2023-2042 System & Resource Outlook Update

Sarah Carkner

Manager, Long Term Assessments

Electric System Planning Working Group (ESPWG)

Thursday March 21, 2024, NYISO Offices

Reposted March 19, 2024

Agenda

- **Scope & Schedule Review**
- **Policy Case Updates**
  - Policy Case Process Flow
  - Capacity Expansion Scenario Results
  - Production Cost Model Generator Placement Methodology
- **Next Steps**
- **Outlook Data Catalog**
- **Appendix**

Supplemental Material Posted

- In addition to today's presentation, documentation regarding assumption changes per the request of NYSERDA and DPS that has been incorporated to the State Scenario has been posted with the meeting materials (link here)

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

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Preliminary Targeted Study Schedule

2024 Q1

Month	January					February				March			
Week	1	2	3	4	5	1	2	3	4	1	2	3	4
~~Benchmarking~~													
~~Assumptions Development~~													
Capacity Expansion Model Development	X	X	X	X	X	X	X	X	X				
Capacity Expansion Results & Analyses						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
Production Cost Results & Analyses	X	X	X	X	X	X	X	X	X	X	X	X	X

2024 Q2

Month	April					May				June			
Week	1	2	3	4	5	1	2	3	4	1	2	3	4
Capacity Expansion Model Development													
Capacity Expansion Results & Analyses													
Production Cost Model Development													
Production Cost Results & Analyses	X	X	X	X	X								
Sensitivities	X	X	X	X	X								
Report	X	X	X	X	X	X	X	X	X	X	X	X	X

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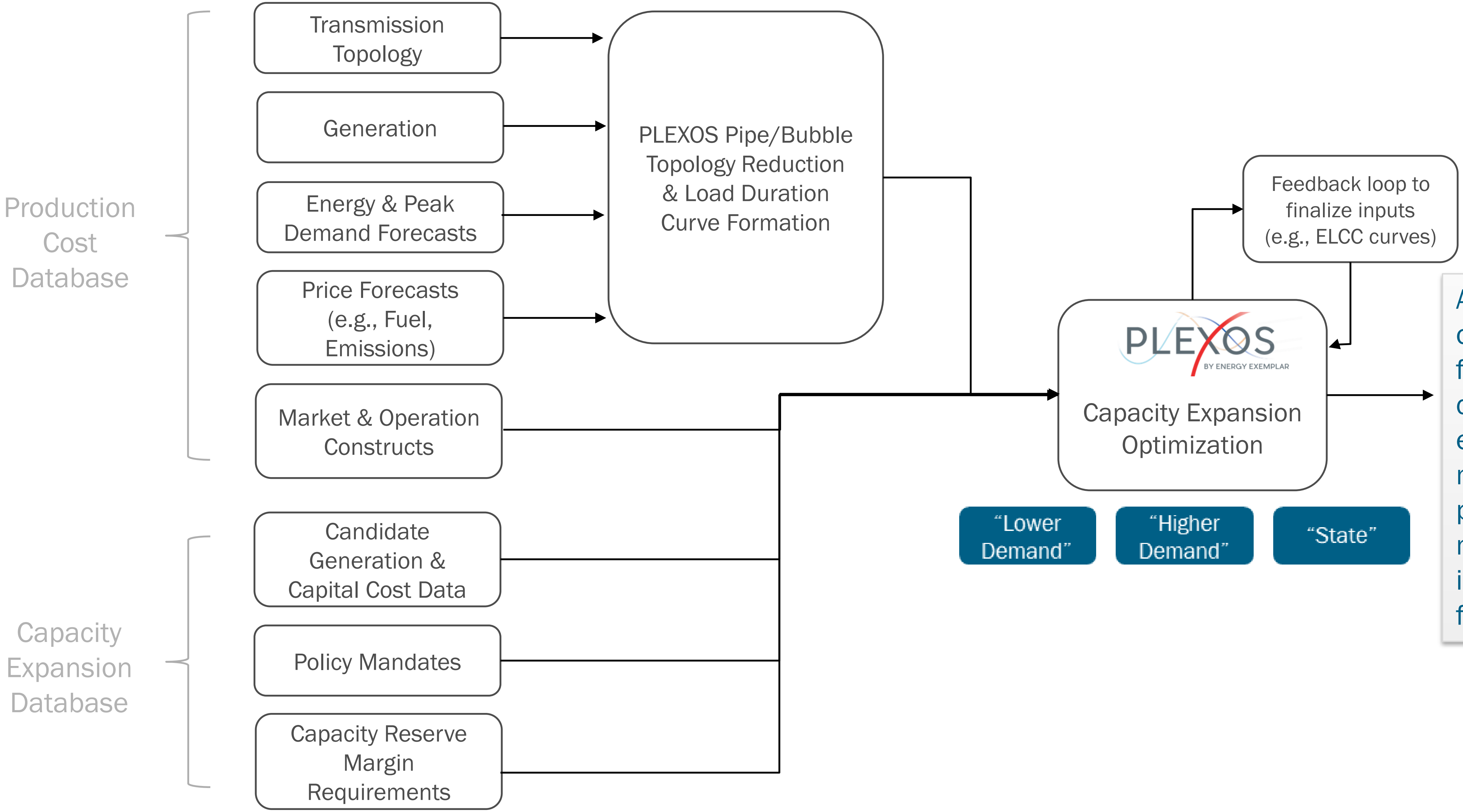
Policy Case Updates:

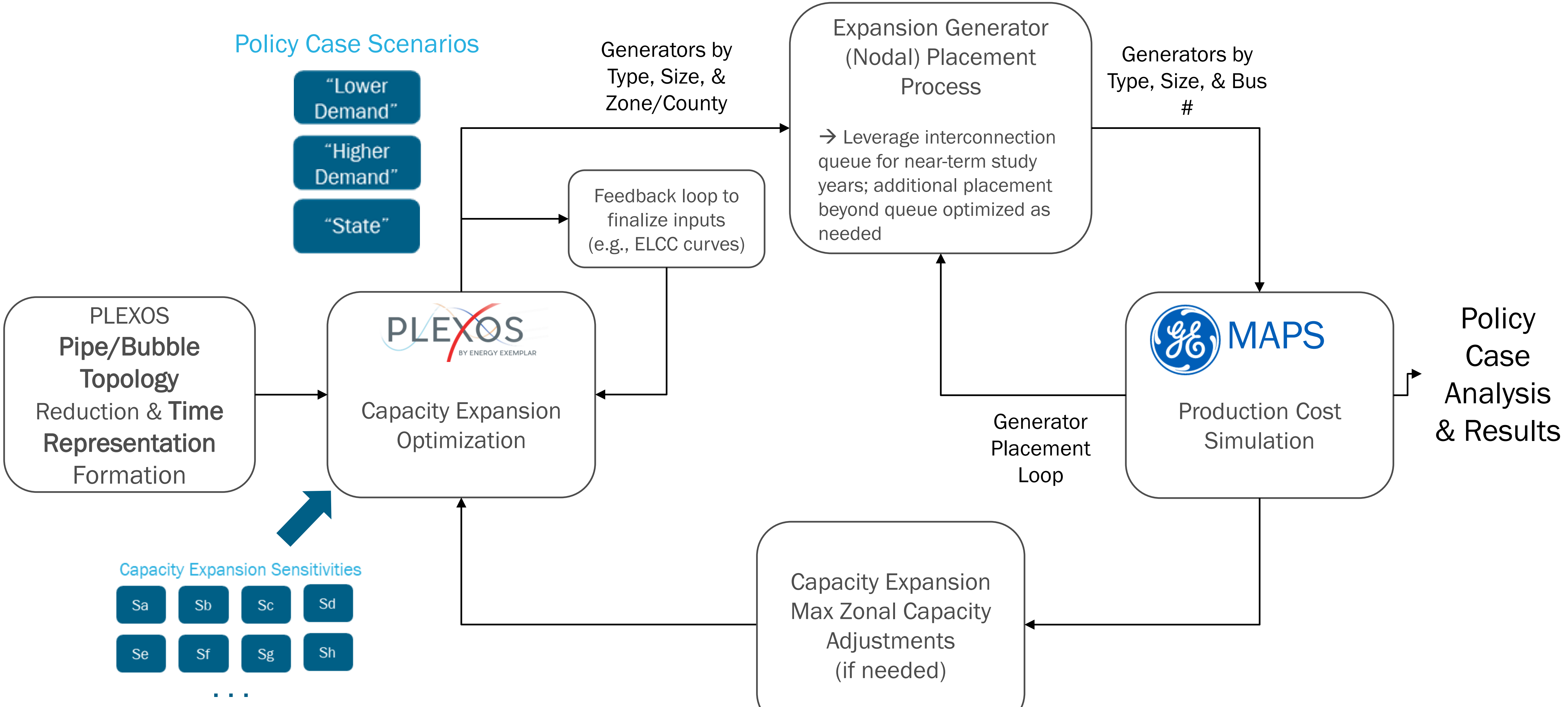
Policy Case Process Flow

Policy Case Process Flow



Additional detail on the process flow from capacity expansion modeling to production cost modeling is included on the following slide

Policy Case Simulation Framework



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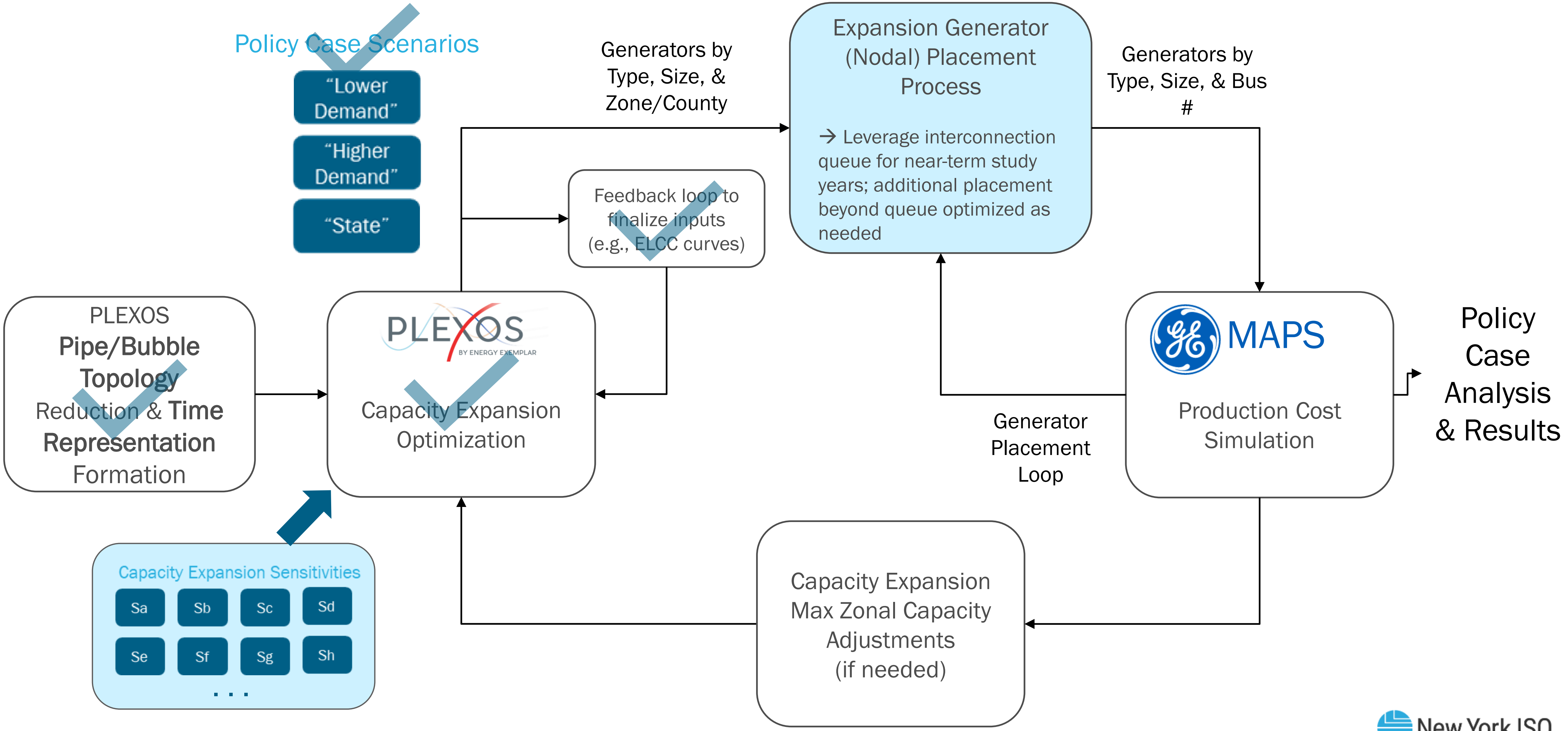
Policy Case Simulation Framework: Status



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Policy Case Updates:

Capacity Expansion Scenario Results

Capacity Expansion Model Assumptions: Overview

- The Policy Case for the 2023-2042 Outlook includes three scenarios
  - Lower Demand Policy Case, Higher Demand Policy Case, State Scenario
- The three scenarios have a similar model framework (e.g., study years, time representation methodology, transmission network, external area representation, etc.)
- Each scenario has a unique evolving 20-year hourly energy forecast to represent a variety of potential future conditions
  - For example, annual energy, peak demand, large loads, BTM solar forecasts
  - Each scenario has unique ELCC curves based on the respective net load
- Detailed assumptions are included in the capacity expansion model assumptions matrix

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State Scenario Assumption Changes

- **This slide summarizes changes in assumptions to the State Scenario Policy Case, as compared to what is included in the capacity expansion model assumptions matrix (posted 11/21/23)**
- **As noted in the supplemental materials posted with today's meeting materials, the following assumption changes have been incorporated per NYSERDA and DPS request:**
  - Changed mathematical formula for calculating the achievement of 70x30

$$\frac{Renewable\ generation}{Load\ forecast\ + electrolysis\ load + net\ storage\ load}$$

  - Large load assumptions to align with Baseline forecast from 2023 Gold Book, excluding WNY Stamp and Air Products to prevent double counting as they are already captured in base load profiles
  - Champlain Hudson Power Express (CHPE) contributes to the achievement of 70x30
  - Implemented constraint to limit annual growth of grid solar through time

State Scenario Assumptions

- **This slide summarizes assumptions that are unique to the State Scenario Policy Case in the 2023-2042 Outlook, as compared to the Lower & Higher Demand Policy Scenarios**
  - Energy Demand and Peak Loads are based on the "Scenario 2" forecast from the Climate Action Council Integration Analysis with additional large loads and electrolysis load
    - Large loads in the Gold Book incremental to state modeling forecasts are included in the load forecast
    - Half of economy wide H_2 demand met by instate electrolysis which increases load
  - Sub-zonal constraints model estimated transmission headroom of local transmission and distribution system and marginal upgrade costs
  - Policy targets:
    - 6 GW energy storage by 2030
  - Load portion of formula for calculating the achievement of 70x30 includes electrolysis and net storage charge
  - Net zero annual NYCA imports starting in 2040
  - Age-based fossil retirements for existing units are assumed
  - New and retrofit hydrogen combustion turbines are the only candidate dispatchable emission free resource (DEFR) option
  - Capital costs for candidate renewable generators are assumed by technology type per NYSERDA Supply Curve Analysis

Lower & Higher Demand Policy Case Scenario Updates

- The Lower & Higher Demand Policy Case scenarios were re-run with updates to more accurately reflect seasonal ratings for generators and to include post-iteration ELCC curves
- Updated results for these two scenarios are included on the following slides
- Overall, the trends remain consistent with previously presented results at 3/1/24 ESPWG
  - Updated results show net increase in LBW and DEFR and net decrease in UPV capacity builds, driven by updated ELCC curves

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Capacity Expansion Key Considerations

- **Results for the three Policy Case scenarios are included on the following slides**
- **The primary drivers of the resource mix for each scenario are:**
  - Hourly load forecast profile (i.e., total energy & peak forecasts)
  - Time representation (e.g., chronology preserved)
  - Assumed policy mandates
  - Resource capital and operating cost assumptions
- **Awarded renewable projects (included in the Contract Case) accounts for a significant portion of new capacity added by 2030**

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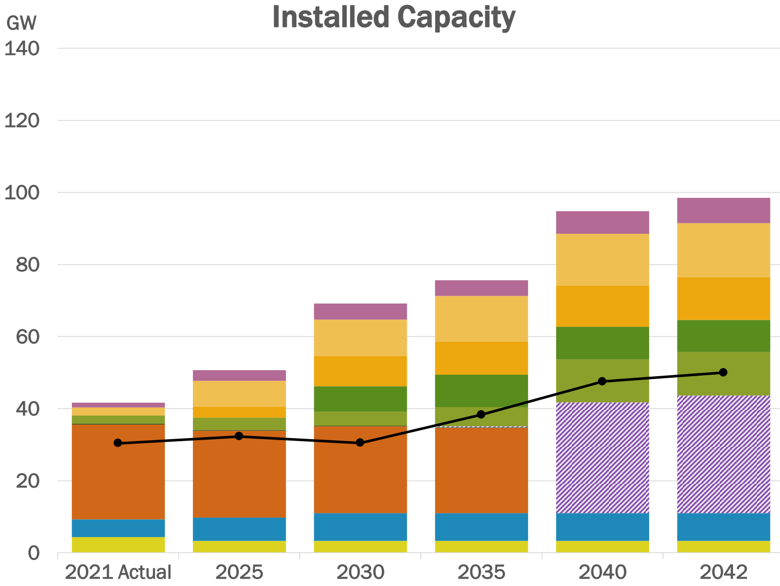
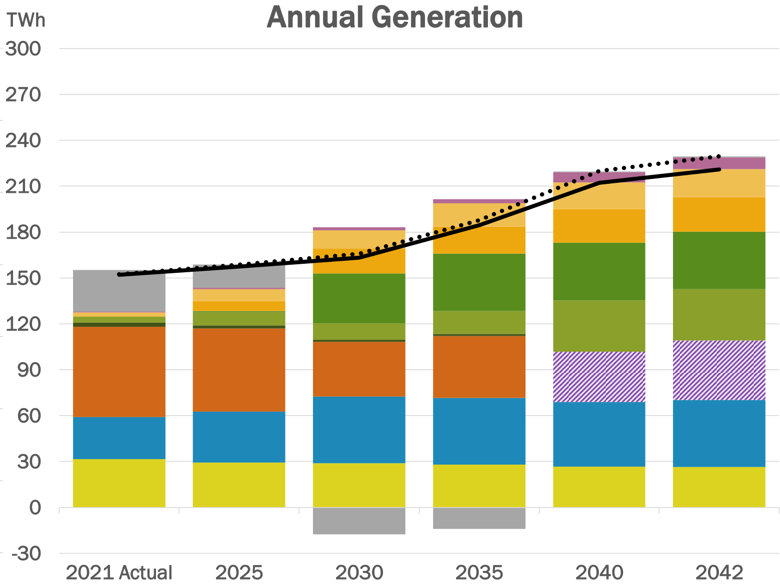
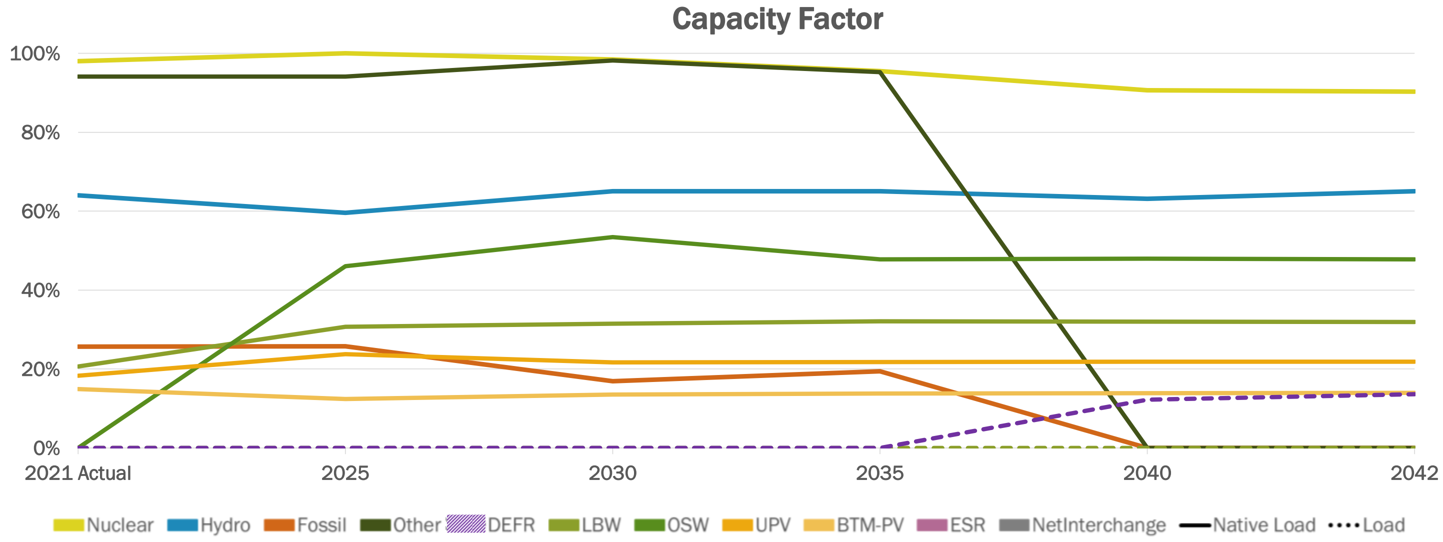
Lower Demand Policy Case







Capacity (Summer MW)	2021	2025	2030	2035	2040	2042
Nuclear	4,378	3,342	3,342	3,342	3,342	3,342
Fossil	26,345	24,122	24,122	23,666	-	-
DEFR - HcLo	-	-	-	-	5,042	5,042
DEFR - McMo	-	-	-	-	-	-
DEFR - LcHo	-	-	-	235	25,655	27,606
Hydro	4,868	6,381	7,665	7,665	7,665	7,665
LBW	2,227	3,291	3,881	5,325	12,000	12,000
OSW	-	136	6,990	9,000	9,000	9,000
UPV	32	3,135	8,422	9,204	11,365	11,821
BTM-PV	2,116	7,097	10,153	12,644	14,444	14,988
Storage	1,405	2,905	4,405	4,405	6,262	7,044
Total (Summer MW)	41,686	50,650	69,147	75,652	94,775	98,508
Annual Peak (MW)	30,397	32,279	30,490	38,297	47,493	49,967

Generation (GWh)	2021	2025	2030	2035	2040	2042
Nuclear	31,609	29,276	28,831	27,950	26,544	26,438
Fossil	59,154	54,403	35,687	40,342	-	-
DEFR - HcLo	-	-	-	-	30,606	35,116
DEFR - McMo	-	-	-	-	-	-
DEFR - LcHo	-	-	-	-	2,168	3,880
Hydro	27,379	33,281	43,688	43,687	42,408	43,686
LBW	4,024	8,841	10,700	14,971	33,660	33,536
OSW	-	549	32,708	37,648	37,806	37,649
UPV	51	6,528	15,991	17,569	21,759	22,603
BTM-PV	2,761	7,718	12,024	15,232	17,582	18,311
Storage	355	1,064	2,171	2,805	6,530	7,494
Total Generation	127,930	143,650	183,233	201,596	219,062	228,715
RE Generation	34,215	56,917	115,110	129,107	153,215	155,785
ZE Generation	65,824	86,192	143,941	157,057	212,532	221,220
Net Interchange	27,222	15,074	(17,674)	(14,109)	478	664
Load	151,979	157,528	163,222	184,439	212,121	220,946
Load+Charge	152,334	158,754	165,738	187,696	219,831	229,631
% RE [RE/Load]	23%	36%	71%	70%	72%	71%
% ZE [ZE/(Load+Charge)]	43%	55%	88%	85%	100%	100%

Emissions (million tons)	2021	2025	2030	2035	2040	2042
CO_2 Emissions	22.24	23.11	15.00	17.07	-	-

* Storage includes Pumped Storage Hydro and Batteries
* Utility solar (UPV) includes existing and new UPV
* Hydro includes hydro imports from Hydro Quebec
* Land-Based Wind (LBW), Offshore Wind (OSW), Renewable (RE), Zero Emissions (ZE)
* Dispachable Emission Free Resource (DEFR), High Capital Low Operating (HcLo), Medium Capital Medium Operating (McMo), Low Capital High Operating (LcHo)

*Net Interchange is reported relative to New York (imports +, exports -)

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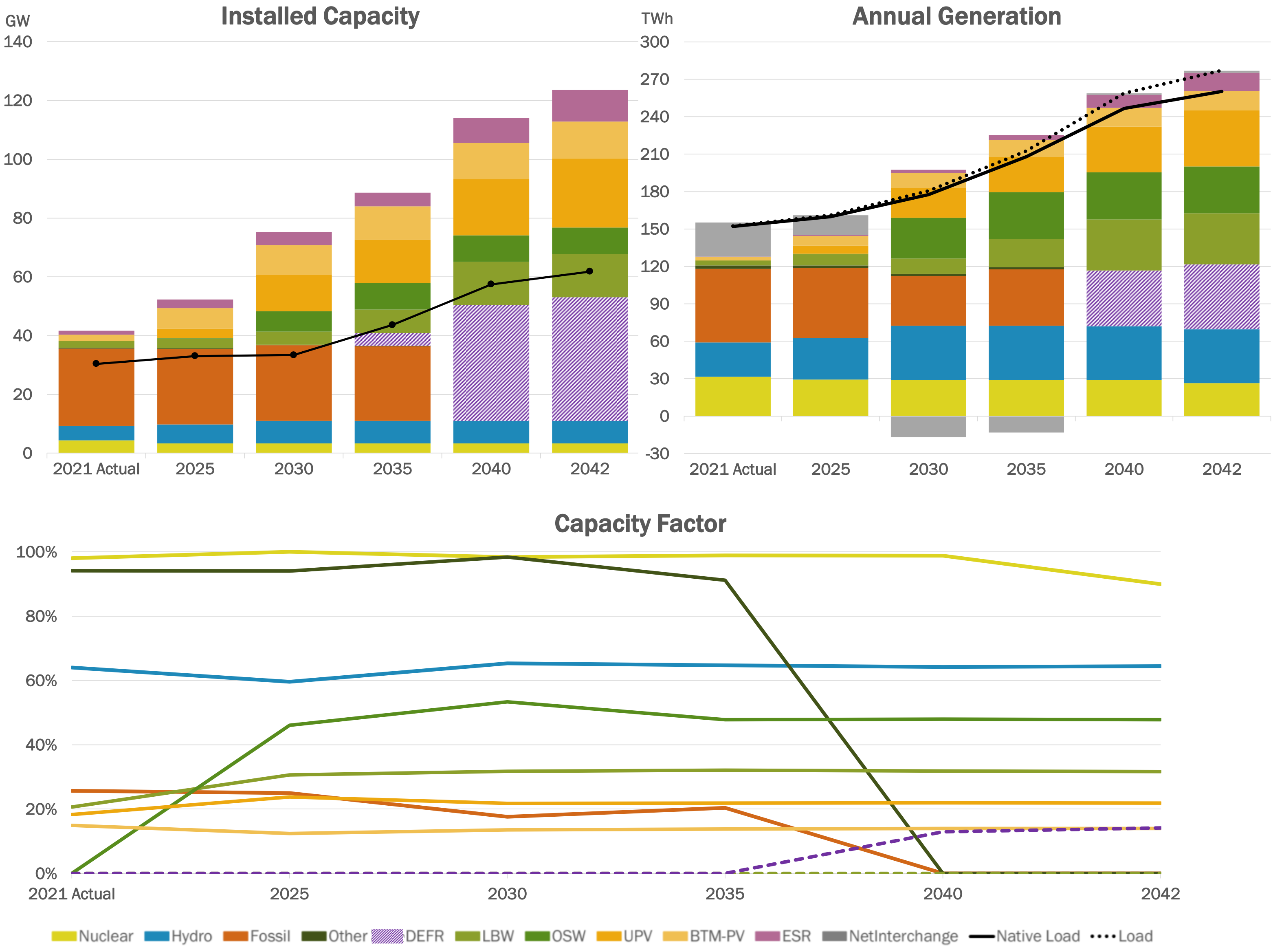
Higher Demand Policy Case



Capacity (Summer MW)							
		2021	2025	2030	2035	2040	2042
Nuclear		4,378	3,342	3,342	3,342	3,342	3,342
Fossil		26,345	25,753	25,753	25,296	-	-
DEFR - HcLo		-	-	-	-	6,748	7,013
DEFR - McMo		-	-	-	-	-	-
DEFR - LcHo		-	-	-	4,332	32,660	35,033
Hydro		4,868	6,381	7,631	7,665	7,665	7,665
LBW		2,227	3,291	4,403	8,025	14,653	14,750
OSW		-	136	6,990	9,000	9,000	9,000
UPV		32	3,135	12,465	14,692	19,136	23,498
BTM-PV		2,116	7,097	10,032	11,420	12,308	12,567
Storage		1,405	2,905	4,405	4,683	8,547	10,673
Total (Summer MW)		41,686	52,280	75,246	88,680	114,059	123,540
Annual Peak (MW)		30,397	33,063	33,358	43,617	57,436	61,809

Generation (GWh)							
		2021	2025	2030	2035	2040	2042
Nuclear		31,609	29,276	28,791	28,947	28,929	26,326
Fossil		59,154	56,261	39,737	45,190	-	-
DEFR - HcLo		-	-	-	-	40,724	46,143
DEFR - McMo		-	-	-	-	-	-
DEFR - LcHo		-	-	-	-	3,996	5,948
Hydro		27,379	33,282	43,679	43,422	43,097	43,255
LBW		4,024	8,837	12,239	22,539	40,853	40,869
OSW		-	548	32,661	37,651	37,789	37,650
UPV		51	6,529	23,805	28,155	36,738	44,989
BTM-PV		2,761	7,720	11,880	13,774	15,022	15,399
Storage		355	960	2,679	3,816	10,504	14,806
Total Generation		127,930	145,401	197,415	225,297	257,653	275,387
RE Generation		34,215	56,916	124,264	145,541	173,500	182,163
ZE Generation		65,824	86,192	153,055	174,488	247,149	260,581
Net Interchange		27,222	15,665	(16,983)	(13,095)	970	1,440
Load		151,979	159,991	177,520	207,916	246,751	260,233
Load+Charge		152,334	161,092	180,664	212,476	258,910	277,078
% RE [RE/Load]		23%	36%	70%	70%	70%	70%
% ZE [ZE/(Load+Charge)]		43%	54%	86%	84%	100%	100%

Emissions (million tons)						
	2021	2025	2030	2035	2040	2042
CO_2 Emissions	22.24	24.04	16.82	19.34	-	-

* Storage includes Pumped Storage Hydro and Batteries
* Utility solar (UPV) includes existing and new UPV
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* Dispachable Emission Free Resource (DEFR), High Capital Low Operating (HcLo), Medium Capital Medium Operating (McMo), Low Capital High Operating (LcHo)
*Net Interchange is reported relative to New York (imports +, exports -)

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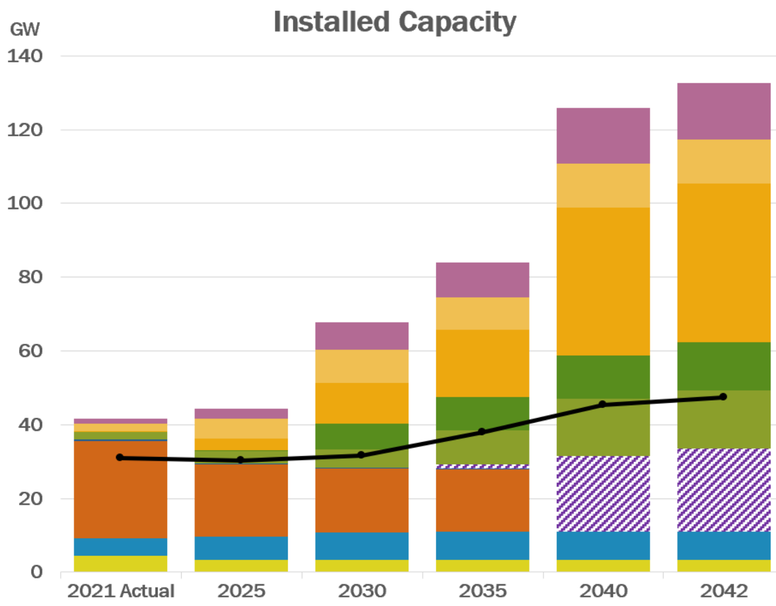
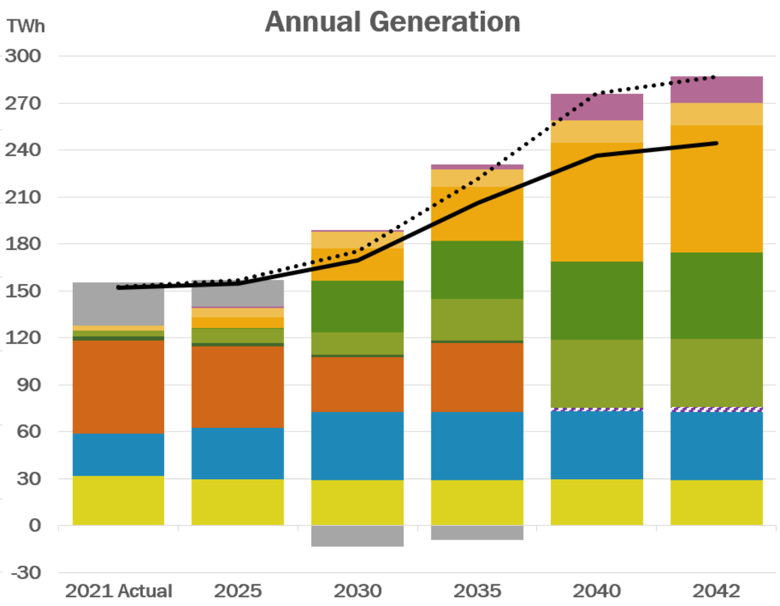
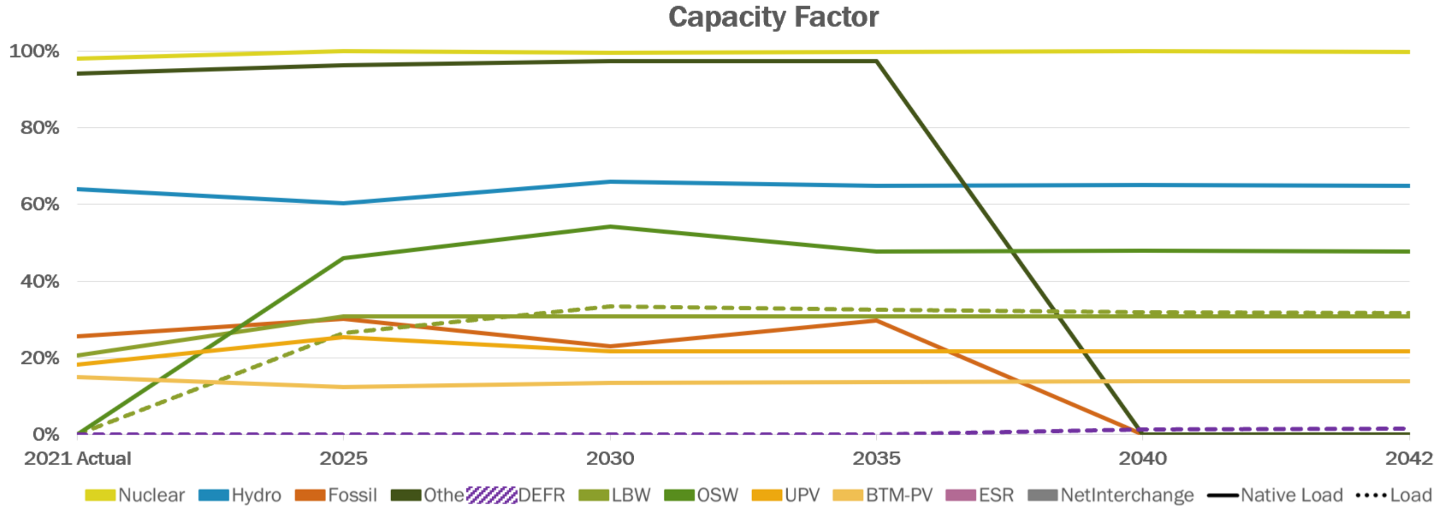
Preliminary Results: State Scenario Policy Case







Capacity (Summer MW)	2021	2025	2030	2035	2040	2042
Nuclear	4,378	3,342	3,342	3,342	3,342	3,342
Fossil	26,345	19,676	17,262	16,805	-	-
DEFR - New CC	-	-	-	-	-	-
DEFR - New CT	-	-	-	201	8,888	9,798
DEFR - Retrofit CC	-	-	-	-	6,976	8,158
DEFR - Retrofit CT	-	-	-	1,010	4,558	4,558
Hydro	4,868	6,294	7,544	7,665	7,665	7,665
LBW	2,227	3,291	5,057	9,360	15,549	15,819
OSW	-	136	6,990	9,000	11,880	13,134
UPV	32	3,135	10,894	18,071	39,903	42,903
BTM-PV	2,116	5,384	8,972	8,973	12,019	12,019
Storage	1,405	2,905	7,405	9,408	15,184	15,184
Total (Summer MW)	41,686	44,444	67,675	84,045	125,965	132,581
Annual Peak (MW)	30,397	29,568	29,861	37,047	45,062	47,046

Generation (GWh)	2021	2025	2030	2035	2040	2042
Nuclear	31,609	29,276	29,174	29,190	29,314	29,213
Fossil	59,154	51,819	34,744	43,784	-	-
DEFR - New CC	-	-	-	-	-	-
DEFR - New CT	-	-	-	-	41	37
DEFR - Retrofit CC	-	-	-	-	2,304	2,870
DEFR - Retrofit CT	-	-	-	-	7	9
Hydro	27,379	33,269	43,607	43,619	43,710	43,562
LBW	4,024	8,747	14,136	26,187	43,156	43,724
OSW	-	549	33,182	37,613	49,871	54,846
UPV	51	6,987	20,684	34,358	76,001	81,331
BTM-PV	2,761	5,871	10,610	10,812	14,589	14,648
Storage	355	1,103	739	3,444	17,183	16,798
Total Generation	127,930	139,990	188,660	230,793	276,169	287,029
RE Generation	34,570	56,526	122,958	156,034	244,510	254,908
ZE Generation	66,179	85,802	152,132	185,223	276,176	287,037
Net Interchange	27,222	16,962	(13,319)	(9,360)	-	-
Load	151,979	154,839	169,374	206,351	236,258	244,484
Load+Charge	152,334	156,952	175,342	221,434	276,176	287,037
% RE [RE/Load+Charge]	23%	36%	70%	70%	89%	89%
% ZE [ZE/(Load+Charge)]	43%	55%	87%	84%	100%	100%

Emissions (million tons)	2021	2025	2030	2035	2040	2042
CO_2 Emissions	22.24	21.99	14.61	18.55	-	-

* Storage includes Pumped Storage Hydro and Batteries
* Utility solar (UPV) includes existing (77 MW) and new UPV
* Hydro includes hydro imports from Hydro Quebec
* Land-Based Wind (LBW), Offshore Wind (OSW), Zero Emissions (ZE)
* Dispachable Emission Free Resource (DEFR)
* Net Interchange is reported relative to New York (imports +, exports -)
* Load+Charge includes electrolysis load

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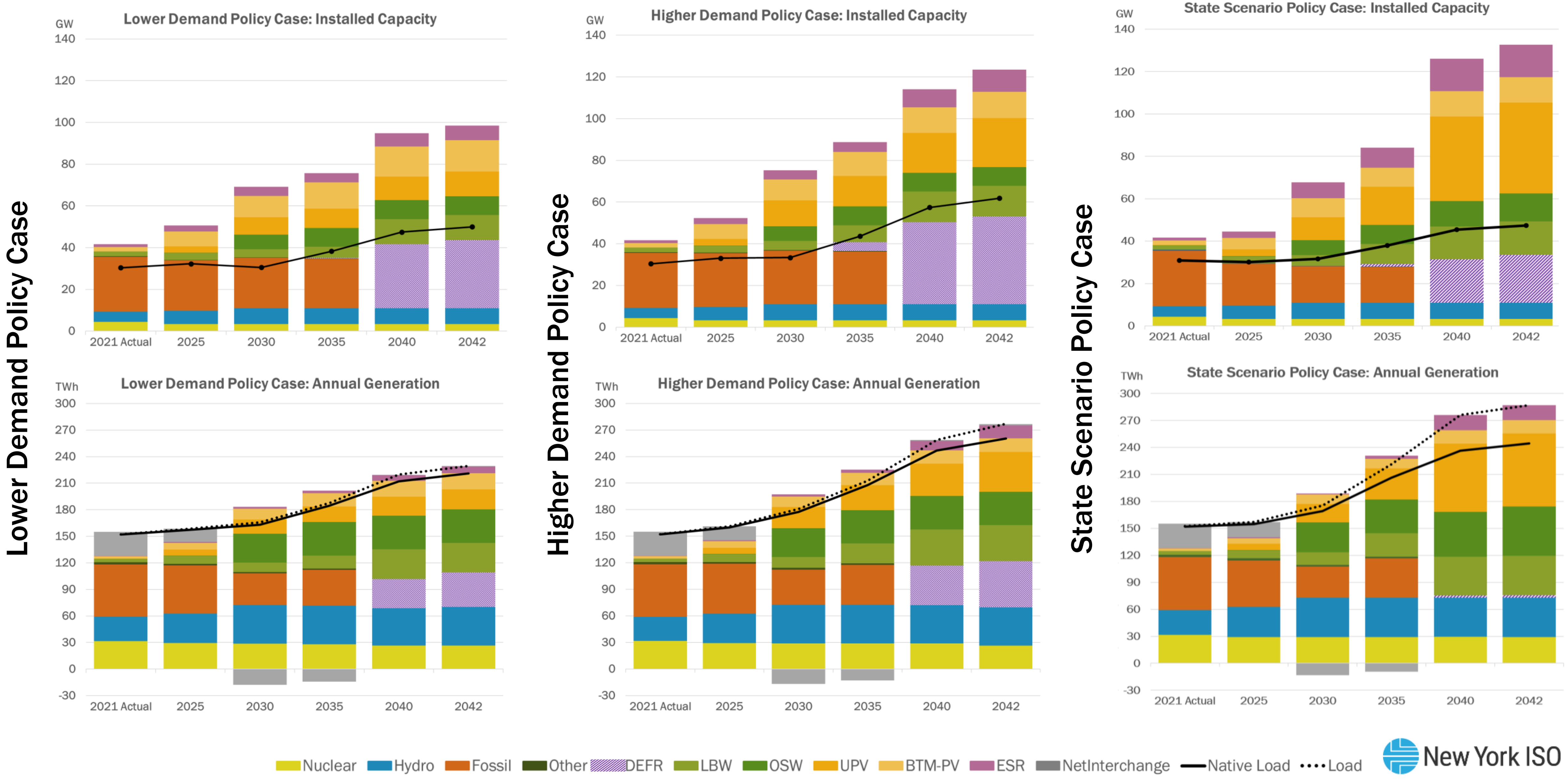
Capacity Expansion Results Comparison



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Capacity Expansion Key Findings

- **Preliminary findings indicate that approximately 65 – 90 GW of new resources would be required by 2040 to achieve policy mandates**
  - This includes firm builds (i.e., awarded resources) and generators selected by capacity expansion model throughout the study period
- **Preliminary results show an increased reliance on dispatchable, flexible resources in the capacity expansion model to support a high renewable system**
  - In model years 2040 and beyond, DEFRs generate to support energy needs in the Lower & Higher Demand Policy Case scenarios
    - The High Capital Low Operating cost DEFR option has a high capacity factor to support energy needs in future years
  - In the State Scenario, DEFRs generate at a much lower capacity factor due to differences in scenario assumptions
    - While DEFR capacity is built to meet capacity requirements because of its high operating cost, utilization is very low
    - Instead, the model chooses to rely more heavily on UPV as it coincides with electrolysis load modeled

Capacity Expansion Sensitivity Analysis

- As part of the 2023-2042 Outlook, the NYISO will conduct sensitivity analysis in the capacity expansion model to assess key drivers for resource additions and impacts on projected resource growth
  - A sensitivity is intended to show the impact on results of a single relatively small assumption change to a reference case
- Appendix G of the 2021-2040 Outlook includes results of the sensitivity analysis conducted in that prior study
- The NYISO requests that stakeholders start to consider parameters/assumptions for potential sensitivity analysis for the Outlook
  - NYISO will continue discussions on sensitivity analysis at future ESPWG meetings
  - A limited number of sensitivities will be evaluated based on feedback from stakeholders

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Policy Case Updates:

Production Cost Model Generator Placement Methodology

Generator Placement for NYISO Units

- **Zonal results from the capacity expansion scenarios are converted to nodal generator placement in the production cost model utilizing the following methodology:**
  - Nodal Placement:
    - Utilize the NYISO's interconnection queue (01/31/2024) points of interconnection (POI) for Land Based Wind, Utility PV and Energy Storage units
    - For zones without any proposed projects in the interconnection queue that have buildouts from CapEx results, utilize 115 kV or higher bus that is closest to locations for the resource type from DNV or LSR Supply Curve datasets
    - For Offshore Wind, utilize identified POI from prior studies (e.g., 2021-2040 Outlook, LI PPTN) and buses specified for Offshore Wind interconnection (e.g., Brooklyn Clean Energy Hub)

Generator Placement for NYISO Units (cont.)

- Sizing:
  - Unit sizes for each resource type (LBW, UPV and ESR) at POI are proportional to the proposed installed capacity of projects to the total proposed capacity in the interconnection queue for the zone
  - If the interconnection queue does not contain POI for certain zones that contain buildouts, unit size for these units are based on assumed size for projects connected to buses with similar kV rating (115 kV, 230 kV, 345 kV)
- Shapes:
  - County-level shapes are utilized from DNV dataset to assign shapes for units located in a particular county for LBW and UPV units
  - Aggregated DNV site-specific shapes are used for offshore wind units for each zone
  - For ESR units, NYISO in-house storage tool is utilized to generate shapes that consider net load, on a daily basis, for a zone to optimize energy arbitrage

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Generator Placement for NYISO DEFR Units

- DEFR unit capacity distributed equally to all 230 kV and 345 kV buses in a zone
- Size of DEFR units are based on generator buildout determined by capacity expansion model for each zone
- Other production cost generator parameters, such as Min Gen, operating and startup costs, heat rates, etc., are consistent with the capacity expansion model assumptions
- For the State Scenario, DEFR units modeled as retrofit or replacement CC and CT units with parameters consistent with the CapEx model results. These units will be placed at nodal locations vacated by retired fossil units

Generator Placement for External Units

- Generator capacity assumptions for each resource type in the production cost model is kept consistent with the capacity expansion model, which is based on recent ISO-NE, PJM, and IESO studies
- Additional generation capacity is added to the production cost model by adding generic generation to the external zones utilizing the following methods
  - Placement:
    - All LBW, UPV and Storage generic buildout utilize the DD logic to spread capacity to all Load Nodes in the zone
    - Offshore Wind resources are placed on buses utilizing available public information.

Generator Placement for External Units

- Sizing:
  - Generic buildout size for each external zone for LBW and UPV units based on data provided by each ISO or based on proportional distribution of capacity for each zone from the interconnection queue.
  - Offshore wind capacity distributed to external zones based on information available from each ISO's interconnection queue or data provided by neighboring ISO.
  - For storage resources, utilize data provided by each ISO for zonal allocation. If zonal data is not available, utilize load ratio share for each zone for storage size allocations.
- Shape:
  - Utilize single shape for each resource type (LBW, UPV and Offshore Wind) for each ISO consistent with the capacity expansion model.
  - For storage resources, utilize the zonal net load, on a daily basis, to produce shapes using in-house optimizer.
- Retirements:
  - Retirements considered for the Policy Case for external zones (informed by publicly availably reports) on are based on unit capacity factors with existing units having the lowest capacity factors being retired first.

Next Steps

Next Steps

- Seek stakeholder feedback
- Continue model development of Policy Case scenarios in the production cost model
- Continue renewable pockets analyses
- Continue stakeholder engagement
  - Return to ESPWGs in April 2024

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 Placeholder

Study Summary

Summary Placeholder

Report Appendices

Production Cost Model Benchmark DRAFT
Production Cost Assumptions Matrix DRAFT
Capacity Expansion Assumptions Matrix DRAFT

Data Documents

Reference Case Results

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

August 22, 2023
- 2023-2042 Outlook Preliminary Reference Case Assumptions

September 21, 2023
- 2023-2042 Outlook Reference Case Assumptions Update

October 24, 2023
- 2023-2042 Outlook Reference Case Assumptions Update

November 2, 2023
- 2023-2042 Outlook Reference Case Assumptions Update & Preliminary Base Case Results

November 21, 2023
- 2023-2042 Outlook Reference Case Updates

December 19, 2023
- 2023-2042 Outlook Reference Case Updates & Preliminary Contract Case Results

January 23, 2024
- 2023-2042 Outlook Reference Case Updates

February 22, 2024
- 2023-2042 Outlook Reference Case Updates & Final Base & Contract Case Results

March 1, 2024
- 2023-2042 Outlook Preliminary Renewable Pocket Analysis & Preliminary Capacity Expansion Scenario Results

2021-2040 System & Resource Outlook Data Catalog

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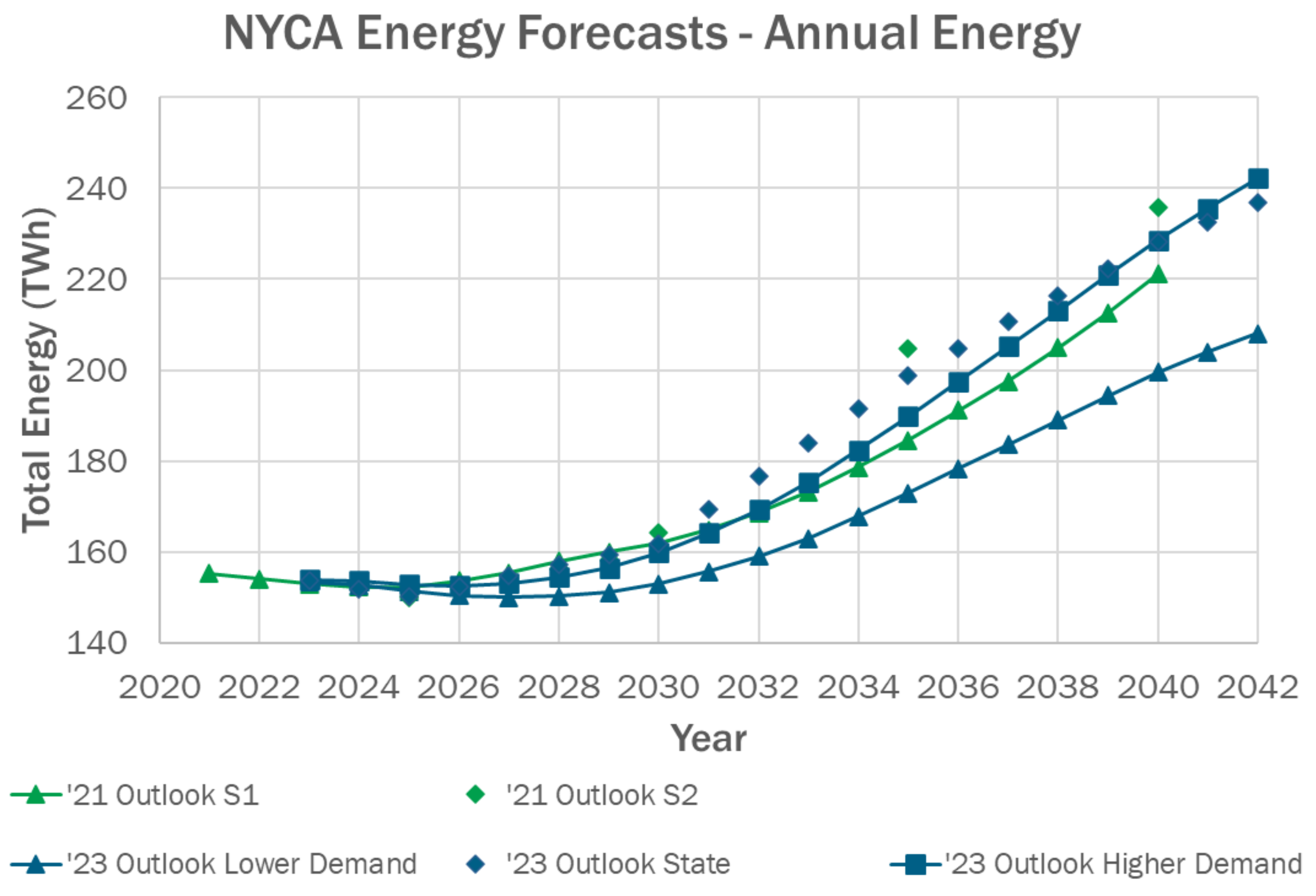
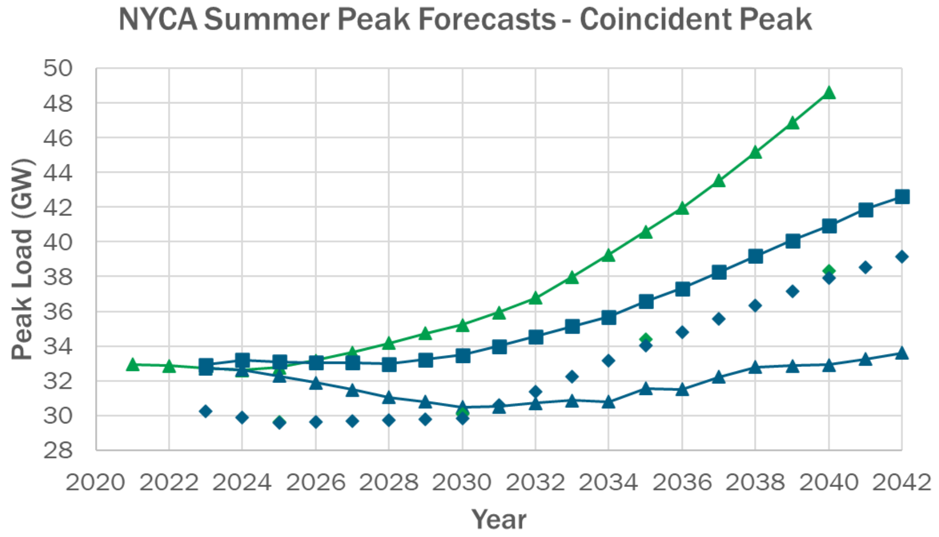
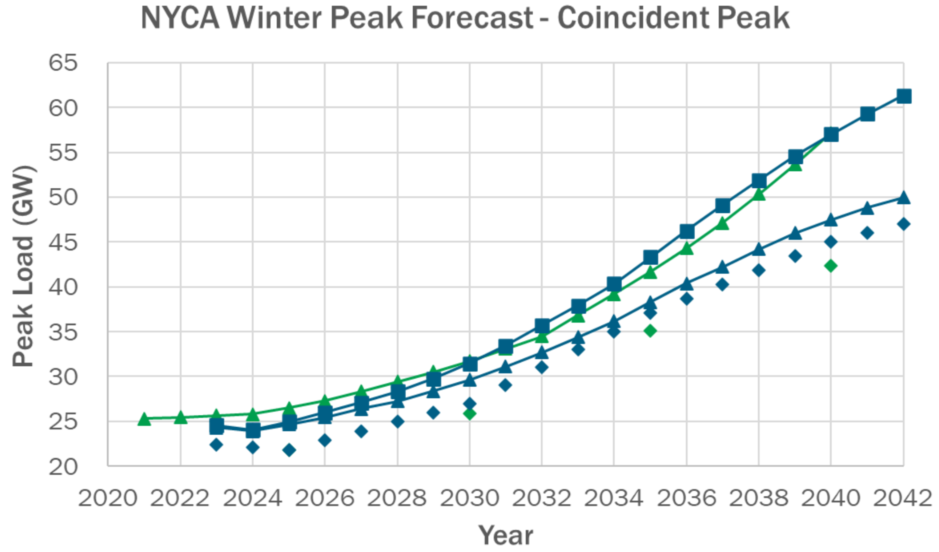
Appendix

Policy Case Load Comparisons







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Capacity Expansion Model Enhancements: Overview

- **In addition to many assumptions that have been updated since the 2021-2040 Outlook, several enhancements have been incorporated into the capacity expansion model for each of the three Policy Case scenarios in the 2023-2042 Outlook as presented at previous ESPWG meetings**
  - Changed methodology for time representation
  - Addition of external pools
  - Addition of generation supply curves for renewable technologies
  - Addition of 8-hour battery storage as candidate for expansion
  - Updated marginal ELCC curves (specific to each scenario)
- **Additionally, the following enhancements have been incorporated into the State Scenario:**
  - Hydrogen repowered units are candidates for expansion, including electrolysis load
  - Sub-zonal constraints modeled to reflect estimated transmission headroom of local transmission & distribution system and conceptual marginal upgrade costs

Key Considerations

- **Methodology for time representation has a major impact on model results**
  - Preserving chronology within each day allows for a more accurate representation of battery storage resources as it tracks state-of-charge and duration limited qualities intraday
  - Preliminary results show a higher need for dispatchable resources to satisfy energy needs as compared to the prior Outlook
- **The capacity expansion model has been updated to include neighboring systems (PJM, ISO-NE, and IESO)**
  - External load and capacity/generation mix has been informed by public information for each respective neighboring system to reflect “policy futures” in each region
  - Preliminary results show interchange between the regions to optimally dispatch generation
- **The marginal ELCC curves for renewable and battery storage resources are unique to each scenario based on the respective resource penetration in each scenario**

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Capacity Expansion Model: Time Representation

- For the 2023-2042 Outlook, each year will be modeled with 13 representative days to represent a year's variety of conditions
- Each model year will include base representative days on load, wind (OSW and LBW), and solar values
- Seek to preserve annual energy total, seasonal peaks, and variable performance of renewable resources
- Each year will include the following representative days (totaling 13 per year) with six 4-hour periods per day:
  - Peak summer day (weighted 1x)
  - Peak winter day (weighted 1x)
  - Near peak summer day (weighted 5x)
  - Near peak winter day (weighted 5x)
  - Moderate day (weighted based on clustering)
  - 8 groups to represent each combination of high/low energy, wind, and solar
- Additional detail on the time representation proposal for the 2023-2042 Outlook is included in the November 2, 2023 ESPWG materials

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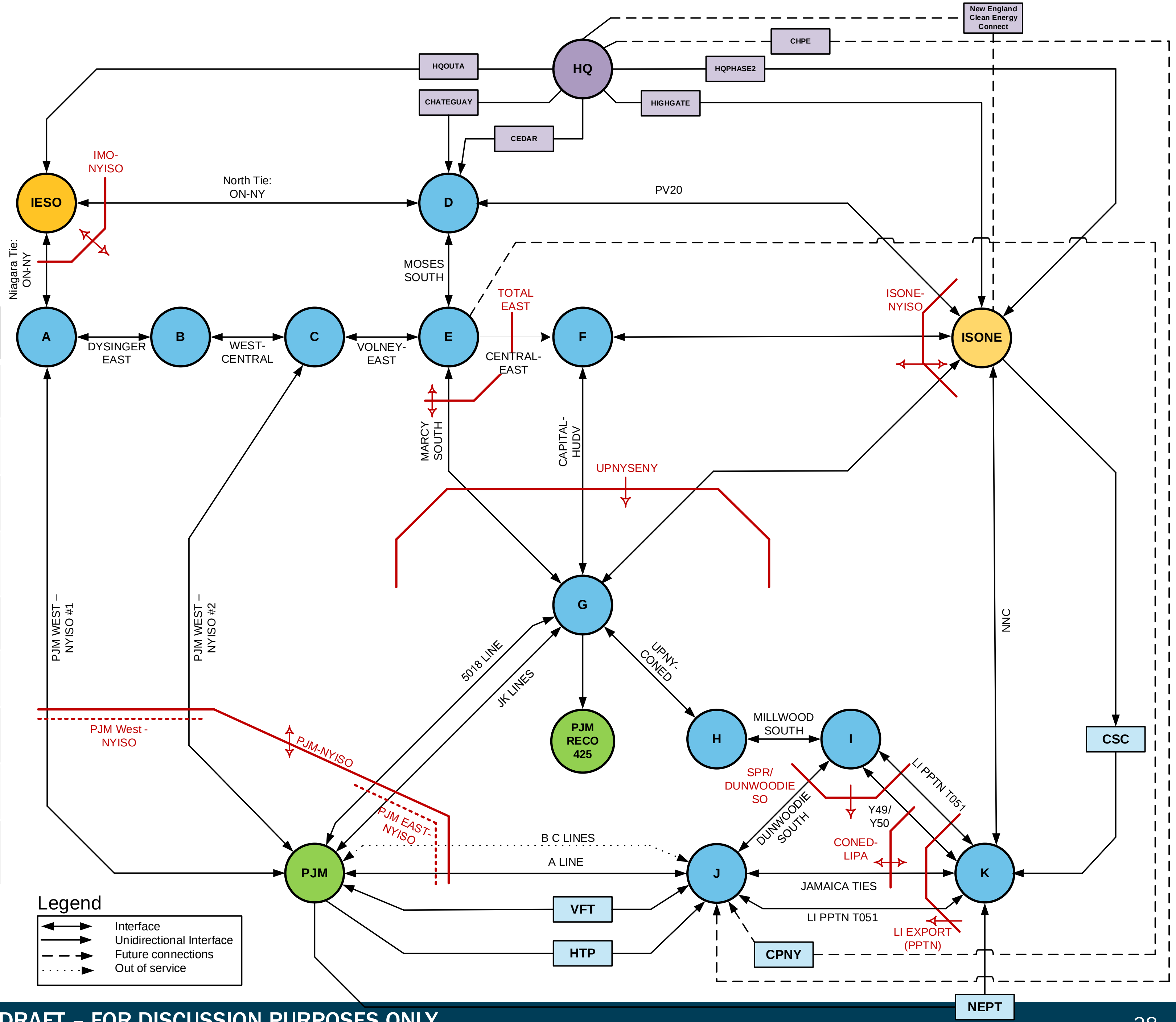
Capacity Expansion Model: Pipe & Bubble Representation

Interface	2023 Limits (MW)	Source
Dysinger East	1700	2020 ATR
West Central	575	2020 ATR
Moses South*	2325	2020 ATR
Central East	3785	2023 Central East Voltage Limit Study
Total East	6175	2020 ATR
UPNY-SENY	6325	2020 ATR
UPNY-ConEd*	7500	2020 ATR
Clean Path New York	1300	NYSERDA Contract
Champlain Hudson Power Express	1250	NYSERDA Contract

*Interface limits are assumed to increase through study period consistent with proposed project upgrades



Capacity Expansion Enhancements: Marginal ELCC Curves

- **For all Policy Case scenarios in the 2023-2042 Outlook, marginal ELCC curves will be assumed for LBW, OSW, UPV, and ESR resources**
  - Updated regional ELCC curves for LBW, OSW, UPV, and storage will be based on hourly input load forecast and resource contribution (by technology type) to quantify the capacity value for that resource type at varying levels of installed capacity
  - This method will base the marginal ELCC values on the load levels and capacity mix specific to each scenario for 2030 model year
- **Marginal ELCC curves will be applied on a NYCA wide and Locality specific basis, as applicable to the resource**
  - "Lower Demand Policy" and "Higher Demand Policy" Scenarios will assume unique curves for summer/winter seasons
  - "State Scenario" will assume annual curves consistent with the Integration Analysis
- **Additional detail on the marginal ELCC value representation proposal for the 2023-2042 Outlook is included in the October 24, 2023 ESPWG materials**

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Capacity Margin Targets

- The proposal for capacity margin targets (NYCA and Localities) in the capacity expansion model for the 2023-2042 Outlook was discussed at the 11/2/2023 ESPWG*
  - Additional details are included in the capacity expansion assumptions matrix
- The minimum capacity margins are adjusted for years 2030 and beyond to address major topology changes and transmission constraints in the NYCA system
  - The primary driver in differences in the calculated capacity margin target are the load forecasts for each scenario
  - The assumed capacity margin targets for the Policy Case scenarios are included in the figure on the right

*Please note that this methodology is proposed for use in the 2023-2042 Outlook and may be modified in future Outlook cycles. This approach does not capture interactions of the entire system and will be explored in future planning studies.

2025 Policy Cases

G-J		Lower Demand Policy Case	Higher Demand Policy Case	State Scenario
Winter	Peak Load (MW)	10,818	10,963	9,305
	Minimum Capacity Margin (%)	80	80	81
	Minimum Capacity Margin (MW)	8,677	8,793	7,538
Summer	Peak Load (MW)	15,678	16,259	13,994
	Minimum Capacity Margin (%)	81	81	81
	Minimum Capacity Margin (MW)	12,758	13,232	11,388

J		Lower Demand Policy Case	Higher Demand Policy Case	State Scenario
Winter	Peak Load (MW)	7,838	7,928	7,101
	Minimum Capacity Margin (%)	78	78	79
	Minimum Capacity Margin (MW)	6,140	6,210	5,618
Summer	Peak Load (MW)	11,236	11,700	10,233
	Minimum Capacity Margin (%)	80	80	80
	Minimum Capacity Margin (MW)	9,029	9,402	8,223

K		Lower Demand Policy Case	Higher Demand Policy Case	State Scenario
Winter	Peak Load (MW)	3,387	3,461	3,223
	Minimum Capacity Margin (%)	94	94	95
	Minimum Capacity Margin (MW)	3,183	3,253	3,060
Summer	Peak Load (MW)	5,330	5,369	5,081
	Minimum Capacity Margin (%)	98	98	98
	Minimum Capacity Margin (MW)	5,199	5,236	4,955

2030 Policy Cases

G-J		Lower Demand Policy Case	Higher Demand Policy Case	State Scenario
Winter	Peak Load (MW)	12,884	13,729	11,910
	Minimum Capacity Margin (%)	87	87	87
	Minimum Capacity Margin (MW)	11,155	11,999	10,412
Summer	Peak Load (MW)	14,592	16,335	13,841
	Minimum Capacity Margin (%)	89	91	89
	Minimum Capacity Margin (MW)	13,045	14,788	12,291

J		Lower Demand Policy Case	Higher Demand Policy Case	State Scenario
Winter	Peak Load (MW)	9,453	9,973	8,729
	Minimum Capacity Margin (%)	84	84	84
	Minimum Capacity Margin (MW)	7,895	8,415	7,328
Summer	Peak Load (MW)	10,530	11,830	10,104
	Minimum Capacity Margin (%)	87	88	86
	Minimum Capacity Margin (MW)	9,118	10,417	8,689

K		Lower Demand Policy Case	Higher Demand Policy Case	State Scenario
Winter	Peak Load (MW)	4,180	4,586	3,865
	Minimum Capacity Margin (%)	63	66	61
	Minimum Capacity Margin (MW)	2,633	3,039	2,371
Summer	Peak Load (MW)	5,042	5,304	4,728
	Minimum Capacity Margin (%)	70	71	68
	Minimum Capacity Margin (MW)	3,506	3,768	3,191

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