

**Testimony of
Daniel Griffiths, Deputy Secretary
Department of Environmental Protection
Before the House Minority Policy Committee
Wind Energy
Friday, June 11, 2010**

Thank you Chairman Saylor and distinguished members of the committee for the opportunity to discuss the opportunities that can be realized from wind energy.

Aside from the environmental and public health benefits that wind energy brings to Pennsylvania, there can be little doubt that our investments in alternative energy resources like wind will become increasingly important in the future success of our economy and protection of national security.

At present, there are 2,292 megawatts (MW) of wind operating in the PJM Interconnection. (PJM, or the Pennsylvania-Jersey-Maryland Interconnection, is the company that operates our electric transmission grid and is responsible for both electric reliability and management of the regional wholesale electricity market.) In 2003, Pennsylvania only had five wind farms that were generating more than 34 megawatts of power annually – enough to power around 9,000 homes. But now, in 2010, Pennsylvania has 16 wind farms that generate more than 748 megawatts of power, adding 388 megawatts of capacity in 2009 alone. The state has increased the power generated by wind by more than **2,200** percent – enough to power about 190,000 homes annually.

Wind Creates Jobs

The localized nature of most renewable energy technologies lend themselves to a large amount of job creation. The commonwealth has considerable experience with companies like Gamesa and Iberdrola that employ hundreds of Pennsylvanians in their manufacturing operations. In addition, dozens of companies manufacture components for wind turbines.

The cost of building wind should no longer be looked at as an economic burden since these costs compare favorably to most other generating sources like biomass, coal or nuclear where, in 2009, the base cost per installed kilowatt was upward of \$3,400.

In late February, Governor Rendell announced \$22.8 million in American Recovery and Reinvestment Act funds through the Green Energy Works! Program to Gamesa, Iberdrola Renewables, and Broad Mountain Wind Energy Center for three large-scale wind projects that will: Create or retain 387 temporary and permanent jobs (240 temporary/147 permanent); Leverage \$200 million in private investment; Produce enough electricity to power more than 32,000 homes; and Reduce carbon dioxide emissions by more than 450 million pounds annually — the equivalent of removing 39,000 passenger vehicles from the road.

Renewable energy projects like these create more jobs than fossil fuel energy projects. A 2010 article in the peer reviewed journal Energy Policy concluded that non-fossil fuel technologies such as renewables create more jobs per unit energy than do fossil fueled plants like coal and natural gas.¹

Wind Saves Consumers' Money

As of January 1, 2011, all customers of regulated electric utilities in Pennsylvania will be paying for electricity that is priced at market rates determined in the wholesale energy market that operates throughout this region. The wholesale market operates under rules that ensure that the lowest cost generators available are the ones that run. Only when reliability considerations require otherwise, does more expensive generation operate before less expensive plants. The important principle here is economics and only when wind is reasonably priced, compared to all other options, will wind operate. Obviously, when it does not operate, wind does not make money so there is a market discipline ensuring that wind operates cheaply or not at all. The corollary to this is that wind consistently sells into the wholesale market so it must be reasonably priced.

In that wholesale market, when new, low cost generation runs ahead of existing, high cost generation, wholesale market prices go down. Demand can then be satisfied by an expanded supply of low cost energy and it is simply not necessary to buy the most expensive energy. This is a real phenomenon and is well supported by a variety of experience and market analyses. For example, a 2009 study by PJM Interconnection examined what would happen if 15,000 MW of new wind generation were added to the power pool.² The result was a reduction in wholesale electricity prices of between \$4.50 and \$6 per megawatt-hour. This translates into an annual electricity cost reduction for Pennsylvania of at least \$675 million or a market-wide reduction of \$3.55 billion to \$4.74 billion. In fact, study after study has concluded that increasing the amount of wind generation will serve to lower electricity prices.³ Wind by its operational nature pushes down wholesale market prices thus reducing consumers' costs.

An additional benefit of wind energy is price stability. For example, over the past decade, natural gas prices have ranged from \$2.50 to \$14. Likewise coal prices have ranged from the \$30 range to well over \$100. We hope that such economically disruptive volatility is not common in the future but the history is one of significant price volatility for fossil fuels. In contrast, wind generation has no fuel cost and thus can offer prices into the wholesale market that are always closer to the bottom.

Reliability is Not Affected by Wind

We can be confident that wind energy will not impact reliability of our electric grid. Under federally approved rules, all large wind generators must interconnect with the federally regulated bulk electricity grid. They may not interconnect until the regional grid manager, PJM Interconnection, LLC, is satisfied that the interconnection will have no detrimental impact on reliability. If reliability impacts are identified, then the interconnecting generator must fund all grid upgrades needed to ensure there are no negative reliability impacts. Also, when discussing and comparing the role of different kinds of electricity generation in maintaining reliability, a first principle is that no technology operates all of the time. Every technology has its own operating characteristics and operates more or less often due the forces in the wholesale markets. PJM continually balances all generating sources to exactly meet customer demand. This ensures that failures almost never happen. If reliability is ever an issue because of wind, the grid operator will dispatch other resources instead and wind will be out of the market.

Another issue on the subject of reliability is the assertion that the intermittent production from wind generation requires the construction of large amounts of natural gas-fired

generation to serve as a backup. In response, I point to significant examples of wind energy being integrated into the grid without causing reliability issues. For example, Iowa is second in the U.S. with 3,670 MW of wind capacity installed as of the end of 2009, and leads the nation with wind power accounting for 17 – 20 percent of the electricity generated in Iowa as reported by the Iowa Utilities Board.⁴ This is without supply disruptions. In another example, Germany has installed over 25,000 MW of wind generation without undermining electric reliability and without finding it necessary to construct significant non-wind resources as a backup.

Subsidies

Renewable energy technologies such as wind are able to work economically with traditional sources of energy such as coal and natural gas. Unfortunately, a significant portion of the costs of fossil fuels do not actually appear in the direct cost that we pay to use them. The cost of increased air pollution and greenhouse gases, the effects of mining on our lands and the effects of catastrophic events like we are experiencing in the Gulf of Mexico are very real. They constitute a significant burden to citizens, both monetary (such as clean-up and healthcare) and as an impact on our environment and way of life. It just is not reasonable to compare fossil fuels to wind and not include these additional effects in that discussion.

Currently, fossil fuels get significantly more public subsidies than do renewables like wind power. A 2009 study by the Environmental Law Institute found that from 2002 to 2008, subsidies to the well established fossil fuel industry totaled over \$72 billion. This is in contrast to the \$29 billion which was received by the developing renewable energy industry. Additionally, over half of this \$29 billion for renewables was slated for the corn-based ethanol industry leaving \$12 billion for other renewable technologies such as wind.⁵

Conclusion

To sum up my primary points for today's hearing, wind creates jobs, lowers consumer prices and does not generate pollution. Wind is an increasing factor in Pennsylvania's economy as it brings a variety of jobs, including high value manufacturing jobs, to the state. Wind reduces overall costs of wholesale electricity by running instead of higher cost resources. Finally, wind does not create air and water pollution or produce wastes that must be disposed of. Nevertheless, wind is subject to permitting for its environmental impacts on land and water during and after construction. In this regard, Attachment A lists the various permits that wind farms may be required to secure. In addition, local governments retain the authority to make final decisions regarding the siting of wind.

Thanks you, again, for the opportunity to speak to you today.

Attachment A

Summary of DEP Process and Regulations Related to Wind Farm Development

The Department follows permitting procedures for wind just as it does for other significant construction projects. I must emphasize that DEP permitting focuses on impacts rather than entities. For wind farms, the likely impacts are those on water quality and wetlands. Generally, these impacts occur mainly from road building and construction. DEP permitting activities occur at the Regional Office covering the area where the project will take place.

Erosion and Sediment Control (from Pages 262-264 in DEP Permits Guide) -

Anyone proposing to discharge stormwater from construction activities disturbing five acres or more of land must apply for and receive an NPDES Permit for Stormwater Discharges Associated with Construction Activities (NPDES Construction Permit).

- The permit requires the development, implementation and maintenance of erosion control best management practices and are set forth in an erosion and sediment control plan.
- For construction activities requiring earth in special protection watersheds, and individual NPDES Construction Permit must be obtained. Individual permit processing is delegated to most county conservation districts; however, the regional office issues the individual permits.

Water Obstruction and Encroachment and Wetlands (from Pages 311-312 in DEP Permits Guide)

- Persons planning to construct, operate, maintain, or enlarge any water obstruction or encroachment that will affect a waterway, its 100-year floodway or any lake, pond, reservoir, or wetland must obtain a DEP permit. The type of general permit is related to the proposed activity (selected activities that may relate to wind development are listed below):
 - GP-05 Utility Line Stream Crossings
 - GP-07 Minor Road Crossings
 - GP-08 Temporary Road Crossings

NOTE: Other DEP permits may be necessary. It is essential that the DEP Regional Office where the project is to take place be notified of all potential environmental impacts.

Policy for Pennsylvania Natural Diversity Inventory (PNDI) Coordination During Permit Review and Evaluation – DEP Document # 400-0200-001

- DEP revised policy guidance in April 18, 2009 that relates to how wind farm developers, and other applicants for DEP permits, authorizations, and plan approvals, must interact with PNHP prior to DEP signing off on a permit. As part of a normal permit application, the applicant or consultant shall include documentation showing that he or she completed an online PNDI Environmental Review (or submitted a “Large Project” review request) and attempted to resolve any conflicts with the required agencies before submitting the permit application to DEP. Information on the Pennsylvania Natural Heritage Program and the

online PNDI Project Planning Environmental Review website is available at: <http://www.naturalheritage.state.pa.us/>. DEP and County Conservation staffs are responsible for ensuring that the PNDI review has been completed. If potential impacts are identified, and the clearance or recommendation letters from the appropriate jurisdictional agencies contain Avoidance Measures, the PNDI review is not complete or satisfied unless the applicant has initialed indicating that they can and will fulfill the Avoidance Measures for that project. The policy contains other information relative to procedures and approvals.

- Description of Processes - Initial permit applications should be made to the DEP regional office covering the area where the project will take place. The Assistant Regional Director is the primary initial point of contact.
- Statutory Authority (links)

Erosion and Sediment Control

The Clean Streams Law, Act of Jun. 22, 1937 (P.L. 1987, No 394), as amended, 35 P.S. §691.1 et seq.

The Clean Water Act, 33 U.S.C. §1251 et seq.

Water Obstruction and Encroachment and Wetlands

Dam Safety and Encroachments Act, Act of Nov. 26, 1978 (P.L. 1375, No. 325) as amended, 32 P.S. §693.1 et seq.

The Clean Streams Law, Act of Jun. 22, 1937 (P.L. 1987, No 394), as amended, 35 P.S. §691.1 et seq.

Flood Plain Management Act, Act of Oct. 4, 1978 (P.L. 851, No 166), 32 P.S. §679.101 et seq.

- Regulations

Erosion and Sediment Control

DEP's Erosion and Sediment Control Rules and Regulations, 25 Pa. Code Chapters 92 and 102.

40 CFR §122.26 (NPDES – Construction)

Water Obstruction and Encroachment and Wetlands

25 Pa. Code Chapters 105 and 106.

For information relative to permitting of specific projects, contact the DEP Regional Office where the project is to take place. Appendix A, Page 1 of Appendix A in the Guide to DEP Permits and other Authorizations has contact information for DEP Regional Offices.

End Notes

¹ **Energy Policy (2010)** – *Putting renewables and energy efficiency to work: How many jobs can the clean energy industry generate in the US?*

² <http://www.pjm.com/~media/documents/reports/20090127-carbon-emissions-whitepaper.ashx>

³ A New York State Energy Research and Development Authority (NYSERDA) analysis of New York's AEPS estimates that the reduction in wholesale electricity prices from the addition of renewable energy resources in 2010 is likely to be approximately \$2/MWh (0.2 cents/kWh).

A 2009 study by Tudor, Pickering, Holt, & Co., Energy Investment & Merchant Banking, of the impacts of wind generation estimated the addition of 6,500 MW of wind **reduces the marginal price of peak power** by \$20/MWh (24%), and \$15 off-peak (25%).

A 2008 academic study, "**The merit-order effect: A detailed analysis of the price effect of renewable electricity generation on spot market prices in Germany,**" published in the peer reviewed journal Energy Policy, quantified the magnitude of the suppression effect in Germany as \$1.3 Billion in 2001 and \$6.5 Billion in 2006. More importantly, the study reported that the value of the suppressive effect exceeded the cost of the renewable energy subsidy – "In the case of the year 2006, **the volume of the (suppressive) effect exceeds the volume of the net support payments** for renewable electricity generation...."

A 2008 academic study, "**Analyzing the impact of renewable electricity support schemes on power prices: The case of wind electricity in Spain,**" also published in the peer reviewed journal Energy Policy, argues that "... The case of wind generation in Spain shows that this reduction is greater than the increase in the costs for the consumers arising from the (renewable energy) support scheme (the feed-in tariffs), which are charged to the final consumer. Therefore, **a net reduction in the retail electricity price results. This provides a meaningful consumer benefit.** This provides an additional argument for RES-E support and contradicts one of the usual arguments against RES-E deployment: the excessive burden on the consumer.

⁴ http://www.state.ia.us/government/com/util/energy/wind_generation.html

⁵ http://www.eli.org/Program_Areas/innovation_governance_energy.cfm