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THE PROSPECT OF OFFSHORE WIND ENERGY ACCORDING TO THE INFLATION REDUCTION ACT OF 2022

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The adoption of clean technology has become pivotal in the nationwide attempt to rely on renewable energy sources. In recent years, the federal government has increasingly supported investment in offshore wind turbines. With the promulgation of the Inflation Reduction Act of 2022, the Biden administration seeks to financially incentivize offshore wind infrastructure, to attain 30 Gigawatts of energy generation capacity from offshore wind by 2030. Unfortunately, this goal seems increasingly unattainable, on such a short timeline, given the nation's current generation capacity. This Article analyzes a mix of economic, environmental, and technological challenges that pose a threat to the timely realization of the Biden administration's offshore wind benchmarks. Additionally, it will explain why a regional approach to offshore wind development might alleviate some of these challenges, and better promote an effective and efficient use of state and administrative resources.

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I. INTRODUCTION

Death Valley, a national park that straddles the California-Nevada border, is known to be one of the driest and hottest places in the United States ("U.S."). In fact, Death Valley holds the record for the highest air temperature on the planet, with a recorded temperature of 134.1 degrees Fahrenheit.[1] Astoundingly, on August 19, 2023, Death Valley was flooded from the remnants of Hurricane Hilary.[2] Not only did the amount of rainfall exceed the average amount of precipitation that Death Valley receives annually, but this also marked the wettest day in history to date for this national park.[3] Unfortunately, the impacts of climate change have been no stranger to national parks throughout the U.S. The Environmental Protection Agency ("EPA"), a federal agency with the mission of protecting human health and the environment, has, for decades, been seeking to mitigate the effects of climate change by, among other things, regulating some of the U.S.' largest contributors to climate change.

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[1] Richard Stone, *Move Over, Death Valley: These are the Two Hottest Spots on Earth*, SCIENCE.ORG (May 19, 2021), https://www.science.org/content/article/move-over-death-valley-these-are-two-hottest-spots-earth#:~:text=Death%20Valley%20holds%20the%20record,C%20(134.1%C2%B0F) [https://perma.cc/3494-N6X5].

[2] *Hurricane Hilary in Death Valley National Park*, NAT'L PARK SERV., https://www.nps.gov/deva/learn/nature/hilary.htm#:~:text=Starting%20in%20the%20late%20afternoon,a%20parkwide%20closure%20for%20safety [perma.cc/YT6L-4YHN] (last visited Sept. 15, 2023).

[3] *Id.*

The EPA states that "[t]he largest source of greenhouse gas emissions from human activities in the United States is from burning fossil fuels for electricity, heat, and transportation."[4] In 2021, electric power generation alone was responsible for a quarter of the total U.S. greenhouse gas emissions.[5] Emissions in the electric power sector can be reduced by implementing clean technology to capture renewable energy sources, rather than depending on fossil fuels to generate electricity.[6] The United Nations adds that renewable energy production, via wind or solar technology, for example, "emit[s] little to no greenhouse gases or pollutants into the air."[7] The plight to reduce carbon emissions, at any scale, will then require "[i]ncreasing the share of total electricity generated from wind, solar, hydro, and geothermal sources."[8]

Accordingly, on April 22, 2021, the Biden administration set a "new target for the United States to achieve a 50–52 percent reduction from 2005 levels in economy-wide net greenhouse gas pollution in 2030."[9] To achieve this goal, President Biden hopes to increase the U.S.' reliance on offshore wind energy, promulgating the administration's strategy for emissions reductions, which involves attaining thirty gigawatts ("GW") of offshore wind energy

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[4] *Sources of Greenhouse Gas Emissions*, ENV'T PROT. AGENCY (last updated Aug. 25, 2023), https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions#:~:text=The%20largest%20source%20of%20greenhouse,electricity%2C%20heat%2C%20and%20transportation [https://perma.cc/9EHN-SY9J].

[5] *Id.*

[6] *Id.*

[7] *Generating Power*, UNITED NATIONS, https://www.un.org/en/climatechange/climate-solutions/cities-pollution [https://perma.cc/Q4TC-7RZJ] (last visited Sept. 22, 2023).

[8] *Sources of Greenhouse Gas Emissions*, *supra* note 4.

[9] Press Release, The White House, Fact Sheet: President Biden Sets 2030 Greenhouse Gas Pollution Reduction Target Aimed at Creating Good-Paying Union Jobs and Securing U.S. Leadership on Clean Energy Technologies (Apr. 22, 2021), https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/22/fact-sheet-president-biden-sets-2030-greenhouse-gas-pollution-reduction-target-aimed-at-creating-good-paying-union-jobs-and-securing-u-s-leadership-on-clean-energy-technologies/ [https://perma.cc/G5GC-X43L].

by 2030.[10] For reference, the power generated by one GW is roughly equal to that of 100 million LED bulbs.[11]

Biden's recent promulgation of the Inflation Reduction Act ("IRA" or "the Act")[12] on September 12, 2022, represents the cornerstone of modern environmental legislation and provides unprecedented incentives for a nationwide transition to clean energy.[13] Nonetheless, the Act's Offshore Wind Energy and Infrastructure provisions[14] cannot reasonably meet the Biden administration's clean energy goals for 2030, considering existing economic, environmental, and technological challenges. As a result, the U.S. Department of Treasury as well as the Internal Revenue Service ("IRS") should expand and clarify renewable energy credits. Additionally, states should reinforce their commitment to a clean energy transition by providing their own economic incentives and encouraging regional, rather than state-specific, project development.

This Article assesses the implications of the IRA on offshore wind development, discusses the reasons the Act's provisions will fall short of the proposed infrastructure goals, and presents potential solutions to better promote offshore wind development. Part II provides a brief account of renewable energy infrastructure in the U.S. and introduces statutory provisions related to offshore wind infrastructure under the IRA. Part III details potential complications that threaten the timely and efficient realization of the Biden

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[10] Press Release, The White House, Fact Sheet: Biden Administration Jumpstarts Offshore Wind Energy Projects to Create Jobs (Mar. 29, 2021), https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/29/fact-sheet-biden-administration-jumpstarts-offshore-wind-energy-projects-to-create-jobs/ [https://perma.cc/265S-JADP].

[11] *How Much Power is 1 Gigawatt?*, OFF. OF ENERGY EFFICIENCY & RENEWABLE ENERGY (last updated Aug. 24, 2023), https://www.energy.gov/eere/articles/how-much-power-1-gigawatt [https://perma.cc/G7PJ-FT5T].

[12] Inflation Reduction Act of 2022, Pub. L. No. 117-169, 136 Stat. 1818.

[13] Exec. Order No. 14082, 87 Fed. Reg. 56861 (Sept. 12, 2022).

[14] LAURA B. COMAY ET AL., CONG. RSCH. SERV., IN11980, OFFSHORE WIND PROVISIONS IN THE INFLATION REDUCTION ACT 2–3 (2022); THE WHITE HOUSE, BUILDING A CLEAN ENERGY ECONOMY: A GUIDEBOOK TO THE INFLATION REDUCTION ACT'S INVESTMENTS IN CLEAN ENERGY AND CLIMATE ACTION 38 (2023).

administration's clean energy goals. Part IV evaluates proposed solutions aimed at circumventing the economic, ecological, and technological complications that are bound to arise from increased investment in offshore wind infrastructure.

II. THE INFLATION REDUCTION ACT OF 2022 AND OFFSHORE WIND

After the Deepwater Horizon oil spill in 2010,[15] President Obama created the Bureau of Ocean Energy Management ("BOEM") for the purpose of overseeing "energy leasing and development in federally managed oceans."[16] In September 2020, President Trump withdrew from wind leasing disposition in areas off the Atlantic coast, spanning from North Carolina to the Gulf of Mexico, barring the federal waters from being leased for project development.[17] In September 2022, President Biden signed into effect the IRA, which has been described as "the single largest and most ambitious investment in the ability of the United States to advance clean energy, cut consumer energy costs, confront the climate crisis, promote environmental justice, and strengthen energy security."[18] The Act counters Trump's prohibition of offshore wind leasing and permits the Secretary of the Interior to "issue renewable

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[15] *Deepwater Horizon – BP Gulf of Mexico Oil Spill*, ENV'T PROT. AGENCY (last updated Aug. 14, 2023), https://www.epa.gov/enforcement/deepwater-horizon-bp-gulf-mexico-oil-spill [https://perma.cc/49Q9-UZ4Q] ("On April 20, 2010, the oil drilling rig *Deepwater Horizon*, operating in the Macondo Prospect in the Gulf of Mexico, exploded and sank resulting in the death of 11 workers on the Deepwater Horizon and the largest spill of oil in the history of marine oil drilling operations. 4 million barrels of oil flowed from the damaged Macondo well over an 87-day period, before it was finally capped on July 15, 2010.").

[16] Will Sennott & Anastasia Lennon, *Blown Away: Fishermen Feel Endangered by Offshore Wind's Political Power*, THE DAILY YONDER (May 1, 2023), https://dailyyonder.com/blown-away-fishermen-endangered-by-offshore-winds-political-power/2023/05/01/ [https://perma.cc/4C6D-QRK5].

[17] *Presidential Determination on the Withdrawal of Certain Areas of the United States Outer Continental Shelf from Leasing Disposition,* THE WHITE HOUSE (Sept. 25, 2020), https://trumpwhitehouse.archives.gov/presidential-actions/presidential-determination-withdrawal-certain-areas-united-states-outer-continental-shelf-leasing-disposition/ [https://perma.cc/YQA5-E8E4].

[18] Exec. Order No. 14082, 87 Fed. Reg. at 56861.

energy leases, easements, and rights-of-way in these areas despite the presidential withdrawal."[19]

A. The IRA's Offshore Wind Provisions

The IRA represents groundbreaking environmental legislation, aimed at the economic advancement of clean technology development and environmentally conscious infrastructure, including offshore wind.[20] Prior to the promulgation of the IRA, offshore wind energy was at a standstill in the southeast, given the Trump administration's ten-year moratorium on offshore wind leases.[21] Conversely, the Act seeks "to accelerate United States global leadership in clean energy innovation, manufacturing, and deployment in a way that cuts consumer energy costs, creates well-paying union jobs and sustainable and equitable economic opportunity, advances environmental justice, and addresses the climate crisis."[22] Through a series of tax credits,[23] offshore wind developers, component manufacturers, and investors are economically incentivized to commit to clean energy development, by a staggering $370 billion in federal investment (equivalent to about $1,100 per person in the U.S.).[24]

In specific regard to offshore wind energy, the Act provides incentives for energy actors to pursue "opportunities for offshore wind lease sales off the coasts of Florida, Georgia, South Carolina, North Carolina, and the U.S. Territories."[25] The Act is generally well disposed to promote the development of offshore wind

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[19] COMAY ET AL., *supra* note 14, at 1.

[20] Exec. Order No. 14082, 87 Fed. Reg. at 56861.

[21] Mark Hibbs, *New Law Repeals Offshore Wind Energy Lease Moratorium*, COASTALREVIEW.ORG (Aug. 18, 2022), https://coastalreview.org/2022/08/new-law-repeals-offshore-wind-energy-lease-moratorium/ [https://perma.cc/FYJ4-LAL3].

[22] Exec. Order No. 14082, 87 Fed. Reg. at 56861.

[23] *See* COMAY ET AL., *supra* note 14.

[24] THE WHITE HOUSE, *supra* note 14, at 5.

[25] Press Release, The White House, Fact Sheet: Biden-Harris Administration Continues to Advance American Offshore Wind Opportunities (Mar. 29, 2023), https://www.whitehouse.gov/briefing-room/statements-releases/2023/03/29/fact-sheet-biden-harris-administration-continues-to-advance-american-offshore-wind-opportunities/ [https://perma.cc/M4MD-DKQ4].

infrastructure in its attempt to meet the Biden administration's renewable energy goals. The Act provides provisions for offshore wind electricity transmission planning, as well as tax credits for project developers, facilities in low-income areas, and advanced manufacturing production.[26] In doing so, "3,411 turbines and 9,874 miles of cable are slated to be built across 2.4 million acres of federally managed ocean" within the next decade.[27]

With such overhaul and reconsideration of the nation's energy reliance, there are a handful of economic considerations that will impact the development of offshore energy infrastructure. The IRA, however, promotes the integration of clean energy sources through a series of progressive tax provisions,[28] which are generally well disposed to promote critical investment in environmentally conscious technology. "The primary federal tax provision supporting offshore wind is the energy investment tax credit (["]ITC["]). This provision provides a 30% tax credit for offshore wind projects that begin construction before January 1, 2026."[29] Additionally, "[s]ection 50153 of the IRA appropriates $100 million for convening stakeholders and conducting analysis related to interregional transmission development and development of transmission for offshore wind energy."[30] For example, "[s]pecific issues for analysis include . . . clean energy integration; effects of climate change on the reliability and resilience of the grid . . . [and] a planned national transmission grid that includes a networked transmission system to optimize the interconnection of offshore wind farms."[31] Such economic incentives are the primary driving forces of the IRA.

The Biden administration, in introducing the IRA, also takes large strides towards the ideals of environmental justice and the provision of equal access to affordable and reliable energy.[32] In 2021, the year before the IRA was passed, Biden promulgated the

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[26] *See* COMAY ET AL., *supra* note 14, at 2–3.
[27] Sennott & Lennon, *supra* note 16.
[28] *See* THE WHITE HOUSE, *supra* note 14.
[29] COMAY ET AL., *supra* note 14, at 2.
[30] *Id.*
[31] *Id.*
[32] *See* THE WHITE HOUSE, *supra* note 14.

Justice40 Initiative, an Executive Order that aims to address the disproportionate number of environmental issues present in low income communities, while advancing a truly nationwide commitment to clean energy and environmental technology.[33] Biden's Justice40 Initiative directs "40 percent of the overall benefits of climate, clean energy, and related federal investments to communities that are marginalized, overburdened by pollution, and underserved by infrastructure and other basic services."[34] The IRA promotes environmental justice and the Justice40 initiative, as its provisions "offer another 10-percentage point bonus allocated investment credit for qualified solar and wind facilities located in a low-income community or on Tribal land and a 20-percentage point bonus for projects that are part of a qualified low-income residential building project or a qualified low-income economic benefit project."[35] This ensures that offshore wind energy is developed with the particular interest of these communities in mind, and incentivizes the expansion of clean energy to historically burdened populations.[36]

Further, the IRA seeks to stimulate the domestic economy by producing incentives for a stateside workforce and supply chain.[37] The IRA provides tax credits "for domestic manufacturing of components along the supply chain for solar modules, wind turbines, battery cells and modules, and critical minerals processing."[38] Such a commitment will inevitably require a high number of domestic workers to fill roles in renewable component manufacturing, supply chain, and construction. "A new analysis shows that the Inflation Reduction Act will be responsible for more than 1 million additional wind and solar jobs by 2035."[39] Doing so will reinforce an already growing domestic energy workforce and

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[33] *Id.* at 7.
[34] *Id.* at 5.
[35] *Id.* at 12.
[36] *See id.*
[37] *Id.*
[38] *Id.* at 26.
[39] Elizabeth Trovall, *The Inflation Reduction Act Will Generate More Than 1 Million Wind and Solar Jobs by 2035*, MARKETPLACE (Jun. 12, 2023), https://www.marketplace.org/2023/06/12/inflation-reduction-act-more-than-1-million-wind-and-solar-jobs-by-2035/ [https://perma.cc/6QC4-8H64].

produce beneficial stimulation of a nationwide renewable technology economy.

B. The Biden Administration's Offshore Wind Strategy

With the summer months of 2023 setting multiple record heights for average surface temperature, an administrative scramble to espouse renewable, carbon-neutral energy technology is seeing unprecedented support.[40] For example, states have adopted renewable portfolio standards, financial incentives, and output-based environmental regulations in order to mandate increased reliance on renewable energy, incentivize support from environmentally conscious investors, and monitor the amount of carbon emissions resulting from energy production.[41] The U.S. Department of Energy ("DOE") has found that "[w]ind energy produces around 11 grams of CO2 per kilowatt-hour (g CO2/kWh) of electricity generated, compared with about 980 g CO2/kWh for coal and roughly 465 g CO2/kWh for natural gas."[42] Offshore wind is thus imperative to addressing climate issues and carbon reduction goals, because "[t]he massive size of turbines at sea make them one of the most efficient ways to generate renewable electricity."[43] The U.S. Geological Survey reports that the "average [wind] turbine [can] generate over 843,000 kWh per month—enough for more than

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[40] Bart Meijer, *Summer 2023 Was Hottest on Record, Scientists Say*, REUTERS (Sept. 7, 2023, 2:43 AM), https://www.reuters.com/business/environment/august-was-hottest-ever-recorded-third-straight-month-set-record-2023-09-06/ [https://perma.cc/D437-QYFQ].

[41] *State Renewable Energy Resources*, ENV'T PROT. AGENCY (last updated Feb. 10, 2023), https://www.epa.gov/statelocalenergy/state-renewable-energy-resources [https://perma.cc/YX62-BB8N].

[42] *How Wind Can Help Us Breathe Easier*, OFF. OF ENERGY EFFICIENCY & RENEWABLE ENERGY (Aug. 24, 2023), https://www.energy.gov/eere/wind/articles/how-wind-can-help-us-breathe-easier#:~:text=Wind%20energy%20produces%20around%2011,2%2FkWh%20for%20natural%20gas [https://perma.cc/36BP-5RMZ].

[43] Will Mathis, *World's Biggest Wind Power Projects Are in Crisis Just When World Needs Them Most*, BLOOMBERG (July 22, 2023, 10:00 AM), https://www.bloomberg.com/news/articles/2023-07-22/biggest-offshore-wind-power-plans-in-crisis-iberdrola-orsted-vattenfall-hit [https://perma.cc/UCP5-4CAP].

940 average U.S. homes."[44] Moreover, Bloomberg notes that "each megawatt of installed capacity of offshore wind farms could produce as much as triple what a solar park would generate."[45] Consequently, if consistent and timely development meets the Biden administration's lofty goal, the "electricity from offshore wind energy generation, in theory, could be transmitted to any of the three interconnections (i.e., grids)[46] of the continental U.S. transmission system,"[47] and would represent a groundbreaking step towards carbon neutralization.

Given that the current operating capacity amounts to only 0.042 GW—as opposed to the 30 GW attainment goal—of offshore wind energy,[48] Biden's nationwide goal proposes a 71,328.6% increase in energy generation from offshore wind turbines in under ten years, a seemingly unrealistic goal. The White House states that about two-thirds of the nation's wind-energy potential depends on the construction of floating turbines,[49] which float atop the ocean's surface and are tethered to the seabed in deep-water locations to

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[44] *How Many Homes Can An Average Wind Turbine Power?*, U.S. GEOLOGICAL SURV., https://www.usgs.gov/faqs/how-many-homes-can-average-wind-turbine-power [https://perma.cc/7BLW-W6NX] (last visited Nov. 21, 2023).

[45] *Id.*

[46] *See* James McBride & Anshu Siripurapu, *How Does the U.S. Power Grid Work?*, COUNCIL ON FOREIGN REL'S (last updated July 5, 2022, 11:53 AM), https://www.cfr.org/backgrounder/how-does-us-power-grid-work [https://perma.cc/UPB7-95AS] ("A vast network of power plants, transmission lines, and distribution centers together make up the U.S. electric grid. The grid constantly balances the supply and demand for the energy that powers everything from industry to household appliances.").

[47] COMAY ET AL., *supra* note 14, at 2. ("[T]he Eastern Interconnection, the Western Interconnection, and the Electric Reliability Council of Texas . . . . interconnections have limited connections among them. The Eastern Interconnection (the largest interconnection) has multiple regions, and transmission development involving two or more regions is relatively rare. Some analysis indicates that increased interregional electricity connection could promote greater use of renewable energy.").

[48] WALTER MUSIAL ET AL., OFF. OF ENERGY EFFICIENCY & RENEWABLE ENERGY, U.S. DEP'T OF ENERGY, OFFSHORE WIND MARKET REPORT: 2022, at vi (Sheri Anstedt ed., 2022).

[49] Press Release, The White House, *supra* note 25.

derive a heightened power generation efficiency.[50] Such a development of offshore wind infrastructure will require massive capital investments and will inevitably create thousands of jobs.[51] Despite the fact that this potential increase in jobs provides economic incentive to pursue offshore wind development, it will likely be a challenge to fill so many positions with skilled laborers.

The Office of Energy Efficiency & Renewable Energy ("EERE") reported that meeting Biden's overall goal "will require over 2,000 wind turbines and foundations, 6,800 miles of cable, and dozens of specialized vessels."[52] As of 2018, "the cost to construct an offshore 1 GW wind farm was on average more than $4 billion in upfront costs," without considering operation and maintenance costs.[53] To help catalyze the breakthrough of innovative environmental infrastructure, the DOE has sponsored "foundational science and prize competitions," in an attempt to reduce the high development costs associated with offshore infrastructure, aiming for a 70% reduction by 2035.[54] While construction costs have been reduced in recent years, the DOE predicts that meeting the Biden administration's offshore wind goals will cost upwards of $100 billion in capital expenditures.[55]

C. Impact of the IRA on Offshore Wind Infrastructure

Following the publication of Biden's offshore infrastructure goals, the Department of the Interior ("DOI") quickly announced a wind leasing plan along with a strategy to hold several lease auctions

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[50] *See Top 10 Things You Didn't Know About Offshore Wind Energy*, OFF. OF ENERGY EFFICIENCY & RENEWABLE ENERGY (Aug. 24, 2023), https://www.energy.gov/eere/wind/articles/top-10-things-you-didnt-know-about-offshore-wind-energy [https://perma.cc/NP9V-HZDU].

[51] *See* Trovall, *supra* note 39.

[52] *Top 10 Things You Didn't Know About Offshore Wind Energy*, *supra* note 50.

[53] Katherine Dunn, *After 'Decade of False Starts' Offshore Wind Power's Time Has Finally Come, IEA Says*, FORTUNE (Oct. 28, 2019), https://fortune.com/2019/10/28/offshore-wind-power-capacity-energy-renewables/ [https://perma.cc/R5Y7-LBYG].

[54] Press Release, The White House, *supra* note 25.

[55] MUSIAL ET AL., *supra* note 48, at 44.

for offshore wind development.[56] Such wind leases constitute "[a] legal document that gives the lease holder a reservation with respect to other developers."[57] This allows developers to bid on leases at assigned auctions and essentially purchase the right to develop offshore wind infrastructure in federally controlled waters.[58] Before a lease can be granted, however, the BOEM must ensure the "protection of the environment, consideration of other uses of the sea—such as the use of the area for fishing—and conservation of natural resources."[59] In support of this requirement, "BOEM is partnering with the National Oceanic and Atmospheric Administration (["]NOAA["]) on advanced spatial modeling to identify sites with the fewest conflicts and environmental impacts."[60]

Following the promulgation of the IRA, the DOI held several offshore wind lease auctions,[61] representing tangible progress towards the realization of Biden's offshore wind and technology goals. In the past year "the domestic offshore wind industry invested $2.7 billion in ports, vessels, supply chain, and transmission,"[62] and

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[56] Press Release, U.S. Dep't of the Interior, Secretary Haaland Outlines Ambitious Offshore Wind Leasing Strategy (Oct. 13, 2021), https://www.doi.gov/pressreleases/secretary-haaland-outlines-ambitious-offshore-wind-leasing-strategy#:~:text=As%20directed%20by%20President%20Biden's,wind%20by%202030%20and%20a [https://perma.cc/PE8F-LC4J].

[57] LAWRENCE M. AUSUBEL & PETER CRAMTON, AUCTION DESIGN FOR WIND RIGHTS, at vi (2011).

[58] *See Offshore Renewables*, U.S. DEP'T OF THE INTERIOR: NAT. RES. REVENUE DATA, https://revenuedata.doi.gov/how-revenue-works/offshore-renewables/ [https://perma.cc/VV25-ZJH5] (last visited Oct. 11, 2023).

[59] Faith Williams, *Fishing Groups Can't Stop Wind Farm, Feds Tell 1st Circ.*, LAW360 (Aug. 31, 2023), https://plus.lexis.com/api/permalink/894a157d-f2a0-4314-8747-0a0a959885c8/?context=1530671 [https://perma.cc/QG3C-M2Z2].

[60] Press Release, The White House, *supra* note 25.

[61] *See* Press Release, U.S. Dep't of the Interior, Biden-Harris Administration Announces First Ever Offshore Wind Lease Sale in the Gulf of Mexico (July 20, 2023), https://www.doi.gov/pressreleases/biden-harris-administration-announces-first-ever-offshore-wind-lease-sale-gulf-mexico [https://perma.cc/DQ7F-Q2WB] ("The lease sale announced today follows the Biden-Harris administration's third approval earlier this month of a commercial-scale, offshore wind energy project in the United States and is part of the leasing path announced by Secretary Haaland in 2021.").

[62] *Top 10 Things You Didn't Know About Offshore Wind Energy, supra* note 50.

a total of 18 projects are currently in the permitting phase of development.[63] In 2022, the federal government received a record-breaking $4.4 billion following an offshore wind lease auction near New York and New Jersey.[64] Additionally, December 2022 saw the very first pacific wind lease, off the coast of California, which garnered "a combined $757.1 million in high bids, equating to an average of $2,000 per acre."[65] Most recently, the DOI held an inaugural wind lease sale for the Gulf of Mexico, including three areas off the coasts of Texas and Louisiana that pose "the potential to generate approximately 3.7 GW and power almost 1.3 million homes with clean, renewable energy."[66] These investments in offshore wind represent a significant increase in development activities, compared to the years prior to the IRA's promulgation.[67] Despite these efforts, meeting Biden's renewable energy goals on time will be a daunting and difficult task.

III. COMPLICATIONS INHIBITING THE REALIZATION OF OFFSHORE WIND GOALS

While the IRA, in theory, provides the necessary incentives to spur clean energy transition in the offshore wind sector, the results do not seem to align with the Biden administration's proffered benchmarks. These pitfalls can be attributed to a variety of economic, environmental, and technological issues. Benjamin Salisbury, the director of research at Height Capital Markets, has

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[63] MUSIAL ET AL., *supra* note 48, at 9.

[64] Jennifer A. Dlouhy & Will Wade, *Orsted's $2.3 Billion Charge Exposes US Offshore Wind Woes*, BLOOMBERG (Aug. 30, 2023, 11:12 AM), https://www.bloomberg.com/news/articles/2023-08-30/orsted-s-2-3-billion-charge-exposes-us-offshore-wind-struggles [https://perma.cc/L8SQ-AJVF].

[65] Noah C. Shaw & Joshua Rosen, *United States: BOEM Announces Provisional Winners Of $757.1 Million California Offshore Wind Lease Auction*, MONDAQ (Dec. 12, 2022), https://www.mondaq.com/unitedstates/renewables/1259616/boem-announces-provisional-winners-of-$7571-million-california-offshore-wind-lease-auction [https://perma.cc/ZT7E-WJ6S].

[66] Press Release, U.S. Dep't of the Interior, *supra* note 61.

[67] *See 2019 Wind Energy Data & Technology Trends*, OFF. OF ENERGY EFFICIENCY & RENEWABLE ENERGY, https://www.energy.gov/eere/wind/2019-wind-energy-data-technology-trends [https://perma.cc/V4CH-TWFV] (last visited Oct. 31, 2023).

asserted that "[t]he massive attention for offshore wind, including ambitious state and federal goals, are running into the hard realities of energy infrastructure."[68] Mounting concern is becoming apparent as available offshore development sites remain unleased, environmental litigation is pursued, and developers abandon projects.[69]

A. Economic Complications

The rising costs of offshore wind development and maintenance serve as one of the most potent deterrents to the adoption of clean energy technology of this kind. "Soaring materials, costs, particularly for steel, forced turbine makers to raise prices. Costs of other key services, like specialized vessels to install the turbines, have jumped sharply as well. And rising interest rates mean that it's more expensive to take on debt."[70] This is creating a positive feedback loop; as temperatures rise drastically, the reliability of electricity is diminishing, yet the need for power generation is increasing.[71] Put simply, by prolonging the use of detrimental fossil fuel sources, delays in renewable energy projects are actively contributing to climate change, making the Biden administration's goals seem less attainable.[72]

1. Challenges Faced by Offshore Wind Developers

A handful of developers have expressed concern with the economic challenges associated with offshore infrastructure projects and have abandoned or stalled projects due to inflated costs and

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[68] Dlouhy & Wade, *supra* note 64.

[69] *See* Madeline Lyskawa, *Gulf Offshore Wind Lease Sale Receives Lackluster Response*, LAW360 (Aug. 29, 2023, 5:05 PM), https://plus.lexis.com/api/permalink/586c7ac8-6df9-432d-a8cb-9fdd75b3819b/?context=1530671 [https://perma.cc/J38C-WQYW]; *see also* Williams, *supra* note 59; Andres Gonzalez & Pietro Lombardi*, Iberdrola Sees No Need to Book Impairments in Offshore Business*, REUTERS (Aug. 30, 2023, 9:46 AM), https://www.reuters.com/business/energy/iberdrola-sees-no-need-book-impairments-offshore-business-2023-08-30/ [https://perma.cc/YRM3-N6RH].

[70] Mathis, *supra* note 43.

[71] *See id.*

[72] *Id.*

unsatisfactory profits.[73] Shell, for example, has refused to entertain renewable projects that have initial returns below 6%, and it has recently pulled out of a joint venture power contract for this very reason.[74] Predictably, eight other energy companies, in varying stages of project development, "have quietly started to back out of wind contracts, or ask to renegotiate deals in ways that will pass more costs to consumers."[75]

As recent as August 30, 2023, the world's largest offshore wind developer, Orsted, lost a quarter of its company value when it announced that "it could face U.S. impairments of around $2.3 billion as a result of supply chain problems, soaring interest rates and a lack of new tax credits."

[76] For similar reasons, Iberdola, a global leader in renewable energy, "agreed to pay $48 million to cancel a long-term agreement to sell energy from a planned wind farm off the coast of Massachusetts in the United States."[77] Bloomberg notes that "[a]t least 9.7 gigawatts of U[.]S[.] projects are at risk because their developers want to renegotiate or exit contracts to sell power at prices that they say are now too low to make the investments worth it."[78] As a result, both developers and investors may be hesitant to pursue offshore projects until such economic conditions are resolved.

Further complications arise as available offshore lease areas are passed up by developers. For example, in the recent Gulf of Mexico lease sales, only one of the three areas offered by the DOI received a bid.[79] While the area near the Louisiana Coast, referred to as "the Lake Charles Lease Area," sold at auction for $5.6 million; the other two sites off the coast of Texas failed to garner bids.[80] These highly

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[73] Avi Salzman, *America's Bet on Wind Power Is Running into a Big Problem*, BARRONS (July 21, 2023), https://www.barrons.com/articles/offshore-wind-power-energy-costs-24a9b387 [https://perma.cc/B5JE-V2TP].

[74] *Id.*

[75] *Id.*

[76] Gonzalez & Lombardi, *supra* note 69.

[77] *Id.*

[78] Mathis, *supra* note 43.

[79] *See* Lyskawa, *supra* note 69.

[80] *Id.*

anticipated locations, near Galveston, totaled a staggering combination of 199,266 acres and offered a generation capacity of 3.7 GW in conjunction with the Lake Charles Lease Area.[81] This may exemplify a stark difference in the attitude of potential investors, as prior Pacific Coast leases "were awarded for more than $757 million in a two-day auction that saw five companies secure rights to develop wind turbines across 373,268 acres."[82] This lack of competitive bids on recent offshore wind leases is indicative of dwindling investor interest in risk laden offshore wind projects.

2. Consumer Concerns

Critics of offshore wind development have linked disinterest in available wind lease areas to customer concern about reliability and cost of energy. For example, "Texas Railroad Commissioner Wayne Christian . . . urged Gov. Greg Abbott and Texas Land Commissioner . . . to block the implementation of offshore wind farms off the Texas coast, warning that the DOI's auction will harm industries and the state's energy grid."[83] Moreover, some Americans are simply complacent with continued reliance on fossil fuels and oppose the development of offshore wind infrastructure for a variety of superficial reasons.[84] While increased taxes and consumer costs are likely needed to offset such a large and immediate investment in the renewable energy sector, it is important for consumers to realize the potential long-term benefits of embracing a nationwide trend toward renewable energy technology.

The high investment funds required for the development of new and updated offshore wind infrastructure, paired with the operating and management costs that allow turbines to provide consumers with reliable energy, provide daunting upfront costs that often deter consumer support for renewable energy.[85] The Institute for Energy

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[81] *Id.*

[82] *Id.*

[83] *Id.*

[84] *See* Robert Gebelhoff, *Opposition to Offshore Wind is a Lot of Hot Air*, WASH. POST (May 11, 2023, 10:43 AM), https://www.washingtonpost.com/opinions/2023/05/11/offshore-wind-opposition-clean-energy/ [https://perma.cc/UF9W-VR8P].

[85] *See* Brian Kennedy et al., *What Americans Think About an Energy Transition from Fossil Fuels to Renewables,* PEW RSCH. CTR. (June 28, 2023),

Research has stated that "offshore wind is 2.6 times more expensive [than] onshore wind power and is 3.4 times more expensive than power produced by a natural gas combined cycle plant."[86] Evidently, the economic incentives proffered through the IRA to encourage wind development fall short of reconciling the financial concerns of the American public.

Much of this consumer opposition to offshore wind development, however, is fueled by misinformation surrounding electricity costs and the pragmatic impacts of increased offshore wind development.[87] Development and construction costs, for example, are projected to continue their historical decline, making offshore wind development more affordable as the groundwork is laid for an increasingly renewable grid.[88] Despite the currently inflated project costs, "experts say that the rough patch should be temporary for offshore wind and point to the industry's long-term benefits around climate, health, economic investment, and energy price stability."[89] Given these prospects, a trend toward renewable energy production might actually be cheaper for consumers in the long run.

Further, concern regarding the potential economic distress to current energy sectors is generally unwarranted. The National Renewable Energy Laboratory ("NREL") "estimates that from 2024 to 2030, the offshore wind energy industry will need an annual

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https://www.pewresearch.org/science/2023/06/28/what-americans-think-about-an-energy-transition-from-fossil-fuels-to-renewables/ [https://perma.cc/PA22-HYBD] ("Slightly more Americans think an energy transition would make the prices they pay to heat and cool their homes worse (42%) than better (37%). And by a wider margin (44% to 25%) Americans think such a transition would make prices for everyday goods worse than better.").

[86] INST. FOR ENERGY RSCH., OFFSHORE WIND ENERGY: A VERY, VERY EXPENSIVE ELECTRICITY SOURCE 1 (2013).

[87] Gebelhoff*, supra* note 84.

[88] *DOE Releases New Reports Highlighting Record Growth, Declining Costs of Wind Power,* U.S. DEP'T OF ENERGY (Aug. 30, 2021), https://www.energy.gov/articles/doe-releases-new-reports-highlighting-record-growth-declining-costs-wind-power [https://perma.cc/895Q-JA5U].

[89] *Why the Rise in Offshore Wind Costs is Temporary*, CLIMATE NEXUS https://climatenexus.org/climate-issues/offshore-wind-costs/ [https://perma.cc/Y6QL-JJBK] (last visited Oct. 16, 2023).

average of between 15,000 and 58,000 full-time workers, based on the proportion of domestic content (materials and goods made in the U.S.) used in offshore wind energy development and construction.[90] This is comparable to the average number of coal mine employees throughout the U.S. in 2022, which totaled 43,582 according to the U.S. Energy Information Administration's Annual Coal Report.[91] While a massive overhaul of the national energy production sector, in favor of a trend towards renewable energy, will inevitably phase out nonrenewable methods of energy production, the emerging investments in clean technology will likely create far more jobs for working Americans.

B. General Public Opposition

Animus toward offshore wind development can also be attributed to a general disdain towards local project development. A survey conducted by the Pew Research Center shows that a respectable "67% of Americans say the U.S. should prioritize developing alternative energy sources, such as wind, solar and hydrogen technology. . . ."[92] However, many specific project proposals face massive public backlash when levied against the interests of local communities.[93] NIMBYism ("Not In My Backyard") is the term coined to describe this general apprehension towards construction and intrusive infrastructure in one's own locale.[94] This sentiment often manifests in "resistance from individual citizens, political leaders, grassroots organizations,

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[90] Caitlin McDermott-Murphy, *Growth in Offshore Wind Energy Offers Huge Opportunity to Create U.S. Jobs*, NAT'L RENEWABLE ENERGY LAB'Y (Oct. 18, 2022), https://www.nrel.gov/news/program/2022/growth-in-offshore-wind-energy-offers-huge-opportunity-to-create-us-jobs.html [https://perma.cc/8P3G-Q4MU].

[91] U.S. ENERGY INFO. ADMIN., ANNUAL COAL REPORT 2022, at 28 (2023).

[92] Kennedy et al., *supra* note 85.

[93] ERIC R. A. N. SMITH & HOLLY KLICK, DEP'T OF POL. SCI., UNIV. CAL. SANTA BARBARA, EXPLAINING NIMBY OPPOSITION TO WIND POWER 2 (2007).

[94] *Id. See also* Krisztina Pjeczka, *Support and Opposition to Offshore Wind Power in the US – A Clash of Perceptions and Reality*, YALE ENV'T REV. (Aug. 1, 2018), https://environment-review.yale.edu/support-and-opposition-offshore-wind-power-us-clash-perceptions-and-reality [https://perma.cc/V5BW-BJYJ].

national interest groups, and in some cases, even environmental groups."[95]

NIMBYism proved fatal to the Cape Wind Project, for example, which was slated to construct "a 130-turbine, 454-megawatt offshore wind farm that would have provided 75 percent of the energy for Cape Cod, Martha's Vineyard, and Nantucket."[96] Local stakeholders opposed the project development, fearing higher electricity costs, wildlife impacts, and declining property values and tourism revenue due to the visibility of large turbines.[97] After fighting sixteen years of opposition and delays, the Cape Wind Project developers finally relinquished their offshore lease in 2017.[98]

The Vineyard Wind Project has faced NIMBYist backlash for its turbine construction at a project site located twelve miles offshore in federally designated waters near Martha's Vineyard and Nantucket.[99] Local opposition to offshore wind development in this area has been mounted by vacationers and homeowners who express aesthetic concerns posed by turbine construction and operation,[100] despite Vineyard Wind's finding that, "[o]n a clear day, the turbines will be marginally visible from the Islands."[101] Further, the Final

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[95] SMITH & KLICK, *supra* note 93, at 2.

[96] Jim Motavalli, *The NIMBY Threat to Renewable Energy*, SIERRA CLUB (Sept. 20, 2021), https://www.sierraclub.org/sierra/2021-4-fall/feature/nimby-threat-renewable-energy [https://perma.cc/V5KJ-NC3S].

[97] *Case Study: Cape Wind Project*, NAT'L GEOGRAPHIC (last updated Oct. 19, 2023), https://education.nationalgeographic.org/resource/case-study-cape-wind-project/ [https://perma.cc/9KYF-JWS3].

[98] *Cape Wind*, BUREAU OF OCEAN ENERGY MGMT., https://www.boem.gov/renewable-energy/studies/cape-wind [https://perma.cc/AFM2-8YT7] (last visited Oct. 16, 2023).

[99] *Barnstable Massachusetts*, VINEYARD WIND, https://www.vineyardwind.com/barnstable#:~:text=No.,marginally%20visible%20from%20the%20Islands [https://perma.cc/8BY9-AR8Y] (last visited Oct. 16, 2023).

[100] *See* Bruce Mohl, *Utilities Terminate Cape Wind Power Contracts*, COMMONWEALTH BEACON (Jan. 6, 2015), https://commonwealthmagazine.org/environment/utilities-terminate-cape-wind-power-contracts/ [https://perma.cc/2PTJ-69SV] ("The Alliance to Protect Nantucket Sound's chief funder is Bill Koch, the flamboyant Florida businessman who didn't want to look at the wind turbines from his Osterville vacation home.").

[101] *Barnstable Massachusetts, supra* note 99.

Environmental Impact Statement ("EIS") for the project states that "[c]onsidering the distance from shore and limited visibility of the offshore structures from residences, coastlines, and businesses, operation of [the proposed turbines] would have negligible impacts on economics due to property value impacts and viewshed impacts on recreational and tourist businesses."[102] It is evident then, that the NIMBY sentiment can threaten the viability of offshore wind projects, even when there are few, if any, tangible downsides.

It is important that the trend towards offshore wind development overcomes the NIMBYist sentiment, since project delays posed by litigation could deter investors and developers from pursuing potentially risky contracts to construct offshore wind infrastructure in productive areas.[103] In order to achieve Biden's clean energy goals, developers, investors, and regulating agencies must be able to mitigate public outcry by simply ensuring that construction and operation of offshore wind turbines take place out of sight from inhabited coastlines. Doing so could potentially eliminate the deleterious effects of NIMBYism and costly litigation, while encouraging consumers, investors, and developers to align their efforts in transitioning to clean, renewable energy.

C. Environmental and Ecological Complications

Offshore wind development has faced especially fervorous backlash from environmental groups and commercial fishing operations. In the U.S., the commercial fishing and seafood industry employs more than one million individuals,[104] not to mention those who represent recreational fishing communities, marine scholars, and nature enthusiasts. Many have complained that offshore wind farms will inhibit efficient and effective fishing.[105] Recent organized opposition, for example, has manifested in a series of lawsuits filed by commercial fishing groups and Nantucket residents, which regard the ecological impacts of wind farm construction near the

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[102] BUREAU OF OCEAN ENERGY MGMT., U.S. DEP'T OF THE INTERIOR, VINEYARD WIND 1 OFFSHORE WIND ENERGY PROJECT FINAL ENVIRONMENTAL IMPACT STATEMENT 3–137 (1st ed. 2021).

[103] Mohl, *supra* note 100.

[104] Sennott & Lennon, *supra* note 16.

[105] *Id.*

coast of Martha's Vineyard.[106] Plaintiff Seafreeze Shoreside filed a motion to enjoin offshore wind developers, pending approval of a Final EIS, as required by the National Environmental Policy Act ("NEPA").[107] While the DOI has emphasized that "BOEM fully ensured that the project would be safe and in compliance with the law . . . fishing groups argued that construction of the wind farm will increase the risk of vessel collision, [and] harm the oceanic environment . . . thwarting fishers' ability to use the area as a prime fishing location."[108] BOEM conceded that the project will result in negative impacts on the productivity of commercial fisheries in the area,[109] and the DOI has offered "$26.7 million in compensation funds, in addition to $14.25 million in aid, [to] mitigate the economic impacts on fishers,"[110] since it initially appeared unlikely that fishing will continue within the boundaries of the 75,614 acre area of development.[111] Consequently, addressing such environmental concerns often results in incidental, but significant costs to these projects, which only add to the weight of the economic barriers previously discussed.[112]

Environmental challenges have also been levied in response to the potential impacts that construction could have on sensitive ocean life.[113] The extensive construction and placement of offshore wind turbines, which can tower at the height of seventy-story buildings, raise concern as to the viability of fish populations.[114] Multiple U.S. National Marine Fisheries Service council directors expressed fears

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[106] Williams, *supra* note 59.

[107] Seafreeze Shoreside, Inc. v. U.S. Dep't of the Interior, No. 1:22-cv-11091-IT, 2023 WL 3660689, at *1 (D. Mass. May 25, 2023).

[108] Williams, *supra* note 59.

[109] Sennott & Lennon, *supra* note 16.

[110] Williams, *supra* note 59.

[111] Sennott & Lennon, *supra* note 16 ("Eight months later, in response to federal lawsuits accusing it of circumventing environmental protection, BOEM walked back its prediction that fishermen would abandon the area.").

[112] *See id.*

[113] *See* David Blackmon, *Biden's Offshore Wind Dreams Face Rising Controversy, Opposition*, FORBES (Feb. 27, 2023, 07:25 AM), https://www.forbes.com/sites/davidblackmon/2023/02/27/bidens-offshore-wind-dreams-face-rising-controversy-opposition/?sh=8449c4f3c941 [https://perma.cc/2UPK-P723].

[114] Sennott & Lennon, *supra* note 16.

about "the cumulative impacts of multiple wind energy projects on the fisheries [that they] manage."[115] Scientists have warned about the Vineyard Wind Project's construction, claiming, in particular, that the sea floor blasts and pile driving often required for the installation of floating turbines can create reverberating sound waves that could inhibit fish spawning and feeding.[116] These compounding effects, resulting from multiple simultaneous construction projects, raise concerns about fishery health and productivity.[117] However, BOEM's chief environmental officer has stated that, while these ecological considerations would not justify delay or abandonment of the project, they could disqualify the project from receiving federal tax credits, which fundamentally removes perhaps the largest incentive for developers brought forth by the IRA.[118]

Opponents to offshore energy have relied heavily on arguments that turbine construction and operation are potentially linked to the deaths of the critically endangered North Atlantic right whales.[119] These critics cite studies, conducted by the Natural Resources Defense Council ("NRDC"), explaining that the population of endangered right whales, which amounted to a mere 340 as of 2021,[120] could be negatively impacted by noise pollution and disrupted feeding, as a result of offshore wind development.[121] Since 2017, NOAA has recorded thirty-six deaths, thirty-four serious injuries, and fifty-one cases of sublethal injury or illness to right whales.[122] The affected whales "represent more than 20 percent of

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[115] *Id.*
[116] *Id.*
[117] *See id.*
[118] *See id.*
[119] Gebelhoff, *supra* note 84; *see also* Blackmon, *supra* note 113.
[120] Alison Chase, *Administration Aims to Protect Right Whale, Advance Wind*, NAT'L RES. DEF. COUNCIL: EXPERT BLOG (Oct. 24, 2022), https://www.nrdc.org/bio/alison-chase/administration-aims-protect-right-whale-advance-wind [https://perma.cc/72HK-Z5PJ].
[121] *Id.*
[122] *2017-2023 North Atlantic Right Whale Unusual Mortality Event*, NAT'L OCEANIC & ATMOSPHERIC ADMIN. FISHERIES (last updated Oct. 4, 2023), https://www.fisheries.noaa.gov/national/marine-life-distress/2017-2023-north-atlantic-right-whale-unusual-mortality-event [https://perma.cc/8SPG-AJ2C].

the population," although it is also emphasized that "only about 1/3 of right whale deaths are documented."[123] This six-year stretch of whale deaths has been labeled an "unusual mortality event,"[124] which is defined by the Marine Mammal Protection Act ("MMPA")[125] as "a stranding that is unexpected; involves a significant die-off of any marine mammal population; and demands immediate response."[126] The evidence of declining North Atlantic right whale populations, paired with the sharp increase of offshore wind development in the Atlantic Ocean, has led to contentious litigation over the potentially dangerous effects of turbine construction, brought by environmentalists, interest groups, and proponents of nonrenewable natural resource use.[127]

Noting concern about the effects of offshore wind farm development on the wellbeing of the North Atlantic right whale, the NOAA and BOEM have taken a variety of steps to ensure protection of endangered species, while also working to mitigate the ecological and environmental effects of offshore wind development.[128] Additionally, the MMPA requires "mitigation measures to avoid and minimize impacts from offshore wind development," which are designed to adequately protect marine life from human interaction.[129] For example, NOAA recently issued a proposal regarding vessel speed restrictions, which would apply to offshore wind vessels, and purportedly reduce the risk of whale deaths

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[123] *Id.*

[124] *Id.*

[125] Marine Mammal Protection Act of 1972, 16 U.S.C. §§ 1371-1393.

[126] *Marine Mammal Unusual Mortality Event*, NAT'L OCEANIC & ATMOSPHERIC ADMIN. FISHERIES (last updated Sept. 29, 2023), https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-unusual-mortality-events#:~:text=Under%20the%20Marine%20Mammal%20Protection,%3B%20and%20demands%20immediate%20response.%22 [https://perma.cc/7LHQ-PA95].

[127] Benjamin Storrow, *4 Lawsuits Threaten Vineyard Wind*, POLITICO (Mar. 29, 2023, 6:54 AM), https://www.eenews.net/articles/4-lawsuits-threaten-vineyard-wind/ [https://perma.cc/CMD4-XQUL].

[128] *See Frequent Questions—Offshore Wind and Whales*, NAT'L OCEANIC ATMOSPHERIC ADMIN. FISHERIES (last updated Aug. 17, 2023), https://www.fisheries.noaa.gov/new-england-mid-atlantic/marine-life-distress/frequent-questions-offshore-wind-and-whales [https://perma.cc/4DNT-SJCJ].

[129] *Id.*

occurring from collisions with vessels.[130] NOAA and BOEM have also collaborated to release a joint strategy that "recognizes efforts to date and identifies areas where BOEM and NOAA Fisheries will work together alongside . . . industry partners in an effort to . . . responsibly develop offshore wind energy while protecting and recovering the North Atlantic Right Whale."[131] Given such concerns, the mitigation of environmental impacts caused by offshore wind turbines is a primary concern of both developers and regulating agencies.

Nonetheless, critics of offshore wind development claim that the mitigation efforts of BOEM and NOAA are insufficient to prevent the irreparable harm that offshore infrastructure development could impose on the right whale population.[132] NRDC points to an absence of proposed funding sources for "the needed rigorous regional and project-level monitoring studies" that ought to accompany BOEM and NOAA's "Draft North Atlantic Right Whale and Offshore Wind Strategy."[133] Scientists have explained that, given the severely strained population of right whales, even one death could render the species unable to recover.[134] While the timely completion of Biden's offshore wind plan is important, avoiding any incidental detriment to biological diversity will likely be a preliminary consideration, and it will conceivably cause further delay or abandonment of project development.[135] However, the DOE has explained that, "[a]s of now, there is no evidence to support speculation that noise resulting from wind development-related site characterization surveys could

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[130] *Id.*

[131] *Notice of Request for Comment on North Atlantic Right Whale Strategy,* BUREAU OF OCEAN ENERGY MGMT. (Oct. 21, 2022), https://www.regulations.gov/document/BOEM-2022-0066-0003 [https://perma.cc/RB33-UXY5].

[132] *See* Chase, *supra* note 120.

[133] *See id*; *see also* Press Release, Nat'l Oceanic and Atmospheric Admin. & Bureau of Ocean Energy Mgmt., BOEM & NOAA Fisheries Announce Draft Offshore Wind, North Atlantic Right Whale Strategy (Oct. 21, 2022), https://www.fisheries.noaa.gov/media-release/noaa-and-boem-announce-draft-offshore-wind-north-atlantic-right-whale-strategy [https://perma.cc/TN2X-Q827].

[134] *See* Chase, *supra* note 120.

[135] *See id.*

potentially cause mortality of whales."[136] Therefore, the best course of action seems to be one that requires rigorous permitting, and stringent noncompliance penalties for all projects posing a risk to marine life, particularly endangered species, as doing so would allow infrastructure development to continue only with the adoption of precautionary measures.

D. Technological Complications

Issues also permeate the planning and development of offshore wind projects, as global supply chain issues lead to further delay in the construction of critical wind farms.[137] EERE explains that, "[a]s the size and complexity of wind turbines grow, so do the manufacturing process requirements and component transportation costs which, in turn, increase the need for local manufacturers who can overcome technical and logistical challenges."[138] Additionally, NREL has stated that "[e]xisting international manufacturing facilities will not likely have sufficient capacity to provide components for the United States and global demand," unless the U.S. is able to streamline its domestic supply chain.[139] The organization's technical report further posits that a domestic supply chain sufficient to meet Biden's offshore energy goals will require upwards of $22 million invested into ports, manufacturing locations, and construction ships.[140] As a result, NREL claims that up to "[h]alf of the U.S. offshore wind energy projects in the pipeline are at risk

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[136] Juaquín Robles, *Addressing Misinformation on Offshore Wind Farms and Recent Whale Mortalities*, U.S. DEP'T OF ENERGY (Apr. 28, 2023), https://www.energy.gov/articles/addressing-misinformation-offshore-wind-farms-and-recent-whale-mortalities [https://perma.cc/3H3T-5GZY].

[137] *See* Nina Chestney & Susanna Twidale, *Explainer: Why the Offshore Wind Power Industry Has Hit Turbulence*, REUTERS (Sept. 8, 2023, 11:54 AM), https://www.reuters.com/business/energy/why-wind-power-industry-has-hit-turbulence-2023-06-26/ [https://perma.cc/MT2S-4UB9].

[138] *Wind Manufacturing and Supply Chain*, U.S. DEP'T OF ENERGY, https://www.energy.gov/eere/wind/wind-manufacturing-and-supply-chain [https://perma.cc/F2M3-GVTY] (last visited Oct. 16, 2023).

[139] *Supply Chain Road Map for Offshore Wind Energy in the United States*, NAT'L RENEWABLE ENERGY LAB'Y, https://www.nrel.gov/wind/offshore-supply-chain-road-map.html [https://perma.cc/CZ39-AAPL] (last visited Sept. 22, 2023).

[140] *Id.*

of being delayed beyond 2030 because of limited port and vessel infrastructure," since alleviation of such a risk would require an excess of $6 billion to be invested into new or developing ports and ships.[141] Consequently, the U.S. will likely rely on international supply chains to obtain the necessary material and technology required to construct offshore wind turbines en masse, regardless of the inherent risk posed by looming delays and increased materials costs.[142]

While the IRA provides incentives for developers to locally source materials and labor for offshore wind projects,[143] given the current lack of a reliable stateside supply chain, "the first offshore wind projects will have to source turbines and other major components from Europe or Asia."[144] This poses a threat to the efficient development of American offshore wind development, however, as rising costs and steep competition continue to cause costly project delays.[145] The recent war in Ukraine has already caused worldwide energy prices to rise sharply and added to inflation in America.[146] Consequently, "[t]imelines[s] of U.S. projects could be impacted by competition from offshore wind builders in Europe as the region accelerates deployment to curb its reliance on Russian oil and gas."[147]

Unfortunately for American developers, foreign developers are likely to prioritize their own offshore wind development, since "European leaders pledged to install 120 GW of offshore wind capacity in northern sea areas by 2030, more than quadruple current capacity."[148] With heavy American reliance on foreign materials

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[141] *Id.*

[142] *Id.*

[143] COMAY ET AL., *supra* note 14.

[144] Eduardo Garcia*, U.S. Invests in Multi-State Offshore Wind Hubs to Narrow Supply Gaps*, REUTERS (Sept. 14, 2022, 8:25 AM), https://www.reuters.com/business/energy/us-invests-multi-state-offshore-wind-hubs-narrow-supply-gaps-2022-09-14/ [https://perma.cc/64UP-P5GD].

[145] *See id.*

[146] Chestney & Twidale, *supra* note 137.

[147] Garcia, *supra* note 144.

[148] Neil Ford, *Offshore Wind in Europe Needs Urgent Factory Aid to Hit Targets*, REUTERS (June 29, 2023, 5:35 AM),

sourcing and supply chains, the European supply chain could face increased strain. Given this possibility, "[t]he EU . . . risk[s] importing more components from China," a strategy that many developers are looking to avoid, due to China's "loose standards on [labor] and environmental protection."[149] One solution to this could be to increase direct investment in both American and European supply chains, until the U.S. can build up an extensive and reliable domestic supply chain.

The U.S. has seen impressive, long-term investment in both its domestic and foreign supply chains.[150] For example, "Siemens Gamesa plans to build the first U.S. offshore wind turbine blade factory in Virginia,"[151] representing a $200 million investment that has the potential to create 260 new jobs.[152] Currently, the U.S. boasts a network of "more than 500 U.S. manufacturing facilities specializing in wind components such as blades, towers, and generators, as well as turbine assembly across the country."[153] Moreover, "[t]he EU has pledged to match the funding offered to U.S. companies under President Biden's Inflation Reduction Act."[154] Further, the price of manufacturing turbine components has fallen quite noticeably recently, as this "intense competition has driven down offshore wind prices and seen manufacturers diversify their supply chains."[155] As a result, both domestic and foreign supply chains will be bolstered with a critical increase in funding and infrastructure in the future.

However, critics note that this approach does not solve the immediate issue of delayed projects and high materials costs, as

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https://www.reuters.com/business/energy/offshore-wind-europe-needs-urgent-factory-aid-hit-targets-2023-06-29/ [https://perma.cc/37KB-Q3NV].

[149] *Id.* (quoting a statement of WindEurope, a European trade association promoting the use of wind power in Europe).

[150] *See id.*

[151] Garcia, *supra* note 144.

[152] Press Release, Siemens Gamesa, Glob. Leadership Grows: Siemens Gamesa Solidifies Offshore Presence in U.S. with Virginia Blade Facility (Oct. 25, 2021), https://www.siemensgamesa.com/en-int/newsroom/2021/10/offshore-blade-facility-virginia-usa [https://perma.cc/A3EK-X96W].

[153] *Wind Manufacturing and Supply Chain*, *supra* note 138.

[154] Ford, *supra* note 148.

[155] *Id.*

reliance on strained international supply chains appears inevitable for the short-term future.[156] One problematic aspect of developing a reliable supply chain is that "[s]tate-level offshore wind targets have led to a fragmented buildout of supply infrastructure that is inefficient and leads to higher procurement costs."[157] Fred Zalcman, Director of the New York Offshore Wind Alliance, explains that supply chain issues could potentially be solved by "a coordinated approach to supply chain development where neighboring states are being mutually supportive instead of competing."[158] This would theoretically provide states with the ability to share financial resources for turbine construction and operation, distribution of developer incentives, and components necessary for turbine construction and operation, minimizing the risk of undue delay and financial losses.

IV. A CASE FOR ADOPTING A REGIONAL APPROACH TO OFFSHORE WIND DEVELOPMENT

Rather than continuing to achieve Biden's plan through national efforts, states should adopt a regional approach to offshore wind development. Just as a regional approach may provide a solution to the supply chain issues that currently plague offshore wind development, it may allow project developers, investors, administrative agencies, and local stakeholders to circumvent complications inherent in a rapid transition to increased renewable energy reliance. Multi-state collaboration has the potential to mitigate ecological concerns, technological complications, and financial distress posed by the Biden administration's ambitious goal to reach 30 GW of reliable offshore wind energy within the next decade. As a result, focus should shift to a collaborative, regional offshore wind strategy, or risk the inefficient and ineffectual pursuit of environmental protection.

Multi-state wind agreements can open the door for the streamlined development of offshore wind infrastructure and the

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[156] Garcia, *supra* note 144.
[157] *Id.*
[158] *Id.*

resulting energy production.[159] For example, a multi-state memorandum of understanding ("MOU") was recently announced by Connecticut, Massachusetts, and Rhode Island, which outlines a regional approach to "amplify efforts to foster regional economic development, create high-paying, in-demand jobs, and promote environmental justice and equity."[160] Under the agreement, "states may agree to select a multi-state proposal(s) up to each states' procurement authority and split the anticipated megawatts and renewable energy certificates from a single project."[161] Doing so would essentially allow the states to collectively support timely development of large offshore wind projects and divide the resulting energy that is produced for the region.

A multi-state approach would mitigate existing labor and supply issues by allowing states to pool resources and collectively invest in developing infrastructure. The lack of domestic infrastructure to support the sourcing and construction of offshore wind technology would be bolstered by "support[ing] the development of regional hubs that allow states to share assembly, staging[,] and [harbor] facilities."[162] Moreover, adopting such a "federal-state initiative will also work to [unionize] the emerging offshore wind workforce, considered by many project partners as crucial for the future of the industry."[163] As large-scale offshore projects are underway, that require high numbers of organized and reliable workers, "[u]nions are positioning themselves as a key part of the Biden administration's goal to deploy 30 gigawatts of offshore wind by 2030, pushing for worker-focused mandates while fielding questions about how it can be done, particularly in the waters off less union-friendly states."[164] Regional sponsorship of offshore

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[159] Press Release, Off. of Governor Ned Lamont, Connecticut, Massachusetts, & Rhode Island Sign First-Time Agreement for Multi-State Offshore Wind Procurement (Oct. 4, 2023), https://portal.ct.gov/Office-of-the-Governor/News/Press-Releases/2023/10-2023/Connecticut-Massachusetts-and-Rhode-Island-Sign-First-Time-Agreement-on-Offshore-Wind [https://perma.cc/29V5-JPQ9].

[160] *Id.*

[161] *Id.*

[162] Garcia*, supra* note 144.

[163] *Id.*

[164] Paige Smith & Stephen Lee, *Unions Jockey for Offshore Wind Leasing Wins in Hostile States*, BL (July 12, 2022, 10:41 AM),

development, however, might encourage union representation of laborers and alleviate the effects of specific "states and places where there's anti-union sentiment."[165] As a result, developers could better balance a demand for both local workers and those interested by the prospect of unionization.[166]

Further, a regional approach may stand to clear up some ambiguity surrounding the availability of IRA funding and state tax credits, as project developers could tap into funding from multiple states. As it stands, "the IRA provides the clean electricity investment tax credit, which is ultimately designed to phase out once greenhouse gas emissions reduction targets are achieved."[167] However, some investors are actively deterred from pursuing project development by a lack of state procurement credits.[168] North Carolina, for example, "does not have a renewable procurement plan in place, while other states, such as New Jersey, offer renewable energy credits for offshore wind developers."[169] As a result, developers planning offshore wind projects to serve North Carolina's energy consumers are essentially hedging their bets on the hopes that the state, or another state in the region, will develop a program to provide renewable energy credits ("RECs") to developers.[170] A regional approach, however, might allow developers to rely on the economic incentives from neighboring states' RECs while still receiving funds from states without REC programs in place.

A regional approach would also protect ecological interests while expanding the reach of the environmental justice approach to renewable energy, including low-income and tribal stakeholders in

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https://news.bloomberglaw.com/daily-labor-report/unions-vie-to-get-in-on-ground-floor-of-offshore-wind-industry [https://perma.cc/556Y-2U5C].

[165] *Id.*

[166] *See id.*

[167] Iulia Gheorghiu, *Duke Energy, TotalEnergies Win North Carolina Offshore Wind Leasing Auction with $315M in Total Bids*, UTILITYDIVE (May 12, 2022), https://www.utilitydive.com/news/north-carolina-offshore-wind-auction-earns-315m-for-2-leasing-areas-duke-energy-totalenergies/623615/ [https://perma.cc/KC3N-5FDV].

[168] *Id.*

[169] *Id.*

[170] *Id.*

the benefits of offshore wind development. Existing MOUs have pledged to maintain commitment to Biden's Justice40 Initiative while adopting a regional plan to "address national high priority offshore wind supply chain gaps."[171] Proponents of a regional, multi-state approach explain, for example, that "studies estimated that a planned grid connecting multiple wind farms off the coast of New York state would lower transmission costs by $500 million and reduce environmental impacts and project risk."[172] Further, studies have shown that an individualized approach may result in prolonged construction and more frequent maintenance, in addition to "costly grid upgrades and complicated permitting challenges."[173] On the other hand, a regional approach is more effective because its "designs are . . . intended to reduce environmental impacts and alleviate local siting conflicts by limiting the number of grid connection points along the coastline."[174] Thus, a multi-state approach to offshore wind development seems to be the prudent method when considering the environmental and ecological effects of infrastructure and the requirements of Biden's Justice40 initiative.

V. CONCLUSION

As global temperatures continue to rise, it is increasingly likely that temperatures will inevitably exceed the preindustrial average by more than 1.5 degrees Celsius.[175] Such a temperature increase

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[171] Memorandum of Understanding By & Among the U.S. Dep't. of Energy et al. on Offshore Wind Supply Chain Collaboration 2 (Sept. 20, 2023) (on file with The White House).

[172] Rona Cohen, *As Offshore Wind Advances, Experts Urge Regional Collaboration on Transmission Planning*, COUNCIL OF STATE GOV'TS E. REG'L CONF. (Dec. 1, 2022), https://csg-erc.org/as-offshore-wind-advances-experts-urge-regional-collaboration-on-transmission-planning/ [https://perma.cc/R8VM-58W9].

[173] *Id.*

[174] *Id.*

[175] Gloria Dickie, *'More Likely Than Not' World Will Soon See 1.5 Degrees Celsius of Warming, World Meteorological Organization Says*, REUTERS (May 17, 2023, 1:01 PM), https://www.reuters.com/business/environment/more-likely-than-not-world-will-soon-see-15c-warming-wmo-2023-05-17/ [https://perma.cc/5RLA-AY2W].

constitutes a grave risk that the planet will experience "more extreme and irreversible climate effects," resulting in a significant decrease in biological diversity, environmental quality, human health, reliable energy, and predictable weather events.[176] This poses an incredible, worldwide challenge, as the Intergovernmental Panel on Climate Change ("IPCC") predicts that, "[t]o hold the planet's long-term average temperature to below the 1.5-degree threshold, the world will have to reach net zero emissions by the year 2050."[177]

To reduce global carbon emissions, and combat rising temperatures, the U.S. is currently engaging in an unprecedented effort to renovate the energy sector. Subsequently, the Biden administration has announced clean energy benchmarks, which require a domestic offshore wind energy capacity of 30 GW by 2030. This goal rests on the support of the IRA and the economic incentives it provides for clean technology users, investors, and producers. The Act represents the largest investment in clean energy ever promulgated and hopes to mitigate the deleterious environmental effects of nonrenewable fuel sources. As a result, historical efforts are being made to improve domestic offshore wind infrastructure.

However, the current offshore wind capacity amounts to a mere fraction of Biden's optimistic goal. Regardless of intentions and efforts of the Administration, a myriad of economic, environmental, and technological issues threaten the timely realization of the proposed renewable energy goals. Due to inflated development costs, investors are shying away from projects and even abandoning efforts to complete construction of offshore wind infrastructure. Further, litigation is causing costly project delays as environmentalists, fishermen, and property owners challenge offshore turbine construction and operation on the basis that it will harm marine life, and in some cases, threaten critically endangered species. A handful of pragmatic issues are also apparent in such an overhaul of the energy sector, as a massive transition to offshore

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[176] Jennifer Chu, *Explained: The 1.5 C Climate Benchmark*, MIT NEWS (Aug. 27, 2023), https://news.mit.edu/2023/explained-climate-benchmark-rising-temperatures-0827 [https://perma.cc/T832-PGY2].

[177] *Id.*

wind reliance requires extensive supply chains and a skilled workforce. As a result, the completion of Biden's offshore wind goals is not likely to be met on time. However, with coordinated action to adopt a regional approach to offshore wind development, rather than a reliance on state sanctioned projects, the nation may adopt a more efficient and cost-effective strategy to strive for renewable energy ideals. Such concerted action would mitigate the obstacles posed by economic, environmental, and technological hinderances, but would allow states, investors, project developers, and local stakeholders to rely on the IRAs essential incentives. In doing so, clean technology can be implemented at a nationwide scale and in a manner that promotes collaboration, environmental protection, and stakeholder satisfaction.