

High Intermittent Renewable Resources Analysis – Phase 3 Part 1

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Background

- For the first portion of the Phase 3 study, the ICS performed an analysis in which 27,000 MW of hypothetical renewable resources were added to the 2022 IRM FBC (9,000 MW each of on-shore wind, off-shore wind, and solar PV)
- This analysis was performed with internal NYCA transmission constraints removed

Note about Study

- Each part of the phase 3 study was developed without capturing the impacts of transmission constraints
- By removing transmission constraints on the system, there are no longer trade-offs between Zone J/K and the rest of the system
- All the results in Phase 3 study are based on parametric comparisons

Reserve Margin Results

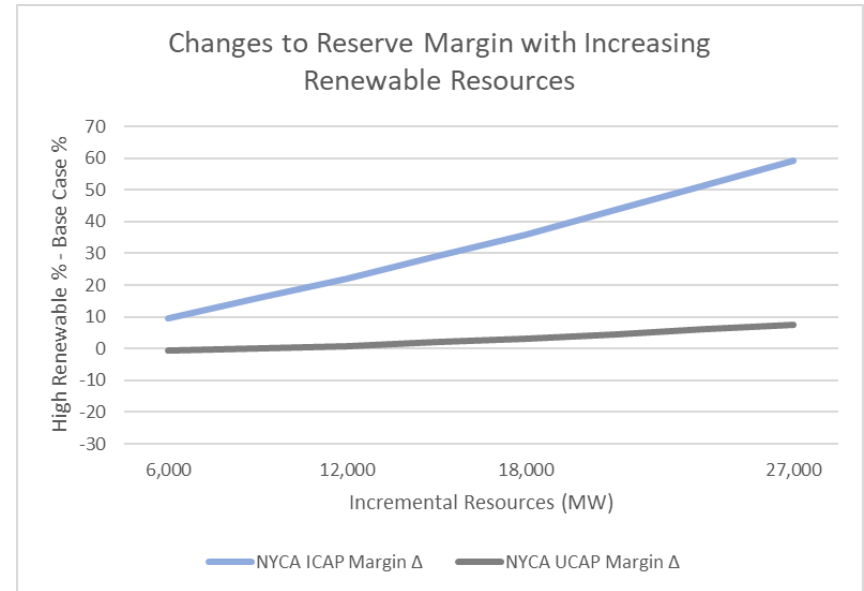
Case and Scenarios	2022 FBC	Phase 3 Part 1	Phase 3 Part 2	Phase 3 Part 3
Resource Changes	Base Case	9,000 MW each renewable type (27,000 MW total)	+3,000 MW ESR	- 1,581 MW Peaker
Transmission Constraints	Included	Removed	Removed	Removed
Installed Capacity Reserve Margin Comparison				
NYCA	119.7%	180.5%		
Unforced Capacity Reserve Margin (URM) Comparison				
NYCA	105.0%	112.5%		

ICAP and UCAP Changes

NYCA	2022 FBC	Part 1	Part 2	Part 3
NYCA Peak Load	32,139	32,139	32,139	32,139
ICAP Changes				
As Found ICAP (MW)	41,037	68,037		
ICAP @ LOLE = 0.1 (MW)	38,481	58,000		
ICAP Removed (MW)	2,556	10,036		
ICAP Reserve Margin	119.7%	180.5%		
UCAP Changes				
As Found UCAP (MW)	36,084	42,938		
UCAP @ LOLE = 0.1 (MW)	33,744	36,147		
UCAP Removed (MW)	2,340	6,791		
UCAP Reserve Margin	105.0%	112.5%		

Results

- This figure aims to illustrate the trend of increasing renewable sources by presenting them relative to their respective base cases



Conclusions

- Increasing the penetration of renewable resources, the ICAP required to maintain the system LOLE at the 0.1 criterion increases. This result is largely driven by lower availability of intermittent resources compared to the average resources on the system
- Similarly, the required UCAP for the NYCA also increases with higher penetration of renewable resources, albeit at lesser slope than that of the IRM

Next Steps

- The runs for Parts 2 and 3 have been completed, and the NYISO is reviewing the results
- The remaining results will be presented in the High Intermittent Renewable Resources Analysis Phase 3 whitepaper

Questions?

Phase 2 Background and Results

- In 2021, the NYRSC ICS performed a three-scenario analysis of potential IRM impacts from hypothetical penetration of intermittent renewable resources (on-shore wind, off-shore wind, and solar PV) on the NYCA
 - 6,000 MW renewable resource ICAP (2,000 MW of each resource)
 - 12,000 MW renewable resource ICAP (4,000 MW of each resource)
 - 18,000 MW renewable resource ICAP (6,000 MW of each resource)
- This analysis added the hypothetical resources to the 2020 IRM PBC with transmission constraints removed
- Results to that study, and the 2020 IRM PBC, are shown below

Case and Scenarios	2020 PBC	Phase 1 Adjusted Results	Phase 2 Scenario A	Phase 2 Scenario B
Resource Changes (of each renewable type)	Base Case	4,000 MW (12,000 MW total)	2,000 MW (6,000 MW total)	6,000 MW (18,000 MW total)
Transmission Constraints	Included	Removed	Removed	Removed
Installed Capacity Reserve Margin Comparison				
NYCA	118.6%	140.8%	128.1%	154.4%
Unforced Capacity Reserve Margin (URM) Comparison				
NYCA	105.0%	105.8%	104.3%	108.1%

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- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policymakers, stakeholders and investors in the power system

