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About the Virginia Coastal Policy Center

The Virginia Coastal Policy Center (VCPC) at the College of William & Mary Law School provides science-based legal and policy analysis of ecological issues affecting the state's coastal resources, by offering education and advice to a host of Virginia's decision-makers, from government officials and legal scholars to non-profit and business leaders.

With two nationally prominent science partners – the Virginia Institute of Marine Science and Virginia Sea Grant – VCPC works with scientists, local and state political figures, community leaders, the military, and others to integrate the latest science with legal and policy analysis to solve coastal resource management issues. VCPC activities are inherently interdisciplinary, drawing on scientific, economic, public policy, sociological, and other expertise from within the University and across the country. With access to internationally recognized scientists at VIMS, to Sea Grant's national network of legal and science scholars, and to elected and appointed officials across the nation, VCPC engages in a host of information exchanges and collaborative partnerships.

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VCPC grounds its pedagogical goals in the law school's philosophy of the citizen lawyer. VCPC students' highly diverse interactions beyond the borders of the legal community provide the framework for their efforts in solving the complex coastal resource management issues that currently face Virginia and the nation.

INTRODUCTION

Wind is a source of renewable energy that can be harnessed to combat climate change and push the United States toward a greener society.[1] Increased utility-scale wind farms can help reduce fossil fuel use, create jobs, and move states closer to their renewable energy goals.[2] Wind farms are collections of turbines, which are essentially very large, very tall fans.[3] As wind moves the blades, the blades then turn a shaft connected to a generator, creating electricity which is transferred to the grid.[4] On land, turbines sit on steel and concrete foundations.[5] Offshore, turbines may be secured to the sea floor with pilings, built into gravity foundations,[6] or float with anchors attached to the sea floor.[7] Cables buried below the sea floor move the energy from the turbines to the onshore grid.[8]

The onshore wind energy industry in the United States has been growing steadily; the amount of wind energy generated has increased consistently since 2008.[9] Onshore wind energy is an established industry in many states, accounting for over twenty percent of the total energy generated in six states: North Dakota, South Dakota, Oklahoma, Maine, Iowa, and Nebraska.[10] In comparison, offshore wind is still very much in its infancy in the United States. There are many offshore wind projects currently in development in coastal states, but the Block Island Wind Farm in Rhode Island was the first operational one, with projects in Virginia following it.[11] Offshore

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[1] *See Environmental Benefits*, AM. WIND ENERGY ASS'N, https://www.awea.org/wind-101/benefits-of-wind/environmental-benefits (last visited Apr. 2, 2021).

[2] *See id.*; *Wind Powers Job Growth*, AM. WIND ENERGY ASS'N, https://www.awea.org/wind-101/benefits-of-wind/powering-job-growth (last visited Apr. 2, 2021); *see also Wind Energy Basics*, OFF. OF ENERGY EFFICIENCY & RENEWABLE ENERGY, https://www.energy.gov/eere/wind/wind-energy-basics (last visited Apr. 2, 2021). Offshore wind farms may also provide opportunities for "mixed-use" zones where structures built for turbines may also support other activities, such as aquaculture; *see also* Rob Fletcher, *Can Aquaculture Co-Locate with Offshore Energy Projects?*, THE FISH SITE (May 20, 2020, 10:30 AM), https://thefishsite.com/articles/can-aquaculture-co-locate-with-offshore-energy-projects; K.A. Abhinav et al., *Offshore Multi-Purpose Platforms for a Blue Growth: A Technological, Environmental and Socio-Economic Review*, 734 SCI. TOTAL ENV'T 138256 (2020), https://doi.org/10.1016/j.scitotenv.2020.138256.

[3] *See Wind Energy Basics*, *supra* note 2; *Basics of Wind Energy*, AM. WIND ENERGY ASS'N, https://www.awea.org/wind-101/basics-of-wind-energy (last visited Apr. 2, 2021).

[4] *How Do Wind Turbines Work?*, OFF. OF ENERGY EFFICIENCY & RENEWABLE ENERGY, https://www.energy.gov/eere/wind/how-do-wind-turbines-work (last visited Apr. 2, 2021); *see also Wind Energy Basics*, *supra* note 2.

[5] *How Big is a Wind Turbine?*, NAT'L WIND WATCH, https://www.wind-watch.org/publication/nwwpub-size.pdf (last visited Apr. 2, 2021).

[6] Used for "large offshore platforms in deep water," a gravity foundation is "a large and heavy concrete structure, usually consisting of a series of cells . . . with a number of towers on which the actual platform is built." ARNOLD VERRUIJT, COMPUTATIONAL GEOMECHANICS 194 (1995), https://link.springer.com/chapter/10.1007/978-94-017-1112-8_11. Its design allows the structure to withstand stresses generated by storms. *Id.*

[7] *See* ENV'T & ENERGY STUDY INST., FACT SHEET: OFFSHORE WIND ENERGY 2 (Oct. 2010), https://www.eesi.org/files/offshore_wind_101310.pdf.

[8] For more information on how wind turbines work, *see How Do Wind Turbines Work?*, *supra* note 4.

[9] AM. WIND ENERGY ASS'N, *Wind Energy Facts at a Glance*, https://www.awea.org/wind-101/basics-of-wind-energy/wind-facts-at-a-glance (last visited Apr. 2, 2021).

[10] *Id.*

[11] Bob Woods, *U.S. Has Only One Offshore Wind Farm, But a $70 Billion Market is on the Way*, CNBC (Dec. 13, 2019), https://www.cnbc.com/2019/12/13/us-has-only-one-offshore-wind-farm-but-thats-about-to-change.html.

wind development will expand, especially with the Biden administration's prioritization of it as an energy source.[12]

Virginia is just beginning to utilize its wind energy potential. The Rocky Forge onshore wind project is in progress in Botetourt County, and would be the first onshore wind farm in Virginia.[13] The project has received approval from the Virginia Department of Environmental Quality (DEQ), secured a purchase agreement with the Commonwealth, and is expected to begin operating commercially in 2022.[14] Twenty-seven miles off the coastline of Virginia Beach, Dominion Energy has constructed two test wind turbines as part of the pilot phase of the Coastal Virginia Offshore Wind windfarm project. The two turbines will inform the procedures for the larger commercial project, which Dominion plans to complete by 2026.[15]

This white paper first explains the federal and state wind energy siting approval processes and the military's current involvement in those processes. In particular, the paper focuses on permit-issuing agencies as opposed to policy-making agencies.[16] Parts I and II outline the federal and state permitting process, respectively. In Part III, the paper discusses the military's concerns regarding wind energy siting. Part IV moves to the current status of Virginia's onshore and offshore wind industries. Part V analyzes two case studies: Block Island Wind Farm in Rhode Island and the Pantego Wind Energy Facility in North Carolina. Finally, Part VI synthesizes recommendations to better incorporate Department of Defense (DoD) input into offshore and onshore wind energy siting decisions in the Commonwealth.

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[12] *See, e.g.*, Exec. Order No. 14008 (Jan. 27, 2021) ("Sec. 207. *Renewable Energy on Public Lands and in Offshore Waters.* The Secretary of the Interior shall review siting and permitting processes on public lands and in offshore waters to identify to the [National Climate] Task Force steps that can be taken . . . to increase renewable energy production on those lands and in those waters, with the goal of doubling offshore wind by 2030. . . .").

[13] *About Rocky Forge Wind*, ROCKY FORGE WIND, https://www.rockyforgewind.com/about_rockyforge (last visited Apr. 2, 2021).

[14] Natasha Montague, *Rocky Forge Wind Continues Amidst COVID-19*, ROCKY FORGE WIND (May 27, 2021), https://www.rockyforgewind.com/rocky_forge_wind_continues_amidst_covid_19; *see also* Stephen Schrichfield, *Governor Northam Announces Power Purchase Agreement With Virginia's First Onshore Wind Farm*, ROCKY FORGE WIND (Dec. 19, 2019), https://www.rockyforgewind.com/governor_northam_announces_power_purchase_agreement_with_virginia_s_first_onshore_wind_farm.

[15] DOMINION ENERGY, COASTAL VIRGINIA OFFSHORE WIND COMMERCIAL PROJECT FISHERIES ROUNDTABLE 8, (Sept. 30, 2020), https://cdn-dominionenergy-prd-001.azureedge.net/-/media/pdfs/global/projects-and-facilities/2020-09-30-virginia-coastal-wind-update-roundtable-slides.pdf?la=en&rev=c90f868604534605b6d7a0f5d0ae84b4&hash=8263A503D684B3FD4B4F1290B7F6C07E).

[16] This white paper is limited to the related issues of siting and permitting wind energy projects in Virginia, its waters, and the federal waters off its coasts. DoD is involved in regional planning bodies such as the Mid-Atlantic Regional Council on the Ocean, and participates in the Mid-Atlantic Committee on the Ocean. *See, e.g.*, MID-ATL. REG'L COUNCIL ON THE OCEAN, MID-ATLANTIC OFFSHORE WIND REGIONAL COLLABORATION 2021 WORK PLAN AND 2020 PROGRESS REPORT 1, https://www.midatlanticocean.org/wp-content/uploads/2021/04/2021-Annual-Work-Plan-and-2020-Progress-Report_Mid-Atlantic-Offshore-Wind-Regional-Collaboration.pdf (listing DoD members). While these groups may inform siting issues such as BOEM leases, they are not permit issuing agencies and are thus outside of the scope of this paper. Exec. Order No. 13547, 3 C.F.R. 13547 (2010) ("The [regional planning body] is not a regulatory body and has no independent legal authority to regulate or otherwise direct Federal, State, Tribal entities, [or] local governments . . . ."). Nevertheless, regional planning bodies may prove a useful model for greater collaboration at the permitting stage. *See infra* Part VI.

I. FEDERAL APPROVAL PROCESSES

A. Requirements for Onshore and Offshore Projects

The U.S. Department of Transportation (DoT) and DoD approval processes for large construction projects such as wind turbines are intertwined. DoT requires anyone who wishes to build a structure "interfering with air commerce or national security" to give public notice "when the notice will promote safety in air commerce, the efficient use and preservation of the navigable airspace . . . or the interests of national security, as determined by the Secretary of Defense."[17] If wind turbines will exceed 200 feet in height, as utility-scale turbines typically do,[18] or where the project is being built within a certain distance from an airport, set by statute, the wind farm developer must receive DoT approval via the Federal Aviation Administration (FAA), which has jurisdiction over anything exceeding 200 feet above ground level.[19] Utility-scale wind projects—and any others with turbines over 200 feet tall—must therefore submit a Notice of Proposed Construction to FAA.[20] FAA determines whether the turbines are likely to interfere with air navigation based on an initial aeronautical study as well as consultation with DoD, which weighs in on any possible impacts to national security.[21] If the FAA determines that the turbines of a proposed wind farm will not obstruct air space and issues a letter with its determination to the developer,[22] an onshore wind farm has met its federal requirements.[23]

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[17] 49 U.S.C. § 44718(a) (2018).

[18] *What is Wind Power?*, OFF. OF ENERGY EFFICIENCY & RENEWABLE ENERGY, https://windexchange.energy.gov/what-is-wind (last visited Apr. 2, 2021).

[19] 14 C.F.R. § 77.9 (2018). The requirements for when a developer must submit a Notice of Proposed Construction to FAA are set by statute. When considering whether a wind farm must submit notice, the only relevant provisions are the height requirement and the airport proximity requirement. The airport proximity requirement varies based on the height of the project and the size of the airport. If the project is within four miles of an airport, it may trigger this requirement. FAA always has the option to require that a developer submit a Notice of Proposed Construction at its discretion, regardless of the size of the project.

[20] *See* 14 C.F.R. § 77.7 (2011). The FAA has developed an online tool as part of the Obstruction Evaluation/Airport Airspace Analysis (OEAAA) to guide developers in determining whether they must submit notice. It can be found here: https://oeaaa.faa.gov/oeaaa/external/gisTools/gisAction.jsp?action=showNoNoticeRequiredToolForm.

[21] *Wind Turbine FAQs*, FED. AVIATION ADMIN. (Nov. 16, 2020), https://oeaaa.faa.gov/oeaaa/external/searchAction.jsp?action=showWindTurbineFAQs; *FAA Determinations*, FED. AVIATION ADMIN., https://oeaaa.faa.gov/oeaaa/external/content/faaDeterminations.jsp (last visited Apr. 2, 2021); U.S. DEP'T OF TRANSP. FED. AVIATION ADMIN., ORDER JO 7400.2M, PROCEDURES FOR HANDLING AIRSPACE MATTERS 7-1-3 (Feb. 28, 2019), https://www.faa.gov/documentLibrary/media/Order/7400.2M_Bsc_w_Chg_1_2_dtd_7_16_20.pdf; *see DoD Preliminary Screening Tool*, FED. AVIATION ADMIN., https://oeaaa.faa.gov/oeaaa/external/gisTools/gisAction.jsp?action=showLongRangeRadarToolForm (last visited Apr. 2, 2021); *see also* David N. Cassuto, *Under the Radar: The Cost and Benefits of Wind Energy through the Lens of National Security*, 2018 MICH. ST. L. REV. 587, 598–99 (2018). Other "sub-agencies," in addition to DoD, also weigh in on FAA's determination. *Id.* at 600. These include the North American Aerospace Defense Command (NORAD) and the United States Northern Command (USNORTHCOM). *Id.*

[22] *Wind Turbine FAQs*, *supra* note 21.

[23] "[A]n Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA) is not required [for wind farms] . . . . Determinations by the FAA dealing with obstruction of air space are considered to be advisory and therefore not a major federal action under NEPA. This means that the only federal requirement for the approval of a wind farm is a determination by the FAA as to whether the object unduly obstructs air space." Cassuto, *supra* note 21, at 598 (citing U.S. DEP'T OF TRANSP., ORDER 1051.1E, SUBJ: ENVIRONMENTAL IMPACTS:

To improve this process, Congress passed the Ike Skelton National Defense Authorization Act of 2011 (ISNDA) in part to "ensure . . . the robust development of renewable energy sources . . . while minimizing or mitigating any adverse impacts on military operations and readiness."[24] ISNDA sets out a number of actions for DoD to take to streamline and speed up DoD's review process.[25] These include the designation of a senior official and lead organization of DoD to, *inter alia*, "serve as a clearinghouse to coordinate [DoD] review of [FAA] applications" and "accelerate the development of planning tools necessary to determine the acceptability to the [DoD] of proposals included in an [FAA] application."[26] As a result, DoD developed its Clearinghouse approval process, which any project triggering FAA review will be subject to, as well as any renewable energy developments seeking DoD's approval.[27]

The Clearinghouse provides both formal and informal review processes. The informal process allows a developer to inquire about military impacts earlier in the planning process, before modifications required to mitigate them become difficult and expensive. For informal review, the developer contacts the DoD Clearinghouse directly and DoD analyzes the project's potential military impacts without FAA involvement.[28] The Clearinghouse must notify the relevant DoD components that have an interest in reviewing the project within five days of receiving the request for informal review.[29] After that, those components have thirty days to review the application and determine whether the project may adversely impact military operations and readiness, and another twenty days to communicate these findings to the developer.[30] The informal conclusions are nonbinding and do not exempt a project from any FAA requirements, including the formal review process.[31] If DoD finds that a project will adversely affect military operations, they must immediately offer to discuss mitigation options with the requester if the requester is the project proponent.[32]

The formal process begins with the developer's Notice of Proposed Construction to FAA.[33] DoD then has thirty days to conduct the same review as in the informal process, and then they must immediately communicate their findings to FAA.[34] FAA then issues either a Determination of No Hazard to Air Navigation (DNH) or a Notice of Presumed Hazard (NPH).[35] If FAA issues

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POLICIES AND PROCEDURES 2-2, 3-1 (2006)). Offshore wind farms face additional requirements, as discussed *infra* Part II. There is no specified timeframe in which FAA must make its determination. *See* 14 C.F.R. § 77 (2010).

[24] Ike Skelton National Defense Authorization Act for Fiscal Year 2011, Pub. L. No. 111-383, § 358, 124 Stat. 4134198 (2011).

[25] *Id.*

[26] *Id.*

[27] 32 C.F.R. § 211.2 (2019).

[28] *See id.* § 211.7.

[29] *Id.* § 211.7(b).

[30] *Id.*

[31] *Id.* § 211.7(b)(2).

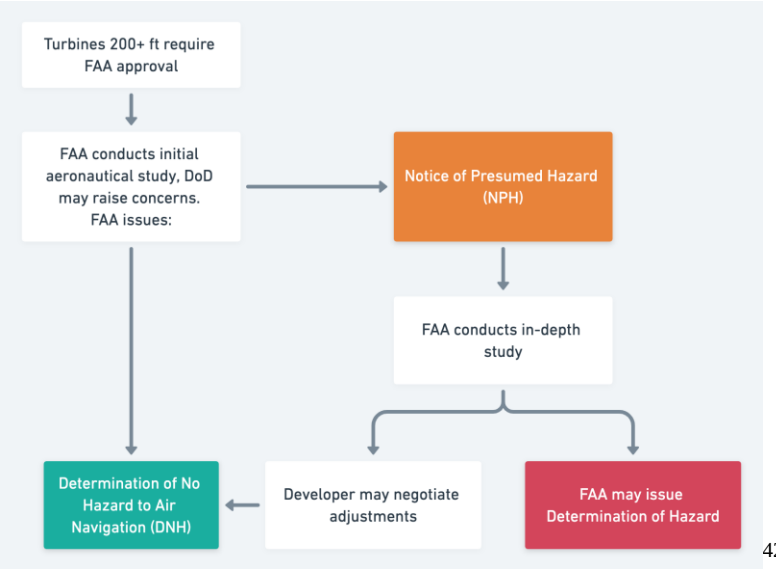
[32] *Id.* § 211.7(b)(2)(iii).

[33] *Id.* § 211.6(a)(3)(iii).

[34] *Id.*

[35] *Wind Turbine FAQs*, *supra* note 21; *FAA Determinations*, *supra* note 21; U.S. DEP'T OF TRANSP. FED. AVIATION ADMIN., ORDER JO 7400.2M, PROCEDURES FOR HANDLING AIRSPACE MATTERS 7-1-3 (Feb. 28, 2019), https://www.faa.gov/documentLibrary/media/Order/7400.2M_Bsc_w_Chg_1_2_dtd_7_16_20.pdf.

a DNH, the developer may push forward with the project.[36] When a project may adversely impact national airspace or military operations and readiness[37] and consequently "resolution or further study is necessary to fully determine the extent of the adverse effect," FAA issues an NPH.[38] If the project receives an NPH, the developer may negotiate with FAA and DoD to make adjustments to mitigate the conflicts and FAA may ultimately issue a DNH.[39] However, if the developer is unable to overcome the conflicts to DoD's or FAA's satisfaction, FAA may issue a Determination of Hazard, which halts both construction and FAA's consideration of the project.[40] This is the only formal way for DoD to raise concerns regarding proposed wind farms, and FAA retains final authority and therefore can overrule any DoD objections in issuing its determination.[41]



[42]

B. BOEM Requirements: Offshore Wind Projects in Federal Waters

Federal regulation of wind projects depends on where in United States (U.S.) waters the project is planned. U.S. jurisdiction extends 200 nautical miles (nm) from the coast.[43] Oceanic waters are divided into different zones: (1) Territorial Sea (0–12 nm); (2) Contiguous Zone (12–24 nm); and (3) Exclusive Economic Zone (24–200 nm).[44] These zones are federally administered, but most states exert control over an area of State Territorial Sea running 0-3 nm from the coast.[45] These zones are primarily a matter of law enforcement, fishery rights, and customs but not

[36] *See* 14 C.F.R. § 77.31(d) (2011).
[37] 49 U.S.C. § 44718(b)(1) (2018).
[38] U.S. DEP'T OF TRANSP. FED. AVIATION ADMIN., ORDER JO 7400.2M, *supra* note 35, at 7-1-3(c).
[39] *See id.*
[40] *See id.* at 7-1-3(e); *FAA Determinations*, *supra* note 21.
[41] Cassuto, *supra* note 21, at 599, 601.
[42] Flow chart of the FAA approval process created at WHIMSICAL FLOWCHARTS, https://whimsical.com/flowcharts (last visited Nov. 13, 2020).
[43] *Maritime Zones and Boundaries*, NOAA OFF. OF GEN. COUNS. (Mar. 1, 2019), https://www.gc.noaa.gov/gcil_maritime.html.
[44] *Id.*
[45] ADAM VANN, CONG. RSCH. SERV., R40175, WIND ENERGY: OFFSHORE PERMITTING 1 (2021).

construction.[46] Accordingly, these areas in and of themselves offer little guidance with regards to siting energy projects other than federal jurisdiction.

While the maritime zones delineate administration of U.S. waters, the Submerged Lands Act (SLA) and the Outer Continental Shelf Lands Act (OCSLA) control the land thereunder.[47] Accordingly, SLA and OCSLA create a dividing line between state sea floor and federal sea floor—called the outer continental shelf (OCS)—at three nm seaward from shore.[48] Because the three nm belt aligns with the divide between state controlled and federally controlled maritime zones, this paper will refer to these two areas as federal waters and state waters for simplicity.[49] By attaching a wind project to the seafloor, the siting of wind projects is a matter of the SLA and the OCSLA, not the maritime zone scheme.[50] Thus, whether federal or state agencies can regulate a wind project's site is determined by whether the project is in state waters or federal waters, not which maritime zone it is placed in. Accordingly, Virginia's agencies have no direct control over siting in federal waters.[51] And while Virginia does have the ability to regulate its state waters, this jurisdiction is still "subject to federal regulation for 'commerce, navigation, national defense, and international affairs'" and the power of the federal government to preempt state law.[52] Therefore, while Virginia has no control over siting in federal waters, the federal government does have regulatory authority in state waters.[53] This paper discusses U.S. Army Corps of Engineers' regulation of projects in state waters in Part III.A.

The federal waters siting process begins with the Bureau of Ocean Energy Management (BOEM), an agency within the Department of the Interior. Under the Energy Policy Act (EP Act) of 2005, BOEM requires additional procedures for offshore wind projects in federal waters. BOEM issues leases, easements, and right of way grants governing offshore wind energy areas in federal waters.[54] While BOEM is the lead agency for siting wind energy projects in federal waters, other federal agencies that have jurisdiction to regulate activities in those waters retain their authority.[55]

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[46] *Id.*; *see Maritime Zones and Boundaries*, *supra* note 43.
[47] 43 U.S.C. § 1332(1) (1986) ("the subsoil and seabed of the outer Continental Shelf appertain to the United States and are subject to its jurisdiction, control, and power of disposition as provided in this subchapter . . . .").
[48] *Id.* § 1312 ("The seaward boundary of each original coastal State is approved and confirmed as a line three geographical miles distance from its coast line . . . ."); 43 U.S.C. § 1331(a)(1) (1978) (defining "Outer Continental Shelf" as "all submerged lands lying seaward and outside of the [3 NM zone]"); *see also* United States v. Maine, 420 U.S. 515, 526 (1975) (describing the relationship between the SLA and the OCSLA). *See generally* FREQUENTLY ASKED QUESTIONS: PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT FOR THE 2017-2022 OUTER CONTINENTAL SHELF OIL AND GAS LEASING PROGRAM, BUREAU OF OCEAN ENERGY MGMT., https://www.boem.gov/sites/default/files/oil-and-gas-energy-program/Leasing/Five-Year-Program/2012-2017/BOEMOceanInfo/faq_boi.pdf (last visited Mar. 4, 2021).
[49] *See* VA. CODE § 28.2-100 (2002).
[50] 43 U.S.C. § 1333(a)(1) (2021) ("The Constitution and laws and civil and political jurisdiction of the United States are extended to the subsoil and seabed of the outer Continental Shelf and to all artificial islands, and all installations and other devices permanently or temporarily attached to the seabed . . .").
[51] *See* VANN, *supra* note 45, at 2.
[52] *Id.* (quoting 43 U.S.C. §§1314(a), 1311(a)(2)).
[53] *Id.*
[54] *See* BUREAU OF OCEAN ENERGY MGMT., *Renewable Energy on the Outer Continental Shelf*, https://www.boem.gov/renewable-energy/renewable-energy-program-overview (last visited Apr. 2, 2021); U.S. COAST GUARD, NVIC 01-19, GUIDANCE ON THE COAST GUARD'S ROLES AND RESPONSIBILITIES FOR OFFSHORE RENEWABLE ENERGY INSTALLATIONS (OREI) at 3 (2019) (hereinafter USCG, NVIC 01-19).
[55] *See* VANN, *supra* note 45, at 5.

For the purposes of wind farm siting, the most notable is the Army Corps of Engineers, which retains its authority to regulate construction activity in federal waters under Section 10 of the Rivers and Harbors Act.[56] Any offshore wind farm will therefore require a Section 10 permit from the Corps.[57]

To develop a wind energy project in federal waters, BOEM first publishes a Call for Information and Nominations related to potential wind energy areas.[58] At this stage, BOEM will identify potential wind energy areas in federal waters that have the characteristics to be developed into large-scale offshore wind farms.[59] BOEM consults with a number of other agencies with subject matter expertise in marine safety, navigation, and the environment. BOEM consults with these agencies through task forces in partnership with the relevant on-shore state.[60] BOEM has previously included DoD in these task forces in order to consider their concerns regarding national security and military operations in this general siting process.[61] However, the final siting decision remains with BOEM.[62] During this stage, the agency also processes any unsolicited lease applications for the area.[63]

When BOEM assesses an application for a lease, the Coast Guard provides information about existing maritime traffic patterns and national defense concerns.[64] As a subject matter expert in navigational safety, maritime security, and national defense, the Coast Guard reviews developers' applications for any potential risk to Coast Guard operations.[65] Because the Coast Guard is housed in the Department of Homeland Security, it does not participate in the DoD Clearinghouse process. Therefore, the Coast Guard's participation in BOEM's permitting process is the main avenue by which it advises on its areas of subject-matter expertise.[66] As a cooperating agency in BOEM's process, the Coast Guard may recommend that the developer submit a

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[56] *Id.* The Army Corps also has authority over OCS administration with a number of other agencies through OCSLA. BUREAU OF OCEAN ENERGY MGMT., BOEM 2016-014, OCS REGULATORY FRAMEWORK 1 (2016), https://www.boem.gov/sites/default/files/environmental-stewardship/Environmental-Assessment/NEPA/Report-OCS-Regulatory-Framework-revised-2016.pdf.

[57] *Id. See generally* U.S. Army Corps of Engineers, Decision Document Nationwide Permit 52 (2021).

[58] FACT SHEET: WIND ENERGY COMMERCIAL LEASING PROCESS, BUREAU OF OCEAN ENERGY MGMT. (Jan. 24, 2017), https://www.boem.gov/sites/default/files/boem-newsroom/Wind-Energy-Comm-Leasing-Process-FS-01242017-%281%29.pdf (hereinafter BOEM FACT SHEET).

[59] *Id.*

[60] *Id.*

[61] *See* BUREAU OF OCEAN ENERGY MGMT., *How did BOEM Delineate the Area Proposed for Leasing?*, https://www.boem.gov/renewable-energy/state-activities/how-did-boem-delineate-area-proposed-leasing (last visited Apr. 25, 2021).

[62] BOEM FACT SHEET, *supra* note 58.

[63] *Id.*

[64] BUREAU OF OCEAN ENERGY MGMT & U.S. COAST GUARD, OCS-06, MEMORANDUM OF AGREEMENT: OFFSHORE RENEWABLE ENERGY INSTALLATIONS ON THE OUTER CONTINENTAL SHELF (Jul. 27, 2011), https://www.boem.gov/sites/default/files/renewable-energy-program/MOA_USCG_BOEMRE_July_27_2011.pdf. For more detail on the NEPA review process, see EPA, *National Environmental Policy Act Review Process*, https://www.epa.gov/nepa/national-environmental-policy-act-review-process (last visited Apr. 2, 2021).

[65] *See* USCG, NVIC 01-19, *supra* note 54, at 4–5.

[66] *Id.* at 2.

Navigation Safety Risk Assessment (NSRA) if the Coast Guard believes the project may present a risk to navigation.[67]

The NSRA is reviewed by the Coast Guard for potential conflicts with navigation safety, as well as for cumulative impacts that may result from multiple neighboring projects.[68] The Coast Guard advises BOEM on potential impacts of the project and may recommend mitigation measures to be undertaken by the developer to reduce the project's impact on navigational safety, but it does not have a role in approving the final BOEM permit.[69] To enable the early identification of risks and to provide flexibility in the permitting process, the Coast Guard has developed Marine Planning Guidelines to aid developers in understanding how the Coast Guard will assess a proposal's impacts on navigation and other existing uses, such as commercial fishing or vessel traffic.[70]

The applicable Coast Guard District and Sector work with the developer and stakeholders—federal, state, tribal, and local agencies, maritime industry representatives, and the general public—to identify potential mitigation measures.[71] The Coast Guard must give their recommendations in a timely manner, because BOEM will incorporate these recommendations into the environmental assessment process as proscribed in the National Environmental Policy Act (NEPA). For offshore wind projects in federal waters, BOEM is responsible for conducting all environmental reviews under NEPA, and such reviews constitute an important step in the decision to issue easements, leases, or rights of way.[72] BOEM cannot issue any of these if they are conditioned on future Coast Guard actions.[73]

If BOEM determines that there is competitive interest in leasing a specific wind energy area, it conducts a lease sale, notifying the public before the sale happens.[74] If there is no competitive interest, BOEM negotiates the lease with the applicant, without an opportunity for the public to comment.[75] Once BOEM grants the lease, the lessee must have a pre-survey planning meeting with BOEM.[76] The lessee then conducts studies specific to their site and project and

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[67] *Id.* NVIC 01-19 is a Coast Guard guidance document drafted to provide developers with a comprehensive understanding of how to conduct a successful NRSA. "NVIC" stands for "Navigation and Vessel Inspection Circular."

[68] U.S. COAST GUARD, COMDTINST 16003.2B, MARINE PLANNING TO OPERATE AND MAINTAIN THE MARINE TRANSPORTATION SYSTEM (MTS) AND IMPLEMENT NATIONAL POLICY, at B-1 (2019).

[69] *Id.*

[70] *See* USCG, NVIC 01-19, *supra* note 54, at Enclosure 3. Enclosure 3 of NVIC 01-19 is entitled "Marine Planning Guidelines." The Enclosure draws from Port Access Route Studies conducted by the Coast Guard to review access routes for ships to access coastal ports. These studies are accessible through an online portal available at *portal.midatlanticocean.org/visualize*, under the headings Maritime/USCG Proposed Areas and Studies. *See, e.g.*, Atlantic Coast Port Access Route Study: Port Approaches and International Entry and Departure Transit Areas, 84 Fed. Reg. 9541 (Mar. 5, 2019).

[71] *See* USCG, NVIC 01-19, *supra* note 54, at 6–7.

[72] *Id.* at 5. Unlike the regulations outlining FAA and Clearinghouse review processes, the Coast Guard's guidance does not specify what timeframe would constitute "timely." *See also* BUREAU OF OCEAN AND ENERGY MGMT., GUIDELINES FOR INFORMATION REQUIREMENTS FOR A RENEWABLE ENERGY SITE ASSESSMENT PLAN 21 (June 2019).

[73] *See* USCG, NVIC 01-19, *supra* note 54, at 6–7.

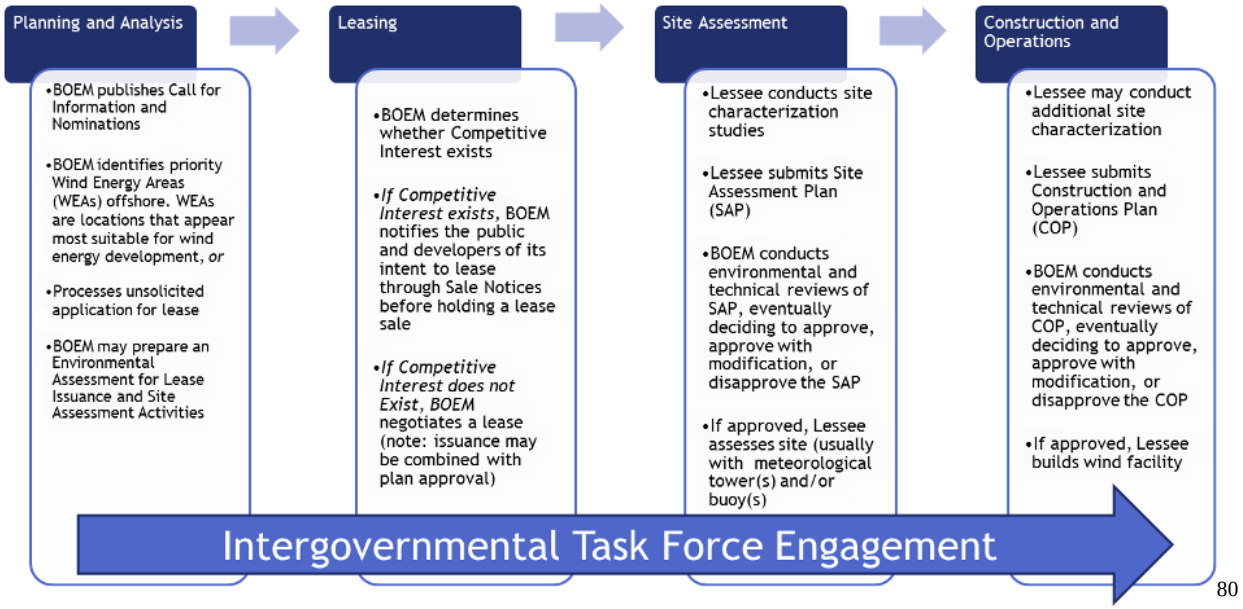
[74] BOEM FACT SHEET, *supra* note 58.

[75] *See id.*

[76] BUREAU OF OCEAN ENERGY MGMT., OFF. OF RENEWABLE ENERGY PROGRAM, MASSACHUSETTS INTERGOVERNMENTAL RENEWABLE ENERGY TASK FORCE MEETING 21 (Apr. 19, 2015),

submits a Site Assessment Plan to BOEM, which conducts an environmental and technical review of the plan.[77] Once approved, the lessee submits a Construction Operations Plan which BOEM must also approve on environmental and technical grounds.[78]

Federal action in federal waters, such as a BOEM lease determination, may be subject to scrutiny and review by adjacent states through the Coastal Zone Management Act of 1972,[79] as discussed in Part II.A.



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II. STATE AND LOCAL APPROVAL PROCESSES

A. State Approval Processes

Starting with regional approval, all electrical projects that intend to connect to the interstate electrical grid in the mid-Atlantic area must apply to the Regional Transmission Organization, Pennsylvania New Jersey Maryland Interconnection, LLC. (PJM).[81] PJM's role is to ensure competitive electricity markets and reliability in the electrical grid.[82] PJM requires the developer to submit a series of impact studies in its application demonstrating the project's effects on the

https://www.boem.gov/sites/default/files/renewable-energy-program/State-Activities/MA/MA-TF-Meeting-Presentation-Intro-and-Next-Steps.pdf.

[77] BOEM FACT SHEET, *supra* note 58.

[78] *Id.*

[79] *See infra* Part II.A.

[80] *Id.*

[81] *Electrical Power Markets*, FED. ENERGY REG. COMM'N (Oct. 23, 2020), https://www.ferc.gov/industries-data/market-assessments/electric-power-markets. PJM is the company's legal name, which stands for Pennsylvania-Jersey-Maryland, the first three states under PJM's purview. *PJM's History Highway*, PJM, https://learn.pjm.com/history-highway.html (last visited May 12, 2021).

[82] *Id.* PJM oversees an area encompassing the mid-Atlantic out to Ohio and Eastern Kentucky. *Id.*

electrical grid and energy market.[83] PJM does not control siting and thus is not a viable avenue for greater DoD input into siting decisions. PJM's interest in siting is limited to ensuring the developer has control of the site,[84] presumably to ensure there are no disruptions to the electrical grid once the facility is running.[85]

Wind energy developers in Virginia must obtain approval from the State Corporation Commission (SCC), the Commonwealth's primary utility regulator, in the form of a Certificate of Public Convenience and Necessity (CPCN), if a project is greater than 150 MW.[86] To decide whether to issue a CPCN, SCC will solicit comments from the public and hold a hearing with witnesses and evidence.[87] SCC will then determine whether the project (i) will not interfere with the reliability of electrical services, (ii) is "required by the public convenience and necessity," and (iii) is "not otherwise contrary to the public interest."[88] If SCC determines that the project meets all of these requirements, the General Assembly has mandated that SCC must issue a CPCN.[89] SCC treats transmission lines and power generation as two separate matters requiring distinct permitting processes.

When considering whether to issue a CPCN, SCC is concerned with the impact to the taxpayer and other financial concerns.[90] SCC will generally be limited to these cost concerns, but SCC is free to consider questions of local siting as well as environmental issues if the agencies responsible for those determinations have yet to issue a decision or failed to consider a question.[91] For example, if DEQ were to fail to make a finding on environmental justice as required by statute, SCC could then make its own findings on environmental justice in determining whether the project is contrary to the public interest.[92] Nevertheless, in an effort to encourage wind energy, the Virginia General Assembly has legislatively mandated that many types of wind projects are statutorily in the public interest.[93] SCC interprets these statutes to limit its ability to reject wind projects.[94]

For projects that are five to one hundred fifty MW, applicants utilize DEQ's streamlined permit by rule (PBR) process.[95] This process is intended to expedite the permitting process for small-scale systems by avoiding the SCC's deliberation process, and removing agency discretion

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[83] *See generally* PJM, MANUAL 14A: GENERATION AND TRANSMISSION INTERCONNECTION PROCESS (2016), https://www.pjm.com/-/media/documents/manuals/archive/m14a/m14av19-generation-and-transmission-interconnection-process-11-01-2016.ashx.
[84] *See id.* at 15.
[85] *See* FED. ENERGY REG. COMM'N, *supra* note 81.
[86] VA. CODE § 10.1-1197.8 (2017) (limiting SCC's authority over small scale projects); VA. CODE § 56-265.2(A)(1) (2017) (describing SCC's applications for large scale projects).
[87] VA. CODE § 12.1-28 (1994).
[88] § 56-580 (D) (2009).
[89] *Id.*
[90] *See, e.g.*, Tamara Dietrich, *SCC Reluctantly Approves Dominion's Offshore Wind Energy Pilot Project* (Nov. 5, 2018), https://www.pilotonline.com/news/environment/article_ee338cc6-e137-11e8-989b-27f7c38a99bd.html.
[91] VA. CODE § 56-46.1 (A) (2020).
[92] *See id.*
[93] *See* VA. CODE § 56-585.1:4(A) (2020); § 56-585.1:4(E) (2020); § 56-585.1(A)(6) (2020); § 56-585.1:1(G) (2020).
[94] *See* Va. Elec. and Power Co., PUR-2018-00121, at 6–8, 16–17 (State Corp. Comm'n Nov. 2, 2018) (adjudicating a prudency determination for transmission lines related to the CVOW project).
[95] 9 VA. ADMIN. CODE § 15-40-20 (2017).

concerning permit issuance if all requirements are met.[96] Thus, a project in this wattage window need not obtain a CPCN from the SCC.[97]

DEQ defines a set of requirements that a proposed project must meet to obtain a PBR.[98] Once an applicant certifies to the agency that all conditions or requirements are met, the applicant receives a permit.[99] Regulations in the Administrative Code of Virginia list the fifteen components.[100] These include:

- certification from all relevant local governing bodies that the project "complies with all applicable land use ordinances;"[101]
- analyses and, if required, a mitigation plan related to the project's possible adverse impacts on air quality, wildlife, and natural and historic resources;[102]
- a detailed site plan pursuant to regulation;[103]
- certification that the project "has applied for or obtained all necessary environmental permits;"[104]
- a report detailing public comments and issues, and the applicant's response(s), from the required thirty-day review and comment period as well as the required public meeting as detailed in regulations;[105] and
- other certifications and notices related to the design, operation, and regulation of the project.[106]

Once DEQ receives an applicant's materials, the agency has ninety days to determine, "after consultation with other agencies in the Secretariat of Natural Resources," whether the application is complete and meets all requirements; if so, the project is approved.[107] DEQ must authorize the project if the application meets all requirements—the PBR process removes agency discretion and requires approval if all conditions are met.[108]

Projects sited in state waters—within three nautical miles from shore—have an additional regulatory hurdle. These projects must go through the same SCC and DEQ processes, as well as a Joint Permit Application (JPA) with the Army Corps of Engineers and the Virginia Marine Resources Commission (VRMC).[109] While VMRC is a part of the process and is responsible for issuing permits for "all reasonable uses" of state-owned waters and submerged lands, which would

[96] VA. CODE § 10.1-1197.8 (2017).
[97] *Id.*
[98] 9 VA. ADMIN. CODE § 15-40-20 (2017).
[99] *Id.* § 15-40-30(B).
[100] *Id.* § 15-40-10 to -140.
[101] *Id.* § 15-40-30(A)(2).
[102] *Id.* §§ 15-40-30(A)(2), (6)-(8), (10).
[103] *Id.* § 15-40-30(A)(11).
[104] *Id.* § 15-40-30(A)(12).
[105] *Id.* § 15-40-30(A)(14).
[106] *See id.* § 15-40-30(A).
[107] *Id.* § 15-40-30(B).
[108] *Id.* § 15-40-30(B)(1).
[109] *Habitat Management Division Permitting*, VA. MARINE RES. COMM'N, https://mrc.virginia.gov/regulations/hm-permits.shtm (last visited Mar. 7, 2021); VA. CODE § 28.2-1203(A) (2020).

include offshore wind installations within state boundaries,[110] the JPA is ultimately an Army Corps of Engineers tool that brings relevant agencies together to make a determination on a permit application.[111] At the state level, this is the only instance when a DoD contact is required to be involved in the application process in any manner.

The final piece of the puzzle for offshore wind projects is Virginia's Coastal Zone Management (CZM) Program. Again, the state's regulatory authority is cut off at the 3 nm mark.[112] The Coastal Zone Management Act of 1972 (CZMA) gives the states the ability to weigh in when federal action affects their coastal zones.[113] Under the CZMA, a state establishes a compliant CZM program that sets management goals for its coastal zone.[114] Once the CZM program is approved, a federal agency's permitting of an activity that affects the state's coastal zone or an OCS lease sale is subject to review by the state.[115] The agency must ensure that the activity "shall be carried out in a manner which is consistent to the maximum extent practicable with the enforceable polices of approved [CZMs]."[116] If the state objects to the agency action due to inconsistency with the CZM Program's enforceable policies, the state will offer reasonable alternatives to make the project consistent.[117] If an agreement cannot be reached, the agency shall not issue the permit or execute the lease.[118] The agency may appeal to the Secretary of Commerce.[119] If the Secretary finds that the permit is "consistent with the objectives of the [CZMA],"[120] the agency may issue the permit despite the state's protest.[121] While this procedure may open the door to Virginia objecting to a wind project, it is limited to environmental concerns, not DoD's concerns.[122]

B. Local Approval Processes

By contrast, one of the first hurdles an onshore wind energy project in Virginia must overcome is compliance with any and all local ordinances that apply to the proposed site. As described above, both SCC's and DEQ's approval processes require proof of compliance with

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[110] *See* Va. Att'y. Gen. Op. No. 10-191 at 3 (Dec. 30, 2010) (citing VA. CODE § 28.2-1203(A) (2007)).
[111] *See Regulatory Branch – Joint Permit Application*, ARMY CORPS OF ENG'RS, https://www.nao.usace.army.mil/Missions/Regulatory/JPA.aspx (last visited Mar. 7, 2021).
[112] *Supra* Part I.B.
[113] *See Federal Consistency*, NAT'L OCEANIC AND ATMOSPHERIC ADMIN., https://coast.noaa.gov/czm/consistency/ (last visited Apr. 25, 2021).
[114] 16 U.S.C. § 1455(d) (1992).
[115] *Id.* § 1456(c).
[116] *Id.*
[117] 15 C.F.R. §§ 930.63, 930.78 (2006).
[118] *Id.* § 930.64.
[119] *Id.* § 930.120.
[120] "[C]onsistent with the objectives of the [CZMA]" has three requirements:
   a. "The activity furthers the interest as articulated in [16 U.S.C. §§1451–52] in a significant or substantial manner,
   b. The national interest furthered by the activity outweighs the activity's adverse coastal effects, when those effects are considered separately or cumulatively.
   c. There is no reasonable alternative available which would permit the activity to be conducted in a manner consistent with the enforceable policies of the management program."

15 C.F.R. § 930.121 (2006).
[121] *Id.* §§ 930.120–21.
[122] 16 U.S.C. § 1455(d) (1992).

local requirements and approvals from all relevant localities.[123] These local-level requirements vary. The majority of Virginia's ninety-five counties do not have any specific wind energy ordinances.[124] These counties approach utility-scale wind energy proposals in a variety of ways. Some simply group such projects under the same umbrella as other public utilities or generating facilities, while others consider them to be a "use not provided for," in which case the ordinance often dictates a particular process to follow for approval.[125] In many counties, "use not provided for" requires that the ordinance be amended in order for the county to give its approval.[126] Other counties only permit systems that do not reach utility size or prohibit turbines as "tall structures" that rise above a specified height limit.

A few counties have ordinances explicitly addressing utility-scale wind farms.[127] Botetourt County requires notice to state and federal agencies that manage land within five miles of the site,[128] while Roanoke County mandates that the applicant work with FAA to ensure no hazards to air navigation,[129] and many counties require an environmental impact study, likely due to the National Environmental Policy Act.[130] Only Northampton County specifically requires contact with DoD, mandating that the county notify the DoD Clearinghouse once the county receives a special use permit application for a wind energy facility.[131] As in the federal approval process, DoD is not involved until the application stage, after siting is completed.[132]

Furthermore, Virginia is a Dillon Rule state. Under the Dillon Rule, localities only have powers: (1) that the state explicitly gives to them; (2) "those necessarily or fairly implied in or incident to the powers expressly granted;" and (3) any that are essential or indispensable "to the declared objects and purposes of the [locality]."[133] If there is reasonable doubt regarding the grant

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[123] Localities in Virginia do not have authority to regulate uses of state-owned bottomland, other than concurrent authority with the VMRC over construction of wharves, piers, docks and other structures along their waterfront. *See* Va. Att'y. Gen. Op., *supra* note 110, at 4–5; *see also* Jennings v. Board of Supervisors of Northumberland Co., 281 Va. 511 (2011).

[124] In 2016, a detailed survey found that 59 of Virginia's 95 counties "lack[ed] comprehensive zoning or ha[d] a zoning ordinance that should be considered silent with respect to the siting of wind generally. Of the remaining 36 counties . . . 21 ha[d] ordinances that specifically allow and regulate certain 'small' wind energy facilities, while remaining silent as to utility-scale systems; two . . . ban or severely restrict the erection of 'tall structures'; and 13 have ordinances that contemplate utility-scale wind energy development with some kind of additional permitting." Mark L. Belleville, *The Wind Blows in Virginia Too - Deconstructing Legal and Regulatory Barriers to the Development of Onshore, Utility-Scale Wind Energy in Virginia*, 41 WM. & MARY ENVTL. L. & POL'Y REV. 151, 167 (2016). A search of Virginia county codes for this paper, included as Appendix A, found that 55 counties currently do not specifically regulate wind energy. City and town ordinances were not surveyed for this paper based on an assumption that generally, cities and towns are less likely to have enough free space to accommodate wind energy projects.

[125] *Id.* at 173–74.

[126] *Id.* at 173.

[127] Belleville, *supra* note 124, at 180; *see also infra* Appendix A.

[128] BOTETOURT CNTY. CODE § 25-446(o)(8).

[129] ROANOKE CNTY. CODE § 30-87-7(B).

[130] *See* 42 U.S.C. § 4321-4347 (1969); Belleville, *supra* note 124, at 180–204 (examining the requirements of each of these counties, as well as Highland County, which has actually issued such a permit, and the City of Suffolk, which specifically regulates utility-size wind farms).

[131] NORTHAMPTON CNTY. CODE § 154.2.115(E)(2) (2016).

[132] *See supra* Part I.A.

[133] Clay L. Writ, Dillon's *Rule*, 24 VA. TOWN & CITY, Aug. 1989, http://578125292684560794.weebly.com/uploads/3/7/7/1/37714259/dillon_rule_article.pdf.

of a particular power to a local government, then the locality's authority to exercise that power will not be upheld.[134] Virginia's Dillon Rule makes it unclear how stringent a locality can be when it regulates wind farm siting.[135]

Virginia Code Section 67-103, enacted in 2011, amended the Virginia Energy Plan to require that a locality adopting a renewable energy siting ordinance must ensure that such an ordinance is consistent with the Commonwealth's Energy Policy and goals of promoting renewable energy.[136] Such ordinances must also include reasonable criteria as well as reasonable requirements related to siting.[137] After the enactment of Virginia Code Section 67-103, localities will find it difficult to amend ordinances to "completely prohibit" or "place unreasonable restrictions" on utility-scale wind projects.[138] Whether a locality can enact a total ban on wind energy development projects is something of an open question in Virginia. The Virginia Attorney General has twice considered whether a locality can ban an energy development activity endorsed in the Commonwealth Energy Policy, once in 2013 and again in 2015.[139] Both opinions consider the legal issue in the context of oil and gas exploration, but come to contradictory conclusions regarding local authority.[140] If this issue were to arise in a court of law, given the precedential value of Attorney General opinions in Virginia, a court would give both opinions due consideration but would not regard either as binding on the issue, and so how a court might rule on this issue is unclear.[141]

III. OVERVIEW OF MILITARY CONCERNS ASSOCIATED WITH WIND SITING

As discussed in Part II, if a proposed wind farm will have turbines over 200 feet high, FAA has the authority to halt the project if it determines that the turbines will interfere with air navigation.[142] In addition to obvious concerns about turbines intersecting with either commercial or military flight paths, one of the most significant ways a wind farm can impact military operations is by interfering with radar technology.[143] Turbines interfere with radar in multiple ways, and the risk they may pose to military operations often depends on the placement, size, and number of turbines, among other factors.[144] Research in this area demonstrates that turbines can affect radar in multiple ways. "Shadowing," when an object in the path of a radar system's electromagnetic wave interferes with that wave, can make it difficult or impossible for radar to detect anything if the shadowing actually blocks the electromagnetic waves;, while "clutter" occurs when an object appears as an unwanted signal in a radar receiver, making it difficult to find an

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[134] *Id.*
[135] Daniel J. Wisniewski, *The Battle for Wind Farm Siting in Virginia*, 63 VA. LAW. 12, 14 (2014).
[136] VA. CODE ANN. § 67-103 (2011).
[137] *Id.*
[138] Belleville, *supra* note 124, at 176.
[139] 2013 Op. Va. Att'y. Gen. 12-102; 2015 Op. Va. Att'y. Gen 14-084.
[140] *Id.*
[141] Commonwealth v. Williams, 809 S.E.2d 672, 676 (Va. 2018); Beck v. Shelton, 593 S.E.2d 195, 200 (Va. 2004).
[142] *Supra* Part II.
[143] *See, e.g.*, Cassuto, *supra* note 21.
[144] Michael Brenner et al., *Wind Farms and Radar*, 3-4 (2008), *available at* https://irp.fas.org/agency/dod/jason/wind.pdf.

object of interest via radar.[145] Interference with radar in turn can affect aircraft, air traffic control, air defense, missile warning systems, and weather forecasting.[146] Because of the complex systems at play, predicting which wind farms may interfere with military radar requires an individual analysis of every proposal.[147]

Proposals for both onshore and offshore projects will have to consider radar as a possible issue. Offshore projects will potentially cause not only impacts to marine navigation, but also possible interference with sonar, which gives rise to concerns related to navigation and security.[148] In addition, DoD expects radar to function with at least eighty percent efficiency, and while DoD knows that turbines can and do interfere with radar, neither it nor other agencies have yet "quantif[ied] when another turbine will push the amount of interference over the twenty percent allowable amount and cause the system to run at less than eighty percent efficiency."[149] Essentially, DoD knows that turbines do interfere with radar—but it does not yet know how much turbines interfere with radar.

The physical space required by wind farms may also have an impact on military operations. The military regularly conducts physical training exercises both on land and at sea and will likely continue to do so even as simulation technology improves.[150] This training is important enough that the United States Army negotiated conservation easements on private land near some of its facilities so that it could continue training operations.[151] Likewise, the United States Supreme Court has recognized the need for the military to conduct realistic training in a case between environmentalists and the United States Navy over the Navy's use of sonar in its training exercises.[152] Such training exercises may be constrained by the presence of large wind farms offshore.

Other possible military concerns associated with wind farms near military sites include the security risks inherent in any construction project undertaken near such sites, impacts of particular electromagnetic signatures emitted by turbines on assorted DoD systems, and interference with

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[145] OFF. OF THE DIR. OF DEF. RSCH. & ENG'G, U.S. DEP'T OF DEF., THE EFFECT OF WINDMILL FARMS ON MILITARY READINESS (2006) (Report to the Congressional Defense Committees), http://users.ece.utexas.edu/~ling/US1%20dod_windfarms.pdf; Dillon Hollingsworth, *Tilting at Windmills: Reconciling Military Needs and Wind Energy Initiatives in the 21st Century*, 4 ONE J. 7, 13–14 (2018).

[146] *See* Cassuto, *supra* note 21, at 10, 19; *see* Hollingsworth, *supra* note 145, at 12–13, 17.

[147] *Id.*

[148] *See* HAO LING ET AL., FINAL REPORT DE-EE0005380, ASSESSMENT OF OFFSHORE WIND FARM EFFECTS ON SEA SURFACE, SUBSURFACE AND AIRBORNE ELECTRONIC SYSTEMS 15 (2013), https://users.ece.utexas.edu/~ling/Final_Report_DE-EE0005380_2013_09_30.pdf.

[149] Cassuto, *supra* note 21, at 597.

[150] Graci Bozarth, *Winning on All Fronts: A Case Study of the Army's Compatible Use Buffer Program at Fort Riley, Kansas*, 48 URB. LAW. 143, 144, 147–48 (2016) (discussing the military's emphasis on and need for physical training).

[151] *Id.* at 145.

[152] Michael Burger, *Consistency Conflicts and Federalism Choice: Marine Spatial Planning Beyond the States' Territorial Seas*, 41 ENVTL. L. REP. NEWS & ANALYSIS 10602, 10610 (2011); Winter v. Nat. Res. Def. Council, 555 U.S. 7, 33 (2008) (holding that the interests in protecting the whales were "plainly outweighed by the Navy's need to conduct realistic training exercises to ensure that it is able to neutralize the threat posed by enemy submarines").

efforts to "relieve encroachment and increase conservations" near various military installations.[153] Furthermore, military branches may not want to discuss conflicts with their operations as part of the federally mandated public comment periods for wind energy projects.[154] Certain operations could either be confidential or the military would simply rather the public not be privy to them, such as nuclear submarine routes.[155] In this type of situation, it would be best for the parties to discuss the military's concerns and needs informally.[156]

IV. MILITARY PRESENCE AND RENEWABLE ENERGY IN VIRGINIA

It is important to confer with the military about wind energy siting because conflicts could hinder military operations that strengthen national security and employ many Virginia residents.[157] There are twenty-seven military bases in Virginia, at least one from each branch, and they are primarily concentrated in coastal areas.[158] Between active duty servicemembers, civilian employees, and reserve members, 253,125 Virginians are employed by the military, the second highest amount of all fifty states.[159]

The Virginia Offshore Wind Development Authority was created in 2010 to bring stakeholders together and encourage offshore wind development in the state.[160] Their approach involves

> [c]ollecting metocean and environmental data; [i]dentifying regulatory and administrative barriers; [w]orking with local, state, and federal government agencies to upgrade port and logistic facilities and sites; [e]nsuring development is compatible with other ocean uses and avian/marine wildlife; and [r]ecommending ways to encourage and expedite offshore wind industry development.[161]

The Commonwealth has a vested interest in promoting this industry, akin to its interest in supporting the military operations that are based here. Under Governor Northam, Virginia has established a goal of generating thirty percent of the state's energy from renewable sources by 2030 and one hundred percent by 2050.[162] Northam has been active on this front, first promulgating

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[153] Hollingsworth, *supra* note 145, at 19–20. A report from DoD to the Congressional Defense Committees in 2006 discusses various military concerns associated with wind farms in greater detail. THE EFFECT OF WINDMILL FARMS ON MILITARY READINESS, *supra* note 145.

[154] Videoconference Interview with Jennifer McCann, Director, U.S. Coastal Programs, Univ. of R.I. (Oct. 27, 2020).

[155] *Id.*

[156] *Id.*

[157] *See* DMDC, NUMBER OF MILITARY & DOD APPROPRIATED FUND (APF) CIVILIAN PERSONNEL PERMANENTLY ASSIGNED (June 30, 2020), https://www.dmdc.osd.mil/appj/dwp/dwp_reports.jsp.

[158] *See* MILITARY BASES, *Virginia Military Bases*, https://militarybases.com/virginia/ (last visited Apr. 2, 2021).

[159] DMDC, *supra* note 157.

[160] *See Virginia Offshore Wind Development Authority*, VIRGINIA OFFSHORE WIND ADVANTAGE, https://www.dmme.virginia.gov/de/VOWDA2.shtml (last visited May 12, 2021).

[161] *See id.*

[162] Va. Exec. Order No. 43 (Sept. 16, 2019), *available at* https://www.governor.virginia.gov/media/governorvirginiagov/executive-actions/EO-43-Expanding-Access-to-Clean-Energy-and-Growing-the-Clean-Energy-Jobs-of-the-Future.pdf.

the goals by Executive Order and then establishing a Mid-Atlantic Wind Training Alliance, partnering with universities and wind energy organizations to train workers for jobs in the growing wind energy industry.[163]

Virginia has also made progress on marine spatial planning—the process of mapping out areas of the ocean to accommodate environmental, tribal, commercial, and military interests and uses—via the collaborative Mid-Atlantic Regional Ocean Action Plan, a voluntary guidance document adopted in 2016.[164] Additionally, the Virginia CZM Program is launching a multi-year ocean planning effort in fall 2021. While expensive and time-consuming, developing a robust marine spatial plan that is binding instead of voluntary could alleviate the uncertainty of different stakeholders raising objections to project siting decisions.[165] Stakeholders, including the military, would have already been involved in discussions about designating certain spaces for certain activities, instead of objecting to a project that is already in development.

A. Onshore Wind Projects

Virginia's Rocky Forge Wind project in Botetourt County will generate 75-80 MW and power 20,000 homes.[166] The area was chosen because of its existing electricity infrastructure and extensive privately owned land.[167] Between construction and operations, the undertaking is projected to create 257 full-time equivalent jobs and $20-25 million in state and county tax revenue.[168] The developers have secured all the necessary local permits and DEQ approved Rocky Forge Wind's permit by rule application in March 2017, after a two-year negotiation and modification process.[169] The developers negotiated with DoD to increase the height and decrease the number of planned turbines, a change made possible through new technology, so that the project does not interfere with a nearby training route for low-flying military jets.[170] In December 2019, Governor Northam entered a purchase agreement with Rocky Forge so that the project will supply energy to the Commonwealth's energy grid.[171] While local conflicts regarding the

[163] *Governor Northam Announces Mid-Atlantic Wind Training Alliance to Build Wind Energy Workforce in Virginia*, VA. GOVERNOR RALPH S. NORTHAM (Oct. 14, 2020), https://www.governor.virginia.gov/newsroom/all-releases/2020/october/headline-860851-en.html.
[164] *See* MID-ATLANTIC REGIONAL PLANNING BODY, MID-ATLANTIC REGIONAL OCEAN ACTION PLAN 14 (Nov. 2016) (https://www.boem.gov/sites/default/files/environmental-stewardship/Mid-Atlantic-Regional-Planning-Body/Mid-Atlantic-Regional-Ocean-Action-Plan.pdf).
[165] *See infra* Part VI.
[166] Schrichfield, *supra* note 14.
[167] *Id*.
[168] *Id*.
[169] APEX CLEAN ENERGY, *Virginia's Rocky Forge Wind Farm Approved* (Mar. 2, 2017), https://www.apexcleanenergy.com/news/virginias-rocky-forge-wind-farm-approved/#:~:text=Charlottesville%2C%20VA%20%E2%80%93%20March%202%2C,milestone%20for%20Virginia's%20clean%20energy; Schrichfield, *supra* note 14.
[170] Laurence Hammack, *FAA Reopens its Analysis of Planned Wind Farm in Botetourt County*, ROANOKE TIMES (Nov. 20, 2020), https://roanoke.com/business/local/faa-reopens-its-analysis-of-planned-wind-farm-in-botetourt-county/article_2002bb5a-2b50-11eb-888d-dfa32230d1e4.html.
[171] Schrichfield, *supra* note 14.

environmental and aesthetic impacts of the wind farm have not been completely resolved, as of 2021 the Rocky Forge project is proceeding as planned.[172]

Other examples of existing onshore wind projects in Virginia are several small turbine projects in Virginia built as a result of the Wind for Schools program, in which students learn about wind energy by developing a small-scale project—usually a single turbine—in their community.[173] There are over 145 programs in schools nationwide, and 24 across the Commonwealth.[174] Most Wind for Schools projects are around 1.8kW in size, far below the 5MW threshold for review at the state level.[175] The goal of these programs is not so much to generate energy as it is to educate students and teachers about the "benefits and challenges of wind energy."[176]

B. Offshore Wind Projects

Virginia's first foray into offshore wind, the Coastal Virginia Offshore Wind project (CVOW), began generating power in late 2020. The project began with a pilot program, during which two offshore wind turbines were constructed in federal waters off the coast of Virginia Beach in summer 2020.[177] CVOW is the first wind project built in federal waters.[178] Accordingly, BOEM issued the lease for the submerged land.[179] Interestingly the Department of Mines, Minerals, and Energy,[180] not Dominion, applied for the lease in 2013.[181] BOEM issued a Finding of No Significant Impact in 2015 and issued the lease.[182] At that point, DMME designated Dominion as the lease operator.[183] SCC approved the pilot project reluctantly, criticizing the project's $300 million cost and low generating potential of only 12 MW.[184] However, SCC ultimately found that its hands were essentially tied because "[r]ecent amendments to Virginia laws that mandate that such a project be found to be 'in the public interest' make it clear that certain

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[172] Laurence Hammack, *Lawsuit seeks to stop proposed wind farm in Botetourt County*, ROANOKE TIMES (Feb. 3, 2021), https://roanoke.com/news/local/lawsuit-seeks-to-stop-proposed-wind-farm-in-botetourt-county/article_72a31faa-666d-11eb-8bf9-5f8616ce5485.html.

[173] *See* U.S. Dept. of Energy, *Wind for Schools Project*, WINDEXCHANGE, https://windexchange.energy.gov/windforschools (last visited May 11, 2021).

[174] *See* U.S. Dept. of Energy, *School Wind Project Locations*, WINDEXCHANGE, https://windexchange.energy.gov/windforschools/projects (last visited May 11, 2021).

[175] *Id.*

[176] *Id.*

[177] DOMINION ENERGY, COASTAL VIRGINIA OFFSHORE WIND (CVOW) PILOT PROJECT UPDATE — JULY/AUGUST 2020 1 (last revised July 9, 2020), https://cdn-dominionenergy-prd-001.azureedge.net/-/media/pdfs/global/wind/071620-cvow-pilot-july-construciton-update.pdf?la=en&rev=74b184b3a5c74a579eebff823def0990&hash=5DA8557776558256CD4E0E8E1CB18D17.

[178] Coastal Virginia Offshore Wind Project (CVOW), BOEM, https://www.boem.gov/renewable-energy/state-activities/coastal-virginia-offshore-wind-project-cvow (last visited Apr. 2, 2021).

[179] *Id.*

[180] Following the 2021 legislative session, the Department of Mines, Minerals, and Energy's name as of Oct. 1, 2021 is simply the "Department of Energy." Act of Apr. 7, 2021, ch. 532, 2021 Va. Act of Assembly, http://leg1.state.va.us/cgi-bin/legp504.exe?212+ful+CHAP0532.

[181] BOEM, *supra* note 178.

[182] *Id.*

[183] *Id.*

[184] Ivy Main, *Offshore Wind: If It's Dominion's Way or the Highway, We Have to Do It Dominion's Way*, VIRGINIA MERCURY (Nov. 5, 2018), https://www.virginiamercury.com/2018/11/05/offshore-wind-if-its-dominions-way-or-the-highway-we-have-to-do-it-dominions-way/.

factual findings must be subordinated to the clear legislative intent" to support renewable energy development.[185]

These two test turbines will set the stage for a larger commercial project, which would consist of 220 turbines and generate 2.6 gigawatts (GW) of electricity, powering 660,000 homes.[186] During the construction phase, the commercial project will bring 900 jobs and $143 million in economic output to Virginia annually, and the operations and management phase will generate 1,100 jobs and $210 million in economic output.[187] These figures include the indirect economic effects of workers moving to Virginia for turbine-related employment, who will stimulate local retail and housing markets.[188]

CVOW encountered a minor setback in 2018, when the Navy raised concerns that the planned onshore connection cable was slated to be located on their property at the Camp Pendleton base, interfering with naval activities and plans to construct a new hygiene facility.[189] These were "new, previously unknown conflicts" requiring rerouting of the onshore cable connection route.[190] Fortunately, there were two other possible routes for the cable, and CVOW and Camp Pendleton were able to negotiate an easement through the Navy's property.[191] Currently, the developers are working on site assessment and surveys to create their Construction Operations Plan, the last part of the BOEM approval process.[192] This situation demonstrates that it is not just the turbines themselves that can conflict with military facilities or operations; the impacts of supporting infrastructure need to be considered when siting wind facilities, as well.

V. CASE STUDIES

A. Block Island Wind Farm, Rhode Island

Operating since 2016 and located in Rhode Island state waters, the Block Island Wind Farm is the nation's first commercial offshore wind farm and is widely cited for its smooth and successful planning and development process.[193] Because this was the first offshore wind farm

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[185] *See id.*; S.B. 966, 2018 Gen. Assembly, Reg. Sess. (Va. 2018) (amending VA. CODE ANN. § 56-585.1(A)(6)). *See also supra* Part II.A.

[186] MAGNUM ECONOMICS, POTENTIAL IMPACT OF THE DEVELOPMENT OF THE OFFSHORE WIND ENERGY INDUSTRY ON HAMPTON ROADS AND VIRGINIA 2 (Sept. 28, 2020), https://hamptonroadsalliance.com/wp-content/uploads/2020/09/Offshore-Wind-Economic-Impact-Report-092820.pdf.

[187] *Id.* at 1.

[188] *Id.* at 1, 8.

[189] MARK MITCHELL, AMENDMENT TO THE COASTAL VIRGINIA OFFSHORE WIND PROJECT (CVOW, FORMERLY THE VIRGINIA OFFSHORE WIND TECHNOLOGY ADVANCEMENT PROJECT OR VOWTAP) RESEARCH ACTIVITIES PLAN (RAP) AND RESPONSE TO COMMENTS 12-13 (May 21, 2018), https://www.boem.gov/sites/default/files/renewable-energy-program/State-Activities/VA/CVOW_RAP_Amendment_Memo.pdf.

[190] *Id.* at 12.

[191] *Id.* at 13.

[192] DOMINION ENERGY, *supra* note 15, at 10.

[193] *Deepwater Wind Block Island*, R.I. COASTAL RES. MGMT. COUNCIL, http://www.crmc.ri.gov/windenergy/dwblockisland.html (last visited Apr. 2, 2021); Mitchell Hokanson, Note, *Avoiding the Doldrums: Evaluating the Need for Change in the Offshore Wind Permitting Process*, 44 COLUM. J. ENVTL. L. 181, 208 (2019); Lauren Perkins, *Hope on the Horizon for Offshore Wind Development: An Examination of the Regulatory Framework Rhode Island Navigated to Make the Nation's First Offshore Wind Farm a Reality,*

developed in the United States, managing the siting and planning process to take account of all stakeholder concerns was of paramount importance.[194] The initial siting decision was managed by the Rhode Island Energy Office in partnership with the Rhode Island Coastal Resources Management Council (CRMC) a state agency responsible for developing a comprehensive management policy for Rhode Island's coast.[195]

The agencies knew that concerns from other stakeholders, including the Department of Defense, would likely be significant when selecting the location, given the uncertainty involved.[196] Therefore, the state decided to adopt a special planning framework that would provide more extensive opportunities to consult with stakeholders and the public during the siting and planning process.[197] CRMC worked with the University of Rhode Island (URI) and others to create a marine spatial plan, which later became the Ocean Special Area Management Plan (SAMP).[198] The creation of the SAMP involved both an analysis of favorable locations for wind energy development in coastal waters and an ecosystem-focused review of current marine uses.[199] Combining the wind siting decision with an analysis of all uses of the marine space provided a clear avenue for the necessary stakeholders to provide input on the optimal location of the project.[200] "[S]trong support at the highest levels of state government combined with URI leadership" are credited for making the SAMP a reality.[201]

The creation of the SAMP involved public notice and hearings, as well as early and intensive involvement of various stakeholders including government agencies, local tribes, fisheries representatives, DoD, and others.[202] The SAMP team carefully designed the stakeholder process, referred to as a "central feature" of the SAMP, "to emphasize consistency of message . . . transparency . . . and responsiveness of the process to stakeholder demands."[203] Trust between stakeholders and the SAMP team is consistently emphasized as critical to the success of the

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and the Implication for California's Ability to Adopt a Similar Approach under the Coastal Zone Management Act, 9 SAN DIEGO J. CLIMATE & ENERGY L. 265, 270 (2017-18); John M. Boehnert, *A New Blueprint for Coastal Zone Management*, 30 NAT. RES. & ENV'T 52, 52–53 (2016); Lawrence Susskind & Ryan Cook, *The Cost of Contentiousness: A Status Report on Offshore Wind in the Eastern United States*, 33 VA. ENVTL. L.J. 204, 229–30 (2015).

[194] Grover Fugate, *Rhode Island's Ocean Special Area Management Plan: Leading the Way for the Nation*, 17 ROGER WILLIAMS U. L. REV. 295, 296 (2012).

[195] *Id.*

[196] *Id.* ("It was indicated to the [Rhode Island] Energy Office that to select the site and immediately do an environmental impact statement (EIS) for the location, was going to be very problematic. Given what we knew about that location, which was very little, we knew there were going to be severe constraints . . . . We convinced the Energy Office that a planning framework was the best alternative.").

[197] TIFFANY SMYTHE ET AL., THE RHODE ISLAND OCEAN SPECIAL AREA MANAGEMENT PLAN, 2008 – 2015: FROM INCEPTION THROUGH IMPLEMENTATION, 3–8 (Jennifer McCann ed., Case Stud. of Marine Spatial Plan. Rep. Series, 2016); *see also* JENNIFER MCCANN ET AL., THE RHODE ISLAND OCEAN SPECIAL AREA MANAGEMENT PLAN: MANAGING OCEAN RESOURCES THROUGH COASTAL AND MARINE SPATIAL PLANNING, A PRACTITIONER'S GUIDE, (2013), https://seagrant.gso.uri.edu/oceansamp/pdf/Practitioner_Guide.pdf (guide developed by leaders of the Rhode Island Ocean SAMP process); Fugate, *supra* note 194.

[198] *Id.*

[199] Fugate, *supra* note 194, at 298.

[200] *Id* at 305.

[201] SMYTHE ET AL., *supra* note 197, at 12.

[202] *Id.* at 3–6.

[203] *Id.* at 14.

project.[204] Crucially, stakeholders—including the military—were genuinely invested in the project.[205] A representative from the Naval Undersea Warfare Center stated that the Navy "ha[s] testing ranges within the area so we have a vested interest in participating in the planning process," and U.S. Coast Guard Waterways Management Chief Edward G. LeBlanc explained that he "was eager to find a solution to these issues surrounding competition over use of the waterways."[206]

Jennifer McCann, Director of U.S. Coastal Programs at URI and a manager of the SAMP project, identified several unique aspects of working with the military. Because of the nature of military activities, military leaders may be unwilling or unable to share certain information either with larger groups or at all.[207] She emphasized that building trusting relationships with military representatives—and speaking with them informally, in one-on-one conversations—is critical, and in some cases the project was able to make use of pre-existing relationships with the military from previous projects.[208] In addition, different branches or units of the military will have different priorities—in Rhode Island, the Navy raised concerns related to a test facility, its underwater research, and an unexploded ordnance site, while the Coast Guard was generally focused on navigation and safety.[209]

Taking the time to intensively study the area and work with stakeholders paid off—not only in terms of the final results, that is, the construction of the first offshore wind farm in the United States, but also during the implementation process. A representative from the developer, Deepwater Wind, observed that the state's creation of a Renewable Energy Zone "was a real positive for [Deepwater Wind] in terms of taking the issue of siting off the table . . . . The process found the site, and then we have to be within it, so it helped the permitting process go smoother."[210] The SAMP also helped to avoid "major objections during the public comment process" and "assured reviewers that it would not interfere with sea duck foraging habitat, shipping lanes, or Navy testing ranges."[211] Because of the extensive research and discussion that went into the SAMP, review and permitting processes went much more smoothly—reviewers not only had more confidence in the information they received, but were already familiar with it, and in some cases had been actively involved in the SAMP's creation.[212]

Block Island's success is notable in comparison to other projects such as Cape Wind, a Massachusetts project that struggled through permitting fights and litigation for almost sixteen years before the developer relinquished its lease in 2018.[213] According to individuals who observed the processes of both Cape Wind and Block Island, "Block Island Wind Farm's comparative success in obtaining necessary permits with minimal public opposition can be traced to the Ocean

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[204] *Id.* at 11, 58; Fugate, *supra* note 194, at 299; Videoconference Interview with Jennifer McCann, *supra* note 154.
[205] SMYTHE ET AL., *supra* note 197, at 15.
[206] *Id.*
[207] Videoconference Interview with Jennifer McCann, *supra* note 154.
[208] *Id.*
[209] *Id.*
[210] SMYTHE ET AL., *supra* note 197, at 20.
[211] *Id.* at 23.
[212] *Id.* at 23–24, 29.
[213] *Cape Wind*, BUREAU OF OCEAN ENERGY MGMT., https://www.boem.gov/renewable-energy/studies/cape-wind (last visited Apr. 2, 2021); SMYTHE ET AL., *supra* note 197, at 26.

SAMP's broad and proactive public planning process."[214] Ultimately, the siting of the Block Island Wind Farm "through a broad, state-led, comprehensive planning process" proved to be much more successful[215] than Cape Wind, which "was sited through a narrowly-focused, developer driven permitting process."[216]

B. North Carolina

Like Virginia, North Carolina has a large military presence.[217] Unlike Virginia, North Carolina law requires wind energy developers to consult with DoD early and frequently "as a prerequisite to applying for or issuing permits to construct wind farms."[218] The law encourages developers to investigate a proposed site's potential military conflicts before the pre-application meeting with the state DEQ, and requires developers to notify commanding officers from potentially affected major military installations of their plans after the DEQ meeting.[219] Before issuing a permit, North Carolina's DEQ must determine, based on these meetings and the developer's investigation, that a proposed wind energy project does not interfere with military operations and interests.[220] The North Carolina DEQ must consult with representatives of major military installations in the state about their operations at least once per year, so the Department can convey that information to permit applicants.[221] This set of laws goes further than interagency agreements or best practices that encourage military collaboration, because it essentially gives the federal government a veto power over permit issuance.[222]

North Carolina's law can have potentially problematic implications for the independent authority of a state or federal regulatory agency, but it can also promote early dispute resolution.[223] For example, the military and the developers for the Pantego Wind Energy Facility were able to coexist.[224] The onshore project to build twenty-nine turbines in eastern North Carolina had been abandoned due to frequent conflicts with a military training installation near the proposed site.[225] After the law requiring consultation with military entities was enacted, DoD and the wind facility developer revisited the project area boundaries and reached an agreement to reposition the planned project site outside a four-nautical-mile buffer area, protecting the military grounds.[226] This

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[214] SMYTHE ET AL., *supra* note 197, at 26.
[215] Some in the fishing industry have raised issues post-construction. *See* Todd McLeish, *Recreation and Commercial Fishermen View the Block Island Wind Farm Through a Different Lens*, SEA GRANT R.I. (Jan. 10, 2019), https://seagrant.gso.uri.edu/recreational-and-commercial-fishermen-view-the-block-island-wind-farm-through-a-different-lens/. Complaints are largely anecdotal and it is unclear if these issues were foreseeable at the planning stage. *Id.* Scientific lessons learned after construction of the Block Island project should be applied in future projects to facilitate better outreach with fishing communities.
[216] SMYTHE ET AL., *supra* note 197, at 26.
[217] *See* DMDC, *supra* note 157.
[218] Brendan Burke, *Dynamic Federalism and Wind Farm Siting*, 16 N.C. J.L. & TECH. 1, 7 (Oct. 2014).
[219] N.C. GEN. STAT § 143-215.117 (2013).
[220] *Id.* § 143-215.120.
[221] *Id.* § 143-215.123.
[222] *See* Burke, *supra* note 218, at 7.
[223] *See id.* at 50, 57–58.
[224] *See id.* at 57–58.
[225] *Id.*
[226] PANTEGO WIND ENERGY PROJECT AGREEMENT 1 (Sept. 30, 2013), https://www.acq.osd.mil/DoDsc/library/Final%20Pantego%20agreement_6JAN2014%20As%20Amended%20for%20Public%20View.pdf.

positive result might have occurred without the state law, but the mandatory consultation requirement ensures that developers can incorporate military concerns into their project plans before spending the time and money seeking approval from state permitting authorities.[227]

The 2013 North Carolina law prohibiting wind energy development without military approval applies to each stage of a wind project, including multiple rounds of construction. In a rural part of North Carolina, Amazon Web Services constructed an onshore wind farm in 2016 with 104 turbines.[228] However, the project cannot expand as originally planned, because a study conducted by the Massachusetts Institute of Technology after the first round of construction shows that while the project currently coexists with military activities, any additional turbines would conflict with a radar system twelve miles away.[229] Fortunately, the project has been successful in its current form, employing thirty North Carolina-based companies and injecting $1.1 million annually into the local economy.[230]

VI. RECOMMENDATIONS

The successes in Rhode Island clearly demonstrate the power of a well-researched, efficiently managed, and thoughtfully planned process.[231] Those involved in the SAMP planning process attribute their success to the decision to nest the siting decision within a larger marine spatial planning exercise. Combining those planning processes improved the certainty of the outcome and shortened the regulatory permitting process. The SAMP process is also credited with reducing the potential for litigation, since all stakeholders were involved in the siting decision from the beginning.[232] Ideally, DoD should be included in the siting process, not just the approval process. Specifically, developers should work with DoD to find a location that can be made to work for both parties, rather than facing the possibility of doing years of work only to have it stalled or shut down by DoD concerns. Integrating DoD into the siting process can be done informally or formally, and there are advantages to each approach.

A. An Informal, Relationship-Based Approach

The successes of the Block Island Wind Farm—compared with the delays and challenges faced by projects such as Cape Wind—clearly demonstrate the importance of early, comprehensive, personalized planning supported by state and local governments, as well as stakeholders. Having informal meetings with DoD and other stakeholders can help stakeholders

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[227] *See* Burke, *supra* note 218, at 58.

[228] POWER GRID INTERNATIONAL, *Amazon Wind Farm U.S. East Completed in North Carolina* (Feb. 9, 2017), https://www.power-grid.com/2017/02/09/amazon-wind-farm-us-east-completed-in-north-carolina/#gref.

[229] Jeff Hampton, *Amazon Wind Farm in North Carolina Can't Expand at All to Protect Naval Radar Nearby, Study Shows*, VIRGINIAN PILOT (July 9, 2019), https://www.pilotonline.com/government/local/article_b1834a06-839e-11e8-b8ec-6f3107e1b518.html.

[230] POWER GRID INTERNATIONAL, *supra* note 228.

[231] *See supra* Part V.

[232] "The nesting of the site specific decisions within [a marine spatial planning] exercise is one of the greatly understated benefits of [marine spatial planning] and one reason why the development community should support [marine spatial planning]. Anything that improves certainty and shortens the regulatory decision-making process will lessen the chance of litigation, and turn projects around more quickly." Fugate, *supra* note 194, at 305.

get to know the people behind an industry or agency.[233] Adding one-on-one meetings would give DoD in particular a place to voice their needs and concerns without the procedure or audience of a formal public hearing. However, informal meetings do not completely alleviate confidentiality concerns, because records made during the proceedings could still be subject to disclosure in response to a Freedom of Information Act request, unless they could be exempted as matters of national security.[234] Still, a relationship-based approach lays the groundwork for future renewable energy development.[235] It is best to conduct these kinds of discussions before many final project decisions have been made.[236] That way, DoD and other stakeholders are meaningfully involved in creating a plan that lets all land or ocean users coexist, instead of having to argue against plans in which the developer has already invested.

Ideally, wind energy developers should collaborate with DoD before the leasing areas are even chosen, like they did for the Block Island Project.[237] Virginia could replicate this approach for projects in state waters, where there is still opportunity to work with DoD before choosing an area to open for leasing. However, BOEM has already designated the available offshore wind energy leasing areas in federal waters off of Virginia's coast.[238] Even so, informal discussions with the military could still be useful in the earliest stages of project planning, before the developer is invested in any particular site design, to reduce potential conflicts with military operations.

B. A Formal, Mandatory Approach

Although taking the opposite route and codifying military consultation during the wind energy siting and approval process loses the more personal, collaborative atmosphere that an informal approach provides, a formal approach has its own advantages. Mandating consultation with DoD early in the siting or approval process would decrease uncertainty regarding military conflicts that could grind the project to a halt later. It would alert any newcomers to the energy industry that the military is an important stakeholder who should be consulted as early as possible. This mandatory approach could be formalized via state code amendments, agency regulations, or even local ordinances.[239]

Even though the leasing areas in federal waters are already finalized by BOEM, a state statute, regulation, or ordinance could mandate consultation with DoD at the earliest stage possible, potentially before BOEM grants a developer's lease. Adding this redundancy would prevent any mismatch between a pre-established wind energy area and the type of project that the area can support without interfering with military operations. A state law may be even more effective for projects in state waters, where it could mandate DoD consultation or approval before a developer even selects a project area.

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[233] Videoconference Interview with Jennifer McCann, *supra* note 154.
[234] 5 U.S.C. § 552(a-b) (2016).
[235] *Id.*
[236] *Id.*
[237] *See supra* Part V.A.
[238] BOEM, VIRGINIA LEASE AREAS (Nov. 21, 2017), https://www.boem.gov/sites/default/files/uploadedImages/BOEM/Renewable_Energy_Program/State_Activities/VA_Project_Area_11_21_2017.jpg.
[239] *See supra* Part V.A; *supra* Part III. For example, the Botetourt County ordinance would mandate consultation with DoD if they were already conducting operations within five miles of a project area. *Id.*

C. Using Both Approaches in Virginia

Virginia would benefit from integrating aspects of both the informal and formal approaches into its approach to wind permitting, due to the dual approval processes through DEQ and SCC. An informal approach is suited to SCC's hearing-oriented application process while a formal approach is appropriate for DEQ's PBR process. SCC's process involves multiple filings as well as a hearing.[240] The SCC process could be modified to include DoD concerns as a determination factor for a CPCN. Alternatively, or additionally, all stakeholders could be invited to submit briefs and give testimony in any hearings. Ultimately, the law could be changed to effectively move SCC's process away from an adjudicative hearing process to a roundtable process, similar to what occurred in Rhode Island. The Virginia General Assembly would need to change the CPCN determination factors because the CPCN is set forth in the Code of Virginia.[241] The General Assembly could also amend the CPCN process to add a requirement to provide notice to the DoD and other stakeholders. This change would immediately allow DoD input into state-level siting decisions.

Adapting the DEQ PBR process to meet both the Commonwealth's goals and DoD's concerns is a more vexing challenge. As discussed, the PBR process was intended to streamline permitting for small-scale systems.[242] If the developer meets the specifications set forth in the regulations, then DEQ must issue the permit.[243] The Commonwealth has a clear interest in preserving this streamlined process to facilitate the rapid expansion of small-scale wind systems.[244] This current approach potentially undermines DoD's role in providing expertise on national security issues in the interest of expediency. However, there are several possible ways the current PBR process could be amended to ensure DoD input. First, the process could be amended to require an informal, roundtable-type discussion with DoD entities within a specified distance of the proposed project. Alternatively, the current PBR process could be amended to require DoD contact as an additional PBR requirement in the list of criteria that must be met to be issued a PBR.[245] This approach would not necessarily create any binding requirements on the developer beyond requiring the developer to either submit a DoD "impact report," outlining the possible impact to DoD facilities, or simply provide proof that the developer notified DoD of the impending project.

Additionally, the General Assembly could statutorily modify the PBR to require that an applicant submit plans to DoD installations within a fixed radius of a proposed project and request input from the DoD on the planned project. If a DoD installation objects to an aspect of a proposed project, DoD could outline its objections and recommended modifications to the project within a certain timeframe. The developer may integrate those proposed modifications, address DoD's concerns in another manner, or reject the modifications. The process could also require that, if the developer rejects the modifications, then the developer must explain in the PBR application why

[240] *See supra* Part II.A.
[241] *See* VA. CODE § 56-580(D) (2009).
[242] *See supra* Part II.A
[243] *See id.*
[244] *Id.*
[245] The elements to receive a PBR are set forth in the Virginia Administrative Code pursuant to Virginia Code Section § 10.1-1197.6. Because this section lists fourteen required conditions that it "shall include" it does not say it shall "only include" these conditions. Therefore, the DEQ could require additional procedures beyond these fourteen. *Id.*

it did so and why no other options can address DoD's concerns. This policy change is likely in the best interests of both the Commonwealth and DoD because it gives DoD more input into siting decisions while preserving the PBR's streamlined nature. Together with the above recommended changes to the SCC process, DoD and the Commonwealth would be able to have a productive partnership in the expansion of wind energy.

CONCLUSION

Virginia and the military have a longstanding, close relationship. The Commonwealth is home to many military installations. As the Commonwealth moves forward with alternative energy development, there are significant opportunities for Virginia to integrate DoD into the wind development process. The only formal avenue currently provided for DoD to comment on proposed projects is at the federal level, through the FAA's Determination of Hazard process. DoD can provide input into permitting decisions at the state level, but only by engaging with the public notice and comment process provided in both the SCC and DEQ regulations. Virginia would benefit from modifying existing permitting processes to invite DoD's opinions on wind siting decisions as well as to bring DoD to the table at an earlier stage. Doing so will reduce the risk of conflicts between military needs and the growth of wind farms that could stall the development of the wind energy industry in the state. Ultimately, this hybrid approach would include DoD at the earliest stages of project development and avoid significant delays in expanding wind energy in the Commonwealth.

APPENDIX A: WIND ENERGY ORDINANCES IN VIRGINIA BY LOCALITY

The following tables compile the results of a survey of the ordinances of the 95 counties and 38 independent cities in Virginia. The tables were modeled after a similar table found in Mark L. Belleville, *The Wind Blows in Virginia Too - Deconstructing Legal and Regulatory Barriers to the Development of Onshore, Utility-Scale Wind Energy in Virginia*.[246] Links to the ordinances are provided where available; however, a few counties did not appear to have their codes published online. Additionally, we have included relevant code sections. Ordinances were searched for any references to wind energy and we endeavored to be as thorough as possible; however, it is possible that some ordinances were missed. We have indicated localities in which there has been opposition to renewable energy projects with footnotes. This information is current as of April 2021.

County Ordinances

COUNTY	WIND ENERGY ORDINANCE(S)	LINK	CODE SECTION
Accomack	Utility-scale allowed with conditional or special use permit	https://library.municode.com/va/accomack_county/codes/code_of_ordinances?nodeId=13191&showChanges=true	§ 106-54; § 106-128; § 106-404
Albemarle	Only regulates smaller-scale systems	https://library.municode.com/va/albemarle_county/codes/code_of_ordinances	§ 5.1.46
Alleghany	Only regulates smaller-scale systems	https://library.municode.com/va/alleghany_county/codes/code_of_ordinances?nodeId=13086	§ 66-736-43
Amelia	Only regulates smaller-scale systems	https://www.ecode360.com/AM4210/laws/LF1210334.pdf	§ 34-3
Amherst	Only regulates smaller-scale systems	https://library.municode.com/va/amherst_county/codes/code_of_ordinances	§ 918
Appomattox	Utility-scale allowed with conditional use permit	http://appomattoxcode.us/chapter-19-land-use-and-development/article-vi-zoning/	§ 19.6-95
Arlington	None found	https://countyboard.arlingtonva.us/county-code/	N/A

[246] *Supra* note 124, at 168–69.

Augusta	Utility-scale allowed with special use permit	https://www.co.augusta.va.us/home/showdocument?id=3203	§ 25-69 et seq.
Bath	Only regulates smaller-scale systems	http://bathco.hosted.civicliv e.com/common/pages/DisplayFile.aspx?itemId=13102125	§ 714
Bedford	Only regulates smaller-scale systems. Will allow larger systems with a special use permit	https://www.bedfordcountyva.gov/home/showdocument?id=8060	§ 30-87-8
Bland	Utility-scale allowed with conditional use permit	https://library.municode.com/va/bland_county/codes/code_of_ordinances?nodeId=12989	§ 62-135
Botetourt[247]	Utility-scale allowed via special exception process	https://library.municode.com/va/botetourt_county/codes/code_of_ordinances?nodeId=10055	§ 25-446
Brunswick	None Found	https://library.municode.com/va/brunswick_county/codes/code_of_ordinances?nodeId=13270	N/A
Buchanan	None found	https://ecode360.com/BU1535	N/A
Buckingham	None found	http://www.buckinghamcountyva.org/zoning/	N/A
Campbell	None found	https://www.co.campbell.va.us/397/Campbell-County-Code	N/A
Caroline	None found	https://ecode360.com/CA1335	N/A
Carroll	None found	https://ecode360.com/CA1276	N/A
Charles City	None found	https://library.municode.com/va/charles_city_county/codes/code_of_ordinances?nodeId=14373	N/A
Charlotte	Only regulates smaller-scale systems	https://charlotteva.com/pdfs/Zoning_ord.pdf	§ 10-10

[247] The County Board modified the ordinances to the Rocky Forge Wind Farm despite public opposition. COLUMBIA LAW SCHOOL, SABIN CTR. FOR CLIMATE CHANGE LAW, OPPOSITION TO RENEWABLE ENERGY FACILITIES IN THE UNITED STATES 60 (2021)

Chesterfield	Only regulates smaller-scale systems	https://www.chesterfield.gov/DocumentCenter/View/6069/Zoning-Ordinance-PDF	Art III. Div. 2-26-27
Clarke	Only regulates smaller-scale systems intended primarily for on-site energy use	https://www.clarkecounty.gov/home/showdocument?id=5224	§ 3-C-2-ll
Craig	None Found	http://craigcountyva.gov/wp-content/uploads/2020/09/Chapter-58-Zoning.pdf	N/A
Culpeper	Utility-size systems allowed with conditional use permits, regulated as "renewable energy generating facilities"	https://library.municode.com/va/culpeper_county/codes/code_of_ordinances?nodeId=14078	§ 3-2-2.18
Cumberland	None found	https://library.municode.com/va/cumberland_county/codes/code_of_ordinances?nodeId=13342	N/A
Dickenson	None found	https://dickensonva.org/350/County-Ordinances	N/A
Dinwiddie	None found	https://library.municode.com/va/dinwiddie_county/codes/code_of_ordinances?nodeId=14211	N/A
Essex	None found	https://library.municode.com/va/essex_county/codes/code_of_ordinances?nodeId=15294	N/A
Fairfax	Mentioned only as an improvement eligible for a Commercial Property Assessed Clean Energy (C-PACE) loan	https://library.municode.com/va/fairfax_county/codes/code_of_ordinances?nodeId=10051	§ 127-2-1
Fauquier	Only regulates smaller-scale systems	https://www.fauquiercounty.gov/government/departments-a-g/community-development/codes-ordinances/zoning-ordinance	§ 6-102-33

Floyd	None found	https://library.municode.com/va/floyd_county/codes/code_of_ordinances?nodeId=13477	N/A
Fluvanna	None found	https://library.municode.com/va/fluvanna_county/codes/code_of_ordinances?nodeId=15686	N/A
Franklin	Regulates small and utility-scale systems	https://library.municode.com/va/franklin_county/codes/code_of_ordinances?nodeId=10799	§ 25-128(c)
Frederick	None found	https://ecode360.com/FR1364	N/A
Giles	None found	https://virginiasmtnplayground.com/wp-content/uploads/2019/07/Giles-Zoning-Ordinance-Online-2019.pdf	N/A
Gloucester	Only regulates smaller-scale systems	https://library.municode.com/va/gloucester_county/codes/code_of_ordinances?nodeId=10843	§ 9-22
Goochland	Only regulates smaller-scale systems	https://library.municode.com/va/goochland_county/codes/code_of_ordinances?nodeId=12226	§ 15-289
Grayson	Regulates small and utility-scale systems	https://graysoncountyva-gov.scdn1.secure.raxcdn.com/wp-content/uploads/2019/01/Zoning-Ordinance121718_approved.pdf	§ 3-14
Greene	None found	https://library.municode.com/va/greene_county/codes/code_of_ordinances?nodeId=13081	N/A
Greensville	None found	http://www.greensvillecountyva.gov/documents/Zoning_Ordinance.scanned.2020.pdf	N/A
Halifax	Only regulates smaller-scale systems	https://library.municode.com/va/halifax_county/codes/code_of_ordinances?nodeId=14120	§ 53-146-152

Hanover	None found	https://library.municode.com/va/hanover_county/codes/code_of_ordinances?nodeId=10338	N/A
Henrico	None found	https://library.municode.com/va/henrico_county/codes/code_of_ordinances?nodeId=14737	N/A
Henry	None found	https://library.municode.com/va/henry_county/codes/code_of_ordinances?nodeId=12210	N/A
Highland	None found; however, Highland County issued a conditional use permit to Highland New Wind: https://www.macalester.edu/windenergy/casestudies/highland/HWdetails.html	http://www.highlandcovabz.org/zoning	N/A
Isle of Wight	None found	https://library.municode.com/va/isle_of_wight_county/codes/code_of_ordinances?nodeId=14449	N/A
James City	None found	https://library.municode.com/va/james_city_county/codes/code_of_ordinances?nodeId=15401	N/A
King and Queen	May be in progress; none found	https://library.municode.com/va/king_and_queen_county/codes/code_of_ordinances?nodeId=13622	N/A
King George	None found	https://library.municode.com/va/king_george_county/codes/code_of_ordinances?nodeId=12064	N/A
King William	None found	https://library.municode.com/va/king_william_county/codes/code_of_ordinances?nodeId=13752	N/A
Lancaster	None found	https://library.municode.com/va/lancaster_county	N/A

Lee	Utility-scale systems allowed with a special use permit	http://www.leecova.org/pdf/ComDev/Ordinance%20-%20Lee%20County%20Zoning%20-%202014.pdf	§ 4-1-3-i
Loudoun	None found	https://www.loudoun.gov/DocumentCenter/View/99645/Revised-1993-Zoning-Ordinance?bidId=	N/A
Louisa	None found	https://library.municode.com/va/louisa_county/codes/code_of_ordinances?nodeId=12480	N/A
Lunenburg	None found	https://library.municode.com/va/lunenburg_county/codes/code_of_ordinances?nodeId=13147	N/A
Madison	Only regulates smaller-scale systems	https://www.madisonco.virginia.gov/sites/default/files/fileattachments/zoning_amp_planning/page/133/madisonzoningordin.pdf	§ 14-14
Mathews	Requires permitting for "commercial and industrial" use. "Public utility buildings" exempt from height restrictions.	https://ecode360.com/MA1886	§§ 175-8.6; 175-15.8; 175-15.25
Mecklenburg	Requires permitting for "towers." May be separate from "Antennas."	https://library.municode.com/va/mecklenburg_county/codes/code_of_ordinances?nodeId=13405	§ 14
Middlesex	None Found	https://www.co.middlesex.va.us/PDF/Ordinances/Zoning%20Ordinance%20of%20Middlesex%20County%20-%2012-03-2019%20Final.pdf	N/A

Montgomery	None Found	https://montgomery.municipalcodeonline.com/book?type=ordinances#name=PREFACE	N/A
Nelson	Only regulates smaller-scale systems	https://library.municode.com/va/nelson_county/codes/code_of_ordinances?nodeId=12109	§ 22
New Kent	General height regulations	https://library.municode.com/va/new_kent_county/codes/code_of_ordinances?nodeId=13371	§§ 154.2.113–154.2.115
Northampton	On receipt of special use permit application for large or utility-scale system, county required to notify DoD clearinghouse; Regulates small and utility-scale systems	http://www.amlegal.com/codes/client/northampton-county_va/	§§ 154.2.113–154.2.115
Northumberland	None found	https://ecode360.com/NO1673	N/A
Nottoway	None found	Unable to find code online	N/A
Orange	None found	http://orangecode.us/docs/OrangeCountyCode.pdf	N/A
Page	Regulates "wind energy systems." Height limited to 80 feet on parcels of 5 acres or more.	https://ecode360.com/PA1470	§ 125-30.8
Patrick	Prohibition on structures over 100 ft.	https://www.co.patrick.va.us/content/uploads/PDF/Ordinances/Structures,%20Tall/structures_tall_combined_files.pdf	No Codification number
Pittsylvania	Special use permits required for "public utilities-structures, towers, power generation" within each zoning district.	https://pittsylvaniacountyva.gov/154/Codes-Ordinances	§§ 35-179, 35-193, 35-223, 35-268, 35-281, 35-295, 35-318, 35-347, 35-366, 35-383

	Permitted in industrial zones.		
Powhatan[248]	Only regulates smaller-scale systems as "accessory use" in each zoning district.	https://library.municode.com/va/powhatan_county/codes/code_of_ordinances?nodeId=14056	N/A
Prince Edward	None Found	https://library.municode.com/va/prince_edward_county/codes/code_of_ordinances?nodeId=13157	N/A
Prince George	None Found	https://library.municode.com/va/prince_george_county/codes/code_of_ordinances?nodeId=10741	N/A
Prince William	Only regulates smaller-scale systems as accessory uses	https://library.municode.com/va/prince_william_county/codes/code_of_ordinances?nodeId=14114	§ 32-300.02
Pulaski	Regulates small and utility-scale systems	https://www.pulaskicounty.org/documents/planning-zoning/ordinances/udo-2020.pdf	§ 3.1(11)
Rappahannock	None found	https://ecode360.com/RA1333	N/A
Richmond	None found	https://codelibrary.amlegal.com/codes/richmondcounty/latest/overview	N/A
Roanoke	Utility-scale: requires FAA approval & consultation w/ county staff at least 30 days before application; regulates small and utility-scale systems	https://library.municode.com/va/roanoke_county/codes/code_of_ordinances?nodeId=12222	§ 30-87-7
Rockbridge	Only regulates smaller-scale systems	http://www.co.rockbridge.va.us/DocumentCenter/View/240/LDR?bidId=	§ 715

[248] A solar project was withdrawn in 2019 following local opposition and a partial no-vote by the Board of Supervisors. *Id.*

Rockingham	"Large scale" systems require 2 public information meetings, with notice: 1 before application submission, 1 after but before permit hearing; regulates small and "large scale" systems (large scale: height 80+ ft or 5+ MW)	https://library.municode.com/va/rockingham_county/codes/code_of_ordinances?nodeId=12196	§ 17-607
Russell	None found	Unable to find code online	N/A
Scott	None found	http://www.scottcountyva.com/2017-ZoningOrdinance.pdf	N/A
Shenandoah	Regulates small and utility-scale systems	https://ecode360.com/SH1548	§ 165-164
Smyth	None Found	https://library.municode.com/va/smyth_county/codes/code_of_ordinances?nodeId=14278	N/A
Southampton	Permitted use within "industrial districts."	https://library.municode.com/va/southampton_county/codes/code_of_ordinances?nodeId=12337	§§ 18-282(a)(15.1)
Spotsylvania[249]	Discussed only with reference to setbacks within a "mixed use district."	https://library.municode.com/va/spotsylvania_county/codes/code_of_ordinances?nodeId=12105	§ 23-6.28.4(c)(2)(a)(iv)
Stafford	None Found	https://library.municode.com/va/stafford_county/codes/code_of_ordinances?nodeId=11500	N/A
Surry	"Windmills" regulated	https://library.municode.com/va/surry_county/codes/code_of_ordinances?nodeId=14669	§ 4-908
Sussex	"Commercial Towers" regulated. Height regulated	https://library.municode.com/va/sussex_county/codes/code_of_ordinances?nodeId=15219	§34-870—34-886

[249] A 6,350-acre wind farm began construction in 2020. Nevertheless, a local group is urging the county board to block it. *Id.*

	within different zoning districts		
Tazewell	Tall structures regulated near Airfields and on "certain ridgelines."	https://library.municode.com/va/tazewell_county/codes/code_of_ordinances?nodeId=12360	§§ 15-54; 15-115
Warren	Full code section regulating "wind energy systems." Regulations control setbacks, noise, height, as well as construction practices	https://ecode360.com/WA1232	§ 180-59.1
Washington	"Large" systems require 2 public information meetings, with notice: 1 before application submission, 1 after but before permit hearing; regulates small and "large scale" systems (large: 25+ kW)	https://library.municode.com/va/washington_county/codes/code_of_ordinances?nodeId=11680	§§ 66-1200–66-1239
Westmoreland	"Windmills" require a permit	https://www.westmoreland-county.org/sites/default/files/docs/zoning_ordinance.pdf	§ 4-1.2.1
Wise	"Wind energy systems" require special use permit	https://library.municode.com/va/wise_county/codes/code_of_ordinances?nodeId=10318	§4-1.2(29)
Wythe	None found	Unable to find code online	N/A
York	Only regulates smaller-scale systems	https://ecode360.com/YO4168	§ 24.1-274

City Ordinances

CITY	WIND ENERGY ORDINANCE(S)	LINK	CODE SECTION
Alexandria	C-PACE participant but no clear regulation of structures themselves	https://library.municode.com/va/alexandria/codes/code_of_ordinances?nodeId=PTIITHCOGEOR_TIT7PLDE_CH7COPRASCLENCEFIPR	§ 7-7-1
Bristol	Windmills exempted from general height limitations but no clear regulation of the structures themselves	https://library.municode.com/va/bristol/codes/code_of_ordinances?nodeId=PTIICO_CH50LAUS_ARTIIZO_DIV4DEYARE_S50-43EXYARE	§ 50-43
Buena Vista	None Found	https://library.municode.com/va/buena_vista/codes/code_of_ordinances?nodeId=15067	N/A
Charlottesville	None Found	https://library.municode.com/va/charlottesville/codes/code_of_ordinances	N/A
Chesapeake	Wind towers permitted as alternative energy facilities for homes and businesses, with a maximum allowable height of 120 ft. Taller structures may receive a conditional use permit	https://library.municode.com/va/chesapeake/codes/zoning?nodeId=ZO_ART14ACUSST_S14-401WITUAGSIMIZODI	§ 14-400; § 17-101
Colonial Heights	Available as a Major Utility Service requiring a special exception permit	https://www.colonialheightsva.gov/DocumentCenter/View/219/Zoning-Ordinance?bidId=	§ 286-406.40
Covington	None Found	https://library.municode.com/va/covington/codes/code_of_ordinances	N/A
Danville	C-PACE participant but no clear regulation of structures themselves	https://library.municode.com/va/danville/codes/code_of_ordinances?nodeId=PTII	§ 10.5-1

		CO_CH10.5COPRASCLENCEFIPR	
Emporia	None Found	https://library.municode.com/va/emporia/codes/code_of_ordinances	N/A
Fairfax	C-PACE participant but no clear regulation of structures themselves	https://library.municode.com/va/fairfax_county/codes/code_of_ordinances?nodeId=THCOCOFAVI1976_CH127COPRASCLENREPR	§ 27-1-1
Falls Church	None Found	https://library.municode.com/va/falls_church/codes/code_of_ordinances	N/A
Franklin	Windmills excepted from general height limitations but no clear regulation of the structures themselves.	https://ecode360.com/28954965	§ 19.2
Fredericksburg	C-PACE participant; wind energy facilities are regulated as a major utility	https://ecode360.com/33875580; https://ecode360.com/29018300	§ 38-500; § 72-83.3
Galax	None Found	https://ecode360.com/GA1297	N/A
Hampton	Small wind energy production systems allowed as an accessory use	https://library.municode.com/va/hampton/codes/zoning?nodeId=CH1GEPR_ARTIIREAPMAALZODI_S1-29REENPRSY	§ 1-29
Harrisonburg	None Found	https://library.municode.com/va/harrisonburg/codes/code_of_ordinances	N/A
Hopewell	None Found	https://library.municode.com/va/hopewell/codes/code_of_ordinances	N/A
Lexington	None Found	https://ecode360.com/LE2692	N/A
Lynchburg	C-PACE participant but no clear regulation of structures themselves	https://library.municode.com/va/lynchburg/codes/code_of_ordinances?nodeId=CH36TACO_ARTVICOPRASCLENCEFIPR	§ 36-301

Manassas	None Found	https://library.municode.com/va/manassas/codes/code_of_ordinances	N/A
Manassas Park	None Found	https://library.municode.com/va/manassas_park/codes/code_of_ordinances	N/A
Martinsville	None Found	https://library.municode.com/va/martinsville/codes/code_of_ordinances	N/A
Newport News	None Found	https://library.municode.com/va/newport_news/codes/code_of_ordinances	N/A
Norfolk	C-PACE participant but no clear regulation of structures themselves	https://library.municode.com/va/norfolk/codes/code_of_ordinances?nodeId=CD_NORFOLK_VIRGINIA_1979	§ 45.8
Norton	None Found	https://library.municode.com/va/norton/codes/code_of_ordinances	N/A
Petersburg	C-PACE participant but no clear regulation of structures themselves	https://library.municode.com/va/petersburg/codes/code_of_ordinances	§ 107
Poquoson	Authorized in "technology zone overlay district." Incentive program, including tax breaks to bring in tech business (including wind production). Certain conditions apply such as employee minimum number and salary. Nothing about height, etc.	https://library.municode.com/va/portsmouth/codes/code_of_ordinances	§11.6-1 through 6-7
Portsmouth	Has green building incentives including relaxing normal building regulations such as allowable height and ground coverage	https://library.municode.com/va/portsmouth/codes/code_of_ordinances	§ 40.1-5.8

Radford	None Found	https://library.municode.com/va/radford/codes/code_of_ordinances	
Richmond	C-PACE participant but no clear regulation of structures themselves	https://library.municode.com/va/richmond/codes/code_of_ordinances	§ 11-192
Roanoke	Permitted accessory use. Exempt from height limits, but other restrictions apply	https://library.municode.com/va/roanoke/codes/code_of_ordinances	§ 36.2-403 (m)
Salem	None Found	https://library.municode.com/va/salem/codes/code_of_ordinances	N/A
Staunton	None Found	https://www.codepublishing.com/VA/Staunton/	N/A
Suffolk	Extensive requirements for applications requiring submission of plans.	https://library.municode.com/va/suffolk/codes/code_of_ordinances	§ 31-722; App'x A, B-24
Virginia Beach	Conditional Use permit required. Extensive requirements including plan submission.	https://library.municode.com/va/virginia_beach/codes/code_of_ordinances	§ 209
Waynesboro	Regulation of "small wind energy systems." Silent on commercial scale	https://library.municode.com/va/waynesboro/codes/code_of_ordinances	§ 98-4.6.14
Williamsburg	None Found	https://library.municode.com/va/williamsburg/codes/code_of_ordinances	N/A
Winchester	None Found	https://library.municode.com/va/winchester	N/A

APPENDIX B: SUGGESTED ADDITIONAL RESOURCES

The following are tools or sources of information that may be useful to anyone involved in siting for wind energy projects:

DoD Preliminary Screening Tool
https://oeaaa.faa.gov/oeaaa/external/gisTools/gisAction.jsp?action=showLongRangeRadarToolForm
Description: Any user may enter coordinates of a site to check whether there are likely to be impacts to radar, military routes, or other special airspace(s) before filing with FAA. Entering coordinates returns a map highlighted in either green (no anticipated impact), yellow (impact likely), or red (impact highly likely).

Rhode Island Ocean SAMP: A Practitioner's Guide
https://seagrant.gso.uri.edu/oceansamp/pdf/Practitioner_Guide.pdf
Description: Details the processes of creating and implementing Rhode Island's Ocean SAMP, with discussion on resources and research as well as assessing progress. Sponsored and written by individuals and entities directly involved in creating and managing the SAMP.

DMME: Virginia Wind Resource Maps
https://www.dmme.virginia.gov/DE/WindResourceMaps.shtml
Description: Wind maps for Virginia provided by the U.S. Department of Energy. Includes maps for utility-scale (land-based and offshore), community-scale, and residential-scale projects.

Office of Energy Efficiency & Renewable Energy: Wind Energy Maps and Data
https://windexchange.energy.gov/maps-data
Description: Offers wind maps for both the entire United States and individual states. Maps available include those for wind speed, installed and potential wind power capacity and generation, offshore wind resource potential, and more. Users may filter by turbine hub height, search by keyword, or see data by state.

NREL: Wind Resource Data, Tools, and Maps
https://www.nrel.gov/gis/wind.html
Description: Offers geospatial data tools including wind profiles and wind supply curve data for both the United States and several other countries. Also includes wind resource maps, with multi-year average wind speeds, for the United States at varying heights above sea level.

MARCO Data Portal: Mid-Atlantic Regional Council on the Ocean
https://portal.midatlanticocean.org/
Description: Online toolkit and resource center that consolidates available data and enables state, federal and local users to visualize and analyze ocean resources and human use information such as fishing grounds, recreational areas, shipping lanes, habitat areas, and energy sites, among others.