WATKINS GLEN SOLAR ENERGY CENTER

Case No. 17-F-0595

1001.8 Exhibit 8

Electric System Production Modeling

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Exhibit 8: Electric System Production Modeling

This Exhibit will track the requirements of Stipulation 8, dated February 21, 2020, and therefore, the requirements of 16 New York Codes, Rules and Regulations (NYCRR) § 1001.8.

8(a) Computer-Based Modeling Tool

The analyses presented in this section of the Application were developed using a computer-based modeling tool, PROMOD. The Applicant reached out to the New York State Department of Service staff (NYSDPS) to develop acceptable input data for the simulation analyses. This data includes modeling for the proposed Watkins Glen Solar Energy Center's (Watkins Glen Solar's) output that will be utilized in calculating, amongst other outputs, the projected emissions predicted to be displaced by the Project from other operating generating facilities.

ICF Resources, LLC (ICF) studied the impact of Watkins Glen Solar Project on the New York Independent System Operator (NYISO) electric power system by performing a nodal simulation with and without the Project in PROMOD IV. PROMOD is an industry standard production cost-modeling software and is permitted for use for Exhibit 8 support. The Project is located in Zone C of the NYISO power market. Base Case and Change Case scenarios were considered for the simulation. Base Case represents market conditions without the proposed Project and Change Case represents market conditions with the inclusion of the Project. The first full year of operation for the Facility, 2023, was analyzed for this study. The study assessed the impact of the Facility's operation on statewide and regional emission levels, the NYISO zonal power market, and dispatch of existing must-run resources.

ICF's full Watkins Glen Solar electric system production model report is included as Appendix 8-1 and contains confidential information. Therefore, the Applicant will seek the requisite trade secret protection for this information pursuant to Public Officers Law (POL) Section 87(2)(d), 16 NYCRR § 6-1.3, other applicable laws, and/or a protective order as necessary.

(1) Estimated Statewide and Regional Levels of SO_2, CO_2, and NO_x

The Project is expected to reduce emissions of sulfur dioxide (SO_2), nitrogen oxides (NOx), and carbon dioxide (CO_2) from the power sector in New York in 2023. Table 8-1 below represents the estimated reduction in emissions.

Table 8-1. Statewide Emissions With and Without Watkins Glen Solar Energy Center

Item	Without Project (Tons)	With Project (Tons)	Reduction in Emission (Tons)	Reduction in Emission (%)
SO_2	961	946	(15)	-1.56%
NO_x	7,338	7,324	(14)	-0.19%
CO_2	26,962,690	26,932,358	(30,332)	-0.11%

(2) Estimated Prices for NYISO Zones

In NYISO Zone C, the average annual price in Change Case (with Project) is expected to be $35.27/Megawatt Hour (MWh) and in Base Case (without Project) is expected to be $35.32/MWh. Therefore, the Project is expected to decrease the annual average zonal prices by approximately $0.04/MWh, or 0.12%, in 2023. Modeling showed that production costs in New York State were reduced by $2.7 million, or 0.08%, with the Project.

Table 8-2. Annual NYISO Zonal Energy Prices

Zone	Annual Prices With Project ($/MWh)			Annual Prices Without Project ($/MWh)		
	Minimum	Maximum	Average	Minimum	Maximum	Average
A	-34.92	168.51	27.43	-34.95	179.67	27.51
B	-31.02	412.49	31.95	-33.57	949.29	32.10
C	-27.00	193.17	35.27	-27.02	195.39	35.32
D	-26.95	177.08	34.42	-26.95	178.22	34.42
E	-27.62	187.33	35.87	-27.65	189.35	35.88
F	-28.59	193.80	38.11	-28.55	195.26	38.10
G	-29.10	197.78	39.81	-29.10	199.51	39.79
H	-29.79	197.47	40.49	-29.79	199.15	40.47
I	-29.86	197.11	40.55	-29.86	198.86	40.53
J	-30.17	198.47	41.45	-30.17	200.10	41.44
K	-30.00	198.97	42.60	-30.00	201.70	42.59

(3) Estimated Capacity Factor

The Project is expected to operate at an annual capacity factor of approximately [redacted], with an off-peak annual capacity factor of [redacted] and an on-peak annual capacity factor of [redacted]. Annual on-peak and off-peak generation and capacity factors are shown in Table 8-3. A detailed generation summary by month can be seen in Table III-6 of the ICF Assessment Report in Appendix 8-1.

(4) Estimated Megawatt (MW) Output Capability Factors

The Project is expected to generate approximately 113,646 MWh/year, with an annual capacity factor of approximately [redacted]. Monthly generation is expected to be approximately [redacted] MW during the off-peak period and approximately [redacted] MW during the peak period. Monthly on-peak and off-peak generation and capacity factor are shown in Table 8-3.

Table 8-3. Monthly Peak and Off-Peak Generation and Capacity Factors for the Watkins Glen Solar Energy Center – 2023

Month	On-Peak Dispatch		Off-Peak Dispatch	
	Energy (MW)	Capacity Factor (%)	Energy (MW)	Capacity Factor (%)
January	[redacted]	[redacted]	[redacted]	[redacted]
February	[redacted]	[redacted]	[redacted]	[redacted]
March	[redacted]	[redacted]	[redacted]	[redacted]
April	[redacted]	[redacted]	[redacted]	[redacted]
May	[redacted]	[redacted]	[redacted]	[redacted]
June	[redacted]	[redacted]	[redacted]	[redacted]
July	[redacted]	[redacted]	[redacted]	[redacted]
August	[redacted]	[redacted]	[redacted]	[redacted]
September	[redacted]	[redacted]	[redacted]	[redacted]
October	[redacted]	[redacted]	[redacted]	[redacted]
November	[redacted]	[redacted]	[redacted]	[redacted]
December	[redacted]	[redacted]	[redacted]	[redacted]
Annual	[redacted]	[redacted]	[redacted]	[redacted]

Note: Peak hours are the hours between 7:00 am – 11:00 pm Eastern Time (Mon. – Fri.). The remaining hours are categorized as off-peak (including holidays and weekends).

(5) Estimated Average Annual and Monthly Production Output

Refer to Table 8-3, above, for the estimated average annual and monthly production output for the Project.

(6) Estimated Production Curve over an Average Year

The estimated production curve for the Project over an average year is shown in Figure III-1 of the ICF Assessment Report in Appendix 8-1. Trade secret protection will be sought for the data and it will also be provided confidentially to NYSDPS under separate cover.

(7) Estimated Production Duration Curve over an Average Year

The estimated production duration curve for the Project over an average year is shown in Figure III-2 of the ICF Assessment Report in Appendix 8-1. Trade secret and confidential commercial information protection will be sought for the data and it will also be provided confidentially to NYPSC under separate cover.

(8) Estimate Energy Dispatch of Existing Must-Run Resources

As indicated in Table 8-4, the Project is estimated to have minimal or no impact on existing must-run generating resources in New York.

Table 8-4. Dispatch of Must-Run Resources With and Without Watkins Glen Solar Energy Center - Statewide Generation (NY)

Generation Type	Base Case	Change Case
Thermal	[redacted]	[redacted]
Hydroelectric	[redacted]	[redacted]
Wind	[redacted]	[redacted]
Solar	[redacted]	[redacted]
Nuclear	[redacted]	[redacted]

8(b) Digital Copies of Inputs Used in Simulations Above

Digital copies of all inputs and outputs used in the simulations required in 16 NYCRR § 1001.8(a) are confidential and will be provided confidentially to NYDPS under separate cover and trade secret. Trade secret protection will be sought as well.