Clean Air Council of New Jersey

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PJM Interconnection

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Good morning Chairman Bielory, Vice-Chairman Hanna, and members of the Council; thank you for inviting PJM to participate in today's hearing. My name is Sean McNamara and I am manager of Regulatory and Legislative Affairs at PJM with responsibilities in the State of New Jersey. Today's hearing is focusing on the need to balance the mix of electric generating options in New Jersey to improve air quality and address climate change. PJM agrees that air quality and climate change are significant issues that need to be addressed. We appreciate the work the Clean Air Council is doing to help New Jersey address these problems and we agree to work with the Council and New Jersey on improving both of these areas.

PJM is the regional transmission organization serving all or part of 13 states and the District of Columbia. Our job is to ensure reliability of the bulk power grid and operate a competitive wholesale market for electricity serving more than 50 million Americans. We do this by operating the electrical grid to meet the highest level of reliability standards, administering a Day-Ahead and Real-Time Market for electricity, and planning the long-term adequacy of the bulk power system.

PJM's number one priority, and the priority that drives all of the decisions it makes, is reliability. In order to ensure that the transmission system remains reliable, PJM uses an open process called the Regional Transmission Expansion Plan (RTEP) to study the transmission system to identify what changes or additions to the grid are needed to ensure reliability and the successful operation of the wholesale markets. As the Federal Energy Regulatory Commission (FERC) approved Regional Transmission Organization (RTO), PJM's RTEP process covers a region that encompasses more than 164,000 square miles in 13 states and the District of Columbia. PJM's

RTEP process includes both five year and 15-year dimensions. Five-year-out planning enables PJM to assess and recommend transmission upgrades to meet forecasted near-term load growth and to ensure the safe and reliable interconnection of new generation and merchant transmission projects seeking interconnection within PJM. These improvements also accommodate the interconnection of new generating projects onto the grid. The decision to build a new electric generating plant or to upgrade or build a new transmission line is significant since these construction projects are costly, time-consuming and subject to numerous regulatory approvals. At the same time, decisions to add generation or transmission resources cannot be made in a vacuum because these projects affect the overall operation of the grid and its ability to deliver power to customers reliably. The RTEP process systematically and objectively evaluates required transmission upgrades and generation interconnection projects to make sure that compliance with reliability criteria is maintained.

The 15-year planning horizon permits consideration of many long-lead-time transmission options. These options often comprise larger magnitude transmission facilities that more efficiently and globally address reliability issues. Typically, these are higher voltage upgrades that simultaneously address multiple NERC reliability criteria violations at all voltage levels. A 15-year horizon also allows PJM to consider the aggregate effects of many system trends including long-term load growth, impacts of generation deactivation and broader generation development patterns across PJM. This could include reliability issues posed by clusters of

development based on innovative coal or nuclear technologies, renewable energy sources, or proximity to fuel sources[1].

The results of studies performed by PJM staff along with recommended upgrades required to address reliability criteria violations are submitted to PJM's independent Board of Managers (PJM Board) for approval. Once approved, the upgrades become part of PJM's overall RTEP. The independent nature of PJM's board cannot be overstated. This requirement of our Operating Agreement ensures that decisions made by PJM about the transmission system are made without undue influence from PJM members and stakeholders.

As mentioned previously, PJM's RTEP process is holistic. The studies consider multiple inputs including load forecasts, market efficiency analysis , generation projects requesting interconnection to the grid which include renewable generation, generation deactivation and retirements, and demand response and energy efficiency. PJM does not control which types of generation resources are proposed to be built or retired. We do not have a preference for certain types of generation nor do we advocate for certain types. PJM can be considered a generation agnostic or neutral organization.

However, PJM provides the process through which resources are added to the grid and the markets where they can participate. PJM's 2008 RTEP, released on February 27, shows that more than 6500 MW of new generating resources are under construction with another 85,000 MW active in our queues. These generation additions and potential additions improve system reliability and generation supply, as well as the competition with PJM markets. More to the

[1] PJM 2008 RETP – page 1

point of today's hearing PJM is an enabler of diverse generation sources. The RTEP process "offers a structure that assures consistent opportunity for development across fuel types[2]." More than 59,000 MW of renewable technologies are active in our interconnection request process. Interconnection request totals through January 31, 2009 include 55,000 MW of wind generation, 600 MW of methane, 500 MW of biomass and 2,700 MW of hydro[3]. The impacts of these renewable sources of generation cannot be underestimated. As an example, an increased penetration of wind power shows the potential for mitigating wholesale prices while providing significant CO2 emissions reductions. With 15,000 MW of wind capacity installed:[4]

- Wholesale market price reductions of $4.50-6/MWh, translating to reductions in annual market-wide expenditures of $3.55 billion to $4.74 billion
- Displacement of about 43,000 GWh (gigawatt-hour) of fossil fueled generation with about 60 percent of the displaced generation being coal and the remainder being natural gas and oil-fired units.
- CO2 emissions reductions of almost 35 million short tons in the absence of any CO2 price

Given our neutral stance on generation sources and our proven methods to provide a way for diverse generation types to connect to the grid and participate in our markets, PJM should be seen as an enabler of renewable generation sources and encourages the development of more

[2] PJM 2008 RTEP – page 26

[3] PJM 2008 RTP – page 26

[4] Potential Effects of Proposed Climate Change Policies on PJM's Energy Market

renewable sources of electricity. This will not to not only assist New Jersey in achieving its air quality and emissions goals but will also improve the reliability of the grid.

PJM is encouraged by the amount of new generation, particularly from renewable sources, in our interconnection queues. The fact still remains that PJM is a Regional Transmission Organization (RTO). Yes, PJM studies and plans for generation interconnection but it also plan for the upgrade and maintenance of the bulk power transmission system. In total, nearly more than $13 billion in new transmission has been approved by the independent PJM Board since 2000, all of which is in various stages of development. Part of this investment is for the interconnection of new generation and part is for addressing the reliability requirements of the region in light of ever increasing growth in demand for electricity[5].

New Jersey's native load growth over the next ten years is projected to be around 1.6% per year which is down slightly given the downturn in the economy. Even with the downturn, the trend for load growth is still moving upward. To address the growing demand in New Jersey, PJM has identified numerous upgrades and is working closely with the transmission owners that are responsible for building the facilities. Among the more significant upgrades is a new 500 kV transmission line from the Susquehanna substation in Pennsylvania to PSE&G's Roseland substation New Jersey. This line will address 23 overload conditions on 230 kV and 500 kV transmission lines in the New Jersey/Pennsylvania area – making the system more reliable, keeping the lights on in New Jersey.

[5] United States Senate Energy and Natural Resources Committee Testimony of Terry Boston – July 31, 2008

New and or upgraded transmission lines do more than enable traditional sources of generation from reaching loads. Transmission lines also enable renewable sources of energy to reach loads. The fact of the matter is that most of the areas in the United States where renewable sources of energy are located are not near the areas where the energy is needed and makes the case that additional transmission lines are required in order to allow the energy to reach the load. The transmission system in PJM and the rest of the country is at the forefront of public policy as never before. Federal legislation is being considered to build more transmission and proponents like T. Boone Pickens are running advertisements selling their plans to build enormous wind farms which will rely on transmission to be successful.

In order to address the air and climate concerns before the council today, new transmission lines and upgrades will be needed. The Susquehanna-Roseland line proposed for northern New Jersey will not only relieve grid congestion and improve reliability but will also enable clean generation resources both within New Jersey and outside its borders to participate in PJM. We encourage the Clean Air Council to consider, as part of its overall recommendations to the New Jersey Department of Environmental Protection, the need for the development of additional high-voltage transmission.

PJM realizes that new transmission is only one way to meet the growing demand in New Jersey and address air quality and climate change issues. It is no secret that New Jersey is an importer of electricity. In fact, the state imports approximately 40% of the energy it needs to meet its demand. PJM is encouraged that the New Jersey Energy Master Plan (EMP) has recognized the need to build new base-load generation.

PJM supports the EMPs direction of looking at the potential to build an additional nuclear power plant within New Jersey. Building this type of plant will help close the supply/demand gap in New Jersey, decrease the state's need to import energy, improve the reliability of the grid, and reduce electricity prices. Subsequently, while improving the energy situation in New Jersey, new nuclear power will assist the state in meeting its highly aggressive reductions in greenhouse gas emissions and assist in improving air quality. A recent Gallop Poll indicates that there are growing levels of support for nuclear power. The poll found that 59 percent of people favor and 27 percent strongly favor – the increased use of nuclear power.[6]. PJM is encouraged that the New Jersey EMP is acknowledging the need for new base-load generation and that they are considering nuclear. We encourage the Clean Air Council to support the EMPs idea that additional base-load generation is needed in the state and believe that a non-carbon emitting solution, such as nuclear, is one possible approach.

Increased sources of clean generation and new transmission will assist the Clean Air Council in meeting the challenges of improved air quality and the risks associated with climate change. PJM believes that demand response and energy efficiency will also play a very prominent role in the generation mix going forward and suggests that the Clean Air Council give great consideration to demand response resources and energy efficiency when making their recommendations. The best and most cost effective means to reduce emissions and improve air quality is to reduce the amount of load on the system – the cheapest and cleanest MW of energy is the one that is not needed.

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6 http://www.boston.com/lifestyle/green/greenblog/2009/03/support_for_nuclear_power_grow.html

Demand Response is the ability of electric consumers to control their costs and reduce their electric loads, often during times of high congestion and high prices, thus reducing the amount of electricity that must be supplied. Demand response demonstrated its value during a heat wave in early August 2006. Reductions in electricity use produced price reductions estimated to be equivalent to $650 million in payments for energy for the week of the heat wave. On the day, PJM reached a new all-time peak, and demand reductions lowered the cost of electricity by about $230 million. PJM currently has a significant amount of demand response participating within its footprint. There are 4,620 megawatts of demand response committed as capacity resources for the 2008/2009 delivery year that began June 1, 2008.

PJM is working with its members and stakeholders on increasing the use of demand response within its footprint. PJM is looking to develop a price responsive demand product and to put into place the infrastructure to enable it. PJM is also looking to develop a CO_2 displacement certification for implementation in our Generator Attributes Tracking System (GATS) and to increase the participation of demand response resources in our markets.

Energy efficiency is the installation of more efficient devices and equipment or the implementation of more efficient processes/systems meeting the requirements that exceed building codes, appliance standards, or other relevant standards at the time of installation. So energy efficiency is designed to achieve a continuous reduction in electric demand over a sustain period of time. PJM is working to increase energy efficiency across the RTO. Starting with the 2012/13 RPM base residual auction later this spring, energy efficiency can bid into our capacity auction and if selected would receive a capacity payment or revenue stream over a four year period of time.

As part of our testimony, I am submitting a report PJM completed in January of this year entitled "Potential Effects of Proposed Climate Change Policies on PJM's Energy Market". PJM recognizes that legislation to reduce carbon emissions is coming and will have a significant impact on PJM, our members and their customers. This study was undertaken to help inform decisions makers in Washington and elsewhere on how climate control proposals will affect the wholesale market and wholesale market prices.

The study's calculations are based on projected carbon prices within ranges identified by the U.S. Environmental Protection Agency and the Energy Information Administration from $10 to $60 per ton and on typical residential use of 750 kilowatt□hours (kWh) per month.

The study used market models to simulate in 2013 the impact of climate change legislation whereby cap□and□trade or carbon tax policies place a cost on emitting CO2. The year 2013 is examined as the year when major legislative proposals would be effective, and also because it represents PJM's five year planning horizon, where there is a greater likelihood of predicting accurately the planned new generation and transmission system upgrades that will be commercially operational. The report concludes the following:

- Because of region's dependence on coal, 75-80% of carbon allowance prices flow through directly through wholesale power costs
- Translates to potential retail electric bill increases from $72 to $408/year based on carbon prices of $10 to $60/ton respectively
- Because of existing spread between natural gas and coal, fuel switching does not occur until carbon prices reach $40-$80/ton

- As a result, customers see increased prices but emissions are not necessarily reduced

However, the study also shows that a significant mitigation of price impacts occurs through increased demand response and energy efficiency

- A 2% to 10% increase in energy efficiency measures can reduce wholesale prices of up to $18 billion per year across PJM

- A 2% to 10% increase in energy efficiency measures results in 14M to 60M tons of emission reductions in 2013

The desired outcome is that PJM will see a significant increase in the amount of demand response and energy efficiency resources has been offered and selected in our RPM capacity market. These resources will not only increase the reliability of the grid but they also will contribute heavily in the process to reduce greenhouse gas emissions. PJM encourages the Clean Air Council to consider greater levels of demand response and energy efficiency when developing their recommendations.

Once again, PJM appreciates the opportunity to share its thoughts to assist the Clean Air Council in making its recommendations on the future electricity generation mix to the New Jersey DEP. From the testimony provided, PJM believes that reliability needs to be the first consideration given the need of and increasing demand for electricity. Aside from that, a holistic approach is required and should include transmission, new baseload generation, and ever increasing amounts of demand response and energy efficiency. Thank you again for inviting me and I will be happy to try and answer any questions.