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RE: PSE&G Susquehanna-Roseland 500-kv Transmission Project
Amended Highlands Applicability Determination - May, 2009
NJDEP Activity # CSD080079 - **Supplemental Comments**

Dear Mr. Baier and Ms. Pilawski:

I write to you on behalf of the New Jersey Highlands Coalition, Sierra Club-New Jersey Chapter, Environment New Jersey, New Jersey Environmental Federation, and Stop the Lines. Thank you for the opportunity to present you with supplemental comments on PSE&G's application for a Highlands Applicability Determination relating to its Susquehanna-Roseland 500kV Transmission Project ("Project").

The primary purpose of these comments is to provide the Division with additional information about the Project, and hopefully provide some context, as well as point out additional areas of concern that should be factored into the Division's decision-making with respect to PSE&G's application. As you know from earlier comments submitted by the New Jersey Highlands Coalition and the New Jersey Conservation Foundation on their own behalf and the behalf of other organizations, these various organizations are opposed to the Project and maintain that it violates the New Jersey Highlands Act and Rules. These groups have already pointed out that the Project impacts not only land in the right-of-way, but also land outside of the right-of-way that will be used for access roads. As such, the Project is not merely an "upgrade" of an existing transmission project within the right-of-way and is not eligible for exemptions and exceptions under the Highlands Act.

As you consider whether the Project meets the requirements of the Highlands Act and the Highlands Rules, we would like to remind the Division of the other significant policy issues that are implicated by the Project. Specifically, in addition to the myriad concerns raised about the Project that relate to the impacts on the Highlands in prior comments, the environmental and energy policies of the State should also be kept in mind. The Project also is in conflict with these policies.

PSE&G has presented this Project as one necessary to address alleged reliability violations identified by the regional transmission operator, PJM. There are significant questions about the need for the Project, which is the subject of a parallel proceeding pending before the Board of Public Utilities ("BPU"). This letter offers some information about the history of the Project, the alleged reliability issues, the role of PJM, the alternatives that have <u>not</u> been considered, both in terms of meeting energy needs in the future as well as the location of the Project, and the overarching mandate the legislature has placed on the DEP in the Energy Master Planning Act and the Global Warming Response Act to help achieve greenhouse gas reductions in the future.

In summary, the Project is about money. The Project is about "paving" the Highlands with a power line sufficient to bring power from coal-fired power plants in the west to lucrative energy markets in the east. The Project is not about: reliability, energy demand, preventing blackouts, or renewable energy. There are alternatives to the Project: energy conservation, energy efficiency, demand side management projects to reduce peak energy demand, and distributed energy projects that locate small scale energy generation where the need exists. In essence, there is no reason to allow additional destruction in the Highlands. In fact, an article in the Bergen Record, dated October 26, 2009, cites that both Governor Corzine and even Ralph Izzo, the Chief Executive Officer of Public Service Enterprise Group (PSE&G's parent corporation) are opposed to large transmission lines that move power from west to east, because they are bad for renewables and environmentally harmful:

> Suggesting we should get our renewables from remote areas regardless of transmission costs is like saying if only we had access to free refrigerated freight trains, we should get all our ice cubes from the North Pole," Izzo said. Who pays to build the trains or lay the tracks? And wouldn't it be cheaper to make the ice locally? <u>Izzo also said that long-distance lines invariably would cross regions where power is produced from coal, and it is unlikely that once lines are built those power plants would be barred from using them</u>. Thus you could end up with transmission lines that are **economically unjustified and environmentally self-defeating**, he said.[1]

[1] Herb Jackson, Bergen Record, *N.J. says green energy effort may be harmful*, October 26, 2009.

<u>The Project Is Unnecessary—When You Have a Hammer, Everything Looks Like a Nail…</u>

PSE&G and PJM have presented the Project to the DEP as one required to address alleged "reliability" violations that are predicted to occur in the future. PSE&G claims that New Jersey <u>needs</u> the Project because PJM has predicted that, in time, there will be "reliability problems." Those "problems" consist of predicted violations of the North American Electrical Reliability Council (NERC)'s standards on some circuits in Pennsylvania and New Jersey.

It bears noting that PJM is the regional transmission operator (RTO)—it manages the transmission grid in its region and the corresponding energy markets. That is all it does. **<u>If PJM predicts problems, the only solutions it will propose involve building new power lines.</u>**

There are many ways to solve reliability problems, including the alleged NERC problems. All of these ways are better and cheaper than building new power lines. Some examples of alternatives include:

- Building new power generating sources where there is the most demand, rather than importing power from hundreds of miles away.
- Rebuilding and "reconductoring" existing lines using existing rights of way.
- Reducing overall demand by managing energy use, by both industrial and residential users with new technologies that allow power companies to reduce use at peak times.

As a threshold matter, the claims PJM and PSE&G are making about the "need" for the line are suspect. The Project is not necessary for a number of reasons. First, the predictions about energy demand increasing have proven to be false. Energy demand is down. Second, PJM's models, which drive the conclusion that there will be reliability violations, do not adequately take into consideration alternative ways to meet demand. Third, the transmission grid could use some modernizing, but the Project will not modernize the grid. The Project is simply a means to move cheap coal-fired power from west to east. If a company can make money producing cheap power anywhere in the vast PJM region, PJM <u>must</u> figure out how to accommodate that power on the grid—regardless of whether we need or want that power. Finally, threats of more blackouts in the absence of the Project are unfounded and amount to baseless fear-mongering by PSE&G. To alleviate any concerns the Department may have in this regard, we have included some information about the causes of the 2003 Blackout in these comments, taken from the official report.

How Did We Get Here? Some Useful Background Information

There is no doubt that energy policy is complicated. It is technical, laden with jargon, and generally difficult to understand. For this reason, we have also attached as Appendix A some common terms and their definitions. Although DEP has been asked to evaluate the merits of PSE&G's application for the Project under the rubric of the Highlands Act and the Highlands Rules, to understand how the Project developed and why it is the subject of intense opposition, some context is useful.

Major changes in the power industry in the last decade created the new push for interstate transmission lines. Competition among providers is now fostered; in addition, new generation and transmission companies have replaced the vertically integrated utilities that served only those customers within their bounded service area. Power providers scouting for new markets to serve are now looking at customers remotely located from their generation plants.

The 'congestion', which is now cited as the justification for constructing interstate transmission lines, reflects the fact that the grid was not built to handle the new volume of long distance bulk power transactions. Power suppliers to our west are thus constrained in their ability to deliver power to higher paying consumer markets to our east. The economic costs ascribed to congestion reflect the grid's limitations to move the power offered by these generation companies to the markets in NY and NJ where they desire to sell their power. The estimates of congestion costs reflect the fact that higher priced power is being consumed regionally than what these power companies would offer to the market.

The Energy Policy Act required the Department of Energy (DOE) to examine transmission congestion and constraints. It is important to bear in mind that transmission system "congestion" and "reliability" are two distinct issues that merit separate consideration in policy decisions. It is possible to have congestion without having reliability problems – as is the case today. Congestion is the inability to deliver lowest priced power at any point in time. This is not a matter of national security, or even system reliability. Congestion is about money—not about need.

Energy Policy Act of 2005

The 2005 Energy Policy Act was pushed through Congress by the Bush (Cheney) Administration and the power industry lobby to put into federal law the industry's plan for electric power. Industry lobbyists scared Congress and the public into thinking there was a major crisis of the grid infrastructure that would lead to more 2003 blackouts. At the very same time, industry and government investigators had actually concluded that power lines had held up very well in 2003 considering all the chaos in the switching of power in the region.

The Act created National Interest Electrical Transmission Corridors (NIETC) that essentially allow federal seizure of private land for use by privately owned power companies, a revolutionary expansion of eminent domain power in federal law. Lobbyists pushed hard for special treatment of companies that built new interstate transmission lines. In particular, they got a provision that FERC could allocate costs of new lines to all ratepayers using power from those lines. Lobbyists also got approval for extra high guaranteed profits on power line rates as an incentive to build new transmission lines. These benefits have been passed on to regional transmission operators (RTOs) and utilities, as discussed in the next section.

As the Department knows, the Department of Energy approved utility companies' requests to designate <u>every single county</u> in New Jersey as part of the NIETC.

PJM's Role

To put PJM's role in context, recall that in 1997, FERC approved the restructuring of PJM (prior to that time, it operated as a power pool) into an independent system operator ("ISO").[2] The ISO has control over the transmission system and the spot energy market. In short—PJM reviews, plans, and approves <u>transmission</u> system projects.

<u>A Brief History of the Project – in the Shadow of "Project Mountaineer"</u>

In the wake of the Energy Policy Act of 2005, PJM rapidly moved to take advantage of the NIETC and the economic benefits that would flow to RTOs and utilities. As a result, our entire mid-Atlantic region is encompassed by an overarching PJM transmission plan known by the name Project Mountaineer.[3] PJM's Western Region President put it best when he testified to FERC in May 2005 about PJM's commitment to increasing transmission for coal-fired generation and describing its then-new initiative—Project Mountaineer:

> PJM is certainly proud of what has been accomplished to date to <u>open up markets to coal</u>, but there is much more that we and others in this region can do to further **<u>enhance that use of coal</u>**. It is for this reason that, today, PJM is setting out by example, a new initiative which we have labeled Project Mountaineer -- appropriately titled for the state that we're in -- to utilize our regional transmission expansion planning process to explore ways to further **<u>develop an efficient transmission super highway, if you will, to deliver the low-cost coal resources in this region of the country, to market</u>**. RTOs have and will continue to bring benefits to this region. PJM has a proven, transparent regional planning process that has already identified over a billion dollars of transmission improvements, all

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[2] José Rotger, et al., Transmission Expansion in New York State, New York Independent System Operator White Paper, November 2008

[3] Testimony of Karl Pfirrmann, President, PJM Interconnection, L.L.C., Western Region, Prepared for the Federal Energy Regulatory Commission's Technical Conference: Promoting Regional Transmission Planning and Expansion to Facilitate Fuel Diversity Including Expanded Uses of Coal-Fired Resources; Docket No. AD05-3-000, May 13, 2005. (emphasis added)

designed to improve the reliability and economics of power flows in this region. This is further been exemplified recently by the announcement by Exelon and PSE&G to contribute an additional $25 million towards construction of projects identified through our regional planning process.[4]

Dating back to at least 2005, the thrust of PJM's regional transmission planning and expansion for Project Mountaineer has been to support the "expanded use of coal-fired resources," building from earlier activities directed at "opening up markets for coal-based resources." Its objective is to explore options to further develop high voltage transmission to move power from the coalfields of Ohio, Kentucky and West Virginia to markets along the eastern seaboard. " It is an example of how the region can take coordinated regional planning to the next level … [outlining] the scope of transmission projects that would be needed to significantly enhance the ability of coal based resources to reach eastern markets." The success of PJM efforts was measured in part in terms of "increased market opportunities for this region's generation resources"

New Jersey sits in a strategic position for Project Mountaineer, as it is in the easternmost portion of PJM's region and the gateway to New York and New England.

PJM's "Backbone" Projects

As part of the restructuring of PJM as the ISO for a vast region, PJM and its transmission owners developed a system-wide rate methodology for allocating the cost of existing transmission facilities and of new facilities below 500 kV. As for new facilities, FERC determined that the costs of all new PJM-planned facilities that operate at or above 500 kV should be shared on a region-wide basis. Notably, FERC extended this rate treatment to both reliability and economic projects. FERC's decision represented a marked departure for transmission cost allocation in PJM, which has long been premised on a 'beneficiary pays' approach. Importantly, the decision represented a victory for transmission owners developing the PJM west-to-east "mega-projects" (e.g., AEP and Allegheny), which have stated that they will not develop these billion-dollar projects absent cost recovery via a regional, PJM-wide cost allocation mechanism.

In 2006 and 2007, PJM authorized four major interstate projects representing well over $5 billion in investment. These four major projects are: Trans-Allegheny Interstate Line (TrAIL), Potomac-Appalachian Transmission Highline (PATH), Susquehanna-Roseland, and Mid-Atlantic Power Pathway (MAPP). All of these projects lie squarely within the recently designated Mid-Atlantic National Interest Electric Transmission Corridor (NIETC).

TrAIL

PJM authorized TrAIL in June 2006. To be built by Allegheny Energy and Dominion, the $1.1 billion TrAIL project is a new 500 kV line from southwestern Pennsylvania through West

[4] Id at 61.

Virginia into northern Virginia. Specifically, the TrAIL project would run from a new Prexy substation in southwestern Pennsylvania to the 1,600 MW Mt. Storm coal plant in West Virginia, continuing east to the Meadow Brook substation in Middletown, Virginia and ending at Dominion's Loudoun Substation in the suburbs of northern Virginia. The Allegheny Energy portion of the project (Prexy-Meadowbrook, about 210 miles) is estimated to cost $820 million, while the Dominion portion in Virginia (65 miles) is estimated at $243 million. On July 21, 2008, FERC approved a settlement agreement that establishes a cost-of-service formula rate for TrAIL, and among other things grants the project several rate incentives, including a **return on equity (ROE) rate of 12.7%; full recovery of construction work in progress** (CWIP) in rate base; and use of a hypothetical 50/50 capital structure and accelerated depreciation expense rates.

PATH

Responding directly to PJM's May 2005 Project "Mountaineer" transmission project, in January 2006 AEP proposed a 550-mile, $3+ billion 765 kV interstate transmission project, dubbed the I-765 project and also known as PATH. Extending from AEP's Amos substation in western West Virginia into the Doubs substation in Maryland, and continuing through southeastern Pennsylvania to **PSEG's Deans substation in northern New Jersey**, the I-765 project would transfer 5,000 MW of energy and capacity from PJM West to PJM East. AEP partnered with Allegheny Energy and submitted the project to PJM for review and potential inclusion in the PJM RTEP as a backbone transmission project.

The remaining portion of the I-765 project from Kemptown in Maryland to the Deans substation in New Jersey remains under study by PJM for potential inclusion in the RTEP, and is not part of the AEP/Allegheny joint venture. **Notably, this line would not be located in the New Jersey Highlands, as PSE&G's Deans substation is located in Middlesex County**.

Susquehanna-Roseland

Authorized by PJM in June 2007, the Susquehanna-Roseland 500 kV line would extend 130 miles from PPL's Susquehanna substation (adjacent to the Susquehanna nuclear power plant) in northeastern Pennsylvania to PSEG's Roseland substation near Newark, New Jersey. Estimated at a total of $1.1 billion, the $500 million Pennsylvania portion of project would be built by PPL and the $600 to $650 million New Jersey portion by PSEG.

MAPP

In October 2007, PJM approved Pepco Holdings Inc.'s (Pepco) MAPP project. It is a new 230-mile 500 kV transmission line running from the Possum Point Station in northern Virginia into Maryland and the Calvert Cliffs nuclear plant, and then crossing the Chesapeake Bay to the Delmarva Peninsula and heading north through Delaware (via the Indian River coal plant) to the Salem Station in southern New Jersey.

Energy Demand Is Down—the Predictions Are Off

PSE&G's original rationale for the Susquehanna-Roseland line was based on PJM's need for the line assuming a projected 4 percent increase in peak demand in 2008. However, **actual demand for electricity was down and continues to decline**. The decrease in demand has been documented by PJM, North American Electric Reliability Corporation ("NERC"), PSE&G, and other utilities. In a November 12, 2008 report, PJM revealed that actual unrestricted peak demand for the summer of 2008 was actually 7.8% lower than summer 2007 demand (as opposed to the predicted 4% increase).[5]

The unexpected drop in electricity demand is widespread, and may be indicative of a permanent shift in consumption rather than a byproduct of the economic downturn. It also may be an indicator of the impacts of conservation mandates enacted by many states, including New Jersey, and contemplated at the federal level. Because consumption dropped even in places where prices were flat or declining, some power companies are questioning the reliability of weather-adjusted forecasting models altogether, like the type of model used by PJM that predicted both an increase in demand and the corresponding reliability violations.[6]

PSEG's reduced demand forecasts are mirrored in PJM's updated load projections. In January, 2009, PJM released its draft 2009 Load Forecast in which PJM assumed a 4,929 megawatt decrease in the projected electric load for the region in the 2011 timeframe.[7] PJM's most updated load forecasts assume that a financial recovery beginning in 2010 will induce a return to pre-recession levels of electricity consumption. But this is a risky bet using New Jersey ratepayers' funds and relying on inherently uncertain economic forecasts. As recently as June, 2009, Eric Rosengren, President of the Federal Reserve Bank of Boston, observed that a poor understanding of the linkages between financial intermediaries, markets and the real economy has led many forecasters to underestimate the size, severity and length of the current economic downtown. Speaking at a Federal Reserve conference in Washington, Rosengren warned that liquidity disruptions were likely to have longer-term repercussions than most forecasters have assumed.[8]

While PJM claims that near-term reductions in consumer demand and recent economic downturns are **not** factored into its long-term load forecasts and should not impact the need for

[5] *See* Brief of Piedmont Environmental Council in Piedmont Environmental Council v. Virginia Electric Power Company, *et al*., on Motion to Virginia Supreme Court, at 8. In a news release on May 5, 2008, PJM states that their weather adjusted peak demand in 2007 was 136,100 MW. 10,591 MW out of a peak of 136,100 MW is about a 7.8 percent reduction.
[6] Smith, Rebecca. *Surprise Drop in Power Use Delivers Jolt to Utilities.* Wall Street Journal. November 21, 2008. See also Exhibit BKS-11, p. 15, Xcel 2008 10-K; Exhibit BKS-12, Duke Energy Corp. 2008 10-K; Exhibit BKS-13, American Electric Power 2008 10-K.
[7] PJM Interconnection 2009 Load Forecast Report
[8] *Fed's Rosengren: Need better research on markets, economy link*. Reuters, June 5, 2009. Available at http://www.reuters.com/article/bondsNews/idUSNYS00512520090605

long lead-time expansions like the Susquehanna-Roseland line, recent transmission expansion delays attest otherwise. On May 19, 2009, Potomac Electric Power Company ("PEPCO"), a subsidiary of PEPCO Holdings, Inc., announced that it was delaying the in-service date of its planned Mid-Atlantic Power Pathway ("MAPP") transmission line from 2013 to 2014 on PJM's recommendation that the line *would not be needed* until demand for electricity increases and the economy recovers.[9] Consideration of near-term demand reductions induced by current economic conditions also factored into PJM's decision to abandon altogether a section of the MAPP line that would have run from Delmarva Power's Indian River substation to Salem, New Jersey.

Despite the fact that the timing of an economic turn-around and its affect on future electricity demand is unknown to PJM, it is committed to pursuing planned RTEP projects. The rationale for pursuing these projects, however, has shifted from the previously stated "need." **Now PJM views these projects as economic investments should it have the opportunity to capitalize on a recovery and attendant increases in consumer demand.** Indeed, in PJM's 2008 Annual Report, President and Chief Executive Officer Terry Boston exclaimed:

> It is still not clear how long or to what degree the current recession will affect electricity demand or how the recovery of financial markets will proceed. The current decline in electricity use can buy us time to get the extra-high-voltage lines built that have already been approved in the RTEP.[10]

Of course, the same decrease in demand is also an opportunity for us to put in place the other programs contemplated by the EMP and the Renewable Portfolio Standards.

It is clear, then, that the stated need for the Project no longer exists. **The projections that led to the predictions that "reliability violations" will occur in the future and must be addressed by constructing the Project have not been borne out.** Instead of abandoning or halting the Project, however, PJM and PSE&G want to press ahead with the Project and are forced to admit that the motivation is economics, not reliability.

The Models Used to Predict Need Do Not Adequately Consider Alternatives

PSE&G justifies both the need and the in-service date of the Susquehanna-Roseland Project using PJM's 2008 RTEP analysis, a Regional Transmission Expansion Plan, which relies on PJM's 2007 Load Forecast Report for projecting the likelihood and severity of reliability criteria violations in the context of transmission planning. However, these reports are outdated. PJM's 2007 Load Forecasting Report uses 2006 data for projecting consumer demand in 2011 and beyond. Not only does this data fail to consider reduced consumption due to the current recession, it does not consider substantial efforts by the BPU and others since 2006 to reduce consumer demand through

[9] *PJM Reinforces MAPP Need; Adds Year to Schedule.* Pepco Holdings, Inc. Press Release. May 19, 2009.
[10] Boston, Terry. *2008 PJM Annual Report,* p.7.

increased efficiency, improved time-of-use metering and expanded demand response. PJM also does not factor in the probability of mandated efficiency standards and conservation efforts.

In December, 2006, The Brattle Group was asked to evaluate PJM's demand forecasting model after PJM's official forecast for the year 2006, made in February 2006, fell far short of the actual RTO peak demand that was observed on August 2, 2006. Their results suggest that **flawed inputs accounted for the forecasting error** rather than any inherent bias in the model.[11] In other words, The Brattle Group found that the accuracy of PJM's load forecasting hinged on the accuracy of the data input into the model. The Brattle Group's findings should highlight the inherent uncertainty of planning transmission infrastructure in 2010 based on limited and demonstrably flawed data from 2006.

Demand Side Management Is Just Starting to Be Considered

In its 2008 RTEP re-tool, PJM finally began to recognize Demand Side Management (DSM) as an explicit adjustment to the unrestricted load forecast.[12] But even this adjustment is problematic and likely to overestimate projected demand since PJM requires that any load management resource fully commit through the Reliability Pricing Model ("RPM") before it is considered in load forecasting. As of 2007, PJM requires any interested parties with demand resources to submit the demand response modification to PJM for its approval prior to the opening of the RPM auction window. Further, load management resources certified as Interruptible Load for Reliability ("ILR") resources must be registered by March of the upcoming delivery year, and PJM will not consider late registrations. Because these requirements were not established prior to 2007, PJM's 2008 RTEP Analysis, which is based on its 2007 Load Forecast Report, cannot fully reflect load management resources that will be available to mitigate or eliminate projected reliability criteria violations in 2011 and beyond.

Because PJM zones were experiencing declining amounts of load management at the time of the 2007 Load Forecast Report, and because PJM had not yet established criteria for demand resources to participate in the RPM auction, PJM assumed that only the amount of load management available in 2007 would be available in future years.[13] This assumption was made despite public policy mandates of load management, conservation and efficiency. By using historical data to limit the assumption of available resources but ignoring historical data for determining load growth, the result was a 2007 Load Forecast Report that severely underestimates PJM's available resources and load management in 2011 and beyond. **Because this flawed load forecasting is the basis for PJM's calculation of load deliverability and generation deliverability tests, PJM's projection of reliability criteria violations is also flawed and likely to bear little relation to PJM's actual ability to meet reliability criteria in 2011 and beyond**.

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[11] The Brattle Group. *An Evaluation of PJM's Peak Demand Forecasting Process,* prepared for the Capacity Adequacy Department, PJM Interconnection, LLC. December 5, 2006. p.25.
[12] PJM 2008 RTEP retool,

[13] Response to BPU Staff Request, S-PP-43

Here are some things we do know about PJM's general assumptions from the Project application:

PJM claims the duration of the recent drop in overall demand in PJM will be "short." PJM managers offer no evidence as to why they believe that new residential construction and industrial production will begin expanding within the next year. Most economists in the US are not so optimistic. We have no way of determining if PJM is right or wrong if they will not provide the reasoning behind their rosy economic predictions.

In its original planning for the Project, PJM has assumed that DSM and increasing efficiency would not result in any reduction in the growth of peak demand in the PJM region. PJM attributes all recent declines in peak demand to "the economic downturn." This is not surprising, because PJM only began its own Energy Efficiency (EE) program in 2008, despite the fact that PJM continually boasts about how it is the oldest Regional Transmission Organization in the US. While claiming that no other power companies' EE programs will have any effect on peak demand, PJM now claims that its own EE program, only one year old, will have an effect on peak demand in the future. PJM's assumptions about the real and potential impact of DSM and EE are inaccurate and confused, at best. PJM's last major electricity auction showed a dramatic increase in sales of DSM resources.

In the past, PJM has not included any new electrical generation capacity in its opaque model unless the new capacity is a new power plant that has reached a certain point in PJM's own application process. In fact, modifications and additions to existing plants, particularly new natural gas fired equipment, can add significant capacity to the PJM process even without adding new plants. This expansion process has resulted in lots of new capacity on the east coast that PJM's model failed to predict.

Even PJM's 2009 draft Load Forecast Report fails to adequately assess the contribution of demand response programs to PJM's load management resources in the project-critical time period. Indeed, PJM's assumption that future available load management include only the demand resources cleared in past RPM auctions, plus the 5-year average of interruptible load for reliability/active load management, and no estimate of even conservative increases in demand response, results in an absurd 2009 Report projection of static or decreasing resources placed under PJM coordination for all years after 2010.[14]

The lesson is simple: without inclusion of a more accurate determination of projected load in the areas affected by the Susquehanna-Roseland Project, **PJM cannot accurately project the criteria reliability violations that the Project is meant to address or even if the Project in-service date can ensure that those projected violations will be addressed.**

14 2009 PJM Load Forecast Report, Table B-7.

There Are Other Methods to Address Peak Demand

PJM Interconnection has based its argument for the need for the Project entirely on projected "reliability violations" in the future that may occur due to stresses on the existing transmission system at times of peak demand.

Peak demand is not the same thing as overall demand for electricity—it is the maximum demand that is put on a part of the electrical grid only a few times a year. Ordinarily this occurs during extreme weather events, when consumers use more electricity to heat or cool homes or offices. Although these extreme events do not occur often, grid planners plan the overall capacity of the electrical grid for these few peak times of the year plus a margin of safety, usually around 15%. This is particularly true of the centralized, inflexible grid that exists in the PJM region today.

Even if PJM's forecasted need for electricity is accurate, conservation and local generation solutions were not adequately considered. **Energy efficiency and demand side management, along with the deployment of distributed generation, are better alternatives than the Susquehanna-Roseland project. All of these non-transmission alternatives are strongly endorsed by New Jersey in the EMP.**

Energy Efficiency

One study in energy efficiency concluded that **increasing efficiency, "is generally the largest, least expensive, most benign, most quickly deployable, least visible, least understood, and most neglected way to provide energy services."**[15] Another study, from the American Council for an Energy-Efficient Economy, noted that cost effective investments in energy efficiency in New Jersey, New York, and Pennsylvania could reduce electricity use by 33 percent in aggregate.[16] An assessment from the Center for Energy, Economic and Environmental Policy at the Bloustein School of Public Policy and Planning at Rutgers University evaluated New Jersey's Reduced Energy Demand Options Program and found that virtually no customers had yet taken advantage of it, implying that significant savings could still be reached through promotion and participation.[17] The Northeast Energy Efficiency Partnership went even further and noted in 2009 that New Jersey could cost effectively save 19,000 GWh per year, including 5,700 MW of peak

15 Amory B. Lovins, Energy End-Use Efficiency 1 (2005)(selected) .

16 Steven Nadel, Skip Laitner, Marshall Goldberg, Neal Elliott, John DeCicco, Howard Geller, and Robert Mowris, Energy Efficiency and Economic Development in New York, New Jersey, and Pennsylvania (Washington, DC: ACEEE, February, 1997).

17 Center for Energy, Economic and Environmental Policy Edward J. Bloustein School of Public Policy and Planning Rutgers, The State University New Brunswick, New Jersey and the Aspen Systems Corporation, PROCESS EVALUATION of the RENEWABLE ENERGY PROGRAMS ADMINISTERED AND MANAGED by the NEW JERSEY BOARD OF PUBLIC UTILITIES OFFICE OF CLEAN ENERGY, November, 2004.

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demand, through energy efficiency and demand side management programs.[18] The study calculated that such programs could collectively realize $16.8 billion in net savings to ratepayers by 2020.

PSE&G has captured only a small fraction of this potential. **A recent 2009 assessment found that of the 75 largest utilities that offered energy efficiency programs in 2007, PSEG did not even make the list of the top 50**.[19] These studies show that residential energy efficiency improvements in lighting, cooling, refrigeration, electronics, space heating, and hot water heating, along with commercial and industrial improvements in lighting, refrigeration, cooling, ventilation, office equipment, manufacturing, water heating, space heating, and building controls, could cost-effectively and reliably displace the need to build electricity infrastructure.

Demand Side Management

Demand side management programs, by contrast, displace the need for generation and transmission infrastructure at a small fraction of this cost. Demand Side Management (or DSM in power business jargon) prevents the need for more generating capacity by lowering the peaks in peak demand, as well as other techniques that reduce overall demand. Instead of having relatively low base load levels of power with just a few high peaks, DSM programs are designed to "shape" energy use to reduce the need to maintain a great deal of unused capacity needed to meet peak load situations.

The obsolete centralized power system that FERC and PJM are pushing with the Susquehanna-Roseland Project and the other "backbone" projects promote huge investment in both distant generating plants and power lines that are needed to meet peak demand. This system is very expensive for rate payers, because they must pay for all this extra investment that is only rarely used.

DSM is a simple way of reducing the need for over-building by reducing the peaks on demand. There are many different ways to utilize DSM to reduce peak load. One of them is the smart grid technology that is a popular topic of discussion currently. DSM can also be done with pricing mechanisms. A simple system involves giving discounts on electric rates during nighttime hours. With cheaper nighttime power, for example, residential users will begin to install timers on washing machines so they run at night and businesses begin to shift their electricity use to night shift work.

PJM noted a dramatic increase in trading in DSM resources in its major wholesale power auction in early May 2009: The increase in demand resources (DR), or 5,682 megawatts (MW), over the last auction a year ago is enough capacity that would be equivalent to the power needs of about five million households. A total of 67 percent of the DR cleared in constrained regions, reflecting its

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18 Northeast Energy Efficiency Partnership, An Energy Efficiency Strategy for New Jersey Achieving the 2020 Master Plan Goals, March, 2009.
19 John D. Wilson, *Energy Efficiency Program Impacts and Policies in the Southeast* (Southern Alliance for Clean Energy, May, 2009), p. 12.

value in helping to reduce congestion. The increase was driven by the market and the elimination of a special interruptible load provision whereby suppliers received payments for curtailing usage. Suppliers in this program are now required to bid as DR. For the first time, energy efficiency (EE) participated in the sixth Reliability Pricing Model auction bringing 569 MW of new EE resources to PJM.

The most dramatic increases in DSM and EE trading occurred in just the areas that PJM has decided are most in need of congestion and reliability relief. If the Project and the other backbone projects are built, the momentum that is developing for inexpensive and immediately available solutions to these problems will be eliminated, because "cheap" coal-fired power will flood into the region. Instead of people and utilities solving their own problems by their own efforts, PJM will pump more "cheap" and dirty energy from OH and WV into NJ and eastern PA. California, which put in place state mandated DSM and energy efficiency standards in the 1970s, has seen per capita electricity use remain constant since the late 1970s. In the US as a whole, over that same time period, per capita electricity use increased 9% each decade.

The International Energy Agency reviewed forty large-scale commercial DSM programs found that they saved electricity at an average cost of 2.1 to 3.0 ¢/kWh.[20] Similarly, the Institute of Electrical and Electronics Engineers found an average cost of 2.6 ¢/kWh for demand-side management, load management, and energy efficiency programs in Vermont.[21] Another 2009 study found that the total cost for DSM programs ranged from 2.6 to 4.0 cents per kWh.

Sadly, despite the clear economic benefits of energy efficiency to both PSEG and the public, PSEG and PJM have practically ignored the value of utilizing demand-side management to displace the need for the Project. By their own admission, PSEG has stated that "voluntary curtailment of customer load … typically results in very small amounts of load reduction and is not a reliable means to resolve violations of reliability criteria,"[22] and later that "there is no documentation to assert that demand reduction will be implemented when called-upon."[23] That is a very disturbing statement, as mechanistic demand reduction is a "flick of the switch" matter, and generalized demand reduction is New Jersey policy. Also, PJM admits that its professionals have "not analyzed" the potential for smart/interval metering[24] which is being used on distribution systems in other areas of the country for peak shaving, load shifting and peak demand reduction.

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20 Howard Geller & Sophie Attali, The Experience With Energy Efficiency Policies and Programs in IEA Countries: Learning from the Critics (2005).
21 Susan Chang, *The Rise of the Energy Efficiency Utility*, IEEE Spectrum, May, 2008, *available at* http://spectrum.ieee.org/print/6216.
22 Response to Municipal Interveners Request Munis-General-16.
23 Response to Municipal Interveners Request Munis-McGlynn-2.
24 Response to Municipal Interveners Request Munis-General-20.

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Distributed Generation

Distributed generation refers to small-scale power supply devices that produce electricity close to its point of consumption—it can improve grid reliability, lessen the need to build expensive transmission infrastructure, reduce congestion, offer important ancillary services, and improve energy reliability and security through geographic diversification. Deploying distributed generation units offers an effective and economic alternative to constructing new transmission and distribution lines, transformers, local taps, feeders, and switchgears, especially in congested areas or regions where the permitting of new transmission networks is difficult.

PJM has conceded that PJM's transmission planning process is designed to specify regulated transmission solutions to reliability problems and does not consider alternatives to transmission *not otherwise proposed though the market*.[25] However, PJM's deliverability tests preclude the possibility of non-transmission solutions because the tests are designed to ignore the reliability benefits of proposed generators until they have progressed through PJM's interconnection queue to the point of executing an Interconnection Service Agreement. Indeed, prior to executing an ISA, the tests are designed to consider any non-transmission solution proposed by the marketplace as an additional burden likely to magnify rather than alleviate reliability concerns. Under such conditions, **few if any non-transmission alternatives could compete with the regulated transmission solutions specified by PJM's planning process**.

We have seen that **the need for new transmission lines can be reduced by decreasing peak demand for power through demand side management**. There is another way that we can make new transmission projects unnecessary.

We now have electrical power generating technologies that allow us to create a safer, less polluting, more reliable electrical grid based on local diversified generating plants. Many of these new technologies are well adapted to producing peak load power, exactly what the PJM engineers say is causing the problem in their grid management.

Building large coal-fired plants far from customers and shipping "coal by wire" hundreds of miles is an inherently insecure and unreliable system. The bigger the transmission system, the greater the potential for power instability on the grid and the more difficult it is to bring the system up after system failures. The 2003 blackout in the Northeast, as discussed elsewhere in this letter, was caused more by the interconnectedness of the massive transmission grid than it was by any technical failures in transmission lines. More and bigger lines will only make things worse.

A truly secure system would include many different kinds of generating sources that in many cases overlap and provide redundancy. These generators would also be very small scale so they could be located close to population centers where power demand is highest.

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25 Response to BPU Request, S-PP-28.

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Pacific Gas and Electric Company (PG&E), the largest investor-owned utility in California, built an entire power plant in 1993 in a specific location to test the grid and transmission benefits of a 500 kW distributed power plant. PG&E found that the distributed generator improved voltage support, minimized power losses, lowered operating temperatures for transformers on the grid, and improved transmission capacity. The benefits were so large that the small-scale generator was twice as valuable as estimated, with projected benefits of 14 to 20 ¢/kWh.[26]

Distributed generation can provide utilities with a variety of important ancillary services as well, including system control, reactive power supply, and spinning reserves. Because of their smaller size, these generators have lower outage rates, decreasing the need for reserve margins and excess transmission capacity. Indeed, researchers at the University of Albany and the National Renewable Energy Laboratory determined that dispersed solar photo-voltaic (PV) resources are so valuable they could have prevented the $6 billion 2003 blackout that affected 40 million people spread across Canada and the eastern United States. After running thousands of simulations, they found that had distributed solar PV facilities been operating on August 14, the blackout most likely would have been avoided.[27]

Rather than building huge transmission lines, new emphasis would be placed on power distribution and switching rather than bulk transmission of electricity. No single failure or sudden demand for peak power on this "distributed grid" would affect many people beyond a small area, and, with sophisticated distribution technologies, power could be rerouted and re-established relatively quickly.

Distributed generation provides a strong, resilient grid that can respond immediately to peaking loads. Massive power lines like the Project dramatically magnify the risks involved with weather damage, power flow instability and sabotage.

Despite the fact that PJM and FERC pricing rules actively discourage new generating technologies on the east coast, new generation has been growing steadily from North Carolina to New York, mainly in the form of gas-fired power plants that are uniquely designed to meet peak demand. The construction of new power plants on the east coast is actually a much more efficient and cost effective way to solve PJM's reliability problems. If the east coast is providing its own power, that power doesn't need new power lines to import it from WV and OH.

26 Howard J. Wenger, Thomas E. Hoff, and Brian K. Farmer, "Measuring the Value of Distributed Photovoltaic Generation: Final Results of the Kerman-Grid Support Project" (presentation at the First World Conference on Photovoltaic Energy Conversion Conference Proceeding, Waikaloa, Hawaii, December 1994) (Washington, DE: IEEE, 1994), 792–796.

27 For a full accounting, see Exhibit BKS-38, NERC Blackout Report, Chap. 5, How and why the blackout began in Ohio, details the multiple stages where controllers failed to take action, required under NERC reliability standards, that could have avoided the blackout..

Planning and Alternatives to Transmission

One perspective on renewable development, reliability, and other power system goals is that new transmission is central to meeting these objectives. This point of view is illustrated by FERC testimony to Congress in early 2009:

> We need a National policy commitment to develop the extra-high voltage (EHV) transmission infrastructure to bring renewable energy from remote areas where it is produced most efficiently into our large metropolitan areas where most of this Nation's power is consumed. Certainly, developing local renewable energy and distributed resources[28] is also important as we expand our capacity to generate clean power, but that is a separate issue from, and is not a substitute for, developing the EHV transmission infrastructure….[29]

An alternative viewpoint is that a **transmission-focused planning process may, almost by definition, not give enough emphasis to non-transmission approaches to meeting energy needs**. This view is illustrated by the reaction of the New York and New England RTOs to the "Joint Coordinated System Plan," which outlines massive transmission construction to allegedly bring wind power from the Dakotas to the East Coast. In the view of the northeastern RTOs, the plan was badly flawed because it did not consider other options, including eastern wind plants, demand response,[30] and building shorter transmission lines to renewable power in Canada.[31] Another example of this perspective is an "infrastructure vision" report of the **National Governors' Association, which emphasizes decentralized and technological solutions to power system issues rather than big transmission projects.**[32]

28 Distributed resources (also called distributed generation) refers to generation located close to load and often owned by the power customer. The term covers a wide variety of technologies, ranging from residential roof-top solar to large industrial cogeneration systems. Depending on individual circumstances the distributed generation system can be connected to the transmission or distribution system of the local utility.
29 U.S. Congress, Senate Committee on Energy and Natural Resources, Prepared Testimony of Acting Chairman Jon Wellinghoff, Federal Energy Regulatory Commission Pending Legislation Regarding Electric Transmission Lines, 111th Cong., 1st sess., March 12, 2009, p. 2, http://www.ferc.gov/EventCalendar/Files/20090312100013-03-12-09-testimony.pdf.
30 Demand response refers to arrangements under which electricity consumers reduce demand in real-time in response to high prices and/or short supply, thus obviating the need to construct or operate expensive peaking power plants and associated transmission lines.
31 Letter from Gordon van Welie, President and CEO, ISO New England, Inc., and Stephen Whitley, President and CEO, New York Independent System Operator, to Joint Coordinated System Planning Initiative, February 4, 2009, http://www.nyiso.com/public/webdocs/services/planning/jcsp/2009_2_4_JCSP_Letter_FINAL.pdf.
32 Darren Springer and Greg Dierkers, An Infrastructure Vision for the 21st Century, National Governors Association, Washington, DC, 2009, pp. 11-13, http://www.nga.org/Files/pdf/0902INFRASTRUCTUREVISION.PDF. The report observes (p. 13) that "electric power demand has typically been met by constructing new electricity generating plants and transmission lines with much less attention to managing demand or encouraging efficiency." The report finds that some new transmission construction will likely be needed, particularly to access new supplies of renewable energy.
For further discussion of these points see U.S. Congress, Senate Committee on Energy and Natural Resources, To Receive Testimony On Pending Legislation Regarding Electricity Transmission Lines, Prepared Testimony of James A.

Reliability and Changes in the Energy Market

The transmission grid was built for a specific business and technical model: power plants would use transmission lines to move electricity to distribution networks for delivery to customers. The power plants were large "central station" facilities using fossil, nuclear, or hydroelectric energy sources, and were designed to run as-needed, when-needed. The power flow was one-way, from the power plant to the customer.

The current grid is unable to respond to demand in any way other than meeting electrical loads (the demand for electricity that is created whenever a switch is flipped), by generating new electricity, or the entire transmission system becomes unstable as voltages drop below their operating requirements.

The current electrical power system in the PJM region relies on a power technology that is rapidly becoming obsolete. The PJM system, especially since **PJM's membership expanded in 2004 to include companies like AEP and its massive coal-fired plants**, relies on large power plants located hundreds of miles from the customers who need power in times of peak load. As a result, PJM relies on huge coal-fired plants that must continue to burn coal and produce electricity even when their power is not needed. This highly centralized system must be built to meet peak demand that may only happen a few times a year. For most of the rest of the year, PJM's generating and transmission system operates far below its peak load capacity.

Peak loads can be managed in a much more flexible and economical way, without rate payers paying for lots of expensive equipment that is only fully used a few times a year. The Project is just more of the same—expensive infrastructure to support an outdated system that will not help New Jersey meet its obligations under the Global Warming Response Act, the Regional Greenhouse Gas Initiative, the Renewable Portfolio Standards, and the Energy Master Plan.

This model is already changing:

Variable Renewable Generation: One factor is the introduction of large amounts of wind power onto the grid. Unlike conventional power plants, the output of wind plants varies with the weather. Power systems were not designed to handle this kind of power supply variability and uncertainty. Total wind capacity is now large enough in some parts of the country, such as the ERCOT Interconnection (covering most of Texas), to be an important influence on how the power system is operated. The variable output of wind plants can be dealt with in a variety of ways, including improved wind forecasting, adding electricity storage and/or quick start natural gas-fired peaking plants to the grid, and drawing wind power from a wide geographic area to smooth out local changes in wind speed.

Dickenson on Behalf of the Large Public Power Council, 111th Cong., 1st sess., March 12, 2009, http://energy.senate.gov/public/index.cfm?FuseAction=Hearings.Testimony&Hearing_ID=b9e47ea9-c62b-23fc-33ff-30fda7b3a744&Witness_ID=ed6a79eb-6664-412c-b66b-7e87e4e55435.

Demand Response: Another factor, as discussed above, is the increasing use of demand response programs, in which large commercial and industrial customers agree to interruptible power service in return for lower rates. Demand response reverses the conventional power system operating model: instead of changing power plant output to match demand, demand is reduced to match the available supply of electricity.

Distributed Generation: A third factor, also discussed above, is the use of distributed generation (local power generation controlled by the customer), which can vary from rooftop solar units to large industrial cogeneration facilities. A distributed generation facility will sometimes take power off the grid. Other times it will have excess power to sell to the utility, reversing the normal flow of electricity. Buying power from customers is inconsistent with standard utility technology, accounting, and rates. This is especially true when the generation is hooked up to the distribution system, which was designed to make final delivery of power to customers, not receive power from the customer.

Integrating non-traditional resources into the grid will be a reliability challenge. This is not because these resources are new. For example, distributed generation in the form of industrial cogeneration has been increasingly common since Congress passed the Public Utility Regulatory Policies Act (P.L. 95-617) in 1978. The issue is integration of much larger amounts of these resources into a power system primarily designed around a different model. To facilitate business as usual with the Project gets us no closer to our energy goals.

<u>We "Need" a Modern Grid—Not a Bigger Grid</u>

Third, the transmission grid could use some modernizing, but the Project will not modernize the grid. The Project is simply a means to move cheap coal-fired power from west to east. If a company can make money producing cheap power anywhere in the vast PJM region, PJM has to figure out how to accommodate that power on the grid—regardless of whether we need or want that power.

Grid Reliability[33]

The transmission grid is sometimes portrayed as a decrepit victim of underinvestment; one recent press report described the grid as "frayed" like grandmother's quilt.[34] There is, in fact, no clear evidence that the transmission grid is physically deteriorating. But this does not mean that the grid is universally well managed or is as up-to-date as it should be. The grid probably needs to be modernized to improve reliability. This is <u>not</u> necessarily the same as installing the full smart grid discussed above. The smart grid is an ambitious concept for integrated operation of the power system. The full smart grid is not needed to use a subset of "intelligent" technologies to improve the reliability of the transmission system.

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33 Congressional Research Service, Electric Power Transmission: Background and Policy Issues April 2009 at 30.

34 Peter Slevin and Steven Mufson, "Stimulus Dollars Energize Efforts to Smarten Up the Electric Power Grid," The Washington Post, March 10, 2009.

One part of a strategy for preventing repetitions of the 2003 blackout is to **modernize the grid from a reliability standpoint. This will not always entail building more power lines**. One analysis written shortly after the 2003 blackout concluded that "The common contributing factor to the recent blackout, based on investigations to date, is confusion-communication breakdowns both technical and human….[W]e maintain that much can be solved by updating technology and by changing procedures followed within the operating companies. This fix is cheaper and much more immediate than huge investment in new power lines."[35]

In summary, depending on the case, building new transmission lines is not the only or best approach to enhancing power system reliability.[36] In some instances investments in new monitoring and control technology may be the better solution.

Smart Grid

Distinct from proposals for expanding the grid are proposals for modernizing the transmission system. Modernization proposals are often made under the rubric of the "smart grid," a term that encompasses technologies that range from advanced meters in homes to advanced software in transmission control centers. There is no standard definition of the smart grid.[37] For the purposes of this letter, the smart grid can be viewed as a suite of technologies that give the grid the characteristics of a computer network, in which information and control flows between and is shared by individual customers and utility control centers. The technologies will allow customers and the utility to better manage electricity demand, and will include self-monitoring and automatic protection schemes to improve the reliability of the system.[38] Although grid technology has not been static over the years,[39] the smart grid concept would implement capabilities well beyond any existing electric power system.

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35 Ralph G. Loretta and James E. Anderson, "The Near-Term Fix," Public Utilities Fortnightly, November 2003, p. 34
36 The Carnegie Mellon study cited earlier observes that "While transmission investment can, but is not guaranteed to, have a positive impact on cascading failure risk and reliability, transmission construction alone is a costly, and potentially ineffective, solution to reliability problems." Paul Hines, Jay Apt, and Sarosh Talukdar, "Large Blackouts in North America: Historical Trends and Policy Implications," Carnegie Mellon Electricity Industry Center, Working Paper CEIC-09-01, March 4, 2009, p. 29, http://wpweb2.tepper.cmu.edu/ceic/PDFS/CEIC_09_01_blt.pdf.

37 DOE's Electricity Advisory Committee noted that "there are many working definitions of a Smart Grid." Electricity Advisory Committee, Smart Grid: Enabler of the New Economy, U.S. Department o Energy, Washington, DC, December 2008, p. 1.
38 Other descriptions of the smart grid emphasize its environmental benefits through reducing fossil-fueled electric generation and air pollution emissions. See the comments of FERC Commissioners Moeller and Spitzer in Federal Energy Regulatory Commission, "FERC Accelerates Smart Grid Development with Proposed Policy, Action Plan," press release, March 19, 2009, http://www.ferc.gov/news/news-releases/2009/2009-1/03-19-09.asp.
39 Scott Gawlicki, "Demonstrating the Smart Grid," Public Utilities Fortnightly, June 2008, p. 51; and Kenneth Martin and James Carroll, "Phasing in the Technology: Phasor Measurement Devices and Systems for Wide-Areas Monitoring," IEEE Power and Energy, September/October 2008.

The smart grid primarily involves the development of software and small-scale technology (e.g., smart meters for homes and businesses that would interface with grid controls) rather than construction of new transmission lines. However, full implementation of the smart grid also requires new electricity rate structures, especially for residential customers, and as discussed below, this and other aspects of the smart grid may prove contentious. This, however, is where resources should be spent.

Blackout Threats Are Idle and Create Unnecessary Fear

PSE&G has used thinly veiled threats of blackouts in its public relations campaign,[40] yet the threats are baseless fear mongering and are not founded on the facts. The need for modernization discussed in the preceding section is illustrated by the causes of the August 14, 2003 northeastern blackout. The blackout, which interrupted service to 50 million people in the United States and Canada for up to a week, started with transmission line trips (automatic shutdowns) and resulting overloads on the FirstEnergy utility system in Ohio. The blackout was not the result of insufficient transmission capacity or deteriorated equipment. As identified by the joint United States – Canada investigating task force, the blackout was caused by factors such as the following:[41]

- FirstEnergy and the NERC reliability region within which it operated did not understand the strengths and weaknesses of the FE system. FirstEnergy consequently operated its system at dangerously low voltages.

- FirstEnergy's system operators lacked the "situational awareness" that would have revealed the blackout risk as lines began to trip. The operators were blinded by monitoring and computer system breakdowns, combined with training and procedural deficiencies which led to those failures going undetected until it was too late.[42]

40 PSE&G Advertisment, "Caution: Blackouts Ahead," Star-Ledger, January 15, 2009 (copy attached).

41 The following points list some of the key factors that contributed to the collapse of the First Energy system and the consequent cascading blackout. For a full analysis of this complex event see U.S.-Canada Power System Outage Task Force, Final Report on the August 14, 2003 Blackout in the United States and Canada: Causes and Recommendations, April 2004, https://reports.energy.gov/BlackoutFinal-Web.pdf. Perhaps the best brief description of the causes of the blackout is the "Voltage Collapse" text box on page 81.

42 "Transcripts of telephone conversations, released by the House Energy Committee, show bewilderment after the first control room computer went down. 'We have no clue,' one operator said. Another, speaking to a regional controller at MISO just before the blackout, said, 'We don't even know the status of some of the stuff around us.'" Ralph G. Loretta and James E. Anderson, "The Near Term Fix," Public Utilities Fortnightly, November 1, 2003, p. 34. The blackout report notes that FirstEnergy had no automatic load-shedding schemes in place, and did not attempt to begin manual load-shedding. U.S.-Canada Power System Outage Task Force, Final Report on the August 14, 2003 Blackout in the United States and Canada: Causes and Recommendations, April 2004, p. 70, https://reports.energy.gov/ BlackoutFinal-Web.pdf.

- The Midwest Independent System Operator (MISO), the RTO that manages the grid in FirstEnergy's service area, did not have the real-time information necessary to assess the situation on FirstEnergy system and provide direction to the utility.

Once the FirstEnergy system collapsed, overloads and power swings spread out across the Northeast, causing a cascading series of transmission line and power plant trips that left tens of millions of people without electricity. One reason the outage spread over such a wide area was because many power plants were equipped with unnecessarily sensitive automatic protection mechanisms that tripped the units prematurely. The speed of the cascade allowed almost no time for manual intervention. The elapsed time from the start of the cascade (i.e., when failures began to radiate out from the collapsed FirstEnergy grid) to its full extent was about seven minutes.

In summary, as discussed in the official blackout report and other analyses, **the 2003 blackout was not caused by a utility having built too few transmission lines, or because power line towers and substations were falling apart**. The blackout was apparently due to such factors as malfunctioning if not obsolete computer and monitoring systems, human errors that compounded the equipment failures, mis-calibrated automatic protection systems on power plants.[43] The report's author also noted that "depending on the case, building new transmission lines is not the only or best approach to enhancing power system reliability. In some instances investments in new monitoring and control technology may be the better solution."[44]

The Project Is Not Only Inconsistent with the Highlands Act, It Is Also Inconsistent with New Jersey's Clean Air Act and Its Energy Policies

The Department has already received comments from the various organizations on whose behalf we submit these supplemental comments about the Project's inconsistencies with the Highlands Act and Highlands Rules. The Project also jeopardizes New Jersey's ability to achieve compliance under the Clean Air Act with the National Ambient Air Quality Standards. The organizations also note that the Project is inconsistent with New Jersey's energy policies. Those policies are embodied in a variety of legislative and regulatory mandates—all of which are designed to reduce decreased greenhouse gas emissions and reduce energy demand by promoting energy conservation and energy efficiency, and increase localized renewable energy resources. **The Department has an affirmative obligation to take actions that are consistent with those mandates and goals.** The Project flies in the face of those mandates and goals.

The Project Is Inconsistent with the Highlands Act

The organizations wish to highlight particular concerns about the apparent attempt by PSE&G to distort the scope of the Project to downplay the impacts by focusing heavily on what will happen in the right-of way. The work in the right-of-way cannot be done without significant

43 Congressional Research Service Report at 31.
44 Id. at 32.

degradation of Highlands Preservation and Planning areas outside the right-of-way that are needed for construction and access roads. Very little analyses of the potential impacts to wetlands, rare plant and animal species or natural communities, to scenic or historic features have been done in these areas. The "Comprehensive Mitigation Plan" in the amended HAD application fails entirely to recognize or analyze the degradation of interior forest habitat caused by construction access roads outside of the existing right-of-way. This is anathema to the Highlands Act.

The organizations have also raised concerns about the lack of coordination between the various divisions in the Department, which is critical because virtually all of the State's resources that are under the jurisdiction of the Department are affected by the Project. State lands will be impacted— lands that are held in trust for the benefit of the public for use as park land, natural areas, wildlife management areas, and other uses that provide both recreational and ecological benefits not only to current residents but also future generations. Rare, threatened and endangered species of plants and animals and unique natural communities, including those in four large designated Natural Heritage Priority Sites in the Highlands, will be affected, as will numerous historic resources. Trail and trail systems, including the Appalachian Trail, the Highlands Millennium Trail, and many viewpoints will sustain permanent recreational and scenic degradation. All of these resources are protected by the DEP Highlands Rules. Therefore, the Divisions of Parks and Forestry and Fish and Wildlife, the Green Acres Program, Natural Lands Management, the Non-Game and Endangered Species Program, the Office of Historic Preservation, and the state Trails Coordinator, should all be involved along with Watershed Management in a fully integrated and comprehensive evaluation of the Project.

The potential impacts of the Project, especially the construction access roads, on State preserved lands (park and wildlife management areas, as well as designated Natural Heritage Priority Sites) should be considered within a broader context of alternatives and with more transparency. The Project's proposed diversions of local parkland are subject to Green Acres rule requirements, including public notice and public hearings. Requests for use of state lands for purposes for which they were not intended should receive a greater level of public scrutiny and transparency.

The potential impacts on rare, threatened and endangered species of plants, animals and significant natural communities, including Natural Heritage Priority Sites, must be assess in a much more robust and comprehensive manner than is proposed by the applicant in the Amended HAD "Comprehensive Mitigation Plan." A minimum of two years of data collection, with data collected in all seasons, is necessary to begin to determine what species are present in the Project area, including the vicinity of the proposed construction access roads. Surveys must include plants, amphibians, reptiles, migratory birds, and selected invertebrates, as well as mammals. No such comprehensive inventory is proposed by the applicant. Until the resources are identified, potential impacts cannot be quantified nor appropriate mitigation calculated. The New Jersey Highlands Coalition, on behalf of a number of other organizations, brought to the attention of the State Historic Preservation Office the inadequacy of the review of impacts to historic sites. In summary, that letter stated the following deficiencies: a number of known, listed sites occur just outside of the delineated areas of proposed impact; the proposed route of the line moves straight through several sites, with no deviance shown to accommodate the resources; and the route passes through at least two large properties (Picatinny Arsenal and the Mahlon Dickerson Reservation of the Morris Co. Park Commission) where independent listings of resources could be expected, but no mention is made of those listings.

PSE&G Failed to Consider Alternative Transmission Routes to Avoid Highlands Impacts

Besides energy source alternatives, PSE&G could have investigated alternative routes that would not have crossed the Highlands Preservation Area. The route between Roseland and Susquehanna was determined by the The Louis Berger Group ("Berger"). In early 2008, PSE&G and PPL Electric Utilities ("PPL Electric") contracted with Berger to perform a routing and siting analysis to determine potential routes to get from Susquehanna to Roseland. Berger Team's efforts resulted in a comprehensive alternative route identification process that established a preferred route (the "Preferred Route") for the Project in New Jersey. Not one of the three routes considered by PSE&G avoided the Highlands. All three routes considered go through the Highlands. Thus, in addition to only considering transmission "solutions" to address alleged reliability violations, those transmission options have always meant further scarring and fragmentation of the Highlands.

Notably, in its 2007 RTEP, PJM specified Roseland as one terminus because it would "provide significant benefit to mitigate overloads in northern New Jersey." It also recommended alternatives that connected to the American Electric Power 765 kV system (Susquehanna) to provide the greatest opportunity to access western generating resources, i.e., coal-fired plants. Another transmission line, still under study, would avoid the Highlands entirely. PSE&G never considered this option.

The Project Will Make It More Difficult to Attain National Ambient Air Quality Standards

The science of air pollution transport from fossil fuel fired generation in the Ohio Valley to the states downwind along the Eastern Seaboard is well established. The United States Environmental Protection Agency (EPA) has studied air pollution transport for decades. EPA has worked with states to assess the causes, contributors and effects of transported air pollution. The data compiled by EPA in the context of these efforts has repeatedly demonstrated that power plants are significant contributors to air pollution problems in the Eastern Seaboard.

An increase in power generation from coal fired power plants in the west, and the economic displacement of higher costing generation options in the east will result in increases in criteria pollutants. New Jersey is in non-attainment for ozone, and there are significant concerns about the affects of increased levels of soot, particularly $PM_{2.5}$ and PM_{10}

The Project Conflicts with the New Jersey Energy Master Plan

After the oil shocks of the early 1970s, New Jersey enacted a law in 1977 requiring an Energy Master Plan for the production, distribution, consumption and conservation of energy in New Jersey. The law requires the Plan to include not only long-term objectives, but also interim measures consistent with achieving those objectives. As stated in the introduction to the Energy Master Plan, finalized in 2008, the ultimate objective is to ensure that New Jersey has a reliable supply of energy, at a reasonable price, produced and used in a manner that meets the state's environmental needs. Despite what appears to be a conflict in goals, New Jersey has discerned that we can make progress toward all of these objectives by using energy more efficiently, by using less of it at times when heavy demand strains our infrastructure, and by producing more clean energy locally.

In the context of energy planning, the legislature mandated that "the actions, decisions, determinations and rulings of the State Government with respect to energy shall to the maximum extent practicable and feasible conform with the energy master plan." N. J. S. A. 52:27F-15b. The Department has a responsibility to conform any actions or decisions it takes with the Energy Master Plan. The proposed project conflicts with New Jersey's stated energy policy due to the substantial environmental and social costs of the project.

The Project is contrary to EMP goals and initiatives

The New Jersey Energy Master Plan, among other things, calls for an energy policy that (1) keeps prices low, (2) minimizes the emission of greenhouse gases and pollutants, (3) invests in energy efficiency and cleaner forms of electricity supply.[45] The Project seems to violate each of these three tenets within the master plan.

PJM and PSE&G are invested in facilitating the transmission of coal-based power

The Project, as part of a much larger plan described earlier in these comments, known as "Project Mountaineer," ostensibly would be used to transmit and distribute electricity from fossil fuel-fired generators, something directly at odds with New Jersey's goal of reducing pollution and mitigating climate change.[46] Using the best data available, when roughly quantified and put into monetary terms, the current negative externalities associated with coal-fired power plants are almost 20 additional cents per kWh, or 74 times greater than those for wind farms.[47] Continuing to generate electricity from these polluting and climate endangering sources has negative implications for human health, social stability, and the quality of the environment. Facilitation of coal generation with transmission is contrary to New Jersey's Master Energy Plan.

45 New Jersey Master Energy Plan, October 2008, pp. 6-10.
46 Testimony of Karl Pfirrmann, President PJM Western Region PJM Interconnection, L.L.C., *Promoting Regional Transmission Planning and Expansion to Facilitate Fuel Diversity Including Expanded Uses of Coal-Fired Resources*, Docket No. AD05-3-000, for a description of how the project could be used to transmit coal-fired electricity from West Virginia as part of "Project Mountaineer."
47 Benjamin K. Sovacool and Charmaine Watts, "Going Completely Renewable: Is it Possible (Let Alone Desirable)?", *Electricity Journal* 22(4) (May, 2009), p. 100.

The Project does nothing to promote energy conservation and efficiency to *reduce* consumption

PSE&G does not appear to be adequately investing in energy efficiency and demand side management programs that would lower costs for New Jersey ratepayers and alleviate any claim of need for the Project. One of the five EMP goals is to maximize the State's energy conservation and energy efficiency to achieve reductions in energy consumption of at least 20% by 2020 resulting in a reduction in our current energy consumption.[48] The Project is an investment in business as usual and does nothing to promote conservation and efficiency.

The Project does nothing to reduce peak demand for electricity

A second goal of the EMP is to reduce peak demand for electricity by 5,700 MW by 2020. Unabated growth in our peak demand for electricity, during a few hours daily, drives the need for expensive expansions of our electricity infrastructure to meet that peak demand reliably. That need, in turn, increases our costs for the necessary capacity reserves. By far, the most cost-effective way to preserve our electricity reliability and lower capacity costs is to reduce peak demand.

Rather than meeting peak demand with additional transmission lines and distant electricity generators, the EMP strives to reduce demand through specific peak demand initiatives. Additional peak demand can be reduced through the energy efficiency and cogeneration action items described in the EMP. The State has also committed to work to coordinate energy efficiency efforts with demand response programs. As noted above, PJM only recently even began taking energy efficiency and demand response programs into consideration, and those benefits are not taken into consideration in the models that have predicted reliability violations and the stated need for the Project.

The Project does nothing to stimulate renewable and alternative energy

A third goal of the EMP is to stimulate growth in renewable and alternative energy technologies by pursuing action items that may result in New Jersey producing 30% of its energy supply from renewable energy sources by 2020. As noted earlier, new, mega-transmission lines are not necessary to stimulate this growth and are not necessary to handle the new generation that we anticipate will come on line. Instead, the Project provides a pipeline for cheap coal fired power straight to New Jersey that will make it even more difficult for renewable and alternative energy technologies to compete with already heavily subsidized, business as usual sources.

48 NJ Energy Master Plan ("EMP"), p 53.

The Project perpetuates old infrastructure instead of encouraging new types

The fourth goal of the EMP is to develop a 21st century energy infrastructure that is responsive to the goals and action items in the EMP, ensures the reliability of the system, and makes available additional tools to consumers to manage their energy consumption. The State's efforts to meet the greenhouse gas targets for 2020 and the need to create a reliable supply of competitively priced electricity will largely depend on the ability of the energy infrastructure, including transmission lines and pipelines, to support the various efforts in the EMP. Rather than pushing through an "upgrade" for the "backbone" projects that are designed to deliver fossil fuel based power to New Jersey, the EMP calls for the grid to be improved in a way to support the new types of energy. This Project does not accomplish this goal.

The Project does not promote investment in clean energy

The fifth goal of the EMP is to invest in innovative clean energy technologies, businesses and workforce to stimulate the growth in the clean energy industry in New Jersey. There is nothing innovative about the Project.

The Project Conflicts with the Global Warming Response Act

In 2006, New Jersey's legislature engaged in a debate about the threats of global climate change and how best to stave off global crisis. After vigorous debate, in 2007 the Legislature passed the Global Warming Response Act. The Legislature found that the earth's ecosystems and environment are at risk from excessive greenhouse gas emissions. Therefore, the Legislature found and declared "that it is in the public interest to establish a greenhouse gas emissions reduction program to limit the level of Statewide greenhouse gas emissions, and greenhouse gas emissions from electricity generated outside the State but consumed in the State, to the 1990 level or below, of those emissions by the year 2020, and to reduce those emissions to 80% below the 2006 level by the year 2050." N.J.S.A. 26:2C-37 et seq.

Recognizing that New Jersey cannot turn a blind eye to greenhouse gas emissions emanating from power sources outside of New Jersey that are imported into the state, a concept referred to as "leakage," these emissions sources will also be factored into the state's efforts to reduce greenhouse gas emissions. The Project does nothing to facilitate these goals. In fact, it promotes exactly the opposite result.

The Project Is Unnecessary to Meet and Will Impede Reaching Renewable Portfolio Standards

States have used their authority to improve the prospects for renewable energy, from policies favoring domestic generation to smart grids and conservation programs. New Jersey has Renewable Portfolio Standards, NJAC 14:8-2.3, which mandate entities that sell electricity to retail customers to include certain percentages of renewable energy by specific dates. Within six years, New Jersey residents must be obtaining 12% of their electricity from renewables and by 2021, over 22%. The chart below shows the percentages required for both years.

Reporting Year	Solar Electric	Class I - biomass, wind, tidal, fuel cell	Class II - resource recovery & hydro	Total Renewable Energy
May 31, 2015	.765%	8.807%	2.50%	12.072%
May 31, 2021	2.120%	17.880%	2.50%	22.50%

Not everyone agrees that a new inter-regional transmission network is needed to distribute renewable energy. In their report *Energy Self-Reliant States*, John Farrell and Davis Morris assert that a new extra high voltage inter-regional transmission network may not be needed to improve network reliability, relieve congestion and expand renewable energy. They propose a focus on encouraging renewable generation and upgrading the transmission, sub-transmission and distribution systems inside states.

The report shows that states have the potential of supplying most if not all of their electricity needs. New Jersey has the potential for renewables to supply 83% of its electricity needs through:

- Onshore Wind Power - 18%
- Offshore Wind Power - 38%
- Solar Power - 18%
- Combined Heat and Power - 9%

The analysis assumed stable electricity consumption but this consumption rate could be reduced by energy efficiency measures. According to the report, if New Jersey matched California's energy efficiency, it could reduce its electricity intensity by 18% (as measured by electricity use per dollar of state GDP per capita).

It is true that states with more reliable and higher speed winds or with more abundant sunshine can generate electricity cheaper. Nevada, for example, can produce solar electricity from photovoltaic panels at a price about 20 percent less than Iowa and about 35 percent less than Pennsylvania. But in most cases these significant variations result in modest variations in the retail cost of energy when the cost of transporting the energy is taken into account. Even if centralized, renewable energy looks attractive when the cost-benefit analysis focuses on the retail price, when a more expansive definition of economic interest is used, that is, the impact of renewable energy development on local jobs and economies, state-based energy strategies can be clear economic winners.

Even though state self-reliance will be a long-term goal, the data in Farrell & Morris's report suggest that states should encourage local generation of renewable fuels, energy efficiency and demand reduction to meet in-state demand. This in turn can free up significant amounts of distribution and transmission capacity. Efficiency Vermont has empirically shown that efficiency investments can displace more than 100 percent of projected load growth (i.e. absolute load can decrease). Smart grid pilot studies find that 20 percent reductions in peak demand are achievable. New in-state transmission lines may well be needed but these will probably be lower voltage lines. In any event, they should be built only after maximizing energy efficiency and the use of existing transmission capacity.

Conclusion

The New Jersey Highlands Coalition, Sierra Club-New Jersey Chapter, Environment New Jersey, New Jersey Environmental Federation, and Stop the Lines respectfully request that the Department reject PSE&G's application for a Highlands Applicability Determination. From every angle, the Project is inconsistent with the Highlands Act and Rules.

A better approach to the building of transmission infrastructure would institutionalize carbon policies first so that new wires do not yield new greenhouse gas (GHG) emissions as is so likely to happen in the mid-Atlantic ('Green Wires' which inconveniently increase GHG). These approaches would also be in harmony with the Department's duties under the Clean Air Act, the EMP, the Global Warming Response Act, and the Renewable Energy Portfolio Standards.

Respectfully submitted,

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Executive Director
Eastern Environmental Law Center

On behalf of the New Jersey Highlands Coalition, Sierra Club-New Jersey Chapter, Environment New Jersey, New Jersey Environmental Federation, and Stop the Lines

APPENDIX A – CERTAIN DEFINED TERMS

Definitions

1. **PSEG Enterprise**

Public Service Enterprise Group Incorporated ("PSEG") is the parent organization and has the following subsidiaries:

PSE&G is an "electric public utility" and a "gas public utility" as those terms are defined in N.J.S.A. 48:2-13 and N.J.S.A. 48:3-51, and is subject to regulation by the Board of Public Utilities ("BPU" or "Board").

PSEG Power, a major supplier of electric energy in the Northeast and Mid-Atlantic markets with 3 main subsidiaries of its own: PSEG Fossil, PSEG Nuclear and PSEG Energy (trading arm of PSEG Power).

PSEG Energy Holdings, which holds financial assets through two subsidiaries: PSEG Global (electric generation facilities in other states) and PSEG resources (energy-related financial transactions - leveraged lease investments); and

PSEG Services Corporation (provides accounting, legal, it, HR, etc. services to internal clients).

2. **Energy Conservation**

Energy conservation is reducing the amount of energy used by any means. One way of achieving this is through energy efficiency.

3. **Energy Efficiency**

Energy efficiency is using less energy to provide the same level of energy service.

4. **Load Management or Demand Side Management**

Load management is the process of balancing the supply of electricity on the network with the electrical load by adjusting or controlling the load rather than the power station output.

5. **Demand Response**

Demand Response ("DR") is a method of load management that adjusts customer consumption of electricity in response to supply conditions, e.g., having electricity customers reduce their consumption at critical times or in response to market prices. There are two types of DR: emergency and economic. Emergency DR is primarily needed to avoid outages; economic demand response is used to help utilities manage daily system peaks.

6. **Distributed Generation**

Distributed generation is the generation of electricity from several smaller facilities that are near points of consumption.

7. **Interruptible Load for Reliability** (ILR)

A resource with a demonstrated capability to provide a reduction in demand or otherwise control load in accordance with PJM Standards that is certified by PJM no later than three months prior to a Delivery Year is known as an ILR Resource.

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Caution: Blackouts Ahead...

Consider this a warning: The experts responsible for maintaining reliability on our electric grid flatly predict that we are risking catastrophic power outages in New Jersey if we don't upgrade the system soon.

It is almost hard to believe. We are so accustomed to the lights snapping on when we flick a switch that it seems like a birthright.

The truth is that our transmission grid, like some of our crumbling bridges, needs attention. We can ignore the warnings. We can look the other way. And we can pretend the experts don't really know what they're talking about.

But play this out for a moment. What exactly will happen in New Jersey if we sit on our hands?

The most urgent problem lies in northern New Jersey, where a line built starting in 1926 is straining to carry voltage between Warren and Essex counties. That stretch of the Susquehanna-Roseland line will start overheating and breaking down, according to the experts, unless changes are made.

What could happen then? For the answer, turn to Valley Forge, PA, the headquarters of an organization called PJM, where experts manage the regional grid stretching from Chicago to Newark.

"The metal in the conductors may become brittle, rendering it useless," says Paul McGlynn, PJM's transmission planner. "In addition, the line may break and fall to the ground causing a potentially dangerous situation...In short, overloading transmission lines may cause permanent damage to transmission infrastructure and catastrophic power outages."

When lines threaten to overload, planners first trim back electricity imports, forcing local prices skyward. They beg consumers to turn off appliances. They reduce voltage, dimming our lights and shrinking our TV pictures. Finally, they force rolling blackouts, as California did in 2000-2001. Flick your switch then, and your house may stay dark.

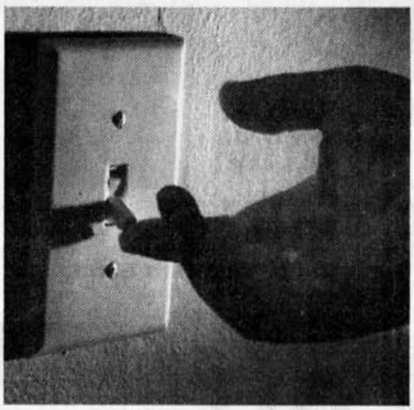
All this strain, of course, increases the risk of an uncontrolled blackout. The worst one, in 2003, cost the national economy $4 billion to $10 billion and contributed to 11 deaths. A smaller one at the Jersey shore that summer stranded vacationers on Ferris wheels and left 180,000 without power for two days. Food rotted in restaurants. Traffic lights went out.

Some hope we can answer this challenge with energy efficiency and local wind and solar power. At PSEG, we are making huge investments in those solutions, doing more than anyone else in New Jersey. But the hard fact is it won't be enough to solve this pressing problem.

PSE&G stands ready to spend $750 million to upgrade that line, creating hundreds of good jobs and keeping a lid on electricity prices.

The latest estimate is that these overloads will begin in 2012. Experts are updating the data now, and the drop in demand due to this recession may buy us an extra year. But we'll still need that upgrade.

It's time now to face that reality. We've had our warning.



...Unless power lines built decades ago are upgraded soon.

What's your view? Please let us know at Opinion@PSEG.com

PSEG

We make things work for you.