

## 2012 IRM Study Parametric IRM Impact Analysis

Category		
Parameter Description		
Yellow-shaded title block represents parameter listed in Table 1: Parametric IRM Comparison		
	2011 IRM Study Assumptions	2012 IRM Study Assumptions
	<ul style="list-style-type: none"> <li>Cause and effect / how the parameter affects or impacts IRM</li> </ul>	Described in Section
		- / + % Change from 2010 IRM Basecase

### NYCA Load Model

NYCA Load Forecast (October)		
	<ul style="list-style-type: none"> <li>NYCA = 33,025 MW</li> <li>Zone J = 11,725 MW</li> <li>Zone K = 5,368 MW</li> </ul>	<ul style="list-style-type: none"> <li>NYCA = 32,872 MW</li> <li>Zone J = 11,463 MW</li> <li>Zone K = 5,414 MW</li> </ul>
	<ul style="list-style-type: none"> <li>Lower forecast → Lower IRM.</li> <li>Lower peak load due to conservation measures and lower economic activity.</li> <li>The 2011 forecast is a reduction of 867 MW from the 2010 Summer Peak Forecast.</li> <li>Forecast based on examination of 2010 weather normalized peaks.</li> <li>Top three external Area peak days aligned with NYCA</li> </ul>	Section A-5.2
		<b>- 0.6%</b>

Load Shape Model		
	2002 Load Shape	2002 Load Shape
	<ul style="list-style-type: none"> <li>After evaluating 2009 data, analysis indicates 2002 load shape is an appropriate representation for this analysis.</li> <li>The same 2002 Load Shape was used in the five previous studies – and is consistent with the load shape used by adjacent NPCC Control Areas.</li> </ul>	Section A-5.2
		<b>0%</b>

Load Uncertainty Model		
	Statewide and zonal model updated to reflect current data.	Statewide and zonal model updated to reflect current data.
	<ul style="list-style-type: none"> <li>LFU recognizes that some uncertainty exists relative to forecasting.</li> <li>Wider Load Shape for NYC → shifted to the right (as well)</li> <li>NYISO developed – based on collected data and input from LIPA and Con Ed (See Attachment A).</li> <li>Separate LFU models are prepared for four areas: 1) Zones H and I, 2) Zone J (NYC), 3) Zone K (LI) and 4) Zones A-G (rest of NYS).</li> <li>New LFU models and data were prepared for the 2010 IRM Study.</li> </ul>	Section A-5.2.1
		<b>+ 0.1%</b>

## Capacity Resources

### Existing Generating Unit Capacities

	Updated DMNC test values	<ul style="list-style-type: none"> <li>Updated DMNC test values</li> <li>Use the minimum of DMNC or CRIS values.</li> </ul>	Section A-5.3
	<ul style="list-style-type: none"> <li>Planned <u>non-wind</u> facilities, retirements and reratings are summarized in Appendix A.</li> <li>The rating for each existing and planned resource facility is based on DMNC, derived from seasonal tests required by the NYISO's ICAP Manual.</li> </ul>		<b>+ 0.2%</b>

### Proposed New Generation Capacity

	<ul style="list-style-type: none"> <li>Those listed on <i>Attachments B-1 (Wind) and Attachment B-2 (Solar)</i>.</li> </ul>	<ul style="list-style-type: none"> <li>Those listed on Attachment B.</li> </ul>	Section A-5.3
	<ul style="list-style-type: none"> <li>New Intermittent generation increases the IRM due to lower unit availabilities.</li> <li>Includes units built since the 2010 Gold Book and those non-renewable units with Interconnection agreements signed by August 1, 2010.</li> <li>Renewables based on RPS agreements and ICS input.</li> </ul>		<b>- 0.1%</b>

### Wind Resource Production Modeling

	1,326 MW ... derived from hourly wind data with average Summer Peak Hour availability factor of approximately 11%.	1,333.2 MW ... derived from hourly wind data with average Summer Peak Hour availability factor of approximately 11%. See Attachment B-1.	Section A-5.3
	<ul style="list-style-type: none"> <li>Based on collected hourly wind data.</li> <li>Summer Peak Hour capacity factor based on June 1 through August 31 – hours (beginning) 2:00 to 5:00 PM.</li> <li>Small increase of wind capacity = 7.2 MW</li> </ul>		<b>0%</b>

### Retirements

	<ul style="list-style-type: none"> <li>NYPA Poletti 1 = 891 MW (02/10)</li> <li>AES Greenidge 3 = 52 MW (12/09)</li> <li>AES Westover 7 = 40.2 MW (12/09).</li> </ul>	<ul style="list-style-type: none"> <li>Energy Systems North East (ESNE) = 74.5 MW (Zone A)</li> </ul>	Section A-5.3
	<ul style="list-style-type: none"> <li>Since the retiring ESNE unit is located in capacity-rich Zone A, there was no system-wide impact of this retirement.</li> <li>Based on 2010 Gold Book plus units indicated by PSC notification.</li> </ul>		<b>0%</b>

## Availability & Maintenance

### Forced & Partial Outage Rates (EFORs)

	5-year (2004-08) GADS data. (Those units with less than five years data could use available representative data.)	5-year (2005-09) GADS data. (Those units with less than five years data could use available representative data.)	Section A-5.3
	<ul style="list-style-type: none"> <li>• Most recent 5-year period (see Attachments C and C-1)</li> <li>• Includes proxy data for unit(s) deemed suspect as part of the GADS screening process.</li> <li>• The EFORs in higher-risk zones has increased dramatically from 2008.</li> <li>• During 2005-2009, NYCA generators are trending higher forced outage rates, particularly in NYC and LI.</li> <li>• Increased 5-year rolling average forced outage rates (FORs) caused a 0.3% FOR Increase in the 2009 Study – and once again, a 0.3% FOR increase for the 2010 IRM Study.</li> </ul>		<b>+0.3%</b>

### Planned Outages

	Based on schedules received by NYISO and adjusted for history	Based on schedules received by NYISO and adjusted for history	Section A-5.3
	<ul style="list-style-type: none"> <li>• Updated schedules</li> </ul>		<b>0%</b>

### Summer Maintenance

	Modeled 150 MW after reviewing last year's data.	Use 150 MW after reviewing last year's data.	Section A-5.3
	<ul style="list-style-type: none"> <li>• Review of most recent data suggests continuing with approximately 150 MW.</li> </ul>		<b>+0.2%</b>

### Combustion Gas Turbines Ambient Derate

	Derate based on provided temperature correction curves.	<ul style="list-style-type: none"> <li>• Derate based on provided temperature correction curves.</li> <li>• Add derates for new units.</li> </ul>	Section A-5.3
	<ul style="list-style-type: none"> <li>• Operational history indicates derates are in line with manufacturer's curves.</li> </ul>		<b>0%</b>

### Environmental Impacts

	No impact on unit availability due to RGGI. The base case assumes that any forthcoming NOx RACT rule will not	No impact on unit availability due to RGGI. The base case assumes that any forthcoming NOx RACT rule will not	
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require compliance by summer 2010	require compliance by summer 2011.	
<ul style="list-style-type: none"> <li>• Future year sensitivity may be run.</li> <li>• No reliability impact due to RGGI.</li> <li>• System can adjust to RGGI.</li> <li>• Little NOx impacts over the next year due to program phase-in.</li> <li>• See NYISO Whitepaper</li> <li>• See Attachment F.</li> <li>• Sensitivity with NOx measures implemented over a 2-year period.</li> </ul>		<b>0%</b>

<b>Non-NYPA Hydro Capacity Modeling</b>		
45% derating	45% derating	Section A-5.3
<ul style="list-style-type: none"> <li>• Review of historic and most recent data.</li> </ul>		<b>0%</b>

<b>Emergency Operating Procedures (EOPs) &amp; Assistance</b>
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<b>Special Case Resources (SCRs)</b>		
<ul style="list-style-type: none"> <li>• 2575 MW (July 10) based on 3 year historical growth rate.</li> <li>• Monthly variation based on historical experience.</li> <li>• Limit to 4 calls per month in July and August for proposed DEC limited generation (about 30 hours total).</li> </ul>	<ul style="list-style-type: none"> <li>• 2498 MW (August 11) based on NYISO growth rate forecast.</li> <li>• Monthly variation based on historical experience.</li> </ul>	Section A-5.3
<ul style="list-style-type: none"> <li>• 77 MW decrease in SCRs.</li> <li>• Those sold for the program, discounted to historic availability and distributed according to zonal performance.</li> <li>• Methodology for growth rate forecast has improved.</li> <li>• See SCR determinations in Attachment F.</li> </ul> <ul style="list-style-type: none"> <li>• Effectiveness of program went from 92% to less than 74% while registrations grew.</li> <li>• The 18% loss of effectiveness translates to 560 MW → well over 1%.</li> <li>• SCRs sold for the program, discounted to historic availability and distributed according to zonal performance.</li> </ul>		<b>- 0.3%</b>

<b>Emergency Demand Response Program (EDRP) Resources</b>		
<ul style="list-style-type: none"> <li>• 329 MW registered</li> <li>• Modeled as 148 MW in July and August and proportional to monthly peak load in other months.</li> <li>• Limit to 5 calls per month.</li> </ul>	<ul style="list-style-type: none"> <li>• 260 MW registered</li> <li>• Modeled as 172 MW in July and August and proportional to monthly peak load in other months.</li> <li>• Limit to 5 calls per month.</li> </ul>	Grandfathered contracts per FERC. Section A-5.3

	<ul style="list-style-type: none"> <li>• 69 MW decrease in EDRP registrations.</li> <li>• 24 MW increase in modeled amount.</li> <li>• Those registered for the program, discounted to historic availability. (66% overall ) August values calculated from 2010 August registrations.</li> </ul>	<b>0%</b>

<b>External Capacity Purchases</b>		
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	<p>Grandfathered amounts:</p> <ul style="list-style-type: none"> <li>• New England = 50 MW</li> <li>• PJM = 1080 MW</li> <li>• Quebec = 1090 MW</li> </ul> <p>Equivalent Contracts modeled.</p>	<p>Grandfathered amounts are modeled as actual contracts on border interfaces:</p> <ul style="list-style-type: none"> <li>• New England = 50 MW</li> <li>• PJM* = 37 MW</li> <li>• Quebec = 1090 MW</li> </ul> <p>* Also, 1043 MW modeled as de-ration on the Upstate ties to PJM.</p>	Section A-5.3
	<ul style="list-style-type: none"> <li>• Grandfathered contracts per FERC.</li> <li>• De-ration to account for Existing Transmission Capacity for Native</li> <li>• Load (ETCNL).</li> <li>• Fewer contracts may translate into more assistance (especially when coupled with new CA representations).</li> </ul>		<b>- 0.4%</b>

<b>Capacity Sales</b>		
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	<ul style="list-style-type: none"> <li>• In addition to the long term firm sales of 303 MW, include known firm contracts of 641 MW from NE FCM market.</li> <li>• Equivalent Contracts modeled.</li> </ul>	<ul style="list-style-type: none"> <li>• In addition to the long term firm sales of 303 MW (nominal value), include known firm contracts of 716 MW as a result of NE FCM market auctions.</li> <li>• Contracts modeled on border interfaces.</li> </ul>	
	<ul style="list-style-type: none"> <li>• Other firm contracts are becoming known, such as from neighbor's forward capacity markets.</li> <li>• Good performers outweigh bad performers leaving system.</li> <li>• Impacts transfers too.</li> <li>• Other firm contracts are becoming known, such as from neighboring CA Forward Capacity Markets.</li> </ul>		<b>0%</b>

<b>Capacity Wheel-throughs</b>		
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	None modeled; sensitivity modeled	None modeled; a sensitivity case may be run.	
	<ul style="list-style-type: none"> <li>• The ISO tariff is silent about capacity wheels through NYCA.</li> </ul>		<b>0%</b>

	<ul style="list-style-type: none"> <li>• Expected to affect Upstate to Downstate transfers.</li> <li>• Potential contracts could have an adverse impact on internal transfers.</li> <li>• One potential capacity wheel-through that was evaluated was the "HQ Wheel" ... 300 MW from HQ with 50% to NE and 50% to PJM.</li> </ul>	
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Emergency Operating Procedures (EOPs) except SCRs and EDRPs		
700 MW of non-SCR/EDRP MWs.	737 MW of non-SCR/EDRP MWs.	Section A-5.4
<ul style="list-style-type: none"> <li>• 37 MW increase of Non-SCR/EDRP EOPs</li> <li>• Based on TO information, measured data, and NYISO forecasts. See Attachment D.</li> </ul>		<b>- 0.4%</b>

### Transmission System Model

Interface Limits		
<ul style="list-style-type: none"> <li>• Based on 2009 Operating Study, 2009 Operations Engineering Voltage Studies, 2009 Comprehensive Planning Process, and additional analysis.</li> </ul>	<ul style="list-style-type: none"> <li>• Based on 2010 Operating Study, 2010 Operations Engineering Voltage Studies, 2010 Comprehensive Planning Process, and additional analyses including interregional planning initiatives.</li> <li>• Operation of M29 Line shows improvement in transfer from Zone I (Dunwoodie) to Zone J (New York City) by 350 MW.</li> </ul>	Section A-5.5
<ul style="list-style-type: none"> <li>• NYISO engineering studies and additional analysis and input from other external Control Areas.</li> <li>• Power factor improvement initiatives and lower forecast loads have resulted in higher transfer capability on the Dysinger East, West Central, and Volney East interfaces.</li> <li>• See Attachments E, E-1, and E-2.</li> </ul>		<b>0%</b>

New Transmission Capability		
Linden Variable Frequency Transformer (VFT) = 300 MW.	Upgrade on Northport Norwalk Cable (NNC) line – from 286 MW to 428 MW.	Section A-5.5
<ul style="list-style-type: none"> <li>• Based on TO provided models and NYISO review.</li> <li>• NNC rating is per preliminary TO study.</li> <li>• Confirmation to occur before final base case.</li> </ul> <ul style="list-style-type: none"> <li>• Helps assistance over multiple lines.</li> <li>• Based on NYISO analysis and Con Edison models.</li> </ul>		<b>- 0.3%</b>

Transmission Cable Forced Outage Rate		
All existing Cable EFORS updated on LI	All existing Cable EFORS updated on LI	Section A-5.5

	and NYC to reflect 5 year history.	and NYC to reflect 5 year history.	
	<ul style="list-style-type: none"> <li>• Based on TO analysis.</li> <li>• Very similar to last year.</li> </ul>		<b>+ 0.2%</b>

<b>Unforced Capacity Deliverability Rights (UDRs)</b>			
	UDRs have been issued for the Cross Sound Cable, Neptune cable, and Linden VFT Project.	No new projected UDRs.	Per transmission owner notification
	<ul style="list-style-type: none"> <li>• Contracted amounts of capacity are confidential – and are included as capacity internal to NYCA.</li> <li>• More contracts mean less assistance.</li> </ul>		<b>0%</b>

### Other Modeling Considerations

<b>GE-MARS computer Model Version</b>			
	Version 2.98	Version 3.01	Section A-2
	<ul style="list-style-type: none"> <li>• Per testing and recommendation by ICS.</li> </ul>		<b>0%</b>

<b>Outside World Area Models</b>			
	<ul style="list-style-type: none"> <li>• Single Area representations for Ontario and Quebec.</li> <li>• Three (3) zones modeled for PJM.</li> <li>• Five (5) zones modeled for New England derived from 13 zones provided.</li> </ul>	<ul style="list-style-type: none"> <li>• Single Area representations for Ontario and Quebec.</li> <li>• Four (4) zones modeled for PJM.</li> <li>• Thirteen (13) zones modeled for New England.</li> </ul>	Section A-5.7
	<ul style="list-style-type: none"> <li>• The load and capacity data is provided by the neighboring Areas. This updated data has been adjusted as described in Policy 5.</li> <li>• Lower load forecasts (due to economy) may possibly allow more emergency assistance into the NYCA.</li> </ul>		<b>- 0.7%</b>

<b>Reserve Sharing between Areas</b>			
	<ul style="list-style-type: none"> <li>• All Control Areas have indicated that they will share reserves equally among all.</li> </ul>	All Control Areas have indicated that they will share reserves equally among all.	Section A-5.7

	<ul style="list-style-type: none"><li>• Per NPCC CP-8 working group assumption.</li><li>• Generally, equal sharing helps NYCA as it is the hub of the Northeast.</li><li>• The Load and Capacity data (including zonal information, if available) is provided by the neighboring CAs.</li><li>• Single area representations are for Ontario and Quebec.</li><li>• Three zones are modeled for PJM.</li><li>• Five zones are modeled for New England (derived from 14 zones provided).</li></ul>	<b>0%</b>
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