

# CARIS PHASE 1 RESULTS

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# Agenda

- ◆ Overview
- ◆ Modeling Improvements
- ◆ Present Value of top congested elements
- ◆ CARIS Base Case Results
- ◆ CARIS Generic Solutions Results
- ◆ Discussion

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## Base Case Modeling Improvements

- ◆ Niagara PMin
- ◆ Unit Configurations
- ◆ Nomograms
  - *NY to PJM Commitment*
- ◆ Cable Ratings MVA to MW
- ◆ Interface definitions
  - *Neptune Loading Factor*
- ◆ Athens SPS 2009 2010
- ◆ HQ Direct Tie Schedules

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# Base Case Results

- ◆ List of congested elements
- ◆ Generation Table
- ◆ Production Cost

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# Base Case Projected Congestion (million \$)

Type	Long Name	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Interface	CENTRAL EAST	11.47	55.83	56.86	70.98	36.26	40.49	50.61	68.01	96.27	89.95	576.74
Contingency	LEEDS-Pleasant Valley	10.91	11.83	66.23	69.00	58.14	58.21	56.45	63.09	70.75	86.34	550.94
Contingency	DUNWOODIE-SHORE RD	12.92	40.09	34.64	36.53	33.04	28.98	30.44	32.44	33.77	35.65	318.49
Contingency	SBK:CLAY_CLAY 345/115	0.00	7.47	17.82	16.34	18.08	18.07	16.95	21.96	16.97	27.75	161.42
Interface	NYISO-PJM_SOFT	(0.02)	4.15	5.26	6.39	6.28	7.88	10.96	12.77	12.62	12.11	78.39
Contingency	FRKILLS_WILOWBK		3.95	4.85	4.63	4.95	5.73	7.21	8.09	7.43	10.16	57.00
Contingency	GOTHLSS_GOWANUSS	(0.07)	2.72	3.11	3.13	3.36	3.89	5.74	6.42	5.43	14.95	48.68
Contingency	NY MTHAVN-RAINY Q12_		2.18	0.25	0.84	1.02	1.67	6.39	9.03	4.14	19.86	45.38
Branch	ASTORIA WEST_QUENBRDG_4		2.67	4.48	3.70	4.13	4.73	5.28	6.02	5.64	6.89	43.55
Interface	NYCLP Greenwood	4.83	5.39	6.78	4.20	3.46	2.79	3.03	2.61	3.81	0.00	36.90
Contingency	VOLNEY_SCRIBA_345	3.40	2.81	3.16	2.99	3.04	3.75	3.64	4.16	4.90	4.67	36.52
Contingency	GOTHN_GOWANN_345	1.21	2.23	2.74	2.77	2.92	3.28	3.23	3.59	3.86	0.09	25.92
Contingency	ASTORIAW138_HG3		0.73	1.10	1.29	1.47	2.21	2.76	4.24	4.99	5.79	24.58
Contingency	E179THST138_HG1	(0.14)	(0.65)	(4.47)	(4.60)	(3.85)	(2.71)	(1.56)	(2.76)	(2.77)	(0.93)	(24.45)
Interface	DYSINGER EAST-OP	(0.27)	(8.22)	(8.70)	(10.23)	0.00	0.00	(0.01)	(0.07)	(0.04)	(0.06)	(27.60)
Interface	Ontario North - NYISO	(3.41)	(2.33)	(2.57)	(2.83)	(3.65)	(3.30)	(3.31)	(3.72)	(3.79)	(6.63)	(35.53)
Interface	NYCLP East River	(0.63)	(3.20)	(3.79)	(3.52)	(3.92)	(4.45)	(3.88)	(5.42)	(5.05)	(6.91)	(40.77)
Contingency	ASTORIAW138_HG5_138		(6.87)	(8.70)	(7.52)	(8.24)	(9.33)	(9.82)	(11.03)	(10.60)	(11.87)	(83.99)
Interface	WEST CENTRAL-OP	(0.02)	(4.30)	(5.06)	(6.78)	(55.83)	(55.33)	(52.98)	(64.87)	(69.32)	(93.52)	(408.03)

Projected Congestion Data Source: NYISO CARIS Base Cases (does not include Virtuals and Transmission outages)

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## Projected Production Cost - Primary Metric -

Generator Production Cost m\$										
Area	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>West</b>	316	333	341	352	356	370	382	391	447	417
<b>Genessee</b>	61	64	64	66	65	67	71	74	78	81
<b>Central</b>	658	695	699	724	754	783	823	857	889	920
<b>North</b>	61	74	77	81	86	93	99	106	118	126
<b>Mohawk Valley</b>	29	35	37	39	40	43	45	48	53	54
<b>Capital</b>	551	830	846	888	906	938	978	1,032	1,082	1,136
<b>Hudson Valley</b>	117	159	169	180	181	196	203	215	231	237
<b>Millwood</b>	205	201	199	205	210	215	230	236	241	249
<b>Dunwoodie</b>	0	0	0	0	0	0	0	0	0	0
<b>NYCity</b>	1,539	1,897	1,969	2,107	2,208	2,360	2,495	2,661	2,788	3,019
<b>Long Island</b>	525	668	692	717	730	774	791	834	873	922
<b>NYISO Total</b>	<b>4,061</b>	<b>4,957</b>	<b>5,092</b>	<b>5,361</b>	<b>5,537</b>	<b>5,839</b>	<b>6,117</b>	<b>6,453</b>	<b>6,801</b>	<b>7,163</b>

Values are in nominal dollars and do not include the cost of interchange  
Increasing production cost reflect higher values for fuel prices, start-up cost, and emission allowance; also inflation rate escalation

Projected Production Cost Source: NYISO CARIS Base Cases Simulation Results (does not include Virtuals and Transmission outages)

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## Zonal Congestion in million \$ Projected

Area	Congestion Demand m\$									
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>West</b>	(6)	(13)	(13)	(16)	(33)	(33)	(34)	(41)	(43)	(57)
<b>Genessee</b>	(3)	(3)	(3)	(4)	(23)	(23)	(23)	(27)	(29)	(38)
<b>Central</b>	0	4	8	8	7	7	7	9	7	11
<b>North</b>	0	1	1	1	1	1	1	1	1	2
<b>Mohawk Valley</b>	1	1	3	3	2	2	2	3	3	4
<b>Capital</b>	3	9	10	12	7	8	10	13	17	17
<b>Hudson Valley</b>	4	9	15	16	12	13	14	17	21	23
<b>Millwood</b>	1	3	4	5	4	4	4	5	6	7
<b>Dunwoodie</b>	3	6	10	11	8	9	10	12	14	16
<b>NYCity</b>	30	56	83	89	65	74	107	124	137	185
<b>Long Island</b>	28	74	84	90	75	71	76	85	95	102
<b>NYISO Total</b>	<b>62</b>	<b>146</b>	<b>202</b>	<b>215</b>	<b>127</b>	<b>134</b>	<b>175</b>	<b>201</b>	<b>230</b>	<b>272</b>

Values are consistent with Historical patterns

Congestion values are determined based on Marcy 345kV as a reference bus

Projected Congestion Data Source: NYISO CARIS Base Cases simulation Results (does not include Virtuals and Transmission outages)

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## Present Value of Top Congested Elements

Rank	Element	Present Value of Congestion in \$ m		
		Historic	Future	Aggregate
1	CENTRAL EAST	\$ 2,436	\$ 381	\$ 2,817
2	ATHENS_PLTVLLEY_345_126294_137451_2_PLTVLLEY_LEEDS 3_2	\$ 2,016	\$ 357	\$ 2,373
3	WEST CENTRAL	-\$ 120	-\$ 260	-\$ 380
4	DUNWOODIE_SHORRD_345_126266_128835_1_DUNWODIE_SHORE RD_1	\$ 307	\$ 236	\$ 543

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# Generic Solutions

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# Generic Solution Results

- ◆ Top Three Groupings
  - *Central-East*
  - *Leeds-Pleasant Valley*
    - TBD
  - *West Central*
    - TBD

# Generic Solution Results

## ◆ Production Cost Savings

### ■ *Top three groupings*

#### ● Central-East

- Transmission, a 2<sup>nd</sup> Edic-New Scotland 345kV O/H
- Generation, 500MW at New Scotland
- Demand Response, 200MW in Zone F

#### ● Leeds-Pleasant Valley

- Transmission, 3<sup>rd</sup> Leeds-Pleasant Valley 345kV O/H
- Generation, 500MW at Pleasant Valley 345kV
- Demand Response, 200MW in Zone G

#### ● West Central

- Transmission, 3<sup>rd</sup> Pannell-Clay 345kV O/H
- Generation, 250MW at Clay 345 kV
- Demand Response, 200MW in Zone C

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 state's bulk electricity system.

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