Agenda Date: 2/19/20
Agenda Item: 8H

STATE OF NEW JERSEY

Board of Public Utilities
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Trenton, New Jersey 08625-0350
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CLEAN ENERGY

IN THE MATTER OF A NEW JERSEY SOLAR TRANSITION PURSUANT TO P.L. 2018, C.17 - CALCULATION OF 5.1% MILESTONE FOR SREC PROGRAM CLOSURE	))))	ORDER DOCKET NO. QO19010068

Parties of Record:

Stefanie A. Brand, Esq., Director, New Jersey Division of Rate Counsel

BY THE BOARD:

BACKGROUND

On May 23, 2018, Governor Murphy signed into law certain amendments to N.J.S.A. 48:3-51 and -87 that became effective immediately ("Clean Energy Act" or "CEA"). Among many other mandates, the Clean Energy Act directed the Board to adopt rules and regulations to close the SREC Registration Program ("SREC Program" or "SRP") to new applications once the Board determines that 5.1 percent of the kilowatt-hours sold in the State by third party electric suppliers and basic generation service providers ("TPS/BGS providers") has been generated by solar electric power generators connected to the distribution system ("5.1 % Milestone").

On August 7, 2019, the Board approved a rule proposal addressing the methodology for determining the percentage of solar electric kilowatts sold ("5.1% Calculation Rule"), 51 N.J.R. 1457(a). Among other things, the 5.1% Calculation Rule requires that the Board:

> … produce, based on stakeholder input, an estimate of solar electricity in MWh expected energy output from one MWdc of installed solar capacity representative of the fleet of New Jersey solar installations. An estimate of retail electricity sold in the previous 12 months shall be calculated from data supplied by PJM-EIS GATS for load served adjusted for distribution line losses through a factor based on stakeholder input.
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> [N.J.A.C. 14:8-2.4(b)6.]

On January 8, 2020, the Board approved the 5.1% Calculation Rule for publication in the New Jersey Register. By Order also dated January 8, 2020, the Board provided Staff's current forecast for attainment of the 5.1% Milestone, provided notice to stakeholders of the opportunity to comment on the calculation of the 5.1% Milestone and directed Staff to report to the Board its findings on the refined estimates by January 31, 2020.[1]

Calculation of the 5.1% Milestone

As reflected in the 5.1% Calculation Rule adopted on February 3, 2020,[2] the CEA requires the Board to compare solar electricity generation and retail electricity sold over the same 12-month time period.

Solar Generation

Consistent with the Board's current practices, Staff estimates solar electric generation on the basis of installed solar capacity as that capacity is reported on a monthly basis from the SRP through New Jersey's Clean Energy Program ("NJCEP"). The amount of installed capacity and the amount of solar irradiance vary each month. In addition, each project's SREC eligibility begins upon a date determined by the local EDC's issuance of a Permission to Operate, or "PTO." Since the generation of each facility is subject to these variables, Staff applies a schedule of twelve months of solar output factors to the cumulative installed solar capacity in each month. This is also consistent with the measurement methodology used in the NJCEP's resource savings procedures,[3] and allows Staff to estimate as accurately as possible the amount of electricity produced by the fleet of statewide installed solar.

Retail Electricity Sold

PJM Interconnection LLC ("PJM"), manager of the regional wholesale electricity market, provides load served data to its unregulated affiliate PJM-EIS. PJM-EIS, which manages the Generation Attributes Tracking System ("GATS"), makes this data available to Board Staff as administrators of the state's Renewable Portfolio Standard rules. The wholesale data thus provided must be adjusted for transmission and distribution losses to determine statewide retail electricity sales.

Response to Staff's Request For Comment

Pursuant to the January 8 Order, Staff issued a request for stakeholder input on January 9th. Five responses were received by the January 17, 2020 deadline and have been posted to the Request for Comments page at NJCleanenergy.com. As noted above, the 5.1% Calculation Rule requires stakeholder input on two items:

1) The estimate of solar electricity output in kilowatt-hours from one kilowatt of installed solar capacity, representative of the fleet of New Jersey solar installations; and

2) The calculation of distribution line losses, which is used to adjust wholesale purchases (as reflected in the data supplied by PJM-EIS GATS) to the amount of load served at retail.

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[1] I/M/O A New Jersey Solar Transition Pursuant To P.L. 2018, C.17, BPU Docket No. QO19010068, Order dated January 8, 2020, ("January 8 Order").
[2] 52 N.J.R. 146 (b) published February 3, 2020.
[3] I/M/O New Jersey's Clean Energy Program – Fiscal Year 2020 Protocols to Measure Resource Savings, BPU Docket No. QO19040471, Order dated July 10, 2019 at p 191.

With regard to the estimate of solar generation, most commenters supported the use of actual observed data from the PJM-EIS GATS to estimate statewide solar electricity generation. Vivint Solar suggested that should newer production figures become available, these figures should be used. New Jersey Resources ("NJR"), on the other hand, recommended that the Board continue to use the 1200 kWh per kw production factor historically used to estimate monthly statewide solar electricity generation in NJCEP.[4] NJR argued that there will be estimation errors regardless of which factor is chosen and that closing the SREC market as soon as possible is essential. PSEG expressed doubt as to whether the GATS calculation of average annual solar productivity is representative of the entire NJ fleet of solar installations. The commenter suggested that actual SREC creation data would enable more accurate estimation of solar electricity generation than the use of the average production factor contained in the PJM-EIS report.[5]

Regarding the calculation of line losses, most commenters supported the Board's use of the historic line loss adjusted load served data from PJM-EIS GATS as an estimate of retail sales. Constellation agreed that the 5% adjustment is reasonable and Vivint stated that Staff's proposal was consistent with Energy Information Agency ("EIA") data on estimated losses.[6] However, Constellation noted that Basic Generation Service ("BGS") supply is obligated at the wholesale level pursuant to the BGS Supplier Master Agreement. Similarly, PSEG referenced the different Renewable Portfolio Standard ("RPS") compliance practices between Third Party Electric Suppliers ("TPS") and the Electric Distribution Companies ("EDCs") for the BGS providers. Despite noting its own lack of familiarity with the "unadjusted load served data" provided by GATS to state RPS administrators, PSEG suggested restricting the application of the line loss adjustment solely to TPS load.

STAFF RECOMMENDATIONS

NJ Solar Electric Generation

Staff generally agrees with commenters that more recent data on solar performance should be used when estimating solar electricity generation over the previous twelve-month period. However, reliance on only the most recent year of reported data may overstate the impact of transient weather conditions on solar productivity. The PJM-EIS February 1, 2019 Report shows a high correlation, for those facilities reporting one full year of meter readings, between New Jersey solar irradiance data for a given year and SREC creation in the corresponding year.
PSEG suggested a reporting bias in the data used by PJM-EIS to estimate fleet wide solar productivity, but the commenter failed to acknowledge that only systems reporting a full year of data are used in the calculation, regardless of system size. The smallest systems, those less than 10 kW, have actually out-performed the facilities in the group of systems 10 kW to 100 kW and also those sized from 101 kW to 1 MW. Similarly, PSEG's suggestion to use GATS-enrolled capacity amounts instead of NJCEP installed capacity figures fails to recognize the significant lag that often occurs between an owner/developer's receipt of a PTO and the establishment of the corresponding GATS account.

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[4] ibid.
[5] New Jersey Solar Performance Analysis. PJM-EIS. February 1, 2019 ("PJM-EIS February 1 Report"). Attachment to the Transition Incentive Staff Straw Proposal. August 22, 2019. https://www.njcleanenergy.com/renewable-energy/program-updates-and-background-information/solar-proceedings. Accessed December 19, 2019.
[6] Vivint calculated the five year average of line losses to be 4.9% based upon EIA data accessible from Table 10 on the New Jersey State Electricity Profile at https://www.eia.gov/electricity/state/newjersey/index.php.

To provide context for its calculations, Staff estimates the amount of solar electricity as a percentage of retail sales over the past twelve months as well as forecasts the date of attainment of the 5.1% milestone. For both calculations, Staff recommends using the monthly cumulative installed solar capacity as reflected in the NJCEP Solar Installation Report. This report is the most accurate, comprehensive and timely report on solar capacity installed in New Jersey. No other report provides the same level of detail; for each project, the final as-built system size and the date the local Electric Distribution Company issued permission to operate are included. The cumulative installed capacity at a given month's end serves as the basis for estimating solar production in the following month, using the appropriate monthly production factor.

In forecasting future monthly solar production, Staff recommends that a monthly growth rate of 35 MWdc be applied to the previous months' reported or calculated installed capacity. For example, the latest NJCEP Solar Installation Report issued on January 15, 2020 showed 3,166 MWdc of cumulative installed capacity through December 31, 2019. Thus, January 2020's estimated solar electricity production is 3,166 MWdc times the monthly output factor of 72 MWh per MWdc. For February 2020, Staff recommends adding 35 Mwdc to that total resulting in 3,201 MWdc as the estimated production for the month.

On January 8, 2020, PJM-EIS provided Staff with an updated estimate of solar performance of NJ solar facilities for each energy year from EY2010 through EY2019. This data showed that in EY2019 the number of MWh – the number of SRECs – created per MWdc installed had fallen to 1,110 MWh for facilities reporting a full year's worth of meter readings. PJM-EIS also provided six and ten year averages, with the latter being 1,154 MWh per MW annually. To account for the full range of variability in solar production, Staff recommends that the Board use the ten-year average as the basis for generating monthly production factors. The monthly production factors will be calculated using the National Renewable Energy Lab tool, PVWatts (Table A). Staff recommends applying these factors to the NJCEP reports of cumulative installed capacity, estimated as described above.

After the monthly output factors have been multiplied by the cumulative installed capacity reported through December 2019 and forecast through June 2020, the twelve month sum will form the numerator in the forecast of solar electricity generation as a percentage of statewide retail electricity sales. See the following tables:

Table A. Monthly Solar Output based on 10-year average annual solar productivity

Expected Monthly Output Factor

Month	(MWH)
June 2019	118
July 2019	123
Aug. 2019	115
Sept. 2019	100
Oct. 2019	84
Nov. 2019	67
Dec. 2019	58
Jan. 2020	72
Feb. 2020	84
Mar. 2020	102
Apr. 2020	113
May 2020	118
Total	1154

Monthly expected solar electricity production factors in Mwh per MWdc installed serve as a proxy for NJ fleetwide productivity based on the PJM-EIS NJ Solar Performance Analysis. Derived from PVWatts results for a 1 kWdc fixed roof mount system located in Trenton 08625 with 20 degree tilt and 180 degree azimuth, system losses of 26.25 percent and inverter efficiency of 96%.

Table B. Monthly Solar Output Factors applied to Reported and Forecast Solar Capacity (July 1, 2019 to June 30, 2020)

Month	Expected Solar Output Factor (MWh/MW)	***NJCEP Reported Capacity*** & Growth @ 35 MW/mo. (Starting MW)	Solar Productivity *(MWh)
July 2019	123	***2,943***	361,989
Aug. 2019	115	***2,981***	342,815
Sept. 2019	100	***3,007***	300,700
Oct. 2019	84	***3,060***	257,040
Nov. 2019	67	***3,095***	207,365
Dec. 2019	58	***3,119***	180,902
Jan. 2020	72	***3,166***	227,952
Feb. 2020	84	3,201	268,884
Mar. 2020	102	3,236	330,072
Apr. 2020	113	3,271	369,623
May 2020	118	3,306	390,108
June 2020	118	3,341	394,238
Total	1154		3,631,688

Retail Sales

The Clean Energy Act mandates calculation of the 5.1% Milestone on the basis of retail electricity sales. GATS provides Staff with monthly wholesale sales rather than retail figures. However, the annual RPS reconciliation process provides the Board with a methodology for turning the wholesale figures into retail sales. In the RPS compliance process for EY19, the TPS reported load reduction, or line losses, of 4.97%. To estimate the amount of retail sales over the previous twelve months, Staff recommends that the Board apply this 4.97% factor to the unadjusted load data supplied by GATS. Staff also recommends the line loss adjustment be applied to all load for this calculation, although the EDCs do not account for line losses in facilitating the RPS compliance of BGS providers.

For the current calculation, Staff found that the unadjusted load served by TPS and BGS Providers for the twelve months ending December 31, 2019 was 74,583,296 MWh. When Staff's recommended 4.97% factor is applied, the calculation produces an estimated retail sales figure of 70,876,506 MWh.

Results from the Application of Refined Assumptions

When the monthly output factors identified in Table A are multiplied by the figures in Table B (showing the actual and forecast cumulative installed capacity figures for the twelve-month period ending June 30, 2020), the calculation produces estimated solar electricity generation in the amount of 3,631,688 MWh. After adding the estimated or forecast solar electricity production for each month together, the sum is divided by the estimated or forecast retail electricity sales over the same twelve months. This calculation produces the percentage of retail sales over the previous twelve months that has been generated by solar energy. With the revised inputs described above, Staff estimates that solar electricity generation over the twelve months ending on January 31, 2020 will constitute 4.81% of retail kWh sold in New Jersey and forecasts the attainment of the 5.1% Milestone in June 2020.

These results are set out below in Table C, which contains actual data available through January 2020 and forecasts for solar installation growth and retail sales growth through June 2020.

To extend the methodology to forecast when the 5.1% milestone will be attained, two solar growth forecasts, of 35 MWdc per month and 45 MWdc per month, are used for February through June 2020. For context, Staff anticipates that the February solar installation report will show that calendar year 2019 set a record for installed capacity of approximately 450 MWdc, an average of 37.5 MWdc. Given the demand-pull from the December 31, 2019 step-down in the Federal Investment Tax credit, Staff anticipates average solar installation activity to be the more likely scenario through June 30, 2020. The scenario of a higher growth rate in installed solar capacity in these remaining months is presented to demonstrate the relative lack of sensitivity of the forecast for 5.1% attainment to accelerated solar growth.

The estimated retail sales for the twelve-month period ending December 31, 2019 was used as the denominator in each monthly calculation of the percentage of attainment. For calculating the percentage in future months, i.e., January 2020 through June 2020, the use of this convention assumes that retail sales in these months will be identical to the corresponding months last year. Since these months are not typically subject to extreme variability in electricity consumption, Staff believe that a forecast of flat retail sales over the six months is reasonable. For illustration purposes, an alternative scenario of high retail sales growth is provided to demonstrate the impact on the forecast of 5.1% milestone attainment. Should retail sales rebound in the remainder of

EY2020 and make up for the comparatively low first six months of reported retail sales, then the 5.1% milestone would be attained after June 2020.

Table C. Monthly Estimate / Forecast of Solar Electric as a Percentage of Retail Electricity Sales for the twelve months ending June 30, 2020.

Scenarios Forecasting Fleetwide Solar Electric Generation as a Percent of Retail Sales in NJ (January 31, 2020)

Monthly Solar Production

	Expected Solar Output Factor (MWh/MW)
June	118
July	123
August	115
September	100
October	84
November	67
December	58
January	72
February	84
March	102
April	113
May	118
Annual Total**	1154

Historic Production Estimates

Estimated Production by Month	NJCEP Reported Installed Capacity at Month Start (MW)	Production *(MWh)
June 2018	***2,536***	299,248
July 2018	***2,578***	317,094
Aug. 2018	***2,596***	298,540
Sept. 2018	***2,626***	262,600
Oct. 2018	***2,643***	222,012
Nov. 2018	***2,681***	179,627
Dec. 2018	***2,704***	156,832
Jan. 2019	***2,743***	197,496
Feb. 2019	***2,773***	232,932
Mar. 2019	***2,809***	286,518
Apr. 2019	***2,836***	320,468
May 2019	***2,859***	337,362
EY19 Total	-	3,110,729
June 2019	***2,882***	354,486
Total (7/18 - 6/19)		3,165,967

EY19 (6/1/18 - 5/31/19) Solar as a % of Retail Sales

Retail Sales Reported for Compliance		EY19 ending % solar
Actual (MWh)	74,482,963	4.18%

* Uses monthly beginning installed capacity with PTOs reported to NJCEP through 12.31.19 multiplied by monthly production factors consistent with PJM-EIS Data.
** PVWatts annual output values sum to 1154 MWh / MWdc.

Actual EY19 year end solar capacity = **2,882 MWdc**

The cumulative installed capacity for a given month forms the basis for calculating solar production in the following month. For example, the capacity reported through May 31, 2019 is used to estimate the June 2019 solar production. The production values provided above for August 2018 through June 2019 are added to the production estimate in the adjacent table for July 2019 to calculate the percentage of solar electricity in July 2019.

	Average Future Installation Growth			High Future Installation Growth		
Month	***NJCEP Reported Capacity*** & Growth @ 35 MW/mo. at Month's Start (MW)	Solar Productivity *(MWh)	% Solar MWh toward retail sales (%)	***NJCEP Reported Capacity*** & Growth @ 45 MW/mo. at Month's Start (MW)	Solar Productivity *(MWh)	% Solar MWh toward retail sales (%)
July 2019	***2,943***	361,989	4.53%	***2,943***	361,989	4.53%
Aug. 2019	***2,981***	342,815	4.59%	***2,981***	342,815	4.59%
Sept. 2019	***3,007***	300,700	4.65%	***3,007***	300,700	4.65%
Oct. 2019	***3,060***	257,040	4.70%	***3,060***	257,040	4.70%
Nov. 2019	***3,095***	207,365	4.74%	***3,095***	207,365	4.74%
Dec. 2019	***3,119***	180,902	4.77%	***3,119***	180,902	4.77%
Jan. 2020	***3,166***	227,952	4.81%	***3,166***	227,952	4.81%
Feb. 2020	3,201	268,884	4.86%	3,211	269,724	4.86%
Mar. 2020	3,236	330,072	4.92%	3,256	332,112	4.93%
Apr. 2020	3,271	369,623	4.99%	3,301	373,013	5.00%
May 2020	3,306	390,108	5.07%	3,346	394,828	5.08%
June 2020	3,341	394,238	5.12%	3,391	400,138	5.15%
Total		3,631,688			3,648,578	

Sensitivity of Attainment Percentage to Solar Growth and Retail Sales

Average Solar Growth in the remainder of EY 20

w/ EY20 Retail Sales Forecast		June 2020 % solar with growth at 35 MW*
6 Months Actual plus 6 Flat	70,876,506	5.124%
12 Mos. Constant at EY 19's	74,482,963	4.876%

* NJCEP reported installed solar at 3166 MW on December 31, 2019 with installed capacity estimated to grow @ 35 MW per month and production factor used in the PJM-EIS Data With slower solar installation rates and very high retail sales in the next five months, the 5.1% milestone may be attained after June 30, 2020.

High Solar Growth in the remainder of EY 20

w/ EY20 Retail Sales Forecast		June 2020 % solar with growth at 45 MW*
6 Months Actual plus 6 Flat	70,876,506	5.148%
12 Mos. Constant at EY 19's	74,482,963	4.899%

* NJCEP reported installed solar at 3166 MW on December 31, 2019 with installed capacity growing @ 45 MW per month and production factor used in the PJM-EIS Data. Higher solar growth results still results in the 5.1% trigger attainment in June 2020 if annualized retail sales remain at the 70 million MWh exhibited through January 2020. Very high retail sales in the next five months may result in the milestone being attained after June 2020.

FINDINGS AND DISCUSSION

The Board **HEREBY FINDS** that Staff solicited and reviewed stakeholder comment on the calculation of the 5.1% Milestone and developed a reasonable approach to calculating distribution line losses and solar production. For the purposes of estimating solar production, the Board **DIRECTS** Staff to calculate monthly solar electricity generation based on the ten-year average of PJM solar production data for the purposes of calculating attainment of the 5.1% Milestone. The Board also **DIRECTS** Staff to use a 4.97% reduction of wholesale sales in order to determine retail kWh sold in New Jersey for the purposes of calculating attainment of the 5.1% Milestone.

The Board **FURTHER DIRECTS** Staff to issue its monthly reports on the estimated time of attainment of the 5.1% Milestone in conformance with these inputs.

Agenda Date: 2/19/20
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This Order shall be effective on February 29, 2020.

DATED: 2\19\20

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BY:

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PRESIDENT

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IN THE MATTER OF A NEW JERSEY SOLAR TRANSITION PURSUANT TO P.L. 2018, C.17
- CALCULATION OF 5.1% MILESTONE FOR SREC PROGRAM CLOSURE

DOCKET NO. QO19010068

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