- W. The ocean is resilient. Once the construction is complete, won't most of the problems resolve themselves?** Construction poses the greatest risk of immediate environmental harm, but long-term changes in the marine ecosystem that can also have detrimental impacts. Invasive filter feeders “biofoul” industrial structures over time. As these organisms reproduce, they reduce the biodiversity of the area and consume large amounts of nutrients, including oxygen. European scientists have discovered that oxygen levels in the lower water layers in the North Sea proximate to wind farms are reduced.<sup>80</sup> Deoxygenation can cause large-scale fish die-offs. Along the continental shelf, reduced levels of oxygen could have long term negative impacts on New England fisheries. The result would not be consistent with the conservation of biodiversity and marine life implied in the Executive Order.
- X. Given the power of our wind, isn't it good to site wind farms off the Rhode Island coast?** The wind off the Rhode Island shore blows fiercely, and New England supports a densely populated area. In theory, siting wind farms in this area would utilize a natural resource and would provide electricity close to the source. However, Rhode Island also hosts one of the most important freshwater estuaries along the Atlantic. The tidal and estuary currents flowing across the underwater portion of the wind turbines will induce sediment plumes, decrease stratification, increase turbidity, and significantly alter this fragile and fertile ecosystem.<sup>81</sup> Furthermore, sediment plumes can resuspend toxic heavy metals and re-introduce them into the food supply chain. As migratory species swim through RI waters, they will be exposed to these toxins, potentially contaminating the marine food web, and further stressing marine mammals.<sup>82</sup>
- Y. Why should we worry about the effects on local climate?** Many offshore wind proponents assume harnessing the wind is free, renewable, and harmless. However, turbines extract kinetic energy out of the atmosphere to generate electricity. This process can increase the temperature of the surrounding air and water, redistribute humidity, and alter atmospheric flow, thereby modifying local weather patterns and regional climate.<sup>83</sup> Raising ambient temperatures can affect fish larvae<sup>84</sup> ocean currents,<sup>85</sup> and vegetation.<sup>86</sup> The study by Miller and Keith from Harvard, cited above, predicts that it will take more than a century of non-fossil fuel electricity generation to compensate for the increased warming caused by utility-scale wind complexes.<sup>87</sup>

### **Will the wind developments protect public health, as the executive order mandates?**

- A. Won't offshore wind help prevent sea level rise?** Given that 80% of the world's population resides within 60 miles of a coast, sea level rise poses a significant threat to public health. Climate change has been associated with slowing the Gulf Stream and reducing the Atlantic Meridional Overturning Current (AMOC). These currents,

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<sup>80</sup> [Daewel et al. 2022](#), *Communications Earth & Environment*.\*

<sup>81</sup> [Chen et al. 2022](#), *Journal of Marine Science and Engineering*.\*

<sup>82</sup> [Huang 2022](#), *Aquatic Conservation: Marine and Freshwater Ecosystems*.\*

<sup>83</sup> [Miller and Keith 2018](#), *J. Joule*.\*

<sup>84</sup> [Moyano et al. 2017](#), *PLoS One*.\*

<sup>85</sup> [Christiansen et al. 2022](#), *Frontiers in Marine Science*.\*

<sup>86</sup> [Diffendorfer, Vanderhoof, and Ancona 2022](#), *Environmental Research Letters*.\*

<sup>87</sup> [Miller and Keith 2018](#), *J. Joule*.\*

particularly the AMOC, contribute to sea level rise. We need to combat climate change to protect ourselves from the devastating effects of sea level rise.

However, installing wind turbines along a significant portion of the Atlantic continental shelf may exacerbate the slowing of the Gulf Stream and the reduction of the AMOC. By extracting kinetic energy from the atmosphere, wind turbines reduce downstream (leeward) wind by over 40% up to a 40–60-mile expanse<sup>88</sup> and can reduce prevailing currents by 15%.<sup>89</sup> Although the earth's rotation helps drive the Gulf Stream, surface wind also provides some of the force propelling these currents. Any further slowing of the Gulf Stream and the AMOC could send the planet beyond the tipping point into catastrophic sea-level rises and mass extinction.<sup>90</sup>

BOEM's own study found that the full buildout of the Rhode Island and Massachusetts windfarms will decrease current magnitude, wave height, and temperature stratification.<sup>91</sup> However, the study does not consider how these potential alterations might affect either the Gulf Stream or the AMOC. The Federal government's plan to develop over 22 million acres (8%) of the continental shelf will substantially increase the risk of altering key hydrodynamic, salinity, and temperature characteristics of our coastal waters. We need to study these potential effects before rushing into the full buildout. Because the ocean is our best defense against climate change, we should adopt solutions that do not alter key ocean characteristics.

- B. How could wind farms threaten public health?** Climate change, as well as other human activities, have increased the prevalence of harmful algal blooms. Harmful algal blooms pose a risk to public health. They cause deadly human diseases by releasing harmful toxins, including domoic acid, a deadly neurotoxin that induces seizures and permanent amnesia.<sup>92</sup> By depleting oxygen in the water, algal blooms can also induce massive marine die-offs.

Industrializing our ocean will increase the risk of harmful algal blooms. Introducing artificial structures in the form of both turbine monopiles and the scouring protection at their bases, will allow invasive filter feeders to alter the complex marine ecosystem.<sup>93</sup> Invasive filter feeders increase the risk of harmful algal blooms, magnifying the likelihood of contaminating the marine food web with potent neurotoxins.

The North Sea has experienced an increase in harmful and costly algal blooms in recent years, coincident with the build-up of offshore winds in the vicinity. These blooms carry an approximate financial burden to the economy of over 900 million euros per year.<sup>94</sup> A toxic algal bloom caused an unusual and “catastrophic” die-off of crabs and lobsters in the late fall/early winter of 2021 along England's North Sea coast.<sup>95</sup> The increased prevalence of harmful algal blooms coincides with the North Sea buildup of offshore wind farms. Increasing the risk of harmful algal blooms

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<sup>88</sup> [Platis et al. 2020](#), *Environmental Research Letters*. \*

<sup>89</sup> [Daewel et al. 2022](#), *Communications Earth & Environment*. \*

<sup>90</sup> [Carrington 2021](#), *The Guardian*; [Goddard et al. 2015](#), *Nat Commun*\*; [Robbins 2022](#), *Yale Environment 360*.

<sup>91</sup> [Johnson 2021](#), p. 90.

<sup>92</sup> [Brown et al. 2019](#), *Reviews in Aquaculture*\*; [Sterling et al. 2022](#), *Limnology and Oceanography*. \*

<sup>93</sup> [Malerba, White, and Marshall 2019](#), *Frontiers in Ecology and the Environment*. \*

<sup>94</sup> [Save the Sea 2023](#)

<sup>95</sup> [Beamont 2022](#), *The Evening Standard*.

potentially violates laws designed to protect public health (the *Clean Water Act* and *Seafood Safety Regulations*).

- A. **Can we install wind complexes without increasing food insecurity?** 25% of RI households suffered from food insecurity in 2020.<sup>96</sup> Higher electricity rates and diminished fishing resources may exacerbate this problem. Many economically challenged families rely on the availability of locally-sourced and affordable seafood, such as scup, squid, and a variety of shellfish. Any diminishment of fish stocks will negatively impact these families. Recently, Mads Nipper, the CEO of Ørsted admitted in the May 2023 investor call, “that the long-term power prices will need to go up.” Rate increases coupled with depressed fishing may become a serious environmental justice issue in the future.
- B. **Will wind farms affect navigation safety?** With a separation of approximately 1 nautical mile, wind turbines can, in theory, support vessel traffic within the confines of the projects. However, wind turbines disrupt radar. To date, no mitigation efforts have successfully remedied the disruptions.<sup>97</sup> This will impede the Coast Guard’s ability to perform search and rescue, and surveillance, in the 900,000-acre area off the coast of RI.<sup>98</sup> Moreover, helicopters cannot fly within the confines of a wind complex, further hindering search and rescue operations. The Congressional Committee on Transportation and Infrastructure reprimanded the Coast Guard for failing to adequately protect these interests.<sup>99</sup>

The CRMC has stipulated that Ørsted microsite the Revolution Wind foundations to avoid placing wind turbines in fragile glacial moraines. Although this has the potential of helping preserve these important ecosystems, micro-siting allows turbines to deviate by 500 feet in any direction, disrupting the uniformity of the grid arrangement of turbines. The Coast Guard, in the public submission to the Revolution Wind DEIS states, “a key means to mitigate effects on safe navigation and Coast Guard missions is the adoption of a uniform grid pattern across the entire MA/RI wind energy area.”<sup>100</sup> A non-uniform arrangement of turbines will create navigational hazards, putting commercial and recreational fishermen, boaters, sailors, and the public in danger.

- C. **Can wind farms undermine National Defense?** National defense does not rank as high as saving the planet. Therefore, we may willingly compromise our national defense if offshore wind could help reduce CO2 and combat climate change. However, given the likelihood that these projects will add to carbon emissions and will inflict harm on the environment, we may not want to risk compromising our national defense. The Committee on Foreign Investments in the US<sup>101</sup> (CFIUS) will not allow foreign governments or entities to own strategic ports and harbors in the US. The committee also attempts to protect the US from installing components in strategic areas that could transmit information or disrupt communications. Because the Danish government will now own the majority share of Revolution Wind’s

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<sup>96</sup> [Ahlquist 2020](#), *UpRise RI*.

<sup>97</sup> [UK.gov 2023](#)

<sup>98</sup> [National Academy of Sciences 2022](#)

<sup>99</sup> [Defazio 2022](#), *Letter from the Congressional Oversight Committee to the USCG*.

<sup>100</sup> [UCSG 2022](#)

<sup>101</sup> [CFIUS](#)



possession of piers in several strategic harbors, the Revolution Wind plan should undergo a CFIUS review, to ensure this complies with the law. An understanding of which portion and what components China will manufacture should also be considered. We should also understand how much taxpayer money will be spent on components manufactured in China. Thus far, no such review has occurred, and the documents provided by the developers do not reveal these details.

- Z. **Can noise pollution from wind farms harm public health?** Offshore wind farms, in general, are sited much farther away from human habitation than onshore turbines. People living close to onshore wind farms have complained of migraines and other health issues related to the noise turbines generate. Although at a greater distance, the noise travels over water and underwater more easily than on land. Some construction noise can be partially mitigated with bubble curtains and by restricting activities in the presence of vulnerable marine mammals, but increasing anthropogenic underwater noise can disrupt reproductive behavior, impede socialization and cooperation, and drive species from their normal habitats, making them more vulnerable to ship strikes, stress, and exhaustion.<sup>102</sup> Even seagrass and plankton die from sound pollution. The single detonation of a seismic survey can kill off zooplankton within a mile radius.<sup>103</sup> Recent marine mammal strandings have been associated with hearing loss.<sup>104</sup> The Revolution Wind DEIS acknowledges that the noise alone, from both construction as well as operations and maintenance, will have a moderate adverse impact on fishing.<sup>105</sup>

Humans will hear the operations of the wind farms from shore, as a low vibratory sound, much like a loud refrigerator. This may or may not bother many people. However, underwater, sound travels faster and is more powerful and may harm marine animals. Pile-driving, for example, requires more than 10,846 strikes per pile with a rate of 50 strikes per minute.<sup>106</sup> The developments will significantly increase ocean noise during planning, construction,<sup>107</sup> operation,<sup>108</sup> and decommissioning.

### **Do offshore wind developments deliver environmental justice, as the executive order mandates?**

- D. **Is electricity a human right?** Affordable, available, and stable electricity is associated with higher levels of female education, improved standards of living and political stability.<sup>109</sup> As a result, some argue that electricity is a human right. Any infrastructure project that increases electricity rates, make the grid less stable, and/or less available will potentially violate the executive mandate to ensure that we fight the climate crisis without compromising justice.
- E. **Is mining rare earth metals consistent with environmental justice?** Wind turbines require rare earth metals sourced primarily from China and Africa. Mining these elements contaminates the local water table, generates radioactive waste, risks

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<sup>102</sup> [Huang 2022](#), *Aquatic Conservation: Marine and Freshwater Ecosystems*. \*

<sup>103</sup> [Bakker 2023](#), *The Guardian*.

<sup>104</sup> [Mann et al. 2010](#), *PLoS One*. \*

<sup>105</sup> [BOEM](#), *Revolution Wind DEIS* 3.9-40

<sup>106</sup> [Tribune News Service 2023](#)

<sup>107</sup> [Stober and Thomsen 2021](#), *The Journal of the Acoustical Society of America*. \*

<sup>108</sup> [Duarte et al. 2021](#), *Science*. \*

<sup>109</sup> Bryce 2020, *A Question of Power*, p. 323, Kindle Edition.

harmful exposures, and generates CO2 emissions.<sup>110</sup> The new push for offshore turbines has increased the demand for rare earth metals. The pressure for more supply may require ocean floor mining, which will incur another stress on the ocean and on global warming by resuspending carbon previously sequestered in marine sediments, heavy metal contamination of marine food webs, and biodiversity loss.<sup>111</sup> This externalizes the cost of local renewable energy to a global scale and fails to meet the executive mandate's promise to combat climate change both *locally and globally*. Furthermore, it transfers the environmental hazards to countries with a lower standard of living. This may not support our efforts to implement renewable energy without compromising environmental justice.

- F. **Will meeting state-mandated quotas help combat climate change?** Although well-intentioned, many states mandated that we adopt renewable energy without qualifying whether a given “renewable” source will actually reduce CO2 emissions. Therefore, meeting renewable energy quotas will not necessarily combat climate change. As the energy companies admit themselves, they anticipate that the wind farms will have *no measurable influence on climate change*, they will merely allow states to meet their renewable energy quotas.<sup>112</sup> A single-minded adherence to meeting a quota, instead of an objective (such as reducing CO2 emissions), risks permanently harming the ocean, the environment, biodiversity, and the food supply.
- G. **Can justice occur without trust?** Justice rarely occurs without open honest communication and trust. Revolution Wind has restricted the public from accessing 25 out of 51 technical reports, including the report on air quality and emissions, the economic benefits to Rhode Island, and the emergency response plans. They have also donated millions of dollars to conservation groups, aquariums, and marine research facilities that now support their efforts,<sup>113</sup> including the Woods Hole Oceanographic Institute, the Audubon Society, and the New England Aquarium. By donating significant sums to these organizations and to the scientists examining the environmental impacts of offshore wind farms, the companies are potentially biasing the conversation in favor of wind farm development. By minimizing the environmental risks, ignoring the adverse impacts on local economies, and obscuring the economic realities and true CO2 cost of the projects; the offshore wind companies and BOEM are violating the Public Trust Doctrine.<sup>114</sup> Our government officials should not be favoring a for-profit industry over the best interests of its people.
- H. **Haven't many of the oil companies given up their fossil fuel businesses to concentrate on wind energy?** Many oil and gas companies have now entered the renewable energy sector. However, none have given up the division of their companies that utilize fossil fuels. Ørsted, previously Danish Oil and Natural Gas, is developing Revolution Wind. Although they lead the offshore wind industry, they continue to receive revenue from fossil fuels and in fact, made large profits from burning coal last year.<sup>115</sup> Shell Oil backs the SouthCoast Wind project. Irving Oil,

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<sup>110</sup> [Ives 2013](#), *Yale Environment* 360.

<sup>111</sup> [Hamley 2022](#), *Review of European, Comparative & International Environmental Law*.\*

<sup>112</sup> [BOEM 2022](#), *Revolution Wind DEIS*, p. 3.8-11.

<sup>113</sup> [Save Right Whales Coalition 2022](#).

<sup>114</sup> [Ryan 2022](#), *The Public Trust Doctrine, Property, and Society Handbook of Property, Law, and Society*.

<sup>115</sup> [Mathis 2022](#), *Bloomberg*.

British Petroleum, ExxonMobil, and Chevron are also investing in wind developments.<sup>116</sup> Even a former Enron executive has jumped into the offshore wind business. Chris Wissemann, a former Enron executive, founded Deepwater Wind and now heads Diamond Wind, the company developing wind complexes off the Gulf of Maine.

- I. **Who is BOEM?** The Bureau of Ocean Energy Management (BOEM), formerly the Department of Energy’s offshore lease granting agency to the oil and gas industry, does not prioritize either biodiversity or the climate crisis. It has the mandate to develop the ocean’s resources for power, regardless of the benefits or the costs to the environment. As a result, BOEM overlooks<sup>117</sup> and even seems to conceal<sup>118</sup> major negative impacts on the environment, even against the recommendations of the US’s own scientists.
- J. **Will these developments affect the public’s ability to enjoy nature?** Residents and tourists from all walks of life enjoy whale and bird watching. The Norman Bird Sanctuary will be just 16 miles from the Revolution Wind Farm. Revolution Wind will also surround Coxes Ledge, a prime site for whale watching. Given safety issues, it is possible that the entire 900,000 acres (1400 square miles) of development will be an exclusion zone for boaters, fishermen, and sailors.
- K. **Will the developments interfere with sailing races?** Sailing in Rhode Island is embedded in the culture. Once constructed, the footprint of the developments will overlap with at least nine long-distance official sailing races.<sup>119</sup> Because of safety issues, the entire envelope will likely be excluded from navigation. No one knows how this will disrupt sailing races over the long term. Short term, the construction in both federal and state waters will likely interfere with dozens of races.

### **Will offshore wind benefit the RI economy and provide the “good-paying” jobs mentioned in the executive order?**

**Overview:** The true economic analysis remains unknown to the public because all the project developers restrict public access to the economic assessment reports. However, the Revolution Wind DEIS admits the project will have an overall **major adverse impact** on employment, demographics, and the economy.<sup>120</sup>

- A. **Has anyone compared the number of jobs created to the number of jobs that will be lost as a result of offshore wind developments?** Rhode Island has lost good union-paying jobs over the past decade. Attracting an industry that can provide such jobs would help the RI economy. However, the statistics touted by politicians and the press in favor of the projects focus on short-term union construction jobs and do not account for the number of jobs lost in the fishing industry, tourism, recreational boating, sailing, whale watching, and all the other sectors that could potentially suffer from the introduction of these projects into our coastal waters. The governor’s office admitted that the Revolution Wind project will only create 50 permanent jobs.<sup>121</sup>

<sup>116</sup> [Cherepovitsyn and Rutenko 2022, Energies.](#)\*

<sup>117</sup> [Dlouhy 2022b, Phys.org.](#)

<sup>118</sup> [Dlouhy 2022a, Bloomberg.](#)

<sup>119</sup> [McCann, 2013, The Ocean SAMP, A Practitioner’s Guide.](#)

<sup>120</sup> [BOEM 2022, Revolution Wind DEIS, Table 2.3-1.](#)

<sup>121</sup> [Governor’s Office 2018](#)

Ørsted has never promised these jobs to local workers. As stated in the Revolution Wind DEIS, even if the full buildout of 30 GW occurs, RW will only add 303 annual full-time equivalents (both direct and indirect) over the span of 30 years.<sup>122</sup> None of these predictions take into account the total number of lost jobs in other sectors of the economy, although Ørsted indicates in Table 2.3-1 of the draft environmental impact statement that the Revolution Wind Farm will have major adverse impacts on employment and the economy.<sup>123</sup>

- B. Will Revolution Wind generate 400 MW of electricity for RI?** Although the Revolution Wind Farm will have a nameplate capacity of 700 MW (400 MW allocated for RI), Ørsted does not anticipate generating that amount of electricity. The Power Purchase Agreement<sup>124</sup> only requires RW to deliver less than ¼ (94 MW) of the 400 MW. Most offshore wind farms produce between 30-40% of the nameplate capacity; although the utilities will pay for the electricity, much of this energy will not be consumed due to the load mismatch and the lack of battery backup.
- C. Who will pay for decommissioning?** The project developers and BOEM both express a commitment to decommission the projects once they have reached the end of their lifespan. However, in the fine print of the newly proposed Modernization Rule, BOEM states that decommissioning may not be required.<sup>125</sup> Some projections estimate that decommissioning will cost 70% of the installation price;<sup>126</sup> yet, Ørsted does not disclose the amount of money allocated for this aspect of the project and BOEM does not require such a disclosure. BOEM has recently proposed changes to their policy, so the companies need not reserve any bonds for the cost of decommissioning within the first ten years of the projects.<sup>127</sup> This puts tremendous risk on the residents of Rhode Island. RI taxpayers may be responsible for paying the millions (or billions) of dollars required for decommissioning<sup>128</sup> and the turbines will remain a blight on the seascape, both above and below the ocean's surface, for generations. If the entire field of turbines planned off the coast of RI is built, the cost of decommissioning could reach \$83 billion.
- D. Who will be responsible for maintaining the wind farm?** As most RI residents know, the Block Island Wind Farm frequently suffers from breakdowns and maintenance issues. Large wind turbines in the inhospitable offshore environment frequently fail and have a finite lifespan due to metal fatigue (approximately 20 years).<sup>129</sup> The 350-foot-long blades require frequent replacement and cannot be recycled. Landfills in Europe are now rejecting turbine blades. As a last resort, some companies are burning these components laden with highly toxic compounds. After construction, Ørsted will no longer be responsible for maintaining the Revolution Wind Farm.<sup>130</sup> Instead, the developers will pass off the legal and financial liability to a shell company, Revolution Wind, LLC, whose only assets will be the turbines

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<sup>122</sup> [BOEM 2022](#), Revolution Wind DEIS 3.11-31

<sup>123</sup> [BOEM 2022](#), Revolution Wind DEIS, Table 2.3-1

<sup>124</sup> [Public Utilities Commission 2017](#)

<sup>125</sup> [BOEM 2023](#)

<sup>126</sup> [Jadali, Ioannou, and Kolios 2021](#), *Energy Sources*. \*

<sup>127</sup> [BOEM 2023](#)

<sup>128</sup> [Lesser 2020](#), *The Manhattan Institute*.

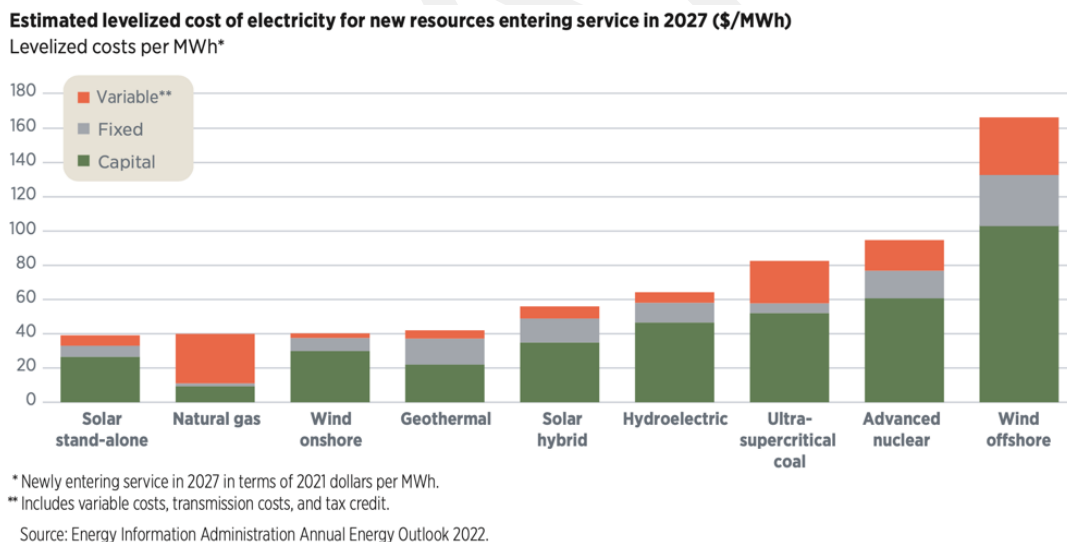
<sup>129</sup> [Hughes 2020](#), *Renewable Energy Foundation*.

<sup>130</sup> [Lesser 2020](#), *The Manhattan Institute*.

themselves and the electricity they generate. Should the Revolution Wind company become insolvent, all damages and unanticipated expenses (such as reburying the cables, turbine failures, and potentially even decommissioning) may fall on RI and CT ratepayers.<sup>131</sup>

**E. Will offshore wind affect electricity rates?** Many citizens concerned about climate change would welcome small rate increases to combat this important issue. However, because offshore wind farms will not achieve the desired reduction in CO<sub>2</sub>, rate increases inflict a regressive tax on the RI population without the assumed benefits. According to the US Energy Information Administration, offshore wind electricity will cost more than any other form generated—over three times more than solar by 2027.<sup>132</sup> RI citizens already pay some of the highest electricity rates in the nation.<sup>133</sup> A greater reliance on offshore wind will almost certainly result in higher rates.<sup>134</sup> The current purchase power agreement stipulates that RI will buy wholesale electricity at \$98/MWh.<sup>135</sup> High electricity rates can cause widespread economic depression and will disproportionately burden economically challenged individuals and those on fixed incomes.

**Figure 5. Price outlooks for electricity generation in 2027 per MWh.**



**F. How will the developments affect fishing?** In New England, the fishing industry averages 5.6 billion dollars of revenue a year.<sup>136</sup> The turbine-induced sediment plumes, EMFs, underwater noise, and ocean floor temperature elevations will all harm squid,<sup>137</sup> RI’s most important commercial fishery.<sup>138</sup> They will also alter larval transport and settlement, thereby potentially changing fish population numbers.<sup>139</sup>

<sup>131</sup> [Collins 2021](#), *The Day*.

<sup>132</sup> [EIA 2022](#)

<sup>133</sup> [EIA 2022b](#)

<sup>134</sup> [Lesser 2020](#), *The Manhattan Institute*.

<sup>135</sup> [PPA 2018](#)

<sup>136</sup> [BOEM 2022](#), *Revolution Wind DEIS 3.9-6*

<sup>137</sup> [Jones 2020](#), *Marine Environmental Research*.\*

<sup>138</sup> [URI 2023](#)

<sup>139</sup> [Johnson 2021](#)

OWF development may cripple this culturally and economically important industry, perhaps even critically.<sup>140</sup> Construction noise can impact sea bass<sup>141</sup>, scallops<sup>142</sup>, and tuna<sup>143</sup>, among other species. The Revolution Wind DEIS states that the presence of structures alone could have a long-term negative impact on certain fish species important to the fishing industry but does not elaborate on which.<sup>144</sup> BOEM concludes, “BOEM anticipates that the overall impacts...would result in an overall long-term **major** adverse impact...” on commercial and for-hire fishing operations...”<sup>145</sup>

**G. Hasn't the Block Island Wind Farm increased tourism?** Block Island has enjoyed hosting “eco-tourists” interested in viewing the nation’s first wind farm. However, once the novelty wears off, a massive complex of offshore turbines may no longer engender the same curiosity. RI beaches host 21 million tourists every year. Tourism provides 11% of RI’s jobs and supplies the state with 1.3 billion dollars of tax revenue.<sup>146</sup> Revolution Wind turbines will dominate the horizon from nearly every public beach in Rhode Island and will be visible from a distance of 40 miles.<sup>147</sup> New Jersey predicts that the loss of tourism from the offshore wind farms planned for its shores could amount to 1 billion dollars.<sup>148</sup> The visual impact will affect over 600 popular destinations, including 178 public beaches in MA and RI.

**H. Cultural Heritage and Tourism:** Although RI has a rich cultural and historic heritage, sea level rise and other downstream effects of climate change threaten this state more than other states in the Union. As a result, we may be more willing to sacrifice our heritage than others. The Revolution Wind project will degrade the historical value of 307 properties with historical relevance within the viewshed. Colonial landmarks attract more tourists than any other type of historical site.<sup>149</sup> The draft environmental impact statement states that the Revolution Wind Project would have an overall **major** adverse impact on cultural resources.<sup>150</sup>

Because these projects have no proven benefit to climate change, and current data suggests they exacerbate climate change issues, degrading these resources would needlessly rob successive generations of their cultural heritage. The projects will have potentially indescribable and irreparable negative impacts. The adverse effect on historic properties violates the Historic Preservation Act.<sup>151</sup> Ørsted will not release the report describing the full impact on our historical properties. The results are listed in the following manner: “U1 - Visual Impact Assessment and Historic Resources Visual Effects Analysis - Revolution Wind Onshore Facilities (CONFIDENTIAL). U2 - Historic Resources Visual Effects Analysis - Revolution Wind Farm (CONFIDENTIAL).

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<sup>140</sup> [RODA 2022](#); [Lapp 2022](#)

<sup>141</sup> [Casper 2013](#), *PLoS One*. \*

<sup>142</sup> [Jezequel et al. 2022](#), *Scientific Reports*. \*

<sup>143</sup> [Puig-Pons et al. 2021](#), *Sensors*. \*

<sup>144</sup> [BOEM 2022](#), *Revolution Wind DEIS* 3.9-40

<sup>145</sup> [BOEM 2022](#), *Revolution Wind DEIS* 3.9-71

<sup>146</sup> [RI Commerce Corporation 2020](#)

<sup>147</sup> [Environmental Design and Research 2021](#)

<sup>148</sup> [Moore 2023](#), *Workboat*.

<sup>149</sup> [Cameron 2000](#), *The Public Historian*. \*

<sup>150</sup> [BOEM 2022](#), *Revolution Wind DEIS* Table 2.3-1

<sup>151</sup> Public Law 89-665; 54 U.S.C. 300101 et seq.

- I. **Who is paying for offshore wind developments?** Tax subsidies will pay for 30% of Ørsted’s investment costs, subsidizing the project for a foreign national profit-making entity without gaining any equity in the projects.<sup>152</sup> Ørsted will not disclose the total cost, but projections based on the Block Island and South Fork wind farms suggest the price of the development could reach \$5 billion (\$50 million per turbine).<sup>153</sup> Taxpayer subsidies would then amount to approximately \$1.5 billion. Spending this amount of money on ineffective and damaging solutions could undermine the entire effort to bring about transformative change. The country will not reward a failure of this magnitude with a second chance.
- J. **How large are the turbines?** The planned 873-1000-foot-tall turbines will tower over any other ocean structure in the world. These trigger the FFA safety concerns on height and proximity to heavily traveled air routes. For scale, only 21 buildings in New York City stand above 800 feet. If Revolution Wind gains approval and begins construction, the other developments may pass through the regulatory approval process with relative ease, leaving RI with 1000 plus turbines over an area *one and a half times the size of its entire land mass* with no clear plans or budget for decommissioning.
- K. **Will we see the turbines from shore?** Many people assume the turbines will be unnoticeable from shore. The visual simulations provided by Ørsted have contributed to this misconception. Below, please see a comparison between the turbines presented by SouthCoast wind from 23 miles (Tom Nevers Beach in Nantucket) and from 16.2 miles (Cisco Beach in Nantucket)<sup>154</sup> to the simulations Ørsted provides from Second Beach in Newport, at a closer distance of 16.1 miles.<sup>155</sup> The comparison exposes Ørsted’s misrepresentation.

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<sup>152</sup> [WINDEXchange 2023](#)

<sup>153</sup> [The Maritime Executive 2015](#)

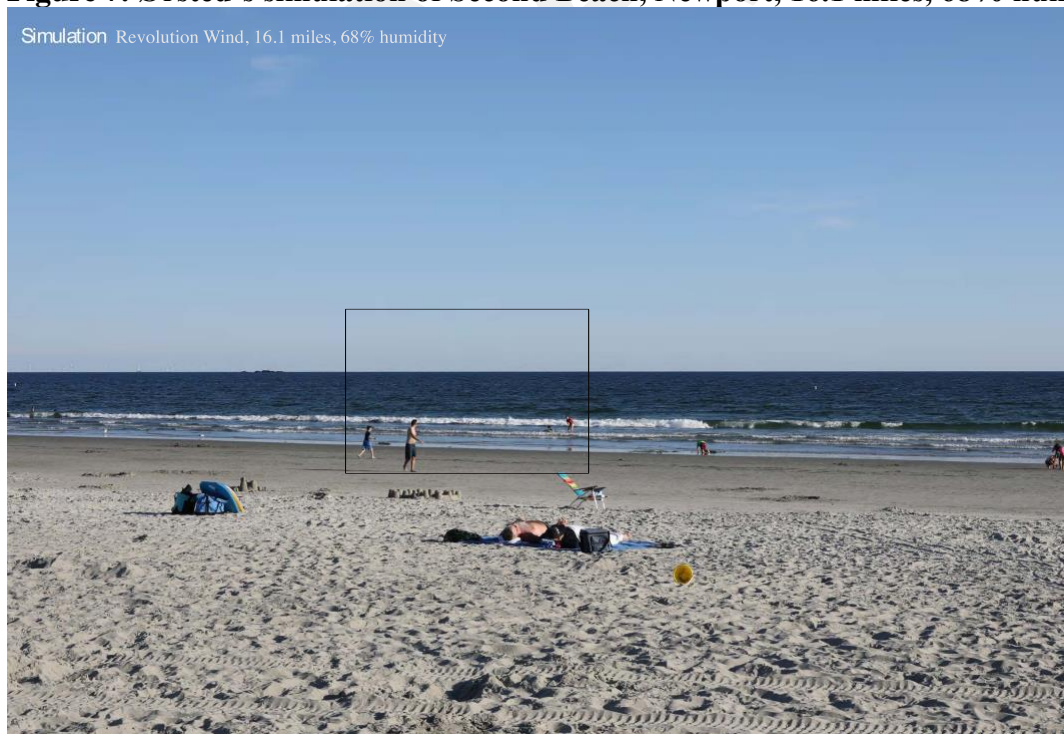
<sup>154</sup> [ICF 2022](#)

<sup>155</sup> [BOEM 2021](#), *Revolution Wind AppU3 Visual Effects Analysis*

**Figure 6. Simulation from Cisco Beach, Nantucket from 16.2 miles, 90% humidity.**<sup>156</sup>



**Figure 7. Ørsted's simulation of Second Beach, Newport, 16.1 miles, 68% humidity.**<sup>157</sup>



<sup>156</sup> [BOEM 2022](#), *Mayflower Wind (aka SouthCoast Wind) DEIS AppH SLVIA*, p. 119

<sup>156</sup> [BOEM 2022](#), *Revolution Wind DEIS, App U3*, p. 252.



The lower humidity would predict more visibility, yet the turbines (closer than the turbines in Figure 6), are imperceptible.

**Figure 8. Enlarged excerpt from figure 6, Cisco Beach (16.2 miles, 90% humidity)**



**Figure 9. Enlarged excerpt from Figure 7 (16.1 miles, 68% humidity).**



Note the blurred turbines, almost invisible in the distance. The lower humidity and closer distance should have made these turbines much more visible than the simulations from Cisco Beach (Figures 6 and 8).

The 800-1000-foot-tall wind turbines will be much more visible than the company's simulations imply and will flash red lights during the night. Moreover, human visual processing enlarges objects on the horizon. This phenomenon, called the Ponzo illusion, explains why a full moon rising on the horizon appears much larger than the same moon, once it is overhead.<sup>158</sup> Humans will experience the turbines as far more sizable than the simulations convey. Human visual processing also pays more attention to moving objects than stationary ones. As a result, humans will be keenly aware of these structures on the horizon. The RW turbines will stand approximately six times higher than Cuttyhunk, which reaches 154 feet at its tallest point and is approximately the same distance from RI's shore.<sup>159</sup> The visual impact on historic properties requires a section 106 review process under the *Historic Preservation Act* (Public Law 89-665; 54 U.S.C. 300101 et seq.) that has not been adequately completed. The cumulative analysis of the projects, provided in the Revolution Wind BOEM project page,<sup>160</sup> admits that the turbines will impact nearly every public beach in RI.

- L. **Well-being:** The climate crisis can exude a sense of doom over people concerned about the environment. RI and the nation as a whole suffer from a mental health crisis and increased drug abuse. Encounters with nature improve both mental and physical health by providing a sense of awe.<sup>161</sup> Compromising the ocean's natural state without improving climate change will potentially exacerbate mental health problems.
- M. **Will the wind farms reduce property values in Rhode Island?** Although not a major concern compared to the looming destruction that unmitigated climate change will confer, no one recommends reducing property values without a proven reason. Europe has not constructed its wind farms within 15 miles of its most popular beaches and tourist attractions—in fact, its largest wind farm, Hornsea is sited 60-80 miles offshore. The Revolution Wind farm will clearly impact property values in coastal communities.
- N. **Will the wind farms provide the financial and economic benefits suggested by our politicians?** None of the Draft Environmental Impact Statements (DEIS) will disclose their assessment of the economic benefits to RI. However, Table 2.3-1 of the DEIS admits that the overall impact to the economy will be major and adverse. If rates increase, as predicted by the Energy Information Administration and the CEO of Ørsted, himself, the entire economy of the state will contract.
- O. **What part of the projects will the US taxpayer subsidize?** We have finally harnessed the political will to combat climate change, after years of effort and billions of dollars. We should not squander this on misguided solutions. Tax subsidies will pay for 30% of Ørsted's construction costs, subsidizing the project for a foreign

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<sup>158</sup> [Gregory 1968](#), *Proceedings of the Royal Society of London*. \*

<sup>159</sup> [Wikipedia 2023](#)

<sup>160</sup> [BOEM 2022](#), *Revolution Wind App U3 Visual Impact Assessment*, p.28.

<sup>161</sup> [Chirico and Gaggioli 2021](#), *Front Psychol*\*; [Lopes, Lima, and Silva 2020](#), *Journal of Environmental Psychology*\*; [Monroy 2022](#), *Perspectives on Psychological Science*. \*

national profit-making entity.<sup>162</sup> To make Ocean Wind 1 in South Jersey financially viable, Ørsted is looking to increase the tax credit amount to 40%. Ørsted will not disclose the total cost, but projections based on the Block Island and South Fork wind farms suggest the price of the development could reach \$5 billion (\$50 million per turbine).<sup>163</sup> Taxpayer subsidies would then amount to approximately \$1.5 billion. Spending this amount of money on ineffective and damaging solutions could undermine the entire effort to bring about transformative change. The country is unlikely to reward a failure of this magnitude with a second chance. The New Jersey legislature recently voted to provide Ørsted with additional tax subsidies for their capital costs at the expense of ratepayers.<sup>164</sup>

- P. **Will the wind farms harm Environmental Justice populations?** Historically, the negative aspects of electricity generation have disproportionately fallen on populations categorized as “environmental justice populations” or those in an economically less advantaged sector. Renewable energy, because of its presumed “cleanliness” could avoid imposing such burdens on these populations. However, according to the Revolution Wind DEIS, “Project construction and installation, O&M, and decommissioning would have short-term to long-term **adverse impacts** on environmental justice populations.”<sup>165</sup> Table 2.3-1 states that the project will have **major adverse impacts** on environmental justice populations. This violates the dictum expressed in the Executive order to promote environmental justice.

These projects disproportionately burden RI, the poorest of the New England states. Both CT and MA, much richer states per capita, and with more carbon emissions, do not share the burden equally. Although relative, the projects should not burden the most economically depressed state in the region with the entire buildout of offshore wind development.

### **The history of Ørsted**

- A. **Who is Ørsted?** Ørsted began life as the Danish Oil and Natural Gas company (DONG Energy). It drilled and maintained offshore oil and gas rigs in the North Sea until reserves in the North Sea began precipitously to decline between 2015-2020. In 2017, DONG Energy strategically decided to re-invent itself as the renewable energy giant and offshore wind developer, Ørsted. The company still maintains nine functioning combustion turbines for electricity production, including three coal plants. Denmark, as a country, ranks 66<sup>th</sup> in the world, with only 0.008% of the planet’s natural gas reserves in 2021,<sup>166</sup> compared to Russia, which ranks highest at 24.3%. In 1991 Denmark had 4,488,000,000 mmcuf, whereas in 2017, this had fallen to 565,000 mmcuf. At current rates of consumption, Denmark has a mere 5 years of natural gas left. Denmark’s oil reserves have also fallen dramatically. Given the bleakness of this future landscape, Denmark has tried to adopt renewable energy. Unfortunately, despite having wind power capacity that equals to over 200% of the country’s total electricity needs, Denmark had to resort to burning coal this past year.

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<sup>162</sup> [WINDEXchange 2023](#)

<sup>163</sup> [The Maritime Executive 2015](#)

<sup>164</sup> [WSJ 2023](#)

<sup>165</sup> [BOEM 2022](#), *Revolution Wind DEIS*, p. 3.12-39.

<sup>166</sup> <https://www.worldometers.info/gas/gas-reserves-by-country/>

The country also relies on wood and biomass for 23.4% of its electricity consumption.<sup>167</sup> They do not include the carbon dioxide emissions from wood or biomass in their overall emissions calculations.<sup>168</sup>

- B. Who owns Ørsted?** The Danish government holds the majority of Ørsted's shares (50.1%), a stake valued at approximately 60 billion kroner (7.9 billion USD).<sup>169</sup> This investment represents about 7% of the total state pension fund value and creates a potential conflict of interest. Over thirty-five percent of the population in Denmark works for the state. The state of Denmark employs every university-based scientist in the country.<sup>170</sup> If Ørsted's share prices fall due to negative press about the environmental consequences of offshore wind, the pensions of over 35% of the population would suffer. Currently, the financial incentives in Denmark would not encourage studies that could potentially expose the environmental impact of offshore wind.
- C. How has Ørsted justified imposing harm on the environment, biodiversity, public health, the economy, and environmental justice?** Ørsted, the Revolution Wind Farm developer, justifies the anticipated harm of the project by comparing their impacts to the damage anticipated from unabated climate change, the "no-action alternative." This strawman argument allows them to deem all resulting damages "negligible" in comparison. To use this argument, Ørsted should prove that their technology will provide measurable reductions in CO<sub>2</sub>. They do not and cannot produce this evidence. Less environmentally harmful alternatives do exist that can reduce CO<sub>2</sub> emissions. By law, BOEM should compare offshore wind projects to other viable options.

### **The motivation of Green Oceans:**

- A. Do the members of Green Oceans have a conflict of interest?** Many of us initially supported offshore wind. We are concerned about climate change, sea level rise, extreme weather events and all the deleterious effects arising from our dependency on fossil fuels. However, our research, prompted by the scale of the planned developments, indicates, and BOEM acknowledges, that these projects will neither combat climate change nor reduce CO<sub>2</sub> emissions. Given this failure, we cannot tolerate the harm to the environment they will impose. For the record, we have never accepted money from the offshore wind developers, nor have we accepted funds, help, or information from fossil fuel interests.
- B. Are members of Green Oceans more interested in their views of the ocean than in combatting climate change?** Many members of Green Oceans, like others, do value natural beauty.<sup>171</sup> Humankind has expressed a heartfelt appreciation for natural beauty since the advent of time. Despite this human affinity, we would support offshore wind if it could significantly reduce CO<sub>2</sub> emissions, reduce our dependency on fossil fuels, and combat climate change.

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<sup>167</sup> <https://www.worlddata.info/europe/denmark/energy-consumption.php>

<sup>168</sup> <https://noah.dk/Biomass-consumption-in-Denmark>

<sup>169</sup> Wienberg 2022, Bloomberg.

<sup>170</sup> Denmark, University staff, Advice and Answers

<sup>171</sup> Sadaniantz 2023

**Possible Solutions:** The scope of this white paper does not include an analysis of alternative energy sources, but merely mentions the initial need to adopt measures that will not add to the industrialization of our ocean.

- A. **Reduce consumption:** As individuals and as a country, we need to reduce our consumption of electricity. Individually, we can increase the temperature settings of thermostats during the summer, buy energy-efficient appliances, utilize public transportation, and limit our air travel (particularly trans-Atlantic flights) to help achieve our shared goal of reducing carbon emissions.
- B. **Limit bitcoin mining:** In addition to these individual measures, government and state policies can also reduce consumption. Limiting bitcoin mining could help reduce our emissions. According to the White House, bitcoin mining accounts for 0.4% to 0.9% of global annual electricity usage.<sup>172</sup> China outlawed bitcoin mining because of environmental concerns in May 2021. Unfortunately, because the RI legislature has passed tax incentives for crypto-mining, RI now hosts eight mining facilities that together consume over 1.7 GW of electricity (over 4 times the size of RI's offshore wind PPA).<sup>173</sup> After years of decrease, Rhode Island's consumption has increased since 2021.<sup>174</sup>
- C. **Limit indoor marijuana cultivation:** Limiting indoor marijuana cultivation could also significantly reduce consumption. Marijuana cultivation often occurs indoors under high-wattage sodium lights that consume large quantities of electricity.<sup>175</sup> Marijuana cultivation has skyrocketed since the legalization of this substance. Electricity usage from marijuana cultivation has driven up consumption. Estimates suggest that marijuana cultivation in the US emits the same amount of CO<sub>2</sub> as 3 million automobiles per year.<sup>176</sup>
- D. **End Deforestation:** In 2022, the world lost 10.2 million acres of primary rainforest, which represented a 10% increase from the year before.<sup>177</sup> Denmark, despite its heavy investment in wind power has contributed significantly to this trend.<sup>178</sup> Despite the 145-country pledge to halt deforestation by 2030, we are trending in the wrong direction. Carbon emissions from last year's tropical forest destruction were roughly equivalent to the annual fossil fuel emissions of India. Changing government policies, better enforcement, logging bans, and improving living standards in rainforest countries are all actions that would make a difference. Forests contain the highest concentration of biodiversity of any ecosystem on the planet, and act as powerful carbon sinks. Reducing deforestation is one of the most cost-effective land-based solutions to mitigate climate change.<sup>179</sup>
- E. **Stop burning wood to generate electricity:** Although policymakers have tried to convince environmentalists that wood is renewable, it still produces greenhouse gases, particularly CO<sub>2</sub>. Moreover, because Europe has adopted wood as a fuel

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<sup>172</sup> [The White House 2022](#)

<sup>173</sup> [FAO 2023](#)

<sup>174</sup> [ISO-New England 2022](#)

<sup>175</sup> [Sevcenko 2016](#), *The Guardian*.

<sup>176</sup> Bryce: Watts to Weeds 2020

<sup>177</sup> [Weisse 2022](#), *World Resource Institute*.

<sup>178</sup> <https://noah.dk/Biomass-consumption-in-Denmark>

<sup>179</sup> [Andreaoni, 2023](#), *The New York Times*.

source for electricity generation, it imports much of this fuel. As a result, Denmark's biomass plants emit as much or more cumulative CO<sub>2</sub> than coal.<sup>180</sup>

- F. **Adopt better farming techniques:** A new study demonstrates that improving global farming techniques could save 31 gigatons of CO<sub>2</sub> per year and could allow the world to stay within the targeted 1.5° C temperature increase.<sup>181</sup>
- G. **Reduce urbanization of the ocean:** Installing artificial structures in the ocean reduces primary productivity. Any reduction in primary productivity will decrease the ocean's ability to sequester CO<sub>2</sub> and produce oxygen.<sup>182</sup>
- H. **Reduce concrete usage and manufacturing:** Concrete manufacturing contributes to CO<sub>2</sub> emissions more than most countries. Reducing our usage or developing new concrete recipes could help reduce the contribution of concrete on climate change.

Many other options exist but extend beyond the scope of this white paper.

### **Conclusion**

We support measures that can sustainably achieve the Inflation Reduction Act's goal to cut 40% of our CO<sub>2</sub> emissions by 2030. Based on our research, however, the plan to industrialize 8% of our coastal waters with offshore wind farms will not accomplish this objective. Instead, the planned wind farms will elevate CO<sub>2</sub> emissions, harm critical aspects of the environment, ensure biodiversity loss, contaminate the food supply chain, impose hardship on environmental justice populations, and violate numerous Federal environmental protection laws. We should learn from Europe's mistakes. Europe is only now beginning to study in earnest the harmful consequences of their offshore wind farm developments that had been previously minimized or overlooked,<sup>183</sup> and to understand that wind and the ocean are neither limitless nor renewable resources.<sup>184</sup> Moreover, the heavy investment in wind energy has not reduced their dependency on carbon-emitting fuel. Sweden, in particular, is turning away from wind energy projects and is embracing nuclear.<sup>185</sup> Neither wind nor the ocean are inexhaustible, and our willful ignorance of these limitations could drive climate change beyond the tipping point.

The expansive wind farms proposed for Rhode Island Sound externalize the cost of energy production to countries that mine rare earth metals; to the marine environment, the signature asset of the Ocean State; and to the residents of RI. Revolution Wind's plan to install 65 turbines, each potentially 873-1000 feet tall, 13 miles off the coast of Rhode Island, has no precedent. The proposed complexes' environmental consequences could undermine decades of protection efforts in Narragansett Bay, New England's largest estuary, and accelerate climate change. A trade-off that sacrifices the ocean's health, biodiversity, and primary productivity for the sake of meeting a renewable energy mandate that ignores the true CO<sub>2</sub> equation will only worsen global warming over time and threaten our own survival. Meeting an arbitrary quota with a technology that has no clear or proven ability to reduce CO<sub>2</sub> without battery backup power, does not justify

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<sup>180</sup> <https://noah.dk/Biomass-consumption-in-Denmark>

<sup>181</sup> [Harvey 2023](#), *The Guardian*.

<sup>182</sup> [Malerba, White, and Marshall 2019](#), *Frontiers in Ecology and the Environment*.\*

<sup>183</sup> [Dannheim et al. 2020](#), *ICES Journal of Marine Science*\*; [MENA Report 2022](#)

<sup>184</sup> [Jacobs 2021](#)

<sup>185</sup> [Reuters 2023](#)

endangering the health of our oceans. Currently, the data fails to demonstrate offshore wind's ability to combat climate change. In fact, the predominance of the scientific findings suggests offshore wind farms will increase net CO2 emissions, violate environmental and species protection laws, and trigger unanticipated, irreparable consequences. Gaining momentum in the fight against climate change is crucial; yet we must not blindly accept profit-driven false remedies that will harm the environment and jeopardize our children's future. We need solutions that will work.

DRAFT