

Economic Planning Process

Production Cost Model Benchmark

Preliminary Results

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Agenda

- **Benchmark Overview**
- **Benchmark Results**
- **Next Steps**

Benchmark Overview

Benchmarking Process Overview

■ Goal

- To validate, test, and tune production cost model performance based on key metrics for the model including Generation, Net Imports, Load and Generation Payments, LBMPs, and Demand Congestion.
- To initialize database for 2023-2042 System & Resource Outlook modelling

■ Process

1. Perform production cost model simulation with actual 2021 historical data as input
2. Compare simulation output with actual system performance for the year 2021 to test model accuracy
3. Adjust model parameters, as needed, to align simulated output with actual historical data
4. Iterate #1-#3

Assumptions & Model Adjustments

■ Assumptions

- 2021 historical year simulated
- 2021 FERC 715 power flow case

■ Model Adjustments

- 2021 actual daily natural gas prices
- 2021 actual zonal hourly load shapes
- 2021 actual emission prices
- 2021 actual renewable energy generation profiles
- 2021 major generation derates and outages captured
- Marcy South Series reactor modeled as in-service in Summer
- Series reactors on Sprain Brook – W 49th St. M51/M52 and Dunwoodie-Mott Haven (71 and 72) lines are bypassed for the entire year

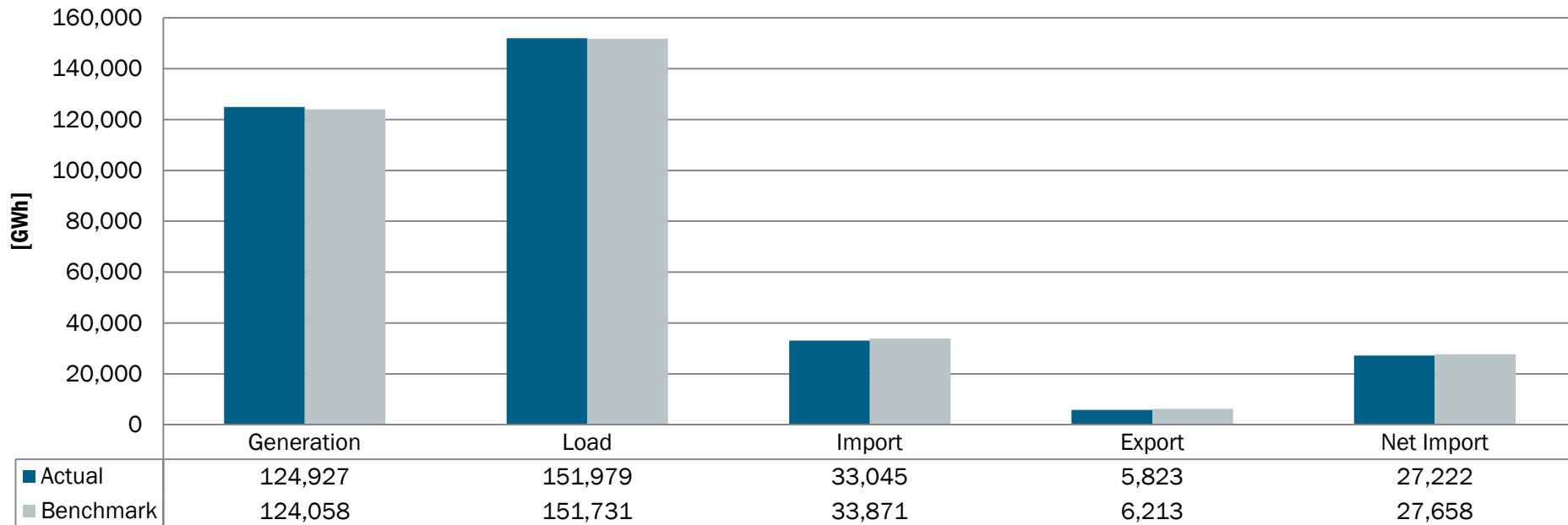
■ Caveats

- Major transmission outages, such as Porter-Rotterdam 230 kV, Moses-Adirondack 230kV, Y49 and Y50 related to construction/upgrades, were not captured in the model

Benchmark Results

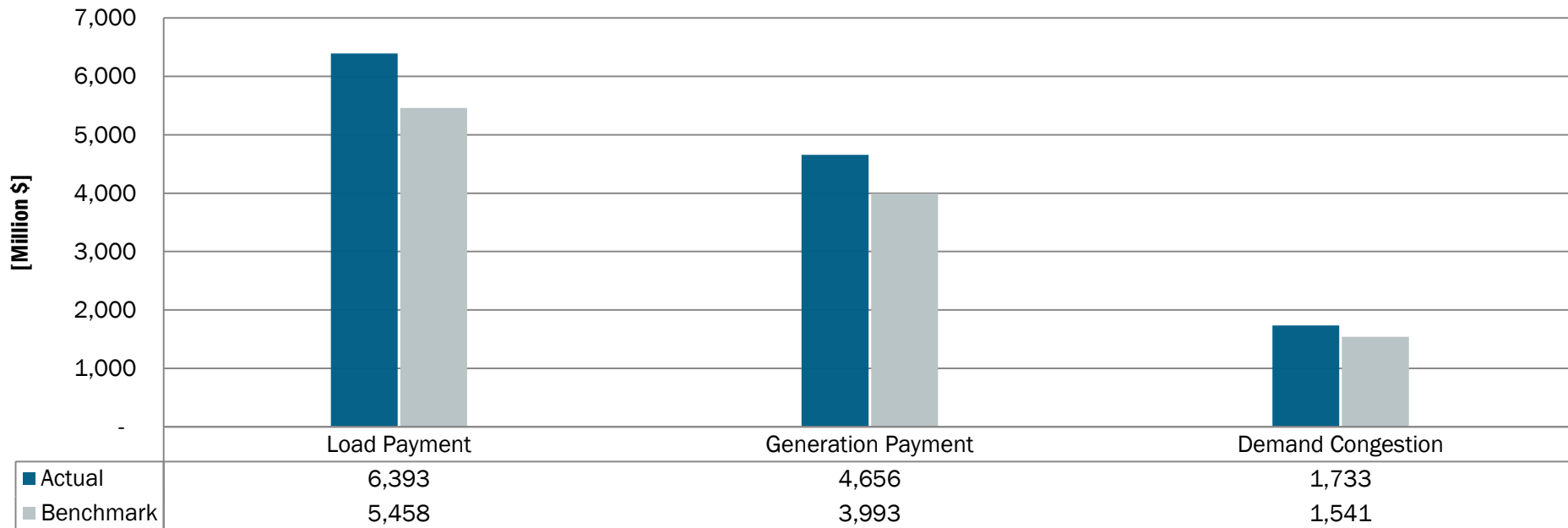
NYCA Summary

2021 NYCA Energy



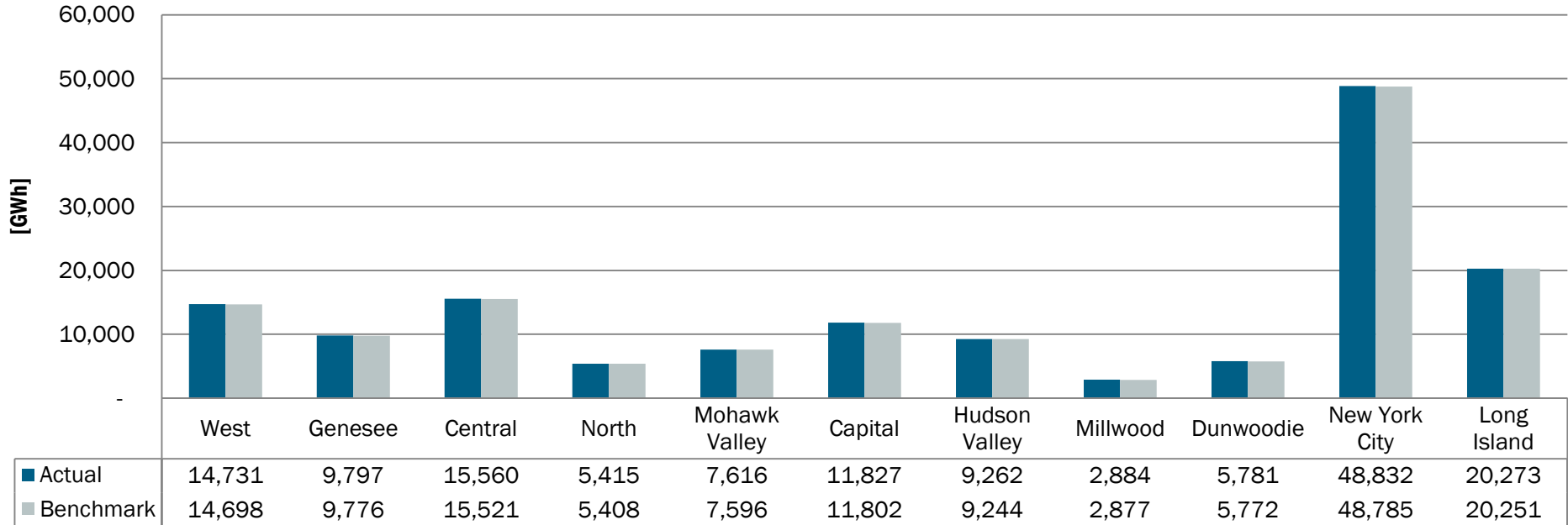
NYCA Cost Summary

2021 NYCA Cost



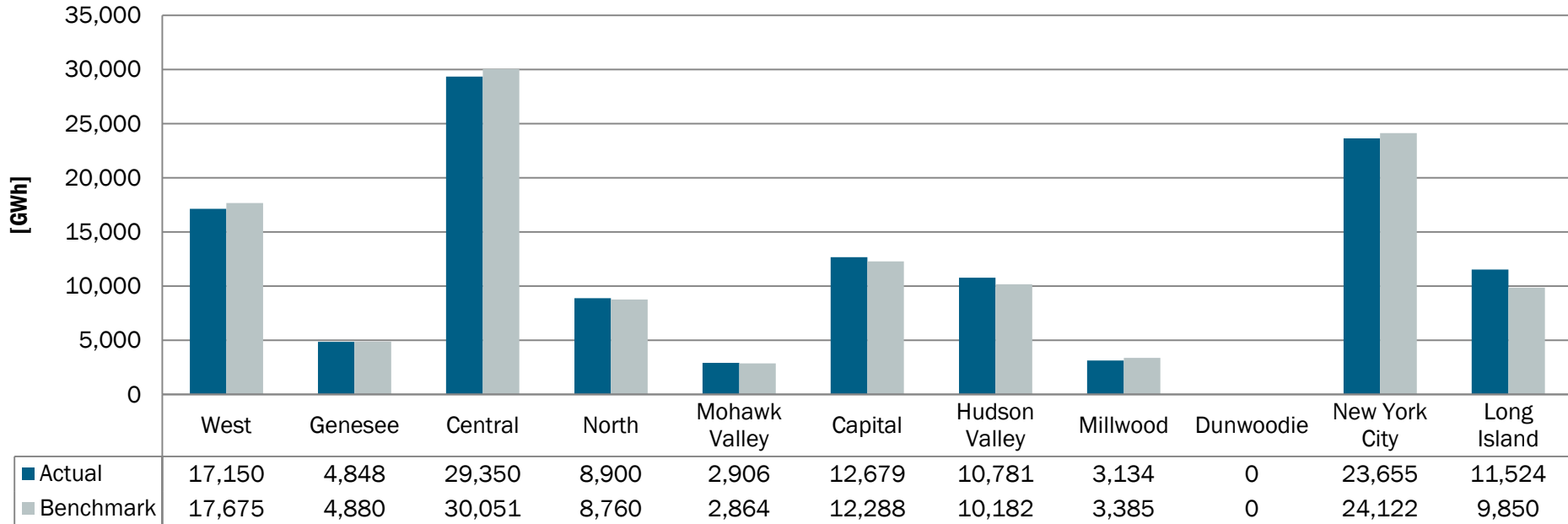
Zonal Load Summary

2021 Zonal Load



Zonal Generation Summary

2021 Zonal Generation



Commitment Hurdle Rates

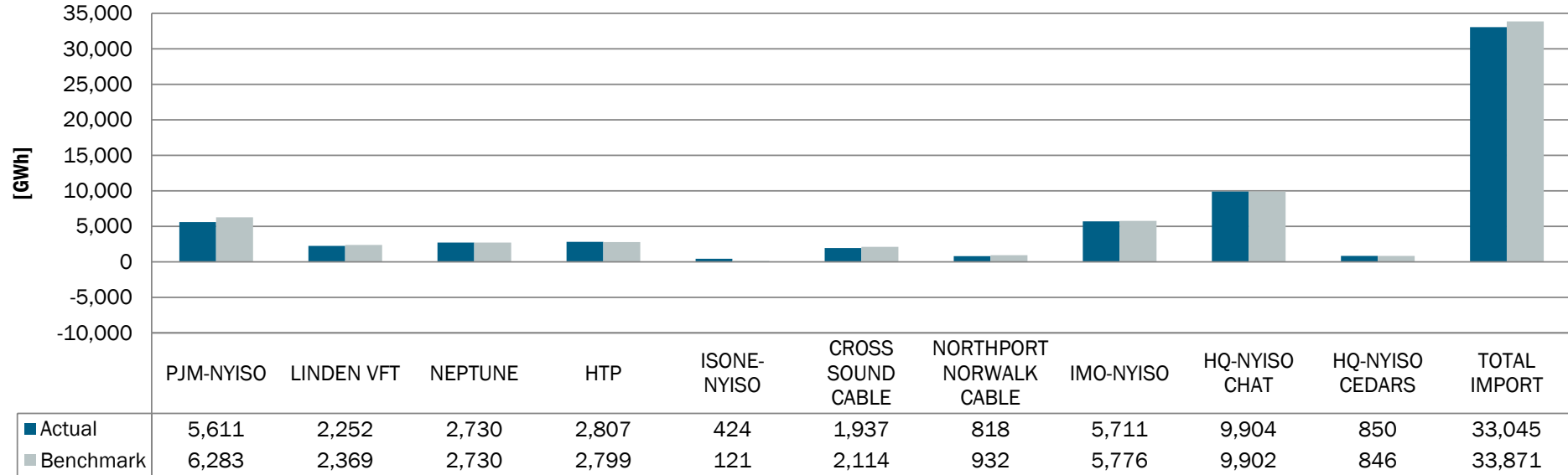
Commitment Hurdle Rate	Export (from NYCA)		Import (into NYCA)	
	2021 System & Resource Outlook	2023 System & Resource Outlook	2021 System & Resource Outlook	2023 System & Resource Outlook
PJM	\$4.00	\$4.00	\$2.00	\$5.50
Linden VFT	\$5.00	\$5.00	\$2.50	\$2.50
Neptune	\$8.00	\$8.00	\$1.80	\$1.80
HTP	\$8.00	\$8.00	\$3.00	\$6.00
ISONE	\$3.00	\$3.20	\$2.00	\$2.00
Cross Sound Cable	\$2.00	\$2.00	\$1.00	\$1.00
Northport Norwalk Cable	\$4.00	\$4.00	\$2.00	\$2.00
IMO	\$6.00	\$7.50	\$3.00	\$3.00

Dispatch Hurdle Rates

Dispatch Hurdle Rate	Export (from NYCA)		Import (into NYCA)	
	2021 System & Resource Outlook	2023 System & Resource Outlook	2021 System & Resource Outlook	2023 System & Resource Outlook
PJM	\$2.00	\$2.00	\$0.50	\$4.50
Linden VFT	\$3.00	\$3.00	\$0.50	\$0.50
Neptune	\$6.00	\$6.00	\$0.80	\$0.80
HTP	\$6.00	\$6.00	\$1.00	\$4.00
ISONE	\$1.00	\$1.20	\$ -	\$ -
Cross Sound Cable	\$ -	\$ -	\$ -	\$ -
Northport Norwalk Cable	\$2.00	\$2.00	\$1.00	\$1.00
IMO	\$4.00	\$5.50	\$1.00	\$1.00

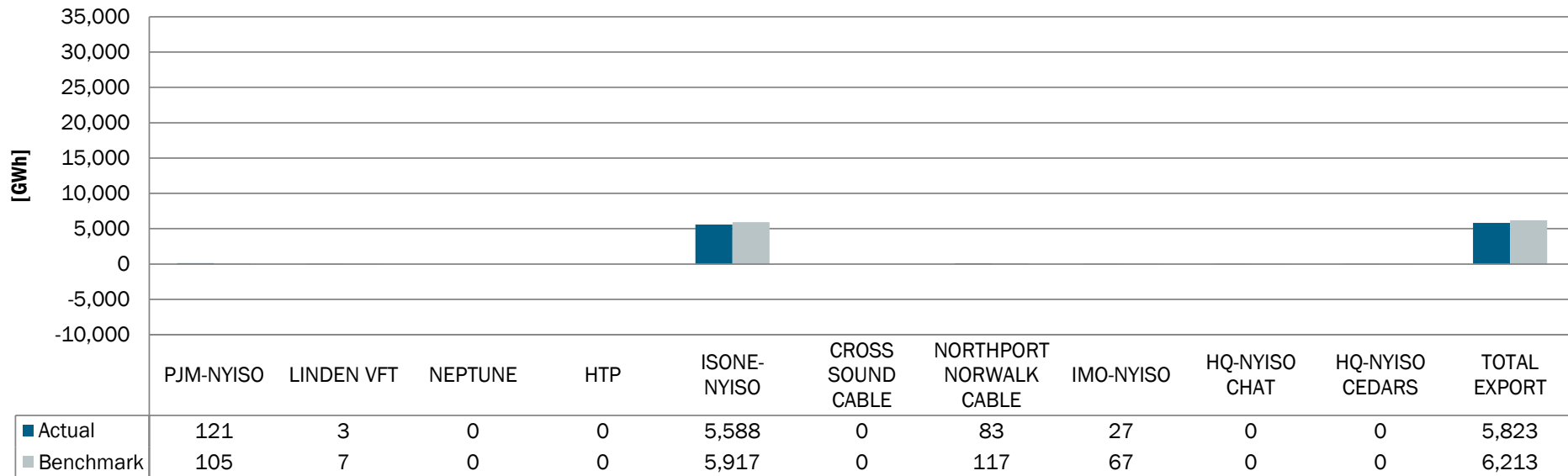
Import Energy Summary

2021 Import Energy



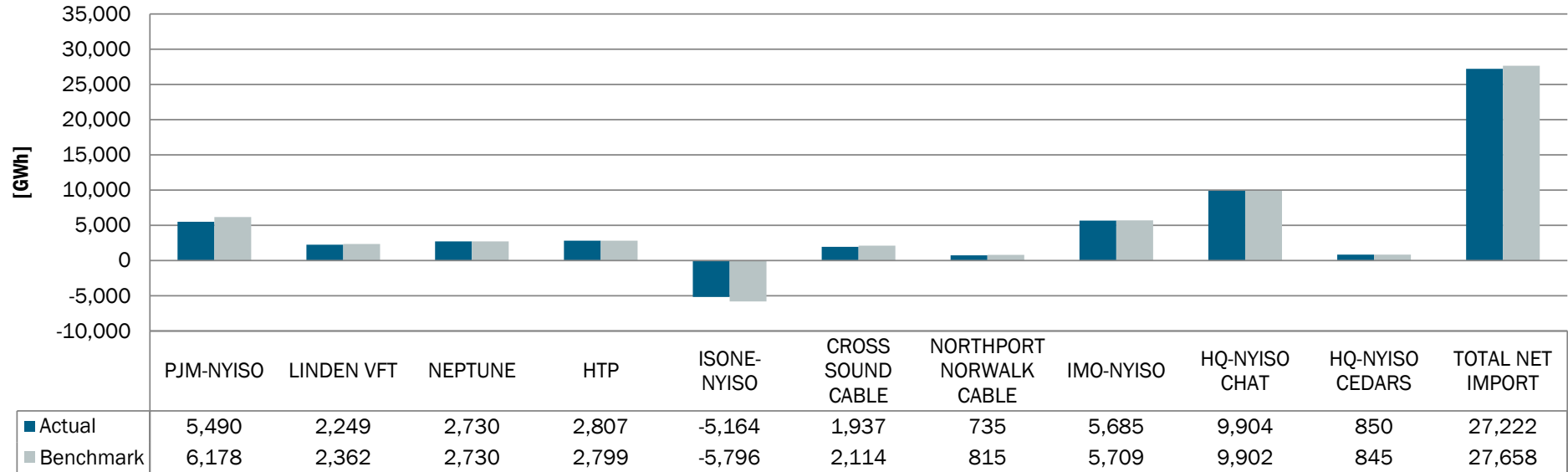
Export Energy Summary

2021 Export Energy



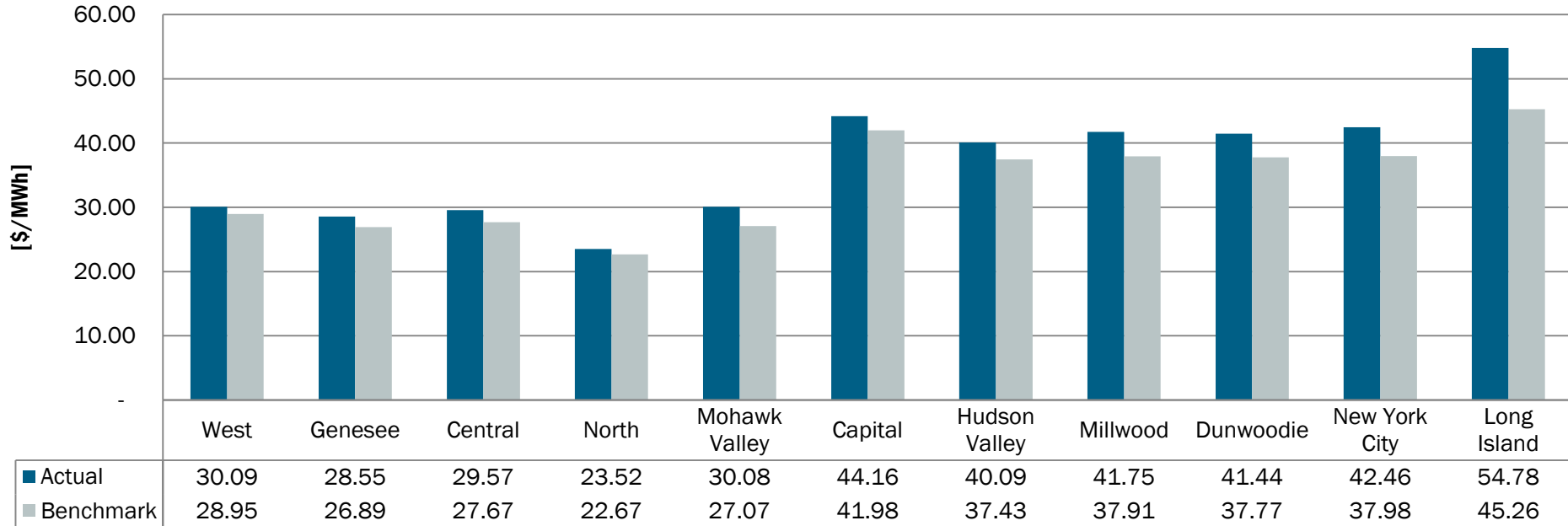
Net Import Energy Summary

2021 Net Import Energy



Zonal LBMP Summary

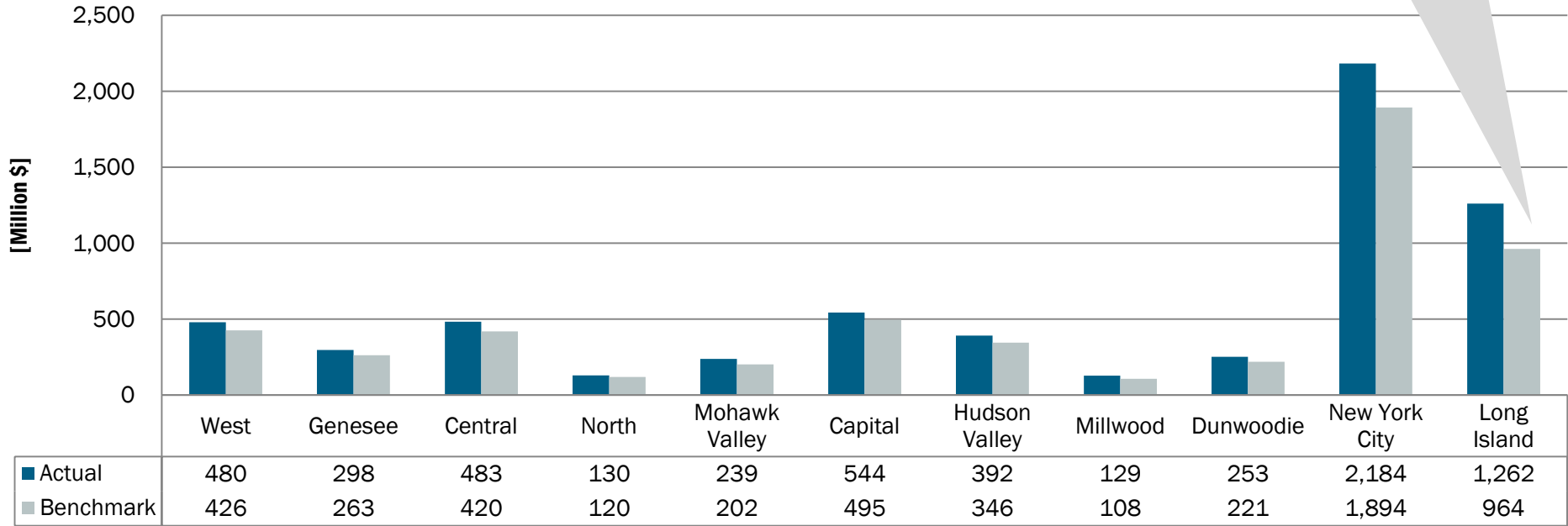
2021 Zonal Average LBMP



Load Payment Summary

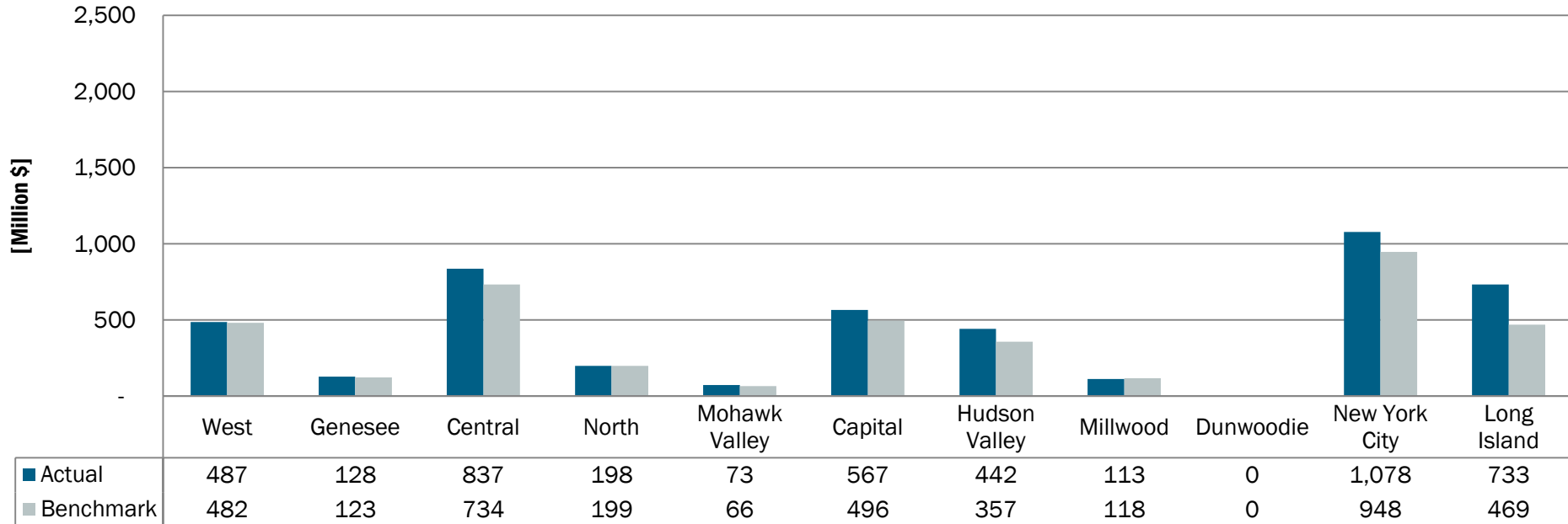
2021 Zonal Load Payment

Lower due to lower LBMP, not capturing outages on Y49/Y50



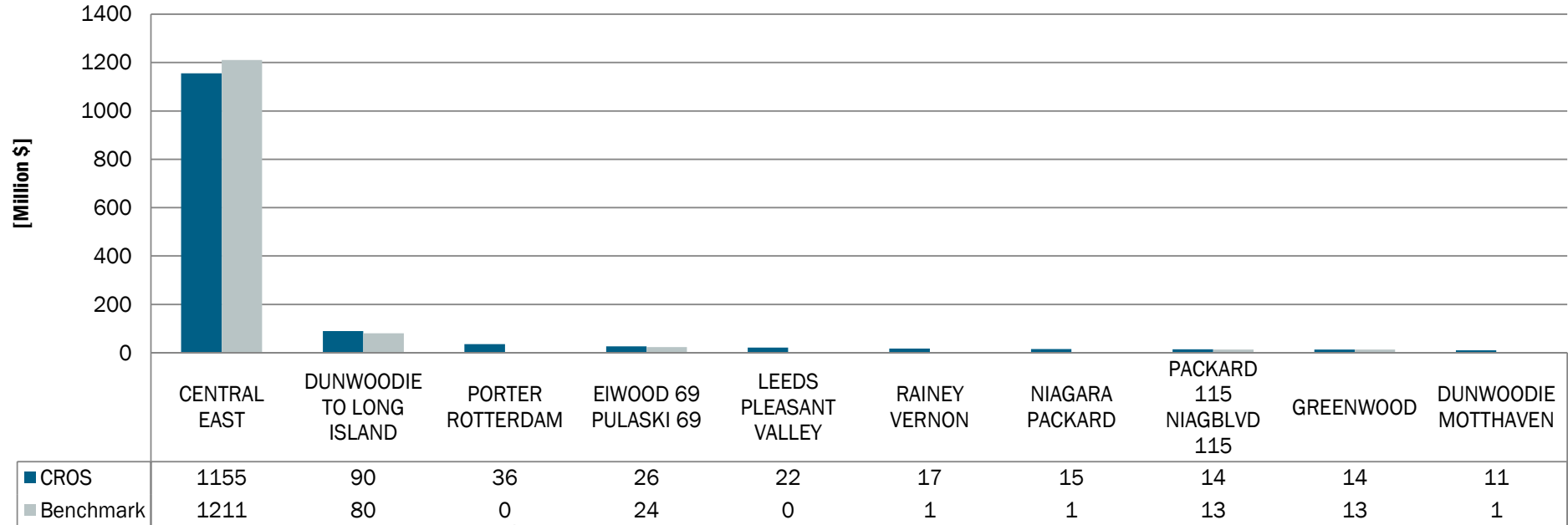
Generation Payment Summary

2021 Zonal Generation Payment



Demand Congestion by Constraint

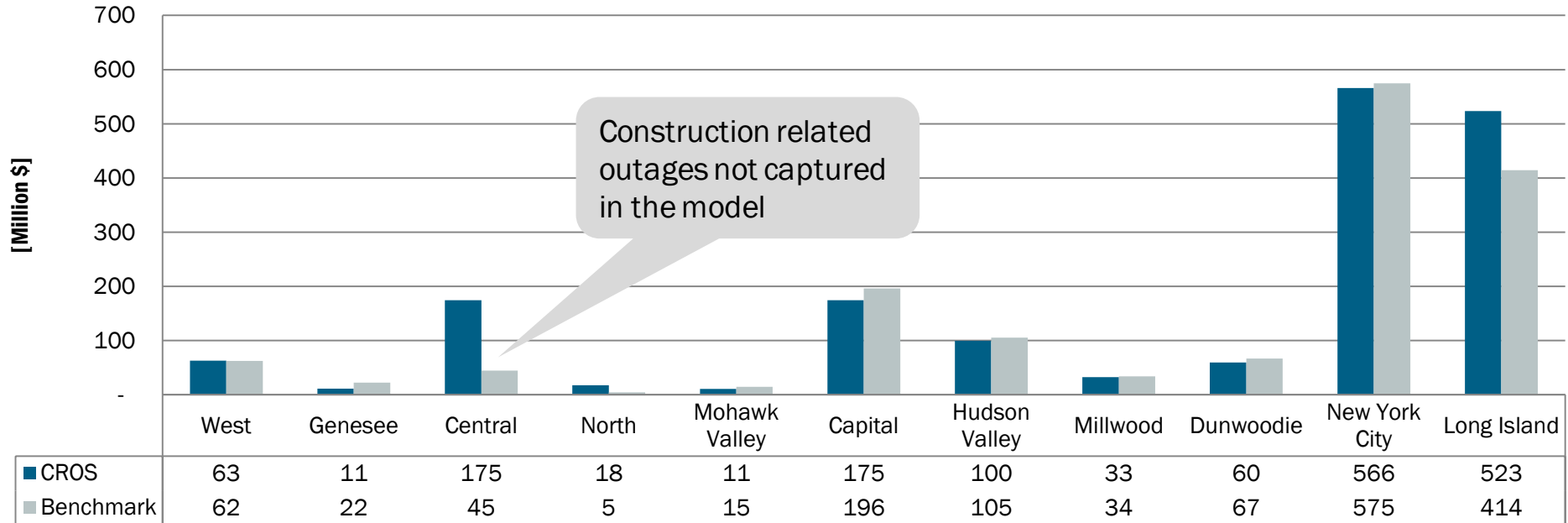
2021 Top 10 Demand Congestion Constraints



Outage related congestion is not captured in the benchmark

Demand Congestion Summary

2021 Zonal Demand Congestion



Next Steps

Next Steps

- **Parameters and adjustments from the benchmark model are carried forward to the production cost database utilized in the 2023-2042 System & Resource Outlook Study.**
- **Continue model development and assumptions for the 2023-2042 System & Resource Outlook Study.**

2023-2042 System & Resource Outlook Data Catalog

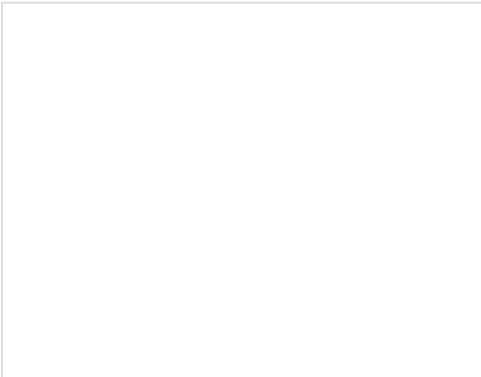
Report



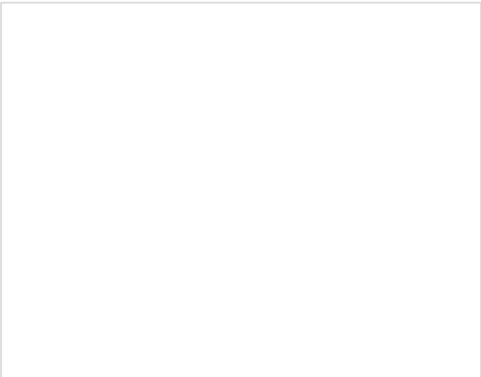
Study Summary



Report Appendices



Data Documents



Stakeholder Presentations

November 18, 2022
[2021 Outlook Lessons Learned](#)
[NYSERDA Outlook Suggestions](#)

June 16, 2023
[2023-2042 Outlook Kickoff](#)

July 17, 2023
2023-2042 Outlook Benchmark
2023-2042 Outlook Update



Appendix

Metric Definitions

$$\text{Load Payment} = \sum_{hour\ 1}^{hour\ 8760} Load \times LBMP$$

$$\text{Generator Payment} = \sum_{hour\ 1}^{hour\ 8760} Generation \times LBMP$$

Zonal Demand Congestion =

$$\sum_{hour\ 1}^{hour\ 8760} \left[\sum_{j=1}^n Shadow\ Price_j \times Zone\ Generation\ Shift\ Factor \times Load \right]$$

Our Mission & Vision



Mission

Ensure power system reliability and competitive markets for New York in a clean energy future



Vision

Working together with stakeholders to build the cleanest, most reliable electric system in the nation