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ENERGY RESEARCH

The Race for Renewables: Incentive outlook in NYISO

Public Webinar

October 8, 2024

REDACTED VERSION

Agenda

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I. **Introduction to today's session**

II. **Context for renewables in NYISO**

III. **NYISO Market Outlook**

1. Overview of renewables solicitations
2. Strike price formation and sensitivities

IV. **Next steps**

V. **Appendix**

Introducing Aurora's speakers

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Commercial Associate

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Source: Aurora Energy Research

Aurora provides global market leading forecasts & data-driven intelligence to advance the energy transition

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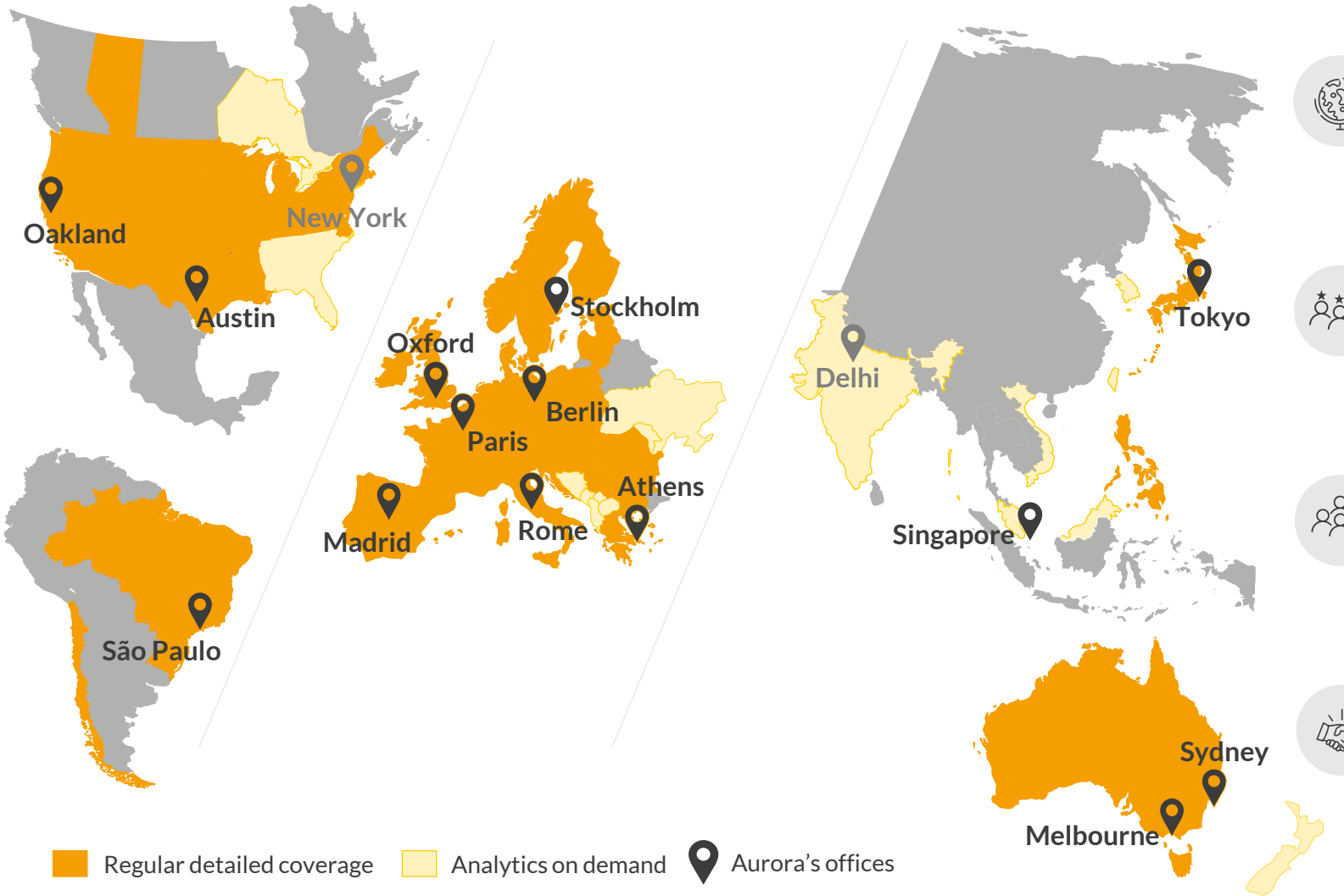
- Power markets
- Renewables & PPAs
- Storage
- Grid & Congestion
- Electric vehicles
- Hydrogen H_2
- Carbon CO_2
- Natural gas



14 offices
and two more coming soon

800+
market experts

850+
subscribing companies

150+
transactions supported in 2023

Source: Aurora Energy Research

Aurora continues to develop our North American financing track record to reach the same depth of bankability as in Europe and APAC

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Aurora's price forecasts have been relied upon by lenders in recently completed transactions:

- ECP, SOCIETE GENERALE — 471MW Solar debt financing in ERCOT leveraging market forecast and transmission modelling
- AIB, lightsource bp, LLOYDS BANK, SOCIETE GENERALE, ING, NatWest — 288MW Solar debt financing in ERCOT leveraging market forecast, transmission modelling, and due diligence support
- HPS, Intersect Power, Deutsche Bank, Morgan Stanley — Three, 320MWh BESS asset debt and tax equity financing in ERCOT leveraging market forecast and transmission modelling
- COMMERZBANK — Lender advisor to Commerzbank for 150MW Solar project financing in ERCOT
- COMMERZBANK — Lender advisor to Commerzbank for a 215MW Solar + Storage facility financing in CAISO

Ongoing financing projects:

- Lender advisor for Solar asset financing in WECC
- Market forecast, transmission modelling for debt financing of 350MW Solar + 1,500MW Storage assets in CAISO for developer
- Debt financing and sell side support for 250MW Solar + 150MW Storage project in CAISO for developer
- Debt financing of 600MW onshore wind farm in ERCOT for developer
- Market forecast and transmission modelling for debt financing of Solar + Storage assets in ERCOT for global project developer
- Lender advisor providing structural floor pricing analysis for term loans
- Tax equity raise support for Solar + Storage project developer in CAISO
- Debt and tax equity raise support for Solar + Storage projects in ERCOT and CAISO for developer
- Market forecast for debt financing of Solar assets in MISO and NYISO for developer
- Market forecast and transmission modelling for debt financing of Storage asset in ERCOT for developer

Source: Aurora Energy Research


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V. Appendix

Today's session will cover renewables and REC economics with a focus on implications for market participants

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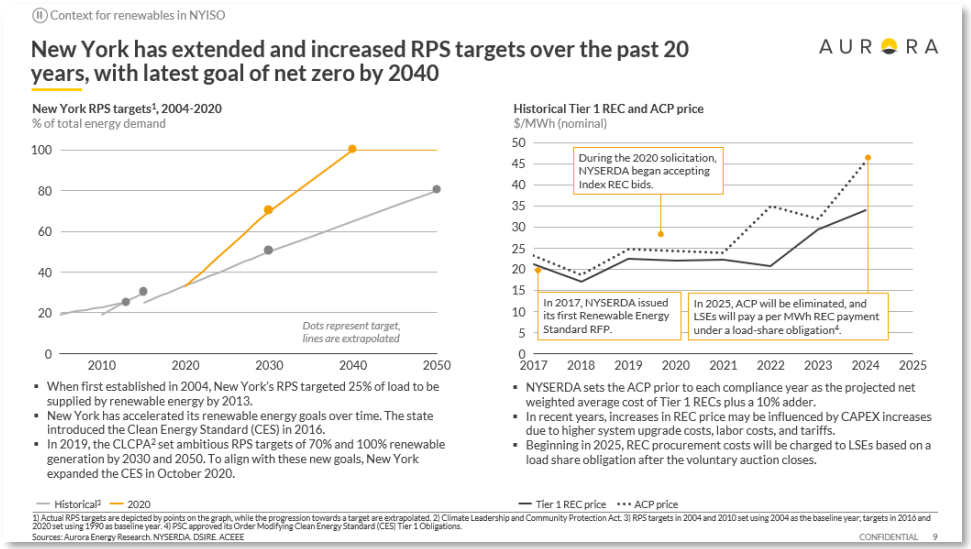
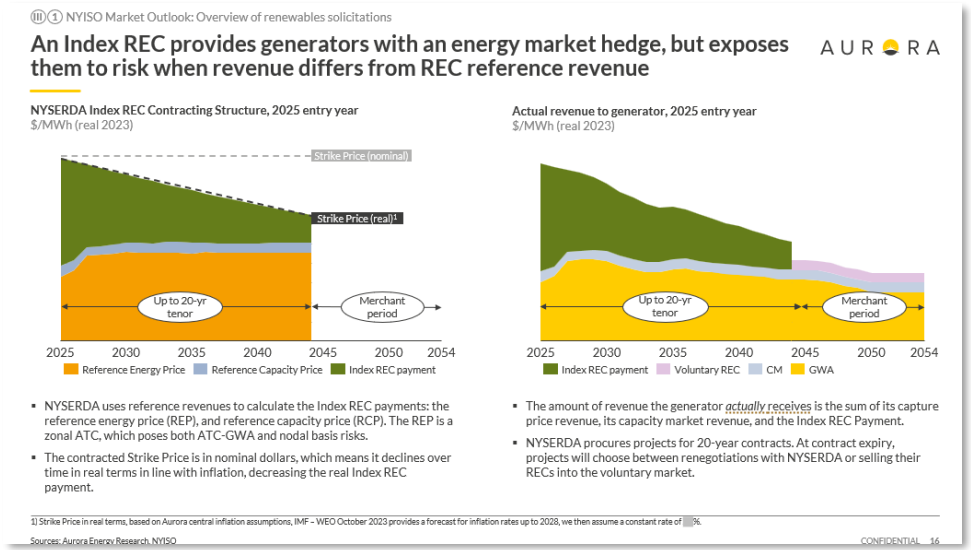
Context for renewables

- **Ambitious state goals:** New York boasts some of the most aggressive renewable goals in the country, but generators there face challenges to profitability compared to other regions.
- **RECs and incentives**: Renewable Energy Credits (RECs) are required for a positive renewables business case.

NYISO Outlook

- **Project developers bear most risks**: Project developers receive contracted revenue through NYSERDA REC solicitations but are also exposed to most risks, incl. cannibalization, curtailment, and inflation.
- **Bill for RECs likely to remain high**: Strike Price expected to stabilize at $[redacted]-[redacted]/MWh after 2035 as pricing of risks counterbalances financing benefits of contracted revenue.





Note: All values in USD (real 2023)

Source: Aurora Energy Research

New York has extended and increased RPS targets over the past 20 years, with latest goal of net zero by 2040

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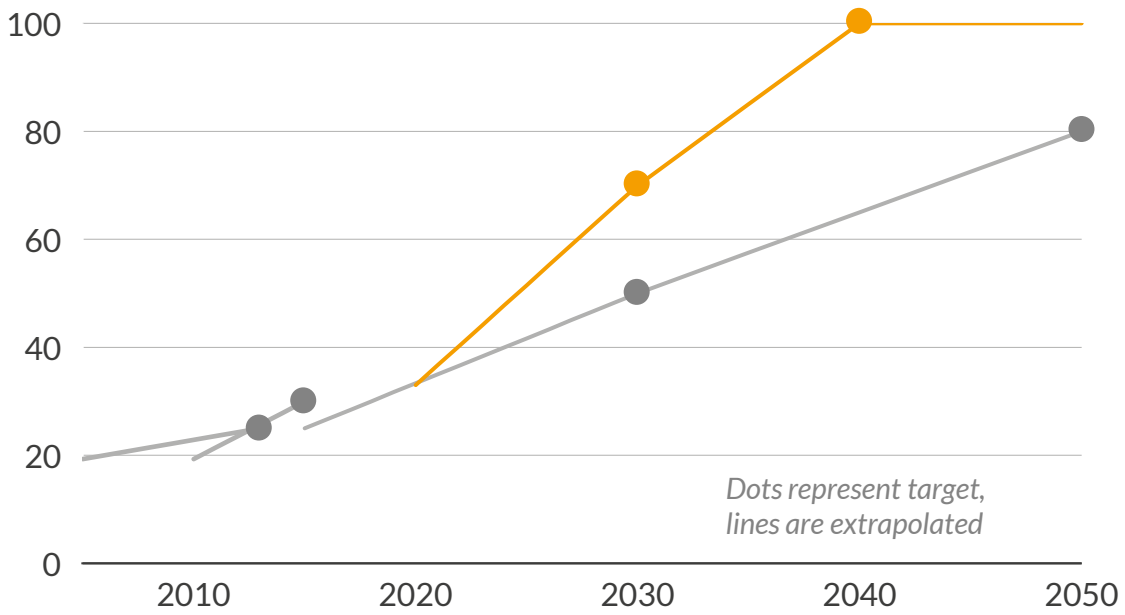
New York RPS targets[1], 2004-2020

% of total energy demand

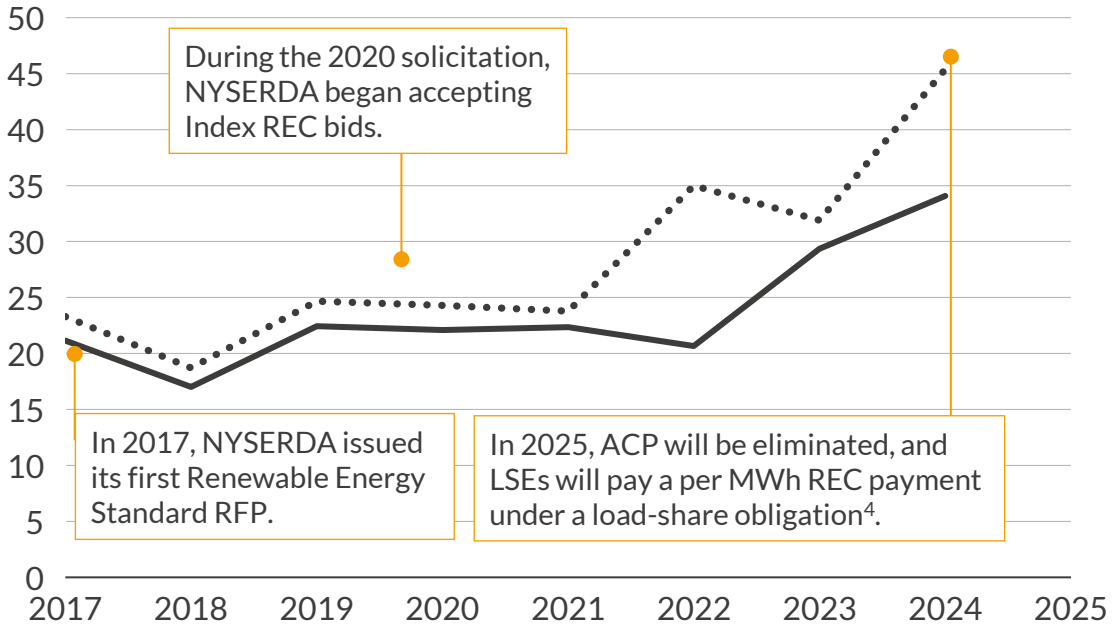


- When first established in 2004, New York's RPS targeted 25% of load to be supplied by renewable energy by 2013.
- New York has accelerated its renewable energy goals over time. The state introduced the Clean Energy Standard (CES) in 2016.
- In 2019, the CLCPA[2] set ambitious RPS targets of 70% and 100% renewable generation by 2030 and 2050. To align with these new goals, New York expanded the CES in October 2020.

Historical[3] 2020

Historical Tier 1 REC and ACP price

$/MWh (nominal)



- NYSERDA sets the ACP prior to each compliance year as the projected net weighted average cost of Tier 1 RECs plus a 10% adder.
- In recent years, increases in REC price may be influenced by CAPEX increases due to higher system upgrade costs, labor costs, and tariffs.
- Beginning in 2025, REC procurement costs will be charged to LSEs based on a load share obligation after the voluntary auction closes.

Tier 1 REC price ACP price

1) Actual RPS targets are depicted by points on the graph, while the progression towards a target are extrapolated. 2) Climate Leadership and Community Protection Act. 3) RPS targets in 2004 and 2010 set using 2004 as the baseline year; targets in 2016 and 2020 set using 1990 as baseline year. 4) PSC approved its Order Modifying Clean Energy Standard (CES) Tier 1 Obligations.

Sources: Aurora Energy Research, NYSERDA, DSIRE, ACEEE

Opinion Poll

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How much of New York's demand will be met by renewable generation in 2030? Today, ~30% of NY demand is met by renewables, and the state target in 2030 is 70%.

A 30-50%

B 50-70%

C 70%+

RECs are essential for the renewables business case and account for nearly % of upstate New York solar revenues by 2050

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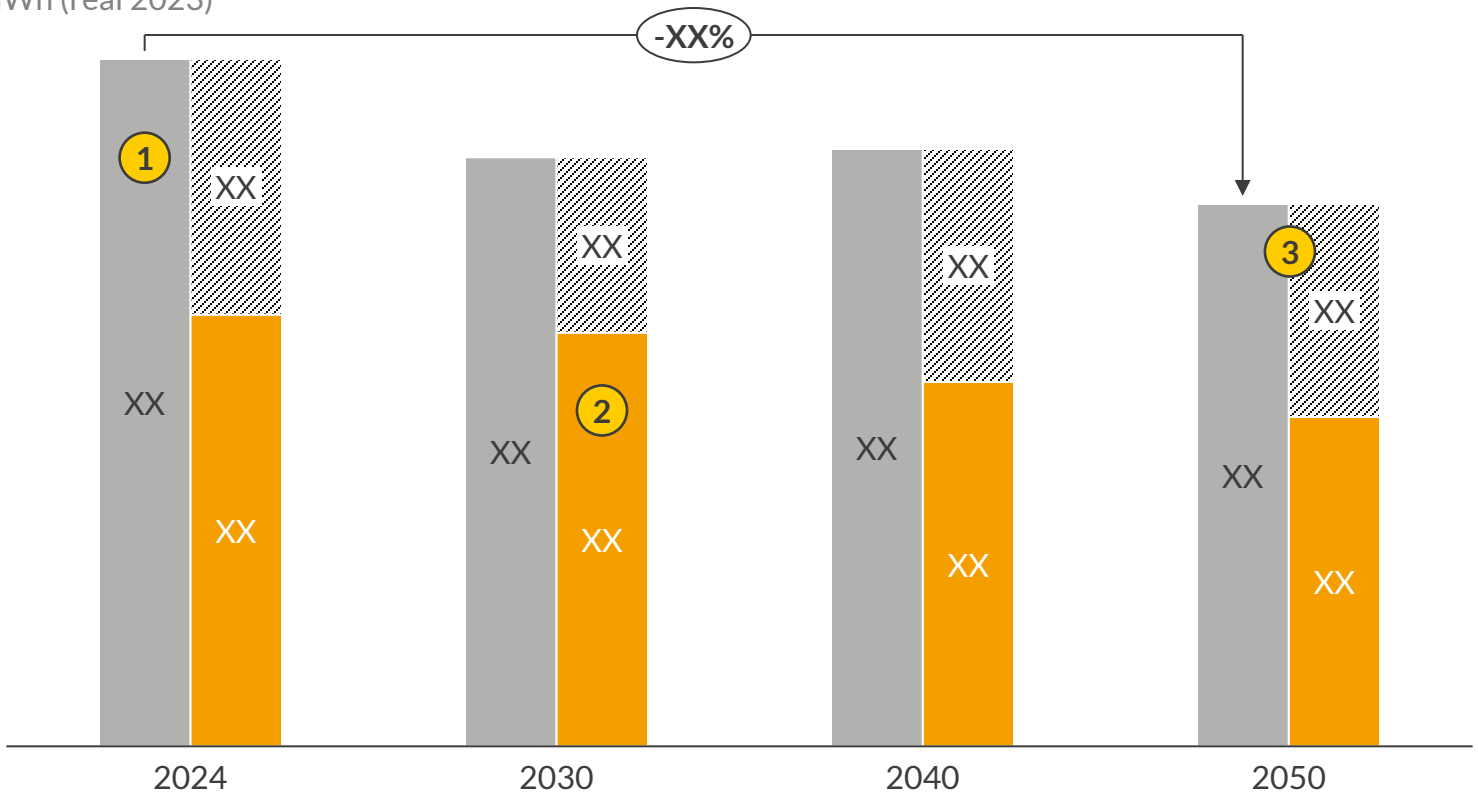
As the business case for renewables in NYISO evolves:

1. The total missing money for a solar project in NY declines over time in line with renewable LCOEs[1], as CAPEX continues to drop through technological and production innovations.
2. However, due to increasing cannibalization (lowering GWAs[2]) and strongly declining derating factors, renewables' wholesale and capacity revenues respectively decline over time. This results in a larger share of the required levelized revenues needing to be met through RECs.
3. LROE[3] remains below LCOE across NYISO throughout the forecast, with % of levelized revenues needing to be covered — explicitly or implicitly — by REC value by 2050.

As a result, it is crucial for renewables' business cases to correctly account for future REC price development in NYISO, including the related risks and underlying drivers.

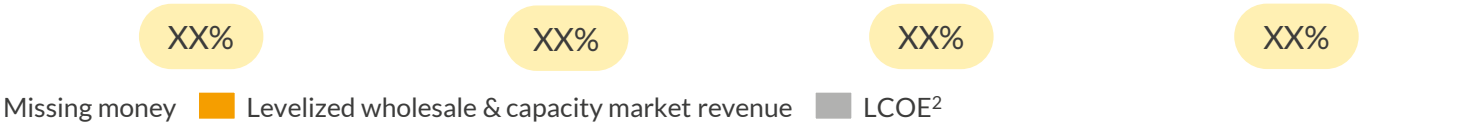
Lifetime expected solar LCOE and LROE by build year (NY illustrative example[4])

$/MWh (real 2023)



Share of solar levelized revenues that must be provided by REC value

%



1) Levelized Cost of Energy; assuming a discount rate of %, lifetime of years, a % load factor, and Energy Community ITC rate (% of CAPEX, with % transaction costs) stepping down in 2034. 2) Generation Weighted Average. 3) Levelized Revenues of Energy. 4) For a solar panel in Zone C receiving Energy Community tax rates.

Sources: Aurora Energy Research

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Aurora's forecast shows New York falling ~ % short of its 2040 net zero target, hindered by permitting delays and limited profitable projects

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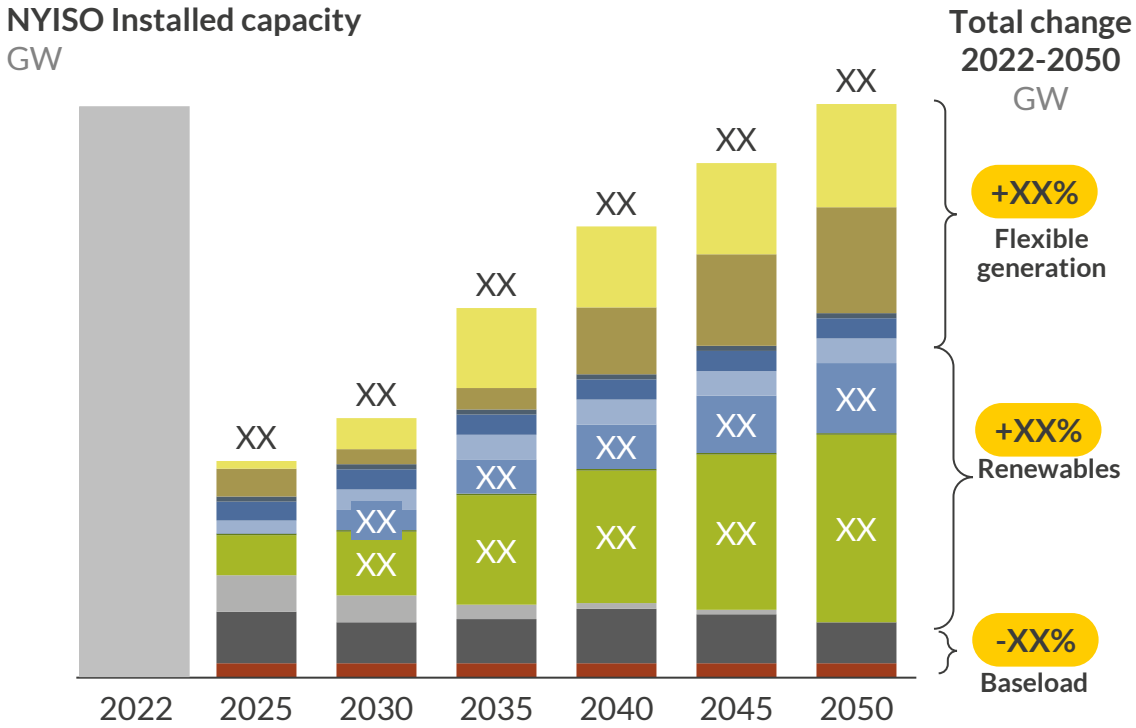

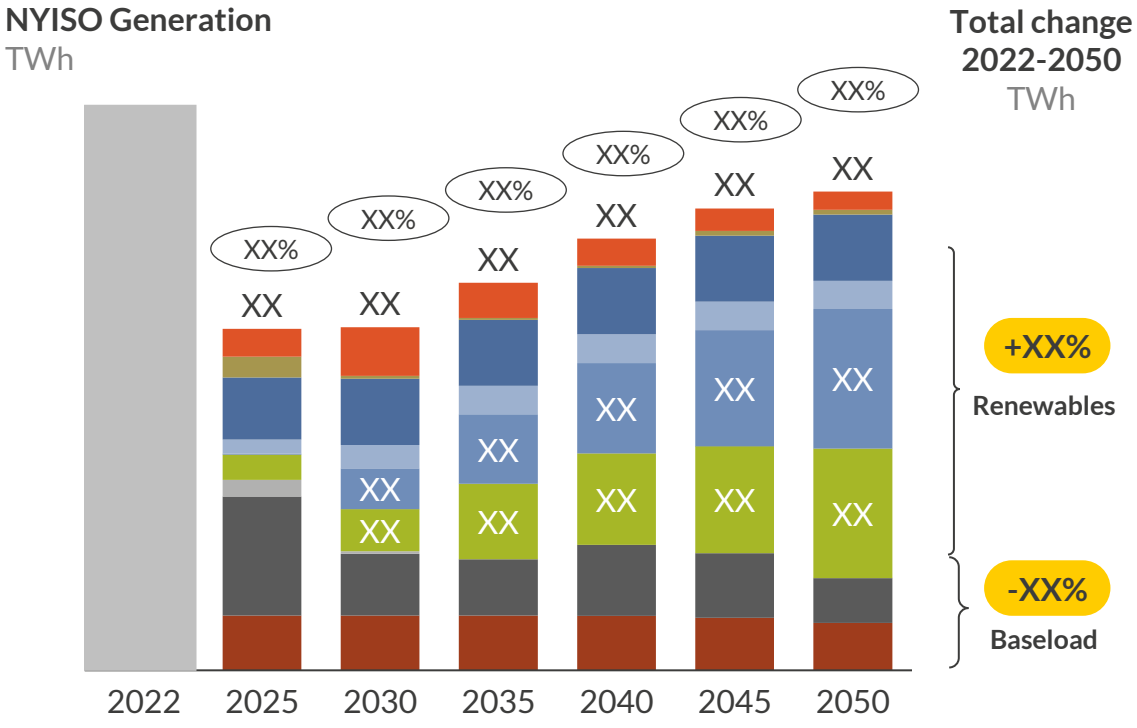

- In our forecast, renewable energy resources are projected to reach only % by 2030 and % by 2050, falling short of New York's RPS targets of 70% by 2030 and 100% by 2050, primarily due to land use constraints, higher interconnection costs, and a lack of profitable projects, despite policy support and targets outlined in the CLCPA.
- Aurora forecasts new peaking and battery capacity to build to fill the need of **GW flexing generating capacity in NYISO by 2040**. Battery storage builds corresponding to the growing solar capacity driven by the policy and its favorable CAPEX. Despite the Peaker Rule in NY, Aurora sees the necessity of new peaking capacity with less than % average capacity factor to meet the ICAP reliability targets.

Nuclear | Gas CCGT | Solar PV | Offshore wind | Hydro | Peaking[3]
Coal | STG[1] | Other renewables[2] | Onshore wind | Pumped storage | Battery storage
Net Imports | % | % of demand met by renewables[5]

1) Steam Gas Turbine. 2) Others include bio and biomass. 3) Peaking includes OCGT, Diesel and reciprocating engines. 4) Came into effect in 2023 and places stricter emission controls on around 3.3GW of flexible and dispatchable electricity generation. 5) Includes Hydro.

Sources: Aurora Energy Research, NYISO, EIA

New York does not rely on a traditional REC market to promote renewables build; NYSERDA instead issues annual requests for proposals (RFPs)

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Solicitation process

1. NYSERDA solicits bids for renewable energy on an annual basis
   - The 8th annual solicitation occurs in 2024
2. Developers bid a nominal Fixed REC price or Index REC Strike Price
   - Fixed REC: Per REC payment between NYSERDA and generator
   - Index REC: Strike Price used to calculate the per REC payment on a monthly basis

Developer sets Index REC Strike Price based on required return

Index REC Strike Price = Levelized cost of energy + Est. risks

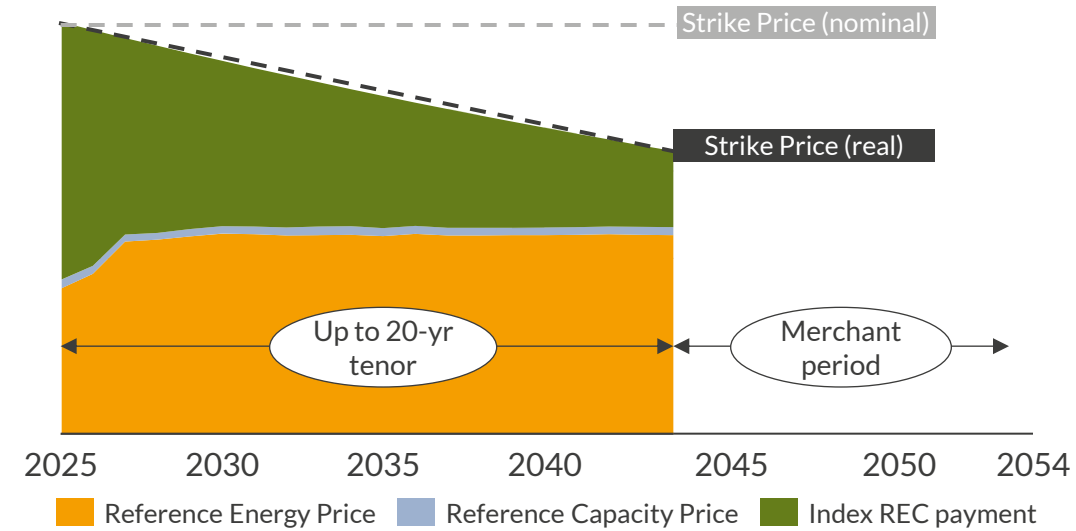
NYSERDA pays out REC payment based on estimated revenues

Index REC Strike Price = Est. earned revenue (REP + RCP) + **REC Payment**

3. NYSERDA converts all bid prices to a Levelized Net REC Cost (LNRC). Bids are compared and evaluated based on:
   - 70% REC price
   - 20% project viability
   - 10% incremental economic benefits to New York
4. NYSERDA holds quarterly auctions in which RECs are sold to LSEs and voluntary offtakers.

NYSERDA Index REC Contracting Structure, 2025 entry year

$/MWh (real 2023)



- **Strike Price:** All-in cost per megawatt-hour to develop a large-scale renewables project competitively bid to NYSERDA.
- **Reference Energy Price:** A simple average of hourly NYISO Day Ahead Locational Based Marginal Price of the control zone of the bid facility.
- **Reference Capacity Price:** Estimated capacity market payment to generator, including capacity accreditation factor.
- **Index REC Payment**: Monthly settlement of the Strike Price less the REP and RCP. If the settlement value is negative, the amount accrues as a debit to be deducted from future months.

Sources: Aurora Energy Research

An Index REC functions most similarly to a contract for difference and has advantages over the Fixed REC bid option

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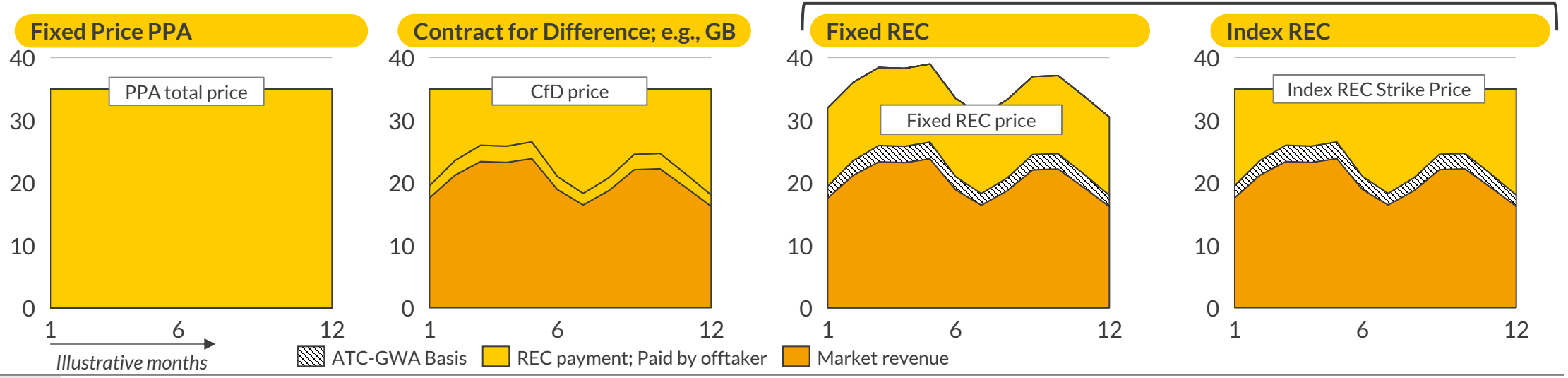
Highly illustrative graphs to show revenue dynamics only

Illustrative revenue payments to renewables generator
$/MWh

NYSERDA Solicitation structures



Product purchased by offtaker	REC Energy	REC Energy	REC	REC
Contracting structure	Bilateral contract between offtaker and generator	Common offake structure in Europe	Annual solicitation through NYSERDA with developer	Annual solicitation through NYSERDA with developer
Distribution of risk				
Market Price Fluctuation	**Offtaker**	**Offtaker**, with limits to downside	**Developer**	**Offtaker**, with limits to downside
Cannibalization	Usually **offtaker**, but negotiable	**Offtaker**	**Developer**	**Developer**
Transmission / Curtailment	Usually **developer**, but negotiable	**Developer**	**Developer**	**Developer**
Inflation	Negotiable	**Offtaker**	**Developer**	**Developer**

An Index REC provides generators with an energy market hedge, but exposes them to risk when revenue differs from REC reference revenue

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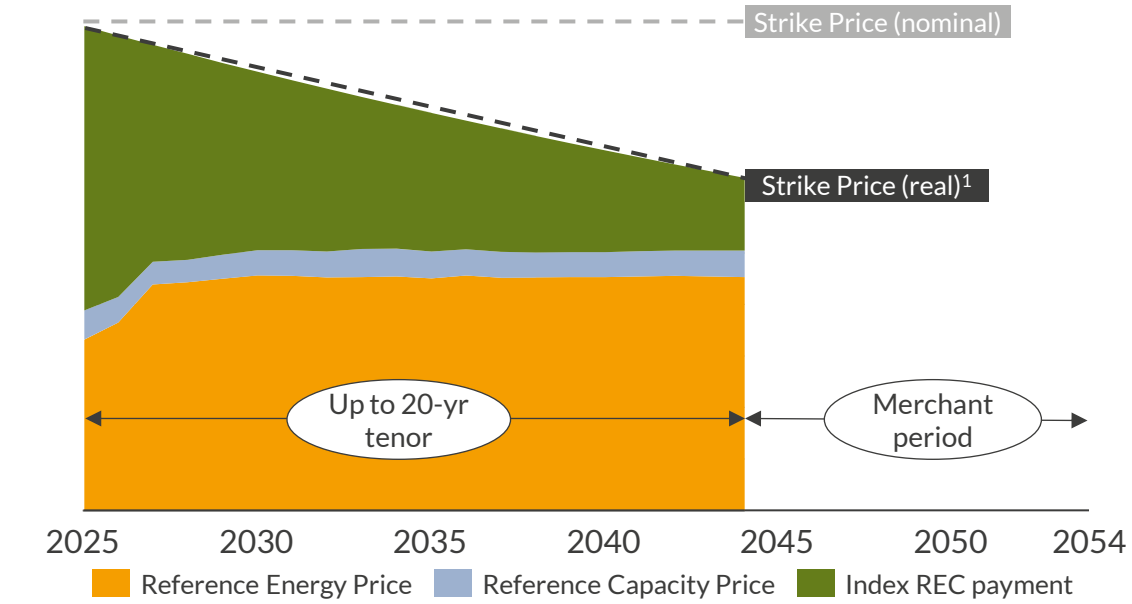
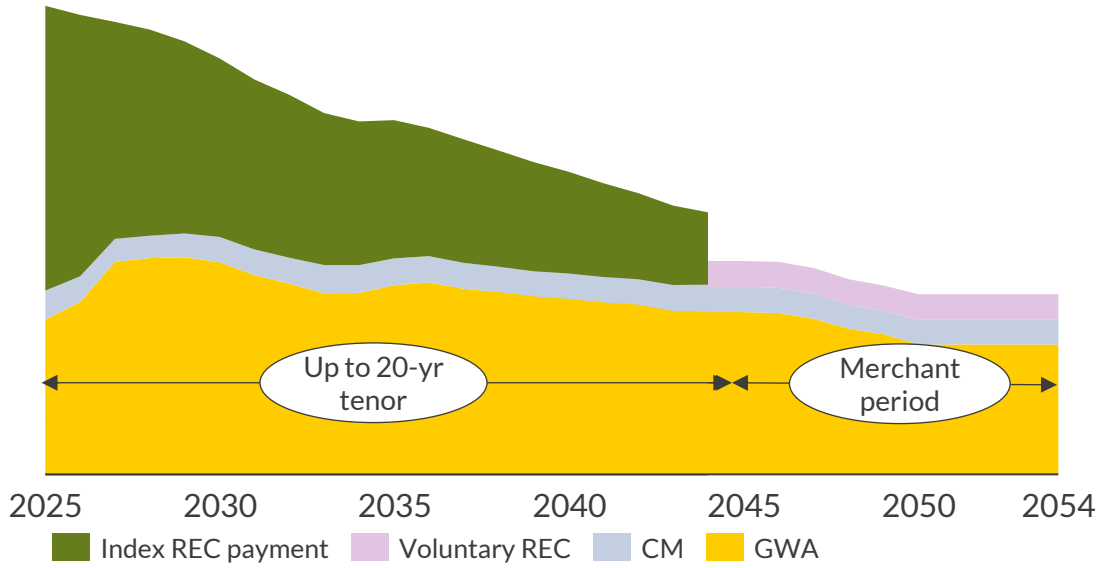
NYSERDA Index REC Contracting Structure, 2025 entry year
$/MWh (real 2023)



Actual revenue to generator, 2025 entry year
$/MWh (real 2023)



- NYSERDA uses reference revenues to calculate the Index REC payments: the reference energy price (REP), and reference capacity price (RCP). The REP is a zonal ATC, which poses both ATC-GWA and nodal basis risks.
- The contracted Strike Price is in nominal dollars, which means it declines over time in real terms in line with inflation, decreasing the real Index REC payment.

- The amount of revenue the generator *actually* receives is the sum of its capture price revenue, its capacity market revenue, and the Index REC Payment.
- NYSERDA procures projects for 20-year contracts. At contract expiry, projects will choose between renegotiations with NYSERDA or selling their RECs into the voluntary market.

1) Strike Price in real terms, based on Aurora central inflation assumptions, IMF – WEO October 2023 provides a forecast for inflation rates up to 2028, we then assume a constant rate of [redacted]%.

Sources: Aurora Energy Research, NYISO

Index REC Strike Price is most sensitive to assumptions on CAPEX and expected market saturation of renewables

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Key assumptions

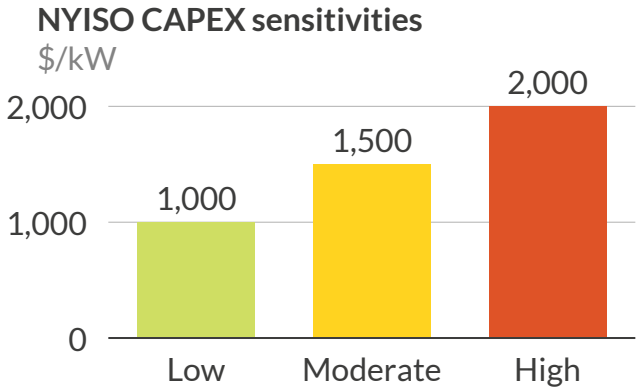
1 CAPEX

As renewables projects are high CAPEX, low OPEX investments, upfront spend is a meaningful driver of total Strike Price.

2 Renewables Saturation level

If renewables build is delayed or accelerated, Index REC Strike Price risks may change due to expected level of renewables cannibalization.

Variables tested



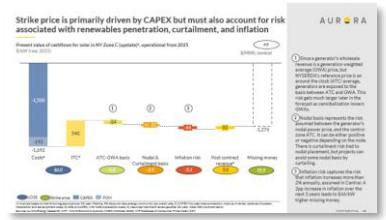
High Renewables Saturation
Renewables build more quickly

Aurora Central
Aurora's view of policy

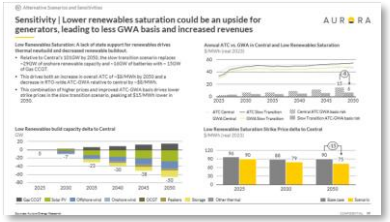
Low Renewables Saturation
No future renewables solicitations

Outcomes

Strike Price



ATC-GWA basis risk



Capacity buildout

Strike Price is primarily driven by CAPEX but must also account for risk associated with renewables penetration, curtailment, and inflation

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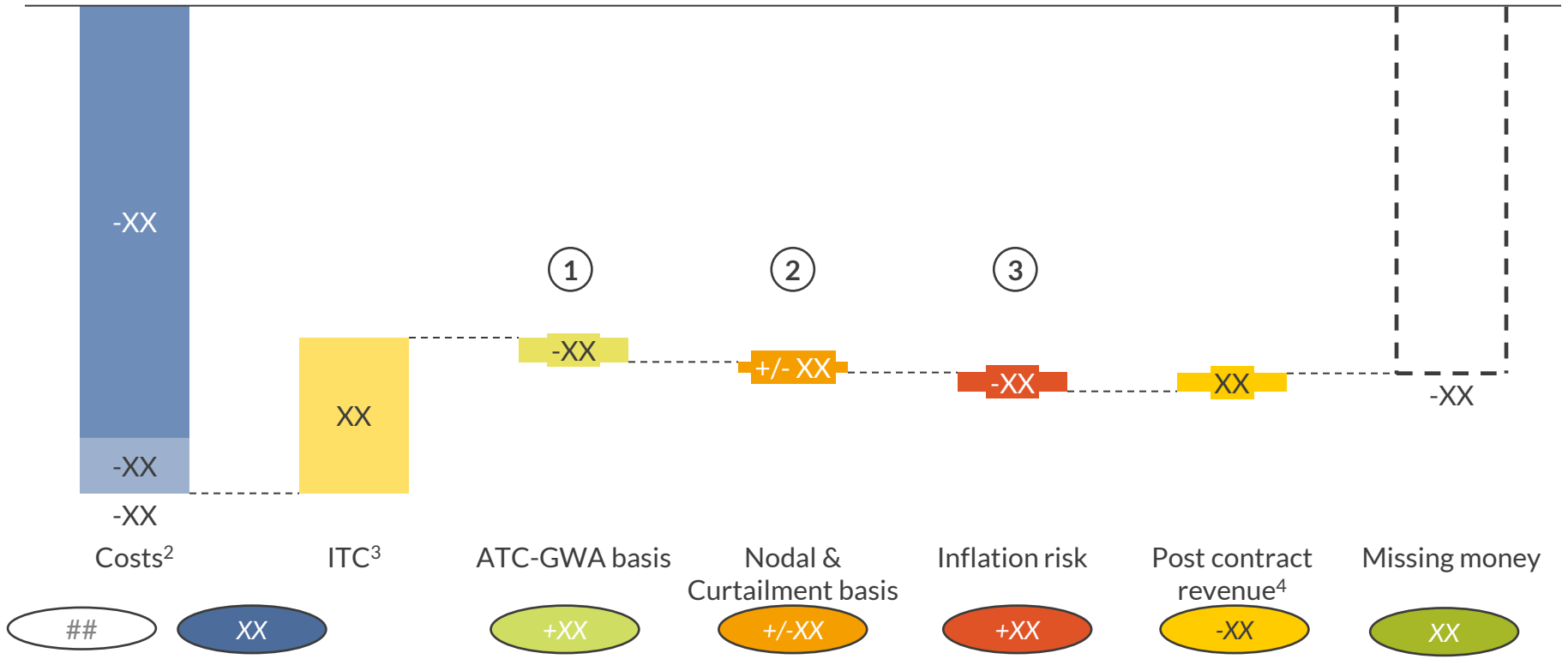
Present value of cashflows for solar in NY Zone C (upstate)[1], operational from 2025
$/kW (real 2023)



$/MWh (real 2023)

LCOE[5] Strike Price CAPEX FOM

1) Analysis based on the following assumptions: [redacted]-year lifetime, [redacted]% discount rate, energy community tax credit rate. 2) CAPEX includes interconnection, module, inverter, balance of system, installation and development costs. 3) [redacted]% of CAPEX, with [redacted]% transaction costs. 4) Assumed merchant revenues after 20-year Index REC contract tenor. 5) Including ITC.
Source: Aurora Energy Research, IMF - World Economic Outlook (WEO) October 2023, IMF Database of Consumer Price Index (CPI)

1. Since a generator's wholesale revenue is a generation weighted average (GWA) price, but NYSERDA's reference price is an around the clock (ATC) average, generators are exposed to the basis between ATC and GWA. This risk gets much larger later in the forecast as cannibalization lowers GWAs.
2. Nodal basis represents the risk assumed between the generator's nodal power price, and the control zone ATC. It can be either positive or negative depending on the node. There is curtailment risk tied to nodal placement, but projects can avoid some nodal basis by curtailing.
3. Inflation risk captures the risk that inflation increases more than [redacted]% annually, assumed in Central. A [redacted]pp increase in inflation over the next 3 years leads to $[redacted]/MWh inflation risk.

Renewables buildout leads to increasing cannibalization and a delta between ATC and GWA, which impacts project REC payments

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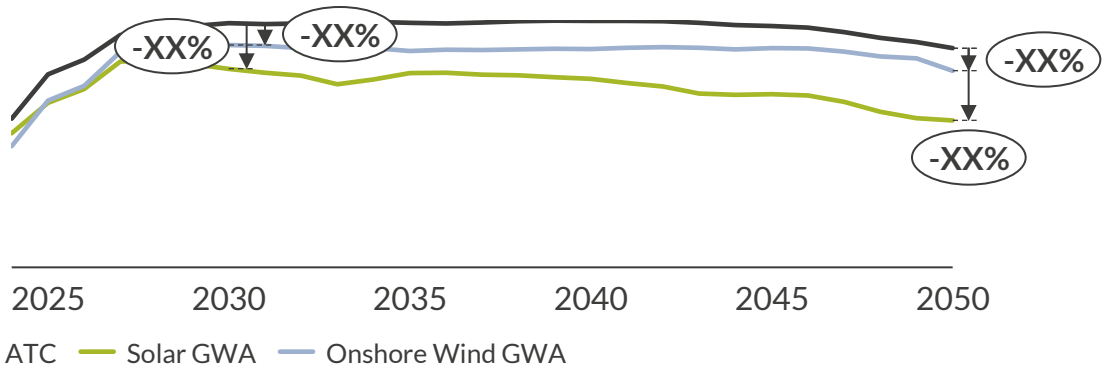
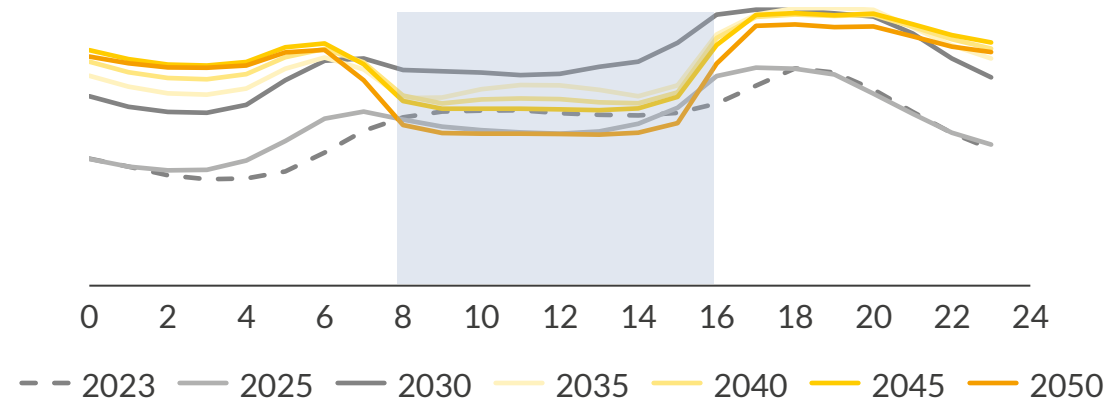
- As solar and onshore wind installed capacity increases, increased solar and wind generation leads to cannibalization of capture prices, lowering especially solar GWAs.
- By 2050, wind GWAs are tracking at a % discount to ATC, and solar GWAs are at a % discount.
- In our central case GWA basis increases by $/MWh over the duration of the forecast, driving increases in Strike Price.
- GWA basis briefly decreases in 2035, as the ITC steps down and solar build slows, but then continues to increase at a slower rate through 2050.
- Solar buildout over the forecast horizon increasingly drives down prices during solar generating hours, increasing the delta between ATC and solar GWA.

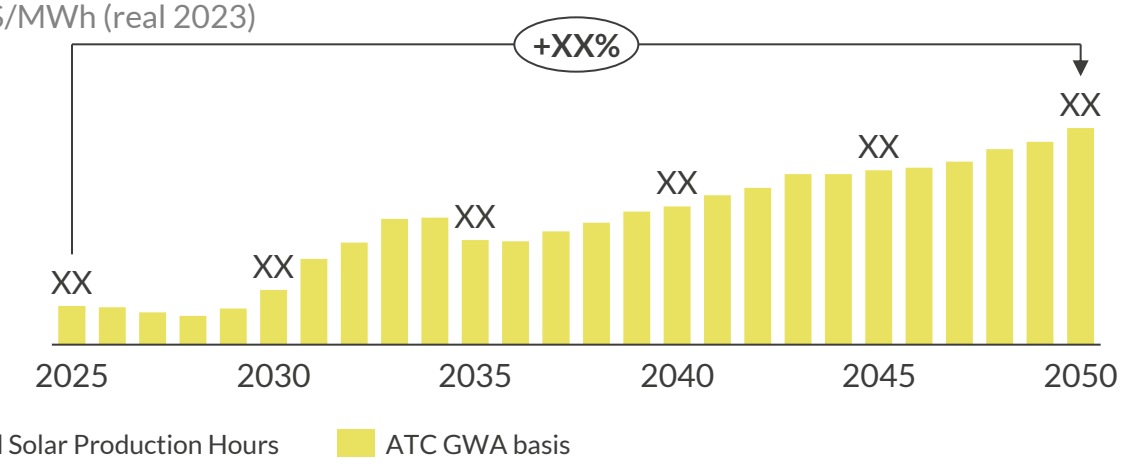
RTO simple-weighted average ATC and GWAs
$/MWh (real 2023)



Zone C average wholesale price by hour of day
$/MWh (real 2023)



Zone C Solar GWA-ATC basis risk by operational year
$/MWh (real 2023)



Sources: Aurora Energy Research, NYISO

Sensitivity | Higher renewables saturation requires higher Strike Price, posing a long-term risk for NYSERDA's solicitations

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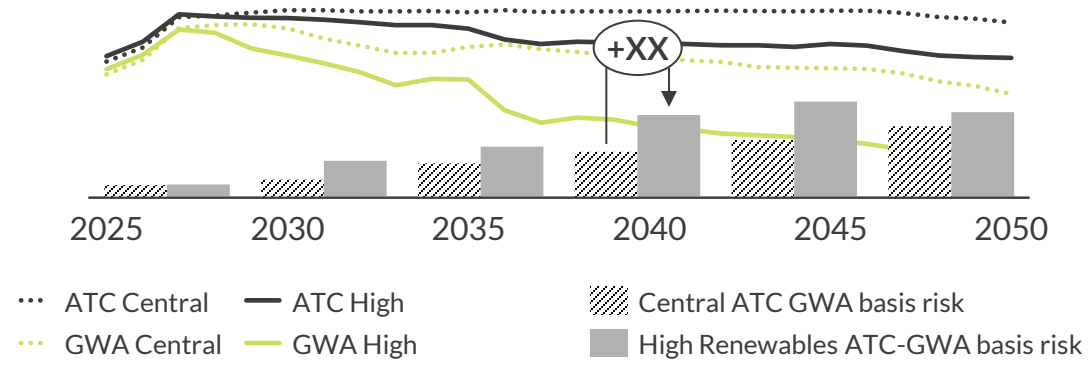
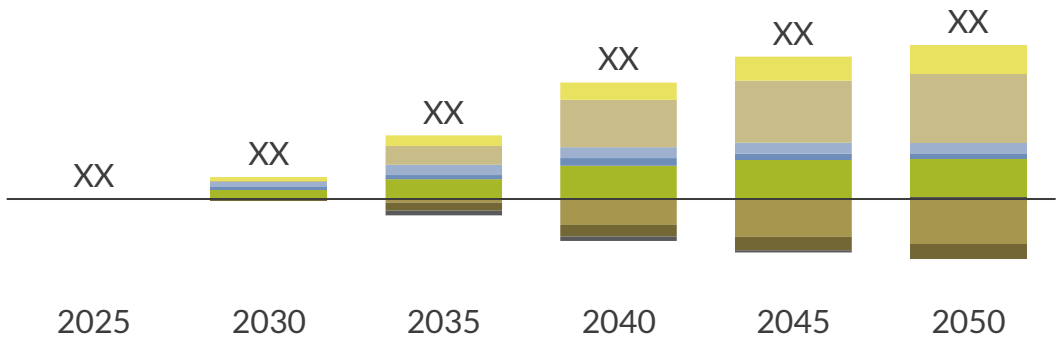
High Renewables Saturation: Stronger decarbonization incentives alongside hydrogen peakers drives increased thermal retirements/renewables newbuild

- Relative to Central's [redacted] GW by 2050, the high renewables saturation scenario adds ~[redacted] GW of onshore renewable capacity, ~[redacted] GW of batteries, and ~[redacted] GW of hydrogen peakers to replace ~[redacted] GW of peakers and ~[redacted] GW of OCGT plants.
- Despite a similar ATC price by 2050, GWA-ATC basis widens by ~$[redacted]/MWh as increased solar build drives higher cannibalization; this in turn drives higher Strike Prices.
- This creates a negative feedback loop; the more solar capacity that NYSERDA contracts, the more expensive the contracts will become, limiting procurement.

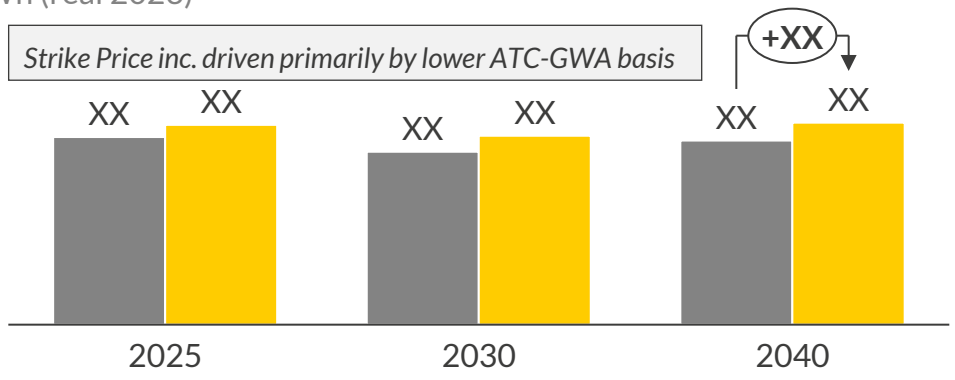
Zone C ATC vs. Solar GWA in Central and High Renewables Saturation
$/MWh (real 2023)



High Renewables build capacity delta to Central
GW



Zone C Solar High Renewables Saturation Strike Price delta to Central
$/MWh (real 2023)



Gas CCGT | Solar PV | Offshore wind | Onshore wind | OCGT | Peakers | Hydrogen peakers | Storage

Base case | Scenario

Sources: Aurora Energy Research

Variations in CAPEX and renewables saturation may impact the Index REC Strike Price by up to $ /MWh

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Renewables Saturation Case	Definition	CAPEX impact on Strike Price[1] in Zone C, $/MWh			Key Scenario Outputs, assuming central CAPEX		
		Low $1,000/kW	Moderate $1,500/kW	High $2,000/kW	ATC vs. GWA price $/MWh (real 2023)	Installed Capacity GW	RPS target % vs. total
High: NYSERDA procures ~50% more renewables	More aggressive decarbonization case, GW solar and XXGW onshore wind by 2050, reaching XX% RPS.	**- $XX/MWh**	**+ $XX/MWh**	**+ $XX/MWh**	-XX	2030 XX 2050 XX	XX XX% XX XX%
Central	Aurora's central view on renewable build, GW solar and GW onshore wind by 2050, reaching % RPS.	**- $XX/MWh**	**$XX/MWh**	**+ $XX/MWh**	-XX	2030 XX 2050 XX	XX XX% XX XX%
Low: NYSERDA cancels future solicitations	Slower decarbonization, testing low bound scenario with no future solicitations.	**- $XX/MWh**	**- $XX/MWh**	**+ $XX/MWh**	-XX	2030 XX 2050 XX	XX XX% XX XX%

2030 2050

ATC Solar GWA Onshore Wind GWA Non-RES Solar PV Onshore Wind Offshore Wind Hydro Battery Storage Hydrogen Peakers RES Target

1) Assuming entry year of 2025 (real 2023).

Upstate solar receiving Energy Community tax credits has the best investment case in NY with the lowest Strike Price

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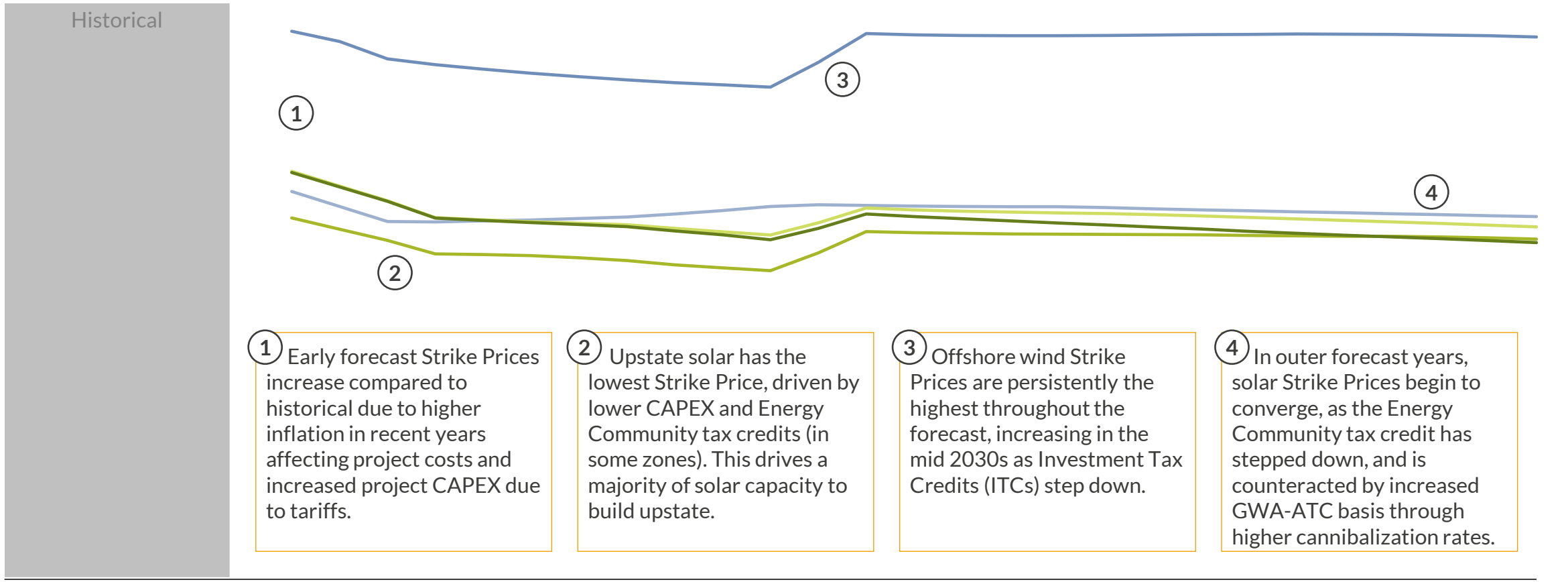
Strike Price by year of entry
$/MWh (real 2023)



1 Early forecast Strike Prices increase compared to historical due to higher inflation in recent years affecting project costs and increased project CAPEX due to tariffs.

2 Upstate solar has the lowest Strike Price, driven by lower CAPEX and Energy Community tax credits (in some zones). This drives a majority of solar capacity to build upstate.

3 Offshore wind Strike Prices are persistently the highest throughout the forecast, increasing in the mid 2030s as Investment Tax Credits (ITCs) step down.

4 In outer forecast years, solar Strike Prices begin to converge, as the Energy Community tax credit has stepped down, and is counteracted by increased GWA-ATC basis through higher cannibalization rates.

1) Energy Community, communities that receive higher Tax Credit rates through the IRA. 2) Highest OREC strike price in a procurement year that got cancelled. 3) Empire Wind 1 successfully renegotiated their OREC contract with NYSERDA for $[redacted]/MWh, while Sunrise Wind was able to renegotiate for $[redacted]/MWh.

Sources: Aurora Energy Research, NYISO, NYSERDA

Key takeaways from Aurora's forecast for renewables economics in NYISO

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1 New York has some of most ambitious decarbonization targets, but **challenging economics for renewables; REC systems are critical** to the region's decarbonization.

2 NYSERDA's Index REC structure provides certainty through a **contracted offtake structure (Strike Prices likely $ - /MWh in the next decade),** but presents additional risks via ATC-GWA, nodal basis, and inflation risk.

3 New York projects with the best economics will win, **favoring upstate regions and developers willing to take on more (or underestimating) contract risks.**

Sources: Aurora Energy Research

Agenda

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I. Introduction to today's session

II. Context for renewables in NYISO

III. NYISO Market Outlook

IV. Next steps

V. Appendix

Our next session will investigate battery economics in NYISO and ISO-NE

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Public Webinar
The Road Ahead for NYISO & ISO-NE

- Aurora Central view, scenarios, and sensitivities for power prices to 2050 across the NYISO and ISO-NE regions.
- How will targets and stricter emissions regulations affect generation mix and capture prices?
- How will transmission impact price differentials across the region?

Public Webinar
NYISO & ISO-NE Capacity Margins & Markets

- Expectations for reserve margins in the region through 2035.
- Amount of capacity at risk of retiring from (proposed) policies .
- Rate and location of new capacity being built.
- Capacity Market forecast and sensitivities.

Public Webinar
Renewable Economics in NYISO

- How will ambitious targets set by New York impact generation mix and capture prices?
- Can states meet their decarbonization targets for offshore wind and solar?

Public Webinar
Battery Storage Economics in NYISO & ISO-NE

- The business case for storage & batteries in NY and NE.
- Historical battery performance.
- Optimal duration and trading strategies.
- Modelling co-optimization of revenue streams for storage assets.

February 6, 2024	May 30, 2024	October 8, 2024	February 2025

Bilateral follow ups and engagement throughout

Quarterly power market forecasts updates ▲ ▲ ▲

Source: Aurora Energy Research

Thank you to all the participants for attending today's session

- We look forward to continuing the conversation via bilateral sessions
- For all comments and questions, you can reach Julia Hoos, Head of US East, at **Julia.Hoos@auroraer.com** and Adelaine Bhattacharjee, Commercial Associate, at **Adelaine.Bhattacharjee@auroraer.com**
- The next NYISO & ISO-NE GM will be in **February 2025,** and will cover batteries in NYISO and ISO-NE
- **NORAM Markets:** We currently cover CAISO, WECC, ERCOT, MISO, PJM, NYISO, ISO-NE, and Alberta and are adding **SPP in Q4 2024**, and **Ontario and SERC in H1 2025**

Source: Aurora Energy Research

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RPS Tier/Classes Included in Supply and Demand curve

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	REC Procurement Target	Classes included	Hydro-generated REC Procurement Target	Classes included	Excluded
		Considered for total REC procurement		*Considered for hydro-generated REC procurement*	*From REC Procurement targets in Aurora modelling*
Connecticut	40% by 2030	Class I 40% by 2030: New renewables	-	-	Class I: Hydro ≤ 30 MW. In service after July 7th , 2003 Class II 4% by 2030: Trash-to-energy facilities Class III 4% by 2030: CHP/waste-heat systems
Maine	50% by 2030 80% by 2050	Class I 50% by 2030: New renewables after Sept 1st, 2005 Class II 30% by 2030: Existing renewables before Sept 1st, 2005; Mainly Hydro	37.5% of total target; driven by inclusion of hydro in Class II	Class II: >100MW. All existing facilities	Class I/IA: < 100MW. In service after Sept 1st , 2005
Massachusetts	65% by 2030 85% by 2050	Class I 40% by 2030: New resources after Jan 1st, 1998 Class II 3.6% by 2030: Renewables before Jan 1st, 1998, mainly Hydro, negligible Landfill Gas CES 20% additional add on including Class 1 resources	-	-	Class I: Hydro <30MW. New and incremental, in service after Dec 31st, 1997 Class II: Hydro ≤ 7.5MW. In service after Jan 1st, 1998 Class II (2) 3.5% by 2030: Waste Energy – Combustion of Solid Waste
New Hampshire	13.5% by 2025	Class I Non-Thermal 12.8% by 2025 : New resources after Jan 1st, 2006 Class II 0.7% by 2025: Solar which began operation after Jan 1st, 2006	-	-	Class I: Hydro- incremental capacity. Production after 2005 Class I Thermal 2.2% by 2025: Geothermal, solar-thermal, and certain biomass generators who began operation after Jan 1st, 2013 Class III 8% by 2025: Existing Biomass/Methane prior to Jan 1st, 2006 Class IV 1.5% by 2025: Hydro <5MW prior to Jan 1st, 2006
Rhode Island	72% by 2030 100% by 2033	Eligible renewable resources include Solar, wind, tidal and geothermal resources as well as hydroelectric facilities up to 30MW	-	-	New Tier: Hydro ≤ 30MW. In service after Jan 1st, 1998 Existing Tier: Hydro in service after Jan 1st, 1998 Biomass generators meeting certain emission criteria and fuel cells using renewable resources
Vermont	84% by 2030 100% by 2035	Tier I 100% by 2030/2035: depending on type of utility Tier II 10% by 2032 : Distributed generation (carve-out from Tier I) up to 5MW	100% of Tier 1 can be satisfied by Hydro	Tier I: All existing facilities	Tier II: ≤ 5MW , connected to the distribution system. In service after 2015, Tier III 12% by 2033: Energy Transformation projects (does not count towards overall standard)

Sources: Aurora Energy Research, NYSERDA, DSIRE

State-level policies in ISO-NE and NYISO are the main driver for renewables and storage development, primarily through RPS

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	CO_2 pricing	GHG Target	Renewable Energy Certificates (REC)					
			Total RPS Target	RPS carveouts	Tier/Class I RPS ACP[1,2]	Tier/Class II RPS ACP[1,2]	Offshore wind target	Storage Target
	Regional Greenhouse Gas Initiative – Cap & Trade	*Pct GHG emissions decrease rel. to base year*	*Pct annual load to be covered by RES gen.*	*Specific portion of total RPS target to be met by Tier/Class subset*	*Penalty for falling short of Tier/Class I RPS (2024)*	*Penalty for falling short of Tier/Class II RPS (2024)*	*RPS + Executive Targets*	*Battery storage targets*
New York	RGGI	-40% by 2030 -80% by 2050[3]	70% by 2030 100% by 2040[6]	-	$45.39/MWh	-	9,000MW by 2035[13]	6,000MW by 2030
Connecticut	RGGI	-45% by 2030[4] -80% by 2050	48% by 2030	Class I 40% by 2030 Class II 4% by 2030[7] Class III 4% by 2030	$40/MWh	$25/MWh	2,000MW by 2030	1,000MW by 2030
Maine	RGGI	-45% by 2030[3] -80% by 2050	80% by 2030 100% by 2050	Class I 50% by 2030 Class II 30% by 2030[8]	$50/MWh	-	3,000MW by 2040[14]	400MW by 2030
Massachusetts	RGGI	-33% by 2025[3] -50% by 2030	44% by 2030 60% by 2050	Class I 40% by 2030 Class II 3.6% by 2030[9] Class II (Waste Energy) 3.5% by 2030	$40/MWh	-	5,600MW by 2027	1,000MWh by 2025[15]
New Hampshire	RGGI	-20% by 2025[3] -80% by 2050[5]	25.2% by 2025	Class I Non-Thermal 12.8% by 2025 Class I Thermal 2.2% by 2025 Class II 0.7% by 2025[10] Class III 8% by 2025 Class IV 1.5% by 2025	$62.87/MWh	$62.87/MWh	-	-
Rhode Island	RGGI	-40% by 2030[3] -80% by 2040 Net-zero by 2050	100% by 2033	-	$83.37/MWh[12]	-	-	600MW by 2033[16]
Vermont	RGGI	-40% by 2030[3] -80% by 2050	75% by 2032	Class I: 75% by 2032 Class II 10% by 2032[11] Class III: 12% by 2033	$12.28/MWh	$70/MWh	-	-

1) Values shown in nominal dollars. 2) Alternative Compliance Payment. 3) Relative to 1990. 4) Relative to 2001. 5) New Hampshire does not have a binding target for lowering emissions. 6) The Climate Leadership and Community Protection Act in 2019 adopted a Clean energy Standard. 7) Class II resources include trash-to-energy facilities that have obtained required permits. 8) Mainly Hydro. 9) Renewable resources operating before Jan 1st, 1998. 10) This class addresses solar built after 2006. 11) Carve-out of Class I - Renewable generators with nameplate capacity less than 5MW. 12) Set at $50 in 2003 and adjusted annually based on inflation. 13) Incentivized via ORECs. 14) Only an Executive Target. 15) A bill was recently proposed to double the state's storage target to 2,000MW by 2030. Clean Peak Energy Standard as incentive. 16) Target was signed into law in June 2024.

Sources: Aurora Energy Research, NYSERDA, DSIRE

Overall RPS Tier/Class Overview for each state

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	Total RPS Target	Technologies in each Tier	Hydro Eligibility
	Pct annual load to be covered by RES gen.		*Capacity and In-service date*
New York	70% by 2030 100% by 2040	Tier 1: New Renewable Resources that came into operation after January 1, 2015 Tier 2: Existing Renewable Resources before Jan 1st, 2015 ZEC: Existing qualifying nuclear facilities Tier 4: New resources serving NYC with clean energy (also transmission)	Tier I: ≤ 5MW. Incremental production from efficiency Tier II: Run-of-river ≤10MW. In service after Jan 1st, 2015
Connecticut	48% by 2030	Class I: New renewables Class II: Trash-to-energy facilities Class III: CHP/waste-heat systems	Class I: ≤ 30 MW. In service after July 7th , 2003
Maine	80% by 2030 100% by 2050	Class I: New renewables after Sept 1st, 2005 Class II: Existing renewables before Sept 1st, 2005; Mainly Hydro	Class I/IA: < 100MW. In service after Sept 1st , 2005 Class II: >100MW. All existing facilities
Massachusetts	44% by 2030 60% by 2050	Class I: New resources after Jan 1st, 1998 Class II: Renewables before Jan 1st, 1998 Class II (2): Waste Energy – Combustion of Municipal Solid Waste OLD: Solar carve-out mandated 1.6GW by 2020. Eligible facilities can generate SRECS until 2023 and then flow into Class I	Class I: <30MW . New and Incremental, in service after Dec 31st, 1997 Class II: ≤ 7.5MW. In service after Jan 1st, 1998
New Hampshire	25.2% by 2025	Class I Non-Thermal: New resources after Jan 1st, 2006 Class I Thermal: Geothermal, solar-thermal, and certain biomass generators who began operation after Jan 1st, 2013 Class II: Solar which began operation after Jan 1st, 2006 Class III: Existing Biomass/Methane prior to Jan 1st, 2006 Class IV: Existing Small Hydroelectric facilities up to 5MW prior to Jan 1st, 2006	Class I: Incremental capacity . Production after Jan 1st, 2006 Class IV: ≤ 5MW of all generators or ≤1MW facilities inter-connected to NH distribution system. In service before Jan 1st, 2006
Rhode Island	100% by 2033	Eligible renewable resources include Solar, wind, tidal and geothermal resources as well as hydroelectric facilities up to 30MW, biomass generators meeting certain emission criteria and fuel cells using renewable resources	New Tier: ≤ 30MW. In service after Jan 1st, 1998 Existing Tier: In service after Jan 1st, 1998
Vermont	100% by 2035	Class I: New renewable resources Class II: Distributed generation (carve-out from Class I) up to 5MW Class III: Energy Transformation projects (does not count towards overall standard)	Tier I: All existing facilities Tier II: ≤ 5MW , connected to the distribution system. In service after 2015,

1) Carve-out of Class I - Renewable generators with nameplate capacity less than 5MW.

Sources: Aurora Energy Research, NYSERDA, DSIRE

Background information about the Index REC in NYISO

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Only considering the NYSERDA Tier I REC mechanism

Program details

Solicitation schedule	Annual; 2024 will be the 8th auction
Bid type	Submit Index or Fixed REC price
Units	USD (nominal); may elect one-time inflation adjustment subsequent to the Step Two Deadline for proposal submissions
Tenor	Max. of 20 years; limit of 10 yrs for tidal/ocean

Hist. Auctions	Date Issued	# Proj.	Capacity secured	Funding	Avg. REC price
RESRFP 24-1	6/20/24[1]	-	-	-	-
RESRFP23-1	11/30/23	24	2.4GW	-	-
RESRFP22-1	9/21/22	22	2.4GW	-	Index: $80.96 (nom), $60.93 (real '23)
RESRFP21-1	4/22/21	22-23+	2.5GW	-	Index: $63.08
RESRFP20-1	7/21/20	22	Not available[2]	Not available[3]	
RESRFP19-1	4/23/19	21	1.3GW	$1.0B	$18.59
RESRFP18-1	4/25/18	19	1.4GW	$1.1B	$18.52
RESRFP17-1	6/2/17	26	1.4GW	$1.4B	$21.71

Eligibility requirements

Technology	• Fuel cells; only if using non-fossil fuel such as hydrogen (excludes biomass, biofuels) • Hydroelectric; with no new storage impoundment • Geothermal; electric and ground source heat • Solar • Tidal, wave, or ocean • On/Offshore wind
Project Viability	Required for Stage Two Bid • Interconnection Facilities Study in progress • Evidence that Key Permit application can be submitted within 180 days of RFP issuance • 50% generator site control, full control of POI • Community engagement plan
Vintage	COD on or after 1/1/15 If COD is prior to 1/1/15, project is only eligible if they are a Vintage Generation Facility (VGF)
Distributed resources?	DERs eligible if they: • Interconnected by 3/17/17 • No other contracted offtake of RECs • Not enrolled in VDER Phase One Tariffs
Imported energy?	• Must apply for Provisional Eligibility • Must be able to prove transmission to NYISO

1) Bids due 8/8/24 with award notifications in late September. 2) NYSERDA cites 4.6GW contracted through REC and OREC with ~2.5GW from ORECs. 3) NYSERDA quoted 40%+ cost savings over 2019. Unclear whether this is on a total or per unit basis, so per unit is assumed due to increase in procured capacity.

Sources: NYSERDA

If NYSERDA procures its current target of 4,500GWh in 2026, Strike Prices could clear up to $ /MWh

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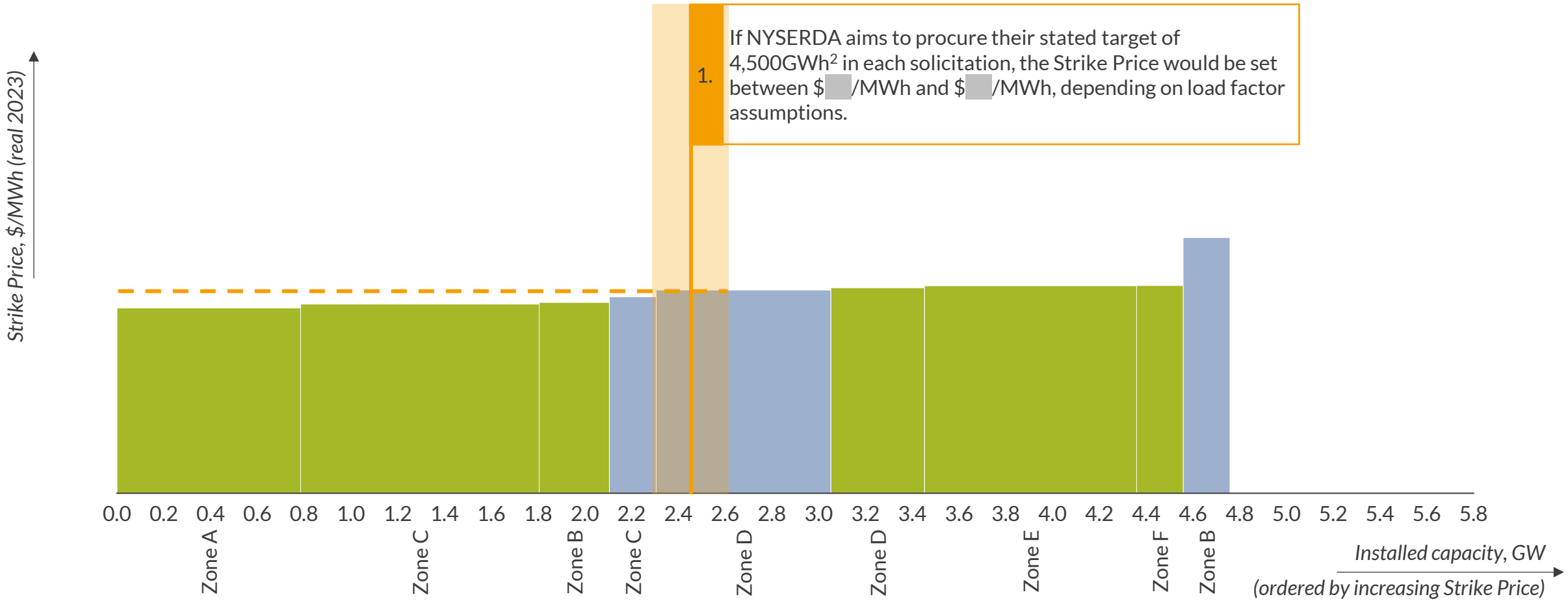
Illustrative procurement in 2026[1] based on NYISO interconnection queue



1) Based on NYISO interconnection queue data as of July 2024. 2) Assuming %- % solar load factors and %- % onshore wind load factors.

Source: Aurora Energy Research

Increasing procurement by 1,100GWh would have little affect on the maximum Strike Price cleared, potentially increasing it around $ /MWh

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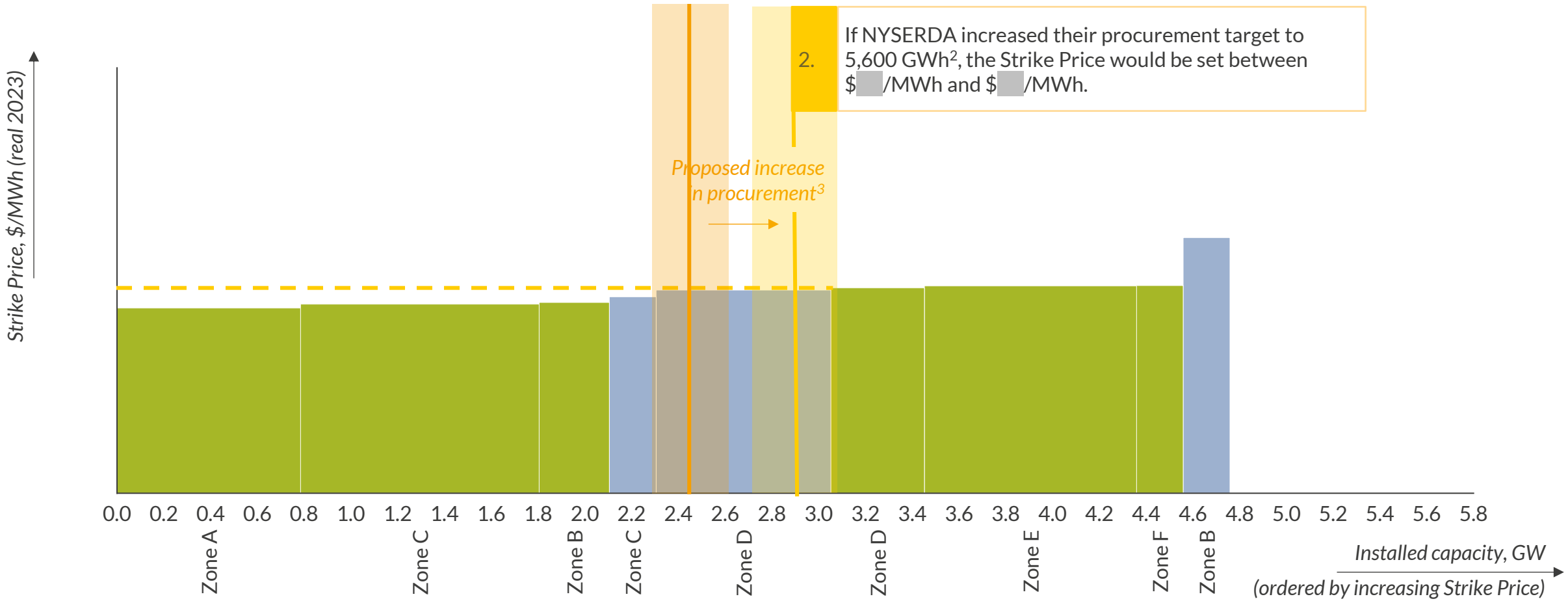
Illustrative procurement in 2026[1] based on NYISO interconnection queue



1) Based on NYISO interconnection queue data as of July 2024. 2) Clean Energy Standard (CES) Biennial Review report filed on July 1, 2024 (Report) by Department of Public Service Staff (Staff) and the New York State Energy Research and Development Authority (NYSERDA) proposed increasing the annual procurement to 5,600GWh in order to meet RPS targets.

Source: Aurora Energy Research

Aurora Central capacity procured in 2026 reflects a conservative outlook on interconnection queue cancelations and project delays

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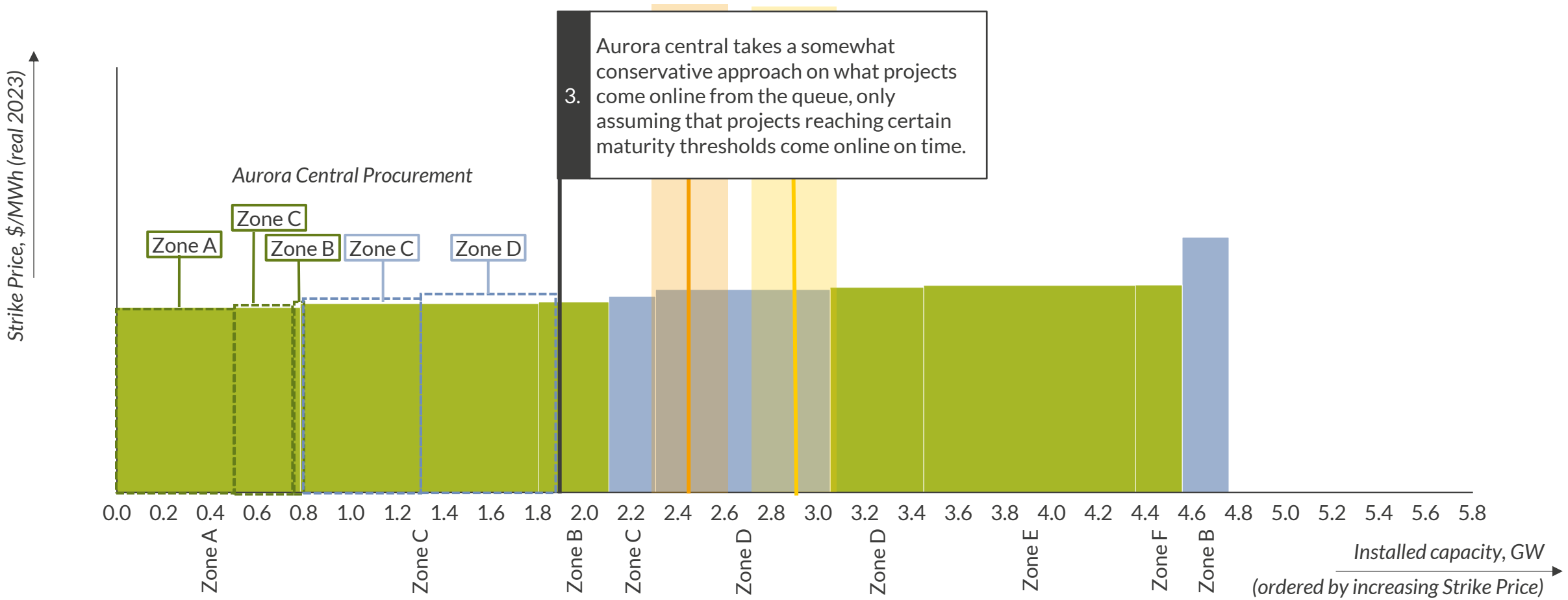
Illustrative procurement in 2026[1] based on NYISO interconnection queue



1) Based on NYISO interconnection queue data as of July 2024.

Source: Aurora Energy Research

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