EDF
ENVIRONMENTAL DEFENSE FUND
Finding the ways that work

August 24, 2015

Via Electronic Mail

New Jersey Board of Public Utilities
44 South Clinton Avenue
Trenton, NJ 08625

RE: Energy Master Plan Update

Dear NJBPU Commissioners:

The Environmental Defense Fund ("EDF") thanks New Jersey Board of Public Utilities ("BPU") for this opportunity to comment on the Energy Master Plan (EMP) Update. EDF is a national non-profit membership organization engaged in linking science, economics and law to create innovative, equitable and cost-effective solutions to society's most urgent environmental problems. EDF has more than one million members nationwide and over 56,000 in New Jersey. As an organization, EDF has been active in New Jersey on environmental issues since the 1970's.

Many of the 2011 EMP goals align with EDF's goals and we eagerly anticipate the BPU's Update that provides more comprehensive analysis and data regarding the state's progress toward meeting the 2011 goals. For future EMP updates and new plans, EDF recommends that clear metrics and an interim reporting schedule be established in order to better track results.

Environmental Defense Fund supports the Board's intent to add "resiliency" to the EMP. Broadly speaking, we believe that the same benefit/cost and environmental impact considerations that are applied to other energy applications must also be applied to energy resiliency policies and projects.

Microgrids:

New Jersey's post-Sandy leadership on microgrid development positions it at the forefront of a national movement to establish the rules and the marketplace that will enable a resilient energy system that can respond to extreme weather events and other challenges like aging infrastructure and security.

From EDF's standpoint, two objectives are of standout importance for any energy system application: Reduction of carbon emissions and ensuring clean air. In this context, microgrids have the potential to integrate clean distributed resources and to contribute to carbon reductions and cleaner air. Additionally, microgrids have the potential to serve as laboratories for innovation.

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It does not go without saying that microgrids will advance the Administration's 2011 EMP stated goal to 'manage energy in a manner which....protects the environment' and 'mitigates long-term cumulative impacts'[1] that would include reducing carbon emissions and other air pollutants. Unless the regulatory framework and/or the marketplace is structured to account for negative environmental impacts, whenever decisions are made about what resources to construct and how to deploy them, highly polluting resources, to the extent they are permitted by law, may prove economic in various circumstances. If microgrids and other distributed energy resources are going to advance carbon reductions and clean air, the rules must be set up to facilitate this outcome.

In addition to microgrids' potential to advance resiliency and a clean environment, every new microgrid is a microcosm of the grid and, as such, has the ability to demonstrate new business models, including new revenue opportunities for third parties and utilities. In this way, they can act as laboratories to advance the transformation of the marketplace.

Energy Resiliency Bank

EDF continues to support the creation of the New Jersey Energy Resilience Bank. We believe that there are a host of environmental, economic and resilience benefits to creating a diverse and robust distributed generation and distributed energy infrastructure that includes energy efficiency. We also strongly believe that it is critical that the State seek to creatively and aggressively engage private capital markets around these efforts, mobilizing new sources of public and private capital into essential distributed energy projects. By engaging private capital markets, it will be possible to enhance the available financing for critical public facilities as well as to more quickly expand eligible projects beyond public facilities.

We believe that moving forward the state should consider the "green bank" construct. A "green bank" construct would leverage public funds with private capital, delivering innovative financing programs and mechanisms into critical public energy initiatives. The ERB has a relatively unique opportunity to carve out a very distinct niche in adaptation technologies and finance and truly make a name for itself amongst green banks not just domestically but globally.

To the extent that there is no one "best" construct for a state-level green bank there is also no one "best" approach to fully leveraging the potential for a green bank to have a positive impact within a specific state to address specific needs. That said, there are still valuable lessons that can be learned from existing domestic state green bank entities and how they are working to craft initiatives and mechanisms that serve to fully leverage public capital and seek to engage private capital markets in support of critical resilience, energy efficiency and renewable energy initiatives.

Connecticut – the nation's first green bank - has perhaps been the most creative and far-reaching in their attempts to leverage public and private capital in support of their mandate to finance clean energy. Initiatives that they have pursued have included subordinated debt, loan loss reserves, perhaps the nation's most robust commercial PACE programs and capital for solar leases and solar loans. Hawaii's Green Energy Market Securitization (GEMS) Program (creating a loan fund capitalized by low interest utility tariff-secured bonds sold to private investors) is designed to make it easier for Hawaii residents to finance solar photovoltaic systems by providing access to low cost loans from the loan fund that can be repaid through utility on-bill repayment.

The New York Green Bank (NYGB) has taken a decidedly different (more commercial) approach than Connecticut, focusing on areas where there is market interest but limited capital availability due to specific financing gaps and barriers. The NYGB partners with intermediaries in order to provide wholesale finance and leverage private capital, funding commercially-proven technologies that are in demand by end-users, are economically viable, and can support a commercial cost of debt. To this end

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[1] http://nj.gov/emp/docs/pdf/2011_Final_Energy_Master_Plan.pdf, Pg. 1

participation by the NYGB can take on role of credit enhancement provider (e.g., a reserve account or a junior interest), lender (e.g., senior, mezzanine or subordinated) or warehouse provider (with the likelihood of being taken out by private sector third parties).

Working with private capital markets, New Jersey can facilitate and support the creation of robust finance mechanisms and tools that can serve to transform state energy markets. Working together, the State can help to unlock private capital market activity toward and in support of State energy resilience and larger environmental and market objectives.

Energy Efficiency and Private Capital Investment

We applaud the BPU's Office of Clean Energy for their commitment to the development of the recently-announced Energy Efficiency Pay for Performance program pilot of the Investor Confidence Project. Standardized data and documentation is a necessary component to accessing private capital investment in the energy efficiency market, an Energy Master Plan goal. As stated in our FY '16 Comprehensive Resource Analysis (CRA) Staff Straw Proposal (Straw Proposal) comments, *"The Investor Confidence Project (ICP) defines a clear road-map from retrofit opportunity to reliable Investor Ready Energy Efficiency™. With a suite of Commercial and Multifamily Energy Efficiency Protocols in place, ICP reduces transaction costs by assembling existing standards and practices into a consistent and transparent process that promotes efficient markets by increasing confidence in energy efficiency as a demand-side resource. The P4P pilot positions New Jersey as a national leader through its recognition and commitment to building an investor ready energy efficiency market."*[2]

Data Access

A necessary building block to accelerating the transition to a cleaner, more efficient energy system is the customer's ability to access their energy consumption data. The electricity system is transforming into an innovative and interconnected ecosystem and as that happens, we need to engage electric customers so that they can make informed energy choices and actively participate in this new system. Providing customers with access to their energy consumption data empowers them to lower their utility bills and is essential to realizing a more efficient and cleaner electricity system that can smoothly integrate energy efficiency and distributed energy resources ("DER").

Adopting standards like Green Button Connect will allow customers access to data in order to make their energy decisions independently or through their energy solutions provider.

Clean Power Plan

The timing of the 2015 Energy Master Plan update process coincides with the state's need to begin to develop its implementation plan in response to the recently released U.S. EPA final Clean Power Plan (CPP) rule. The CPP provides a framework for New Jersey to further enhance its leadership as a clean-energy state and stimulate economic development and job creation at the same time.

The 2011 EMP states that there are "challenges related to aging grid infrastructure, and the need to reduce reliance on high emission sources of energy, particularly from out-of-state coal resources."[3] Robust investment, including the approval of policies and mechanisms that provide a pathway for private capital engagement, in energy efficiency and renewable energy including the expansion of solar will advance the state's EMP goals.

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2 http://www.njcleanenergy.com/files/file/public_comments/CRA%20FY16%20CP%20Public%20Comments%200612 15.pdf, Pg. 11

3 http://nj.gov/emp/docs/pdf/2011_Final_Energy_Master_Plan.pdf, Pg. 9

Natural Gas Infrastructure

Since the issuance of the 2011 New Jersey Energy Master Plan, new analysis and information are informing perspectives on the extent to which natural gas constitutes a "clean energy" resource[4] and the economics of natural gas infrastructure. In sum, and as discussed in further detail below:

- massive amounts of methane are emitted throughout the natural gas supply chain weakening its environmental attributes;
- on the financial merits, rapidly decreasing prices for renewable energy and expanding opportunities for demand-side measures (e.g., demand reductions) are suggesting a more narrow role for natural gas in the energy mix;
- changing market dynamics and the high cost of interstate natural gas pipeline infrastructure for supplying gas-fired power plants are undercutting the presumption that "new or expanded pipelines will confer energy price benefits."[5]

It is axiomatic that over time energy technology and information will evolve and improve. As the Energy Master Plan Update proceeds, it is imperative for policymakers to consider the most current facts and analysis to inform New Jersey's strategies for achieving the state's energy objectives.

Methane Emissions:

Natural gas, which is mostly methane, burns with fewer carbon dioxide emissions than other fossil fuels. However, when uncombusted methane leaks into the atmosphere from wells, pipelines and storage facilities, it acts as a powerful greenhouse gas with enormous implications for global climate change due to its short-term potency: Over a 20-year time frame, each pound of methane is 84 times more powerful at increasing the retention of heat in the atmosphere than a pound of carbon dioxide.

Fugitive methane emissions from natural gas production, transportation and distribution are the single largest U.S. source of short-term climate forcing gases. The EPA estimates that 2.3% of total natural gas production is lost to leakage, but this estimate, based on early 1990's data, is sorely in need of updating. To determine the true parameters of the problem, EDF has been working with diverse academic partners and dozens of industry partners on direct measurements of fugitive emissions from the U.S. natural gas supply chain. The initiative is comprised of a series of sixteen independent and rigorously executed studies, peer-reviewed and published in respected scientific journals, analyzing emissions from the production, gathering, processing, long-distance transmission and local distribution of natural gas, including data on the use of natural gas in the transportation sector.[6]

The most recent study, published August 18, 2015, concludes that emissions from facilities that collect and gather natural gas from well sites across the United States emit about one hundred billion cubic feet of natural gas a year, roughly eight times the previous estimates by the U.S. Environmental Protection Agency for the segment. The wasted gas identified in the study is worth about $300 million, and packs the same 20-year climate impact as 37 coal-fired power plants. The study is the last of numerous EDF-organized studies focused on the individual segments of the natural gas supply chain (production, gathering and processing, transmission and storage, and local distribution). A forthcoming synthesis paper will put these pieces together to present a more complete picture of the methane emissions across the different sectors in the natural gas supply chain.

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[4] See 2011 EMP pg. 9, (recommending that the "definition of 'clean energy' is broadened beyond renewables to include nuclear, natural gas, and hydroelectric facilities.)

[5] 2011 EMP at. Pg. 85.

[6] The full set of studies can be accessed at https://www.edf.org/climate/methane-studies.

While all of the studies inform the extent to which natural gas use in New Jersey affects the state's energy and environmental goals, leaks from local natural gas distribution systems are of particular relevance in New Jersey, the state with the highest proportion of leak-prone cast iron pipe. The goals and strategies to be considered in the Energy Master Plan Update must take into account the extent of methane leakage across the natural gas supply chain and include measures to accelerate the replacement of leak-prone gas and pipe infrastructure in New Jersey.

The Evolving Role of Natural Gas and Natural Gas Infrastructure:

In 2011, many viewed natural gas as the fuel of choice to replace baseload coal-fired power plants for generating electricity. Numerous recent studies, however, have observed that the costs for renewable energy sources continues to decrease to the point that they are now competitive with natural gas-fired electricity generation and are projected to be lower cost in the near future.[7] Moreover, demand-side measures are reducing demand growth, and more nimble smart technologies allow customers to dynamically manage their energy use. Increasingly, the energy delivery system will need to be optimized around lower cost, variable output renewables, distributed generation, and new energy storage technologies because this is what technological innovation is increasingly and cost-effectively providing, and what customers are demanding. These trends express a new cost hierarchy and role for natural gas in the power sector, one that is not heavily weighted towards increased reliance on natural gas as a baseload electricity resource.

Natural gas is a tool that can be either a facilitator of a smarter more flexible and dynamic energy system, or an obstacle, particularly if ratepayer obligation and capital is directed by the state into infrastructure that does not keep up with the ongoing evolution of the energy system. New natural gas-fired power plants and interstate pipelines are long-lived resources with useful lives (and depreciated) over forty years or longer. New pipelines, for example, must apply for and obtain FERC approval, in the form of a Certificate of Public Convenience and Necessity, prior to commencing construction. Before a proposed new pipeline can apply for a FERC Certificate, it must execute contracts providing sufficient revenue from shippers to pay for the full cost of the project. Because the costs of constructing a new pipeline (particularly a greenfield project) are so great, these contracts ("precedent agreements" providing for binding transportation service agreements) must be of long duration, typically around 20 years or longer. In precedent agreements, the costs are almost entirely imposed on shippers through take or pay obligations whereby daily pipeline delivery capacity is reserved and paid for by shippers for every day over the period of the transportation service agreements -- whether or not those services are used.

A primary consequence of take or pay transportation agreements is that the fewer the days and the lower the quantities shippers take on those days as natural gas delivery from the pipeline (i.e., the lower the load factor of use), the higher the effective incremental cost of the transportation service per dekatherm delivered or megawatt hour generated using the gas – the effective "cost-in-use." The fewer megawatt hours generated, the higher the effective incremental, per megawatt hour cost to customers. There may be a point at which the extent of utilization of new capacity renders its long term cost to be lower than the alternatives. However, this may require a much higher level of utilization than can be reasonably expected (depending on the size of the capacity addition) and will be challenging to predict accurately into the future given the ongoing technologically and customer driven trends in the market. Natural gas (the commodity) may be priced relatively low but pipelines to transport it are very expensive, especially when the gas is used primarily to address peak demand conditions or as a firming resource to balance lower cost renewable power generators. Therefore, extreme diligence must be exercised in determining the size of

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[7] *See*, e.g., Lazard – *Levelized Cost of Energy Analysis – Version 8.0* (September 2014), available at http://www.lazard.com/media/1777/levelized_cost_of_energy_-_version_80.pdf ; U.S. Department of Energy – *Wind Technologies Market Report* (August 2015), available at http://www.energy.gov/2014-wind-market-report

the need and duration of use for new pipeline capacity, especially insofar as fixed long term obligations would be imposed on retail ratepayers. Any continuing presumption that new natural gas pipeline infrastructure will provide price benefits must be supported by analysis, and should consider the stranded cost risk inherent to expensive long-lived infrastructure.

Respectfully submitted,

Mary Barber
New Jersey Director, Clean Energy

N. Jonathan Peress
Air Policy Director, Natural Gas

August 24, 2015

EMP Update
Board Secretary
PO Box 44 S. Clinton Ave
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Re: Comments of the Mid-Atlantic renewable Energy Coalition on the Update to the 2011 Energy Master Plan

Dear Secretary Asbury:

The Mid-Atlantic Renewable Energy Coalition ("MAREC") appreciates the opportunity to comment on the Update to the 2011 Energy Master Plan ("EMP" or "Plan"). MAREC is a nonprofit organization that was formed to help advance the opportunities for renewable energy development primarily in the region where the Regional Transmission Organization, PJM Interconnection operates. MAREC's footprint includes New Jersey and eight other jurisdictions in the region. MAREC members include wind developers, wind turbine manufacturers, service companies, non-profit organizations and a transmission company dedicated to the growth of renewable energy technologies. MAREC members have developed, own, and operate thousands of megawatts of renewable energy serving the PJM territory, including serving customers in New Jersey.

One of the main themes of the EMP was that New Jersey ratepayers pay too much for electricity and that all resource procurement and development whether done to meet general electricity needs or to meet the RPS should be evaluated based on the procurement being cost-effective. We, too, share concerns about utility rates and the cost of energy and understand the need to drive down costs for all customers. Nevertheless, we believe that the 2011 Energy Master Plan fails to consider a significant renewable energy resource, regional onshore wind

energy, which would provide New Jersey ratepayers a cost-effective opportunity to help meet the mandates of the Renewable Energy Portfolio Standard ("RPS").

According to the DOE's Lawrence Berkeley National Laboratory, since 2009, onshore wind prices have dropped nearly 67 percent at their lowest levels ever.[1] The following graph from the Department of Energy's just released 2014 Wind Technologies Market Report clearly reflects this steep decline in prices for wind purchase power agreements ("PPAs").[2]

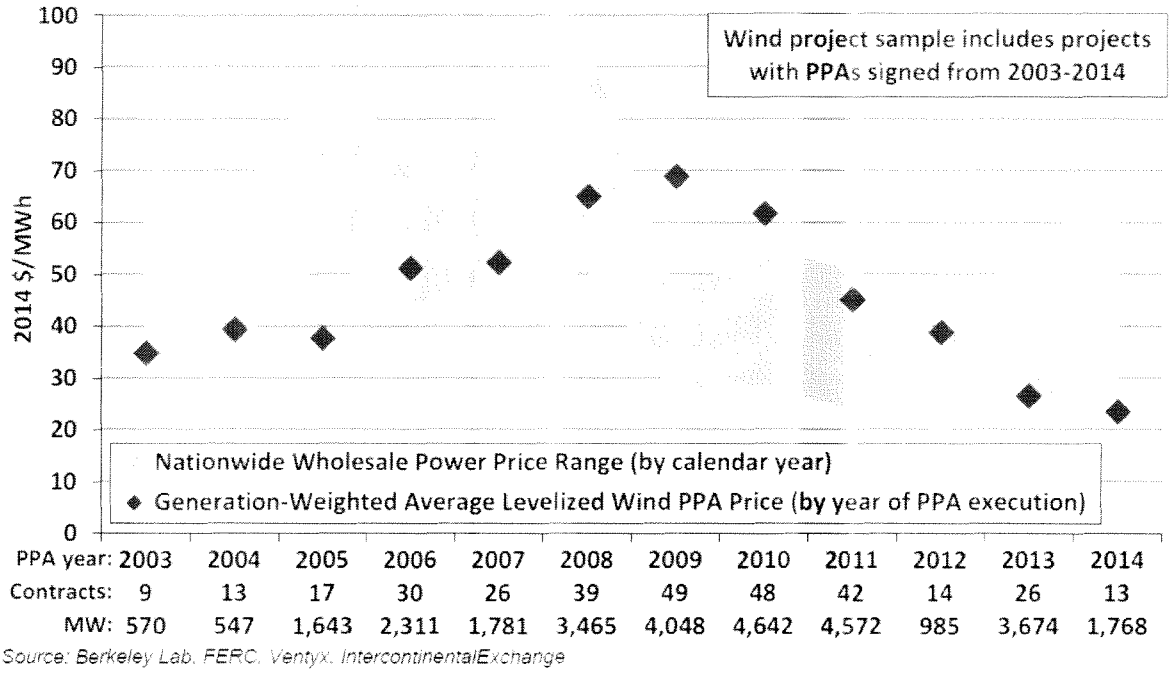

Figure 47. Average levelized long-term wind PPA prices and yearly wholesale electricity prices over time

Wind energy from onshore land-based wind farms from a price perspective compares very favorably to other energy resources in wholesale markets[3] and when comparing new construction of these generating resources.[4]

Not only is wind energy cost-effective, but policies supporting long-term contracts for wind energy (10-20 years) help get these projects financed at reasonable rates and ensure price

[1] Department of Energy (DOE)'s "2014 Wind Technologies Market Report" (released August 20150) at page 56. http://emp.lbl.gov/sites/all/files/lbnl-188167.pdf

[2] *Id* at 58.

[3] *Id* at 57-58

[4] Lazard's Levelized Cost of Energy Analysis — Version 8.0 at page 2. http://www.lazard.com/media/1777/levelized_cost_of_energy_-_version_80.pdf (September 2014).

stability. This is because the resource itself is not subject to the price volatility facing traditional fossil fuel resources over the long-term, like coal and natural gas. In addition to the EMP's support of offshore wind, we think it is important that onshore wind resources be considered as a significant resource in helping New Jersey meet its renewable portfolio standard.

New Jersey has recognized that large-scale capital investments in the energy sector, such as the proposed 1,100 MW offshore wind farms, require stable, long-term revenue streams. Similarly, other Class 1 resources also require long-term revenue streams to achieve economic viability, and New Jersey policymakers should not be overly reliant on one or two resources, particularly when less expensive options are available to meet a portion of the RPS goal.

The 2011 Energy Master Plan expresses a preference for in-state renewable development, and we do not oppose some reasonable preferences, such as the existing solar carve-out. However, we think it is important not to lose sight of the value lower electricity prices have with respect to economic development for the state. As New Jersey seeks to attract and retain businesses and industries, we believe that the New Jersey Energy Master Plan should maintain the eligibility for all low-cost options in meeting the state's renewable energy standards to prevent unduly expensive electricity prices, which could have an adverse impact on economic development. MAREC believes that an over-emphasis on in-state resources could have the reverse, unintended impact on economic development by causing prices to spike and deter businesses from expanding or investing in New Jersey as a result of higher energy prices.

Also of significant concern with the EMP is that it reduced the target for the state's renewable energy portfolio standard from 30% in 2020 to 22.5% by 2020. We believe, as other commenters have stated, that the Plan should be updated to reflect a significant increase in the standard. Not only will the citizens of the state gain from increasing the level of zero emitting energy resources into the air, as noted, increased reliance on renewable resources can be achieved cost-effectively by the procurement of wind energy resources from land-based projects. Moreover, the final rules of the EPA's Clean Power Plan now require the state to plan to further reduce its carbon footprint. One of the three building blocks of the final rule is to achieve the reductions of carbon through increased emphasis on renewable technologies.

Finally, we would urge that it be made clear in the Energy Master Plan that the requirements for Class I renewable energy resources be left solely for zero-emitting renewable resources. Renewable energy resources, like solar, wind and geothermal energy serve to reduce the state's carbon footprint consistent with the intent of the renewable energy portfolio standard, but are also a critical element ("building block") now in meeting the requirements of the EPA's Clean Power Plan. When an RPS standard is amended to move a non-renewable energy source,

such as waste energy, into Class I, the incentives to produce clean and renewable technologies are weakened.

MAREC again wants to thank the Board of Public Utilities for allowing interested parties, like MAREC, to participate at the hearings on the update to the EMP, as well as providing written comments on the update to the Plan.

Sincerely,

Bruce H. Burcat

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August 24, 2015

Re: Energy Master Plan Update

Dear President Mroz,

I am writing to express my support in updating the 2011 Energy Master Plan to include emerging issues related to improving energy resiliency, emergency preparedness and response. Hoboken is an urban coastal community that was greatly impacted by Hurricane Irene, and Superstorm Sandy. Hoboken also deals with systemic flooding from more frequent lower impact rain events which can disrupt electric service, and adversely affect the functions of our most critical facilities.

We are working diligently to address these issues by taking a holistic approach to increase the resilience of our infrastructure. One strategy to increase energy security includes the development of a municipal microgrid that will add another layer of protection to the $230 Rebuild by Design coastal flood protection project. With the help of the Board of Public Utilities, Hoboken wants to demonstrate the immense value of distributed energy resources and provide an adaptive utility business model where resiliency services are monetized. In the short term, the microgrid will support the health and safety of Hoboken residents, help critical facilities to respond and recover, and enable sheltering in place. Over time, I believe the microgrid will demonstrate to BPU the myriad benefits accumulated from increased economic development, loss avoidance, strengthened homeland security, and multi-modal transit access.

I agree that policy recommendations should be developed that include: protecting critical energy infrastructure, improving the Electric Distribution Companies emergency preparedness and response, increasing the use of microgrid technologies and applications for distributed energy resources, and creating long-term financing for resiliency measures through the Energy Resilience Bank. Please consider this letter of support as you undertake updates to the 2011 Energy Master Plan.

Sincerely,

Mayor Dawn Zimmer

Participating Organizations

Clean Ocean Action

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RE: Comments on revisions to 2011 New Jersey Energy Master Plan

To Whom It May Concern:

Clean Ocean Action (COA), a regional, broad-based coalition of 117 conservation, environmental, fishing, boating, diving, student, surfing, women's, business, civic and community groups with a mission to restore and protect the degraded water quality of the marine waters off the New Jersey/New York coast, submits the following comments on the NJ Board of Public Utilities' (BPU) updates and revisions to the 2011 NJ Energy Master Plan. COA appreciates the opportunity to comment on potential revisions and additions to the NJ Energy Master Plan (EMP) and urges BPU to integrate these concerns and suggestions into the updated plan.

COA focuses on the health and resilience of our coastal and marine areas; therefore, positions are developed through this prism. COA is participating in the development of NJ's EMP to ensure that it is protective of the ocean and coastal areas, and its many varied, valuable, and vulnerable resources to sustain their essential role in New Jersey's economy, ecology, and quality of life.

New Jersey has a proud history of innovation in the field of technology and energy generation. Carried forward by Samuel Morse and Alfred Vail in the early 19th century, New Jersey's research and development reached a global peak with Thomas Alva Edison and his industrial research lab in Menlo Park. Furthermore, Bell Labs, the numerous military research programs at Ft. Monmouth and other installations throughout the state, and the vast network of premier universities including Princeton, Stevens Institute of Technology, and other schools, have all been responsible for groundbreaking research energy and technology. This innovative background, along with New Jersey's concentrated population centers, and the economies of scale necessary to amplify small changes in energy generation and use, make this state a perfect incubator for and innovator of innovative and cutting edge energy policies and technology. This would establish New Jersey as a premier green energy state, castly increasing industry, opportunity, and high paying jobs.

Climate Change and Energy Generation

Since 2011, New Jersey has been impacted by numerous severe weather events including Hurricane Irene, Superstorm Sandy, and two derechos. While it is impossible to link individual weather events directly to anthropogenic induced climate change, climate scientists have indeed connected the intensity and frequency of these severe weather

events with climate change in a scientific inquiry known as "attribution studies".[1] The science is clear; warming of the atmosphere increases the number of times temperatures reach extreme levels and evaporates more water from the oceans.[2] It is from this hotter, wetter background that extreme weather events emerge. Furthermore, the rate of ice sheet melt and sea level rise has outpaced all scientific projections and clearly shows that the pace of climate disruption is increasing.[3] Dr. James Hansen and colleague's newly published paper makes this exceedingly clear:

"Continuation of high fossil fuel emissions, given current knowledge of the consequences, would be an act of extraordinary witting intergenerational injustice. Responsible policymaking requires a rising price on carbon emissions that would preclude emissions from most remaining coal and unconventional fossil fuels and phase down emissions from conventional fossil fuels."[4]

A thorough and comprehensive Energy Master Plan must acknowledge climate change and the related impacts that *will* affect New Jersey now and in the coming decades. Climate change should influence which energy sources BPU invests in or approves, where and how BPU sites critical energy infrastructure, and the methodology behind how BPU analyzes the costs of both carbon intensive fuels such as coal and natural gas as well as the costs of renewables such as solar and wind. These aspects will be considered in more detail below.

This is an extraordinary time and opportunity for NJ to once again become a national model and embrace policies that will truly make NJ energy wise. Planning NJ's energy future to prioritize energy efficiency, conservation, and truly renewable energy as a first choice for new electricity generating sources will create jobs, improve the quality of life for all citizens and protect the environment.

The Energy Master Plan is a critically important document. It serves as a strategic vision for the use, management, and development of energy in New Jersey over the next decade and more. The choices that are made today are numerous and complex: whether to continue to invest in fossil fuel based energy sources and infrastructure -- which energy sources will replace the aging and outdated fleet of nuclear generating stations that will soon be phased out -- whether New Jersey will find itself leading, or struggling to catch up to, the clean energy revolution . How we choose to respond to these choices will reverberate through the decades and impact future generations. Investing in energy infrastructure is a study in long term pay offs; power plants take years to build and even longer to pay for. While the Board of Public Utilities has a responsibility to today's ratepayers, it must also consider the ratepayers of twenty, and fifty years from now, who will continue to pay for the investments and decisions made in the present.

Governor Christie's Record on Energy

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[1] *See* Hegerl and Zwiers, "Use of models in detection and attribution of climate change", 2011, Vol. 2, Issue 4 of Wiley Interdisciplinary Reviews: Climate Change, *available at* http://dx.doi.org/10.1002/wcc.121. *See also* Mathiesen,"Extreme Weather Already on Increase Due to Climate Change, Study Finds" The Guardian, *available at* http://www.theguardian.com/environment/2015/apr/27/extreme-weather-already-on-increase-due-to-climate-change-study-finds.

[2] *Id.*

[3] Hansen J, Kharecha P, Sato M, Masson-Delmotte V, Ackerman F, et al. (2013) Assessing "Dangerous Climate Change": Required Reduction of Carbon Emissions to Protect Young People, Future Generations and Nature. PLoS ONE 8(12): e81648. doi: 10.1371/journal.pone.0081648

[4] *Id.*

There are key energy policy decisions that Governor Christie has made that are laudable. COA implores the Christie administration to continue its' opposition to any Liquefied Natural Gas facility off of New Jersey's coast, including the ill-fated Port Liberty facility, and the pending Port Ambrose facility. BPU and Governor Christie must continue to hold firm in this opposition, and ensure that New Jersey's energy future does not include these dangerous, and environmentally harmful industrial facilities off our cherished shore line. Governor Christie must use the veto power of the Deepwater Port Act to ensure that Port Ambrose will not exacerbate the effects of climate change on the environment and future generations.

COA supports Governor Christie's decision to shut down Oyster Creek Nuclear Generating Station by 2019. The once through cooling system of Oyster Creek decimates the fish and aquatic species population of Barnegat Bay and is at least partly responsible for the eutrophication of this cherished waterbody. Shutting down this obsolete plant, and replacing its' production with conservation measures, efficiency measures, and properly cited clean and renewable energy technology will be a step toward a healthier Barnegat Bay, and a cleaner energy future for New Jersey.

Governor Christie has also opposed any oil and gas exploration and drilling off the coast of New Jersey. COA has supported this stance and believes that our marine resources are too valuable to allow a potential catastrophe to occur. The Energy Master Plan should state that any non-renewable energy exploration and development in the ocean must be prohibited.

While BPU is not necessarily the agency tasked with regulating or overseeing these issues, the Energy Master Plan is the perfect document to memorialize this administration's opposition to these dangerous and misguided attempts to industrialize our coastal areas. These commitments should be included into the EMP in order to ensure that there will not be a regression of these goals when a new administration takes over

The 2011 EMP's 5 Overarching Goals

The 2011 EMP identified 5 overarching policy goals that New Jersey should pursue:

Drive down the cost of energy for all customers;
Promote a diverse portfolio of new, clean, in-State generation;
Reward energy efficiency and energy conservation and reduce peak demand;
Capitalize on emerging technologies for transportation and power production; and
Maintain support for the renewable energy portfolio standard of 22.5 percent by 2021.

COA will analyze these goals more specifically below; however, what is readily lacking from these overarching goals is a hierarchical structure and connectivity between these goals. COA believes that conservation and efficiency should be the first, second, and third choices for any EMP. A utility should be required to prove that any infrastructure or new energy generation investment it wants to make cannot be achieved by efficiency and conservation first. The second goal should then be implementation of renewable energy technologies that have been responsibly planned and sited. By focusing on efficiency, conservation and renewables as the main tenants of the EMP, and linking these overarching policy goals to a hierarchy, the cost to ratepayers will be reduced. COA recommends that the NJ EMP contain an overarching policy vision organized as such:

Implement Energy Efficiency and Conservation Programs and Infrastructure to reduce NJ's use of energy. This will "drive down the cost of energy for all customers".
Promote a diverse energy portfolio consisting of Energy Efficiency and Conservation gains and "non-

carbon" energy sources to reduce all demand. This will also "drive down the cost of energy for all customers".
Reward energy efficiency and energy conservation and reduce demand.
Capitalize on emerging energy efficiency and conservation technologies for transportation and power production; and
Maintain support for the renewable energy portfolio standard of 30% share of NJ's energy portfolio by 2021, and to continue to phase out Nuclear and Fossil Fuel based generating facilities with energy efficiency and renewable as they go offline.

Clean Ocean Action urges BPU to adopt a sixth overarching goal which would recognize New Jersey's vulnerabilities to climate change:

Adapt New Jersey's energy infrastructure to meet anticipated climate change induced sea level rise predictions by the National Oceanic and Atmospheric Administration.
New Jersey should plant one tree for every current resident to act as a carbon sink.

BPU should ensure that any goals it drafts into the 2015 EMP strive towards these structural ideals of a clear hierarchy, and interconnectivity between goals.

Conservation and Efficiency

New Jersey's greatest energy resource and economic opportunity is not solar or offshore wind, but demand-side generation through conservation and efficiency. It must be NJ's First Choice Fuel. The EMP should be based upon this principle, as it will support and enhance all 5 goals. The waste in our current energy use undermines the ability of utilities, energy companies, and suppliers of energy-using products and services to plan and execute a comprehensive energy strategy that will deliver the sustained economic process, reliability, and sustained employment envisioned by the EMP. Considering the main parts of a typical Transmission & Distribution network, here are the average values of power losses at the different steps[5]:

1-2% – Step-up transformer from generator to Transmission line
2-4% – Transmission line
1-2% – Step-down transformer from Transmission line to Distribution network
4-6% – Distribution network transformers and cables

The overall losses between the power plant and consumers is then in the range between 8 and 15%. This means that 100 units saved at home can save 300 units at the power plant.[6] This emphasizes the importance of energy efficiency and conservation at the consumer level. Furthermore, a great deal of idle electricity can be saved through no-cost or low-cost actions by motivated consumers once they are informed about how energy and money are being needlessly wasted.[7] Unfortunately, New Jersey has made little progress in implementing these programs. In

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[5] Estimates taken from International Electrotechnical Commission "Efficient Electrical Energy Transmission and Distribution" (2007).
[6] *Id.*
[7] *See* Forbes Magazine, "America: The Worldwide Leader in Wasting Energy", available at http://www.forbes.com/sites/ciocentral/2013/02/22/america-the-worldwide-leader-in-wasting-energy/. *See also* NRDC, "Home Idle Load", *available at* http://www.nrdc.org/energy/home-idle-load.asp.

fact we have backslid.

New Jersey has dropped from 8th place in 2007 to now 19th place for energy savings, according to the American Council for an Energy Efficient Economy (ACEEE).[8] ACEEE gave NJ Utilities a score of 8.5 out of 20 noting that

Since 2003, the Office of Clean Energy within the Board of Public Utilities has administered the New Jersey Clean Energy Program, which has offered statewide customer energy efficiency programs. Prior to this, the regulated energy utilities in New Jersey had been responsible for administering electric and natural gas efficiency programs. New Jersey electric programs have been successful in generating significant savings. However, portions of the state's societal benefit charge (SBC) have been re-allocated to pay state energy bills in recent years, reducing potential energy efficiency programming.

The 2008 EMP sets energy savings goals of 20% savings by 2020 relative to predicted consumption in 2020 in its Energy Master Plan of 2008. This was inexplicably taken out of the 2011 EMP. Furthermore, even though the BPU is tasked with setting annual energy savings targets through its Comprehensive Resource Analysis (CRA) proceeding, it has yet to pursue a binding Energy Efficiency Resource Standard (EERS) that would require each electricity supplier/provider to meet long-term energy efficiency goals. Although they are required to submit individual energy master plans pursuant to the New Jersey Energy Master Plan, these have been delayed indefinitely.[9]

Also disappointing is the 2011 EMP's softened focus on energy efficiency and reduced energy consumption, as well as the gains that could be achieved from energy efficiency in transmission, distribution, consumption, building codes, transportation and mass transit, and other energy efficiency measures that should be considered "low hanging fruit". Furthermore, In June 2014, the Board of Public Utilities denied a citizens petition by the Sierra Club to create an Energy Efficiency Resource Standard (EERS), which would have created long-term savings targets and fully-funded energy efficiency programs.

Currently the state does not have an energy efficiency resource standard. COA strongly supports a 20 percent reduction in energy use by 2020 and 30 percent reduction by 2030 through efficiency. These goals should be included in the EMP and made binding on BPU with real consequences put into effect if they are missed.

Adopting binding and ambitious energy savings standards will have the greatest impact on reducing carbon pollution while strengthening New Jersey's economy and saving money for New Jersey's families and businesses. A binding statewide policy will help secure clean energy funds and attract private investment and much needed new high-paying jobs in energy efficiency. At a wide scale view, the EMP should focus on optimizing energy efficiency *before* committing to new supply sources. On the small scale view, optimizing efficiency throughout state, municipal, and corporate infrastructure, transportation, and building codes should be priority one, with residential standards a close second.

COA recommends adopting policies that value energy efficiency and demand side measures as a

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[8] American Council for an Energy Efficient Economy, "New Jersey Overview", available at http://database.aceee.org/state/new-jersey.

[9] *Id.*

resource (preferably valuing them higher than the supply side). This will lead to solutions that avoid continued reliance on building more transmission lines or building more generators. This in turn will reduce the need to operate inefficient fossil-fueled generation on peak days and help to achieve our air quality objectives. Focusing conservation efforts on reducing energy consumption during peak demand periods will solve a number of New Jersey's energy problems by reducing emissions, transmission constraint on load centers, and energy costs to consumers. There are several strategies that can be employed to encourage conservation during peak demand including:

Establishing an "energy hog" program that will assess fees on all uses of energy determined to be inefficient or excessive. "Energy Hogs" should be identified as those users of a class (i.e. Large Office Buildings or similar industrial activities) that consume over 10% more energy than average users of that same class. Funds generated from this program will be directed to fund implementation of conservation and efficiency measures for low income communities.
Expanding the Demand Response Program to offer a variety of different opportunities that encourage participating industry and consumers to reduce demand in return for financial incentives and other benefits.
Exposing ratepayers to real-time pricing (i.e. hourly basic generation service, in order to encourage efficiency and conservation during the most expensive/high demand periods. The current subsidized system (i.e. fixed cost service) offers no incentive for implementing conservation/efficiency measures during these critical usage periods.

Last year, PSE&G committed to investing $95 million in energy efficiency projects throughout the state. This is a good first step in the right direction. However, along with monetary investments, we need the state to commit to energy efficiency by adopting stronger policies that promote it. Governor Christie and BPU must make energy efficiency and conservation a well-publicized priority through education, outreach, and political pressure.

Sea Level Rise, Storm Surge, and Energy Infrastructure Development

The issue of coastal vulnerability and energy and critical infrastructure is a hugely significant issue to the people of NJ. A newly published study written by James Hansen, NASA's former lead climate scientist, and 16 co-authors, many of whom are considered among the top in their fields—concludes that glaciers in Greenland and Antarctica will melt 10 times faster than previous consensus estimates, resulting in sea level rise of at least 10 feet in as little as 50 years.[10] The impacts of sea level rise are also becoming apparent in big storm surge events such as Sandy when it roared ashore in the Northeast in October 2013. Climate Central researchers found that sea level rise caused an estimated $2 billion of the $9.6 billion in flooding damage from the storm.[11]

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[10] Hansen J, Kharecha P, Sato M, Masson-Delmotte V, Ackerman F, et al. (2013) Assessing "Dangerous Climate Change": Required Reduction of Carbon Emissions to Protect Young People, Future Generations and Nature. PLoS ONE 8(12): e81648. doi: 10.1371/journal.pone.0081648

[11] Earth and Space Science News (EOS), "Sea Level Rise Added $2 Billion to Sandy's Toll in New York City", *available at* https://eos.org/articles/sea-level-rise-added-2-billion-to-sandys-toll-in-new-york city.

Coupled with sea level rise, climate change will also increase the intensity of precipitation events as well as strengthen the winds and precipitation amount of tropical storms and hurricanes.[12] According to NCAR senior climatologist Kevin E. Trenberth, "The answer to the oft-asked question of whether an event is caused by climate change is that it is the wrong question. All weather events are affected by climate change because the environment in which they occur is warmer and moister than it used to be."[13]

Superstorm Sandy illustrated these points in a stark and destructive way; at The Battery in Lower Manhattan, the water level reached a record 13.88 feet above the average low tide level, which included a surge component of 9.23 feet.[14] That set an all-time record for the location. Sandy Hook, N.J., where Clean Ocean Action is located, saw record coastal flooding during Sandy. The water level there rose to 13.31 feet above the average low tide level before the gauge malfunctioned. Or to put it another way, the water level at Sandy Hook rose to 8.1 feet above the average high-tide line.

As a first common sense step in planning for increased climactic events and sea level rise, the siting of energy infrastructure and energy generating facilities must take into account the newly updated forecasts of sea level rise and frequency of storm surges. Continuing to allow investments in generating facilities such as the B.L. England plant, which is outdated and sits entirely within a FEMA mapped coastal hazard zone and is vulnerable to climate change driven sea level rise and storm surge is fiscally and environmentally irresponsible.[15] The EMP must include the newly calculated sea level rise predictions and increased storm events in any coastal energy infrastructure project.

On May 21, 2014, BPU approved the investment of $1 billion in infrastructure hardening measures as prudent expenditures to mitigate the effects of future severe storms on Public Service Electric & Gas Company's (PSE&G) electric and natural gas delivery systems. BPU must continue to stormproof the state's utilities by hardening critical infrastructure; however, BPU can improve this process by focusing on other improvements to providers' emergency response plans; distributing power more evenly using so-called "micro grid" technology, decentralizing coastal energy generation and focusing on distributed generation projects for isolated coastal communities, and creating a stable source of funding for long-term resiliency projects.

While COA supports projects seeking to stormproof infrastructure, these efforts cannot stand alone; island communities that will be cut off from the mainland when the next storm event occurs must have the resilience and independent generating capabilities that can only be achieved from smart planning and investment in micro-grids and distributed generation. [16] COA urges BPU to utilize these concepts as it

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[12] *See* EPA, "Weather and Climate", *available at* http://www.epa.gov/climate/climatechange/science/indicators/weather-climate/index.html.

[13] Trenberth, Kevin (March 2012). "Framing the way to relate climate extremes to climate change". Climatic Change 115 (2): 283–290. doi:10.1007/s10584-012-0441-5.

[14] Climate Central, 32 Foot Plus Waves From Hurricane Sandy Topple Records", available at http://www.climatecentral.org/news/32-foot-wave-from-hurricane-sandy-topples-records-noaa-finds-15241.

[15] *See* FEMA flood hazard mapping portal at https://msc.fema.gov/portal/search?AddressQuery=Marmora%2C%20NJ

[16] *See* FERC 2007 study on benefits of Distributed Generation, "THE POTENTIAL BENEFITS OF DISTRIBUTED GENERATION AND RATE-RELATED ISSUES THAT MAY IMPEDE THEIR EXPANSION", *available at*

plans and invests in resilience and reliability projects for coastal communities. The EMP should incorporate these concepts into New Jersey's energy future, as they are essential in ensuring that reliable electricity near coastal load centers. Incorporating COA's suggested sixth overarching goal (referenced above) would ensure that the BPU's strategic plan reflect this commitment.

The Concept and Calculation of "Costs" in the Energy Master Plan

The 2011 Energy Master Plan placed a significant emphasis on driving down the cost of energy to ratepayers and industrial consumers. However, the BPU included no methodology for how they calculated the price of energy from certain sources. This is incredibly important, as the cost of energy determined many of BPU's decisions regarding the denial of many renewable energy projects as too expensive, and the approval of fossil fuel based infrastructure and generating investments. BPU must make transparent the methodology and analysis it will subject potential generating and infrastructure projects to, and include this in the EMP. Furthermore, this methodology must include what has been called "the social costs" or "externalities" associated with carbon emissions as well as once through cooling systems at plants such as Oyster Creek, Salem, and B.L. England. These are the costs borne not by the energy producer, or owner of the infrastructure, but by the public, and future generations. These externalities include:

The environmental degradation from continued fossil fuel extraction throughout the United States including water and air contamination from drilling, spills, transportation, destruction of land and marine habitat, health impacts to thousands of Americans, and much more.
The trillions of dollars that will be spent to prepare for, and recover from climate change related events;
Superstorm Sandy cost New Jersey more than *37.1 billion dollars* statewide thus far including 13.6 billion in direct physical and economic damage and 23.5 billion in remediation costs[17]
As stated earlier, in 2014 BPU approved $1 billion dollars in infrastructure hardening measures.
The United States by the end of the century may face up to $180 Billion dollars in economic losses because of drought and water shortages alone.[18]
Sea level rise will cost American coastal cities over $200 billion dollars[19]
The millions of fish and other aquatic organisms killed each year by once through cooling systems such as those used at Salem Nuclear Generating
Outside consultants have estimated that the total annual fish kills at the Salem intakes translate into fish losses which are over four times the total drawn by commercial fishing (bay anchovy and weakfish) in the Delaware Estuary: 30,000,000 lb. per year of bay anchovy and weakfish were the losses due to

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https://www.ferc.gov/legal/fed-sta/exp-study.pdf. See also Berkeley Energy and Resources Collaborative, "How to Build a Microgrid", *available at* http://berc.berkeley.edu/build-microgrid/.

[17] *See* Governor Christie's statements on November 28, 2012, "Christie Administration Releases Total Hurricane Sandy Damage Assessment of $36.9 Billion", available at http://nj.gov/governor/news/news/552012/approved/20121128e.html. *see also* US Dept. of Commerce report "Economic Impact of Hurricane Sandy", *available at* www.esa.doc.gov.

[18] *See* NY Times, "E.P.A. Warns of High Cost of Climate Change", June 22, 2015, *available at* http://www.nytimes.com/2015/06/23/us/politics/effects-of-climate-change-could-cost-billions-epa-report-says.html?_r=0.

[19] *See* Business Insider, "Obama: Rising Sea Levels Could Cost the US up to $200 billion", available at http://www.businessinsider.com/afp-obama-to-warn-rising-sea-levels-could-cost-us-200-bn-2015-5.

entrainment and impingement at Salem.[20]
There are impacts from climate change that cannot be monetized; the destruction of our ocean ecosystem from ocean acidification, the drowning of wetlands that provide habitat for thousands of species – the results of these impacts cannot be measured in dollars.[21]

These external costs of conventional power generation are not counted in the 2011 EMP, or taken into account by BPU when it makes its' decisions. Because of this omission, the 2011 EMP devalues investment in renewable energies stating "the current price of fossil fuels, particularly the delivered cost of natural gas to power plants across PJM renders renewable energy technology more costly than power production from many conventional resources…"[22]

These environmental costs must be included in any analysis in order to understand the real price of solar and offshore wind versus fossil fuels. As many members of the public made clear in their testimony during the three BPU hearings for the 2015 EMP, these externalities must be calculated into the costs of energy sources, especially as compared to renewable energy technology. The 2015 EMP must include this methodology.

Defining "Clean Energy Sources"

The 2011 EMP called for a goal of meeting 70 percent of overall electricity demand from "clean energy sources". However, BPU, as well as EPA, inappropriately included nuclear generation and natural gas in this definition of "clean". Natural gas will be covered in more detail below; suffice it to say, the lifecycle studies of natural gas show that, while cleaner burning than coal, the extraction process, fugitive methane emissions from leaks and spills throughout the lifecycle, impacts from transportation infrastructure, and carbon and particulate emissions when burned, all prove that natural gas is certainly not a "clean" energy source either. Similarly, the impacts of once through cooling systems at Salem and Oyster Creek, as well as the storage of hazardous nuclear waste at these coastal facilities show that nuclear energy, while carbon free, cannot be considered "clean".[23]

Any analysis of Nuclear or Natural Gas as a source of energy would illustrate how unclean these sources really are. COA requests that BPU remove Nuclear and Natural Gas from this categorization, or alternatively, remove the term altogether. This would ensure that such terms do not become confused with actual renewable energy sources, and that energy portfolio goals are clear to BPU, utilities, and residents of New Jersey. Secondly, COA urges BPU to implement a "non-carbon" goal of 70%. This would ensure that no more Natural Gas infrastructure is built and this source of energy will be phased out as other technologies and efficiency measures are implemented.

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[20] *See* Delaware Riverkeeper fact sheet "Salem Nuclear Generating Station's License to Kill", *available at* https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&sqi=2&ved=0CB4QFjAAahUKEwjeqp-0i7jHAhVRf5IKHRuGC60&url=http%3A%2F%2Fwww.delawareriverkeeper.org%2Fresources%2Ffactsheets%2Fsalem_nuclear_generation_station.pdf&ei=YAHWVd76MtH-yQSbjK7oCg&usg=AFQjCNFrYOooxP6-Qbsx9kQ0p4utrfCnbQ&sig2=iiEjP6aGcKCMRDVShjZ-hg&cad=rja

[21] *See* Planet Experts, "Ocean Acidification is Toxifying Phytoplankton", *available at* http://www.planetexperts.com/ocean-acidification-toxifying-phytoplankton/. *See also* EPA factsheets and analysis on Wetlands, *available at* http://water.epa.gov/type/wetlands/.

[22] 2011 New Jersey Energy Master Plan, page 86.

[23] *See* generally, Climate Progress, "Natural Gas Bombshell: Switching from Coal to Gas *Increases* Warming for Decades, Has Minimal Benefit Even in 2100", *available at* http://thinkprogress.org/romm/2011/09/09/315845/natural-gas-switching-from-coal-to-gas-increases-warming-for-decades/.

Renewable Energy Sources Generally

The 2011 Energy Master Plan scaled back New Jersey's goals for renewable energy, calling for 22.5 percent of electricity to be generated from such sources by 2021. The 2008 EMP called for 30 percent of electricity to be generated from renewables. This rollback of the renewable portfolio standard has cost the state green jobs and economic stability, critical pollution reductions, and energy independence. Undercutting an attainable goal because of perceived difficulties is unwise both environmentally and economically. Therefore, COA urges BPU amend the EMP to include a 30 percent RPS standard by 2021. However, even with a 22.5 percent goal, the actions of the BPU, the Christie Administration, and the 2011 EMP ensured that this goal would not be met in time.

Solar Energy

Currently, there are more than 513 solar companies already at work throughout New Jersey, employing 7,200 people.[24] NJ already has 1,489 megawatts of solar energy installed, ranking third in the nation for installed solar capacity. That's enough energy to power 234,000 homes.[25] However, the 2011 EMP reduced the 2016 Solar Alternative Compliance Payment (SACP) by 20 percent and then by 2.54 percent each year thereafter. The SACP is a fee imposed on electricity providers if they fail to meet their solar requirement established in the RPS. This fee ensured that electricity providers would continue to invest in solar technology. Furthermore upfront rebates and incentives for solar installations have been removed. COA believes that the 2015 EMP should reinstate upfront rebates and incentives and increase the SACP to continue encouraging the deployment of solar technology

Furthermore, BPU should implement a program specifically designed to encourage the installation of Solar PV technology on Barrier Island and short communities as a means of establishing independent generation capabilities for these potentially isolated towns. COA believes that Solar PV arrays installed on vacation homes and year round residents alike would increase resilience and vastly reduce the amount of consumption during peak summer months.

Offshore Energy Projects

In recent years, several proposals for developing electric energy in the ocean have surfaced including offshore wind farms. The 2011 EMP set a goal of developing 1,100 megawatts of offshore wind capacity by 2020. However, because of delays in adopting the regulations, it is very unlikely to meet that target.

COA supports the *responsible* development of offshore wind energy (OWE) off the coasts of New Jersey and New York. This would be a firm step towards reducing reliance on fossil fuel energy sources. However, responsible development is key. BPU should take a lead role in implementing the necessary pre-planning, oversight, and precautionary framework that must be required before any OSW development occurs. Specifically, COA calls for BPU to establish a clear permitting program for offshore wind projects that should include comprehensive ecological baseline studies, standardized data collection methods, ecological performance standards, risk analyses, pilot studies, and the recognition of the importance of meaningful public

[24] *See* Solar Energy Industres Association, "State Energy Policies", *available at* http://www.seia.org/state-solar-policy/New-Jersey.
[25] *Id.*

participation in all stages of the process. These requirements are consistent with the recent federal government initiatives to integrate ocean resource uses and users.[26]

Furthermore, COA supports the development of small scale pilot studies and initial deployments before BPU commits to any largescale offshore energy project. Environmental impacts of new technologies are largely unknown and different design scenarios often result in different levels of impact. Initial deployments must be limited in scale to ensure environmental protection and inform regulatory decision-making regarding best available technologies that will reduce or eliminate impacts. BPU should greenlight well vetted and small scale pilot projects, including Fishermen's Energy off the coast of Atlantic City, so as to ensure the viability of these projects, and sort out the environmental and regulatory kinks of a smaller operation before larger projects are developed.

Finally, as discussed above in the section titled "The Concept and Calculation of "Costs" in the Energy Master Plan", the EMP must include the externalities of fossil fuel generated energy in the pricing methodology. This will ensure a level playing field for renewables as well as conventional energy sources.

Natural Gas

The 2011 EMP states that New Jersey has one of the highest concentrations of natural gas use in the U.S. and that natural gas is a key fuel for the generation of electricity, transportation, and heating. The 2011 EMP encourages the expansion of the interstate pipeline network from the Marcellus Shale production area to the market centers of New Jersey.[27]

As noted previously, Natural Gas is not a "clean energy" fuel source. It should not be a primary source for new electricity infrastructure, and existing facilities should be phased out. If New Jersey rushes to build long-lived infrastructure around natural gas, we risk locking in our region's dependence on fossil fuels and locking out energy efficiency and conservation, and renewable solutions like solar and offshore wind – undermining the climate benefits of replacing coal- and oil-fired plants in the first place. In the BPU's rush to permit unfettered natural gas infrastructure development, New Jersey could be saddled for decades with the costs of an extensive network of new pipelines that become obsolete in the near future as energy efficiency and renewable energy technologies increase.

Firstly, the climate benefits of natural gas have been grossly overstated. Natural gas extraction and transport tends to release non-negligible amounts of methane into the air. A paper by Cornell's Robert Howarth, sought to quantify the impact of the leakage from the best available data. It concluded: "Natural gas is composed largely of methane, and **3.6% to 7.9% of the methane from shale-gas production escapes to the atmosphere in venting and leaks over the life-time of a well**." These methane emissions are at least 30% more than and perhaps more than twice as great as those from conventional gas. Methane is a powerful greenhouse gas, with a

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[26] The Interagency Ocean Policy Task Force website, available at www.whitehouse.gov/administration/eop/ceq/initiatives/oceans (last visited March 2, 2011).

[27] 2011 New Jersey Energy Master Plan, page 61-63.

global warming potential that is far greater than that of carbon dioxide.[28] This leakage rate, coupled with the emissions resulting from burning it as an electricity generating source, has shown that the substitution of gas for coal as an energy source results in increased rather than decreased global warming for many decades.[29] While EPA's new methane rule will address some of these issues, the fugitive emissions from the extraction process itself, and the long term lifecycle analysis of natural gas shows that it *is not a long term solution to climate change.*

Secondly, the impacts of pipelines throughout our state have continued to come to light[30] as health and safety impacts, water quality issues, and open space and habitat degradation result from continued expansion of the pipeline network necessary to sustain a natural gas dominated energy future. Every dollar spent on natural gas infrastructure today is an investment in a dead end energy future, and the continued degradation of water quality throughout our state.

Third, the number of proposed pipelines in New Jersey far outpaces the actual demand for natural gas. The state is literally flush with natural gas right now, and in no way needs additional capacity. As the New Jersey Conservation Foundation has repeatedly pointed out, recent analysis conducted by Labyrinth Consulting Services found that the proposed PennEast pipeline alone would result in a 53 percent surplus beyond current demand in Pennsylvania and New Jersey, and concluded that gas is bound for other markets, including export overseas.[31] The current rush to build multiple pipelines in New Jersey runs the risk of significantly over-building, resulting in supply that far exceeds actual needs. This leads us into the final point on natural gas.

COA has been leading a regional NY/NJ campaign opposed to any offshore Liquefied Natural Gas (LNG) facilities along our coasts, as they represent potential environmental disasters, the industrialization of our coastal areas, and the end game of energy extraction companies' goal to export domestically produced natural gas to Europe and beyond, while New Jersey is left with the environmental, health, and safety impacts of these pipelines and facilities. Again, Governor Christie's clear opposition to LNG facilities off of the coast of New Jersey should be incorporated into the EMP to ensure no future development of these projects.

The EMP must deemphasize natural gas in its strategic vision for New Jersey's energy future. BPU should carefully manage that role so that natural gas contributes to rather than overwhelms New Jersey's efforts to reduce its greenhouse gas emissions.

EPA's Clean Power Plan and the New Jersey Energy Master Plan

COA supports the goals of EPA's newly unveiled Clean Power Plan (CPP). However, this plan must be weighed against the science which states that an 80% worldwide reduction of carbon emissions by 2050 is

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[28] *See* EPA, "Overview of Greenhouse Gases", *available at* http://epa.gov/climatechange/ghgemissions/gases/ch4.html.

[29] Tom Wigley, Climactic Change Letters, "Coal to gas: The influence of methane leakage", *available at* http://www2.ucar.edu/atmosnews/news/5292/switching-coal-natural-gas-would-do-little-global-climate-study-indicates. *see also* http://opinionator.blogs.nytimes.com/2013/09/24/is-natural-gas-clean/#1

[30] *See* "New Jersey Communities Unanimously Say 'No' to PennEast Pipeline", *available at* http://www.huffingtonpost.com/wild-river-review/beleaguered-new-jersey-co_b_7984424.html

[31] Michele Byers of New Jersey Conservation Foundation, "Time to Fast Track Renewables", *available at* http://www.dailyrecord.com/story/opinion/2015/08/11/time-fast-track-renewable-energy/31425479/.

necessary to avoid a 2 degree centigrade rise in global temperatures.[32] However, the Obama administration has continued to support domestic "fracking" and natural gas use, the approval of oil and gas drilling in the Arctic and off the mid-Atlantic coast, and the amending of the Deepwater Port Act to allow liquefied natural gas to be exported to foreign countries. While the CPP is a positive step forward, the rest of these decisions illustrate how behind the United States is in its' efforts to combat climate change.

Under the Obama Administration's Clean Power Plan, EPA expects US power plant emissions will be 32 percent lower in 2030 than they were in 2005; a significant cut, though still just a tiny piece of what's needed to reduce Climate Changes. NJ's Energy Master Plan should be supportive of EPA's efforts, and seek to go above and beyond the Federal Government's Clean Power Plan's standards. This should be rather easy for the state of New Jersey as the actual emission rate reduction required under the rule is just is 13.4%.[33]

The Energy Vacuum

COA supports the closing of Oyster Creek Nuclear Generating Station in 2019. The plant is outdated and its' once through cooling system is responsible for killing millions of fish and aquatic organisms each year which contributes to Barnegat Bay's eutrophic state. Relatedly, the repowering of B.L. England plant should be denied by BPU. This powerplant is obsolete, and can be easily replaced by the current generating stations on line, as well as by efficiency, conservation, and renewables. Moreover, the once through cooling system at B.L. England would be allowed to run 24/7, essentially trading Oyster Creek's destruction of Barnegat Bay for the deterioration of Great Egg Harbor Bay.

The 2015 Energy Master Plan must plan for these closings, and ensure that a combination of conservation, efficiency, and renewable energy technology is deployed to fill this vacuum. This should be seen as an opportunity to turn a strategic vision into reality, and ensure a clean energy future for the state of New Jersey, and an example to the rest of the nation.

Carbon Sinks

BPU should seek to plant trees, conserve green space, and provide incentives to consumers to do the same, in order to absorb carbon in the atmosphere as well as to reduce energy demands for buildings by utilizing shade and green infrastructure.

Conclusion

New Jersey's energy future should be as a leader in this country for the implementation of efficiency, conservation, and renewable energy technologies. The resources and opportunities exist; it is up to BPU to ensure these concepts are incorporated into the EMP, and serve to guide the choices it makes in moving this state forward. COA again thanks the BPU for this opportunity to submit comments on the EMP.

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[32] *See* Yale Environment 360 Report "Pathways to Deep Decarbonization", *available at* http://unsdsn.org/what-we-do/deep-decarbonization-pathways/.

[33] See Final Rule, Table 12 on page 842, *available at* http://www.epa.gov/airquality/cpp/cpp-final-rule.pdf.

2050. The EMP should foster needed collaborative and synergistic thinking and creative approaches to maintaining reliability and adequate supply at a reasonable cost while transitioning to the envisioned greener future.

The EMP encourages the expansion of Combined Heat and Power ("***CHP***") systems including district energy systems. The Board's notice indicates that while "New Jersey is on target to meet its goals for new distributed generation ... the amount of [CHP] being developed is not on target to meet the goal" suggesting the need for new programs and efforts to "improve this trend." Board Notice at 2. Because there may be limits to the commercial applications (such as continuous manufacturing processes) that are ideal for CHP, where an appropriate heat-load is available and overall operational efficiencies can be realized, any new programs to improve the CHP development trend needs to address obstacles to greater market penetration and include careful analysis of electric system benefits.

The EMP promotes greater application of Distributed Generation ("***DG***"). It should be recognized that the varied and expanded use of the electric grid beyond the purposes for which it was initially designed or intended has been sparked by the proliferation of this technology. The EMP should recognize the need for transparency with respect to the true cost to consumers from DG. In this regard, the EMP should emphasize the need for DG proponents to provide information and data regarding, among other things, cost savings, electric system benefits, levels of DG penetration and projected load growth, without which decision-making regarding rate design and inter-, and intra-, customer rate class impacts cannot be reasonably made.

Relative to any potential growth or expansion in net-metering, the Company encourages that the EMP recognize and address the realities of cost shifting between participants and non-participants. Net metering reduces the billable volume of electricity charges for a net metered customer, but it does not reduce the cost to provide distribution service to the customer. The result is the imposition, or shift, of distribution costs from net metered customers to non-net metered customers, which customers are often those that can least afford to pay higher utility charges. Such cost shifting is discussed in more detail in the NJUA Comment Letter.

The Company continues to believe that the current model for delivery of energy efficiency programs that allows for both utility-initiated and State-administered programs can continue to function effectively. Statewide energy efficiency programs provide a consistent, efficient channel to market programs to consumers. In addition to reducing delivery costs, these programs help to minimize consumer confusion regarding program offerings across utility boundaries. Further, because there are surplus funds from Societal Benefits Charge ("***SBC***") collections, Statewide programs may be expanded without additional costs to utility customers. Further, enhanced consideration should be given to implementing more stringent building codes, which could provide an alternative to program subsidies as a means of increasing the adoption and market penetration for energy-efficient technologies.

The Board's Notice seeking comments regarding an update to the EMP also recognizes the need to address certain emerging issues or trends in the EMP since 2011, making specific reference to the significant and devastating impact of Superstorm Sandy and other major storm

events on New Jersey, which became the driver for prioritizing emergency preparedness and response. The Board's Notice suggests and invites comments regarding the potential need for new policy recommendations to address such matters as 1) Protecting critical energy infrastructure, 2) Improving the Electric Distribution Companies ("***EDCs***") emergency preparedness and response, 3) Increasing the use of micro-grid technologies and applications for distributed energy resources, and 4) Creating long-term financing for resiliency measures through the Energy Resilience Bank ("***ERB***"). Board Notice at 2. In support of these initiatives, the Board should consider alternative ratemaking mechanisms to accelerate utility infrastructure investment. Ratemaking mechanisms that provide more contemporaneous return of and more competitive return on utility capital investments are necessary to attract the capital necessary to fund these and other initiatives set forth in the EMP.

The Company agrees that the EMP should be updated to reflect policy considerations and recommendations regarding these important developments. Indeed, the NJUA Comment Letter addresses most of these suggested areas. With respect to improving the EDCs emergency preparedness and response, the Company believes that the updated EMP should reflect the Board's strong and affirmative leadership in this area through its orders (in BPU Dockets No. EO11090543 (the "***Hurricane Irene Order***") and No. EO12111050 (the "***Superstorm Sandy Order***")), as well as the responses of the EDCs through implementation of the Board's extensive recommendations. In this regard, the importance of the more consistent implementation of incident command systems ("***ICS***") by the EDCs for managing significant storm events should

be endorsed. In addition, the recent conclusion of the Board's rulemaking with respect to Chapter 5 (Electric Service) of Title 14 of the New Jersey Administrative Code particularly with respect to subchapter 8 (Electric Distribution Service Reliability and Quality Standards) and subchapter 9 (Electric Utility Line Distribution Vegetation Management) should also be recognized as codifying important programmatic and reporting requirements from, or programs and innovations arising as a result of, the Hurricane Irene Order. The updated EMP should reflect these developments as consistent with the Administration's policies and goals in the aftermath of these significant events and recommend Board monitoring, and only incremental adjustments, as necessary, to address new and unforeseen eventualities.

The Company also supports updating the EMP to reflect the developments related to the creation and implementation of the Energy Resilience Bank as an important and innovative mechanism for funding and financing resiliency measures. The ERB is the first public infrastructure bank in the nation that focuses exclusively on energy resiliency in order to support the development of distributed energy resources at critical facilities throughout the State. The Company also asks that the updated EMP reflect an appreciation that the State's goal of adding resiliency in preparation for any future emergency events through such initiatives may also create cost issues that could impact utility customers. The updated EMP should also recommend the development of ERB financing opportunities for which the EDCs, if interested, would be eligible to participate.

In closing, the Company continues to believe that the EMP, as issued in 2011, generally strikes and, if updated consistent with the comments offered herein and in the NJUA Comment Letter, will continue to strike, a reasonable balance between maintaining New Jersey's position as a leader in clean energy and moderating costs to consumers, by providing a fundamentally sound foundation for achieving the State's goals for energy, the environment and the economy over the next decade. The Company believes that the additions and improvements proffered herein and in the NJUA Comment Letter will function to enhance the overall success and benefits of the EMP for the State and for its utility customers.

Respectfully submitted,

Jersey Central Power & Light Company

By: _____
Michael J. Connolly, Esq.
Windels Marx Lane & Mittendorf, LLP

cc: J.V. Fakult, President – JCP&L
J.A. Harkness, Director, State Affairs, FirstEnergy Service Company
M.A. Mader, Director – NJ Rates & Regulatory Affairs, FirstEnergy Service Company,
L.M. Lepkoski, Esq., Attorney, FirstEnergy Service Company
G. Eisenstark, Esq., Windels Marx Lane & Mittendorf, LLP

Comments Submitted to the New Jersey Board of Public Utilities (BPU)
as part of the Updating of the 2011 New Jersey Energy Master Plan
by
Alfonso Gaudiosa

Honorable Commissioners:

Thank you for the opportunity to submit these comments to you for the updating of the 2011New Jersey Energy Master Plan.

This is the main body of my comments where I recommend that you include in the Revised New Jersey Energy Master more opportunities to further develop the following four technologies in New Jersey:

1. Waste-To-Energy (WTE)
2. Solar Energy
3. Wind Energy
4. Fuel Cells

We are living in very challenging times relative to energy and its associations with economics, environment and ethics. To all readers I highly encourage you to read **Attachment A - Disclaimer** before you continue reading the rest of these comments.
Based on my professional energy related experience, I can tell you without any doubt, equivocation and/or hesitation that we need to change our ways of using and transforming energy as a species. We need to become bolder in the use of renewable energy sources like solar, wind, hydro and garbage (the technical term is Municipal Solid Waste - MSW) and fuel cell technology. In the words of George Bernard Shaw:

> *"You see things, and you say, 'Why?' but I dream things that never were, and I say, 'Why not?'"*

Let us follow the example of German Chancellor Angela Merkel that has determined to lead Germany to a fossil and nuclear free energy future after the tragic accident at the Fukushima-Daichi plant in 2011. As a retired electric utility employee I submit to you that the environmental and safety risks of these two technologies are not worthy for us to continue to pursue them and I present my reasons in the next two sections (**B** and **C**). I personally do not believe that either PSE&G or Exelon will propose to build a new nuclear power plant in New Jersey within the foreseeable future due to the perceived public opinion of nuclear energy after the Fukushima-Daichi disaster. I also discuss the hydro energy situation in Section **D.** Sections **E** to **H** give the reasons and background for my four recommendations above.

B. NUCLEAR ENERGY

Table 1 (page 2) shows the four existing nuclear power plants in New Jersey Oyster Creek, Salem I and II and Hope Creek and some of their characteristics. I recommend that these plants continue to operate under their capable and dedicated employees and the strict regulation of the U.S. Nuclear Regulatory Commission (NRC) and our New Jersey Department of Environmental Protection (NJDEP) until their useful plant lives expire and then decommission them. This puts an awesome responsibility on all of us, and especially on you, because we will need to replace 4,000 MW_e of generating capacity in the next four to thirty one years. Oyster Creek will be closed in four years and we will lose its 653 MWe capacity.

The 2013 capacity factors for these four reactors were 80% and above and their 2013 weighted average capacity factor was 92%. This is a very impressive record and it a layperson terms it means that on average these four plants were generating electricity 92% of the time during 2013 or for about 8,060 of the 8,760 hours in that year. We will be very hard pressed to find a similar performance in solar or wind facilities. Solar facilities operate only during day time hours when the sun is out and shining and wind facilities operate in an intermittent fashion according to the direction and strength of the wind at their sites.

Table 1. New Jersey Nuclear Power Plants by Age

Name	Capacity (MW_e) / 2013 *C.F.*[a]	Commission Date	Age (Years & Months)	Latest NRC License Renewal Date / Expiration Date	Full Time Employees (FTE)
1. Oyster Creek	637 *106%*	12/23/1969	45 8	04/08/2009 04/09/2029 [b]	~ 600
2. Salem I	1,174 *88%*	06/30/1977	38 2	06/30/2011 08/13/2036	~ 600
3. Salem II	1,130 *100%*	10/31/1981	33 10	06/30/2011 04/16/2040	~ 600
4. Hope Creek	1,059 *80%*	12/10/1986	28 8	07/20/2011 04/11/2046	~ 600
TOTAL / 2013 W.A.C.F.[c] >>>	4,000 *92%*	**Average Age >>>**	36 7	**Total Number of FTEs >>>**	~ 2,400

a. C.F - Capacity Factor
b. Exelon, the owner/operator of Oyster Creek, announced that it will close this plant in 2019
c. W.A.C.F. - Weighted Average Capacity Factor %

We also need to consider the job losses as these four plants close. It is not only the ~ 600 FTEs in each plant. Typically, 250 contractors work year-round at each of these four plants and about 1,000 refueling contractors work during the 8-week refueling outages which occur every 18 months at each plant. When we consider the entire FTE workforce at each plant we are talking about 3,400 FTE jobs including the contractors that work on site all year round and live within reasonable commuting distances from the plants. These are not casino jobs. These workers have very well paid jobs due to the nature of their work. The equivalent FTEs per year due to the refueling outages need to be considered also but they are more difficult to calculate.

The refueling process is highly specialized and the contractors are hired for each specific job and most of them move together from job to job.

C. FOSSIL FUELS ENRGY

I will be very brief in this section. Fossil fuels, especially coal, have provided the world with very reliable, high density electricity generation but they are the main generators of greenhouse gases (GHG). The market forces will play their role here just as they did for oil. Before the 1973 Oil Embargo about 40% of the electricity generated in the U.S came from oil and today is less than 1%. The OPEC cartel members priced their product out of consideration because the electric utilities are not stupid. We went through very difficult times with the infamous Levelized Energy Adjustment Clause (LEAC) that you had to institute because of the steep increases in the price of oil.

I remember very well that Atlantic City Electric received an award from President Richard M. Nixon in 1974 for being the first U.S. electric utility that switched to coal from oil at the B.L. Englad Units I and II in Beesly's Point, New Jersey, that have a dual fuel capability form oil to coal and vice versa. Natural gas has been a main stay for new electric generation in the last twenty years and will continue to do so especially with the advent of the new GE 9000 turbines. Natural gas plants cannot be larger than 300 MW but they can be built in a modular fashion and they cannot run as base units because of the operating restriction of the combustion turbines. However, they are excellent peaking and/or shoulder load units as the Lakewood Combined Cycle Facility owned by the North American Energy Alliance (NAEA) has demonstrated throughout its years of operation. By the way, I take my "Energy and Ethics" students for a field trip of this plant in each of the three times per year that I teach this course.

D. HYDROELECTRIC ENERGY

Capacity factors of hydroelectric plants, on the other hand, vary depending on the availability of their fuel, water. Some existing hydro plants that are run as base load units due to their continuous and abundant supply of water have a high capacity factor that is comparable to thermal plants. For example, the Itaipu hydroelectric power plant at the Iguazú Falls in the Brazilian-Paraguayan border not far from the Argentinian border had a capacity factor of 77% in 2008 and 74% in 2007. The unconfirmed capacity factor for 2014 is 60% calculated using the 2014 numbers available in Wikipedia of 87.8 TWh annual generation and 14 GW of installed capacity. This significant decrease of 20% in the capacity factor was caused by the severe drought currently affecting the region.

According to the U.S. Energy Information Administration (EIA), on the other hand, the typical capacity factor of a hydroelectric power plant in the U.S. is 44%. It seems that this number is based on a peaking hydro plant. A low capacity factor such as this is also common to run-off river hydro plants because of the intermittent availability of water supply. Let us keep in mind that these numbers are for comparison purposes only and that we have no appropriate hydroelectric sites left in our state with the exception of the Great Falls Power Plant in Patterson, New Jersey (see **Appendix D**).

For some hydro plants, which are dam-type and do not have much water supply, they could only have a capacity factor of around 40% and could go to less than 20% during extreme dry season like during El Niño. Pantabangan hydroelectric plant in the Philippines, for example, had capacity factors of only around 30% in 2004 and 2005, and a lowest of 5.5% in 1984. Hydro

plants with low capacity factor are usually run as peaking plants that operating only during peak demand to take advantage of the high price of electricity.

E. WASTE-TO-ENERGY (WTE) TECHNOLOGY

My passion in the last twenty years has been to advocate for the use of MSW as our primary energy source. Let's follow the example of Denmark where every single day 80% of the MSW they collect is used to generate hot water, steam, electricity and chilled water (yes, using steam compressors as Atlantic City Electric does at its Midtown Complex in Atlantic City, New Jersey). It is so amazing to see what Copenhagen's latest project at the Amager Bakke plant expansion will look like (see **Attachment E-1**). This expansion will be completed by 2017 and it will become the largest European tourist attraction. It will be an absolute home run: energy, economics, environment and tourism! There is some food for thought in this project for everybody in New Jersey with the disappointment of the mismanaged and misregulated casino industry. Let's build a plant like this by our beautiful shoreline and nobody will be able to compete with us because they do not have that shoreline that we have not been able to appreciate, protect and develop properly.

In 2004, the amount of heat and power generated from WTE plants in Copenhagen was enough for the needs of 70.000 households, producing 210,000 MWh of electrical energy and 720,000 MWh of heat. All of this valuable energy was obtained from the city's three municipal WTE plants: I/S Amagerforbrænding, I/S Vestforbrænding, and Rensningsanlæg Lynetten.

In Sweden and Norway, the utilization percentage of MSW is about 65%. In our country, it is only 9% and we desperately need to increase it because of these three reasons:

1. Using MSW to generate electricity in what we call waste-to-energy (WTE) plants will significantly reduce our reliance on fossil fuels and the use of landfills. The volume of MSW after combustion is reduced to 10% of its original volume as an inert ash that can be disposed off in an ash landfill which contains an inert residue compared to the extremely harmful leachates generated in a regular landfill especially as in most of our unlined landfills.
2. According to Dr. Nickolas John Themelis from Columbia University's Earth Engineering Center, for every ton of MSW that we burn we produce one ton less of greenhouse gases (for more information about Dr. Themelis go to http://eee.columbia.edu/nickolas-john-themelis).
3. As long as we have people like you and me on this Earth, there will always be garbage, making it the most renewable energy resource known to us.

Please take a look at **Attachments E-1** to **E-5** and their related links that describe the most recent WTE developments in Copenhagen, Denmark and West Palm Beach, Florida spearheaded by Vorlund, the Scandinavian subsidiary of Babcock & Wilcox from Charlotte, North Carolina. The excellent news is that the West Palm Beach, Florida plant was inaugurated this past June 27. 2015 and it is operating like a charm (**Attachment E-4**). Hopefully, under your guidance we will have many more plants like this one in this country in the foreseeable future and especially in New Jersey as you consider the inclusion of WTE technology in your revised 2011 Energy Master Plan.

By the way, I also take my "Energy and Ethics" students to the Camden Energy Resource Recovery Facility in Camden, New Jersey here times per year when I teach this course.

F. SOLAR ENERGY

I do not have to tell you about the significant inroads that solar energy has been making throughout the world in the last decade as well as in our state thanks to your leadership in this very important area. I respectfully request that you continue to do so and increase the opportunities for solar energy to become more prominent in our state.

G. WIND ENERGY

This energy technology has been booming throughout the world in the last decade also with significant developments in Germany, Spain, Norway, Sweden, Denmark and Finland.

It is very unfortunate that you as a regulatory body has not approved the Fishermen's Energy project in our state because of economic reasons but with the gloomy outlook for nuclear energy and coal in our state we need all the generating capacity that we can install even if its life cycle cost is above the established norms.

I recommend that another round of economic analysis be done by independent energy/economic/environmental consultants working together with your staff and Fishermen's Energy staff. This is a much better approach instead of wasting money in lengthy and costly legal proceedings that only benefit the "legal beagles." It you consider it appropriate, I volunteer to participate in this endeavor on a pro-bono basis as long as we meet via teleconferences most of the time as we do in the NJ DEP Commission on Radiation Protection (CORP) to which was appointed by Governor Christie T. Whitman in the mid-1990s.

H. FUEL CELLS TECHNOLOGY

This technology promises significant results because of its generating efficiency (~75%), environmental effects and modularity. I suggest that you include fuel cell energy options in your Energy Master Plan Revision. **Attachment H** describes the inauguration of a fuel cell technology facility in Germany.

Again, I thank you for the opportunity to make these comments and if there is any questions about them please have one of your staff members contact me at their convenience.

Alfonso Gandica

Alfonso Gandica

The New Jersey Municipal Shared Services Energy Authority Act

- **Bipartisan Support.**

  Assembly Telecommunications & Utilities Committee: 6-0.

  Assembly. 70-0-1.

  Senate Environment and Energy Committee. 5-0.

  Senate Budget & Appropriations Committee. 12-1.

  Senate. 39-0.

- **Sound Public Policy.** Sharing services and joint action at the local level is accepted as sound public policy in New Jersey. The Act extends this sound public policy and savings opportunities to just nine municipalities distinct in their operation of electric utilities as departments of local government. It will give them a tool available for decades to municipal electric utilities in 37 other states.
- **Savings.** The average customer will save between $81 and $833 per year.[1]
- **Limited Application**. Only the nine municipalities that now own and operate their own electric utilities as departments of local government and NJ's only rural electric cooperative can ever join the Authority.[2]

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[1] Legislative Fiscal Estimate. Assembly No.2316, May 31, 2012. The minimum savings would result from wholesale purchases from the Authority. The maximum savings would be realized if the Authority were to build enough generation to supply the total requirements of eligible systems.

[2] The Boroughs of Butler, Lavallette, Madison, Milltown, Park Ridge, Pemberton, Seaside Heights, South River, The City of Vineland, and Sussex Rural Electric Cooperative.

- **Permissive**. None of the 10 potential members of the Authority are required to join. Each governing body has passed a local resolution in support of the Act. Those that do join may choose to leave the Authority at any time, but must fulfill existing contract requirements.
- **Advantages.** The municipalities and cooperative have the experience and expertise to make the Authority work. The first electric utilities in NJ were municipally-owned! They purchase electricity at wholesale and own generating plants today and have since the 1800s. The Act will allow them to maximize savings in two ways. They will leverage their combined load through the Authority to attract more wholesale markets suppliers and more competitive bids to maximize savings on purchases. They may choose to share in the cost of construction and benefits of traditional and renewable generation proposed by the Authority. No projects can go forward without the support of a sufficient number of local governing bodies.
- **Self-Supply.** The Act is clear. Wholesale purchases and generation shall be restricted to self-supply of member systems and their own retail customers to fulfill the long-term obligation to serve their customers at the lowest reasonable cost.
- **Customers Protected.** The municipalities and cooperative have effectively managed risk for as long as 127 years. Still, the Act contains 13 references to regulatory safeguards. These include: five (5) references to oversight of the Local Finance Board; compliance with Local Authorities Fiscal Control Law; two (2) specific references to compliance with the Local Public Contracts Law; compliance with 40A:5A-1, et seq.; Title 12A as to negotiable instruments; submittal of an annual audit to the Director of DLGS; submittal of all bond resolutions to the Director of DLGS; adherence to DLGS-approved Procurement Model for the purchase of electric supply at wholesale. Municipal electric utilities are regulated by their local governing bodies and applicable statutes. The rural electric cooperative, established under statutes that govern NJ corporations, is regulated by its customers who elect nine of their fellow customers to their

board of directors. The Act prohibits the Authority from speculating in today's electricity markets; a common practice among market participants.

- **Authority Governance.** The Authority will be governed by a volunteer board of commissioners who shall receive no compensation of any kind. Each Authority member will appoint one member to the board of commissioners who must be an employee or member of the local governing body.
- **Fully-Vetted.** The Act is the product of collaboration with a variety of interested parties. Amendments offered by the Division of Rate Counsel and the New Jersey Utilities Association ("NJUA") have been adopted. Other amendments are the result of conversations with the Division of Local Government Services ("DLGS"), and the Board of Public Utilities ("BPU").
- **Good for All NJ Ratepayers.** Generation for self-supply of Authority members can mitigate the highly volatile and costly charges presently paid by all NJ electric utility customers under PJM's Reliability Pricing Model ("RPM"). It would be bid into PJM auctions and reduce RPM charges for NJ electric utility customers served in PJM's delivery zones where the generation is located.

Michael J. Renna
President and
Chief Executive Officer

August 25, 2015

VIA REGULAR AND ELECTRONIC MAIL
Irene Kim Asbury, Secretary of the Board
New Jersey Board of Public Utilities
44 South Clinton Avenue, PO Box 350
Trenton, NJ 08625
EMPupdate@bpu.state.nj.us

Re: Comments 2015 Energy Master Plan

Dear Secretary Kim Asbury:

Thank you for the opportunity to offer comments on the Energy Master Plan, and for allowing South Jersey Industries the chance to help drive the state's vision for our energy future.

South Jersey Industries continues to be well positioned and able to help the state advance all of its energy goals outlined in the Energy Master Plan. Since 2011, South Jersey Industries has been a leader in achieving the goals set forth in the plan by partnering with the state to promote energy efficiency, expand and improve utility infrastructure, investing in renewable energy, and promoting emerging technologies for transportation. We believe that natural gas can and should be the centerpiece of a strategy to expand cleaner in-state electric generation.

In consideration of the Christie Administration's overarching goals for the EMP - driving down energy costs for consumers, promoting a diverse portfolio of new, clean, in-state generation, rewarding energy efficiency and conservation to reduce peak demand, capitalizing on emerging technologies for transportation and power production, protecting critical energy infrastructure, and maintaining support for the RPS of 22.5% by 2021 – natural gas will continue to have a vital role to play in driving each of these, in conjunction with renewable energy innovations.

South Jersey Industries is a ready and willing partner in the state's pursuit of its Energy Master Plan objectives. To this end, please see the following comments and suggestions we believe can help further these objectives.

Affordable Supply of Energy

New Jersey is located within 100 miles of the largest natural gas shale basin in the United States, accounting for almost 40% of the total shale production nationally. In the past four years, since the last revision to the Energy Master Plan, natural gas production per day in the Marcellus region has increased almost 400% to nearly 16 billion cubic feet per day according the U.S. Energy Information Administration. This rapid and sustained growth of production has resulted in a dramatic impact on prices resulting in spot prices in the Marcellus region at times trading lower than the national benchmark spot price at the Henry Hub in Louisiana.

The dramatic shift in production has and can continue to benefit New Jersey. Despite the greatly reduced cost of natural gas, supply constraints are preventing New Jersey ratepayers from taking full advantage of the abundant resource in neighboring states. Pipeline infrastructure has not been able to keep pace with the expanding production resulting in price volatility. During the winter of 2014, high demand and supply constraints forced the average price of natural gas for the week of January 18 – 24th to a high of $36.909 a dekatherm while gas was trading at a mere $2.839 dekatherm in the Marcellus region.

We strongly believe that by effectively utilizing this resource, New Jersey can benefit from its proximity and abundance of supply to help drive down gas pricing in our market area through the safe and responsible extraction and transportation of natural gas.

Natural Gas Infrastructure and Resiliency

The impacts by Sandy resulted in a paradigm shift among utilities in recognizing the urgency and importance of renewing aging infrastructure. Since 2009, South Jersey Gas has had accelerated infrastructure improvement programs in place focused on replacing aging pipelines within the system, particularly bare steel and cast iron infrastructure. Most recently, the company received approval for the Storm Hardening and Reliability program, also known as SHARP, to invest $103.5 million in upgrading low pressure mains along coastal barrier islands that are susceptible to storm-related damage.

South Jersey Industries applauds the Board of Public Utilities actions following the devastation from Superstorm Sandy in implementing programs aimed at strengthening and improving utility infrastructure for storm resiliency. It is also vitally important to recognize that communications systems are a necessary part of restoration and storm response that utilities rely upon during significant events and should not be overlooked. We respectfully request continued support for accelerated infrastructure programs and timely recovery mechanisms in replacing aging utility infrastructure.

It is equally critical for the state to support the continued expansion of infrastructure in underdeveloped areas of the state. Southern New Jersey still lacks adequate infrastructure to serve rural customers that are currently served by other more costly fuels. Expanding natural gas infrastructure will enable the support of gas-fired generation and increased growth in the development of compressed natural gas stations.

Compressed Natural Gas Vehicle Technology

The vehicle fuel market is primed for continued expansion of compressed natural gas vehicles and increased infrastructure. Natural gas transmission and distribution infrastructure can be easily enhanced with reasonable investment to accommodate the proliferation of CNG vehicles among public and private fleets, and ultimately the general public. The state's support of this technology through incentive programs and tax credits is imperative to the continued investment in CNG infrastructure. Such incentives and tax programs spur growth

through the purchase of vehicles and continued expansion of infrastructure. This growth serves to enhance the growth of alternative fuels as set forth by the EMP, as well as drive down consumer costs.

Combined Heat and Power and Microgrids

Increased efficiency, energy savings, and reliability are factors that contribute to the benefits to the development of CHP projects. Despite the numerous benefits, the high initial cost poses a problem to the initial development of these facilities. We support the continued goal set forth in the Energy Master Plan for the development of 1500 megawatts of installed combined heat and power facilities. Using a variety of vehicles to help drive these projects will create new construction jobs and deliver significant energy savings for commercial and industrial users. Programs such as the Energy Resilience Bank, low interest loans, and a predictable and steady incentive program will help many projects reach development. Additionally, other incentives like loan guarantees and streamlined permitting will help the industry expand.

Expanding the use of CHP-based microgrids to serve critical facilities in the state will also enable greater resiliency in the event of significant outages by natural disasters. Microgrids, such as the first of its kind in the nation planned for NJ Transit, offer greater reliability and can serve as a model for other priority institutions such as hospitals, universities, and critical state facilities. We believe the Energy Master Plan should continue to support the deployment of CHP and microgrids in the state.

Utility Supported Energy Efficiency

Thanks to the progressive thinking of the Board of Public Utilities, New Jersey continues to be a leader in the nation for energy efficiency. South Jersey Gas was one of the first utilities in the country to implement an innovative Conservation Incentive Program rate structure. The program encourages customers to use natural gas more efficiently by educating them about measures they can take to reduce consumption. The CIP program focuses on reducing consumption. As a result of the CIP, from October 2006 through June 2015, customers have reduced their natural gas usage by a total of 49.2 billion cubic feet, enabling them to save $511.0 million in energy costs.

Since 2009, South Jersey Gas has assisted nearly 11,000 customers with energy efficiency upgrades, with residential, commercial and industrial customers receiving $37 million in grants, rebates and no interest loans to increase their energy efficiency. Through the continued support of the Board of Public Utilities in achieving the goals set forth in the Energy Master Plan, customers will continue to benefit through longer term energy efficiency and conservation goals.

Supporting the Current Renewable Portfolio Standard

We support the action by the state in 2012 and 2015 to stabilize the solar market and increase the solar net metering capacity; encouraging steady continued development of solar. New Jersey continues to be a leader in the nation for the development of small and large scale solar projects. South Jersey Gas supports the state's continued investment in renewable energy and the long term commitment to achieving a renewable portfolio standard of 22.5% by 2021.

In closing, South Jersey Industries remains committed to partnering with the state to help drive down the cost of energy, deliver safe and reliable service, improve energy efficiency, and support

investment in renewable energy. We hope that the above referenced strategies can be incorporated in support of these goals.

Thank you again for the opportunity to provide comments.

Sincerely,

Michael J. Renna
President and CEO

Rockland Electric Company

August 25, 2015

VIA ELECTRONIC MAIL

Irene.asbury@bpu.state.nj.us
Board.secretary@bpu.state.nj.us
EMPUpdate@bpu.state.nj.us

Honorable Irene Kim Asbury
Secretary
State of New Jersey
Board of Public Utilities
44 South Clinton Ave., 9th Floor
PO Box 350
Trenton, New Jersey 08625-0350

RE: Comments of Rockland Electric Company on the Update to New Jersey's 2011 Energy Master Plan

Dear Secretary Asbury:

Rockland Electric Company ("the Company" or "RECO") appreciates the opportunity to provide these comments in response to the New Jersey Board of Public Utilities' ("BPU" or "the Board") request for input on the update to the 2011 Energy Master Plan ("EMP"). The Company has already joined comments that were filed by the New Jersey Utilities Association ("NJUA") on this matter on August 13, 2015. RECO offers these comments as a supplement to those submitted by NJUA.

The Company supports the Board's effort to review and update the EMP. Across the U.S., utilities, regulators, and customers are considering new ways to manage energy bills, meet infrastructure needs, increase system resiliency, and reduce emissions. New and improving technologies are transforming the utility industry, from distributed solar to enhanced large-scale wind installations to "smart" homes and meters. At the same time, severe weather events are changing the way we think about resilience and reliability. Utilities and regulators are well-positioned to guide this change, through engaging customers, and implementing plans that enhance the ability to provide safe, reliable natural gas

and electricity to customers at fair and reasonable rates. The EMP update process is critical to aligning stakeholders and outlining New Jersey's vision for the future.

Advanced Metering Infrastructure

Advanced Metering Infrastructure ("AMI") is an important step toward achieving a resilient, smart, clean, reliable, and cost-effective energy system. According to the Edison Foundation Institute for Electric Innovation, as of July 2014, more than 50 million smart meters had been deployed in the U.S., covering more than 43 percent of U.S. homes. AMI is an enabling technology with many benefits.[1]

First, AMI will significantly improve outage management and outage detection capabilities, allowing for faster response, and also for the dispatch of crews appropriate to the service problem. Additionally, communications with individual meters will allow for the identification of nested outages, *i.e.*, where restoration was completed on the main lines of a circuit, but customers whose service is provided through distribution spurs are still without power. Further, AMI will identify customers already restored and will eliminate unnecessary field visits to these customers. All of these capabilities should ultimately result in shorter outages and better service for customers by allowing the Company to deploy resources more effectively following a major storm.

Once implemented, AMI will also reduce every day operating costs, such as the cost of meter reading, as well as the costs associated with back-office operations that respond to customer billing inquiries by reducing estimated bills. In addition, the upgraded system will provide data which customers can use to better manage their energy use. AMI meters can serve as a conduit to enable demand response, potential time-variant pricing, and integration of distributed energy resources. Further, significant benefits can be realized through voltage optimization and more granular forecasting.

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[1] RECO has included a metering upgrade proposal to bring AMI to its New Jersey customers in its storm hardening plan. The Company's proposal emphasizes AMI's resiliency benefits to customers. BPU Docket No. ER14030250 – In the Matter of the Verified Petition of Rockland Electric Company for Establishment of a Storm Hardening Surcharge. RECO Verified Amended and Restated Petition. Filed on March 16, 2015.

Based on the many benefits of AMI, New Jersey should include a policy to support AMI implementation in the update to the 2011 EMP.

Storm Hardening

Five severe weather events including Hurricane Irene and Superstorm Sandy have significantly impacted New Jersey in recent years. The Company agrees with the BPU's assessment that there remains a significant risk of future severe weather patterns impacting utility infrastructure in the state.[2]

The Company believes that resilience planning and storm hardening should remain a priority for the BPU, and should be included in the update to the 2011 EMP. The Company looks forward to future action by the Board in its Storm Hardening proceeding.

Net Metering

The Company reiterates the importance of resolving cost shifting that occurs under existing net metering rules, and looks forward to participating in any efforts the Board may institute to consider alternative ways to promote and compensate distributed energy resources.

Renewables Development & Greenhouse Gas Reductions

New Jersey has long been recognized as a national leader in renewable policy, with more than 1 GW of solar capacity in operation. RECO has supported cost-effective clean generation and the reduction of greenhouse gas emissions, and appreciates the state's efforts in this area. The Environmental Protection Agency's recently released Clean Power Plan only serves to increase the urgency for the development of zero-emissions resources.

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[2] The Company has proposed several Enhanced Operational Programs in its Storm Hardening Petition, including: selective undergrounding; enhanced overhead system construction; enhanced transportation crossings; substation flood mitigation; and enhanced vegetation management. Additionally, as discussed above, the Company has proposed AMI to provide further resilience benefits to New Jersey customers. BPU Docket No. AX13030197 - Order Establishing a Generic Proceeding To Review Costs, Benefits and Reliability Impacts Of Major Storm Event Mitigation Efforts. Issued March 20, 2015.

Large-scale renewables will have an important role to play in meeting the state's and EPA's targets. Promoting the development of these resources in the most cost-effective way for customers should remain a cornerstone of the state's policy, and should be reflected in updates to the 2011 EMP. There has been significant discussion but little progress in achieving the state's goals related to offshore wind development. Offshore wind is a promising but still developing technology in the United States, and RECO supports the state's current approach of requiring offshore wind projects requesting cost recovery to show that they are cost effective for customers. The Board should continue to balance the cost of State policy to promote offshore wind with the impact of costs on customers.

Respectfully submitted,

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