



# **EIGHT POINT WIND ENERGY CENTER**

**Case No. 16-F-0062**

**1001.8 Exhibit 8**

**Electric System Production Modeling**

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## Appendices

Appendix 8-1. Eight Point Wind ICF Assessment

## Exhibit 8: Electric System Production Modeling

### 8(a) Computer-Based Modeling Tool

The analyses presented in this section of the Application was developed using a computer-based modeling tool, PROMOD. The Applicant consulted with DPS and the NYSDEC to develop acceptable input data for the simulation analyses. This data includes modeling for the proposed Eight Point Wind Energy Center's output that will be utilized in calculating the projected emissions predicted to be displaced by the Project from other operating generating facilities.

ICF Resources, LLC (ICF) performed the modeling using the PROMOD platform for a security constrained unit commitment (SCUC) and security constrained dispatch (SCED) simulation of the Northeast US power markets. The Project is located in Zone C of the New York Independent System Operator (NYISO) power market. Two scenarios were considered for simulation, a Base Case and a Change Case. The Base Case represents market conditions without the proposed Project and the Change Case includes the Project. The first full year of operation for the facility, 2019, was analyzed for this study. The study assessed the impact of the plant's operation on statewide and regional emission levels, NYISO zonal power market and dispatch of existing must-run resources.

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

#### *(1) Estimated statewide and regional levels of SO<sub>2</sub>, CO<sub>2</sub>, and NO<sub>x</sub>*

The proposed Project is expected to reduce emissions sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), and carbon dioxide (CO<sub>2</sub>) emissions from the power sector in New York in 2019. Table 8-1 below represents the estimated reduction in emissions.

**Table 8-1. Statewide Emissions With and Without EPWEC**

Item	Without EPWEC (Tons)	With EPWEC (Tons)	Reduction in Emission (Tons)	Reduction in Emission (%)
SO <sub>x</sub>	1,442	1,433	(10)	-0.7%
NO <sub>x</sub>	12,751	12,681	(70)	-0.5%
CO <sub>2</sub>	31,017,381	30,925,263	(92,119)	-0.3%

*(2) Estimated Prices for NYISO Zones*

In NYISO Zone C, the average annual price in Change Case (with Project) is expected to be \$38.36 \$/MWh and in Base Case (without Project) is expected to be \$38.51 \$/MWh. The Project is therefore expected to reduce the annual average zonal prices by approximately \$0.15 \$/MWh in 2019.

**Table 8-2. Annual NYISO Zonal Energy Prices**

Zone	Annual Prices With EPWEC (\$/MWh)			Annual Prices Without EPWEC (\$/MWh)		
	Minimum	Maximum	Average	Minimum	Maximum	Average
A	-8.8	183.5	39.5	-8.8	178.7	39.7
B	-6.6	118.7	38.0	-6.6	115.6	38.1
C	-4.9	151.8	38.4	-4.9	146.8	38.5
D	-4.8	134.9	34.9	-4.9	126.8	35.0
E	-4.8	149.9	38.0	-4.8	144.6	38.1
F	-5.0	179.4	49.1	-5.0	179.4	49.2
G	-5.3	172.3	47.2	-5.2	170.3	47.2
H	-5.3	173.3	47.4	-5.2	171.3	47.4
I	-5.3	172.9	47.4	-5.2	170.9	47.4
J	-5.4	173.8	47.7	-5.3	171.8	47.8
K	-5.3	177.2	53.2	-5.2	175.2	53.2

*(3) Estimated Capacity Factor*

The Project is expected to operate at a capacity factor of approximately 38%, with an off-peak annual capacity factor of 40% and an on-peak annual capacity factor of 36% (based on net output and without any curtailment).

*(4) Estimated MW Output Capability Factors*

The Project is expected to generate approximately 340 GWh/year, with an annual capacity factor of approximately 38%. The annual generation is expected to be 188 GWh during the off-peak period and 154 GWh during the peak period. The monthly 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 EPWEC Facility – 2019**

Month	On-Peak Dispatch		Off-Peak Dispatch	
	Energy (MWh)	Capacity Factor (%)	Energy (MWh)	Capacity Factor (%)
January	20,147	53%	19,975	51%
February	16,766	50%	20,318	56%
March	16,931	49%	20,185	49%
April	11,898	32%	12,353	33%
May	12,307	32%	16,069	40%
June	9,049	27%	17,643	39%
July	6,776	17%	8,962	24%
August	9,486	26%	9,896	26%
September	10,116	29%	14,140	36%
October	12,239	32%	15,446	39%
November	13,544	39%	16,318	40%
December	17,247	47%	17,070	44%
<b>Annual</b>	<b>156,504</b>	<b>36%</b>	<b>188,374</b>	<b>40%</b>

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

*(5) Estimated Average Annual and Monthly Production Output*

See Table 8-3 above.

*(6) Estimated Production Curve over an Average Year*

The estimated production curve for the Project over an average year is shown in Exhibit 18 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 DPS under separate cover.

*(7) Estimated Production Duration Curve over an Average Year*

The estimated production duration curve for Project over an average year is shown in Exhibit 18 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 DPS under separate cover.

*(8) Estimated Energy Dispatch of Existing Resources and Co-generation Facilities.*

The proposed Project is estimated to have minimal or no impact on existing must-run generating resources in New York. The Project could reduce the dispatch from combined cycle (CC) units by 0.09%, when compared to a Base Case scenario.

**Table 8-4. Dispatch of Must-Run Resources With and Without EPWEC**

Unit Type	Dispatch Without EPWEC		Dispatch With EPWEC		Change in Dispatch (%)
	Dispatch (GWh)	Capacity Factor	Dispatch (GWh)	Capacity Factor	
CC	11,097	65%	11,087	65%	-0.09%
CT	1,208	32%	1,209	32%	0.04%
O&G	379	25%	379	25%	0.01%
Hydro	25,847	60%	25,847	60%	0.00%
Nuclear	43,091	93%	43,091	93%	0.00%
Solar	859	20%	859	20%	0.00%
Wind	4,020	24%	4,109	24%	-0.01%
<b>Total</b>	<b>86,501</b>	<b>65%</b>	<b>86,490</b>	<b>65%</b>	<b>-0.01%</b>

Note: CC = Combined Cycle, CT= Combustion Turbine, O&G = Oil and Gas Steam

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

The Article 10 Application will provide digital copies of inputs and outputs used in the simulations required in 16 NYCRR § 1001.8(a). Trade Secret Protection will be sought for them and they will also be provided confidentially to DPS under separate cover.