

Congestion Impact Calculation Update

NYISO ESPWG
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9/9/04

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Congestion Reporting

- Congestion Impact Metrics Defined
- 2003
 - Data Sufficient for Constrained-Unconstrained Calculation Available for All Hours
 - “PROBE Lite” Calculation without Network Models
 - 2003 Congestion Previously Reported
- 2004
 - Hourly Market and Network Model Available for All Hours (1/1 – 8/30)
 - Monthly Congestion Report
 - PROBE Available for Sensitivity and “What If” Analysis



PROBE Performance

Tests Performed: All Hours of May 2004

Simulation Time with Unit Commitment Solution: <20 seconds per Day

SCUC vs. PROBE Simulator Production Cost Comparison Constrained Network 31 Days of May 2004

	Unmitigated Bids	Mitigated Bids
Cumulative Monthly % Difference	0.0%	-1.1%
Maximum Daily Difference	-8.6%	-8.6%

PROBE Simulator vs. PROBE Lite Production Cost Comparison Unconstrained Network 31 Days of May 2004

	Unmitigated Bids	Mitigated Bids
Cumulative Monthly % Difference	0.0%	0.0%
Maximum Daily Difference	-0.1%	-0.1%



Congestion Impact Reporting

- Annual Total or Year-to-Date
- Monthly Totals

	Report By			
	NY Total	Zones	Monitored Element	Contingency
Generation & Import Bid Production Cost	✓	✓	No	No
Total Load Payment	✓	✓		
Load Congestion Payments TCC Hedge	✓	✓		
Net Load Payments Due to Congestion	✓	✓		
Total Load Congestion Payments	✓	✓	✓	
Load Congestion Payments TCC Hedge	✓	✓	✓	
TCC Unhedged Load Congestion Payments	✓	✓	✓	
Total Generation & Import Payment	✓	✓		



2004 Q1 & Q2 New York Congestion PRELIMINARY

All Calculations Are Constrained – Unconstrained Values

Table 1
2004 Congestion Impact Metrics

1.1 Bid Production Cost Impact (\$ Millions)	Jan	Feb	Mar	Apr	May	Jun	Q1&2 Total	
Total	\$23	\$6	\$5	\$3	\$4	\$8	\$49	+ Number Means Congestion Increased the Supply Production Cost
1.2 Congestion Payments Impact (\$ Millions)	Jan	Feb	Mar	Apr	May	Jun	Q1&2 Total	
Total Congestion Payments	\$155	\$53	\$37	\$31	\$65	\$82	\$424	
TCC Hedge	\$85	\$34	\$27	\$22	\$36	\$47	\$250	
Total Unhedged Congestion Payments	\$70	\$20	\$11	\$9	\$29	\$36	\$174	+ Number Means the Congestion Component of LMP Increased Due to Congestion
1.3 Load Payments Impact (\$ Millions)	Jan	Feb	Mar	Apr	May	Jun	Q1&2 Total	
Total Load Payments	\$59	\$23	\$18	\$9	\$18	\$21	\$148	+ Number Means Congestion Caused Load Payments to Increase
Hedge	\$85	\$34	\$27	\$22	\$36	\$47	\$250	
Total Unhedged Load Payments	-\$26	-\$11	-\$9	-\$13	-\$18	-\$26	-\$102	A Negative Number Means Unhedged Load Payments Went Down Due to Congestion
1.4 Generation Payments Impact (\$ Millions)	Jan	Feb	Mar	Apr	May	Jun	Q1&2 Total	
Total Generation Payments								
Total	-\$26	-\$11	-\$9	-\$13	-\$18	-\$26	-\$102	A Negative Number Means Congestion Decreased Payments to Generators



2004 Q1 & Q2 New York Congestion PRELIMINARY

All Calculations Are Constrained –
Unconstrained Values

Societal Impact

The SCUC Minimization
Objective

2.1 Bid Production Cost Impact

	Jan	Feb	Mar	Apr	May	Jun	Q1&2 Total
WEST	-\$6	-\$2	-\$1	-\$2	-\$3	-\$5	-\$18
GENESE	-\$1	\$0	\$0	\$0	\$0	\$0	-\$2
MHKVL	-\$7	-\$4	-\$4	-\$3	-\$1	-\$5	-\$23
NORTH	-\$1	-\$1	-\$1	-\$1	\$0	-\$1	-\$3
CENTRL	-\$1	-\$1	\$0	\$0	\$0	\$0	-\$3
CAPITL	-\$2	-\$1	\$0	\$0	-\$1	-\$3	-\$8
HUDVL	-\$4	-\$5	-\$1	-\$1	-\$1	-\$3	-\$16
MILLWD	\$0	\$0	\$0	\$0	\$0	\$0	\$0
DUNWOD	\$0	-\$1	\$0	\$0	\$0	-\$1	-\$3
N.Y.C.	\$49	\$23	\$16	\$13	\$12	\$31	\$144
LONGIL	\$4	\$6	\$4	\$4	\$10	\$16	\$44
New York	\$31	\$16	\$12	\$10	\$14	\$28	\$111
NPX	\$0	-\$1	\$0	\$0	-\$1	-\$1	-\$3
OH	-\$1	-\$1	-\$1	-\$1	-\$1	-\$1	-\$6
PJM	-\$8	-\$5	-\$3	-\$3	-\$3	-\$10	-\$33
HQ	\$1	-\$3	-\$3	-\$2	-\$4	-\$7	-\$19
Imports	-\$9	-\$9	-\$8	-\$7	-\$9	-\$20	-\$62
Total	\$23	\$6	\$5	\$3	\$4	\$8	\$49

+ Number Means Congestion
Increases Supplier Production Cost



2004 Q1 & Q2 New York Unhedged Congestion Payments PRELIMINARY

All Calculations Are Constrained – Unconstrained Values

[Accounting Impact](#)

LMP, Congestion
Component Change ONLY

2.2 Congestion Payments Impact (\$ Millions)

		Jan	Feb	Mar	Apr	May	Jun	Q1&2 Total
A	WEST	\$0	\$0	\$0	\$0	\$0	\$0	-\$1
B	GENESE	\$0	\$0	\$0	\$0	\$0	\$0	\$0
C	MHKVL	\$0	\$0	\$0	\$0	\$0	\$0	-\$1
D	NORTH	\$0	\$0	\$0	\$0	\$0	\$0	\$0
E	CENTRL	\$0	\$0	\$0	\$0	\$0	\$0	\$0
F	CAPITL	\$1	\$0	\$0	\$0	\$1	\$0	\$2
G	HUDVL	\$2	\$0	\$0	-\$1	-\$1	-\$2	-\$2
H	MILLWD	\$0	\$0	\$0	-\$1	-\$1	-\$2	-\$5
I	DUNWOD	\$2	\$0	\$0	\$0	\$1	\$1	\$3
J	N.Y.C.	\$54	\$13	\$7	\$7	\$16	\$26	\$123
K	LONGIL	\$12	\$7	\$5	\$4	\$13	\$13	\$54
	New York	\$69.7	\$19.5	\$10.7	\$8.9	\$28.9	\$35.8	\$174
N	NPX	\$1	\$0	\$0	\$0	\$0	\$0	\$1
O	OH	\$0	\$0	\$0	\$0	\$0	\$0	\$0
P	PJM	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Q	HQ	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	Imports	\$0.3	\$0.0	\$0.0	\$0.0	\$0.1	\$0.0	\$0
	Total	\$70.0	\$19.5	\$10.7	\$8.9	\$29.0	\$35.8	\$174

+ Number Means Congestion
Increases Load Cost



2004 Q1 & Q2 New York Unhedged Congestion Load Impact

All Calculations Are Constrained – Unconstrained Values

Bills Impact

Energy, Losses, & Congestion Components Change

2.3 Load Payments Impact (\$ Millions)

		Jan	Feb	Mar				Q1 Total

Not Prepared Pending Resolution of Export Handling

+ Number Means Congestion Increases Load Payments

2004 Q1 & Q2 New York Unhedged Congestion Supply Impact PRELIMINARY

All Calculations Are Constrained – Unconstrained Values

Payments Impact
Energy, Losses, &
Congestion
Components Change

2.4 Generation Payments Impact (\$ Millions)

		Jan	Feb	Mar	Apr	May	Jun	Q1&2 Total
A	WEST	-\$17	-\$6	-\$4	-\$5	-\$10	-\$11	-\$52
B	GENESE	-\$3	-\$1	-\$1	-\$1	-\$2	-\$2	-\$9
C	MHKVL	-\$25	-\$9	-\$7	-\$6	-\$10	-\$13	-\$70
D	NORTH	-\$4	-\$2	-\$2	-\$2	-\$4	-\$4	-\$18
E	CENTRL	-\$3	-\$1	-\$1	-\$1	-\$1	-\$1	-\$7
F	CAPITL	-\$6	-\$2	-\$1	-\$1	-\$5	-\$6	-\$20
G	HUDVL	-\$16	-\$8	-\$4	-\$3	-\$5	-\$7	-\$44
H	MILLWD	-\$9	-\$3	-\$2	-\$2	-\$3	-\$4	-\$23
I	DUNWOD	\$0	\$0	\$0	\$0	\$0	\$0	-\$1
J	N.Y.C.	\$69	\$24	\$14	\$11	\$15	\$26	\$161
K	LONGIL	\$5	\$8	\$6	\$5	\$18	\$15	\$56
	New York	-\$8.3	-\$0.3	-\$1.0	-\$5.8	-\$7.0	-\$5.4	-\$28
N	NPX	\$0	-\$1	\$0	\$0	-\$1	-\$2	-\$4
O	OH	-\$4	-\$1	-\$1	-\$2	-\$3	-\$3	-\$14
P	PJM	-\$12	-\$6	-\$5	-\$4	-\$4	-\$10	-\$41
Q	HQ	-\$2	-\$3	-\$1	-\$1	-\$2	-\$5	-\$14
	Imports	-\$18.1	-\$10.6	-\$7.7	-\$7.1	-\$10.6	-\$20.2	-\$74
	Total	-\$26.4	-\$10.9	-\$8.8	-\$12.9	-\$17.6	-\$25.6	-\$102

+ Number Means Gen
Payments Went Up
Due to Congestion



2004 Q1 & Q2 New York Unhedged Congestion Load & Congestion Payments by Constraint (95% or more of Total)

2004 Monthly Congestion

Unhedged Congestion Payments in \$ Millions

Monitored Facility	Jan	Feb	Mar	Apr	May	Jun	Total YTD	% of YTD	Cum % of YTD
RAINEY__ 345 DUNWODIE 345 1	\$56	\$12					\$68	38%	38%
DUNWODIE 345 SHORE_RD 345 1	\$11	\$6	\$3	\$1	\$6	\$10	\$37	21%	59%
RAINEY__ 138 VERNON__ 138 1			\$2	\$2	\$9	\$10	\$23	13%	72%
CENTRAL EAST - VC			\$1	\$3	\$3	\$2	\$10	6%	77%
PLSNTVLY 345 LEEDS__ 345 1					\$4	\$4	\$8	5%	82%
SHORE_RD 345 SHORE_RD 138 1					\$4		\$4	2%	84%
RAINEY__ 345 DUNWOD71 345 1						\$3	\$3	2%	86%
VALLYSTR 138 EGRDNCTY 138 1	\$1	\$1			\$1	\$1	\$3	2%	88%
E13THSTA 345 W49TH_ST 345 1	\$1	\$1		\$1			\$3	2%	90%
W49TH_ST 345 SPRNBRK_ 345 1						\$3	\$3	2%	91%
SPR/DUN-SOUTH			\$1	\$1			\$2	1%	92%
HUDS_AVE 138 JAMAICA_ 138 2					\$1	\$1	\$2	1%	93%
LEEDS__ 345 ATHENS__ 345 1						\$2	\$2	1%	94%
FRESHKLS 138 WILLWBRK 138 1							\$1	1%	95%



Observations

- 2004 Metrics Following Close to 2003 Pattern
- Similar Constraints to 2003
- New Constraint: Leeds and Athens to PV
- Dozen Constraints in Top 95% Contributors



Future Efforts

First Priorities

- Review the Load Impact Calculation
- Align SCUC and PROBE Modeling **Underway**
 - SMD
 - Refine Representation of Multiple SCUC Passes
- Analyze 2004 Q3
- Recompute 2003 Metrics

Next Priorities

- Unusual Day Analysis
- Develop Automated SCUC – PROBE Results Comparison
- Automate Calculation Process
- Report Metrics Monthly Going Forward

