

Energy & Government Facility Siting

Section 309 Enhancement Objectives

Adoption of procedures and enforceable policies to help facilitate the siting of energy facilities and government facilities and energy-related activities and government activities which may be of greater than local significance

Resource Characterization

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

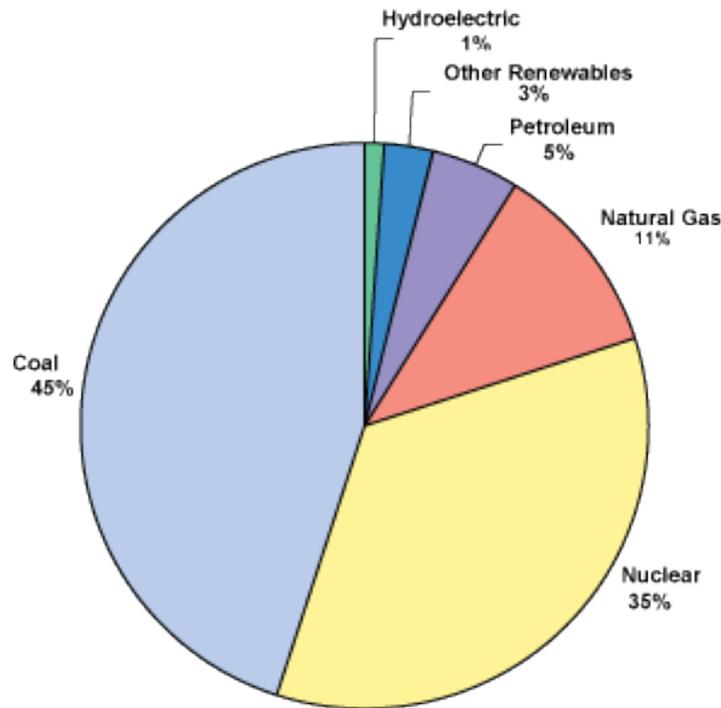
- 1. In the table below, characterize the types of energy facilities in your coastal zone (e.g., oil and gas, Liquefied Natural Gas (LNG), wind, wave, Ocean Thermal Energy Conversion (OTEC), etc.) based on best available data. If available, identify the approximate number of facilities by type.**

Type of Energy Facility	Exists in CZ (# or Y/N)	Proposed in CZ (# or Y/N)	Interest in CZ (# or Y/N)	Significant changes since last assessment (Y or N)
Oil and gas facilities	No production facilities exist. The Yorktown refinery is located along the York River (with access to the Chesapeake Bay) and has a throughput capacity of 70,000 barrels of crude oil per day. ¹⁹	Y	Y	Yes – federal moratorium on offshore oil and gas development lifted; proposed Lease Sale 220 (the name it is referred to by the Minerals Management Service) in federal waters off VA shore potentially beginning in 2011 or 2012.
Pipelines	Y	N	Y	Yes – Hampton Roads Crossing natural gas pipeline started operation in December 2009.
Electric transmission cables	Y	Y	Y	Yes – Discussions have started about offshore electric transmission cables for offshore wind and upgrades to the on-shore transmission system.

¹⁹ From the website: <http://www.wnr.com/Refining.aspx>

LNG	No production facilities; one on-shore storage facility; LNG tankers pass through state waters	N	N	N	
Wind	N (although there are measuring towers at Quinby and at Port Isabel near Tangier Island and on the Chesapeake Bay Light tower.)	Y	Y	Y	
Wave	N	N	Y	N	
Tidal	N	N	Y	N	
Current (ocean, lake, river)	N All hydro facilities are in the Piedmont or farther west.	N	Y	N	
OTEC	N	N	N	N	
Solar	Y	Y	Y	Y	
Other: Algae bio-fuel			Y	Y	
Other: Energy Efficiency and conservation	Y	Y	Y		Significant opportunity to increase utilization of energy efficiency and conservation efforts across the state and the coastal zone

2. Please describe any significant changes in the types or number of energy facilities sited, or proposed to be sited, in the coastal zone since the previous assessment.



*This graphic is provided to offer a baseline for **electrical power generation in Virginia in 2005** for comparison with assessment information below, and is the most current graphic available from DMME. Total = 78,943,045 megawatt-hours.²⁰*

Wind

Wind and biofuels are actively emerging as viable energy sources throughout Virginia. Currently wind development is being sited onshore and nearshore, and the potential for offshore wind development continues to be recognized as significant. Extensive research is currently taking place regarding offshore wind potential. New wind facilities include one to two wind turbines being constructed at Port Isabel near Tangier Island in the Chesapeake Bay, and two companies have requested leases for offshore wind turbines in federal waters. It would likely be several years before these wind energy projects would be constructed (see the section below under *Management Characterization* for additional information on this topic).

The Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) formed a taskforce of federal, state and local government officials on December 8, 2009 to manage the offshore wind leasing process. The Virginia Marine Resource Commission (VMRC) is looking at the potential for renewable energy, particularly wind, in state waters in Virginia (see the

²⁰ From the website: <http://www.dmme.virginia.gov/DMR3/energyresources.shtml>

section below under *Policies* for additional information on this topic). At the same time, there is a new Governor's Task Force to look at commercial offshore wind development opportunities in Virginia.

There is a growing market for small residential and commercial-size wind systems, and there is a strong potential for community-scale projects of 1 to 5 megawatts in state waters in Virginia. Areas along the coastal zone have a stronger potential for wind systems than inland areas.

Coal

As a whole, a significant amount of coal is shipped in and out of the Port of Hampton Roads at Norfolk. On the facility side of coal, Old Dominion Electricity Cooperative has proposed a new 1,500 megawatts coal fired power plant in Surry County, which would be Virginia's largest coal-burning plant. Concern has been expressed over this plant, particularly around expanding the use of coal and its associated environmental impacts instead of increasing the use of renewables in the state, and around maintaining air quality standards in the Hampton Roads area. The region may currently be at the limit for air quality attainment, and there are concerns that if the plant is constructed and air quality standards are no longer met, transportation funding could be limited for the region.

Regarding coal exports and imports, changes are taking place at some terminals which could affect their ability to serve as a conduit for imported coal to power plants, including to Dominion's Chesapeake Gap and Chesterfield facilities. The amount of coal exported through Hampton Roads has fluctuated over the last five years, and will be determined by the broader economic recovery and demand overseas. The coal market will be affected by carbon regulations as a whole, but the impact on the Hampton Roads region will be indirect.

Biomass/ biofuels

There may be some biomass development in the coastal region, both in direct electricity production and an increase in wood pellet production for export and domestic use. Additional biomass energy techniques are currently in research and development, such as growing algae as a water quality improvement strategy, with the algae used to produce liquid fuels or a solid coal-substitute fuel product. (See below under *Research* for additional information on this topic).

Nuclear

Dominion Nuclear applied to the Nuclear Regulatory Commission (NRC) for an Early Site Permit to reserve sites to add two reactors to its current two-reactor North Anna Power Station facility in Louisa County (while the current site in Louisa County is outside the Coastal Zone, the North Anna is a coastal river). A Draft Environmental Impact Statement (DEIS) was submitted that considers three additional sites for the expansion, one in Virginia at the existing Surry Power Station along the James River. This permit would reserve the selected expansion site for up to 20 years, and potentially allow site preparation and preliminary construction.

The Commonwealth completed reviews of the Draft Environmental Impact Statement (March 3, 2005) and Supplement to the DEIS (September 8, 2006) for the NRC Early Site Permit at the North Anna Power Station in Louisa County. Virginia's review of the Federal Consistency Certification for the ESP was completed on November 21, 2006. The Commonwealth conditionally concurred with the consistency certification provided Dominion obtain and adhere to all applicable permits and conduct an Instream Flow Incremental Methodology study (IFIM). The IFIM was completed and on October 28, 2009 a MOA between Dominion and the Department of Game and Inland Fisheries was signed committing Dominion to funding for the restoration and enhancement of the North Anna and Pamunkey River watersheds should the new Unit 3 be constructed.

On March 18, 2009, the Office of Environmental Impact Review submitted the Commonwealth's response to the Draft Supplemental Environmental Impact Statement prepared by the NRC for the Combined License (COL) for the proposed Dominion Virginia Power North Anna Power Station Unit 3. A Federal Consistency Certification has not been submitted for the COL. Currently, Dominion has not made a final decision on whether to pursue the new reactor construction.

Infrastructure

Various electrical transmission lines have been built in the coastal areas in recent years. One of the biggest proposed lines is under the Potomac River and the Chesapeake Bay, the MAPP (Mid-Atlantic Power Pathway) line, which has been controversial due to concerns over loss of farm land, potential impacts to forests, viewsheds and property values, health and safety risks, loss of open space and public areas, impacts to Native-American sites and rare, and threatened and endangered species. The proposed line would run from Possum Point, Virginia, near Fredericksburg, and then run east to Maryland before going out to the ocean, eventually returning onshore at New Jersey. There is an additional electrical transmission line crossing under the York River from York County to Gloucester.

Two companies are discussing developing a North-South electrical cable to link offshore wind projects together which would run from North Carolina and Virginia to New York and New Jersey. This line would be a shorter transmission line to the grid for transporting wind energy.

There is a Natural Gas Pipeline crossing Hampton Roads from Newport News to Craney Island in Portsmouth. Additionally, there is a planned expansion at Cove Point, Maryland by Dominion Power for an existing liquefied natural gas (LNG) import facility. With regard to the proposed expansion at Cove Point, on July 2, 2008 the Commonwealth responded to a Draft Supplemental Environmental Assessment and Federal Consistency Certification prepared by the U.S. Coast Guard for LNG Ship Transit in United States Waters (Chesapeake Bay). Virginia noted that it has no objection to the proposed increase and found it consistent with the enforceable policies of the VA Coastal Zone Management Program.

Additional infrastructure will be needed to support new wind energy projects, including transmission cables. Currently, the state has the opportunity to attract new wind-energy related businesses with the anticipated expanded markets for wind-energy production in the state, and an

increase in manufacturing capacity will enhance this potential. There is a need to increase the capacity for creating infrastructure, manufacturing, and installation components for renewable energy projects that will be developed in Virginia's coastal zone in the near future. The capacity for high-voltage wind facilities to tie into the grid is being examined, particularly in looking at what the highest capacity to tie into the grid is, and upgrades that would be needed. The city of Virginia Beach is looking at adaptive reuse of vacant industrial properties to build wind farm components including turbines and blades, such as the Ford plant in Norfolk as it has deep water access. According to the 2007 Virginia Energy Plan, General Electric has a facility in Salem that makes turbine components.

3. Does the state have estimates of existing in-state capacity and demand for natural gas and electric generation? Does the state have projections of future capacity? Please discuss.

Oil and Gas

On October 1, 2008, the federal Outer Continental Shelf (OCS) Moratorium on offshore oil and gas exploration expired. The Minerals Management Service (MMS) of the U.S. Department of Interior (DOI) is in the process of considering a lease-sale of lands off the Virginia Coast for the purpose of oil and gas exploration and eventual production. The sale was first listed in the last five year plan. In January 2009, public responses to the notice of information were received and a general scoping for an environmental impact statement will soon be issued. The BOEMRE estimates that this area may contain 130 million barrels of oil and 1.14 trillion cubic feet of natural gas.

Currently, DOI is also updating its five-year plan for 2010–2015 under the Outer Continental Shelf Land Act (OCSLA). Secretary of Interior Ken Salazar suspended the update process to receive public comment and review the policy regarding offshore oil and gas development. Secretary Salazar has stated he will issue the results of this analysis and a decision on whether, and if so how, to proceed with the new 5-year plan, including Virginia Lease Sale 220, during the summer of 2010.

While Virginia has stated its support for gas exploration only, the MMS authorizes lease-sale for both oil and gas together. In the past, Virginia legislators and others have discussed the possibility of the Commonwealth receiving revenue from the lease-sale, but Congress has recently rejected legislation that would allow states to share in the revenue. Currently, the leasing of exploration and development rights off the Virginia coast is scheduled for 2011.²¹

In 2005, the Virginia General Assembly commissioned a study on offshore natural gas exploration. As a result, the report "Study of the Possibility of Exploring for Natural Gas in the Coastal Areas of the Commonwealth" was released in January 2006. The 2006 Virginia General Assembly passed Title 67-300 of the Code of Virginia, which enumerated state policy toward offshore gas for the first time. The Title supports exploration for natural gas only, in areas no

²¹ Information from the Virginia Conservation Network website:
<http://www.vcnva.org/anx/index.cfm/1,284,0,0,html/Offshore-Drilling>

closer than 50 miles from the shore. In March 2010, the General Assembly passed HB787, which changed this policy so that both exploration and production, for both oil and gas, are now allowable. The new legislation maintains the stipulation that these activities must occur at least 50 miles from the shore.

Governor-elect Robert McDonnell sent a letter on December 23rd, 2009 to U.S. Interior Secretary Ken Salazar asking him to allow for the exploration of oil and gas off Virginia's coast, urging him to avoid any further delay in granting offshore leases, now scheduled for 2011.

Minerals Management Service staff have noted that the process to develop the Lease Sale 220 off of Virginia's coast will take longer than November of 2011. Therefore, if the lease sale goes forward, it would take place at a later date.

As of May 2010, the US Department of the Interior had suspended plans for offshore drilling near Virginia. Public comments are no longer being accepted and a series of public meetings regarding Lease Sale 220 were cancelled. This has occurred in the wake of the sinking of the Deepwater Horizon rig off the coast of Louisiana, which has been responsible for the leak of hundreds of thousands of gallons of oil into the Gulf of Mexico.

Natural Gas

According to the 2007 Virginia Energy Plan, Virginia's natural gas utilizes serve more than a million residential (approximately 37% of households) and 90,000 commercial natural gas customers. Virginia produces about 85 billion cubic feet of natural gas per year and has a demand of approximately three times that amount (with demand on the rise). New infrastructure will be needed to meet the demand for natural gas, which grew 30% between 1997 and 2007 in the Virginia Natural Gas service area—twice the national average.²²

The state recently received a grant for developing infrastructure for utilizing propane as an alternative fuel.

- 4. Does the state have any specific programs for alternative energy development? If yes, please describe including any numerical objectives for the development of alternative energy sources. Please also specify any offshore or coastal components of these programs.**

Renewable Energy rebates and initiatives

Virginia has received significant funding under the American Recovery and Reinvestment Act of 2009 (Recovery Act), and the Commonwealth is using a portion of it to support renewable energy development. Programs include: \$38 million total in rebates for solar thermal, photovoltaic panels, and small-scale wind, to help grow the deployment of these technologies; \$10 million will be available for wind and solar energy for local governments; \$13 million in rebates will be available for state facilities; and an additional \$15 million for conservation. The

²² From the website: <http://www.dmme.virginia.gov/vaenergyplan.shtml>

rebates are for systems installed in or after 2009. The rebates allow up to \$2000 a watt for solar photovoltaic systems, \$1500 a watt for wind, and \$1000 per watt equivalent for solar thermal. There is a 30% federal tax credit for renewable energy systems. The website for further information on rebates is www.dmme.virginia.gov.

Under the Recovery Act, the Navy is purchasing \$25 million in solar photovoltaic systems in their Hampton Roads facility, and \$100 million worth of solar energy around the country.

Research and Renewable Energy Goals

- \$10 million in research is being directed toward biomass and waste-to-energy projects, through April 12, 2012.
- There is a 15% renewable energy standard to be met by electricity producers by 2025. Investor-owned electric utilities can receive an enhanced return on their investment under this program.
- There is a focus to meet the goal to increase baseline in-state energy production by 20% by 2017 with “clean fuel” (including fuels with lower environmental impact such as solar, wind, biomass and other renewable sources of electricity, non-petroleum liquid fuels such as biofuels, and potentially including nuclear).
- The first ethanol plant under construction in Virginia is in Hopewell using hullless barley, which can be grown in the wintertime and can have beneficial water quality impacts. Although this is not located in the coastal zone, Hopewell is located on the intertidal James River. The future impact this ethanol plan may have on renewable energy production (for cellulosic material to be grown, as well as siting of future production plants) is significant for the coastal areas.

5. If there have been any significant changes in the types or number of government facilities sited in the coastal zone since the previous assessment, please describe.

NASA is looking to the possibility of installing two large wind turbines at Wallops Islands, with construction likely in 2010. The Navy will be installing over \$25 million worth of solar photovoltaic systems on Navy facilities in Hampton Roads, Virginia (as mentioned above in the *Renewable Energy rebates and initiatives* section).

The Navy at Naval Station Oceana is looking at five sites in Virginia and North Carolina for the location of a 2,000 acre "outlying" landing field facility.

Fort Monroe will close in 2011. On November 6, 2009 the Commonwealth completed the review of the DEIS and Federal Consistency Determination submitted by the Army, which evaluates the environmental and socioeconomic impacts of closing the installation and disposing of the 570-acre federal fee-owned property and considers reasonable reuse alternatives. The document also considered the cumulative impacts of potential reuses of approximately 290 acres of the property that will revert to the Commonwealth. Virginia noted that it has no objections to

the proposed closing and concurs that it is consistent with the VA Coastal Zone Management Program.

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

1. Does the state have enforceable policies specifically related to energy facilities? If yes, please provide a brief summary, including a summary of any energy policies that are applicable to only a certain type of energy facility.

The State has enforceable environmental permitting and control requirements for energy facilities. Permit requirements exist for facilities involving State-owned submerged lands and leasing authority (SB 1350, 2009) for renewable energy facilities on State-owned submerged lands. The permit authority for tidal wetlands and coastal dunes/beaches would also apply. Local Governments have the first permitting authority for wetlands specifically. Additionally, the Virginia Energy Plan was issued in 2007 (see the section below under *Policies* for additional information on SB1350 and the Energy Plan).

In December of 2008, the Environmental Law Institute prepared a report, funded by CZM FY 2006 Task 1.06), entitled *Virginia Offshore Energy Development Law and Policy Review and Recommendations: An Evaluation of Implementation of Virginia Laws to Address Coastal Impacts of Potential Energy Development Activities*. The report assessed the strength of Virginia's enforceable policies to manage energy development and made recommendations regarding the state's capacity to respond to concerns related to offshore energy proposals. Key among them were:

“1. We found that Virginia's laws and policies are generally sufficient to address anticipated environmental impacts from proposed offshore energy development, and are comparable to those of other coastal states that anticipate such development on a case-by-case basis.

2. However, Virginia has not adopted laws and policies that affirmatively assist in facilitating offshore energy development review.

3. Virginia also could benefit from information gathering and from policies that could allow advance identification of suitable areas for offshore energy transmission and support facilities.

4. In addition, Virginia has a number of articulated energy policies that are not reflected in enforceable legislation or regulations in ways that would ensure the desired outcomes in federal or state permitting.”

2. Please indicate if the following management categories are employed by the State or Territory and if there have been significant changes since the last assessment:

Management categories	Employed by state/territory (Y or N)	Significant changes since last assessment (Y or N)
Statutes or regulations	Y	Y
Policies	Y	Y
Program guidance	Y	Y
Comprehensive siting plan (including SAMPs)	Y (under development for wind)	Y
Mapping or GIS	Y	Y
Research, assessment or monitoring	Y	Y
Education and outreach	Y	Y
Other (please specify)	Y	Natural Gas Conservation and ratemaking Efficiency Act (2008) – encourages natural gas companies to promote energy efficiency and use alternative rate design strategies.

3. For management categories with significant changes since the last assessment provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference rather than duplicate the information.

- a) **Characterize significant changes since the last assessment;**
- b) **Specify if it was a 309 or other CZM-driven change (specify funding source) or if it was driven by non-CZM efforts; and**
- c) **Characterize the outcomes and effectiveness of the changes.**

Statutes or regulations

The Energy Policy Act of 2005 was signed into law in August of 2005. According to the Minerals Management Service (MMS), this law grants the MMS new responsibilities over Federal offshore alternative energy and alternate uses of America’s offshore public lands, also known as the Outer Continental Shelf (OCS). Section 388 of the Act provides an initiative to increase alternative energy production on the OCS. It gives the Secretary of the U.S. Department of the Interior the authority to:

- grant leases, easements, or rights-of way for alternative energy-related uses on Federal OCS lands;
- act as a lead agency for coordinating the permitting process with other Federal Agencies; and,
- monitor and regulate those facilities used for alternative energy production and support services.²³

²³ From the website: <http://www.mms.gov/ooc/PDFs/EnergyPolicyActof2005andMMS.pdf>

There are new federal permitting rules affecting offshore wind permitting from the Minerals Management Service (MMS) as of June 29, 2009. Two new offshore wind projects are being considered in Virginia currently, and they will need to comply with the new MMS federal permitting regulations if approved.

Several localities across Virginia, especially counties, have created wind siting ordinances developing mechanisms for permitting wind. Counties reported to not potentially allow wind turbines include Patrick County and Tazewell County, which have passed ordinances that prevent all tall structures. The City of Virginia Beach has passed a wind ordinance for where home or commercial scale wind generation can take place by-right. Other coastal communities with wind ordinances include the city of Suffolk and the City of Chesapeake, which is considering an ordinance in the spring of 2010 regarding small wind turbines as an accessory use.

The State Corporation Commission (SCC) approved a natural gas conservation and rate “decoupling” plan for Virginia Natural Gas (VNG) in December of 2008. The approved conservation programs provide incentives to residential customers of VNG to reduce the amount of natural gas they consume. The rate “decoupling” plan guarantees the company a certain level of revenue whether or not customers use less natural gas. Over the initial three years of the plan, VNG anticipates spending approximately \$6.6 million on various conservation programs. The programs include monetary incentives to customers to replace furnace filters, purchase efficient water heaters, and conduct seasonal home energy audits. The SCC directed the company to include in its conservation program a significant incentive to customers to install programmable thermostats.²⁴

In 2009, regulations were amended so that investor-owned electricity facilities can utilize a rate-of-return on their investment for conservation and energy efficiency.

Ongoing statutes are being developed by state and federal agencies to require improved technologies around wind energy, such as lighting, rotor shape, etc. Changing and improving technology will have an impact on wind-related regulations in terms of what can and should be expected from a developer. In addition, there is continuing research about how these technologies might affect wildlife. Scientific standards are changing as new technology is emerging. There is an additional need for research into offshore impacts of wind energy, and adjustments will be made as lessons continue to be learned from developed wind energy projects.

Policies

The Virginia Energy Plan was issued in 2007. The purpose of the Virginia Energy Plan is to “chart a path forward that will provide for reliable energy supplies at reasonable rates and increase the use of conservation and efficiency measure in Virginia. The Plan has been developed in accordance with 2006 legislation (Title 67 of the Code of Virginia) that set out energy policy statements and objectives and directed the Department of Mines, Minerals and

²⁴ from the State Corporation Commission website: <http://www.scc.virginia.gov>

Energy (DMME) to develop a ten-year state energy plan.”²⁵ The Plan is to be updated every five years, and updates will be available on the DMME website at www.dmme.virginia.gov.

The plan establishes four primary goals for Virginia:

1. Increase energy independence, with an emphasis on conservation and clean fuel technologies, by:
 - Reducing the rate of growth of energy use by 40 percent. This will reverse the projected growth in per capita energy use and result in a nearly level per capita energy use per year.
 - Increasing Virginia’s indigenous energy production by 20 percent.
2. Expand consumer energy education to overcome barriers to implementing energy-efficiency and conservation actions.
3. Reduce greenhouse gas emissions by 30 percent by 2025, bringing emissions back to 2000 levels.
4. Capitalize on economic development opportunities through business expansion and increased research and development in areas of strength, including alternate transportation fuels, nuclear technology, coastal energy production, and carbon capture and storage.²⁶

The Mid-Atlantic Regional Council on the Ocean (MARCO) is an effort that in June 2009 brought together governors from New Jersey, New York, Delaware, Maryland, and Virginia to coordinate state action on coastal issues. The governors identified four categories of action, with specific objectives for each (see the *Ocean Resources* Assessment section for additional information, as well as the website: www.midatlanticocean.org).

The MARCO objectives for offshore renewable energy are: 1) Develop and finalize shared research and monitoring protocols for assessing the construction and operations impacts of energy development on ocean and coastal resources, and identify appropriate opportunities for integration into permitting conditions. 2) Define regulatory steps, time frames, and potential barriers to the development of the region’s offshore renewable energy resources and identify appropriate coordinating measures. 3) Complete a comprehensive offshore use map and decision-support tool to facilitate siting of renewable energy projects to minimize adverse impacts to other ocean users and ecological communities.

Additionally, there is an Ocean Policy Task Force under the Council for Environmental Quality which is interested in federal policy through regional partnerships, and MARCO is participating in this effort by participating in conference calls and commenting on the “Interim Framework for Effective Coastal and Marine Spatial Planning.”

The Governors of Virginia, Maryland, and Delaware have signed a Memorandum of Understanding to create a partnership called the Mid-Atlantic Offshore Wind Partnership to

²⁵ From the Virginia Energy Plan

²⁶ From the DMME website: <http://www.dmme.virginia.gov/vaenergyplan.shtml>

cooperate on issues related to development of offshore wind resources and the associated economic development.

As a result of the 2009 Virginia General Assembly House Bill 2175, the Department of Environmental Quality (DEQ) is developing a permit-by-rule for community-scale wind systems less than 100 megawatts without a combustion engine, and a permit for renewable energy media of less than 20 megawatts with a combustion engine. Projects over 100 megawatts undergo a permitting process through the State Corporation Commission. A Regulatory Advisory Panel (RAP) is currently develop the standards for this permit-by-rule, which will establish criteria an applicant needs to meet for constructing and operating a wind energy facility, including environmental and historic resources considerations. The permit-by-rule requirements should be finalized in 2011 after it undergoes an extensive review process. The RAP will develop permits-by-rule for other renewable energy sources after it completes its work on wind; the Panel is addressing land-based wind projects first, and then will address water-based wind projects.

The Virginia Marine Resources Commission (VMRC) currently has a permitting process in place for wind projects based in state waters, although there are no wind energy projects currently located offshore in Virginia. This VMRC permitting process includes a review by the US Army Corps of Engineers.

VMRC is conducting a statutorily-mandated (SB1350) mapping and leasing study for renewable energy located in state waters. SB1350 requires VMRC to determine if areas of state-owned submerged lands are suitable for wind energy development. The bill also provides VRMC with the authority to lease subaqueous lands for the purpose of generating electrical energy from wave or tidal action, currents, offshore winds, or thermal or salinity gradients, and of transmitting energy from such sources to shore. The bill requires that any leases require a royalty to be appropriated to the Virginia Coastal Energy Research Consortium (VCERC). Specifically, the bill directs VMRC to:

- Identify 100 acres suitable for use by the VCERC as a research site; and
- Determine whether sufficient and appropriate subaqueous land exists in state territorial waters to support the generation and transmission of electrical or compressed air energy from offshore wind;
- Consult with the VCERC, other state agencies, conservation and industry representatives, and other interested parties, as appropriate;
- Identify areas where resource and use conflicts would preclude offshore wind development;
- Identify and evaluate other potential resources that require further analysis in remaining areas to determine suitability for offshore wind development;
- Develop leasing and permit requirements.

The Virginia CZM Program has been assisting VMRC with this study by providing GIS support. The findings of this VMRC study will be presented to the Virginia General Assembly in the spring of 2010.²⁷ Any update here?

Program Guidance

In 2008, the Virginia General Assembly added the Virginia CZM Program to the Board of Virginia Coastal Energy Research Consortium's (VCERC). See the section below under *Research* for information on the activities of VCERC around renewable energy.

Virginia Senate Bill 262, which enacted the Virginia Energy Plan in 2006, assigned the Department of Mines, Minerals and Energy (DMME) responsibility for developing a numerical scoring system to help evaluate the suitability of specific sites within the Commonwealth for wind and solar energy systems. The Virginia Renewables Siting Scoring Systems (VRS3) was consequently designed by researchers at James Madison University for use by government decision makers in Virginia to aid land use planning related to wind and solar energy. According to the VRS3 website, although developers, private citizens, businesses, and non-profit groups may use the VRS3, the features and methods of these tools are designed to facilitate land use planning and land use decision-making.²⁸ This tool was released in May 2009, with a training for Planning District Commission staff members; researchers will examine how the tool is being utilized in the coming months.

The U.S. Fish and Wildlife Service is currently drafting a guidance document regarding wildlife issues at wind energy projects. The Virginia DEQ is considering this guidance as they are developing the permit-by-rule regulation for wind energy projects.

Comprehensive siting plan (including SAMPs)

See the Assessment areas *Special Area Management Plans* and *Ocean Resources* for additional information on comprehensive siting and marine spatial planning.

Mapping or GIS

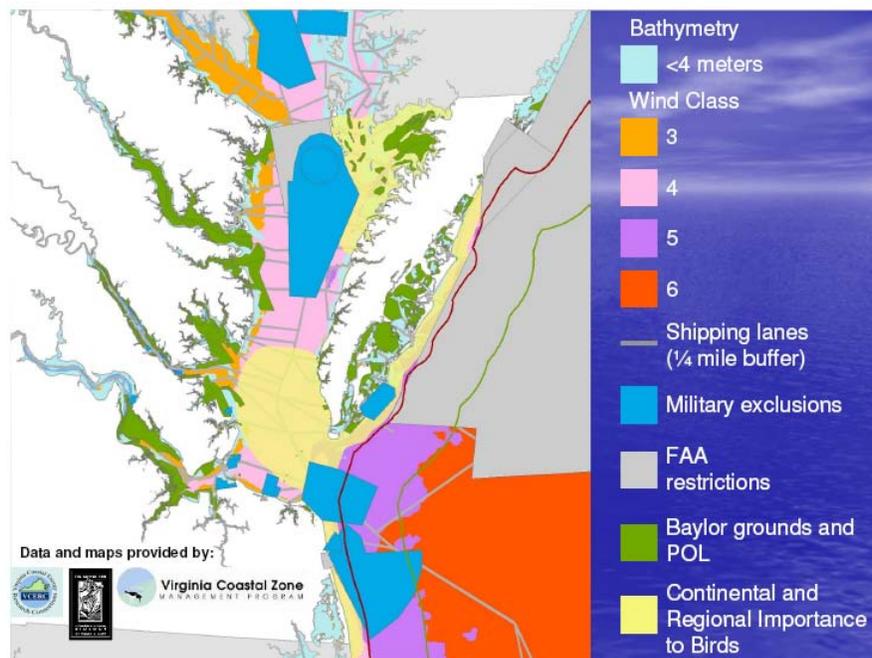
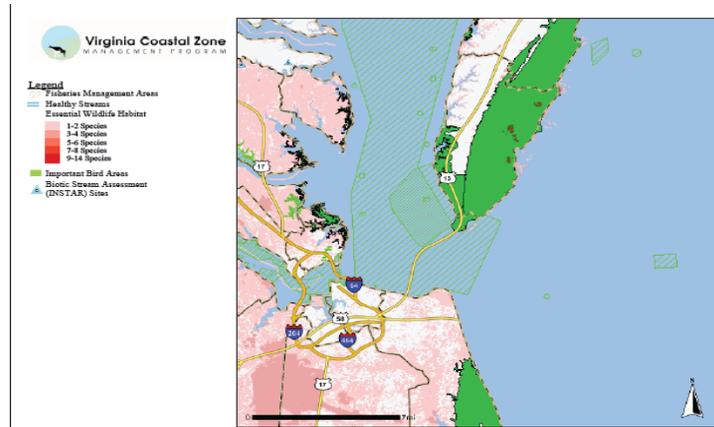
“Wind areas” (areas with high potential for wind power) have been identified by the Virginia Wind Energy Collaborative housed at James Madison University which has been gathering information on wind speed for several years. Funded by the DMME, the Wind Energy Collaborative created wind maps depicting areas in Virginia with high wind potential.

The Nature Conservancy has been active with coastal mapping as well as with mapping ocean resources. The Virginia Coastal Energy Research Consortium (VCERC) is working to create an interactive online GIS mapping tool for public use in partnership with James Madison University, Virginia Institute of Marine Science, Old Dominion University and Virginia Tech -

²⁷ Information from the Virginia Marine Resources Commission

²⁸ VRS3 website: <http://vrs3.cisat.jmu.edu/index.html>

Advanced Research Institute. The Virginia CZM Program has created extensive mapping resources, including Coastal GEMS, and an example of a GEMS map is below.



This map of offshore wind energy resource considerations was produced by Virginia CZM for a VMRC presentation on SB1350.

Research, assessment or monitoring

There are a number of new areas of research related to Energy and Government Facility Siting in Virginia including:

- The Virginia Institute of Marine Science at the College of William and Mary is conducting research on growing algae in the Chesapeake Bay or open Ocean, as well as other algae research, through STATOIL funding (a Norwegian energy company).

- The Chesapeake Bay Commission issued its “Biofuels in the Bay” report in 2007 which looked at biofuels and water quality in the Chesapeake Bay. The Report suggested that corn-based development could have negative effects, but cellulosic-based biofuels could have positive effects (utilizing wood, grasses, etc.). Poultry waste can be used to generate electricity and for transportation fuels, and research is being conducted at Virginia Tech on this topic.
- Two research projects at Old Dominion University concern the utilization of algae for generating energy: one examines the potential of growing algae in ponds, and another examines algae as a way to clean up nutrients before they pollute surface waters.
- The Hampton Roads Service District is looking at sewage treatment as a way of creating bio-diesel and reducing the need for petroleum. The VCERC has been involved in this research.
- As is mandated in the Virginia Energy Plan, the research focus for the Virginia Coastal Energy Research Consortium (VCERC) is on offshore winds, waves and marine biomass. VCERC is a group created in 2007 by the General Assembly. Their work has been broken down into four major work projects with each project involving multiple universities in a collaborative effort. The topics for research, with links available at the website www.vcerc.org/research.htm, are below:²⁹
 - Feasibility-Level Design and Economic Assessment for a Reference Baseline Offshore Wind Power Project;
 - Preliminary Mapping of Offshore Areas Suitable for Offshore Wind Development, with Identification of Excluded Areas to Avoid Potential Conflicts, and Mapping of Offshore Benthic, Pelagic and Avian Habitats;
 - Evaluation of Economic Development Impact of Commercial Offshore Wind Power Development and Associated Workforce Training and Entrepreneurial Development Needs, and Preliminary Planning for Ocean Test Bed;
 - Feasibility-Level Design and Economic Assessment for a Biodiesel Algae Culture System.

VCERC is also developing comprehensive siting plans for potential sources of renewable energy, and analyzing offshore renewable energy resources. This effort includes modeling the economic viability of offshore wind projects, particularly wind energy sites up to 12 miles offshore. Wind developers are utilizing this research for the potential siting of wind projects in offshore Virginia.

- The Center for Conservation Biology at William & Mary is conducting a Virginia CZM funded project to develop a framework for evaluating the impacts of wind farms on migratory birds.
- Virginia Tech is creating a report on wind and algae potential.
- MARCO has conducted significant research into offshore renewable energy (see the section under *Policies* for additional information).

²⁹ From the website: <http://www.vcerc.org/research.htm>

- NASA is conducting a wind study on turbines at their Wallops Island facility.
- A carbon footprint analysis is being conducted for the Norfolk and Chesapeake region with Dept. of Energy funding in the winter to spring of 2010.
- Old Dominion University has plans to relocate its biofuel research facility from Hopewell to Virginia Beach. This facility focuses on research for algae-based biodiesel; a grant has been applied for that would increase size of the facility substantially.

Education and Outreach

The Virginia Coastal Energy Research Consortium (VCERC) conducts significant education and outreach activities around biomass from algae, renewable energy, and wind and wave energy resources with key stakeholder groups, the public, as well as in school systems. Many have stated that the educational and outreach efforts of VCERC have led to wide-spread support of renewable energy throughout the coastal zone, particularly in the Hampton Roads area where VCERC has examined, researched and addressed issues such as navigation and jet traffic and conducted follow-up outreach efforts.

The Mayor of the City of Virginia Beach has established an Alternative Energy Task Force, which has been meeting since May of 2009 and will finalize its recommendations in 2010. In addition, the City of Virginia Beach created a Green Jobs Task Force working with local schools and colleges to create an Alternative Energy Academy for research and development and training technicians. The focus of the Academy is to increase the regional training and capacity for installing alternative energy systems, including for home energy audits and retrofits. To date, block grants have been received for this program. Finally, the City of Virginia Beach sponsored a workshop for mid-Atlantic offshore wind tech companies in May of 2009.

Other

A reduction in property taxes has been considered in Virginia at the locality level for residential, municipal, or commercial properties that meet LEED or similar green building standards or meet Energy Star standards. This has not yet gone into effect, but an enabling state law was adopted by the 2009 General Assembly.

Priority Needs and Information Gaps

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the CMP and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H,M,L)
<p>1. Research for wind facilities: Need research into both state and federal coastal and offshore waters suitable for wind development, including consideration of potential impacts on habitat, marine flora and fauna, wildlife onshore and nearshore, as well as socioeconomic and infrastructure impacts.</p> <p>Data is needed on bird, marine mammal and sea turtle migration corridors, feeding and nursery areas, threatened and endangered species, and distribution and abundance. This information is needed in the near future, as offshore renewable energy projects are being considered. Avian, fisheries and marine mammal data is particularly important for siting wind farms. Turbines may set up vibrations or electrical fields around cables from offshore wind turbines to land; data is needed around whether they are emitting soundwaves or electromagnetic waves that are disrupting the echo-location capability of marine mammals and fin fish.</p> <p>Exploration for and mapping of cold water corals is needed to ensure their protection.</p> <p>There is a need to develop greater scientific consensus on how to protect wildlife occurring near offshore wind energy projects.</p> <p>There is a need for different sites for longitudinal research and testing of underwater conditions; this research could be co-located at wind testing platforms. Currently, a buoy located near the Chesapeake light tower in state waters is gathering data, but a more robust instrument is needed to gather data. This need is connected to SB1350 regarding assessment of subaqueous lands for suitability for wind resources.</p>	<p>Data</p>	<p>H</p>

<p>Research is also needed into how other coastal states are addressing the siting of offshore wind and other renewable energy projects. (For example, Rhode Island and New Jersey have conducted extensive assessments with contractors for offshore renewable energy projects.)</p>		
<p>2. Regulations for offshore wind: The most advanced scientific research should inform the development of new regulations for offshore wind energy projects.</p> <p>There is also a need to consider local governments and local jurisdictional planning issues as offshore and nearshore regulations are being developed for wind energy projects.</p>	Regulatory	H
<p>3. Research on algae-based fuel: Need additional research into best development methods and potential impacts of algae-based fuel, including its potential beneficial impacts on water quality.</p>	Data	H
<p>4. Research for offshore gas: Need research into ocean areas where offshore oil or gas development could happen and potential impacts on habitat, wildlife onshore and offshore, aquatic organisms, geology, and other related issues.</p>	Data	H
<p>5. Research for both wind and oil/gas facilities: Need to map human uses that may conflict with energy facilities. These include recreational and commercial fishing areas.</p>	Data, Outreach	H
<p>6. Promoting behavior changes: Need to increase energy efficiency and conservation measures across Virginia and in the coastal zone. Efforts by localities are needed, as well as at the state level, to decrease the overall demand for electricity consumption in the state.</p>	Regulatory, Capacity, Outreach	H
<p>7. State Oversight: There is a strong need at the state level for additional capacity to address new energy development across the state and in the coastal zone. A new staff position could provide the coordination and communication needed for new energy facilities, specifically for their impacts on infrastructure, and marine flora and fauna.</p>	Capacity	H
<p>8. Research into national defense conflicts: Need additional research into potential conflicts between military defense radar systems and offshore wind projects, including radar of the Dept. of Defense and the Federal</p>	Data, capacity, outreach	H

Aviation Administration. Research is needed into how other countries are addressing this problem, which could limit offshore wind development.		
9. Research on climate change impacts: Energy and Facility Siting will be strongly impacted by sea level rise (particularly the required coastal infrastructure for renewable energy projects). There is a need to increase data gathering and planning around climate change and sea level rise, including hazard identification and developing tools to relocate and redirect energy and government facility development out of hazard areas. Mechanisms need to be found to offset the cost of redirecting development. Hampton Roads has been identified as the second most vulnerable region in the country to climate change and sea level rise, second only to New Orleans, and this vulnerability needs to be accounted for in the siting of renewable energy infrastructure.	Data, Capacity	H
10. Develop partnerships: Need public and private partnerships, including state investments and infrastructure, to attract renewable energy developers, suppliers and manufacturers to Virginia, and to keep the current momentum going around wind policy development and data collection.	Capacity and outreach	M
11. Training: Need more training or retraining for renewable energy development. The Hampton Roads area offers a good place for this training with its industrial and educational facilities. Industrial and skilled labor that can participate in ship building, repair, and offshore marine work are the same types of labor needed for the anticipated increase in renewable energy development work.	Education, capacity and outreach	M
12. Integration of Research: Examine how wind and algae-based energy areas relate to other areas of the ocean research, such as the work of VCERC. Explore data overlaps in mapping and other resources. Build and expand on The Nature Conservancy's ocean habitats classification and prioritization work.	Outreach, Data	M

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)?

High ✓
Medium
Low

Briefly explain the level of priority given for this enhancement area.

The interagency Coastal Policy Team reviewed and ranked this issue at its February 17, 2010 meeting according to the following criteria: feasibility; importance and appropriateness. Up to 5 points were allotted to each of the three criteria so that a maximum score would be 15. Scores from 0-4.99 are considered low priority; 5-9.99 is medium priority and 10-15 is high priority. Energy and Government Facility Siting received a score of 11.11.

2. Will the CMP develop one or more strategies for this enhancement area?

Yes
No ✓

Briefly explain why a strategy will or will not be developed for this enhancement area.

Energy siting is high priority however; the siting issue of most importance for the next five years is likely the siting of energy activities in marine waters. Therefore this issue area will be addressed as part of a larger marine spatial plan that will allow Virginia to consider energy siting comprehensively along with other coastal water and ocean uses and so has been merged into the Ocean resources Strategy.

<u>2000 Assessment</u>	<u>2005 Assessment</u>	<u>This Assessment (2010)</u>
High <u> </u>	High <u> </u>	High <u> ✓ </u>
Medium <u> </u>	Medium <u> ✓ </u>	Medium <u> </u>
Low <u> ✓ </u>	Low <u> </u>	Low <u> </u>