Federal Policies for Promoting Large-Scale Offshore Wind Energy in the United States

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Introduction

- Offshore wind is a renewable, clean, domestic energy source that is located very close to the high electricity demand along the East Coast of the United States. It is also an abundant energy source: Atlantic offshore wind resources from Massachusetts to North Carolina are capable of producing 330-GW of energy on average (Kempton et al. 2007). Other renewable energy options in this region of the US are limited (Musial and Ram 2010).
- Although over 2-GW of offshore wind has been installed globally over the last twenty years, particularly in Northwestern Europe and in China, no offshore wind farms have been constructed in the US. However, approximately 5-GW of offshore wind capacity has been proposed in US waters (Musial and Ram 2010). Figure 1 shows proposed projects in the Atlantic Ocean that have a high chance of development since they have advanced in the permitting process.
- East Coast state governments have been very supportive of offshore wind, as they want to generate renewable energy locally and attract manufacturing jobs.
- In his 2011 State of the Union Address, President Obama called for 80% of the nation's electricity to be generated from clean energy sources by 2035 (DOE 2011). The administration recognizes that offshore wind can be an important part of the US clean energy portfolio.

Figure 1
U.S. Offshore Wind Projects Proposed in the Atlantic Ocean

However, major challenges exist for offshore wind development in the US:

- Offshore wind is extremely expensive to develop, and the cost of energy from offshore wind is significantly higher than market prices – double the cost of land-based wind energy.
- The US permitting process in federal waters has been slow and uncertain. DOI is in charge of permitting, but up to twenty other agencies must be consulted in the process. Only one project (Cape Wind) has received all of its permits, and the process took nine years (Musial and Ram 2010).

It is widely recognized that government action is necessary to overcome these hurdles and develop an offshore wind industry in the US on par with the European offshore wind industry.

Yet few publications have focused on US offshore wind policy.
This thesis therefore discusses what the federal government has done, and what more needs to be done, to promote large-scale offshore wind development in the US.

Methodology

- Analyzed academic publications, government, industry, consulting, and non-profit reports, and news articles related to offshore wind development and federal policy.
- Conducted seven interviews with offshore wind experts.

What is the federal government doing to encourage offshore wind development in the US?

Secretary of the Interior Salazar and Cape Wind Associates signed the first lease for offshore wind development on the Outer Continental Shelf (OCS) in October 2010, bringing the US closer to installing the first offshore wind farm in the nation. In addition, several important federal initiatives and policies are currently in place to develop an offshore wind industry in the US. They are described in Table 1.

Table 1
Federal Action to Encourage Offshore Wind Development

Government Action	Description
Streamlining Federal Permitting Process	
Greater collaboration among agencies and different levels of government	Memorandums of Understanding (MOU) signed regarding offshore wind project permitting: • Between 11 coastal state governments and DOI • Between DOI and DOE (DOE 2011)
"Smart from the Start" initiative	DOI initiative to streamline permitting process for offshore wind: • Identifies Wind Energy Areas (WEAs) that appear very well-suited for offshore development and performs an Environmental Assessment for all leasing activities within each WEA • Eliminates several redundant steps in the leasing process • Considers applications to build an offshore transmission line Should shorten permitting process to 5-7 years (DOI 2011)
Executive Order on Stewardship of the Ocean, our Coasts, and the Great Lakes	Requires coastal and marine spatial planning for analyzing current and anticipated uses of the ocean, which will: • Eliminate conflicts over offshore wind siting • Collect, organize, and publicize useful baseline data for environmental assessments • Improve interagency coordination on offshore wind permitting (The White House 2009)
Offshore Wind R&D	
American Recovery and Reinvestment Act projects	$90 million to offshore wind research, includes: • Turbine research and testing facilities, characterizing offshore wind resources, assessing environmental impacts of offshore wind (DOE 2011)
Offshore Wind Innovation & Demonstration (OSWInD) initiative	DOE initiative to consolidate & expand the agency's efforts to promote responsible commercial offshore wind development: • Has identified new research & development activities needed to reduce the cost of offshore wind and reduce the timeline for deploying offshore wind • Announced $50 million available for these R&D projects (DOE 2011)
More Favorable Tax Policy	
American Recovery and Reinvestment Act tax provisions	Allows projects eligible for the Production Tax Credit (PTC) – including offshore wind projects – to instead elect to receive the Investment Tax Credit (ITC) or Section 1603 cash grants (Bolinger et al. 2009)

What future policies and actions are needed to develop large-scale offshore wind in the US?

Greater interagency coordination in the federal permitting process. Though substantial progress has been made in streamlining the federal offshore wind permitting process, experts claim that it can be shortened to 3-5 years if the government continues to make improvements (Ohleth 2011). In particular, interagency coordination when considering individual projects can be improved. It is also critical for agencies to collaborate on coastal and marine spatial planning and in collecting data for environmental assessments.

Additional funding for offshore wind R&D. Innovative turbines that are larger (over 10-MW each), more reliable, and can be used in deep waters (such as floating turbines) are all needed to reduce the cost of offshore wind in the next decade. NREL analysis predicts that technological improvements can bring the cost of offshore wind energy down from 27 cents/kWh in 2010 to 10 cents/kWh in 2020, which would make offshore wind competitive with conventional electricity sources (DOE 2011). It is therefore crucial that the many research and development needs outlined in the DOE and DOI *National Offshore Wind Strategy* receive federal funding.

Investment Tax Credit (ITC) extensions. Industry experts agree that the ITC, which offers developers a credit equal to 30% of a project's costs, is the most essential policy for offshore wind development. They also agree that offshore wind cannot flourish with the current short-term tax extensions, because financing these extremely expensive projects requires long-term planning. The ITC for other renewable energy technologies with high capital costs, such as solar, has been extended until 2016, and offshore wind would benefit from similar long-term extensions (Lanard 2011).

A comprehensive national policy that promotes renewable energy production. A patchwork of state policies exists that helps to make renewable energy competitive with conventional energy sources, but a comprehensive national policy, such as a national price on carbon or clean energy standard, would send better signals to offshore wind developers, investors, and manufacturers.

Conclusions

- Experts predict that a few initial offshore wind farms will be built in the next decade, regardless of federal policy. However, for large-scale development, including domestic manufacturing facilities and innovative technological designs, government action is critical.
- Many first steps to promote the offshore wind industry have been taken, and offshore wind policy has been constantly evolving in the US in recent years. The DOI "Smart from the Start" initiative, DOE OSWInD initiative, Executive Order for coastal and marine spatial planning, and use of ARRA funds to promote offshore wind have been the most important government actions for promoting offshore wind development.
- In the future, favorable renewable energy tax credits, consistent offshore wind R&D funding, and greater interagency coordination in the permitting process will go a long way towards promoting this nascent industry and harnessing this renewable energy resource.

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