

Demand Curve Sensitivity Analysis for Lower Hudson Valley Capacity Zone

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Background

- ◆ Beginning with the 2007 State of the Market report, the NYISO's independent Market Advisor has recommended that the NYISO look into creating a new capacity region in southeastern NY.
 - *The #1 High Priority Recommendation in the 2009 State of the Market Report (p. 13) was for the “NYISO to prepare to define a new capacity zone(s) in eastern New York...”*
- ◆ At the April 23, 2009 IITF meeting, the NYISO presented an analysis of demand curve parameters for a Lower Hudson Valley (LHV) capacity region to the ICAPWG, using 2007 costs developed for the last demand curve reset.
- ◆ The recent demand curve reset analysis provides updated information on CONE, net CONE.
- ◆ The discussion of general criteria for creation of new capacity zones can be informed by an updated analysis of LHV demand curve.

Demand Curve Parameters

- ◆ Based upon nested G – K capacity region
- ◆ CONE, net CONE
 - *Taken from most recent NERA model for LMS100 located in Zone G, including oxidation catalyst*
- ◆ Level of excess for energy, capacity revenue
 - *1% level of excess modeled for energy, capacity revenue in NERA model*
- ◆ Demand curve slope
 - *Sensitivity analysis based on 112, 115 and 118 percent zero crossing values*

Demand Curve Parameters

- ◆ Reserve margin
 - *Based on GE, NYISO MARS analyses using 2011 IRM model*
 - *Shift MW out of J, K, and G-I individually to compute appropriate capacity multipliers*
 - *Using the capacity multipliers, shift MW out of G-K to bring LOLE to 0.100*
 - *Convert MW shifted into reserve margin %*

Reference Values as a Function of Slope

- ◆ From NERA model

Zero Crossing (% of Requirement)	Demand Curve Ref. Price (\$/kW-mo)
112	13.86
115	12.82
118	12.21

Interaction of LHV, NYC, LI and ROS Capacity Regions

- ◆ Developed model of spot market clearing prices using 2010 Gold Book data for Summer 2010 Capability Period
 - *Existing generation per Gold Book*
 - *UDR MW as awarded except where notice provided to Reliability Council for IRM analysis*
 - *New projects entering in Summer 2010 (Empire, Gilboa uprate)*
 - *NYCA SCR total per Gold Book; Zones G-K SCR levels based on NYISO June 2010 demand response report to FERC*
 - *Load as identified in Table I-2a of the Gold Book (LI coincident peak in Table I-2b used)*
 - *EFORd values by capacity region as noted in ICAP-to-UCAP translation; LHV EFORd computed using same method*

LI and NYC Models

LI	X (%)	X (MW)	Y (\$/kw-mo)	NYC	X (%)	X (MW)	Y (\$/kw-mo)
Existing Generation (MW)		5543		Existing Generation (MW)		8955	
New Generation (MW)		0		New Generation (MW)		0	
UDRs (MW)		760		UDRs (MW)		300	
Imports (MW)		0		Imports (MW)		0	
SCRs (MW)		165		SCRs (MW)		500	
Generation (MW):		6468.0		Generation (MW):		9755.0	
Load (MW):		5368.0		Load (MW):		11725.0	
IRM/Locality %:	104.5%	5609.6		IRM/Locality %:	80%	9380.0	
DC Zero Crossing:	118%	6619.3	\$ -	DC Zero Crossing:	118%	11068.4	\$ -
DC Reference Point	100%	5609.6	\$ 8.69	DC Reference Point	100%	9380.0	\$ 15.99
DC Cap:	68%	3801.6	\$ 24.25	DC Cap:	87%	8183.7	\$ 27.32
EFORd:	10.49%			EFORd:	11.13%		
Zero Crossing (UCAP):		5924.9	\$ -	Zero Crossing (UCAP):		9836.5	\$ -
Reference Pt (UCAP):		5021.1	\$ 9.71	Reference Pt (UCAP):		8336.0	\$ 17.99
slope (\$/kW-mo/100 MW):		\$ (1.074)		slope (\$/kW-mo/100 MW):		\$ (1.199)	
Generation (MW UCAP):		5886.5		Generation (MW UCAP):		8758.3	

LHV and NYCA Models

LHV	X (%)	X (MW)	Y (\$/kw-mo)	NYCA	X (%)	X (MW)	Y (\$/kw-mo)
Existing Generation (MW)		19586		Existing Generation (MW)		37334	
New Generation (MW)		0		New Generation (MW)		665	
UDRs (MW)		1060		UDRs (MW)		1060	
Imports (MW)		0		Imports (MW)		1360	
SCRs (MW)		800		SCRs (MW)		2251	
Generation (MW):		21446.0		Generation (MW):		42670.0	
Load (MW):		21416.0		Load (MW):		33025.0	
IRM/Locality %:	91%	19488.6		IRM/Locality %:	118%	38969.5	
DC Zero Crossing:	112%	21827.2	\$ -	DC Zero Crossing:	112%	43645.8	\$ -
DC Reference Point	100%	19488.6	\$ 13.86	DC Reference Point	100%	38969.5	\$ 9.90
DC Cap:	-753%	-146736.2	\$ 999.00	DC Cap:	96%	37306.8	\$ 13.42
EFORd:	10.71%			EFORd:	10.07%		
			1				
Zero Crossing (UCAP):		19489.5	\$ -	Zero Crossing (UCAP):		39250.7	\$ -
Reference Pt (UCAP):		17401.3	\$ 15.52	Reference Pt (UCAP):		35045.3	\$ 11.01
slope (\$/kW-mo/100 MW):		\$ (0.743)		slope (\$/kW-mo/100 MW):		\$ (0.262)	
Generation (MW UCAP):		19348.3		Generation (MW UCAP):		38843.5	

Sensitivity Results

Reserve Margin (%)	Zero Crossing (% of RM)	Loss of GHI Capacity (MW)	LI Clearing Price* (\$/kW-mo)	NYC Clearing Price (\$/kW-mo)	LHV Clearing Price (\$/kW-mo)	NYCA Clearing Price (\$/kW-mo)
91	112	0	0.41	12.93	1.05	1.07
91	115	0	0.41	12.93	3.65	1.07
91	118	0	0.41	12.93	5.17	1.07
94	112	0	0.41	12.93	5.64	1.07
94	115	0	0.41	12.93	7.04	1.07
94	118	0	0.41	12.93	7.87	1.07
91	112	1000	0.41	12.93	7.69	3.42
91	115	1000	0.41	12.93	8.56	3.42
91	118	1000	0.41	12.93	9.07	3.42
94	112	1000	0.41	12.93	12.07	3.42
94	115	1000	0.41	12.93	11.80	3.42
94	118	1000	0.41	12.93	11.64	3.42

*based on LI demand curve only

Summary

- ◆ Results are not meant to be definitive; if an LHV zone were to be created, under the NYISO's proposed process, the final demand curve parameters would be computed as part of the next demand curve reset, with reserve margins determined in line with ICS procedures.
- ◆ Values indicate that relative clearing prices are significantly affected by slope, reserve margin, and level of excess.
- ◆ Analysis does not consider measures of market power – would need to be evaluated and may affect slope and possibly additional mitigation rules if warranted.

The New York Independent System Operator (NYISO) is a not-for-profit corporation that began operations in 1999. The NYISO operates New York's bulk electricity grid, administers the state's wholesale electricity markets, and provides comprehensive reliability planning for the state's bulk electricity system.

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