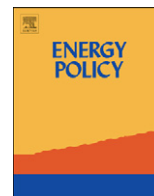




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# Potential role of power authorities in offshore wind power development in the US

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## ABSTRACT

This article examines how power authorities could facilitate and manage offshore wind power development in US coastal waters. The power authority structure is an American 20th century institution for managing energy resources—a form of a public authority or public corporation dedicated to creating, operating and maintaining electric generation and transmission infrastructure. Offshore wind power is characterized by high capital costs but no fuel costs and thus low operating costs. Therefore a power authority, by virtue of its access to low-cost capital and managerial flexibility, could facilitate offshore wind power development by reducing financial risk of developing and lowering debt payments, thus improving the risk profile and lowering the cost of electricity production. Additionally, power authorities can be made up of multiple states, thus opening the possibility for joint action by neighboring coastal states. Using primary and secondary data, we undertake an in-depth analysis of the potential benefits and shortcomings of a power authority approach.

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## 1. Introduction

Wind power is now a major source of renewable energy in the US. As of April 2011, more than 41 GW (gigawatts) of wind capacity has been installed, all of which is on land ([American Wind Energy Association \(AWEA\), April 2011](#)). Utility-scale turbines are now a familiar feature on ridge tops, cornfields, prairie lands and other landscapes in states that are endowed with significant land-based wind resources. Coastal states in the US northeast and southeast until recently have been an exception to the fast expansion of wind developments, because those states lack significant land-based resources. Some of the small existing resource is unlikely to be developed due to conflicting land-uses. Thus, these coastal states naturally look to the possibility of developing their abundant offshore wind resources. Recent resource analysis for the Mid-Atlantic Bight,<sup>2</sup> and Great Lakes region ([Kempton et al., 2007](#); [Dhanju et al., 2008](#); [Adelaja and McKeown, September 2008](#); [Hingtgen, 2003](#)) indicates that offshore wind resource potential is sufficient to meet all the energy needs in the region. Consistent with these developments, a recent report by the US Department of Energy (U.S. DOE, July 2008)

anticipates that offshore wind power will play a major role in the expansion of wind power in the US.

Nevertheless, the promise of bountiful clean energy from offshore wind power could be delayed or forestalled for a number of reasons: early-introduction economics, where wind power has to compete with long established and subsidized conventional energy sources in the open markets ([Environmental Law Institute \(ELI\), September 2009](#); [US Government Accountability Office \(US GAO\), October 2007](#)); high capital costs due to submerged support structures and grid connection ([British Wind Energy Association \(BWEA\), n.d.](#)); localized public opposition to the first proposed facility, spooking developers despite opposition not appearing in other locations ([Firestone and Kempton, 2007](#)) and high operational and maintenance risk in the marine environment ([Fichaux, May 2009](#)).

More importantly, high price of electricity and greater risks make financing of projects more difficult. Reducing the risks and decreasing the cost of financing would substantially facilitate competitive offshore wind power development.<sup>3</sup> One way to achieve this is with a joint effort between industry and government ([Bruijne, March 2004](#)). The public authority structure provides the institutional framework for such an effort.

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<sup>2</sup> The Mid-Atlantic bight is a broad sand and gravel continental shelf extending from Cape Cod to Cape Hatteras.

<sup>3</sup> Additional ways of reducing costs such as technology research and development, and economics of scale through larger production volumes are not addressed here.

Public authorities are a time-tested approach for managing socio-economic projects that have public benefit. It provides the efficiency of a private corporation and the financial benefits of a government agency. For offshore wind power, public authorities as project developers and potentially operators can abate resource development risk, provide access to low-interest financing and promote interstate collaboration.

This article explores the potential role of a power authority, one type of public authority, to facilitate and manage offshore wind power development in the US. The first section of the paper provides background information on the state of offshore wind power in the US and various financial arrangements through which power will be sold. The next section examines the public authority model as an institutional concept, explores its important attributes such as governance and financial mechanisms, and discusses its strengths and weaknesses. It sets the stage for analyzing power authority model for electric generation and transmission. The final section uses qualitative and quantitative data to assess the potential role of power authority model in facilitating offshore wind power development by lowering the cost of capital, reducing the financial risk of developing and operating a wind power project and enhancing regional collaboration among coastal states.

## 2. Offshore wind power proposals and financial arrangements in the US

Although there are no operational offshore wind power projects in the US (as of August 2011) utility-scale projects have been proposed off the coasts of Massachusetts, Rhode Island, New York, New Jersey, and Delaware. All of the proposed projects, with the exception of the Long Island Power Authority (LIPA) and New York Power Authority (NYPA) proposals,<sup>4</sup> can be categorized as Independent Power Producers (IPPs) or Non-Utility Generators (NUGs). A product of 1978 Public Utility Regulatory Policy Act (PURPA) and electric deregulation, an IPP is not an electric utility and has no assigned service territory. Rather, it is a stand-alone entity that owns or operates electric generation facilities. An IPP either services an obligation, that is, a power sales contract with a local utility, or it offloads its generation into the short-term regional wholesale energy markets managed by Independent System Operators (ISOs) or other regional market-making authorities. For example, the proposed offshore wind power project in Delaware by Bluewater Wind will service a binding obligation enshrined in a Power Purchase Agreement (PPA) with the regional electric utility, Delmarva Power. The Cape Wind project off the coast of Cape Cod, Massachusetts, had earlier expressed interest in selling into the New England ISO<sup>5</sup> spot or residual market. As of this date it is in discussions seeking a power purchase agreement with the electric utility National Grid. IPPs that have no sales contract and rely on the spot market to assure a long-term income stream are also known as merchant power plants (Schroeter, May, 2000).

<sup>4</sup> In August 2007, LIPA suspended the proposal for a 140 MW offshore wind farm. In 2009, it revived the proposal for a much larger 700 MW facility in collaboration with Con Edison electric utility and other stakeholders. On December 1, 2009 New York Power Authority issued a Request For Proposal (RFP) for a utility-scale offshore wind project in New York state waters of the Great Lakes. The proposed project will be developed and operated by the successful bidder, and the power authority will purchase the full output of the project under a long term power purchase agreement (New York Power Authority (NYPA), December 1, 2009a, 2009b).

<sup>5</sup> New England ISO is a Regional Transmission Organization (RTO) serving Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont (source: [www.iso-ne.com](http://www.iso-ne.com)).

Allocation of price risk is the major difference between the PPA and the spot market approach. A PPA transfers part of the price risk from the IPP to the electric utility customers, in exchange for stable-priced electricity over the life of the project. The risk of a PPA to the power buyer is the potential for lower future power prices, whereas a PPA mitigates the risk of higher future power prices.

On the other hand, by offering the power output in spot market auctions, the IPP takes the risk of lower future prices, and reaps any benefit of higher future prices. Although one might consider this a reasonable trade, betting that future prices will go up, most large lenders would not consider this uncertainty acceptable for project financing—certainty is required. A public authority dedicated to developing offshore wind resource can hedge and transfer the financial risk, as explained in the following sections.

## 3. Public authorities background

Public authorities emerged in the early twentieth century from the need for greater efficiency in public services. Taking a cue from private corporations, public service reforms in the late nineteenth and the early twentieth century introduced the corporate culture for public projects. The main mission of a corporation is to generate wealth for its shareholders and since corporations are answerable to their shareholders, they are always under pressure to refine their business practices to maximize returns. Through such a structure, corporations symbolize efficient and flexible operations tuned for profit maximization. This was the genesis of the public authority concept, a public entity with a social mission, but the structure and capabilities of a private corporation. It loosely integrates the governance and management of private organization with that of public and non-profit sectors into a unique organizational form. Public authorities are designed to separate politics from administration, yet in a way keep them indirectly accountable to the public. They are expected to be entrepreneurial, yet with a sense of fiscal responsibility.

Jerry Mitchell, an expert on the issue, defines public authorities as “a corporate entity chartered by one or more governments (national, state or local), governed by an appointed board and responsible for various public service functions” (Mitchell, 1992). This definition applies to almost every organization with the name ‘public authority’ and to some organizations that have ‘corporations’ or ‘commissions’ as their names.

The concept of public authority was first practiced in Australia with the creation of the State Saving Bank of Victoria as a statutory corporation in 1841 (Wettenhall, 1985). Thereafter, such entities slowly begin to appear around the world, mostly as part of the local or municipal governance reforms. The Port of London Authority, formed in 1908, was the first public-benefit corporation to use the ‘authority’ name. It was so because nearly every paragraph of its enabling legislation included the phrase, “Authority is hereby given” (Cohen, 1946).

An early authority-like mechanism in United States was the Panama Railroad Company established in 1904 (Mitchell, 1992), but the first American organization to use authority in its name was the Port Authority of New York and New Jersey (PANYNJ), formed in 1921. Its establishment was closely associated with public service reforms undertaken at the time. Effort to introduce private sector business-type management techniques into the public sector was an important aspect of that movement (Leigland, 1994). Quasi-independent government corporations like PANYNJ were portrayed as an ideal way for a government enterprise to realize many of the strengths of business management, including administrative and

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