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September 16, 2013

Alisa Bentley
Secretary
Public Service Commission
861 Silver Lake Boulevard
Cannon Building, Suite 100
Dover, DE 19904

By Hand Delivery for Filing

Re: In the matter of the Application of Integrated Resource Planning for the Provision of Standard Offer Service by Delmarva Power and Light Company Under 26 *Del. C.* § 1007 (c) & (d) (Opened December 7, 2012)

Dear Ms. Bentley:

On behalf of the Department of Natural Resources and Environmental Control, please find enclosed for filing the original and ten copies of the Comments of the Department of Natural Resources and Environmental Control in the above-referenced matter.

Thank you for your assistance.

Very truly yours,

David L. Ormond, Jr.
Deputy Attorney General

DLO/jrm

Enclosure

cc: Service List

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF DELAWARE

IN THE MATTER OF INTEGRATED RESOURCE PLANNING FOR THE PROVISION OF STANDARD OFFER SERVICE BY DELMARVA POWER & LIGHT COMPANY UNDER 26 *DEL. C.* §1007(c) & (d) (OPENED DECEMBER 7, 2012)	)))))	PSC DOCKET NO. 12-544

DNREC'S COMMENTS ON DELMARVA'S IRP

Intervenor State of Delaware Department of Natural Resources & Environmental Control ("DNREC") respectfully submits these comments on the Delmarva Power and Light, Inc. ("Delmarva" or "DPL") 2012 Integrated Resource Plan ("IRP") filed December 6, 2012.

DNREC's policy is to support the development of cleaner, less expensive and more reliable electricity for Delaware. The 2012 IRP supports these policy objectives by illuminating and expanding our understanding of all the costs of our energy supply, particularly those environmental costs and benefits known as externalities, which do not show up on customers' bills but nevertheless affect all Delawareans.

The 2010 and 2012 IRPs have broken new ground in considering externalities in resource planning, and DNREC commends Delmarva for its innovation in this area. By including externalities and a broader economic analysis of energy efficiency and renewable energy, the IRP provides us with a more complete picture of all of the costs and benefits of the energy Delmarva procures for Delaware ratepayers.

To further fill in the total policy picture, DNREC proposes that the next IRP (1) expand the externality analysis to include a more complete picture, including the cost of carbon emissions, (2) present a more complete picture of the economic costs and benefits of our energy

supply by including analysis of the avoided costs and price suppression effects of renewable energy, and (3) update the consideration of energy efficiency programs and policies.

The parties to the IRP docket have consistently expressed an interest in understanding the costs (and benefits) of renewable energy. A more complete understanding of the overall electricity price impacts of Delaware's clean energy policies, including environmental and public health benefits, efficiency programs and avoided cost and price suppression effects should be used to guide policy makers in determining which scenarios meet the objective of providing resource supply alternatives at minimum cost.

1. Externalities

The IRP Regulations (13 *DE Reg.* 953 (01/01/10)) assign DNREC a unique role in the consideration of externalities in the IRP:

> The Commission shall seek input from DNREC on the issue of externalities and environmental benefits due to emissions, as the result of the proposed IRP. (IRP Regulation 9.20)

Noting this role, DNREC has conferred with Delmarva on the externality analysis presented in the IRP. Delmarva broke ground in its 2010 IRP by presenting an externality finding of the avoided health and mortality costs from reduced air emissions associated with the combustion of fossil fuels. The externality finding presented in the 2012 IRP represents further progress in considering all of the costs of electricity generation.

Using the same methods employed in the 2010 IRP, the externality benefits from projected reductions in NOx, SOx, PM2.5 and ozone in 2022 compared to 2013 are calculated to be $980 million to $2.2 billion (IRP p. 129). The 2012 IRP presents the externality benefits in terms easily understood by utility customers as $0.04 to $0.10 per kWh (IRP p. 4-21). The IRP

takes another innovative step in offering a rough estimate of the benefits of Delmarva's compliance with Delaware's Renewable Portfolio Standards as ranging from $10,672,442 to $21,344,884 in 2013, depending on whether renewable power reduces emissions from the displaced power generation in the PJM region by either 25 percent or 50 percent. (IRP p. 108)

A new study conducted by researchers at the Massachusetts Institute of Technology finds that 22,000 premature deaths annually in the PJM region are attributable to PM2.5 emissions from electric power generation. Using spatial and temporal data analysis, the study calculates that 248 premature deaths annually in Delaware are attributable to PM2.5 emissions from electric power generation.[1]

The IRP Regulations require that DPL shall "[i]nclude a current evaluation, detailing and giving consideration to environmental benefits and externalities associated with the utilization of specific methods of energy production." (IRP Regulations 6.1.4) The IRP Regulations go further in stating "The IRP must show an investigation of all reasonable opportunities for a more diverse supply at the lowest reasonable cost, including consideration of environmental benefits and externalities." (IRP Regulations 5.2)

While the overall externality calculation is useful in providing a general picture of the costs associated with energy generation, the 2014 IRP should do more to detail the externalities associated with "specific methods of energy production" as required by the IRP Regulations. This can be done in a way that doesn't require multiple runs of complicated and cumbersome models. A simpler way to do it would to use the same science used for the modeling to offer

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[1] Fabio Caiazzo, Akshay Ashok, Ian A. Waitz, Steve H.L. Yim, Steven R.H. Barrett, Air pollution and early deaths in the United States. Part I: Quantifying the impact of major sectors in 2005, *Atmospheric Environment*, Volume 79, November 2013, Pages 198-208, ISSN 1352-2310, http://dx.doi.org/10.1016/j.atmosenv.2013.05.081. (http://www.sciencedirect.com/science/article/pii/S1352231013004548)

externality costs of different fuels. To make the numbers meaningful for policy purposes, these numbers should be expressed as overall numbers and on a per kWh basis.

In order to provide a more complete picture of externality costs, DNREC further proposes that the next IRP include a calculation of the externality costs of carbon emissions from energy generation. This should be a simple and straightforward calculation involving figures that are publicly available. The U.S. Interagency Working Group on Social Cost of Carbon recently updated its cost of carbon to $36/ton, based on a discount rate of 3.0 percent for future costs.[2]

Including this cost in the IRP should not involve a technically difficult calculation. Because the environmental effects of carbon emissions are global and not regional, this calculation would not require the CMAQ modeling used for other emissions. This can be calculated for Delaware by multiplying total carbon emissions (IRP, figure 3, p. 12) times the cost/ton figures.

On September 12, 2013, Governor Markell signed Executive Order 41 creating the Cabinet Committee on Climate and Resiliency, which "shall oversee development of an implementation plan to maintain and build upon Delaware's leadership in responsibly reducing greenhouse gas emissions, including identifying appropriate interim goals."[3] Delaware's Sea Level Rise Advisory Committee has published a comprehensive vulnerability assessment, which details economic and environmental risks from sea level rise along the state's entire coastline.[4] In addition, the State's Climate Change Advisory Committee is preparing an impact assessment of the effects of higher temperatures and increased precipitation on Delaware. While climate

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[2] *Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866*, May 2013, p. 18. Available at http://www.whitehouse.gov/sites/default/files/omb/inforeg/social_cost_of_carbon_for_ria_2013_update.pdf

[3] Executive Order Number Forty One: Preparing Delaware for Emerging Climate Impacts and Seizing Economic Opportunities from Reducing Emissions. Available at http://governor.delaware.gov/orders/EO41.pdf

[4] *Preparing for Tomorrow's High Tide: Sea Level Rise Vulnerability Assessment for the State of Delaware*, Sea Level Rise Advisory Committee. Available at http://www.dnrec.delaware.gov/coastal/Pages/SLR/DelawareSLRVulnerabilityAssessment.aspx

change is a global problem, the effects in Delaware will be local and are expected to be significant. Decision makers have an obligation to understand the extent to which our energy use contributes to the problem.

2. Avoided Cost and Price Suppression Effects of Renewable Energy

The 2012 IRP includes cost projections for compliance with the state's Renewable Portfolio Standards (RPS) (IRP, pp. 100-1). However, these figures do not provide a complete picture of the costs and benefits of renewable energy. The next IRP should include estimated avoided cost and price suppression benefits from the siting of renewable energy resources in Delaware.

Even though renewable energy sources such as wind and solar photovoltaics (PV) are still more expensive than conventional baseload generation, they provide net positive benefits to the grid when they replace expensive, inefficient generating units within the PJM region. When demand peaks, as on hot summer afternoons, more expensive (and often dirtier) generating units are called into service to meet the demand, driving up the locational marginal pricing (LMP) for the region, especially for Delaware. Distributed solar PV generation, which closely matches demand on such occasions, can reduce the need for such expensive power and reduce the need to import this power over overloaded transmission lines. By helping to ameliorate LMP costs, distributed PV can benefit all power customers.

These avoided cost or price suppression effects, which have been calculated in other regions, can be substantial according to a growing number of studies that have identified such effects attributable to wind and solar power. In 2006, Austin Energy commissioned a study "to

ensure that the cost of solar generation is commensurate with its value," that found that distributed PV created value for customers ranging from 10.4¢ per kWh to 10.7¢ per kWh.[5]

A study of energy prices in Pennsylvania and New Jersey by Clean Power Research finds that distributed solar power has price suppression effects, and that "[b]y reducing demand during the high priced hours, a cost savings is realized by all consumers."[6]

The Public Utility Commission of Ohio (PUCO) commissioned a study that finds that "consistent with theoretical expectations, Ohioans are already benefiting from renewable resource additions through downward pressure on wholesale market prices and reduced emissions."[7]

Wind power has been shown to have similar price suppression effects, though the market mechanisms may be different. A study by Synapse Energy Economics finds that the increasing use of wind power in the PJM region benefits ratepayers by putting downward pressure on energy prices.[8]

DNREC sees the inclusion of avoided costs and price suppression effects as a logical next step in developing a more complete picture of the costs and benefits of electricity generation and delivery in Delaware. The IRP already provides an estimated range for externality benefits from Delmarva's RPS compliance (IRP p. 108). In order to provide the fullest picture of the costs and benefits of renewable energy, the next IRP should include a study of these avoided cost and/or price suppression effects. The combination of electricity price impacts along with offsetting

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[5] *The Value of Distributed Photovoltaics to Austin Energy and the City of Austin*, p. ES-3. Available at http://cleanpower.com/wp-content/uploads/034_PV_ValueReportAustinEnergy.pdf

[6] *The Value of Distributed Solar Electric Generation to New Jersey and Pennsylvania*, November 2012, p. 3. Available at http://mseia.net/site/wp-content/uploads/2012/05/MSEIA-Final-Benefits-of-Solar-Report-2012-11-01.pdf

[7] *Renewable Resources and Wholesale Price Suppression*, August 2013, p. 7. Available at http://www.ohioadvancedenergy.org/files/dmfile/1308-Renewable-Resources-and-Wholesale-Price-Suppression1.pdf

[8] *The Net Benefits of Increased Wind Power in PJM*, April 8, 2013. Available at http://www.synapse-energy.com/Downloads/SynapseReport.2013-05.EFC.Increased-Wind-Power-in-PJM.12-062.pdf

environmental and public health benefits should be used as the determinant for which scenarios meet the requirements of providing resource supply alternatives at minimum cost. DNREC is committed to working with DPL and the other parties to create models that show all of the costs associated with energy generation and use in Delaware and to use such analysis to shape environmentally responsible and economically efficient plans for meeting our energy needs.

This analysis can be used to guide DPL, DNREC and other stakeholders in procuring the most beneficial and cost effective renewable resources to fulfill DPL's RPS requirements through 2025.

3. Energy Efficiency Programs

In commenting on the 2010 IRP, DNREC argued that DPL did not adequately meet the statutory requirement that the economic and environmental value of a variety of resources be considered in the IRP (26 *Del. C.* § 1007 (c)(1)(b)) or the requirement in the IRP Regulations that it "shall identify and evaluate all reasonable resource options…at the lowest reasonable costs, including consideration of environmental benefits…" (IRP Regulations 5.2) When it comes to energy efficiency, it should be noted that this is not so much a shortcoming of the IRP itself, but highlights a lingering problem in the Energy Efficiency Resource Standards (EERS) statute (26 *Del. C.* § 1500), which prohibits Delmarva from seeking cost recovery for efficiency programs, and designates the Sustainable Energy Utility (SEU) as the vehicle for funding and implementing these programs. While the SEU has instituted some effective programs, it does not have the capacity to fund and administer all of the programs needed to reach the EERS targets. DNREC has worked with stakeholders to craft legislation, House Bill 179, now before the

General Assembly, which would create a coordinated effort to encourage utilities including DPL to invest in cost effective efficiency programs.

There is general agreement among utilities and regulators that energy efficiency is the cleanest and most cost-effective supply option available. Procurement of energy efficiency resources as the lowest-cost alternative has the potential to reduce customer bills significantly (both in terms of quantity and unit cost through significant peak reductions). A potential study commissioned by the DNREC Division of Energy & Climate and conducted by Optimal Energy, Inc., finds that the economic potential of energy efficiency investments is enormous:

> If the total economic potential were hypothetically captured, it would produce $438 million in net benefits (in real 2013 $) to the Delaware economy, at a benefit-cost ratio of 4.01. Total investment would be $146 million, with benefits to consumers (mostly energy bill savings) of $584 million.[9]

Instead of simply presenting analysis of the status quo including current law, the IRP scenarios should provide meaningful guidance to shaping future procurement, including efficiency resources. Recognizing the limitations in the current statute, DNREC is committed to working with Delmarva and all the parties to make the next IRP a meaningful document in terms of assessing the current state of efficiency programs and mapping a future in which we take advantage of the full environmental and economic benefits of efficiency.

Conclusion

The IRP is a valuable tool that illuminates and expands our understanding of all the costs of our energy supply and provides us with a more complete picture that includes environmental

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[9] *Delaware Economic Energy Efficiency Potential*, May 24, 2013. Available at http://www.dnrec.delaware.gov/energy/information/Documents/EERS/Potential%20Study%20Phase%20I.pdf

externalities. By including externalities and a broader economic analysis of energy efficiency and renewable energy, we increase the value of the IRP as a policy planning tool.

To further fill in the total policy picture, DNREC proposes that the next IRP (1) expand the externality analysis to include a more complete picture, including the cost of carbon emissions, (2) update the consideration of energy efficiency programs and policies, and (3) present a more complete picture of the economic costs and benefits by including the avoided costs and price suppression effects of renewable energy. DNREC is committed to working with DPL and all stakeholders to develop future IRPs that more fully illuminate the overall picture of costs and benefits of our changing electric supply options.

Respectfully submitted,

/s/David L. Ormond, Jr.
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