
High Renewable Resource Modeling

Joshua Boles

Senior Manager, Capacity Market Operations

NYSRC Executive Committee

January 10, 2020,
Wolferts Roost Country Club, Albany, NY



Background

- **The NYSRC Executive Committee requested that the Installed Capacity Subcommittee, with the support of the NYISO, perform an analysis of the potential impact on the IRM and LCRs from a hypothetical case in which the NYCA has a high penetration of intermittent renewable resources over the 2020 Capability Year**
 - Analysis performed with the support of the NYISO

Study Data & Methodology

DRAFT – FOR DISCUSSION PURPOSES ONLY
© COPYRIGHT NYISO 2019. ALL RIGHTS RESERVED.

Methodology

- Provide a LOLE evaluation to determine NYCA IRM in high renewable scenario
- Begin with the NYSRC 2020 IRM Study Preliminary Base Case (PBC) assumptions (in which $LOLE \leq 0.100$)
 - Add 4,000 MW of solar PV
 - Add 4,000 MW of incremental onshore wind
 - Add 4,000 MW of offshore wind
- Perform Tan45 Analysis

Location of ICAP

Area	Solar (MW)	On-Shore (MW)	Off-Shore (MW)	Total (MW)
A	874	1,030		1,904
C	406	994		1,400
D		894		894
E		1,082		1,082
F	1,884			1,884
G	448			448
J			2,000	2,000
K	388		2,000	2,388
NYCA	4,000	4,000	4,000	12,000

<http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={424F3723-155F-4A75-BF3E-E575E6B0AFDC}>

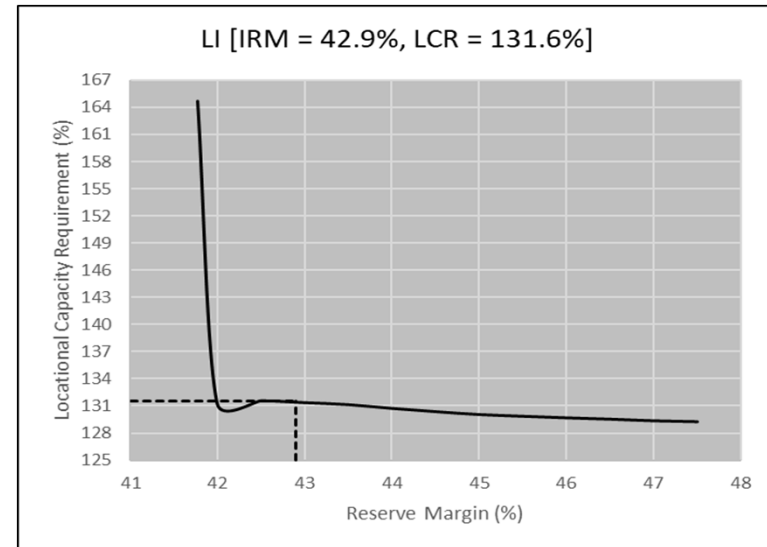
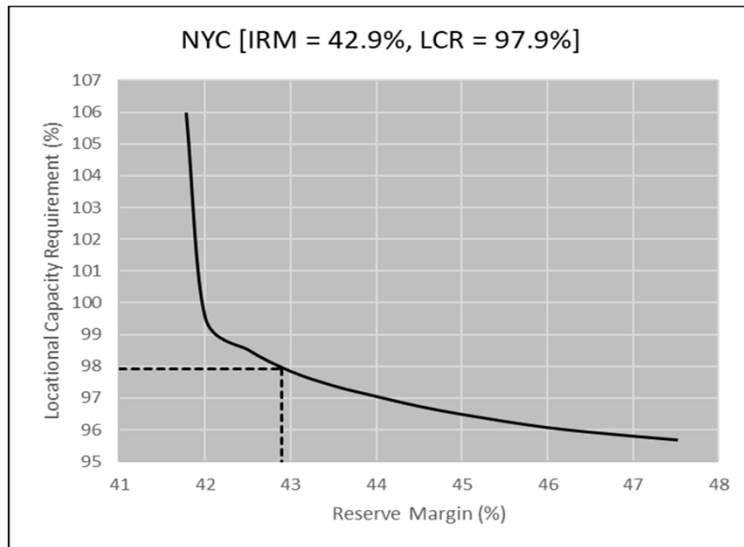


Preliminary Results & Takeaways

DRAFT – FOR DISCUSSION PURPOSES ONLY
© COPYRIGHT NYISO 2019. ALL RIGHTS RESERVED.

Tan 45 Results

Case	Statewide	URM*	NYC	NYC URM*	Long Island	LI URM*
High Renewable	142.9%	105.1%	97.9%	77.8%	131.6%	95.5%
PBC	118.6%	104.7%	83.9%	75.5%	102.3%	92.1%



*Where **URM** is defined as the **Unforced Capacity Reserve Margin**, or the IRM translated to an unforced capacity basis considering the forced outage ratings of individual units.



Changes from PBC to High Renewables

NYCA	Preliminary Base Case	High Renewable Sensitivity	Deltas
As Found ICAP (MW)	42,465	54,465	+12,000
ICAP @ LOLE =0.1 (MW)	38,251	46,088	+7,837
ICAP Removed (MW)	4,213	8,376	+4,163
UCAP Removed (MW)	3,720	6,162	+2,442
Zone J			
As Found ICAP (MW)	10,348	12,348	+2,000
ICAP @ LOLE =0.1 (MW)	9,775	11,406	+1,631
ICAP Removed (MW)	573	942	+369
UCAP Removed (MW)	515	749	+233
Zone K			
As Found ICAP (MW)	6,133	8,521	+2,388
ICAP @ LOLE =0.1 (MW)	5,292	6,807	+1,515
ICAP Removed (MW)	841	1,714	+873
UCAP Removed (MW)	760	1,244	+484

Additional UCAP

- Based on ICAP Manual (*these values are not directly used by the MARS software*)

Zone	Solar PV	On-Shore	Off-Shore	Total UCAP
A-C	401	312		713
D		123		123
E		186		186
F	525			525
G	123			123
J			588	588
K	113		673	788
Total	1,164	621	1,261	3,046

Recommendations

- This study should be performed periodically as a function of experience with intermittent resources and plans for future developments
- The state also has plans for substantial Energy Storage Resources (ESR) that were not evaluated as part of this study. As MARS capability of modeling storage resources is improved, modeling of ESR should be added to future studies.
- The discrepancies between existing unforced capacity rating methodologies and MARS' UCAP elimination indicates that the reliability value of the added intermittent resources was less than expected and indicates a need for further analysis to understand what is driving the result.
- This study was performed using different annual generation shapes for FTM PV, onshore, and offshore wind that did not overlap. As more annual generation data is developed, the shapes should be aligned so that the study can evaluate the reliability risk of coincident periods of low renewable generation.

Questions?

DRAFT – FOR DISCUSSION PURPOSES ONLY
© COPYRIGHT NYISO 2019. ALL RIGHTS RESERVED.