New York ISO
Independent System Operator

System & Resource Outlook Update

Economic Planning Department

Electric System Planning Working Group (ESPWG)

Jason Frasier

Tuesday April 26, 2022

Agenda

- **Outlook Study Status**
- **Contract Case Update**
  - Renewable Generation Pockets
  - Energy Deliverability Metric Results
- **Policy Case Update**
  - Baseline & Alternative Forecasts Update
  - Alternative Forecast Scenario Testing Results
  - Production Cost Scenario Selection
- **Next Steps**

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Outlook Study Status

- September – October 2021: Finalize reference case assumptions*
- November - December 2021: Conduct simulations and analysis*
- January, February, March, April 2022, *May 2022:* Conduct Policy case simulations and analysis
- *May-June 2022: Issue draft report*, Finalize draft report, seek Business Issues Committee and Management Committee review and approval
- July 2022: Seek Board of Directors review and approval

*Collaborate with ESPWG and seek stakeholder input

Italics indicate adjustment made from last presentation

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Contract Case: Preliminary Renewable Generation Pockets

2019 CARIS Phase 1 "70x30" Scenario Renewable Generation Pockets

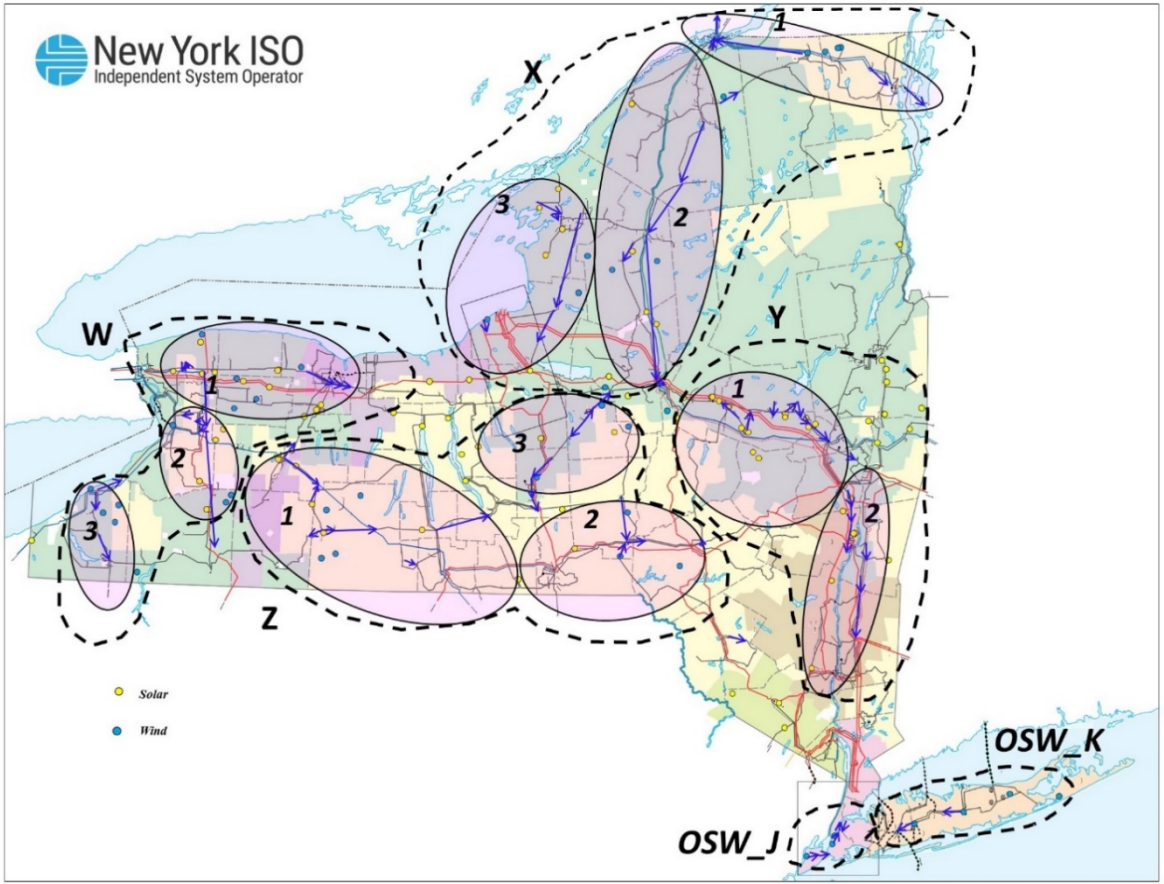

Figure 75 from 2019 CARIS Phase 1 Report

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Contract Case Resources vs 70x30 Resources for year 2030

Total Installed Capacity

Resource Type	2019 CARIS 1 70x30 Scenario Load Case (MW)	2021 System and Resource Outlook Contract Case (MW)
HYDRO	4,467	4,489
UPV	10,831	4,804
OSW	6,098	4,316
LBW	6,476	3,670
Total	27,872	17,279

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Renewable Generation Pocket Method

- Begin with production cost simulation results
- Identify transmission constraints on system based on number of congested hours
- Identify and correlate renewable generation impacted by transmission constraints
- Create pocket encapsulating correlated transmission and generation
- High level geographic locations identified by letters (W, X, Y…)
- Congested transmission areas identified within geographic areas and are identified by numbers (1, 2, 3…)
- Pockets identified with letter followed by number (W1, X2, Z3…)

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Outlook Renewable Generation Pocket Process

- Pockets identified in 2019 CARIS Phase 1 70x30 scenario will act as starting point
- Pockets will be identified for 2030 year for the following cases:
  - Contract Case
  - Policy Case Scenario 1
  - Policy Case Scenario 2
- Pocket definitions (lines & generators) will be published
- Pocket metrics (curtailment, energy deliverability, etc.) will be reported

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Major Constraints Defining Pockets in Contract Case

2030

Congested_Hours	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
BARRETT 2 138.00-VLY STRM 138.00	300	224	126	116	123	4,760	4,748	4,761	4,739	4,768	4,791	4,799	4,836	4,858	4,843	4,846	4,862	4,885	4,885	4,920
STOLE0-GIRD_115	-	1,161	2,524	1,507	2,673	3,491	3,605	3,419	4,052	3,816	4,210	3,872	3,854	4,003	3,609	3,522	3,433	3,502	3,499	3,150
RTDM1-AMST_115	-	22	1,122	1,191	1,197	1,185	1,202	1,186	1,223	1,201	1,202	1,173	1,188	1,167	1,199	1,180	1,183	1,159	1,152	1,152
COFFEEN-GLEN PRK_115	-	-	-	618	1,134	1,149	1,154	1,140	1,143	1,119	1,130	1,102	1,109	1,071	1,115	1,110	1,111	1,099	1,086	1,070
ALCOA-NM - ALCOA N_115	210	322	615	627	732	893	951	868	926	913	992	969	905	869	878	961	860	829	857	832
STONER-VAIL TAP_115	18	38	535	676	746	805	916	822	1,013	882	892	825	885	774	937	781	829	745	775	681
JMC2+9TP-OC W +MG_115	3	146	134	955	844	904	718	610	633	702	685	703	835	855	751	790	868	926	942	1,247
ALCOA-DENNISON_115	60	211	541	661	687	731	765	755	784	781	808	788	757	747	764	735	775	767	717	733
GOLAH-MORTIMER_115	-	48	175	654	706	780	769	838	860	845	813	806	763	790	802	788	759	754	707	753
COFFEEN-E WTRTWN_115	-	-	100	553	678	717	741	741	751	748	709	738	743	722	752	743	740	749	752	731
JENN-SIDNT_115	3	227	662	782	683	507	575	570	640	540	586	615	644	608	707	697	605	631	517	499
HTHSE HL-MALLORY_115	27	14	221	634	575	557	545	597	567	591	578	576	564	593	591	565	577	575	568	614
NICHOLVL-PARISHVL_115	2	29	247	357	381	359	397	413	498	515	456	406	503	480	516	509	441	422	483	509
TAYLORVL-LOWVILLE_115	-	-	-	538	496	397	385	438	426	431	424	391	449	471	460	459	406	409	465	467
EDNK-161-ARKWRIGH_115	34	98	173	126	196	315	299	274	312	297	323	291	273	269	246	232	232	217	207	204
LOUNS-STAGECOA_115	296	166	126	252	129	142	145	220	187	170	134	198	188	196	127	146	148	138	145	136
PORTER 1-ILION_115	1,270	1,324	775	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TAYLORVL-BU+LY+MO_115	-	15	215	201	150	155	142	153	178	182	168	156	164	164	186	197	176	168	175	172
W.WDB-FERND_115	297	253	285	144	129	100	63	53	84	54	75	89	73	60	78	108	123	103	132	124
NOEND-PLAT_115	11	30	71	117	199	185	179	101	146	128	152	165	117	80	110	125	97	84	101	123
LOWVILLE-BOONVL_115	-	-	-	116	88	88	94	87	97	96	97	97	99	79	101	92	92	91	95	89

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Contract Case Pocket Definitions

- W1 – Orleans-Rochester Wind (115 / 345 kV)
- W3 – Chautauqua Wind & Solar (115 kV)
- X1 – North Area Wind (230 kV)
- X2 - Mohawk Area Wind & Solar (Mainly 115 kV in Lewis County)
- X3 - Mohawk Area Wind & Solar (115 kV in Jefferson & Oswego Counties)
- Y1 – Capital Region Solar Generation (115 kV in Montgomery County)
- Z2 - Southern Tier Transmission Corridor (115 kV)
- OSW_J – NYC Offshore Wind (Mostly Existing Bulk Transmission)
- OSW_K – Long Island Offshore Wind (138 kV)

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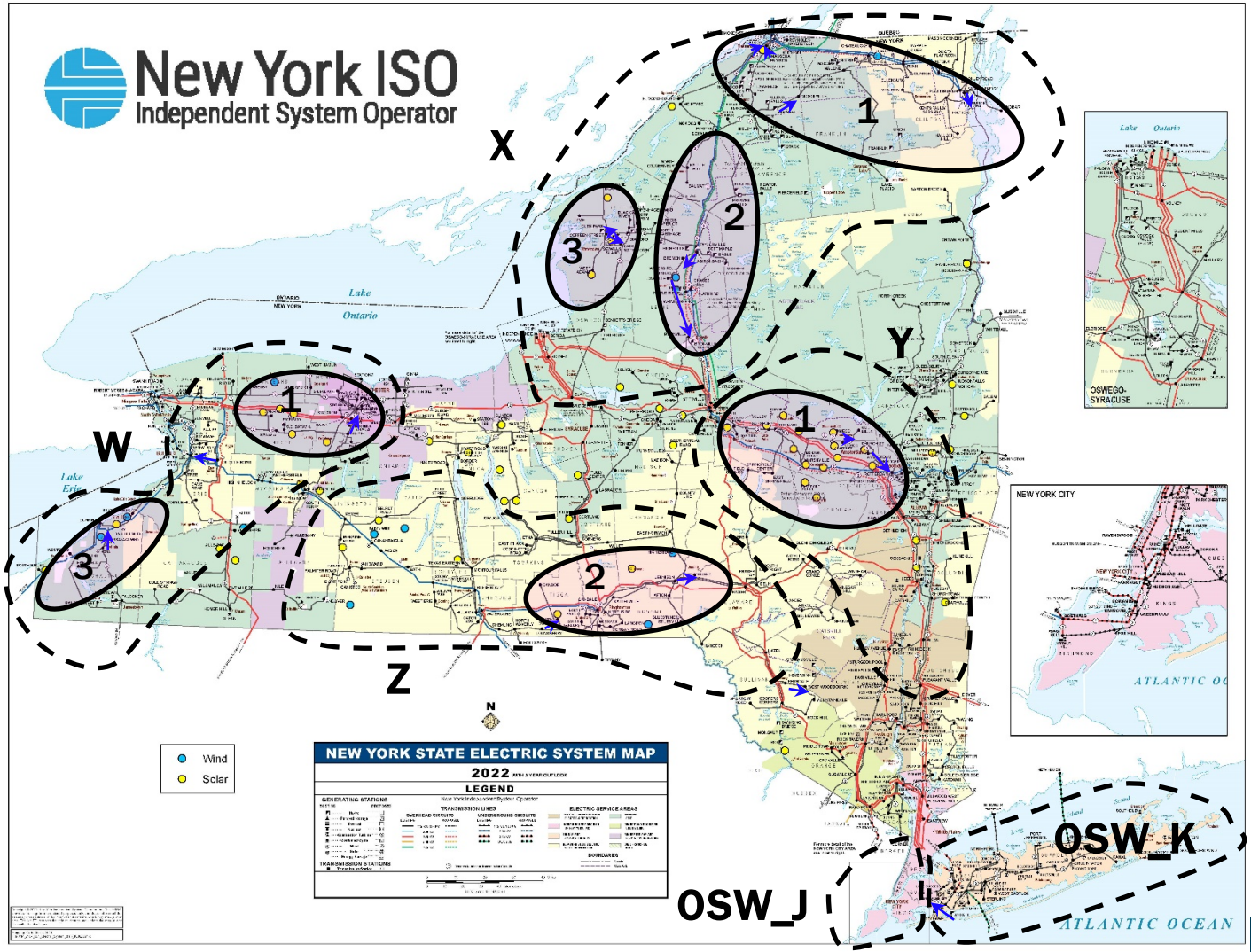
2021-2040 System & Resource Outlook Renewable Generation Pockets: Contract Case identified for 2030



Note: Pockets W2, Y2, and Z1 are not formed in the Contract Case due to the inclusion of only contracted generation through the 2020 NYSERDA solicitation.

Contract Case Pocket Metrics

Pocket	Type	Capacity (MW)	Energy (GWh)	Scheduled Energy (GWh)	Curtailment (GWh)	Energy Deliverability (%)
W1	Solar	1,110	2,180	2,198	18	99%
	Wind	200	393	393	0	100%
W3	Solar	290	448	448	0	100%
	Wind	178	435	436	1	100%
X1	Hydro	1,007	7,929	7,929	0	100%
	Solar	180	367	367	0	100%
	Wind	678	1,441	1,442	0	100%
X2	Hydro	240	1,405	1,407	3	100%
	Wind	505	1,154	1,154	0	100%
X3	Hydro	152	771	782	11	99%
	Solar	369	609	678	69	90%
	Wind	80	179	179	0	100%
Y1	Hydro	30	114	114	0	100%
	Solar	941	1,765	1,832	66	96%
	Wind	74	179	184	5	97%
Z2	Solar	40	64	64	0	100%
	Wind	213	696	703	7	99%
OSW_J	Offshore Wind	2,046	8,366	8,368	2	100%
OSW_K	Offshore Wind	2,270	6,815	8,891	2,076	77%

- Energy = Scheduled Energy – Curtailment
- Energy Deliverability (%) = Energy / Scheduled Energy
- Hourly simulations underestimate real-time curtailments due to several factors including, but not limited to, not capturing: transmission outages, forecast error, and real-time events
- Specific project interconnection configurations are not modeled as part of the Outlook

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Policy Case:
Capacity Expansion Results Update

Assumptions Matrix

- Updated document posted here.

Capacity Expansion Cases for Production Cost Analyses

- **Baseline w/ CLCPA Case Forecast Scenario**
  - Summary of the assumptions for this case are included on slides 16-18 of this presentation
- **Baseline w/ Alternative Forecast Scenario**
  - Several tests were conducted for the Alternative Forecast Scenario to more closely align with assumptions in the Climate Action Council draft scoping plan
  - Following these tests, additional assumption changes were adopted for the Alternative Forecast Scenario
    - Age based retirements assumed for applicable units
    - Only allow medium capital/medium operating cost (McMo) DEFR option to build
    - Additional constraints imposed on max capacity build limitations for land based wind (LBW)
  - Summary of the assumptions for this case are included on slides 20-23 of this presentation

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Summary of Assumptions for Baseline w/ CLCPA Case Forecast Scenario

- CLCPA Case load forecast from 2021 Gold Book, with adjustments to BTM:PV, energy storage, and electrification forecasts
  - BTM-PV is included in the load forecast and is not modeled as a candidate technology eligible for capacity expansion
- CLCPA targets enforced (see next slide for additional detail)
- UCAP equivalents of IRM and LCR requirements enforced, adjustments for future transmission (see 3/24/22 ESPWG materials for additional information)
- Generation resource investment and operating costs as outlined in the capacity expansion assumptions matrix
  - Overnight capital, fixed O&M and variable O&M costs assumed per 2021 EIA Energy Outlook
  - Fuel and emissions prices consistent with production cost database
  - DEFR capital, fuel, and operating costs informed by recent studies

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Summary of Assumptions for Baseline w/ CLCPA Case Forecast Scenario (cont.)

- Delay start year of new builds of Dispatchable Emission Free Resource (DEFR) technology options to 2030
- Max capacity limitations of UPV, LBW, and OSW aligned with 2040 limits per Appendix G: Annex 1: Inputs and Assumptions Climate Action Council draft scoping plan
- Declining capacity value curves for UPV, LBW, OSW, and ESR generators to model declining capacity value of these generators as a function of installed capacity
- Scheduled retirements of fossil generators to align with peaker rule compliance plans

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Summary of Assumptions for Baseline w/ CLCPA Case Forecast Scenario

- **Candidate technologies eligible for capacity expansion:**
  - Land based wind
  - Offshore wind
  - Utility PV
  - 4-hour battery storage
  - Dispatchable Emission Free Resource (DEFR)
    - High Capital/Low Operating, Medium Capital/Medium Operating, and Low Capital/High Operating DEFR generator options allowed to build

- **CLCPA targets and other state policy mandates modeled:**
  - 6 GW BTM-PV by 2025
  - 70% renewable energy by 2030
  - 3 GW energy storage by 2030
  - 10 GW BTM-PV by 2030
  - 9 GW offshore wind by 2035
  - 100% CO_2 emission free by 2040

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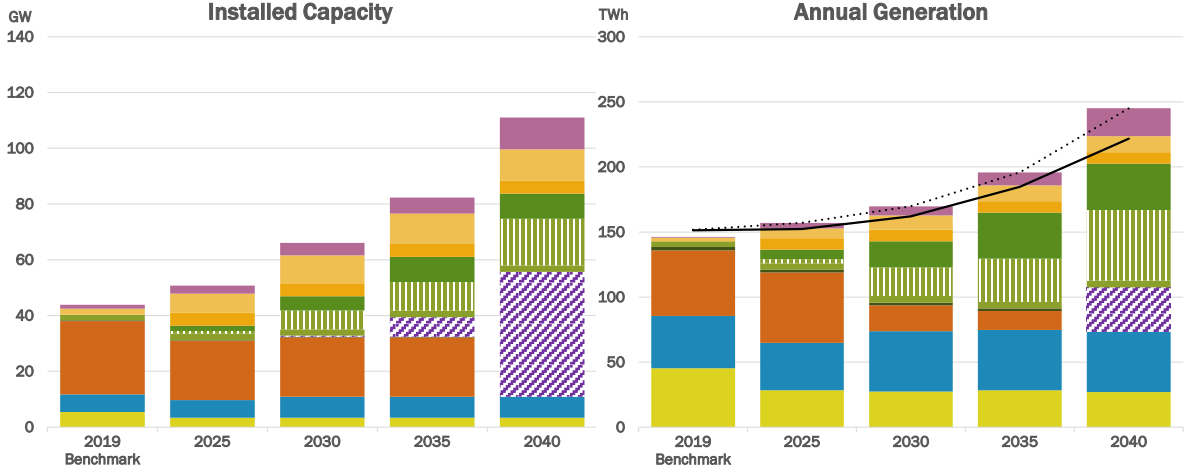
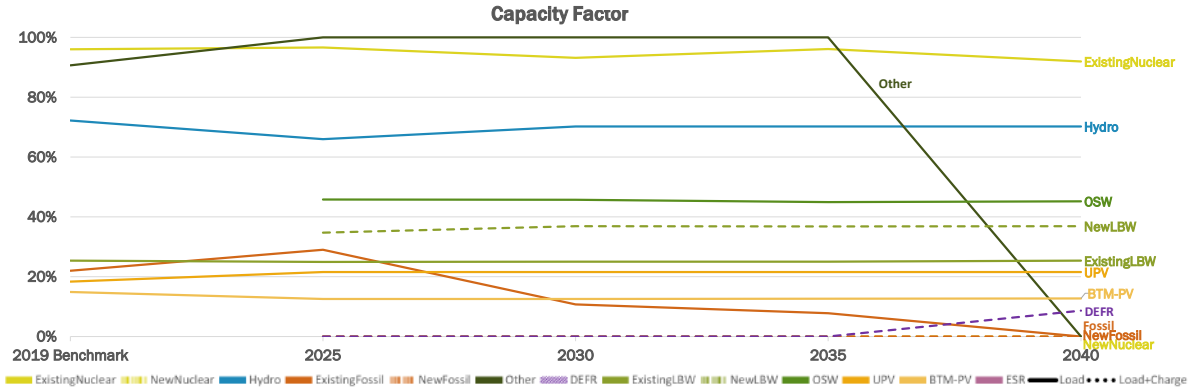
Baseline w/ CLCPA Case Forecast Scenario





Installed Capacity (MW)	2019	2025	2030	2035	2040
Nuclear	5,400	3,346	3,364	3,364	3,364
Fossil	26,262	21,310	21,232	21,234	-
DEFR - HcLo	-	-	-	-	3,812
DEFR - McMo	-	-	-	-	-
DEFR - LcHo	-	-	420	7,053	40,938
Hydro	6,331	6,302	7,537	7,540	7,540
LBW	1,985	3,335	9,086	12,612	19,087
OSW	-	1,826	5,036	9,000	9,000
UPV	32	4,676	4,676	4,676	4,676
BTM-PV	2,116	6,834	10,055	10,828	11,198
Storage	1,405	2,910	4,410	5,793	11,450
Total	43,838	50,763	66,460	89,376	111,066

Generation (GWh)	2019	2025	2030	2035	2040
Nuclear	45,429	28,338	27,444	28,338	27,092
Fossil	50,520	54,174	19,987	14,516	-
DEFR - HcLo	-	-	-	-	33,482
DEFR - McMo	-	-	-	-	-
DEFR - LcHo	-	-	-	-	523
Hydro	40,034	36,418	46,342	46,392	46,391
LBW	4,416	8,189	26,971	38,297	59,362
OSW	-	7,331	20,186	35,460	35,647
UPV	51	8,817	8,816	8,817	8,819
BTM-PV	2,761	7,483	11,068	11,983	12,454
Storage	612	4,347	7,004	10,084	21,339
Total Generation	146,262	157,088	169,810	195,879	245,109
RE Generation	47,261	68,238	113,383	140,949	162,672
ZE Generation	93,301	100,922	147,831	179,371	245,109
Load	151,386	152,336	162,122	184,836	221,828
Load+Charge	151,773	157,089	169,811	195,879	245,109
% RE [RE/Load]	31%	45%	70%	76%	73%
% ZE [ZE/(Load+Charge)]	61%	64%	87%	92%	100%

Emissions (million tons)	2019	2025	2030	2035	2040
CO_2 Emissions	22.24	23.53	8.50	6.22	-

* 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), High Capital Low Operating (HcLo)

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Summary of Assumptions for Baseline w/ Alternative Forecast Scenario

- **Alternative load forecast from Draft Scoping Plan for Climate Action Council work**
  - BTM-PV is included in the load forecast and is not modeled as a candidate technology eligible for capacity expansion
- **CLCPA targets enforced (see next slide for additional detail)**
- **UCAP equivalent of IRM and LCR requirements enforced, adjustments for future transmission (see 3/24/22 ESPWG materials for additional information)**
- **Generation resource investment and operating costs as outlined in the capacity expansion assumptions matrix**
  - Capital, fixed O&M and variable O&M costs assumed per 2021 EIA Energy Outlook
  - Fuel and emissions prices consistent with production cost database
  - DEFR capital, fuel, and operating costs informed by recent studies

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Summary of Assumptions for Baseline w/ Alternative Forecast Scenario, Continued

- Delay start year of new builds of Dispatchable Emission Free Resource (DEFR) technology options to 2030
- Max capacity limitations of UPV, LBW, and OSW aligned with 2040 limits per Appendix G: Annex 1: Inputs and Assumptions Climate Action Council draft scoping plan
- Declining capacity value curves for UPV, LBW, OSW, and ESR generators to model declining capacity value of these generators as a function of installed capacity
- Scheduled retirements of fossil generators to align with peaker rule compliance plans

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Summary of Assumptions for Baseline w/ Alternative Forecast Scenario

- **In addition to the assumptions outlined on the previous slide, the following assumptions have been adopted for the capacity expansion Baseline w/ Alternative Forecast to more closely align with assumptions in the Climate Action Council draft scoping plan:**
  - Age-based fossil retirements for applicable units assumed per Climate Action Council Appendix D (ST at 62 years and GT at 47 years of age)
  - Zonal multipliers for DEFR capital costs applied to assume higher capital costs in downstate zones as compared to upstate zones
  - Only allow medium capital/medium operating cost (McMo) DEFR option to build
  - Max capacity limitation of LBW aligned with 2030 limits for model years 2021-2030, per Appendix G: Annex 1: Inputs and Assumptions Climate Action Council draft scoping plan
    - Max capacity limitation of LBW aligned with 2040 limits for model years 2031-2040

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Summary of Assumptions for Baseline w/ Alternative Forecast Scenario

- **Candidate technologies eligible for capacity expansion:**
  - Land based wind
  - Offshore wind
  - Utility PV
  - 4-hour battery storage
  - Dispatchable Emission Free Resource (DEFR)
    - Medium Capital/Medium Operating DEFR generator option allowed to build

- **CLCPA targets and other state policy mandates modeled:**
  - 6 GW BTM-PV by 2025
  - 70% renewable energy by 2030
  - 3 GW energy storage by 2030
  - 10 GW BTM-PV by 2030
  - 9 GW offshore wind by 2035
  - 100% CO_2 emission free by 2040

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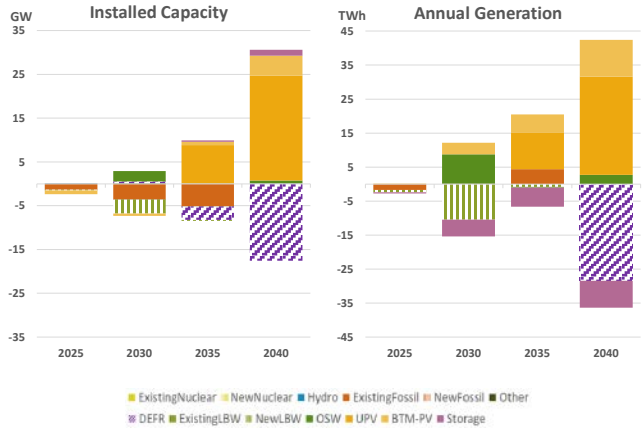
Baseline w/ Alternative Forecast Scenario

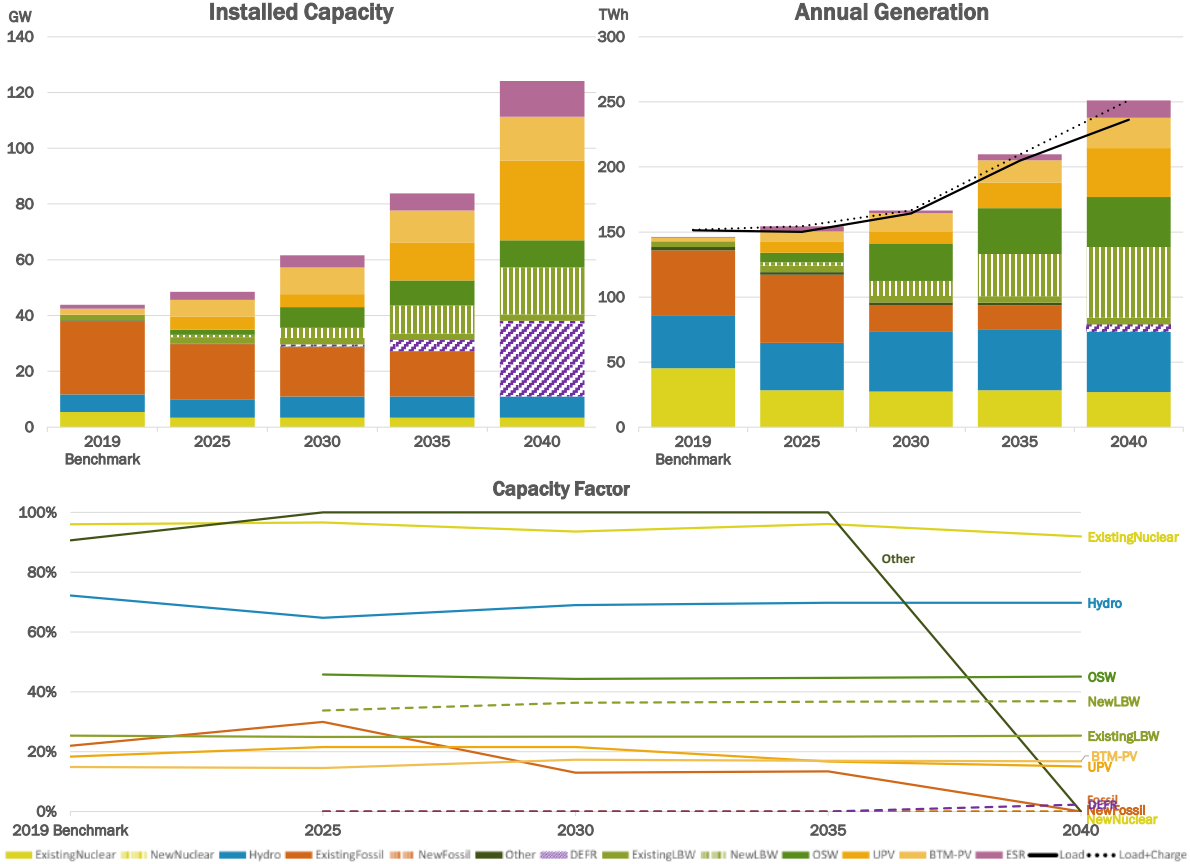
- **Input Assumption Adjusted:**
  - Load forecast to align with Draft Climate Action Council Scoping Plan Analysis Forecast
    - BTM-PV included in load forecast to align with CAC values
  - Age-based fossil retirements to align with Climate Action Council Appendix D
  - Zonal multipliers for DEFR capital cost assumptions
  - Only allow Medium Capital/Medium Operating (McMo) DEFR option to build
  - Max capacity limitation of LBW aligned with 2030 limits for model years 2021-2030, per Appendix G: Annex 1: Inputs and Assumptions Climate Action Council draft scoping plan
- **Caveats:**
  - Scenario #2 (S2) development contains resource mix directionally aligned with the Climate Action Council Integration Analysis Scenario 2. This study does not endorse one scenario over the other which should be viewed as potential options given large uncertainty of future system.
  - DEFR option may ultimately prove to not be representative of actual future technology
  - Effective Load Carrying Capability (ELCC) curves used are not study or case specific
- **Observations:**
  - Decrease capacity built from DEFRs
  - Increase in UPV, OSW, and storage capacity builds
  - Large UPV build leads to UPV curtailments
  - Retirements from fossil units occur earlier on in model horizon, due to assumption on scheduled retirements
  - Less LBW capacity builds earlier on in the model horizon, due to 2030 max capacity limitation, comparable LBW capacity builds by 2040
  - DEFR build and operation changes due to differing DEFR assumption
- **Deltas (from S1):**



Installed Capacity (MW)	2025	2030	2035	2040
Nuclear	-	(17)	-	-
Fossil	(1,322)	(3,582)	(5,163)	-
Other	-	(2)	(0)	-
DEFR	-	400	(3,063)	(17,550)
Hydro	113	123	44	44
LBW	(197)	(3,196)	(246)	-
OSW	-	2,400	-	720
UPV	-	-	8,772	23,930
BTM-PV	(834)	(532)	773	4,566
Storage	-	-	355	1,360
Total	(2,240)	(4,406)	1,473	13,069

Generation (GWh)	2025	2030	2035	2040
Nuclear	-	-	-	-
Fossil	(1,737)	79	4,392	-
Other	-	-	-	-
DEFR	-	-	-	(28,422)
Hydro	-	-	-	-
LBW	(671)	(10,478)	(836)	-
OSW	-	8,680	(213)	2,741
UPV	-	-	10,844	28,886
BTM-PV	148	3,393	5,240	10,766
Storage	(343)	(4,912)	(5,583)	(7,920)
Total Generation	(2,604)	(3,237)	13,845	6,051

Baseline w/ Alternative Forecast Scenario



Installed Capacity (MW)	2019	2025	2030	2035	2040
Nuclear	5,400	3,346	3,346	3,364	3,364
Fossil	26,262	19,988	17,650	16,071	-
DEFR - HcLo	-	-	-	-	-
DEFR - McMo	-	-	819	3,990	27,200
DEFR - LcHo	-	-	-	-	-
Hydro	6,331	6,415	7,660	7,584	7,584
LBW	1,985	3,138	5,890	12,366	19,087
OSW	-	1,826	7,436	9,000	9,720
UPV	32	4,676	4,676	13,448	28,606
BTM-PV	2,116	6,000	9,523	11,601	15,764
Storage	1,405	2,910	4,410	6,147	12,810
Total	43,838	48,523	62,454	87,787	124,135

Generation (GWh)	2019	2025	2030	2035	2040
Nuclear	45,429	28,338	27,444	28,338	27,092
Fossil	50,520	52,437	20,066	18,908	-
DEFR - HcLo	-	-	-	-	-
DEFR - McMo	-	-	-	-	5,584
DEFR - LcHo	-	-	-	-	-
Hydro	40,034	36,418	46,342	46,392	46,391
LBW	4,416	7,518	16,494	37,460	59,362
OSW	-	7,331	28,865	35,247	38,388
UPV	51	8,817	8,816	19,661	37,705
BTM-PV	2,761	7,631	14,461	17,223	23,220
Storage	612	4,007	2,086	4,492	13,414
Total Generation	146,262	154,488	166,567	209,714	251,155
RE Generation	47,261	67,715	114,979	155,984	205,065
ZE Generation	93,301	100,059	144,509	188,814	251,155
Load	151,386	150,047	164,255	204,764	236,334
Load+Charge	151,773	154,488	166,567	209,715	251,155
% RE [RE/Load]	31%	45%	70%	76%	87%
% ZE [ZE/(Load+Charge)]	61%	65%	87%	90%	100%

Emissions (million tons)	2019	2025	2030	2035	2040
CO_2 Emissions	22.24	22.87	8.98	8.50	-

* 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), High Capital Low Operating (HcLo)

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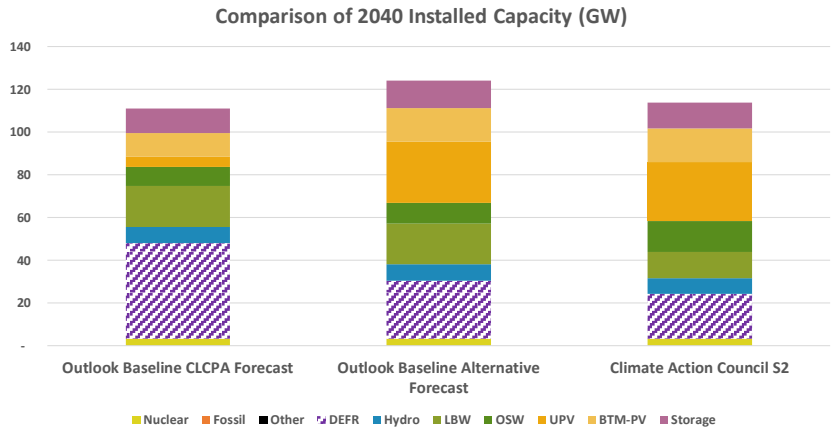
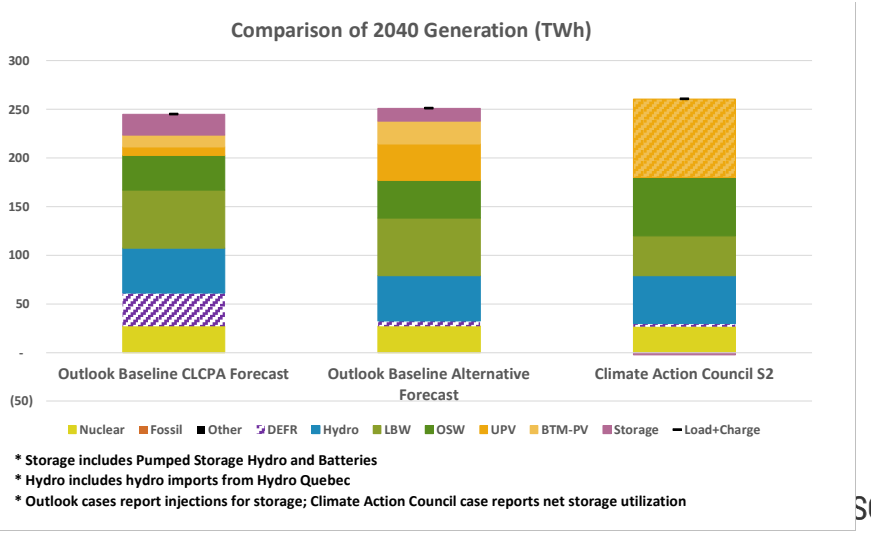
Recommendation

- **Proceed with the following cases for production cost modeling:**
  - Scenario #1 (S1) – Baseline w/ CLCPA Case Forecast Scenario
  - Scenario #2 (S2) – Baseline w/ Alternative Forecast Scenario





Next Steps

Next Steps

- Generator placement process for S1 & S2
- Production cost simulations for S1 & S2
- Policy case preliminary results
- Draft report sections

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Questions, Feedback, Comments?

- Email additional feedback to: JFrasier@nyiso.com

2021-2040 Outlook Data Catalog

ESPWG/TPAS Presentations

May 20, 2021
- Model Benchmark Results

September 22, 2021
- System & Resource Outlook Update

October 25, 2021
- Capacity Expansion Model Primer
- System & Resource Outlook Update

November 19, 2021
- System & Resource Outlook Update

December 19, 2021
- System & Resource Outlook Update

January 25, 2022
- System & Resource Outlook Update

February 9, 2022
- System & Resource Outlook Update
- Base & Contract Case Results

February 25, 2022
- System & Resource Outlook Update

March 8, 2022
- System & Resource Outlook Update

March 24, 2022
- System & Resource Outlook Update
- Contract Case Congestion Analysis

April 1, 2022
- System & Resource Outlook Update

Final Reports

2022 Release

Data Posted to ESPWG

- Assumptions Matrix v1
- Capacity Expansion Assumptions Matrix v1
- Contract Case Renewable Projects
- Emissions Price Forecast
- Fuel Price Forecast
- Capacity Expansion Assumptions Matrix v2 (Redline)
- Capacity Expansion Assumptions Matrix v3 (Redline)
- Production Cost Assumptions Matrix v2 (Redline)
- Capacity Expansion Assumptions Matrix v4 (Redline)
- Capacity Expansion Assumptions Matrix v5 (Redline)
- Policy Case Hourly Load Forecasts
- Policy Case Zonal Capacity Expansion Preliminary Results
- Capacity Expansion Assumptions Matrix v6 (Redline)

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Appendix

Capacity Expansion Model Overview

Capacity Expansion Model Framework

- **Capacity expansion models simulate investment and retirement of resources to meet load, policy targets, and other operational/capacity constraints by optimizing over the entire 20-year study period for the NYCA only**
  - The capacity expansion model assumes linear expansion, which allows for partial build/retirement decisions
    - Capacity builds are assumed at the zonal level, such that a single generator by technology type can be built in each applicable zone
    - Economic retirements are enabled such that individual generators could retire in part or in its entirety within the overall optimization
- **The NYISO capacity expansion model uses 17 time slices per year to represent the 8,760-hour load and generation profiles**
  - For each year, 16 of the load blocks are represented by splitting hours of the year by season (Spring, Summer, Fall, Winter) and time of day (overnight, morning, afternoon, evening) and the 17th load block represents a period of peak load hours
  - The time slices capture seasonal and diurnal variation in wind, solar, and load profile
- **PLEXOS creates a reduced "pipe-and-bubble" model by performing a nodal to zonal reduction of the transmission system**

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Capacity Expansion Model Limitations

- The capacity expansion model was developed as an initial reasoned trade-off between balancing model fidelity, runtime, and future uncertainty/knowledge of input assumptions (characterized by scenario testing) to produce representations of outcomes of the future NY generation fleet and operations
- The capacity expansion modeling framework employed will not capture curtailment of renewable resources due to specific transmission constraints. Curtailments will be reported as part of the Policy Case production cost model results.
- Ongoing work will continue to refine the methods, assumptions, and reporting in the years to come

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Capacity Expansion Model Caveats

- The capacity expansion model is a projection of the future system mix and not an endorsement of outcomes under any specific set of assumptions. It is intended to inform NYISO studies and stakeholders of potential future generation buildouts under a multitude of scenarios
- The results of capacity expansion models are sensitive to the input assumptions related to cost and performance of resources and the modeling framework used to represent chronology and nodal/zonal representations
- The capacity expansion model does not capture capacity market dynamics beyond simplified assumptions of satisfying current published IRM and LCR requirements on an unforced capacity basis

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Capacity Expansion Model Caveats (cont.)

- A set of proxy generic Dispatchable Emission Free Resources (DEFRs) was used to approximate a range of capital and operating costs given uncertainty of future technology pathways to serve this role
- All DEFRs are modeled as highly flexible resources with operational parameters (*i.e.*, heat rate, ramp rate, reserve contribution, start time, etc.) similar to a new natural gas combined cycle (but with zero emission rate)
- While these proxy DEFR options may ultimately prove to not be representative of actual future technologies, they were used as a modeling framework to highlight the operational needs that would have to be met by the DEFRs when performing production cost simulations

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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

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