

ATTACHMENT F

A Review of the Participation of Selected Generating Units in the NYISO Marketplace on Ozone Non-Attainment Days

May 6, 2009

In the NYSPSC Case 07-M-0548 Energy Efficiency Portfolio Standard July 3, 2008 Procedural Ruling, Demand Response and Distributed Generation was identified as a Critical Path Issue.

“Demand Response and Distributed Generation. Defining the role of demand response and distributed generation in this proceeding is a critical path issue because gains can be made in reducing peak load in constrained areas, while at the same time realizing significant energy savings. The EEPS Order includes consideration of demand effects, in particular in constrained areas, in the criteria for program approval. The principal issue for working group discussion and recommendations is to identify specific measures that are not presently achievable through ISO and SBC programs, utility programs, or EEPS initiatives as recently ordered by the Commission. In addition, the environmental justice roundtable requested consideration of a study to assess health impacts on communities that host peak generation facilities to a disparate extent, and of opportunities to render those facilities obsolete through the acquisition of energy efficiency resources. We will immediately convene a working group on these issues.”

The Order further identified several outstanding policy issues including:

“Low Income Customers and Environmental Justice. These issues concern the adequacy of funding and program availability for low income New Yorkers; availability of training and participation opportunities for disadvantaged communities, as well as the exploration of reducing peak load generation facilities in those communities.”

Working Group VIII was assigned Demand Response and Peak Reduction. The working group has diverse representation including generation owners, environmental justice community groups, and representatives of various state agencies. NYSDEC has developed a list of generating units that generally perform in peaking service and are located in or adjacent to areas identified as potential environmental justice communities. The units are:

Seneca Power Partners	Shoemaker (Orange County): 1 turbine
Consolidated Edison	59th Street Station (NYC): 1 turbine
Consolidated Edison	74th Street Station (NYC): 2 turbines
Consolidated Edison	Hudson Avenue Station (NYC): 3 turbines
Astoria Generating/US Power Gen	Narrows Generation Station (NYC): 16 turbines
Astoria Generating/US Power Gen	Gowanus Turbines (NYC): 32 turbines
NRG Power	Astoria Gas Turbines (NYC): 31 turbines

The Administrative Law Judge set up a Technical Study Group (TSG) to collect and analyze data on the role that these units have served in the electric system and what their respective emission profiles have been. NYSDEC is in the process of air quality modeling and collecting information on health profiles in the environmental justice communities. The NYISO has been requested to collect and analyze data on the market roles served by these units. Consolidated Edison has been requested to identify the electric system attributes that the targeted units supply.

In order to make the task manageable, the NYISO's data collection and analysis efforts have been focused on the Day Ahead Market activities for all days in 2005 through 2008 when the ozone concentration in New York State exceeded the National Ambient Air Quality Standard. A subset of this data, containing only data from days when the New York City Metropolitan Area (NYCMA) was in non-compliance, was also analyzed. The NYISO's data collection and summarization effort is complete and results are reported in the table below.

Ozone Season		Generation						Emissions				
	High Ozone Days	Hours Scheduled for L R R	Capacity Called * Hours Called for LRR	Target Unit Operating Time	Target Unit Gross Generation	Target Unit Net Generation	NYCA Net Generation	Target Unit NOx	NYCA NOx	Target Unit Emission Rate	NYCA Emission Rate	Target Unit Emission Rate
	Days	Hrs	MWh	Hours	MWh	MWh	MWh	Tons	Tons	# NOx / Gross MWh	# NOx / Net MWh	# NOx / Net MWh
2005	14	62	975	12,447	216,495	176,770	7,938,220	664	4,518	6.1	1.1	7.5
2006	13	354	7,465	7,341	123,226	105,972	7,132,103	372	3,273	6.0	0.9	7.0
2007	22	122	2,121	2,913	51,519	41,371	10,555,347	140	3,412	5.4	0.6	6.8
2008	28	238	4,104	5,624	96,461	82,664	12,766,364	273	4,882	5.7	0.8	6.6
Total	77	776	14,664	28,325	487,701	406,777	38,392,034	1,449	16,085	5.9	0.8	7.1

Among the relevant reliability standards is the "Loss Of Load Expectation" of once in ten years. Compared to this standard it can be stated briefly that approximately one half of these units frequently fulfill local reliability needs for which energy efficiency and demand response are not real-time substitutes. All of the units have participated in NYISO's markets through selection in the economic dispatch process. The selection as an economic unit can solve reliability needs in these areas. It is reasonable to conclude that on some occasions appropriately located energy efficiency and demand response projects can and does compete. Focusing additional demand resources that are closely electrically connected in the vicinity of the targeted units could reduce the operation frequency and duration of these units.

USEPA Clean Air Markets Division data (CAMD) was queried to retrieve emissions data for the selected units as well as for all NYCA generators on high ozone days. While the emission rates for the selected units are relatively high, the aggregate emissions represent approximately one tenth of all daily NOx emissions from electric generators in New York. Aggregate NOx emissions for both the selected units and the NYCA fleet are trending downward. The CAMD also contains information on reported gross generation levels which is shown in the table above. The net generation data represents Day Ahead Market commitments which generally reflect more than 95% of the energy that is actually generated. The analysis focused only on the DAM market to reduce the data retrieval and analysis effort.

The statistical analysis of the operating history of the targeted units has determined the following:

- The median time of operation when called was 9.5 hours with a mean time for all units across all hours studied of 4.3 hours.
- There are some differences in the CAMD data set and the NYISO's market information that should be noted. The CAMD reports all fired hours and gross generation. The NYISO's data reports all connected hours and net generation. CAMD data evolves over time as data errors are corrected. The NYSDEC and NYISO may have used different versions.

- There is a strong correlation between total daily generation (MWh/day) in the New York Control Area (NYCA) and the total number of targeted units that operated.
- There is a very strong correlation between the net daily generation of targeted units and the total daily emissions from those units. This suggests that the highest emitting targeted units are the last to be dispatched.
- These two correlations suggest that reducing peak generation in NYCA will reduce emissions from the targeted units.
- The correlations between net generation or emissions from the targeted units and ambient concentrations of ozone on all New York State ozone non-attainment days are weak. The data show a number of days when none of the targeted units operated and the ozone concentrations were above the NAAQS.
- The correlations between net generation or emissions from the targeted units and ambient ozone concentrations on NYCMA ozone non-attainment days are very weak.
- This shows targeted unit NO_x emissions correlate more strongly with regional ozone concentration than they do with local ozone concentrations.

These correlations imply that other factors more strongly influence the concentrations of ozone in the NYCMA. Those other factors are known to include other generating units in the region, automobile emissions, and cross boundary transport of ozone and ozone precursors from neighboring states.

While demand response and energy efficiency can reduce the operation frequency and duration of generation they can not completely eliminate the need for either generation or transmission resources that are electrically connected near to the targeted units. As has been mentioned, generation fulfills local reliability needs for which energy efficiency and demand response are not real-time substitutes. There are several proposed projects in the interconnection queue that could also meet these reliability needs and do so at much lower emissions profiles.

Since a primary focus of this study is to identify the air quality impacts resulting from the operation of the targeted units on the potential Environmental Justice neighborhoods, with an expectation that demand response and energy efficiency can reduce those air quality impacts, proposed new generation projects in these locations that could also have a beneficial impact on air emissions in these potential Environmental Justice neighborhoods should not be ignored. While the emission limitations have not been finalized for these proposed projects, it is reasonable to assume they would be comparable to limits established for other relatively recently completed generating plants located in New York City. Generation projects, with emissions comparable to these already sited projects, would reduce NO_x emissions 99.6% or greater compared to the emission profiles of the targeted units.

As the study of the effectiveness of demand resources and energy efficiency on the air quality of the impacted neighborhoods goes forward, it should be compared to the costs and benefits of other resources that the competitive marketplace can deliver.

Definitions

High Ozone Days: Days when the Ozone National Ambient Air Quality Standard Ozone is exceeded somewhere in New York State

Hours Scheduled for LRR: The number of hours that target units were scheduled in the Day Ahead Market (DAM) on High Ozone Days.

Capacity Called * Hours Called for LRR: This quantity represents the amount of energy scheduled in the DAM . The sum of the products of the amount of target unit capacity called in the DAM times number of hours that the target unit is called for.

Target Unit Operating Time: The sum of the number of hours each target unit operated on all High Ozone Days in a year.

Target Unit Gross Generation: The gross number of mwhrs reported to USEPA CAMD that were produced by target unit at the generator terminals on High Ozone Days.

Target Unit Net Generation: The net number of mwhrs delivered to the metering point as reported to the NYISO on High Ozone Days.

NYCA Net Generation: The net number of mwhrs delivered by all New York State generators to the metering point as reported to the NYISO on High Ozone Days.

Target Unit NOx: The number of tons of NOx emissions reported by target units to USEPA CAMD on High Ozone Days

NYCA NOx: The number of tons of NOx emissions reported New York State generators that are required to report to USEPA CAMD.

Target Unit Emission Rate # NOx/ Gross MWH: Target Unit NOx divided by Gross MWHs as reported to USEPA CAMD

NYCA Emission Rate # NOx/Net MWH.: NYCA NOx divided by NYCA Net Generation

Target Unit Emission Rate # NOx/MWH: Target Unit NOx divided by Target Unit Net Generation

All New York State Ozone Non-Attainment Days

Ozone Season		Generation						Emissions				
	High Ozone Days	Hours Scheduled for L R R	Capacity Called * Hours Called for LRR	Target Unit Operating Time	Target Unit Gross Generation	Target Unit Net Generation	NYCA Net Generation	Target Unit NOx	NYCA NOx	Target Unit Emission Rate	NYCA Emission Rate	Target Unit Emission Rate
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2008	28	238	4,104	5,624	96,461	82,664	12,766,364	273	4,882	5.7	0.8	6.6
Total	77	776	14,664	28,325	487,701	406,777	38,392,034	1,449	16,085	5.9	0.8	7.1

New York City Metropolitan Area Ozone Non-Attainment Days

Ozone Season		Generation						Emissions				
	High Ozone Days	Hours Scheduled for L R R	Capacity Called * Hours Called for LRR	Target Unit Operating time	Target Unit Gross Generation	Target Unit Net Generation	NYCA Net Generation	Target Unit NOx	NYCA NOx	Target Unit Emission Rate	NYCA Emission Rate	Target Unit Emission Rate
				Hours	MWh	MWh	MWh	Tons	Tons	# NOx / Gross MWh		# NOx / Net MWh
2005	14	62	975	12,447	216,495	176,770	7,938,220	664	4,518	6.1	1.1	7.5
2006	9	249	5,788	6,799	114,259	98,078	5,151,459	348	2,594	6.1	1.0	7.1
2007	16	94	1,523	2,478	43,800	35,376	7,894,402	116	2,696	5.3	0.7	6.5
2008	22	177	3,096	5,405	92,425	79,405	10,339,663	261	4,058	5.7	0.8	6.6
Total	61	641	11,382	27,128	467,166	389,797	31,323,743	1,389	13,867	6.1	0.9	7.3











