

# DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

## DIVISION OF ENERGY AND CLIMATE

Statutory Authority: 7 Delaware Code, Chapter 60 (7 Del.C. Ch. 60)

### GENERAL NOTICE

#### Director's Determination under 26 Del.C. §354(i)&(j) and Regulation 104 Implementation of Renewable Energy Portfolio Standards Cost Cap Provisions

November 10, 2016

#### Summary

The Director of the DNREC Division of Energy & Climate is required under 26 Del.C. §354(i) & (j) and Regulation 104 Implementation of Renewable Energy Portfolio Standards Cost Cap Provisions to review the calculations of the costs and benefits of Delaware's Renewable Portfolio Standards (RPS), consult with the Public Service Commission, and determine whether to freeze the RPS and the solar PV carve-out of the RPS.

For Compliance Year 2015/16 (June 1, 2015 to May 31, 2016) the benefits were slightly higher than the cost of compliance for the RPS and clearly exceeded the cost of compliance of the solar PV carve-out.

The externality benefits and the economic benefits of solar PV used to satisfy DPL's solar carve-out totaled 2.24 percent, far greater than the 1.28 percent cost of solar PV compliance. Based on this analysis, and exercising my statutory discretion, I have determined to not freeze the solar PV carve-out of the RPS.

The externality benefits and the economic benefits of renewable energy used to satisfy DPL's RPS requirement totaled 4.71 percent, slightly higher than the 4.69 percent cost of RPS compliance. Based on this analysis, and exercising my statutory discretion, I have determined to not freeze the RPS.

#### Background

The Division of Energy & Climate has reported on the cost of RPS compliance as required under Section 4.0 of Regulation 104 Implementation of Renewable Energy Portfolio Standards Cost Cap Provisions (Regulation) promulgated under 26 Del.C. §354(i) & (j). The Director of the Division may, in consultation with the PSC, decide to freeze the RPS as provided in Section 5.0 of the Regulation. Thomas Noyes, the responsible staff member in this matter, has reported on the costs and benefits of RPS compliance.

I and Mr. Noyes briefed the Public Service Commission on the calculations on the costs and benefits of RPS compliance on November 1, 2016. His memorandum with the calculations of the costs and benefits, and with supporting appendices, is available online at <http://www.dnrec.delaware.gov/energy/information/otherinfo/Pages/Renewable.aspx>.

#### Calculation of the Costs and Benefits of Solar PV Carve-out

The solar PV cost of compliance has been calculated as follows:

##### *Section 4.3 Solar Renewable Energy Cost of Compliance*

The Solar Energy Cost of Compliance in Compliance Year 2015/16 was \$8,738,344, or 1.28 percent of the total retail cost of electricity of \$682,403,734. The benefits have been calculated as follows:

##### *Section 5.4.1 Overall energy market conditions*

Overall market energy conditions have not changed sufficiently enough to significantly affect this analysis.

##### *Section 5.4.2 Avoided cost benefits from solar PV carve-out*

Avoided cost benefits are those market benefits known as price suppression effects attributable to reduced demand because of distributed renewable energy generation in PJM, which leads to lower capacity and energy prices particularly at times of peak demand. The methods for calculating these benefits are still being developed and no calculation has been performed.

##### *Section 5.4.3 Externality benefits due to solar PV carve-out*

The Solar Energy Cost of Compliance in Compliance Year 2015/16 was \$8,738,344, or 1.28 percent of the total retail cost of electricity of \$682,403,734. Of the total externality benefits, 16.01 percent are attributed to solar PV based on the ratio of MWh generated of solar PV to all renewable energy generated during the compliance year. The solar PV portion of the externality benefits totaled \$3,215,949, or 0.47 percent of the total retail cost of electricity.

##### *Section 5.4.4 Economic impacts of the deployment of renewable energy in Delaware.*

The Division, working with the Delaware Solar Energy Coalition, surveyed the solar energy industry to determine the jobs impact of the industry in Delaware. The survey reports 326 solar industry jobs in Delaware with total salaries of \$17,410,375. Of those, the survey reports that 254 jobs serve the Delaware market. The survey found that 143 jobs would be lost if the RPS were frozen, with lost salaries of \$7,637,066. Mr. Noyes used this narrower figure in his calculations.

The IMPLAN analysis performed earlier this year resulted in a total multiplier effect (total direct, indirect and induced economic benefits) of 1.58 times salaries. When the same multiplier is applied to the total amount of salary lost if

the RPS were frozen, the direct, indirect and induced effects total \$12,040,396.

The results summarized below show that the benefits of the solar PV carve-out exceed the cost of compliance:

<b>Solar PV</b>	<b>Cost in \$</b>	<b>% of Retail</b>
<b>Total Retail Costs of Electricity</b>	\$ 682,403,734	
<b>GEF used to support PV</b>	\$ 1,950,730	
<b>DPL SREC procurement</b>	\$ 6,787,614	
<b>Solar Cost of Compliance</b>	\$ 8,738,344	1.28%
<b>Offsets</b>		
<b>Market conditions</b>	n/a	n/a
<b>Avoided costs capacity in MW</b>	n/a	n/a
<b>Avoided costs energy in MWh</b>	n/a	n/a
<b>Externalities NOx and SO2</b>	\$ 2,349,134	0.34%
<b>Externalities CO2</b>	\$ 866,815	0.13%
<b>Economic impacts</b>	\$ 12,040,396	1.76%
<b>Total offsets</b>	\$ 15,256,344	2.24%
<b>Net Cost (Benefit) of PV Compliance</b>	\$ (6,518,000)	-0.96%

#### Calculation of the Costs and Benefits of RPS Compliance

The RPS cost of compliance is calculated as follows:

##### *Section 4.2 Renewable Energy Cost of Compliance*

The Cost of RPS Compliance in Compliance Year 2014/15 was \$32,035,895, or 4.69 percent of the total retail cost of electricity. The benefits to have been calculated as follows:

##### *Section 5.4.1 Overall energy market conditions*

Overall market energy conditions have not changed sufficiently enough to significantly affect this analysis.

##### *Section 5.4.2 Avoided cost benefits from the RPS*

Avoided cost benefits are described in more detail above. Since that calculation has not been performed for CY 2015/16, no result is presented for your consideration in this report.

##### *Section 5.4.3 Externality benefits due to the RPS*

Delmarva Power calculated the externality benefits of renewable energy in its 2014 Integrated Resource Plan (IRP). This externality benefit calculation incorporates the avoided mortality costs for NOx and SO2 and the social cost of CO2 emissions. DPL calculated the externality benefits of reduced emissions of NOx and SO2 due to renewable energy in Delaware to be \$14,670,119 based on the assumption that renewable energy displaced 50 percent of the PJM generation mix (which can be considered a conservative estimate due to the efficiency of the grid).

The cost of CO2 is calculated to be \$5,413,175. DPL, in its 2014 IRP, set the cost of CO2 to be \$1 per metric ton, the low end of the EPA/OMB range of the social cost of carbon (SCC) at the time. These figures were updated in July, 2015. Mr. Noyes used the figure of \$38.00 per metric ton for 2015, which assumes a 3.0 percent discount rate of future costs in 2007 dollars. The figure in 2007 dollars has been adjusted using the CPI, resulting in a SCC of \$32.75 in 2016 dollars. As with DPL's externality calculations, it is assumed that renewable energy displaced 50 percent of the PJM generation mix.

The Regulation includes "improvements to habitat" as part of the definition of externality benefits. We have not developed methods for calculating habitat benefits of renewable energy.

Externality benefits of the RPS in Delaware in CY 2015/16 totaled \$20,083,294, or 2.94 percent of the total retail costs of electricity.

##### *Section 5.4.4 Economic impacts of the deployment of renewable energy in Delaware.*

The economic impacts of solar PV in Delaware are described above, and the results are incorporated into the overall RPS calculations.

The results summarized below clearly show that the benefits exceeded the cost of compliance:

<b>All Renewable Resources</b>	<b>Cost in \$</b>	<b>% of Retail</b>
<b>Total Retail Costs of Electricity</b>	\$ 682,403,734	
<b>GEF to support renewable resources</b>	\$ 1,950,730	
<b>DPL REC and SREC procurement</b>	\$ 30,085,165	
<b>Renewable Energy Cost of Compliance</b>	\$ 32,035,895	4.69%
<b>Offsets</b>		
<b>Market conditions</b>	n/a	n/a
<b>Avoided costs capacity in MW</b>	n/a	n/a
<b>Avoided costs energy in MWh</b>	n/a	n/a
<b>Externalities NOx and SO2</b>	\$ 14,670,119	2.15%
<b>Externalities CO2</b>	\$ 5,413,175	0.79%
<b>Economic impacts</b>	\$ 12,040,396	1.76%
<b>Total offsets</b>	\$ 32,123,690	4.71%
<b>Net Cost (Benefit) of RPS Compliance</b>	\$ (87,795)	-0.01%

### Conclusions

The calculations of the externality benefits and the economic benefits of the solar PV used to satisfy DPL's solar carve-out totaled 2.24 percent, which is greater than the 1.28 percent cost of solar PV compliance. Based on this analysis, and exercising my statutory discretion, I have determined to not freeze the solar PV carve-out of the RPS.

The externality benefits and economic benefits of renewable energy used to satisfy DPL's RPS requirement total 4.71 percent, compared to the cost of compliance of 4.69 percent. Based on this analysis, and exercising my statutory discretion, I have determined to not freeze the RPS.

### Opportunity for Public Comment

Members of the public may submit comments up until 4:30 p.m. on December 22, 2016 to:

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Approved:  
Philip T. Cherry, Director  
November 10, 2016

**20 DE Reg. 493 (12/01/16) (Gen. Notice)**