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COMMONWEALTH OF PENNSYLVANIA
BEFORE THE PUBLIC UTILITY COMMISSION

JOINT APPLICATION OF PECO ENERGY COMPANY AND PUBLIC SERVICE ELECTRIC AND GAS COMPANY FOR APPROVAL OF THE MERGER OF PUBLIC SERVICE ENTERPRISE GROUP INCORPORATED WITH AND INTO EXELON CORPORATION	:	Docket No. A-110550F0160

DIRECT TESTIMONY

OF

DANIEL DESMOND

Describing Additional Ways to Improve Reliability of Service Through Energy Efficiency and Energy Conservation Programs, Demand Response Programs, Distributed Generation and Micro-Grids

Dated: June 28, 2005

Q. Please state your name and work address.

A. My name is Daniel Desmond. My work address is Pennsylvania Department of Environmental Protection, Office of Energy and Technology Deployment, Rachel Carson State Office Building, 16th Floor, 400 Market Street, Harrisburg, PA 17101-2301.

Q. What position at the Department of Environmental Protection do you hold?

A. I am the Deputy Secretary for the Office of Energy and Energy Technology Deployment at the Department.

Q. Please summarize your professional background and your experience with the Department.

A. I am the Deputy Secretary for the Office of Energy and Technology Deployment. The Office, created in January 1996, works with citizen's groups, businesses, trade organizations, local governments and communities to help them understand and adopt pollution prevention and energy efficiency practices. I am also responsible for fostering the deployment and use of innovative environmental and advanced energy technologies, including renewable energy.

I am also responsible for oversight of DEP's Energy Harvest, Small Business Ombudsman's Office, the Pennsylvania Governor's Green Government Council and Pennsylvania Energy Development Authority staff. These programs provide funding and technical support for a variety of green business and economic development initiatives.

I joined the Pennsylvania Energy Office in 1983 and developed a number of environmental technology initiatives for the agency, and served as its Executive Director until its merger with DEP in 1995. From April 1995 until my appointment in May 2003, I was Chair of the Pennsylvania Energy Resources Center, an advocacy and public

education project that worked to secure funding for renewable energy in the aftermath of utility deregulation. In addition, I was President of Sustainable Systems Research, a Lancaster-based firm specializing in development and commercialization of environmentally beneficial technology.

I am a graduate of the University of Toledo

Q. What is the purpose of your testimony in the proceeding?

A. I have been advised by counsel that in order for the Public Utility Commission to approve this merger, the Commission must find that the merger is necessary and proper for the service, accommodation, convenience or safety of the public. Such a Commission finding must be predicated on a demonstration by the Joint Applicants that the merger will benefit the public in some substantial way. The issue of continued or improved reliability of service is a major consideration in determining whether a merger will benefit the public in some substantial way.

The purpose of my testimony is to identify several aspects of the reliability of service issue that are of interest to the Commonwealth and that the Commission should consider as part of its evaluation of the impacts and benefits of the proposed merger. Although the Joint Applicants have addressed some aspects of the reliability of service issue in their application, there are several key aspects that need to be evaluated in order to determine whether the merger will benefit the public in some substantial way.

Q. Please describe briefly the Commonwealth's interest in ensuring that the proposed merger does not adversely affect reliability of service.

A. Executive Order Number 2002-8 of July 18, 2002 declares that ensuring affordable energy supply is critical to the welfare of Pennsylvania's citizens and to the continued

economic prosperity of the Commonwealth. It further declares that maintaining a diverse and reliable energy portfolio will be critical to minimizing the effects of any single energy source on Pennsylvania's consumers and maintaining a sustainable supply of energy. In addition, providing a reliable supply of energy for local emergency infrastructure is an important consideration in overall efforts to maintain reliable sources of energy. As the executive agency with the powers and duties of the Pennsylvania Energy Office, the Department is concerned whether the proposed merger will affect its efforts to promote reliable sources of energy, particularly for local emergency infrastructure. The Department is also interested in ensuring that the proposed merger does not diminish the reliability of service to Pennsylvania customers and in fact serves to improve reliability and efficiency.

Q. How can the Joint Applicants address the reliability of service concerns?

A. There are a number of ways the Joint Applicants can address reliability issues in addition to those items identified in their merger filing. The purpose of this testimony is to identify additional opportunities to enhance electric system reliability and generate additional public benefits from the merger by means of promoting fuel diversity, micro-grids, demand response programs, distributed generation, and energy efficiency and conservation.

In 2002, the Governor's Interagency Task Force on Energy put forward a number of energy policy recommendations for Pennsylvania. This report was accompanied by Executive Order 2002-8 which directed the Commonwealth's executive agencies to implement the recommendations of the Task Force.

The first series of recommendations sought to "Encourage a diverse supply of energy using both traditional and renewable sources and ensure adequate delivery systems." The report envisioned investments in renewable and alternative energy as vital to complementing traditional energy sources.

Q. Why is the fuel diversity of the Joint Applicants' final energy portfolio an important consideration?

A. The Department contends that reliance on a few sources of fuel for the Commonwealth's energy needs is detrimental to electric system reliability.

DEP is concerned that this merger will lead to the divestiture of assets in Pennsylvania that dramatically reduces the fuel diversity portfolio of the joint petitioners. Under a scenario in which the new company is heavily reliant on one form of electricity generation – such as nuclear – we could envision scenarios in which reliability would be compromised should constraints occur in using that type of fuel. For example, in the nuclear case, challenges arising from waste disposal or safety concerns.

The Governor's Interagency Task Force on Energy recognized that fuel diversity is an important means to combat reliability concerns. We do not know the final form of the company's proposed divestiture, but we encourage the Commission to ensure that the new company continues to invest in a diversity of energy resources, particularly from renewables and indigenous alternatives such as waste coal and coal mine methane. Additionally, the Commission should encourage the company to invest in a diversity of fuels indigenous to Pennsylvania and the United States in order to reduce the potential for price spikes associated with volatile imported peaking fuels such as natural gas or, increasingly, liquefied natural gas. In today's volatile energy market, supply interruptions

are also a possibility. Having a diverse indigenous supply of fuels to generate electric power also reduces the risk of supply interruptions.

Q. What are micro-grids and how do they promote reliability?

A. A micro-grid[1] is a small-scale power generation and distribution network serving multiple customers, with generators near or on the same site as demand. Micro-grids promote reliability by reducing the load on the transmission and distribution system. Micro-grids can be particularly helpful to reliability in areas of high load congestion, by reducing load at points in the transmission and distribution system experiencing heavy utilization.

Q. What are demand response programs and how do they promote reliability?

A. Demand response programs provide electric customers with the opportunity to shift their usage from periods of typically high demand to periods of lower demand and to receive financial compensation for doing so. Demand response programs promote reliability by reducing load during periods of peak usage, thus reducing stress on the transmission and distribution system.

Q. What is distributed generation and how does it promote reliability?

A. Distributed generation refers to electricity generation close to its use. According to the Carnegie Mellon Electricity Industry Center, "Only 31.6% of energy used in electric power generation winds up in electricity, the remainder is given off as waste heat." By locating electricity generation near its use, greater efficiency is promoted. Additionally, distributed generation enhances system reliability by providing opportunities for electric

[1] The Carnegie Mellon Electricity Industry Center defines a micro grid as "...a small-scale power generation and distribution network serving multiple customers, with generators near or on the same site as the customer. Most micro-grids are interconnected with the grid, but can be operated independently when the grid fails."
Carnegie Mellon Electricity Industry Center, "Critical Issues in Pennsylvania: Transmission, Distribution Generation, and Continuing Services when the Grid Fails." Jay Apt and Granger Morgan, July 30, 2004. P. 5.

customers to back-up the electricity grid with small-scale systems on-site. Therefore, during periods of grid failure, or also in concert with demand-response programs, distributed generation can provide back-up power to electric customers or can supplement the transmission and distribution system during periods of peak usage.

Q. How do energy efficiency, energy conservation, demand response programs and distributed generation and micro-grids promote reliability of service?

The Governor's Interagency Task Force on Energy recognized the value of "promoting conservation, efficiency and demand management" and provided eight recommendations for the Commonwealth's Executive Agencies to implement. Providing customers with opportunities to reduce their dependence on the electric system is another means to mitigate electric system reliability concerns. There are a number of methods by which customers can reduce their reliance on a central generation/transmission and distribution electric system. The Joint Applicants' leadership and policy advocacy are critical to ensuring that customers have opportunities to reduce their reliance on the electricity grid, reducing pressure on already stressed transmission and distribution systems and enhancing system reliability.

Energy efficiency and energy conservation, demand-response programs, and distributed generation and micro-grids are all methods by which customers can complement the Joint Applicants' existing reliability efforts.

Customers' electricity needs are reduced through energy efficiency and energy conservation programs. Robust programs for energy efficiency and energy conservation reduce the amount of generation required to meet demand and reduce load on the

transmission and distribution system. These programs can also address important low-income customer concerns while simultaneously providing system reliability benefits.

Demand response programs can complement energy efficiency and energy conservation by reducing load during times of heavy electricity usage. Reducing loads during periods of peak usage also eliminates pressure on the electric system and can reduce the need for additional investments in transmission and distribution, thereby, promoting greater system reliability without expensive additional investments in transmission and distribution.

Implementing distributed generation and micro-grids can also reduce customers' dependence on the electric grid and benefit system reliability. In 2004, DEP commissioned a report by the Carnegie Mellon Electricity Industry Center. The purpose of the report was to identify barriers to the implementation of distributed generation and micro-grids in Pennsylvania and to provide recommendations on options for enhancing reliability and ensuring continuity of operations in the face of grid failures.

The report found that:

- Distributed generation can offer greater efficiency, lower costs, greater reliability, greater security, and reduced need for transmission.
- Distributed generation can also increase power adequacy (the ability to meet power needs), potentially decreasing the magnitude of outages by more than a factor of ten over central generation.
- Micro-grids located in some places could prove highly beneficial to the operation of the legacy distribution system by relieving congestion and providing needed system support.

- The report further clarifies that grouping distributed generators into micro-grids can alleviate any operations issues introduced by distributed generation.

Additionally, distributed generation and micro-grids can provide back up during system outages. "The North American Reliability Council (NERC) lists 533 transmission on generation related outages over the period 1984 through 2004. These are not distribution system losses; users were affected because the generation and transmission system failed. Forty-six of the events, or nearly three per year, are losses of 1000 MW or greater (about the size of the load in the city of Pittsburgh)."[2] The report further notes that it is impossible to harden every piece of infrastructure against accidental or intentional disruptions. Like the internet and cyber security, which is based on a decentralized system of information storage, distributed generation and micro-grids have the benefit of decentralizing and localizing electricity generation and delivery, thereby, greatly enhancing reliability, security and providing delivery consistency for critical infrastructure.

Each of the methods listed above, energy efficiency and energy conservation, demand-response, and distributed generation and micro-grids benefit reliability by reducing demand on the electricity grid and, in the case of distributed generation and micro-grids, decentralizing electricity generation. These options provide additional means to enhance grid reliability. Robust programs to promote each method can lead to additional positive public benefits from the merger, which, in their absence, would not have occurred otherwise under the current merger proposal. We strongly urge the Commission to consider the merger's impact on reliability and whether the merger as proposed properly

[2] Ibid. P. 12.

addresses reliability in a way that leads to a substantial benefit for the Commonwealth of Pennsylvania.

Q. What can the Joint Applicants do as part of the proposed merger to further promote reliability of service by means of energy efficiency, energy conservation, demand response programs and distributed generation and micro-grids?

A. The Joint Applicants should adopt best practices for energy efficiency, energy conservation and demand response programs. Specifically, PECO should be examining the robust programs of PSEG to determine the elements of PSEG's energy efficiency, energy conservation and demand response programs they can adopt. PECO should also support efforts at the Commission, which address future demand response programs, and should make demand response options available to all customer classes. The Joint Applicants should adopt the New Jersey rules for net-metering in the PECO service territory. The Joint Applicants should also work with the Commission to establish the legal framework in support of independent micro-grids within the PECO service territory. The Joint Applicants should also provide funding to support the deployment of renewable energy resources.

Q. Does this conclude your testimony?

A. Yes it does.