

**Pennsylvania House of Representatives
Republican Policy Committee Hearing on Wind Energy in Pennsylvania
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**Testimony of Eric Thumma
Director of Institutional Relations
Iberdrola Renewables, Inc.**

Introduction

Chairman Saylor, Energy Task Force Co-Chairs Reed and Pickett, Representative Fleck and members of the Committee, thank you for the opportunity to speak to you about wind energy in Pennsylvania. Our experience in Pennsylvania has demonstrated that wind energy can be a meaningful complement to the state's electricity supply. It can provide cost-effective resource diversification, in a sustainable manner, while expanding the states high-tech job base and positioning Pennsylvania as a leader in the large and growing global marketplace for renewable energy.

Iberdrola Renewables, Inc. is the North American subsidiary of Iberdrola Renovables – the world's largest owner and operator of wind energy. Iberdrola's first U.S. investment was in Pennsylvania when it acquired Delaware County based Community Energy. In 2007, Iberdrola Renewables set-up its first U.S. headquarters in Radnor, Delaware County. This office now serves as the company's eastern development hub and hosts approximately 60 employees. The company owns and operates three wind farms, two in Schuylkill County and one in Somerset County, totaling 162.5 megawatts of capacity. The investments in these wind farms were in excess of \$300 million. We continue to develop projects across the state and look forward to further investments in the Commonwealth.

In reviewing the Committee's Energy Task Force website I find a real symmetry between the characteristics of wind energy and the Task Force's "best strategies." As I will demonstrate further, wind energy is creating well-paying jobs across Pennsylvania today and, with the properly structured policies, can provide for electricity rate stabilization. Further, wind energy is an excellent resource complement to natural gas, which enables variable renewable energy resources, like wind energy, to operate efficiently on the electricity grid.

In our view, the state will benefit from policies which seek to add cost-effective wind generation capacity to the state's electricity resource base. Pennsylvania is unique among states hosting wind farms in that it has a good wind resource, mostly along the various Appalachian ridges, close to significant centers of electricity demand in the middle of the most flexible electricity system in the world. While it is true that Pennsylvania is not the windiest location -- other regions like the Dakotas and the Great Plains have better wind resources -- the lack of high voltage bulk transmission from those regions to centers of electricity demand in the Great Lakes and on the coasts mean that it is often more economical to site wind farms in the relatively windy regions of Pennsylvania (and New York or Ohio for example). For a number of reasons which I will outline more fully below, wind energy is a beneficial, affordable resource for Pennsylvanians. To fully understand wind energy's positive contributions to the electricity system, let's briefly review the history of electricity generation investment in Pennsylvania.

Prior to the passage of Electricity Generation Customer Choice and Competition Act in 1996 -- commonly referred to as electricity restructuring -- investments in electricity generation were made by vertically integrated utilities and paid for through a regulatory approved rate-of-return set by the Public Utility Commission. Most power plants in Pennsylvania recovered their

capital costs via this mechanism. Some others, most notably the state's fleet of waste coal burners, were beneficiaries of a federal mandate which required utilities to purchase their power. As a result, virtually every single power plant in operation today had its capital costs guaranteed either by rate-payers or through a federal mandate. The primary purpose of electricity market restructuring was to promote competition. The act has been tremendously successful in promoting wholesale competition as demonstrated by year on year declines in the fuel-weighted average price of electricity and the enhanced efficiency of many power plants.

However, electricity competition has never properly addressed revenues necessary to promote new investments in the electricity sector. Any new power plant, to achieve revenue adequacy, whether it is a wind farm or a new coal or new nuclear power plant will need to generate revenue above the current wholesale market price of electricity. This is because existing power plants only need a wholesale electricity price high enough to cover their operating costs, while new investments must account for both their operating costs and capital costs. As a result, investments in new technologies cannot properly be evaluated simply by comparing their "costs" to the wholesale price of electricity. Rather, it is important to assess all the benefits a new technology provides for rate-payers. While rate-payers will pay a premium above the wholesale cost of energy – as they would for any new power plants investment – these same rate-payers receive numerous benefits for doing so. The following is a brief summation of the numerous benefits of wind energy:

Investment in the Future: Every good homeowner knows that to maximize the value of their home they need to make new investments from time to time. The electricity system is no different, power plant retirements, the potential for increasing electricity demand, and the

emergence of new technologies make it prudent to invest in new power plant capital over time. Incremental additions to the electricity system are the best way to avoid massive price shocks later.

Resource Diversification: The electricity system is a portfolio of resources. Being overly dependent on any one or two forms can leave rate-payers susceptible to fuel price shocks and volatility. Because renewable resources like wind energy do not have any fuel costs, they have the potential to help stabilize prices over the long-run.

Wholesale Electricity Price Reductions: Competitive wholesale electricity markets, like any other commodity market, set prices based on the most expensive resource necessary to meet demand. Because wind energy has very little operational costs and no fuel costs, it is among the cheapest resources to run. This potentially reduces wholesale prices by making it unnecessary to dispatch more expensive resources with higher operational and fuel costs.

New Jobs and New Markets: Investments in wind energy do create jobs. Our senior developer tracked the number of jobs created for three projects he worked on (some predate his joining Iberdrola Renewables). For a typical approximately 30 megawatt project on which he worked, he found that on average 86 jobs were created throughout the design and development process; 157 through the approximately one year construction period, and; three to four full time operations and maintenance personnel. Note, however, that these projects are in rural areas and so these job numbers represent very meaningful investments in these communities.

Pennsylvania's economy is also benefitting from its leadership role in the wind energy supply chain. According the American Wind Energy Association's survey of wind supply chain

participants there are now 4,000 Pennsylvanians directly involved in jobs supporting the wind industry, ranking Pennsylvania fifth in the nation in wind energy related jobs.

As the global market for clean power continues to inexorably grow, Pennsylvania will benefit through a continued leadership role in wind energy supply chain and manufacturing. Wind energy, like biotechnology, advanced manufacturing, and health sciences – new fields embraced by Pennsylvanians since deindustrialization -- represents a new, continually growing field of endeavor in which Pennsylvania can continue to lead.

Local Economic Development: A wind farm often represents a major investment in a rural community. In many cases a new wind farm will become that community's largest taxpayer. For example, over their expected 20 year lifetime the Locust Ridge I and II wind farms in Schuylkill County will pay \$8,000,000 in local taxes and provide \$15,000,000 in local landowner payments. We estimate that the Casselman Wind farm in Somerset County will provide \$7,500,000 in local taxes, and easement and landowner payments over its twenty year lifetime.

Sustainability: The history of energy production demonstrates an inexorable move to cleaner and less impactful technologies. Wind energy, while not without impacts, is one of the least impactful forms of electricity generation. Wind energy does not require any fuel extraction or waste disposal; it has no air pollutant emissions, does not use any water for cooling or other purposes, nor does it potentially pose long-term or perpetual environmental liability concerns. Further, the relative ease with which wind projects can be decommissioned after their useful life means that the aesthetic impacts to the landscape last only for the lifetime of the project during which it is producing electricity to help meet society's energy needs.

In the Northeastern United States and in Pennsylvania, some wind farms have led to bat mortality. Iberdrola Renewables is very concerned about these impacts and has partnered with Bats Conservation International to study the effects of wind turbines on bats at our Casselman site. To date, the results of our adaptive management strategy, which curtails certain high risk turbines at times of high bat mortality risk, is reducing the rate of bat mortality by 70 percent. The company has also implemented an Avian and Bat Protection Plan, the first of its kind in the industry, in which we perform pre- and post-construction monitoring at all of our sites even if it is not required.

Wind farms sited in Pennsylvania are subjected to rigorous environmental requirements. The state permitting process ensures that wind farms are not adversely impacting state or federal listed or threatened species or plants, guard against invasive species and requires no impact to water quality. None of Iberdrola Renewables three Pennsylvania wind farms has negatively impacted water quality in their host watersheds. Wind farms are the cleanest, least environmentally disruptive utility-scale electricity generation resource.

Reliability and the Natural Gas Nexus: Some opponents of renewable energy have claimed that wind energy's variable nature – wind turbines only operate when the wind blows – could lead to reliability concerns. To date, there has not been a single electricity reliability issue caused by a wind farm in PJM (the operator of the regional electricity grid). Before explaining how PJM integrates wind energy into its large, robust transmission grid let me clarify a few facts about wind energy's contributions to the electricity system.

In Pennsylvania, a wind farm will be generating at least some power approximately 80 percent of the time and will generally achieve about 30 percent of its maximum-rated capacity

over an annual period. Given this variable nature of wind energy, how does the grid operator ensure reliability? PJM has a series of power plants dedicated to balancing supply and demand. These are called reserve generators. The electricity system has always dealt with fluctuations in supply and demand, whether caused by variable hydroelectric resources on the supply side or electric arc furnaces on the demand side (these are just two examples of resources which have historically affected fluctuations in electricity supply and demand). When wind speed drops PJM simply calls on one of these reserve generators to provide more power, when the wind farm ramps up, those reserve generators are backed down. There is an entire market and set of operating rules regarding reserve units and wind generators pay the costs when these units are called upon to meet fluctuations in wind energy output. A large, diverse control area such as PJM can easily integrate several thousand megawatts of wind energy without any concerns regarding electricity reliability.

Pennsylvania's Marcellus Shale resource can be an excellent complement to wind energy. In most cases, reserve units use natural gas, thus Marcellus Shale could essentially become the reserve or "storage" fuel which complements Pennsylvania's wind energy resource.

Cost: How much does wind energy cost? Many renewable energy "critics" point to its "high cost" as a reason not to pursue public support for establishing a reasonably meaningful amount of renewable energy, including wind power, on the grid. There is a cost for wind energy. It is the incremental difference between the wholesale price of electricity and cost of fully paying for the new capital investment required to build a wind farm. This "price" is embodied in the Alternative Energy Credit used for compliance with Pennsylvania's Alternative Energy Portfolio Standard.

Recently, there have been contradictory studies examining the cost of renewable energy. However, we examined a likely “real world” scenario, based on experience in the market, to give this committee some idea of the additional cost of moving from the state’s current 8% renewable energy requirement to the 12% requirement found in House Bill 2405 (please note that I am not addressing solar costs which is a separate requirement). In one scenario, we assumed that the price premium for meeting the HB 2405 incremental increase was \$20 per MWh. This would cost the average Pennsylvania consumer \$0.45 per month or \$5.46 per year. A more expensive scenario examined the cost impacts of a \$30 per MWh price premium. In this case, the costs would be \$0.68 per month or \$8.19 per year. These price premiums, in our experience, are reasonable scenarios for ascertaining future costs as they represent AECs prices we have experienced as necessary for economically constructing new wind farms.

Please note that these future costs are, in our view, conservative as they do not account for potential increases in wholesale electricity costs due to the incorporation of new coal or nuclear power plants, increases in electricity demand, or potential carbon pricing. Nor do these scenarios suggest a relative decline in the capital costs of constructing a new wind farm. It is reasonably conceivable that increases in wholesale electricity prices, coupled with falling capital costs, could lead to lower costs for wind farms in the medium-term.

Furthermore, at least one study, conducted on behalf of the New York State Energy Research and Development Authority (NYSERDA) has shown that reductions in wholesale electricity prices were six times greater than the cost of incorporating approximately 1200 MWs of new renewables, including large amounts of wind energy, on their grid.

Wind energy is an affordable resource with upfront capital costs comparable to new coal or nuclear power plants, even before accounting for all environmental externalities. Supporting wind energy is an investment in Pennsylvania's future and a key element in the state's continued leadership in expanding global fields such as biotechnology, advanced manufacturing and health sciences. The benefits of wind energy, relatively low cost, potential to reduce wholesale electricity prices, local and regional economic development, and incomparable environmental sustainability, make it a preferable resource for diversifying our electricity system.

Pennsylvania's groundbreaking Alternative Energy Portfolio Standard, passed with bipartisan support in 2004, has led to hundreds of millions of dollars of investment in the state's economy and put the Commonwealth at the forefront of a vast and rapidly expanding global market for renewable energy. As noted earlier, wind energy is consistent with the Task Force's stated best strategies, and we respectfully encourage the Committee's continued support for wind energy.

Recommendations

Before concluding I have a few policy recommendations for the Committee's consideration:

- The Alternative Energy Portfolio Standards Act of 2004 provided an outstanding framework and impetus for investments in renewable energy. There are a few opportunities to further enhance the value of this legislation.
 1. A number of nearby states with which the Commonwealth is competing for renewable energy investments now have higher renewable energy standards,

including New Jersey, 17.88 percent ;Ohio, 12.5 percent, and; Illinois, 23.5 percent. Passage of HB 2405 will enable Pennsylvania to maintain its national leadership in renewable energy, while providing utilities until 2014-15 to begin meeting the increased non-solar Tier I requirements found in the bill.

2. As mentioned above, because wind energy has no fuel costs, power pricing can be provided without any fuel cost adjustment. This enables wind energy to be sold long-term for a stable price. We strongly encourage both legislation, as found in HB 2405 and policies at the Public Utility Commission level, which enable consumers to benefit from the long-term price stability potential of wind energy.

I thank the Committee for the opportunity to testify before you today. Iberdrola Renewables, Inc. is proud to be a Pennsylvania business and corporate citizen. We look forward to making many more investments in Pennsylvania's energy future. I would be pleased to answer any questions at this time.