

CARIS CONGESTION RESULTS

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**ESPWG
August 7, 2009**

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Agenda

- ◆ Modeling Changes Since Last ESPWG Presentation
- ◆ Input Assumptions
- ◆ New Backcast Results – Four months 2009
- ◆ CARIS Base Case Results
- ◆ Discussion

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Modeling Changes Since Last ESPWG Presentation

- ◆ Hydro schedules
- ◆ Downstate LOGMOB rules
- ◆ Hurdle Rates
- ◆ Improved minimum up and down time on units in the City

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Input Assumptions

- ◆ Central East Interface Limit
 - *Utilizes multiple limits based upon configurations at the Oswego complex*
 - *RTM (Real Time Market) adjusts limits based upon operational conditions which are not reflected in DAM or CARIS (e.g. 100 MW)*

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Input Assumptions

- ◆ Hurdle Rates
 - *Dispatch - external interfaces*
 - 4 \$/MWh (2009)
 - 6 \$/MWh (2010-2018)
 - *Rational - related to fuel prices*
 - Projected Imports near historic level
 - Lower fuel prices in 2009 return to trend in 2010-2018

- ◆ Controllable Facilities
 - *Ramapo PARs +/- 500MW each*
 - *Hudson Valley-PSEG-ConEd Wheel*
 - Waldwick delivery - 600-1200MW
 - Deliveries on ABC - 600-1200MW
 - Imbalance +/- 25MW with soft limit of \$3
 - *CSC +/- 330 MW and Neptune 0-660 MW into Long Island*
 - *Linden VFT 250-300MW into ConEd (2010)*

- ◆ CCFE - Chicago Climate Futures Exchange
 - *We used published data and extrapolated the trend in futures prices*

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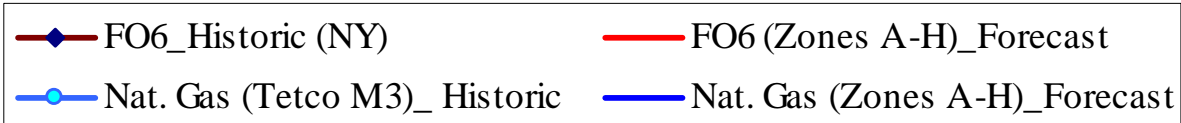
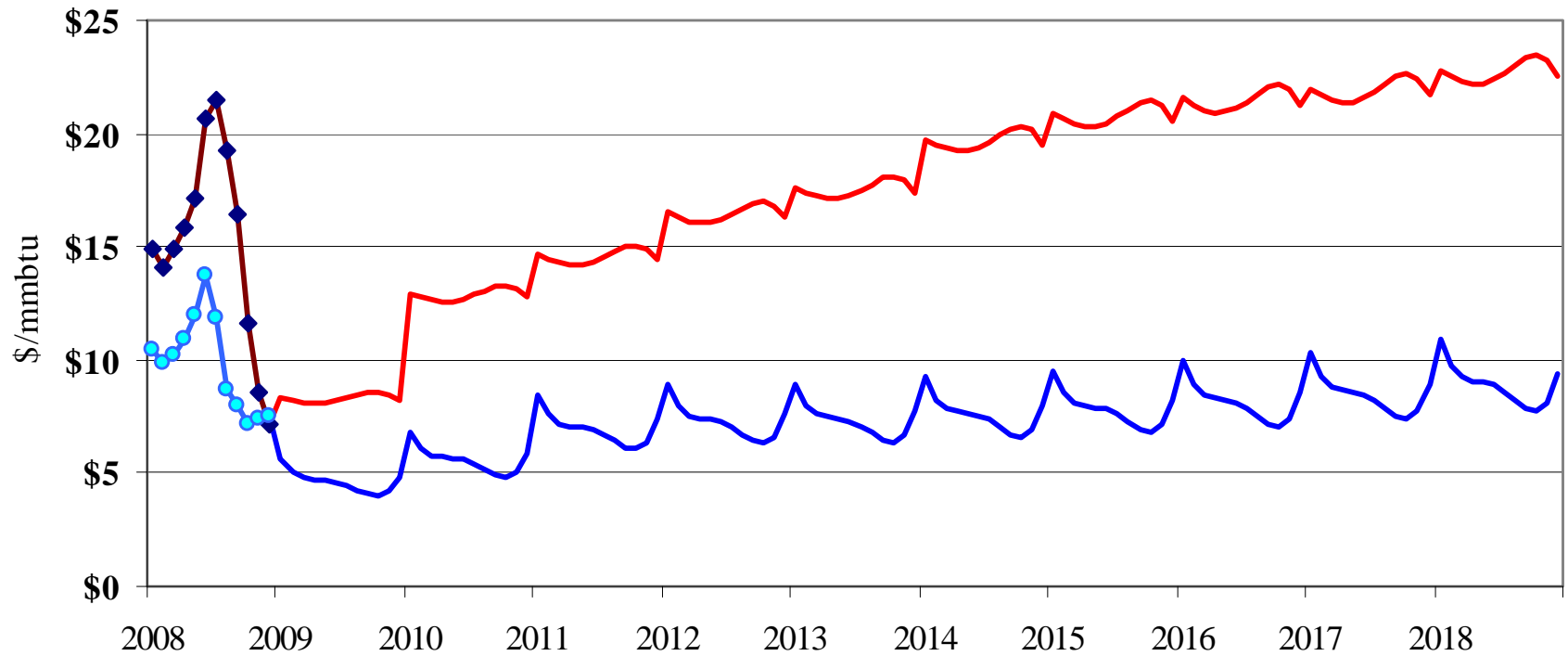
Generation Maintenance

- ◆ Planned maintenance outages duration was developed based upon historic maintenance schedules.
 - *The planned outage schedules was initially specified by the program and manually modified so that the total capacity outage for each month is consistent with historic levels (FERC FORM 714 2007-2008).*
 - *The forced outage duration was based upon the data specified in the 2009 CRP. The forced outage duration was then added to the planned outage schedule.*

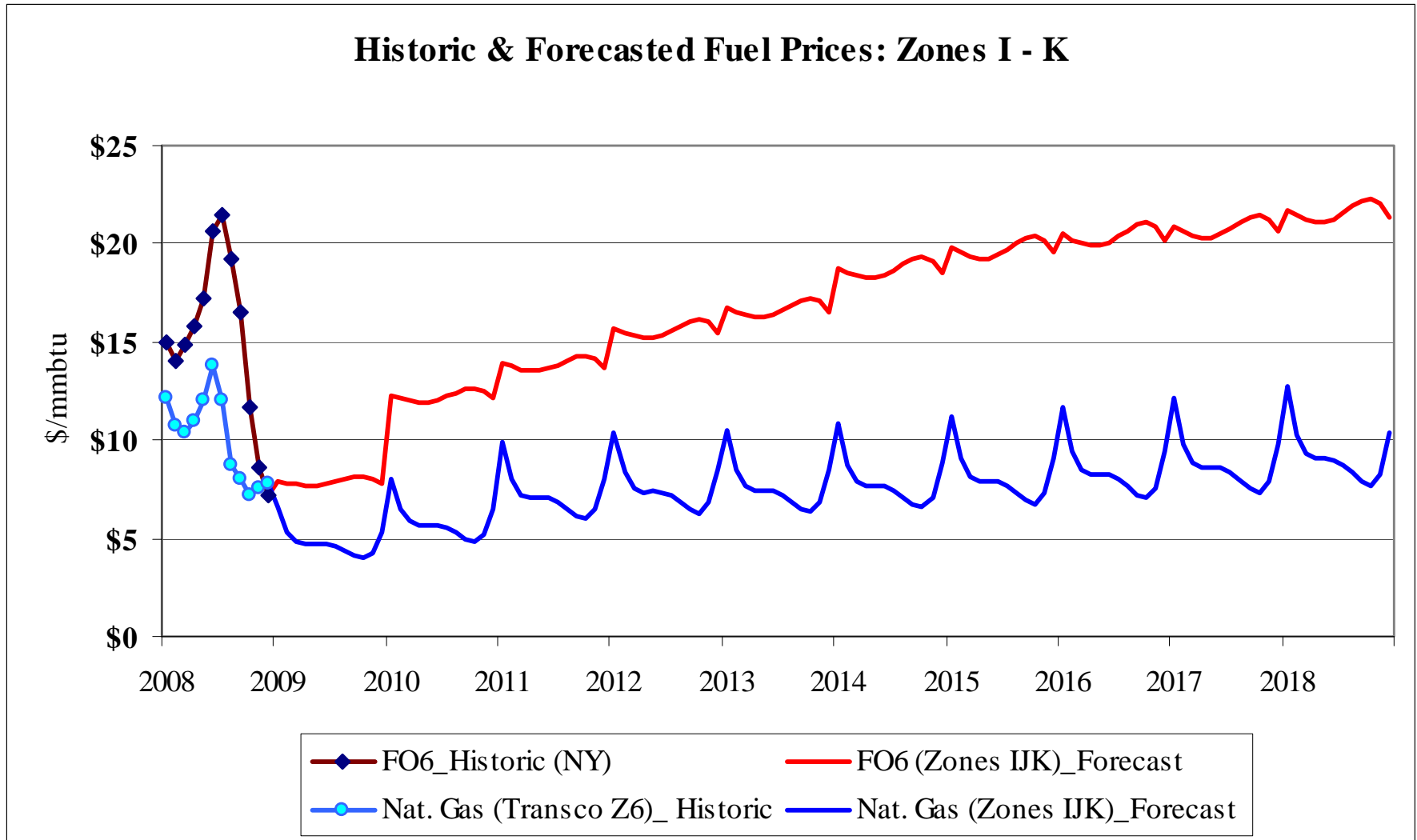
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Historic & Forecasted Fuel Prices

Historic & Forecasted Fuel Prices: Zones A - H



Historic & Forecasted Fuel Prices



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Generation by Fuel Type (Historical 2008 vs. Projected 2009 Generation GWh)

2008 GWh	Coal	Dual Fuel	F02	F06	Hydro ⁽¹⁾	KER	NG	Other		URAN	Wind	Grand Total
Capital	-	5,223	-	0	2,931	-	6,397	131		-	-	14,682
Central	3,385	259	-	92	529	-	1,507	495		21,079	81	27,427
Dunwoodie	-	-	-	-	3	-	-	-		-	-	3
Genessee	258	-	0	-	73	-	38	63		4,743	11	5,188
Hudson Valley	-	3,619	-	-	296	0	-	44		-	-	3,962
Long Island	-	8,796	190	-	-	-	1,338	917		-	-	11,241
Millwood	-	-	0	-	-	-	-	400		17,382	-	17,782
Mohawk Valley	460	-	-	-	2,604	-	20	143		-	859	4,087
North	-	4	-	-	7,359	-	2,119	137		-	169	9,788
NYCity	-	17,889	8	-	-	3	6,203	-		-	-	24,104
West	11,485	15	-	-	13,704	-	325	665		-	161	26,354
Grand Total	15,588	35,804	199	92	27,501	3	17,948	2,996		43,203	1,282	144,618

2009 GWh	Coal	Dual Fuel	F02	F06	Hydro	KER	NG	Other	P.S.	URAN	Wind	Grand Total
Capital	-	6,807	-	-	1,830	-	8,299	0	1,288	-	-	18,224
Central	4,087	469	-	242	349	-	7,147	248	-	20,806	82	33,430
Dunwoodie	-	-	-	-	6	-	-	-	-	-	-	6
Genessee	-	-	-	-	181	-	186	0	-	4,468	16	4,852
Hudson Valley	-	3,854	-	-	363	2	8	45	-	-	1	4,273
Long Island	-	6,900	31	4	-	-	3,679	937	-	-	-	11,552
Millwood	-	-	-	-	1	-	0	408	-	16,738	-	17,146
Mohawk Valley	409	-	-	-	1,852	-	374	1	-	-	996	3,633
North	-	329	-	-	6,814	-	1,341	3	-	-	434	8,921
NYCity	-	23,413	20	-	-	5	8,239	-	-	-	-	31,677
West	11,235	203	-	-	13,799	-	559	310	286	-	277	26,670
Grand Total	15,731	41,976	51	246	25,195	7	29,833	1,951	1,574	42,012	1,807	160,383

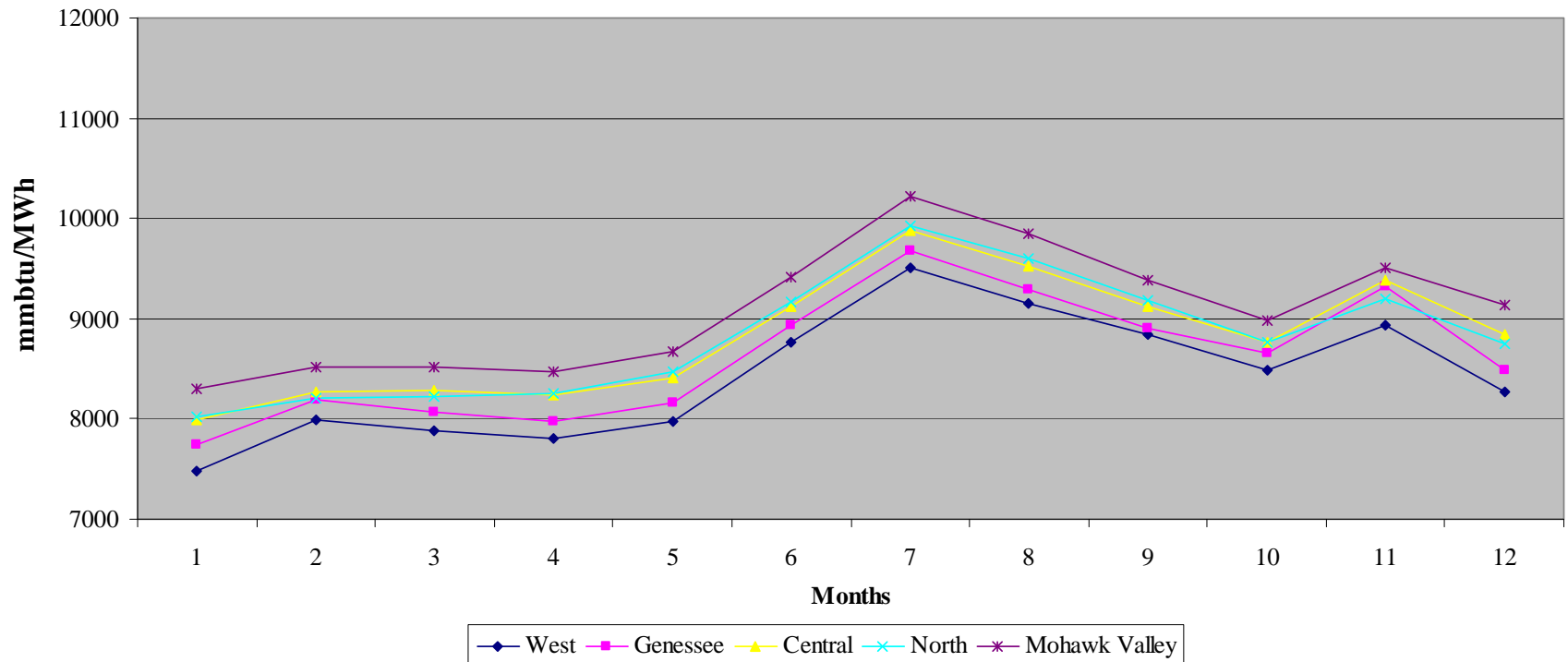
(1) 2008 Hydro Generation Included Pumped Storage

Generation by Fuel Type cont....

- ◆ As Fuel prices in 2009 have come down we see pick up in NYCA generation for 2009 in the model.
- ◆ Actual generation for 2009 confirms this pattern as we also see pick up in NYCA generation.
- ◆ As natural gas prices are lower we see increased NG generation in city.
- ◆ Publically available information supports the increased level of generation in Central.
- ◆ Projected level of Interchange in 2009 supports the projected increase in generation in NYCA.

Heat Rates

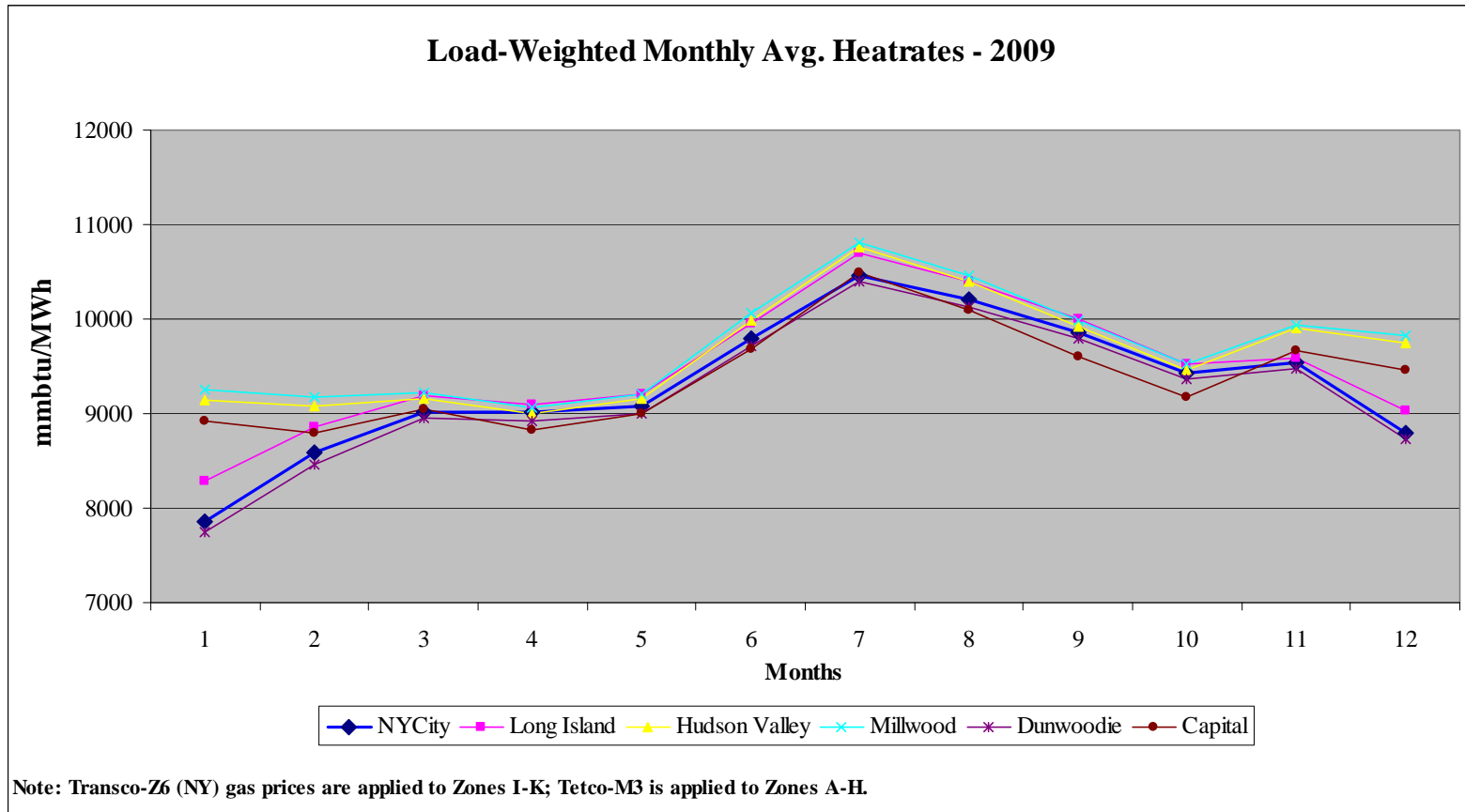
Load-Weighted Monthly Avg. Heatrates - 2009



Note: Transco-Z6 (NY) gas prices are applied to Zones I-K; Tetco-M3 is applied to Zones A-H.

Heat Rates of marginal units are increasing from Zone A through Zone E
 Across Zones A – E, the implied heat rates display the expected seasonal patterns with Summer months being the highest. The relative magnitudes are consistent with the differences in the generation fuel-mixes.

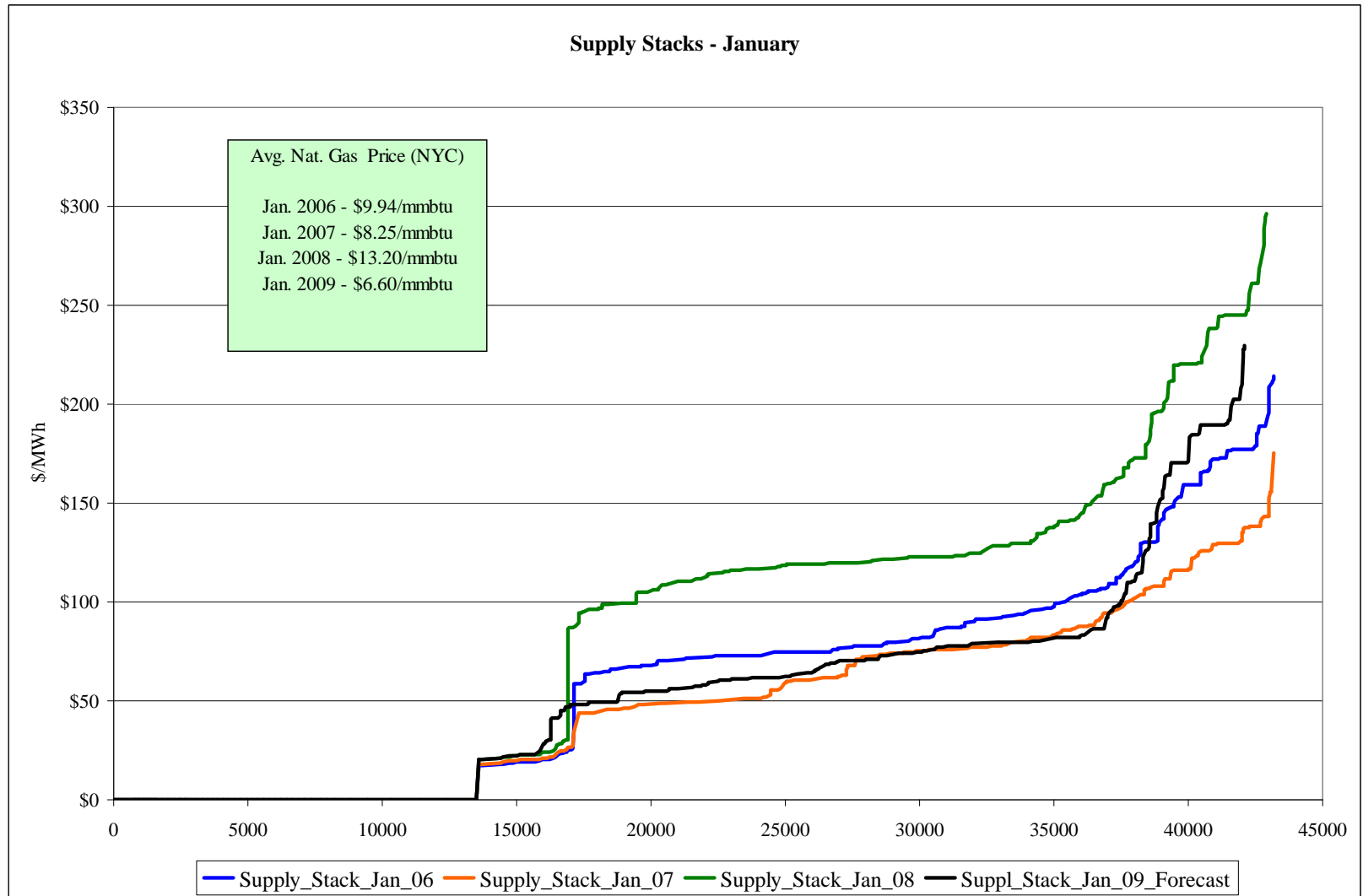
Heat Rates cont....



Heat rates of Marginal units are highest for Millwood, Hudson Valley, NYC and Long Island
 In all zones, the implied heat rates display the expected seasonal patterns. With respect to zones G and J, the difference in assumed gas prices explains the parity during non-winter months and the divergence during the winter.

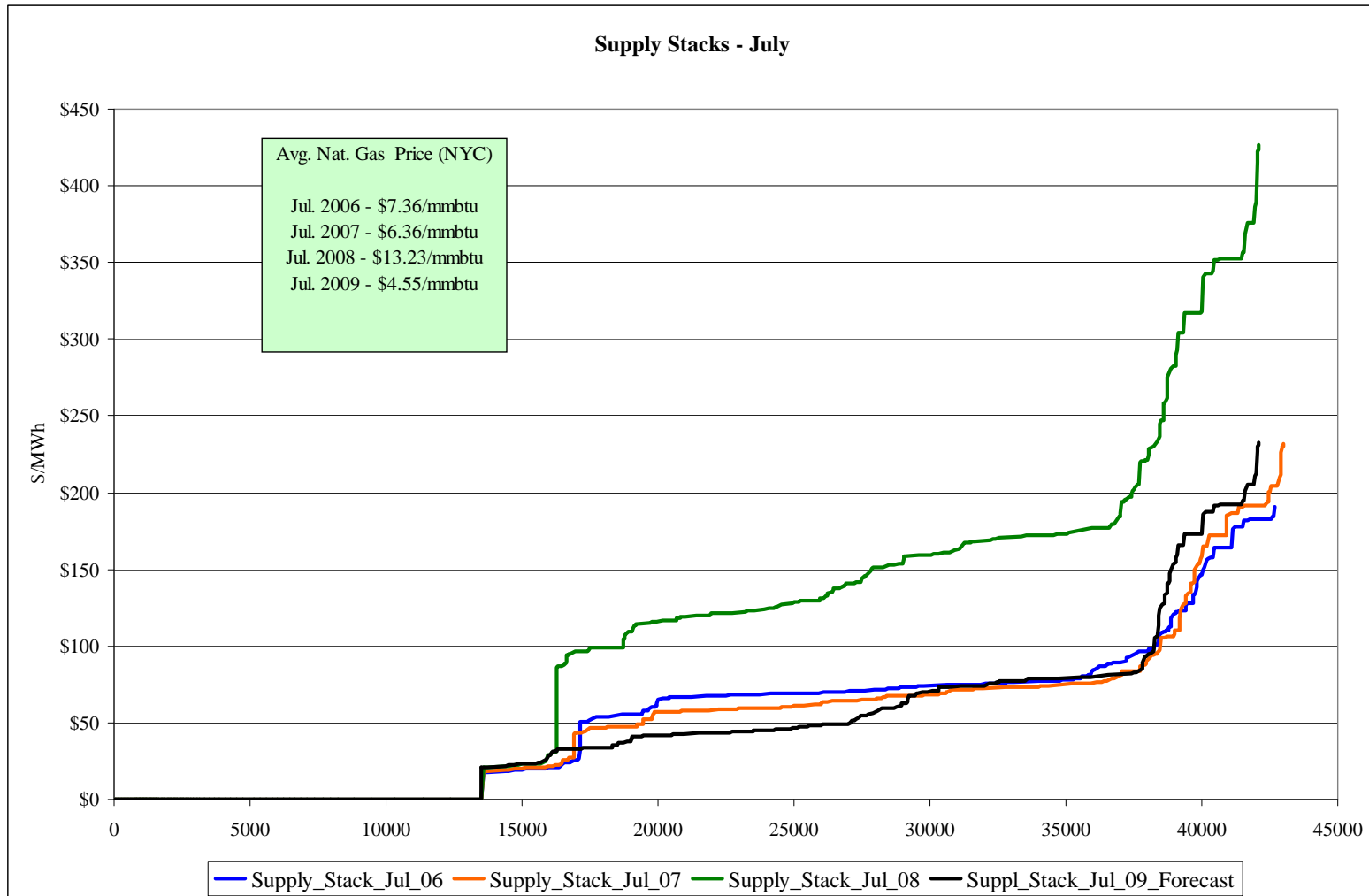
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Supply Stacks



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Supply Stacks



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2009 In-City Back Cast

- ◆ Compare Jan-April Actual Generation and fuel mix for selected NYC stations to simulation for the same period
- ◆ Selected stations report generation and fuel use via EIA f923
- ◆ Results
 - *General overall agreement on total production and fuel mix (6% higher generation level supported by forecasts in fuel and load, Rav 3 active in model during back cast period, and Linden EIA reporting)*
 - *Some specific plants show generation shifts (Sensitivity case better aligns unit generation levels except Linden due EIA reporting; unit results further aligned with Rav 3 out)*

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2009 In-City Back Cast

Jan - April 2009 Actual						
Facility Name	FO2	RFO	KER	NG	WO	Grand Total
Arthur Kill Generating Station		0	0	215,920		215,920
Astoria Energy	28,380			982,634		1,011,014
Astoria Gas Turbines			4,387	7,748		12,135
Astoria Generating Station		136,792		330,972		467,764
Brooklyn Navy Yard Cogeneration	2,635			568,240		570,875
Charles Poletti		76,693		413,334		490,027
East River	0	39,563		775,794		815,357
Gowanus Gas Turbines Generating	4,435	0	0	955		5,390
Linden Cogen Plant	2,578			1,659,797	67,491	1,729,866
Narrows Gas Turbines Generating	16,701		0	7,469		24,170
Poletti 500MW CC	0		19,919	791,248		811,167
Ravenswood	0	39,757	11,041	735,385		786,183
	54,729	292,806	35,347	6,489,495	67,491	6,939,868
Jan - April 2009 T25						
Plant Name	FO2	FO6	KER	NG		Grand Total
Arthur Kill Generating Station				344,915		344,915
Astoria Energy				948,670		948,670
Astoria Gas Turbines	245		0	11,732		11,978
Astoria Generating Station		0		1,685,187		1,685,187
Brooklyn Navy Yard Cogeneration				50,310		50,310
Charles Poletti		0		454,211		454,211
East River		0		118,290		118,290
Gowanus Gas Turbines Generating	6,254			212,827		219,081
Linden Cogen Plant				1,079,165		1,079,165
Narrows Gas Turbines Generating				0	117,898	117,898
Poletti 500MW CC				854,514		854,514
Ravenswood		465,617	0	1,128,636		1,594,253
	6,500	465,617	0	7,006,356		7,478,472

2009 In-City Back Cast – Sensitivity Case

Jan - April 2009 Actual						
Facility Name	FO2	RFO	KER	NG	WO	Grand Total
Arthur Kill Generating Station		0	0	215,920		215,920
Astoria Energy	28,380			982,634		1,011,014
Astoria Gas Turbines			4,387	7,748		12,135
Astoria Generating Station		136,792		330,972		467,764
Brooklyn Navy Yard Cogeneration	2,635			568,240		570,875
Charles Poletti		76,693		413,334		490,027
East River	0	39,563		775,794		815,357
Gowanus Gas Turbines Generating	4,435	0	0	955		5,390
Linden Cogen Plant	2,578			1,659,797	67,491	1,729,866
Narrows Gas Turbines Generating	16,701		0	7,469		24,170
Poletti 500MW CC	0		19,919	791,248		811,167
Ravenswood	0	39,757	11,041	735,385		786,183
	54,729	292,806	35,347	6,489,495	67,491	6,939,868
Jan - April 2009 T25AR1Q1						
Plant Name	FO2	FO6	KER	NG		Grand Total
Arthur Kill Generating Station				96,888		96,888
Astoria Energy				983,721		983,721
Astoria Gas Turbines	828		0	36,082		36,910
Astoria Generating Station				266,727		266,727
Brooklyn Navy Yard Cogeneration				588,297		588,297
Charles Poletti		0		638,390		638,390
East River		0		237,876		237,876
Gowanus Gas Turbines Generating	14,546			309,543		324,088
Linden Cogen Plant				1,107,935		1,107,935
Narrows Gas Turbines Generating			0	177,509		177,509
Poletti 500MW CC				876,491		876,491
Ravenswood			0	0	1,270,951	1,270,951
	15,374	0	0	6,590,408		6,605,783

CONGESTION Results

DOES NOT include:

- *Virtual Supply and Demand Bidding*
 - Virtual Bidding Patterns show net Virtual Supply in Upstate and net Virtual Load Downstate
- *Transmission Maintenance Schedules*
- *De-rates on the cable ratings (Zones J & K)*

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Projected Production Cost - Primary Metric -

Generator Production Cost m\$										
Area	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
West	330	334	343	355	362	377	389	400	462	437
Genessee	60	62	63	65	66	68	72	76	80	85
Central	673	719	725	753	776	814	854	881	918	948
North	67	78	81	85	90	99	105	111	123	127
Mohawk Valley	41	42	45	49	49	52	58	60	65	66
Capital	555	789	803	842	855	893	922	969	1,005	1,045
Hudson Valley	139	201	211	229	233	251	258	278	295	283
Millwood	205	201	199	205	210	215	230	236	241	249
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NYCity	1,587	1,962	2,040	2,162	2,256	2,413	2,551	2,703	2,839	2,996
Long Island	549	771	798	833	841	892	921	964	1,012	953
NYISO Total	4,206	5,159	5,309	5,578	5,739	6,074	6,361	6,678	7,041	7,190

Values are in nominal dollars

Increasing production costs reflect escalating fuel prices, start-up costs, and emission allowance costs

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

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Congestion Comparison – CARIS to Probe

- ◆ Compare 2009 Q1 Projection versus Probe results

	PROBE	CARIS T25A
2009 Q1	\$194 M	\$117 M
Without Externals or Contracts	\$189 M	\$170 M (virtual impact approximated from simulation)
With Virtuals		
With CE@ 2400 MW		

- ◆ Summary

- *CARIS base case modeling results are reasonably aligned with PROBE once adjusted for Externals, Virtuals, and CE limit*
 - *CARIS base case modeling results would be further aligned with PROBE if Transmission outages are considered (e.g. Laden-Buch and Buch-Millwood throughout March)*

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Congestion Results

Zonal Congestion in million \$ Projected

Congestion Demand m\$										
Area	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
West	(13)	(15)	(16)	(17)	(24)	(22)	(24)	(27)	(29)	(34)
Genessee	(5)	(4)	(4)	(4)	(13)	(12)	(13)	(15)	(17)	(21)
Central	0	1	1	1	0	0	0	0	0	(1)
North	0	0	0	0	0	0	0	0	0	1
Mohawk Valley	1	1	1	1	1	1	1	1	1	1
Capital	7	6	7	8	6	7	8	11	14	17
Hudson Valley	10	8	10	11	9	9	10	13	15	19
Millwood	3	3	3	3	3	3	3	4	5	6
Dunwoodie	7	6	7	8	6	6	7	8	10	12
NYCity	66	45	50	56	43	47	57	70	83	103
Long Island	40	69	69	73	64	61	62	69	72	83
NYISO Total	118	119	128	140	94	99	113	134	154	186

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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Projected Congestion (million \$)

Long Name	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
CENTRAL EAST	38.10	33.46	40.80	51.29	35.14	39.94	49.12	65.23	86.47	105.88	545.42
ATHENS PLTYLLEY 345 PLTYLLEY LEEDS 3 2	41.54	35.81	43.49	45.71	38.52	36.46	37.19	41.20	44.15	59.20	423.28
HMPHRBR DYNPT 345 DUNWODIE SHORE RD 1	0.91	3.31	28.02	28.25	12.59	11.95	10.54	11.88	11.69	3.50	122.65
DUNWOODIE SHORRD 345 DUNWODIE SHORE RD 1	0.34	2.19	3.30	3.61	17.38	15.85	16.10	15.97	14.76	1.93	91.43
LIPA Cable	0.00	6.27	5.41	5.68	5.08	4.62	4.42	5.03	4.78	6.92	48.20
NYCLP Greenwood	2.56	3.70	2.39	2.04	1.43	2.81	1.78	1.90	2.19	0.00	20.80
Ontario North - NYISO	(4.58)	(7.51)	(7.57)	(7.62)	(7.83)	(7.83)	(7.82)	(8.06)	(7.89)	(7.75)	(74.46)
PJM LINDEN-GOETHALS	(1.37)	(9.43)	(9.49)	(9.78)	(9.62)	(9.92)	(9.72)	(9.43)	(9.77)	(8.16)	(86.70)
WEST CENTRAL-OP	(0.00)	(0.15)	(0.12)	(0.30)	(24.85)	(21.10)	(22.77)	(27.63)	(34.13)	(46.65)	(177.69)

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

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Present Value Top Congested Elements

Rank	Element	Present Value of Congestion in \$ m		
		Historic	Future	Aggregate
1	CENTRAL EAST	\$ 2,436	\$ 358	\$ 2,795
2	ATHENS_PLTVLLEY_345_126294_137451_2_PLTVLLEY_LEEDS_3_2	\$ 2,016	\$ 297	\$ 2,313
3	DUNWOODIE_SHORRD_345_126266_128835_1_DUNWODIE_SHORE RD_1	\$ 307	\$ 59	\$ 366
4	HMPHRBR_DVNPT_345_126266_128835_1_DUNWODIE_SHORE RD_1	\$ -	\$ 88	\$ 88
5	NYCLP Greenwood	\$ -	\$ 16	\$ 16

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

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Projected Congestion Cont....

- ◆ Congestion = zonal load MW * zonal LBMP
Congestion component; summed across all the zones impacted by this constraint
- ◆ MMWG Load flows base case changes in years 2009, 2013, 2018; 2010-2017 CARIS cases utilize the 2013 MMWG case; 2010-2012 CARIS cases were also adjusted for major facility installation dates
- ◆ Commissioning of Caithness in 2009 and Besicorp in 2010; Poletti Retirement in 2010; Susquehanna-Roseland (Hudson) 500kV line in 2013

Additional Information

Historical & Projected

YEAR	NYCA Actual GWh		
	Demand	Generation	Interchange
2004	160,211	147,171	13,040
2005	167,208	153,265	13,943
2006	162,237	148,359	13,878
2007	167,341	150,407	16,934
2008	165,613	144,619	20,994
	PROJECTED		
2009	168,128	160,383	7,745
2010	169,747	157,365	12,382
2011	170,954	158,028	12,926
2012	171,927	158,294	13,632
2013	173,156	159,070	14,086
2014	174,800	160,589	14,211
2015	176,177	160,855	15,322
2016	178,250	161,905	16,345
2017	179,283	162,398	16,885
2018	180,427	160,908	19,519

NYCA Actual Data Source: NYISO archived hourly metered generation and load

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

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Projected Zonal Load Payments

Load LBMP Payment m\$										
Area	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
West	624	807	820	852	873	922	954	990	1,029	1,086
Genessee	404	534	541	563	570	606	630	657	686	719
Central	679	897	915	951	975	1,027	1,063	1,107	1,151	1,212
North	285	376	384	400	410	430	442	458	473	501
Mohawk Valley	309	415	424	442	451	474	490	509	528	544
Capital	506	670	685	720	737	776	807	846	889	942
Hudson Valley	492	655	674	705	720	759	787	824	863	911
Millwood	123	164	169	177	182	191	198	207	217	230
Dunwoodie	298	394	404	420	428	446	460	479	500	528
NYCity	2,593	3,441	3,545	3,746	3,858	4,098	4,291	4,550	4,762	5,043
Long Island	1,096	1,464	1,486	1,546	1,556	1,616	1,663	1,743	1,811	1,902
NYISO Total	7,409	9,817	10,046	10,520	10,760	11,343	11,786	12,369	12,910	13,618

Values are in nominal dollars

Increasing LBMP payments reflect escalating fuel prices, a slightly increasing trend of zonal forecasted demand (GWh) and the increase of projected zonal congestion payments (downstate)

Projected Load Payment Data Source: NYISO CARIS Base Cases Simulation Results (does not include Virtuals and Transmission outages)

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Zonal LBMPs \$ per MWh - Projected

Load Weighted LBMP \$/MWh										
Area	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
West	39.87	51.30	52.04	53.96	55.01	57.79	59.60	61.43	63.56	66.29
Genessee	40.78	53.42	54.22	56.33	56.80	59.69	61.53	63.47	65.69	68.53
Central	41.78	54.69	55.56	57.75	58.99	61.69	63.54	65.71	68.15	71.59
North	41.74	54.48	55.32	57.52	58.72	61.47	63.33	65.46	67.79	71.60
Mohawk Valley	43.01	56.22	57.12	59.40	60.60	63.37	65.28	67.53	70.04	73.54
Capital	44.58	58.30	59.34	61.86	62.85	65.66	67.73	70.24	73.09	77.06
Hudson Valley	45.73	59.74	60.83	63.37	64.32	67.13	69.16	71.75	74.58	78.44
Millwood	46.06	60.26	61.37	63.94	64.88	67.70	69.75	72.38	75.24	79.26
Dunwoodie	46.34	60.57	61.68	64.26	65.20	68.03	70.09	72.73	75.61	79.57
NYCity	46.76	61.02	62.04	64.65	65.61	68.50	70.64	73.30	76.20	80.12
Long Island	47.76	63.84	64.80	67.46	68.25	70.97	73.00	75.81	78.68	82.53
NYISO Total	44.04	57.62	58.57	60.95	61.93	64.73	66.69	69.07	71.69	75.32

Projected Zonal LBMPs Data Source: NYISO CARIS Base Cases Simulation Results (do not include Virtuals and Transmission outages)

Projected Zonal Generator Payment (million \$)

Generator LBMP Payment m\$										
Area	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
West	1,000	1,324	1,343	1,396	1,419	1,495	1,543	1,596	1,653	1,736
Genessee	191	250	255	265	266	280	289	300	308	310
Central	1,346	1,722	1,750	1,823	1,868	1,965	2,025	2,100	2,181	2,280
North	363	476	485	505	520	550	570	591	622	635
Mohawk Valley	146	191	194	203	207	217	226	235	243	257
Capital	716	1,000	1,017	1,063	1,086	1,143	1,178	1,232	1,277	1,330
Hudson Valley	198	283	291	309	312	333	342	362	386	388
Millwood	777	1,017	1,035	1,082	1,094	1,142	1,176	1,224	1,268	1,335
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NYCity	1,482	1,709	1,761	1,834	1,900	2,029	2,121	2,239	2,342	2,457
Long Island	552	743	764	790	798	845	864	900	942	911
NYISO Total	6,772	8,714	8,894	9,269	9,471	10,000	10,333	10,779	11,222	11,638

Values are in nominal dollars

Increasing LBMP payments reflect escalating fuel prices, a slightly increasing trend of zonal forecasted demand (GWh) and the increase of projected zonal congestion payments (downstate)

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

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Zonal Generation (GWh) - Projected

Load Area	Generator GWh									
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Capital	18,224	19,222	19,197	19,239	19,326	19,457	19,442	19,595	19,496	19,350
Central	33,430	32,499	32,516	32,564	32,682	32,881	32,884	32,972	33,001	32,867
Dunwoodie	6	6	6	6	6	6	6	6	6	6
Genessee	4,852	4,846	4,858	4,871	4,851	4,854	4,860	4,889	4,850	4,929
Hudson Valley	4,273	4,661	4,707	4,792	4,775	4,882	4,859	4,951	5,066	4,847
Long Island	11,552	11,452	11,601	11,524	11,516	11,745	11,658	11,680	11,790	10,853
Millwood	17,146	17,147	17,147	17,197	17,147	17,147	17,147	17,198	17,147	17,147
Mohawk Valley	3,633	3,585	3,602	3,614	3,607	3,621	3,649	3,665	3,661	3,687
North	8,921	8,953	8,997	8,997	9,071	9,165	9,213	9,245	9,393	9,106
NYCity	31,677	27,883	28,291	28,294	28,920	29,614	29,932	30,419	30,628	30,559
West	26,670	27,112	27,107	27,196	27,170	27,218	27,206	27,286	27,361	27,556
NYISO Total	160,383	157,365	158,028	158,294	159,070	160,589	160,855	161,905	162,398	160,908
Ontario Hydro Total	161,779	167,184	167,610	168,512	167,867	173,388	173,711	174,114	173,860	174,264
PJM Total	767,984	766,348	766,580	769,455	767,306	767,895	762,268	764,432	763,057	768,545
HQ Total	5,808	5,816	5,814	5,813	5,807	5,807	5,808	5,816	5,807	5,822
NEISO Total	140,923	140,788	140,677	140,904	140,597	141,616	140,633	139,734	139,358	140,163

PJM includes PJM Classic, AP, AEP, CE, DAY, DLCO and DVP

Projected Zonal Generation Data Source: NYISO CARIS Base Cases Simulation Results (does not include Virtual Bidding and Transmission outages)

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Additional Metrics – For Informational Purposes

Losses Costs - Projected

Cost of Losses (m\$)										
Area	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
West	(\$17.33)	(\$40.78)	(\$42.81)	(\$46.12)	(\$41.92)	(\$42.33)	(\$42.05)	(\$45.03)	(\$47.69)	(\$54.74)
Genessee	(\$3.71)	(\$8.11)	(\$8.80)	(\$9.76)	(\$8.47)	(\$7.69)	(\$7.04)	(\$7.60)	(\$7.76)	(\$9.72)
Central	\$2.63	\$0.94	\$0.78	\$0.41	\$2.39	\$2.62	\$3.12	\$3.31	\$3.51	\$6.16
North	\$0.54	(\$0.59)	(\$0.72)	(\$0.94)	(\$0.70)	(\$0.11)	(\$0.08)	(\$0.52)	(\$1.16)	\$0.16
Mohawk Valley	\$10.54	\$12.95	\$13.22	\$13.71	\$14.17	\$15.02	\$15.53	\$16.09	\$16.75	\$17.74
Capital	\$29.25	\$40.15	\$41.37	\$43.91	\$44.24	\$45.73	\$47.34	\$49.77	\$52.89	\$58.91
Hudson Valley	\$37.33	\$52.03	\$53.78	\$56.55	\$56.49	\$58.45	\$59.68	\$62.86	\$66.20	\$72.15
Millwood	\$9.96	\$14.27	\$14.72	\$15.51	\$15.64	\$16.09	\$16.45	\$17.34	\$18.27	\$20.32
Dunwoodie	\$25.16	\$35.55	\$36.40	\$38.08	\$38.02	\$38.92	\$39.58	\$41.44	\$43.44	\$45.39
NYCity	\$233.79	\$335.35	\$344.93	\$367.48	\$372.65	\$390.02	\$403.13	\$430.99	\$453.06	\$493.97
Long Island	\$107.72	\$155.89	\$158.24	\$165.63	\$163.85	\$167.47	\$170.47	\$179.68	\$187.59	\$196.27
NYISO Total	\$435.88	\$597.65	\$611.11	\$644.46	\$656.36	\$684.20	\$706.12	\$748.35	\$785.11	\$846.62

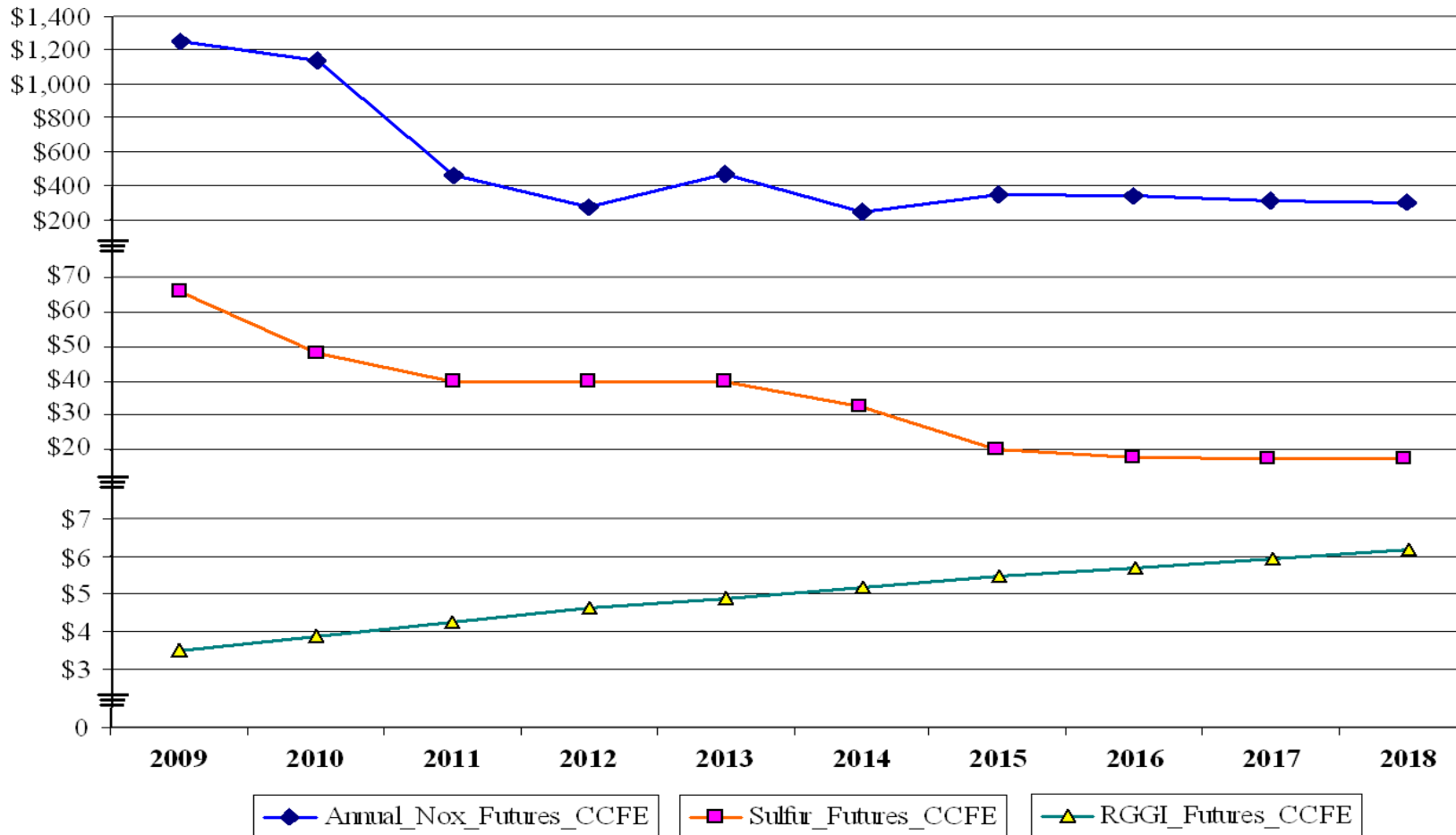
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Emissions and Emission Costs – NYCA Only

	Emissions			Cost		
	NO _x	S _O 2	C _O 2	NO _x	S _O 2	C _O 2
	Tons	Tons	KTons	K\$	K\$	K\$
	Projected			Projected		
2009	38,523	69,019	56,079	48,154	4,555	196,275
2010	40,630	72,896	54,481	46,277	3,514	210,296
2011	40,952	72,848	54,739	18,644	2,894	234,282
2012	41,199	73,235	54,865	11,095	2,910	253,476
2013	41,218	72,926	55,243	19,185	2,917	270,692
2014	41,798	73,424	55,976	10,164	2,379	289,958
2015	41,765	73,254	56,074	14,275	1,459	306,162
2016	42,187	73,662	56,622	14,055	1,317	322,744
2017	42,836	73,984	57,041	13,146	1,292	338,081
2018	41,911	73,547	56,126	12,586	1,262	346,861
(1) EPA Clean Air Markets Database						
(2) NYISO CARIS Database Simulation Results						

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Emission Allowance Forecasts



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Emission Forecasts

- ◆ Use Chicago Climate Future Exchange Prices when available
- ◆ Extrapolate for the remainder of the period when future is not traded
- ◆ CO2 based upon RGGI - Federal CO2 Bill is not assumed in the base case

Discussion

- ◆ Next Steps
 - *CARIS 3-Studies Selection (the three element groupings)*
 - *Application of Generic Solutions*
 - *Scenario Selection*
- ◆ Discussion

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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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