

# 2023-2042 System & Resource Outlook Update

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**Electric System Planning Working Group (ESPWG)**

Tuesday, November 21, 2023

# Agenda

- **Scope & Schedule Review**
- **Reference Case Updates**
  - Base Case
  - Contract Case
  - Policy Case
- **Next Steps**
- **DNV Presentation**
- **Outlook Data Catalog**
- **Appendix**

# Scope & Schedule Review

# System & Resource Outlook Scope

## Model Development

Benchmark

Assumptions

Reference Cases

Sensitivities

Congestion Assessment

Historic & Future Transmission Congestion

Congestion Relief Analysis

## Analyses

Resources to Meet Policy Objectives

Renewable Pockets & Energy Deliverability

Renewable Generation Profiles

Future Resource Attributes

Report, Appendix, Data Catalog, & Fact Sheet

# Preliminary Targeted Study Schedule

| 2023 Q3 | Month                             | July |   |   |   |   | August |   |   |   | September |   |   |   |
|---------|-----------------------------------|------|---|---|---|---|--------|---|---|---|-----------|---|---|---|
|         | Week                              | 1    | 2 | 3 | 4 | 5 | 1      | 2 | 3 | 4 | 1         | 2 | 3 | 4 |
|         | Benchmarking                      | X    | X | X |   |   |        |   |   |   |           |   |   |   |
|         | Assumptions Development           | X    | X | X | X | X | X      | X | X | X | X         | X | X | X |
|         | CapEx Model Development           | X    | X | X | X | X | X      | X | X | X | X         | X | X | X |
|         | Production Cost Model Development | X    | X | X | X | X | X      | X | X | X | X         | X | X | X |
|         | CapEx Results                     |      |   |   |   |   |        |   |   |   |           |   |   |   |
|         | Production Cost Results           |      |   |   |   |   |        |   |   |   |           |   |   |   |
|         | Analyses                          |      |   |   |   |   |        |   |   |   |           |   |   |   |
|         | Report                            |      |   |   |   |   |        |   |   |   |           |   |   |   |

| 2023 Q4 | Month                             | October |   |   |   |   | November |   |   |   | December |   |   |   |
|---------|-----------------------------------|---------|---|---|---|---|----------|---|---|---|----------|---|---|---|
|         | Week                              | 1       | 2 | 3 | 4 | 5 | 1        | 2 | 3 | 4 | 1        | 2 | 3 | 4 |
|         | Benchmarking                      |         |   |   |   |   |          |   |   |   |          |   |   |   |
|         | Assumptions Development           | X       | X | X | X | X | X        | X | X | X |          |   |   |   |
|         | CapEx Model Development           | X       | X | X | X | X | X        | X | X | X |          |   |   |   |
|         | Production Cost Model Development | X       | X | X | X | X | X        | X | X | X | X        | X | X | X |
|         | CapEx Results                     |         |   |   |   |   |          |   |   |   | X        | X | X | X |
|         | Production Cost Results           |         |   |   |   |   |          |   |   |   |          |   |   |   |
|         | Analyses                          |         |   |   |   |   |          |   |   |   |          |   |   |   |
|         | Report                            |         |   |   |   |   |          |   |   |   |          |   |   |   |

# Final Assumptions Matrices

- Also posted with this ESPWG meeting material are the following documents:
  - Production Cost Assumptions Matrix – 11/21/2023
  - Capacity Expansion Assumptions Matrix – 11/21/2023
- Base Case assumptions locked down: 10/15/2023
- Contract Case assumptions locked down: 10/30/2023
- Policy Case assumptions locked down: 11/15/2023

# Base Case

# Base Case Results

- Preliminary Base Case results were presented at the 11/02 TPAS/ESPWG
- The following incremental changes have been made to the Base Case model:
  - Ratings updated for Knickerbocker – Alps 345 kV line
  - Updated annual energy target for hydro resources
  - Updated inflation patterns from EIA's Annual Energy Outlook
- Results from the updated Base Case are consistent with preliminary Base Case results and trends presented at the 11/02 TPAS/ESPWG meeting
  - Differences in results as compared to the preliminary Base Case include changes to internal NY generation and net imports due to updates to inflation patterns and hydro resource energy forecasts
- Final Base Case results for the 2023-2042 Outlook are included in the Appendix



# Updated Renewable Profile Integration

- **DNV was contracted to provide simulated hourly LBW and UPV profiles**
  - Corresponding OSW project [details](#) and [profiles](#) have previously been shared with stakeholders
- **The NYISO is translating the DNV database profiles for use in the production cost and capacity expansion modeling. The NYISO will utilize the 2018 year to align with load shapes as discussed at October 24, 2023 ESPWG ([Slide 9](#))**
  - Base and Awarded wind and solar generators at the generator/county level
  - Candidate generators in the capacity expansion model will assume aggregate county or zonal profiles
  - In production cost, new candidate units are placed at an interconnection point within the selected county/zone. Candidate units are assigned a profile from the nearest site in the same county in the DNV database to the assumed project interconnection point
  - OSW modeling will use profiles reflective of location of awarded projects. More details on OSW candidate generator modeling in capacity expansion will be provided at a future ESPWG
- **Profiles used as inputs to the modeling will be made available with the study materials**
  - The NYISO is considering posting 2018 hourly aggregate zonal and county LBW and UPV net capacity factor profiles
  - The NYISO seeks feedback on posting additional years and more granular site level data

# Contract Case

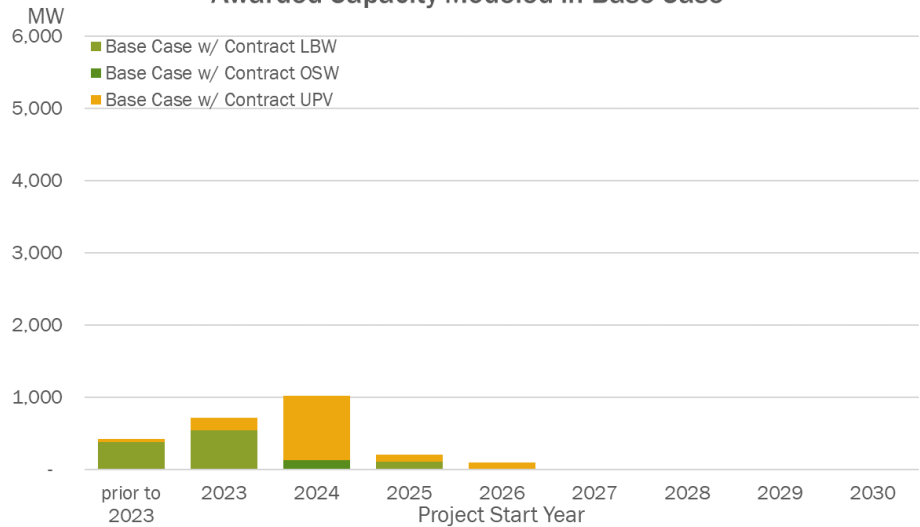
# Contract Case Update

- Assumptions for the Contract Case were locked down 10/30/2023
- Model development for the Contract Case is ongoing
- Preliminary results for the Contract Case are anticipated December 2023

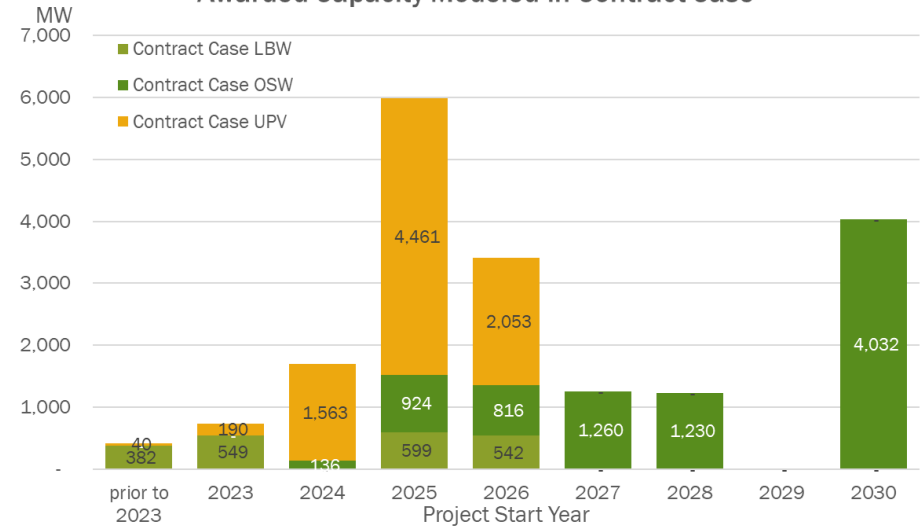
# Summary of Contract Case Capacity Additions

- Figures show capacity added to the Base Case generation resources, which also have existing awards and meet filter criteria

Awarded Capacity Modeled in Base Case



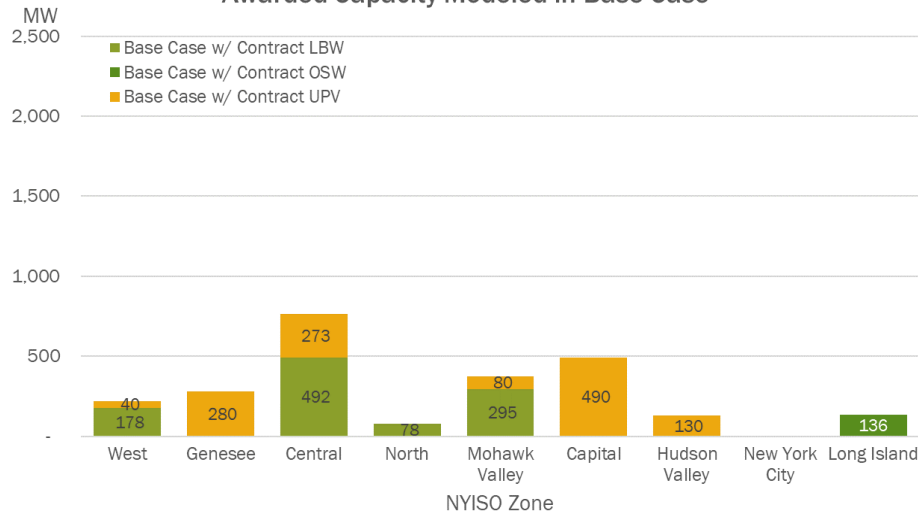
Awarded Capacity Modeled in Contract Case



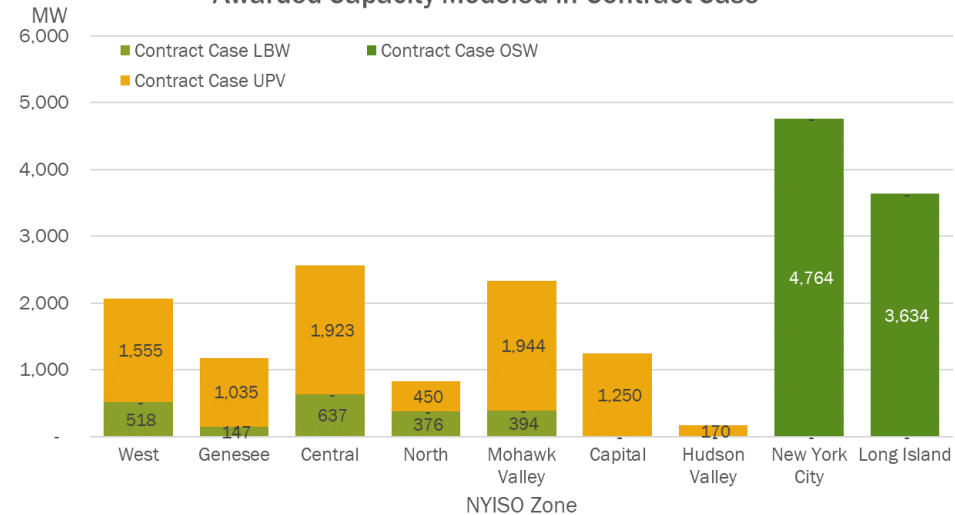
# Summary of Contract Case Capacity Additions

- Figures show capacity added to the Base Case generation resources which also have existing awards and meet filter criteria

Awarded Capacity Modeled in Base Case



Awarded Capacity Modeled in Contract Case



# Policy Case

# Policy Case Assumptions

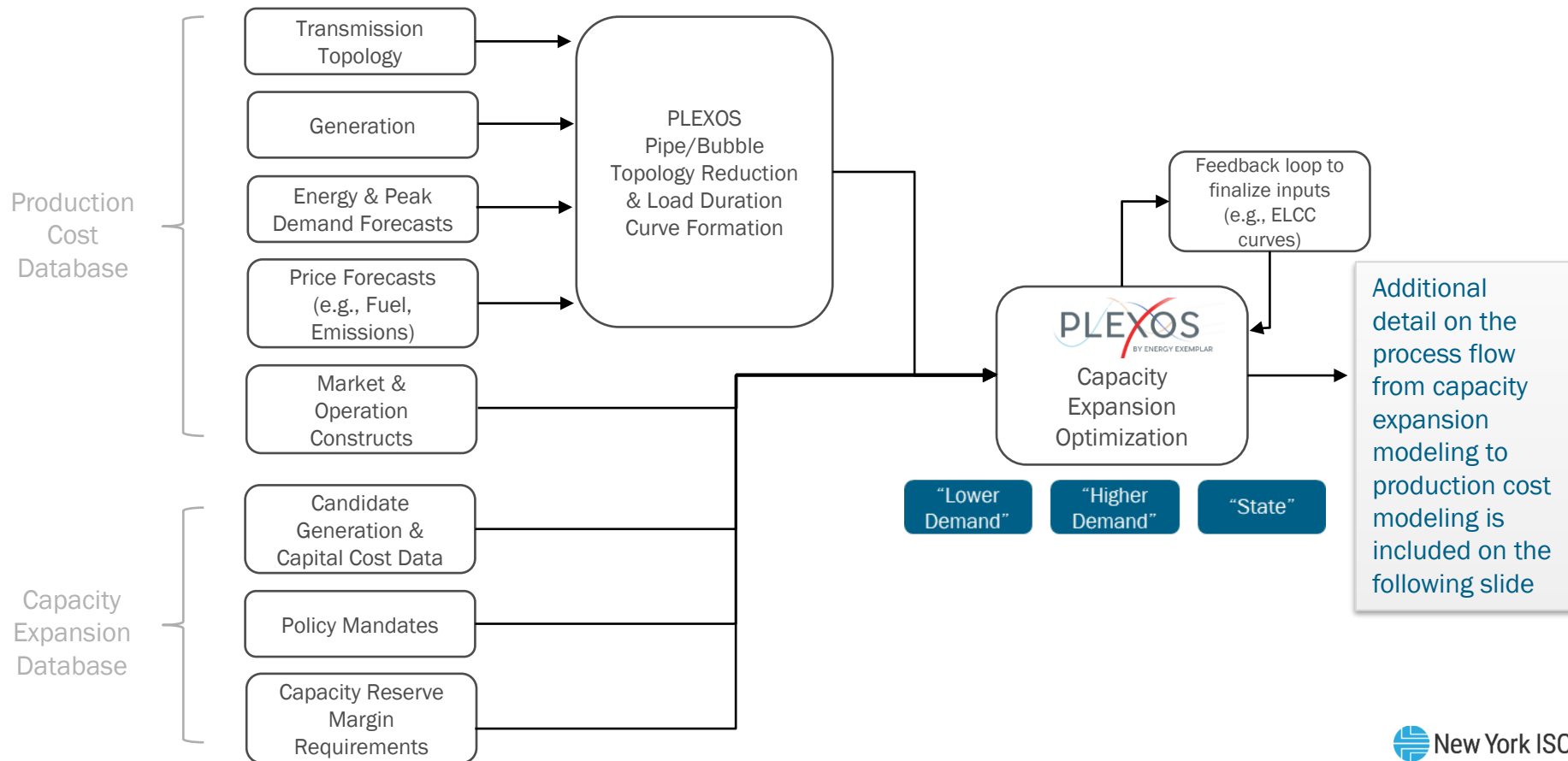
- Assumptions for the Policy Case were locked down 11/15/2023
- The following documents are posted with today's meeting materials:
  - Production Cost Assumptions Matrix (11/21/2023)
  - Capacity Expansion Assumptions Matrix (11/21/2023)
- Development of the three Policy Case scenarios in the capacity expansion model is ongoing
  - Development of the production cost model for the Policy Case will begin following the completion of the Contract Case

# Policy Case Overview

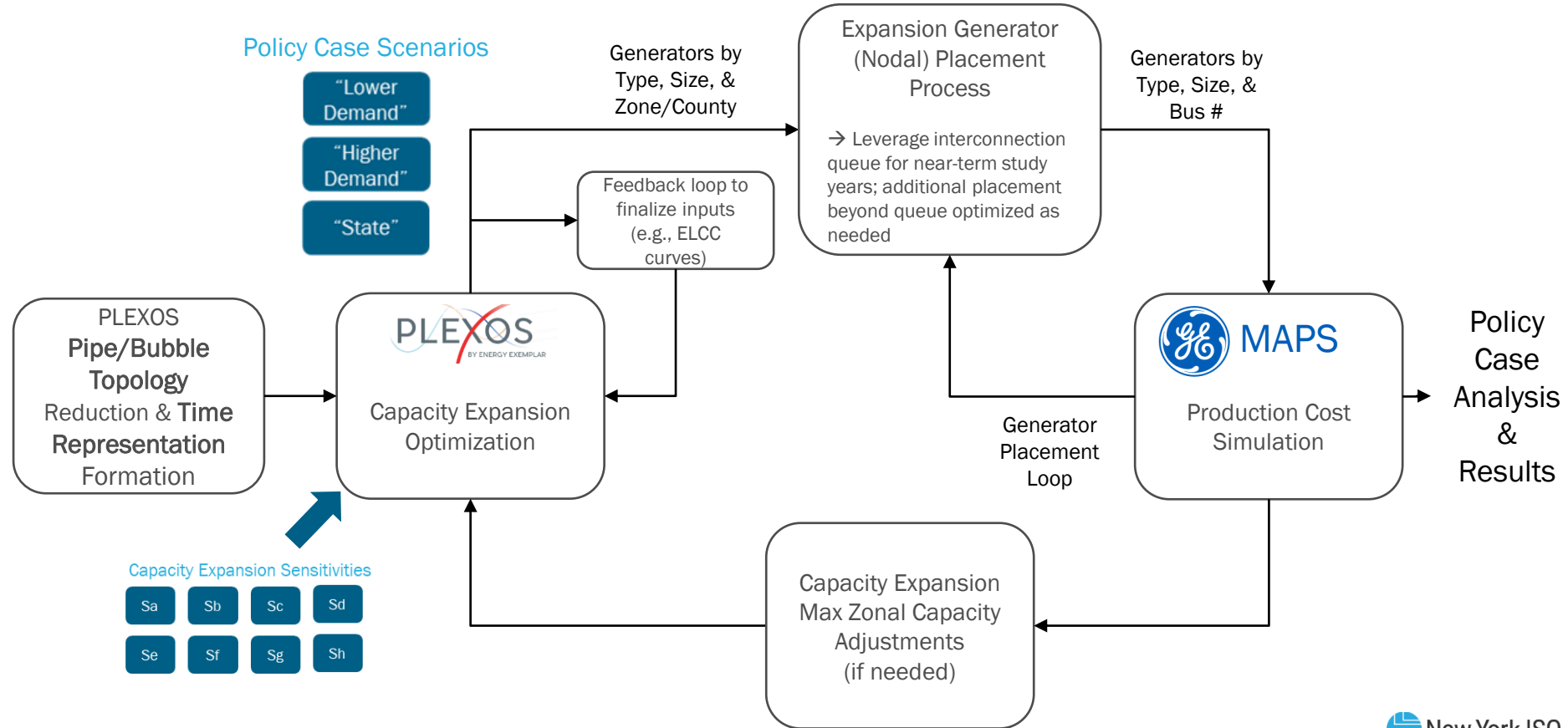
- In addition to production cost simulations, the Policy Case will also include capacity expansion modeling
- An overview of the process for the Policy Case, including the interplay between the two models, are included on the following slides



# Policy Case Process Flow



# Policy Case Simulation Framework



# Next Steps

# Next Steps

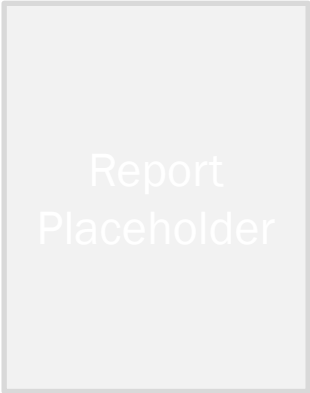
- Continue model development of production cost and capacity expansion models
- Preliminary Contract Case results
- Upcoming Stakeholder Presentations
  - December 19, 2023 ESPWG

# Questions, Comments, & Feedback?

Email additional feedback to:  
SCarkner@nyiso.com  
one week prior the next ESPWG

# 2023-2042 System & Resource Outlook Data Catalog

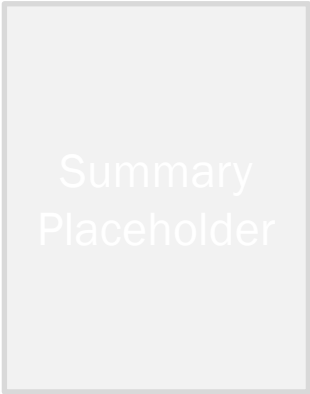
Report



Report Appendices

Production Cost Model Benchmark Draft

Study Summary



Data Documents

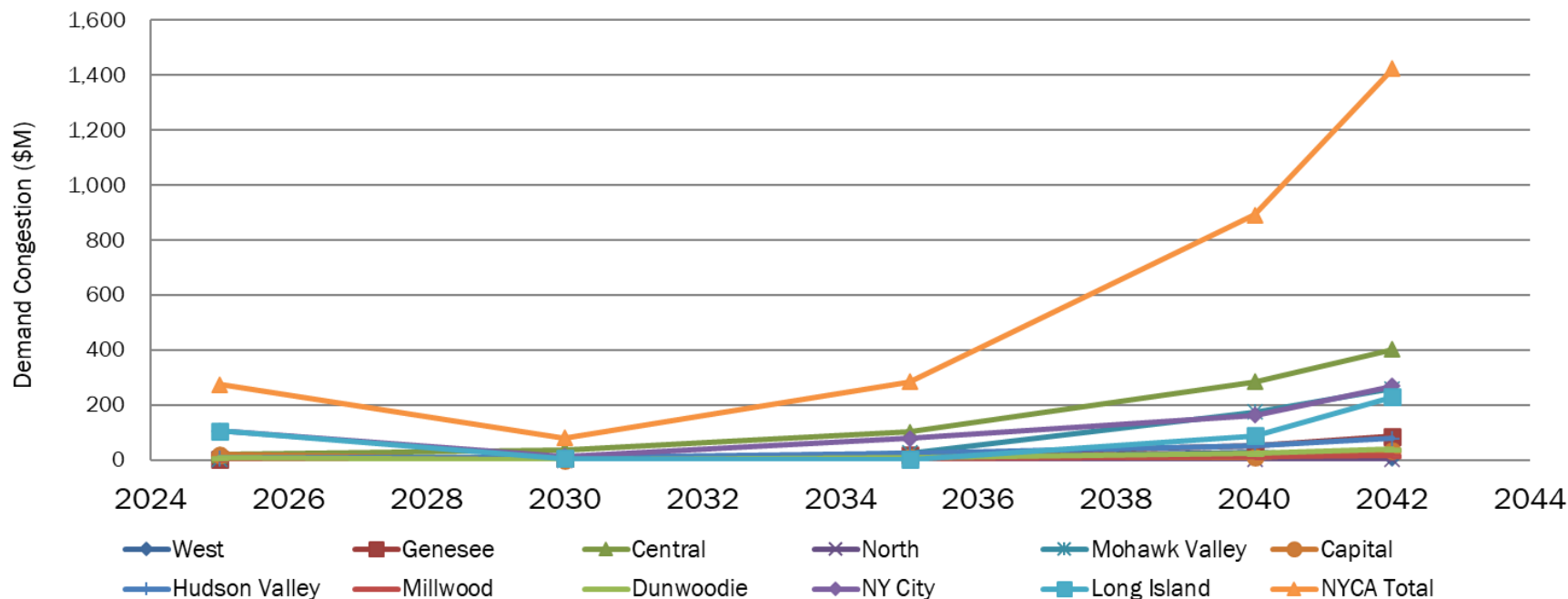
Offshore Wind Simulated Hourly Profiles

## Stakeholder Presentations

|   |  |
|---|--|
| <p><u>November 18, 2022</u></p> <p><u>2021-2040 Outlook Lessons Learned</u><br/><u>NYSDA Outlook Suggestions</u></p> <p><u>June 16, 2023</u></p> <p><u>2023-2042 Outlook Kickoff</u></p> <p><u>July 17, 2023</u></p> <p><u>2023-2042 Outlook Benchmark</u><br/><u>2023-2042 Outlook Update</u></p> <p><u>August 22, 2023</u></p> <p><u>2023-2042 Outlook Preliminary</u><br/><u>Reference Case Assumptions</u></p> <p><u>September 21, 2023</u></p> <p><u>2023-2042 Outlook Reference Case</u><br/><u>Assumptions Update</u></p> <p><u>October 24, 2023</u></p> <p><u>2023-2042 Outlook Reference Case</u><br/><u>Assumptions Update</u></p> <p><u>November 2, 2023</u></p> <p><u>2023-2042 Outlook Reference Case</u><br/><u>Assumptions Update &amp; Preliminary</u><br/><u>Base Case Results</u></p> |  |
|---|--|

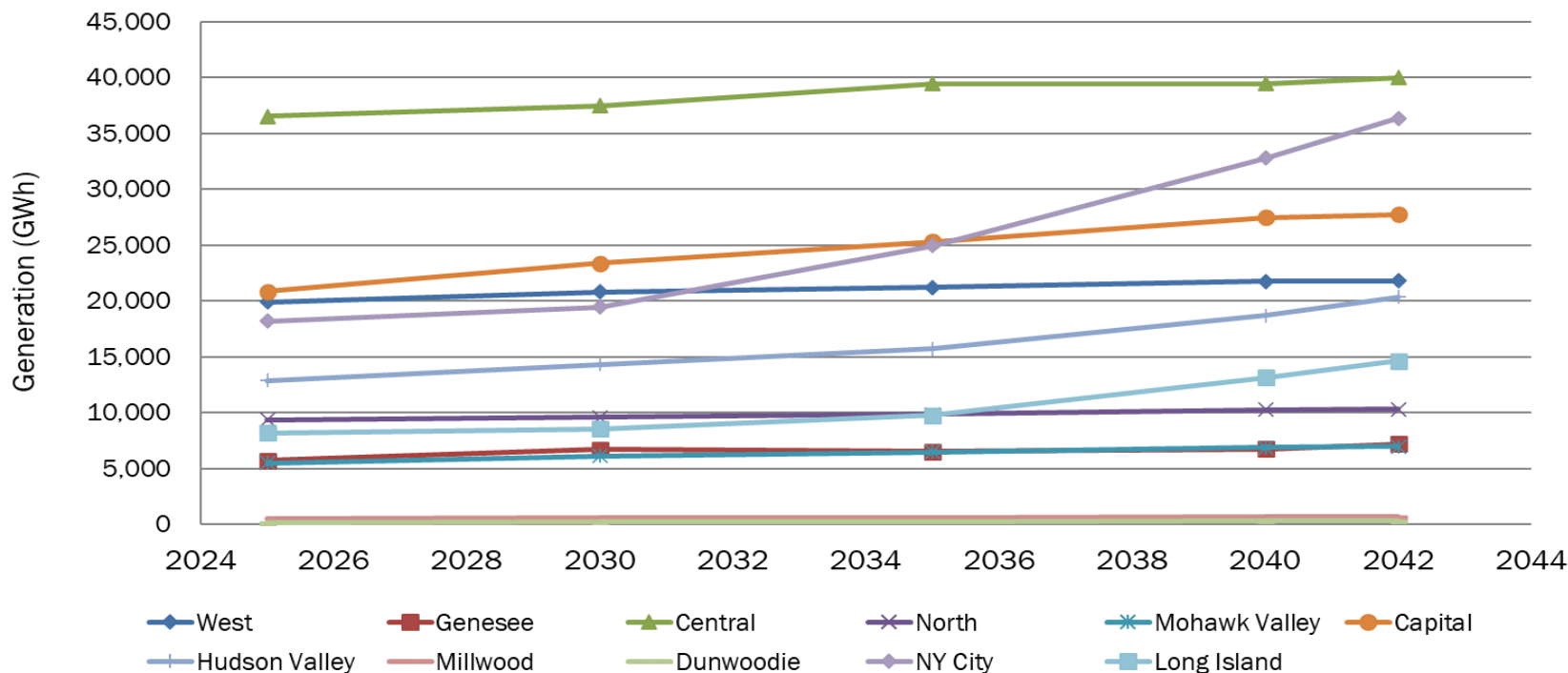
# Appendix: Final Base Case Results

# Zonal Demand Congestion (nominal \$M)

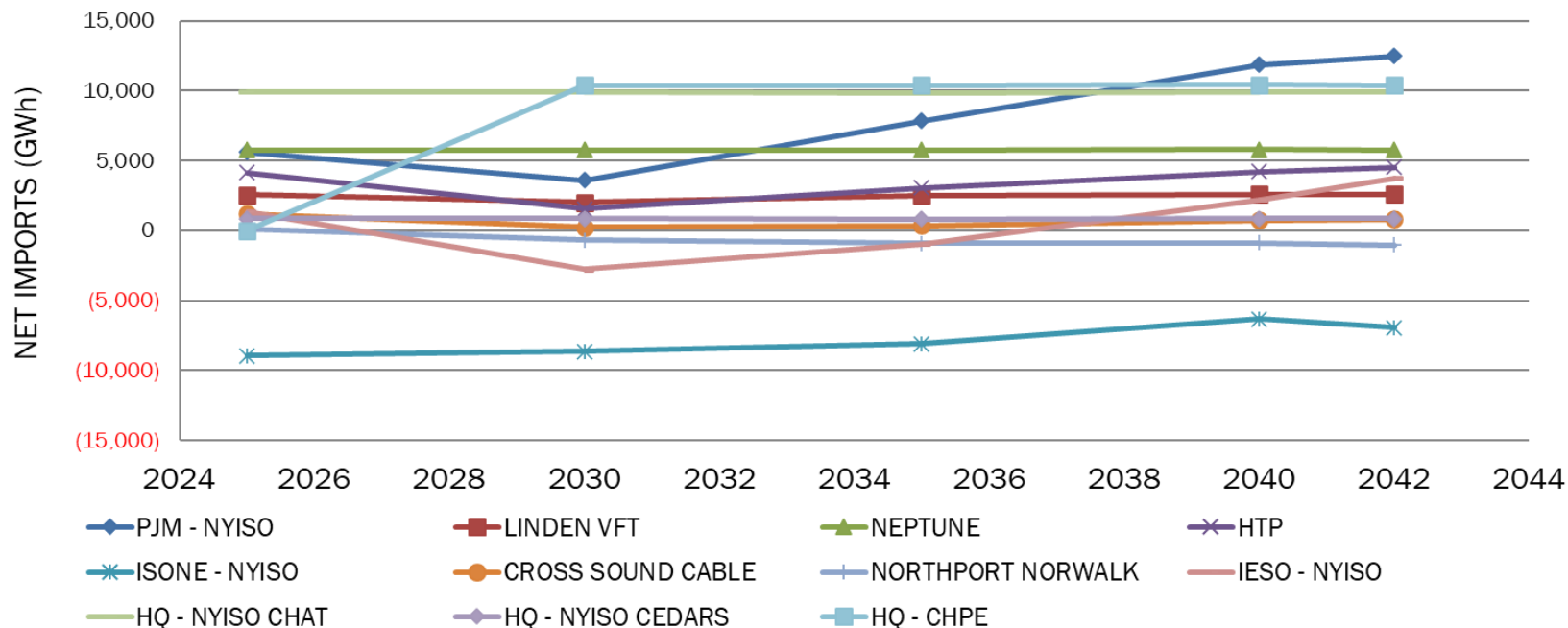




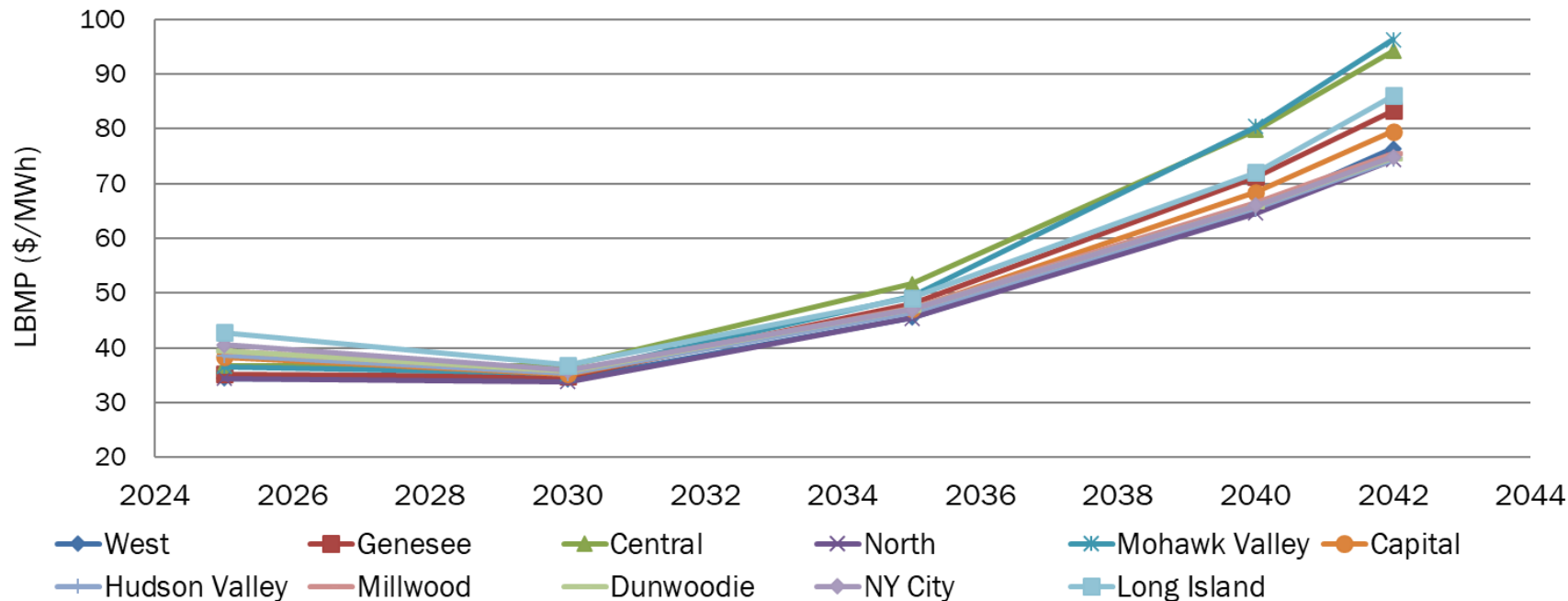
# Zonal NYCA Generation (GWh)



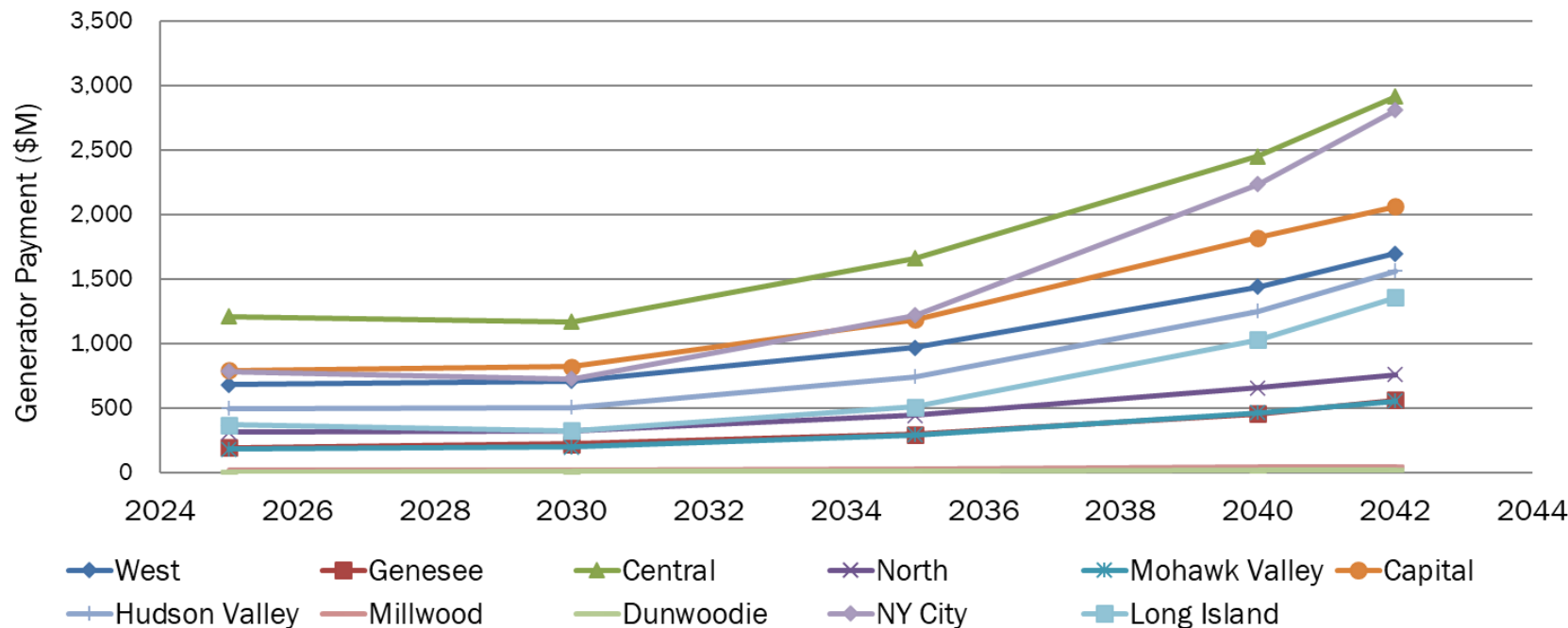
# Projected Net Imports (GWh)



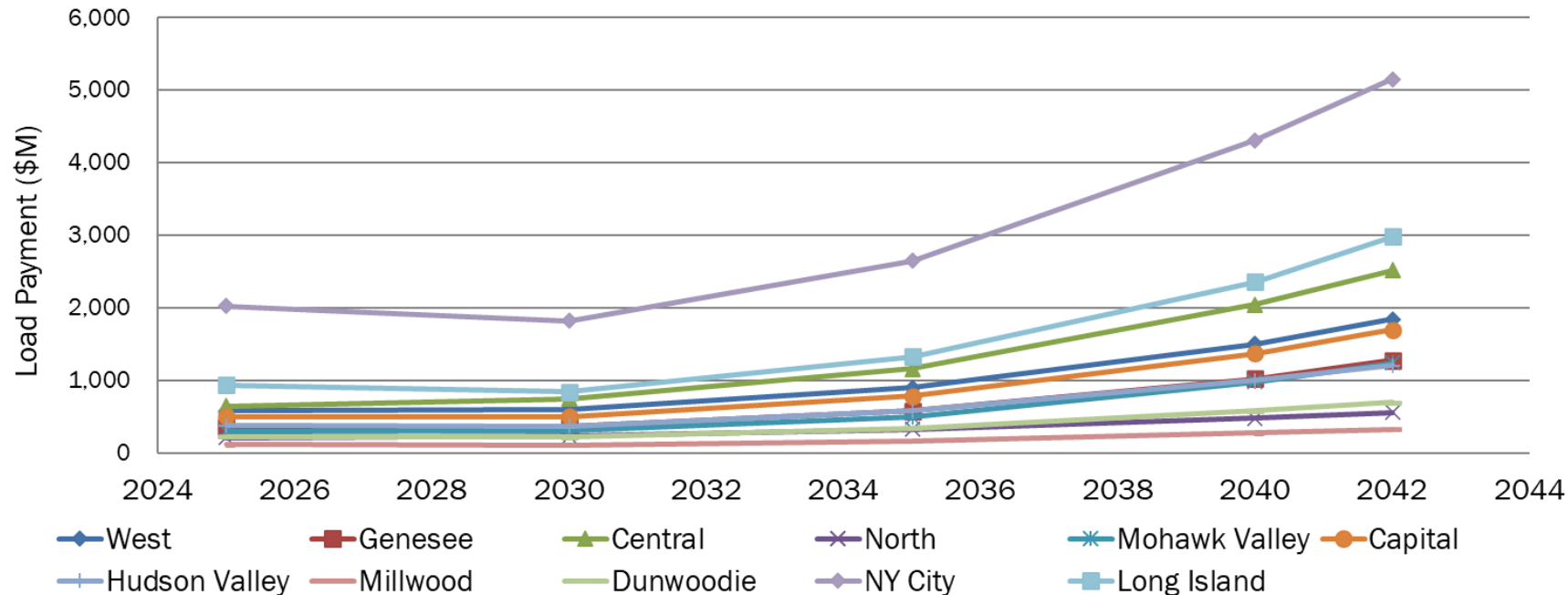
# Zonal NYCA LBMP (\$/MWh)



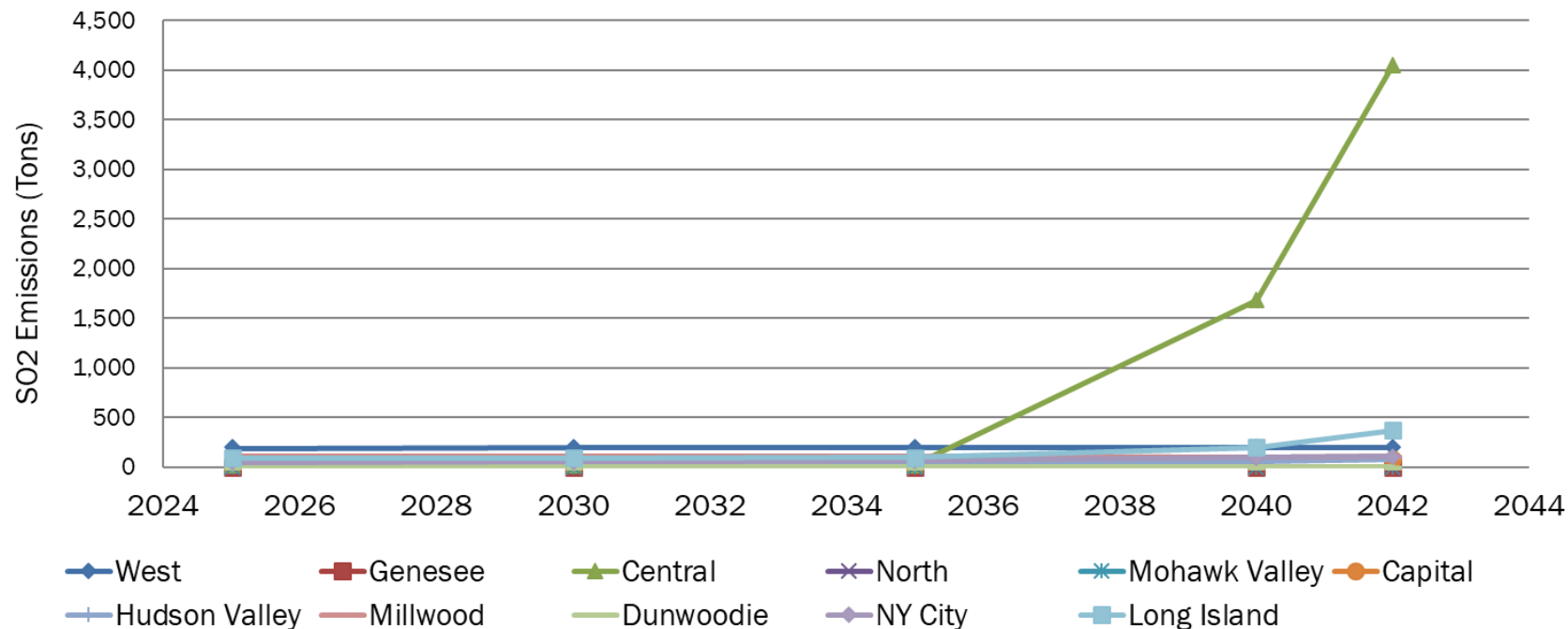
# Zonal Generator Payments (nominal \$M)



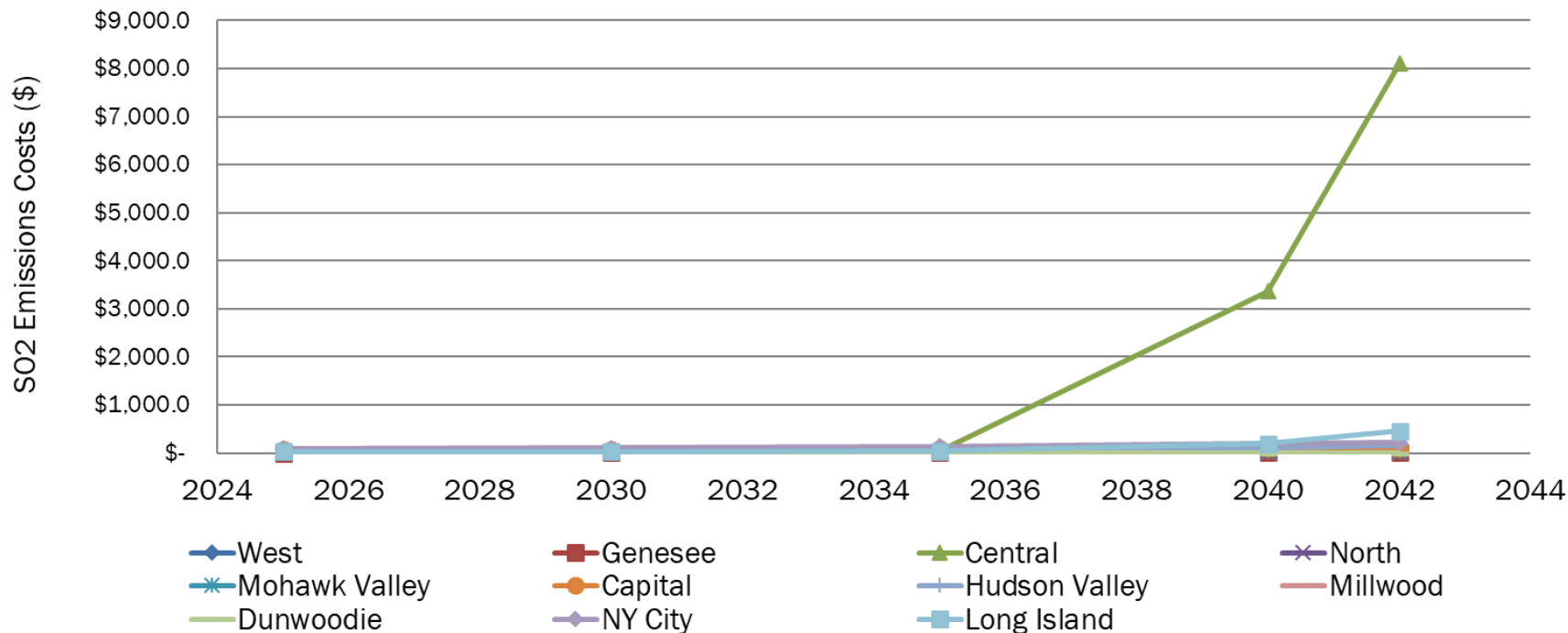
# Zonal Load Payments (nominal \$M)



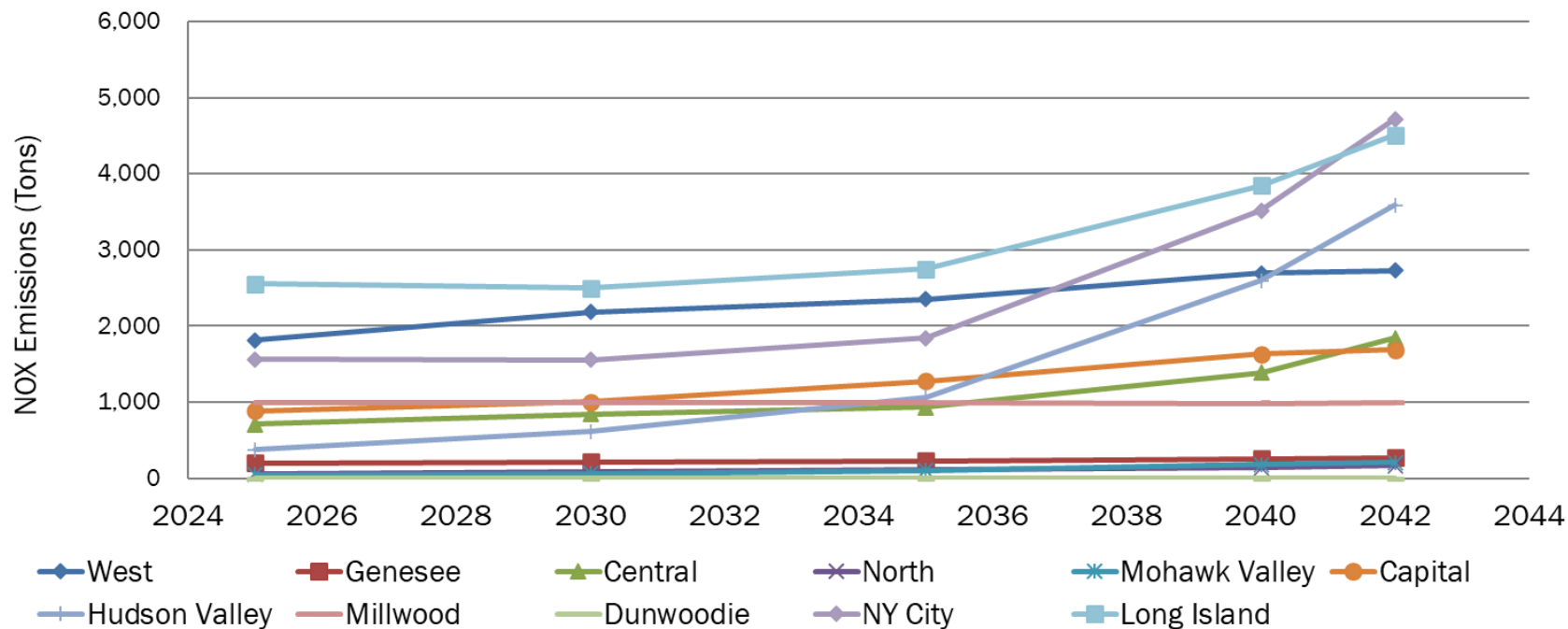
# Zonal SO<sub>2</sub> Emissions (Tons)



# Zonal SO<sub>2</sub> Emissions Costs (nominal \$)

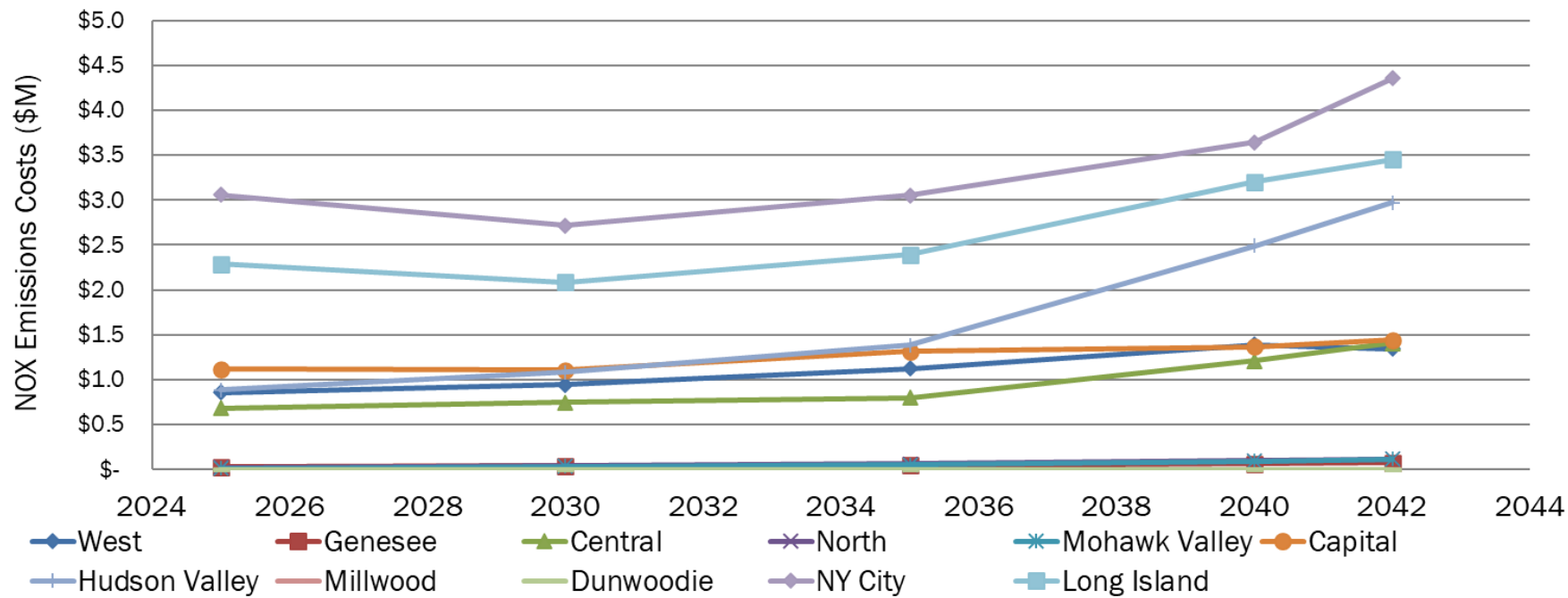


# Zonal NO<sub>x</sub> Emissions (Tons)

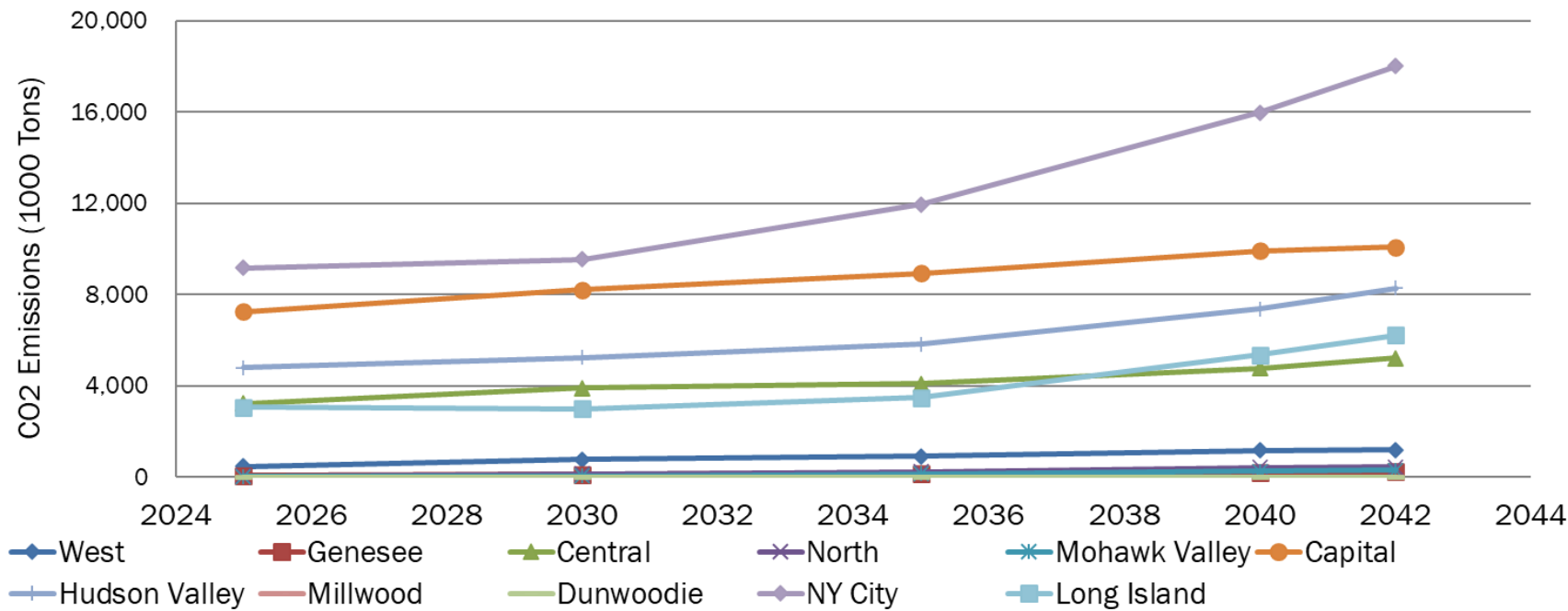




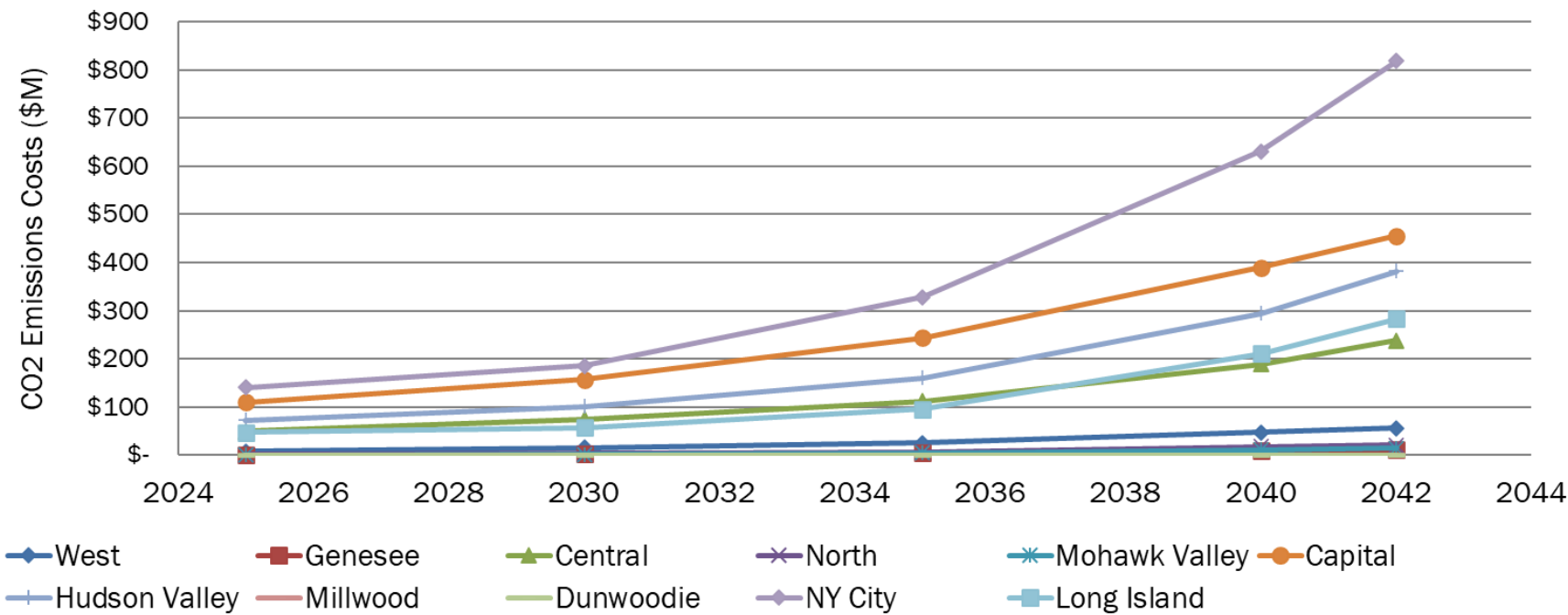
# Zonal NO<sub>x</sub> Emissions Costs (nominal \$M)



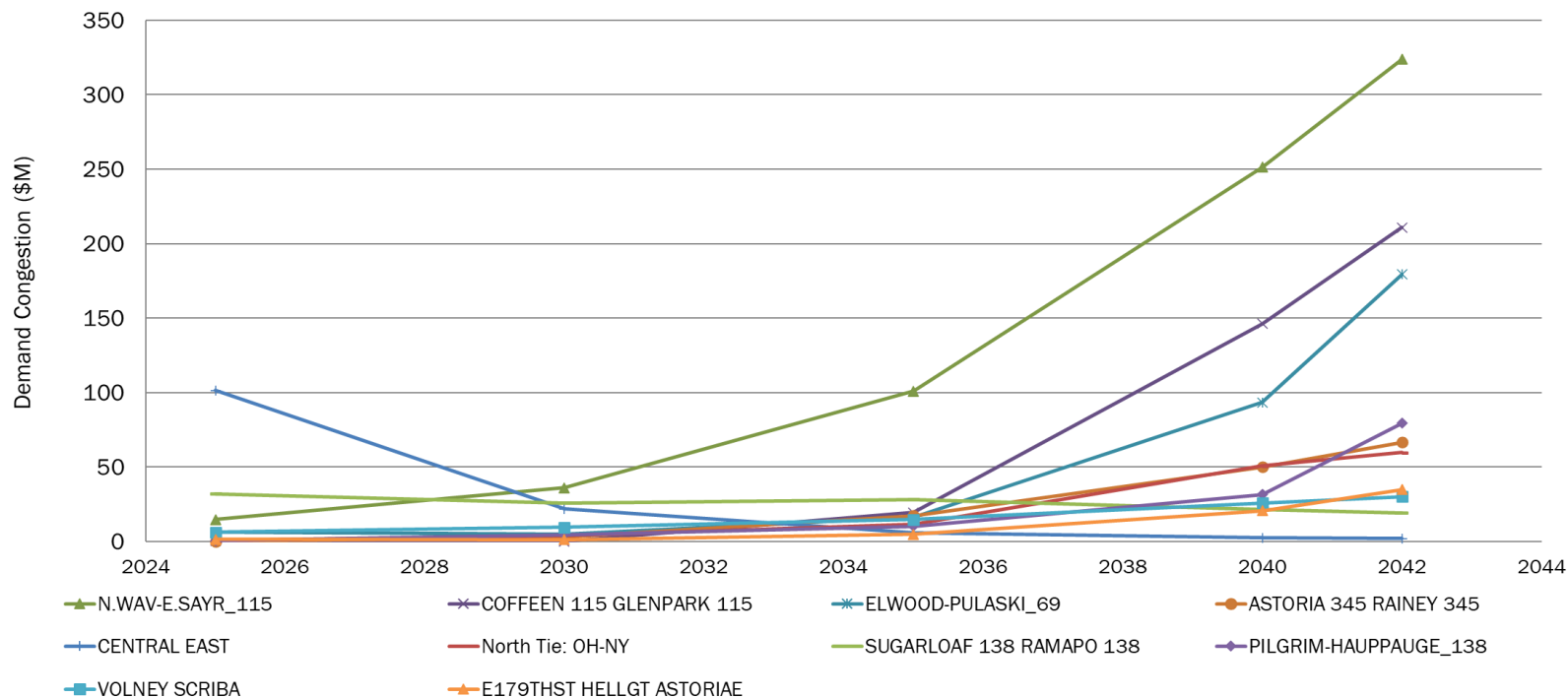
# Zonal CO<sub>2</sub> Emissions (1000 Tons)



# Zonal CO<sub>2</sub> Emissions Costs (nominal \$M)



# Projected NYCA-Wide Demand Congestion by Constraint (nominal \$M)



# 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