

NYISO Study on ROS BSM and Uneconomic Retention/Repowering



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Albany, NY*

- ◆ On March 19, 2015 the FERC issued an order directing the NYISO to establish, and report on, a stakeholder process
 - *150 FERC ¶ 61,214, FERC Docket No. EL13-62-000*
- ◆ In general, FERC asked that the NYISO look at:
 - *Whether there are circumstances that warrant the adoption of BSM measures in Rest of State (ROS)*
 - *Whether there is a need for, and what mitigation measures would need to be in place to address, repowering agreements with the potential to suppress capacity prices*
- ◆ Stakeholder discussions
 - *The NYISO made three presentations in the Spring and Summer of 2015, primarily focused on assessing the potential need to apply BSM to new entry in ROS*
 - *The NYISO made an additional presentation on November 19, in which it discussed issues surrounding uneconomic retention and repowering of existing units*

- ◆ **The NYISO's filed a report with FERC on June 17, 2015. In its report, the NYISO:**
 - *Described that it did not see a compelling need for BSM rules for new entry in ROS at this time*
 - *Indicated that there may be concerns regarding the potential market effects of uneconomic retention and repowering*
 - *Requested that the Commission allow it to:*
 1. **Propose any necessary measures related to uneconomically retained units and repowering projects that address a reliability need in its October 19 RMR Compliance Filing**
 2. **File a further report 90 days after filing the RMR Compliance Filing addressing further analyses and stakeholder discussion on the uneconomic retention of existing units and repowerings pursuant to agreements that are not principally driven by a reliability need.**

- ◆ **On November 16, FERC issued a letter order requesting additional information on four items:**
 - 1) *The July 15 spreadsheet update, and a summary of stakeholder discussions on this issue since June 17*
 - 2) *The NYISO's analysis on repowering pursuant to agreements not principally driven by reliability needs. FERC directed the NYISO to file its analysis and outcome of the stakeholder discussions on this issue by December 16*
 - 3) *The existing tariff provisions referenced by the NYISO in its Compliance Filing regarding the applicability of BSM rules to certain repowering projects*
 - 4) *Whether the NYISO has performed forward-looking analysis examining the effect of the anticipated departure of several generating resources that have announced their intention to retire or mothball on the ability and/or incentive of an LSE to exercise buyer-side market power*

- ◆ Discuss with stakeholders the changes to June 15 workbook incorporated in the July 15 workbook, and the further updated analysis to the July 15 spreadsheet posted for today's meeting (“November update”)

- ◆ Discuss with stakeholders the effect of the announced departures of generating units on the ability and incentive to exercise buyer-side market power

- ◆ Describe further work and next steps
 - *Response to FERC due December 16, 2015*

- ◆ Solicit Stakeholder feedback

- *After discussions both internally and with the Market Monitoring Unit, the NYISO made corrections and enhancements to the NPV workbook sent to stakeholders on June 18, 2015*
- *Changes included the correction of errors, the use of alternative data sources, the use of the most recent data, and the enhancement of assumptions*
 - **Recalculated Net E&AS revenues using updated gas futures and power futures prices**
 - Gas futures dropped on average by \$0.26/mmbtu
 - Forward power dropped on average by approximately 6.90\$/MWh
 - Resulted in a 38% reduction in Net E&AS revenue on average
 - **Because of the significant movement in estimated revenues in such a relatively short time, the NYISO substituted escalated Net E&AS revenues calculated as part of the 2014/17 Demand Curve reset where they were available**

July 15 Spreadsheet Update



Summary of Net E&AS Changes

June Peak/Off-Peak Model	1x1 CC C	1x1 CC F	2xGT wSCR C	2xGT wSCR F	GT woSCR C	GT woSCR F	GT wSCR C	GT wSCR F	LMS C	LMS F
Net E&AS - 2018/19	\$ 32,953,558	\$ 32,866,527	\$ 10,852,160	\$ 9,197,742	\$ 3,069,395	\$ 2,649,571	\$ 5,064,139	\$ 4,307,720	\$ 7,383,882	\$ 7,156,097
Net E&AS - 2019/20	\$ 31,795,478	\$ 30,812,124	\$ 10,004,594	\$ 8,359,810	\$ 2,887,883	\$ 2,439,016	\$ 4,625,539	\$ 3,904,416	\$ 7,026,817	\$ 6,656,327
Net E&AS - 2020/21	\$ 33,828,294	\$ 32,877,060	\$ 12,913,533	\$ 10,616,294	\$ 3,078,608	\$ 2,851,739	\$ 6,052,813	\$ 5,010,564	\$ 8,390,670	\$ 8,117,494

July Update Peak/Off-Peak Model	1x1 CC C	1x1 CC F	2xGT wSCR C	2xGT wSCR F	GT woSCR C	GT woSCR F	GT wSCR C	GT wSCR F	LMS C	LMS F
Net E&AS - 2018/19	\$ 19,303,762	\$ 22,277,113	\$ 4,678,167	\$ 6,085,827	\$ 2,370,860	\$ 3,147,722	\$ 2,144,142	\$ 2,854,183	\$ 3,713,125	\$ 5,272,859
Net E&AS - 2019/20	\$ 18,302,574	\$ 21,268,093	\$ 4,144,975	\$ 5,272,199	\$ 2,143,501	\$ 2,797,088	\$ 1,882,460	\$ 2,476,371	\$ 3,515,403	\$ 4,750,026
Net E&AS - 2020/21	\$ 18,956,295	\$ 20,746,229	\$ 6,660,927	\$ 6,971,842	\$ 2,869,075	\$ 3,308,624	\$ 3,102,061	\$ 3,390,570	\$ 4,654,973	\$ 5,688,615

DCR Estimates	1x1 CC C	1x1 CC F	2xGT wSCR C	2xGT wSCR F	GT woSCR C	GT woSCR F	GT wSCR C	GT wSCR F	LMS C	LMS F
Net E&AS - 2018/19	\$ 20,157,720	\$ 22,506,654	\$ -	\$ -	\$ 3,526,380	\$ 4,239,463	\$ -	\$ -	\$ -	\$ -
Net E&AS - 2019/20	\$ 20,621,347	\$ 23,024,307	\$ -	\$ -	\$ 3,607,487	\$ 4,336,971	\$ -	\$ -	\$ -	\$ -
Net E&AS - 2020/21	\$ 21,095,638	\$ 23,553,866	\$ -	\$ -	\$ 3,690,459	\$ 4,436,721	\$ -	\$ -	\$ -	\$ -

Deltas	1x1 CC C	1x1 CC F	2xGT wSCR C	2xGT wSCR F	GT woSCR C	GT woSCR F	GT wSCR C	GT wSCR F	LMS C	LMS F
Updated Peak/Off-Peak to DCR	\$ (1,770,692)	\$ (1,597,797)	NA	NA	\$ (1,146,963)	\$ (1,253,241)	NA	NA	NA	NA
Updated to Published P/OP	\$ (14,004,900)	\$ (10,754,759)	\$ (6,095,406)	\$ (3,281,326)	\$ (550,817)	\$ 437,703	\$ (2,871,276)	\$ (1,500,525)	\$ (3,639,289)	\$ (2,072,806)

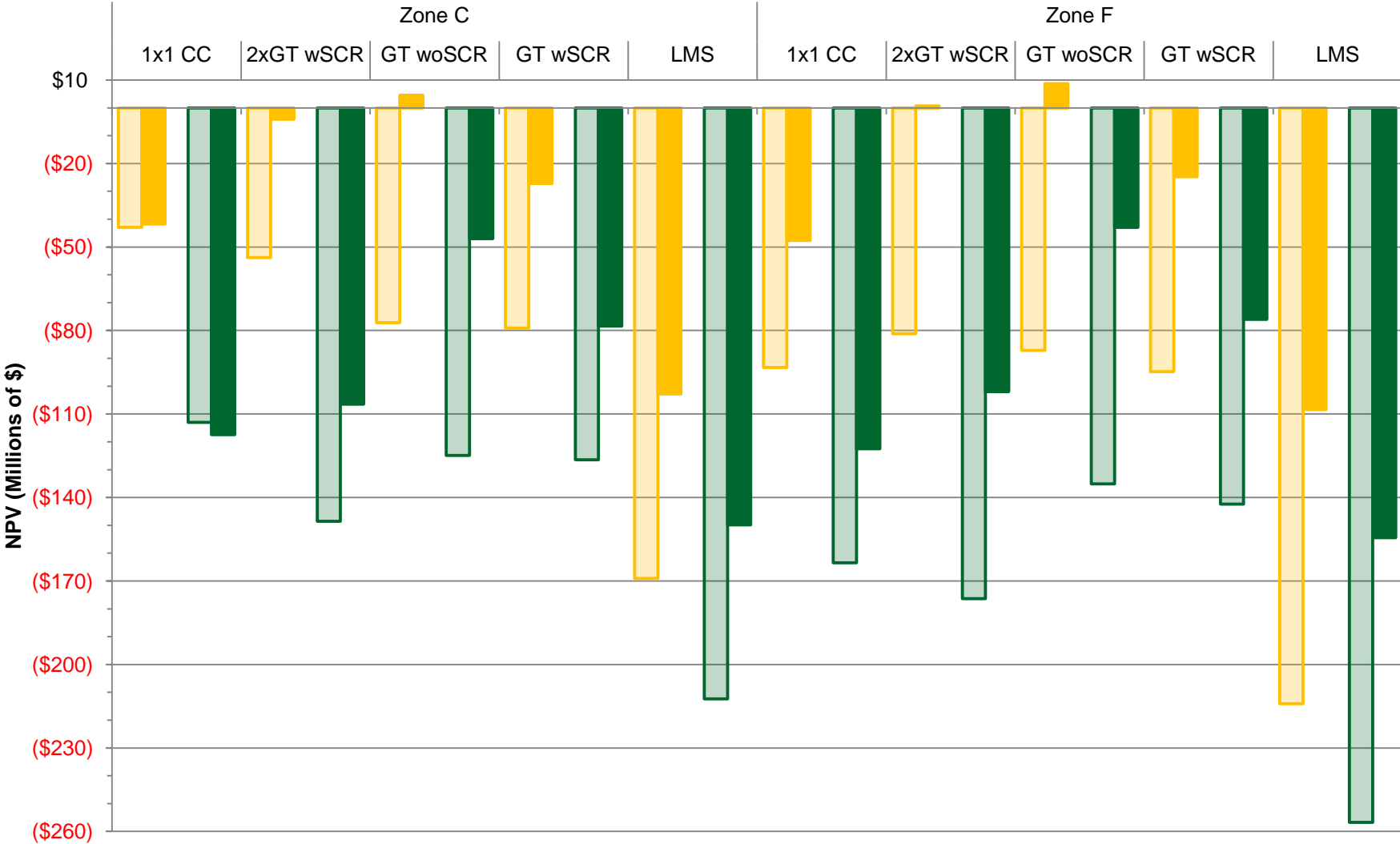
% Delta	1x1 CC C	1x1 CC F	2xGT wSCR C	2xGT wSCR F	GT woSCR C	GT woSCR F	GT wSCR C	GT wSCR F	LMS C	LMS F
Updated P/OP to DCR	-9%	-8%	NA	NA	-49%	-41%	NA	NA	NA	NA
Updated P/OP to Published P/OP	-74%	-50%	-122%	-54%	-24%	14%	-126%	-52%	-93%	-40%

■ *Changes (continued)*

- **Decreased the projected UCAP revenue by 0.25% per year in order to account for technological progress and other factors**
 - The use of this factor was validated during the 2013 ICAP Demand Curve reset.
 - Its inclusion reduced the amount of estimated ICAP revenue each of the plants received, thereby reducing each unit's respective NPV
- **Replaced the interest and ROE rates from real to nominal**
 - The use of real rates was inappropriate as inflation was accounted for elsewhere through the use of an escalation factor
 - Reduced each unit's NPV
- **Removed 'Target Cash Flow to Equity' and Discounted future cash flows using nominal ROE instead of the pre-tax WACC**
 - The inclusion of opportunity cost was inappropriate if the equity cost was included in the NPV calculation
 - The opportunity cost represented the revenue that an LSE could be expected to earn with an alternate investment, which is defined by the LSE's nominal ROE
 - Using nominal ROE as the discount factor makes the explicit treatment of opportunity costs as a cash flow unnecessary and inappropriate
 - The removal of the opportunity cost significantly increased each unit's NPV while the use of nominal ROE to discount future cash flows significantly decreased each unit's NPV

Net Present Value of Subsidized New Entry in ROS

■ June NPV w/LSE cost savings
 ■ July NPV w/LSE Cost Savings
 ■ June NPV
 ■ July NPV



NPV of Subsidized New Entry in ROS - Summary of Changes

Parameters				June 17 Analysis				July 15 Update			
Generator Type	MW (Summer/Winter Average)	Zone	NPV Term	NPV	IRR	NPV w/LSE cost savings	IRR w/LSE cost savings	NPV	IRR	NPV w/LSE cost savings	IRR w/LSE cost savings
1x1 CC	319.7	Zone C	25	\$ (113,033,302)	6.90%	\$ (42,950,810)	9.47%	\$ (117,456,976)	2.08%	\$ (41,786,633)	4.53%
	316.2	Zone F		\$ (163,486,119)	5.76%	\$ (93,320,923)	8.12%	\$ (122,477,860)	2.18%	\$ (47,635,939)	4.45%
2xGT w/SCR	432.6	Zone C	20	\$ (148,515,973)	4.72%	\$ (53,848,970)	10.87%	\$ (106,455,862)	-1.35%	\$ (4,063,024)	5.01%
	433.7	Zone F		\$ (176,337,088)	3.27%	\$ (81,127,861)	9.41%	\$ (102,000,788)	-0.75%	\$ 652,411	5.49%
GT w/o SCR	217.7	Zone C	20	\$ (124,879,062)	-1.98%	\$ (77,161,544)	4.39%	\$ (47,002,118)	-0.20%	\$ 4,525,669	6.18%
	218.2	Zone F		\$ (135,139,225)	-3.62%	\$ (87,166,159)	2.83%	\$ (42,980,283)	0.67%	\$ 8,665,850	6.90%
GT w/SCR	216.3	Zone C	20	\$ (126,461,117)	-0.13%	\$ (79,127,615)	5.31%	\$ (78,414,835)	-6.46%	\$ (27,218,416)	-0.33%
	216.8	Zone F		\$ (142,349,902)	-2.24%	\$ (94,745,288)	3.27%	\$ (75,992,781)	-5.34%	\$ (24,678,016)	0.56%
LMS 100	198.8	Zone C	25	\$ (212,381,350)	0.31%	\$ (169,112,665)	2.25%	\$ (149,801,452)	-9.21%	\$ (102,747,139)	-7.34%
	194.4	Zone F		\$ (256,723,103)	-1.95%	\$ (214,070,053)	-0.25%	\$ (154,426,612)	-8.25%	\$ (108,413,742)	-6.45%

- ***The November workbook update includes three cases for the Zone F Frame GT w/o SCR, which is the hypothetical unit with the highest NPV and therefore of particular importance to this analysis:***
 1. The unchanged July calculation for reference
 2. Updated calculations reflecting current market conditions
 3. The updated calculations reflecting a hypothetical scenario where capacity that has provided notice of retirement or mothball has exited the market
- ***Update reflecting current market conditions***
 - Calculated the Annual ICAP Price and Annual Impact/100MW using auction results from Summer 2015 and Winter 2015/16 and the current Demand Curve slope
 - The December Monthly Auction results were used to estimate the UCAP and clearing prices for January through April 2016. The calculations are included in the spreadsheet.
 - The Impact/100MW increases as the amount of ROS UCAP increases, but is not directly dependent on clearing prices or on changes in UCAP outside ROS

	July	November
Annual ICAP Price	\$42,000/MW-year	\$28,840/MW-year
Impact/100MW	\$41,850,000/year	\$43,849,400/year

■ *Hypothetical retirement scenario*

- Roughly 2,000 MW of ROS UCAP has submitted notice of an intent to retire or mothball
- The hypothetical retirement scenario reflects the removal of all of those MW
- The removal of ROS UCAP reduces the amount of capacity ROS LSEs procure in the ICAP Market, which reduces the Impact/100MW and corresponding LSE cost savings from price suppression
- However, the removal of UCAP increases the NYCA ICAP price, which makes new entry look more economic and may make it easier to subsidize new entry
- Under the hypothetical scenario, the NPV of the Zone F Frame GT w/o SCR is positive even without LSE cost savings

	November Update	Retirements Scenario
Annual ICAP Price	\$28,840/MW-year	\$85,451/MW-year
Impact/100MW	\$43,849,400/year	\$33,659,341/year

■ *Qualitative effects on the incentive & ability to exercise buyer-side market power*

- Increased risk of price response to new entry if generators that have rescinded noticed are still in the market
- May be more opportunities for retention strategies

Generators submitting Notice

- Retirements and mothballs outside Zones A-F affect the NYCA ICAP price, but do not affect the Impact/100MW as they do not change the amount of capacity ROS LSEs procure in the ICAP Market
- Only generators located in Zones A-F are shown below

	Zone	Summer ICAP	Winter ICAP
R.E. Ginna	B	582.1	581.4
Entergy Fitzpatrick	C	853.3	836.8
Dunkirk 2	A	75.0	75.0
Huntley 67	A	188.0	187.9
Huntley 68	A	186.8	189.5
Cayuga 1	C	153.3	152.3
Cayuga 2	C	151.0	156.8
	<i>Sum</i>	2,189.5	2,179.7
Weighted Average EFORd		0.0828	0.0531
<i>Total UCAP Removed</i>		2,008.3	2,063.9

November Update – Summary of Inputs and Results



Original - June/July		
	ROS UCAP	Average MCP
Summer	18,187.3	\$ 5.96
Winter	18,963.2	\$ 2.03
Annual ICAP Price		\$ 47,950
<i>Addition</i>	100 MW	
<i>Slope</i>	(\$0.002290) \$/kW-month/MW	
	ROS UCAP	Average MCP
Summer	18,287.3	\$ 5.73
Winter	19,063.2	\$ 1.80
Price Impact		\$ 46,524,610

Update - November 2015		
	ROS UCAP	Average MCP
Summer	18,355.2	\$ 3.83
Winter	18,565.8	\$ 0.98
Annual ICAP Price		\$ 28,840
<i>Addition</i>	100 MW	
<i>Slope</i>	(\$0.002317) \$/kW-month/MW	
	ROS UCAP	Average MCP
Summer	18,455.2	\$ 3.59
Winter	18,665.8	\$ 0.75
Price Impact		\$ 48,721,555

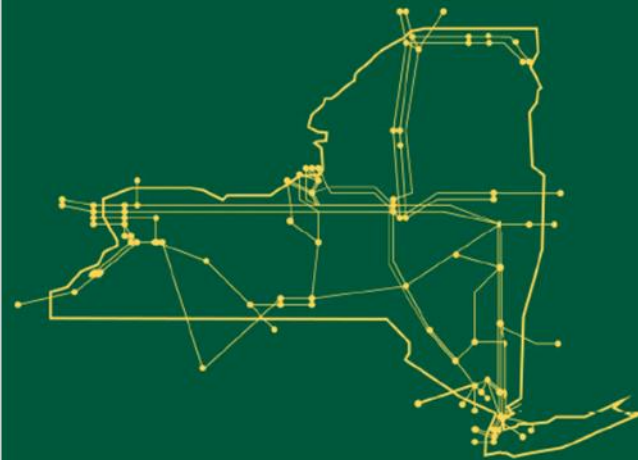
Hypothetical Retirements		
	ROS UCAP	Average MCP
Summer	16,346.9	\$ 8.48
Winter	16,501.9	\$ 5.76
Annual ICAP Price		\$ 85,451
<i>Addition</i>	100 MW	
<i>Slope</i>	(\$0.002317) \$/kW-month/MW	
	ROS UCAP	Average MCP
Summer	16,446.9	\$ 8.25
Winter	16,601.9	\$ 5.53
Price Impact		\$ 37,399,268

Zone F Frame GT w/o SCR				
	June 17 Spreadsheet	July Enhancements	November Update	Hypothetical Retirements
Base Case				
IRR	-0.76%	0.67%	-4.19%	9.87%
NPV	\$ (138,277,717)	\$ (42,980,283)	\$ (70,445,856)	\$ 29,031,918
LSE Cost Savings Case				
IRR	5.65%	6.90%	2.00%	14.41%
NPV	\$ (87,586,565)	\$ 8,665,850	\$ (16,332,309)	\$ 70,570,146

- ◆ **The NYISO's response to FERC is due December 16**
 - *The NYISO will include a summary of stakeholder discussions and feedback on the topics covered in this presentation in its response*

- ◆ **Stakeholders are encouraged to provide further comments to deckels@nyiso.com by Wednesday, December 9**

The New York Independent System Operator (NYISO) is a not-for-profit corporation responsible for operating the state's bulk electricity grid, administering New York's competitive wholesale electricity markets, conducting comprehensive long-term planning for the state's electric power system, and advancing the technological infrastructure of the electric system serving the Empire State.



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