PJM Solar and Battery Forecast 2024

Phase II - Forecasts

SPGCI Power Market Consulting

November 4, 2024

S&P Global
Commodity Insights

Agenda

Methodology and Assumptions **4**

Solar and batteries forecast **15**

Presenters

Christopher Wilfong
Director, Power Market Consulting
Christopher.Wilfong@spglobal.com

Diego Garcia
Consulting Principal, Power Market Consulting
Diego.Garcia@spglobal.com

Andres Sanchez
Sr. Consultant, Power Market Consulting
Andres.Sanchez@spglobal.com

Methodology and assumptions

S&P Global
Commodity Insights

Solar PV and battery forecasting methodology

Analytical Framework

The S&P Global outlook for solar power takes into account multiple drivers and inhibitors that reflect the maturity of the market and its growth potential for solar and batteries.

Key components of our framework for assessing market attractiveness for solar:

- State renewable policy (including renewable portfolio standard [RPS], net energy metering [NEM], community solar, and renewable corporate policies)
- Regulatory incentives
- Solar resources
- Site approval
- Grid access and offtake

Short-term data points

In the short term (one to four years), our forecast is based primarily on existing policies, the late-stage project pipeline, and status of procurement and equipment orders.

Key data inputs collected and assessed by S&P Global energy analysts include:

- Project announcements
- Utility requests for proposal (RFPs), auctions, and tenders
- Existing mandates and incentives
- Project development track record
- Reported costs and pricing
- Supply chain announcements and equipment orders

Longer-term assumptions

In the longer term (5–20 years), our forecast draws upon rigorous bottom-up research and on economic fundamentals, energy prices, and macroeconomic factors.

Key data inputs and assumptions include

- Policy and regulatory trends
- Power demand growth and capacity retirements
- Annual solar power pricing forecasts
- Power and gas prices
- Transmission and grid infrastructure

Key assumptions

Solar forecast scenario overview

Assumptions	Scenario 1: "Inflated Costs"	Scenario 2: "Base case"	Scenario 3: "Accelerated solar build"
Federal policy support	Current ITC schedule (post-IRA)	Current ITC schedule (post-IRA)	Current ITC schedule (post-IRA)
NEM policies and retail rate structures	Utilities/PUCs (and regulators approve) reform NEM policy earlier owing to costly DG programs. Current retail rate structures are adjusted; existing NEM caps are maintained (and many reduced). Utilities and PUCs also phase out "community solar" and carve-outs for DERs.	From 2024 to 2027, utilities adopt (and regulators approve) changes to NEM and retail rate structures, which result in a more cost-based approach to customer-sited solar compensation; current detailed state NEM policy.	Reflecting a greater emphasis distributed solar as a resource for decarbonization, current retail rate structures and NEM are maintained for three years beyond the reform timeline in the base case; they are then reformed in a similar manner.
Solar costs ($/kW)	Solar costs plateau for the next five years owing to continued supply chain disruptions before resuming their prior rate of decline. Disruptions are linked to the moratorium on tariffs for imported modules having expired recently in June 2024 (linked to the Auxin trade dispute), potential for new SE Asian tariffs (solar manufacturer petition filed Apr 2024), shipping backlogs, and higher raw material prices due to elevated global demand. Panel availability is restricted through the mid-2020s. Continued project delays owing to grid interconnection, zoning and local ordinances cause development costs to slightly increase, however, ultimately capital costs decline by 0–5% in nominal terms from 2024 to 2045.	Solar costs decline by 2-10% in nominal terms from 2024 to 2045 (33–41% in real terms).	Solar costs decline by 10–20% in nominal terms from 2024 to 2045, driven by a combination of technology advancements and policy incentives. Highest decrease in price is seen up to 2035, with a slower rate after this owing to technology maturity, land scarcity and greater onshoring. Supply chain issues disappear leading to low prices and widespread availability.
State policy support	Current RPS policies and state-level incentives are maintained.	Current RPS policies and state-level incentives are maintained.	Current RPS policies and state-level incentives are maintained.
Power demand	Base-case demand	Base-case demand	Base-case demand

Note: DG = distributed generation. ITC = investment tax credit. PUCs = public utility commissions. DERs = distributed energy resources.

Source: S&P Global

US renewable energy tax credit availability, reflecting changes made in August 2022 following passage of the IRA

			Start of construction†				
			2006–19	2020–21	2022	2023–33	2034 and beyond
ITC	**Base rate** (project does not meet labor requirements*)	Base credit	30%	26%	6%	6%	Tax credits begin to phase out starting in the later of 2034 or the first year when annual US-level greenhouse has emissions fall 75% below 2022 levels. During the phase-out, tax credits decline to 75% of their full value in the first year, 50% in the second year and 0% in the third year. For the purposes of our modeling the tax credits are assumed to continue beyond the horizon of our outlook.
		Domestic content**				+2%	
		Energy community***				+2%	
	Full rate (project meets labor requirements)	Base credit			30%	30%	
		Domestic content				+10%	
		Energy community				+10%	
PTC for 10 years (2022 $/MWh)††	**Base rate** (project does not meet labor requirements)	Base credit	$26	$15	$5	$5	
		Domestic content				+$1	
		Energy community				+$1	
	Full rate (project meets labor requirements)	Base credit			$27.5	$26	
		Domestic content				+$3	
		Energy community				+$3	

Data compiled July 2024.
* Labor bonus requires developers to meet prevailing wage and apprenticeship requirements.
** Domestic content bonus requires a certain percentage (rising over time) of components to be made domestically.
*** Energy community bonus requires projects to be sited in census tracts that formerly hosted coal plants or had a significant amount of employment from fossil fuel industries.
† Start of construction is defined as having incurred 5% of final qualifying project costs or having completed "physical work of significant nature". Both definitions require that projects make continuous progress toward completion once construction has begun and be placed into service within four years of starting construction to qualify for tax credits.
†† Technology eligibility rules have been relaxed under the IRA, meaning solar photovoltaic (PV) and geothermal are eligible for the PTC, and standalone storage is eligible for the ITC.
Source: S&P Global Commodity Insights.

Options for NEM and retail rate reform

- SPGCI will not predict specific changes to state or utility NEM policies or rate structures; however, we assume states will choose from a variety of options that reduce the compensation for customer-sited solar but still provide sufficient compensation for a moderate pace of additions.
- Holistic rate reform options for all residential customers: lower volumetric (dollars per kilowatt-hour) price in favor of higher
  > Minimum (fixed) bill charge
  > Peak-demand (dollars per kilowatt) charge
- Narrowly tailored NEM reform options:
  > Reduce bill credits for all solar generation exported to the grid in real time (may require new meters)
  > Add “standby” or similar charges for NEM customers only
- NEM replacement options:
  > Value-based tariff (adjusted periodically to account for changes in wholesale power markets, transmission and distribution costs, etc.)
  > Transition toward time-of-use (TOU) pricing for all NEM customers
  > Competitive process (for example, rolling tenders or RFPs)

RPS and NEM policy assumptions by state

Detailed RPS policy assumptions

State	RPS target (percentage of retail sales)*	Solar carve-out (percentage of retail sales)*/Distributed carve-outs
DE	25% by 2025, 28% by 2030, 40% by 2035	3.5% by 2025, 5% by 2030, 10% by 2035
DC	100% by 2032	2.85% by 2023, 5.50% by 2032, 10% by 2041
MD	50% by 2030	14.5% by 2030
NJ	50% by 2030*	5.1% by 2021, gradually reduced to 1.1% by 2031
OH	8.5% by 2026	-
PA	18% by 2021	0.5% by 2021
WV	-	-
IN	10% by 2025 (voluntary)	-
IL	25% by 2025, 40% by 2030, 50% by 2040**	Solar PV 55% of retail sales (27.5% for DG and Community Solar)
KY	-	-
MI	50% by 2030, 60% by 2035***	
NC	12.5% by 2021****	0.2% by 2020****
VA	100% by 2045*****	1,100 MW by 2035 (Dominion only) - nameplate capacity between 50kW-3 MW. Of the 1,100 MW, 35% of capacity procured shall be from the from solar facilities owned by persons other than a utility. Dominion is required to meet 1% of RPS requirements from DG sources less than 1 MW, no more than 3 MW in one single location. No less than 25% of such 1% shall be composed of low-income qualifying projects.
TN	-	-

Note: RPS includes solar carve-outs. RPS targets are based on Tier 1 requirements where applicable. *New Jersey RPS target only includes Class I renewable technologies and the solar carve-out. **Illinois solar carve-out requires that 50% of the solar procurements must be from distributed/community solar. RPS mandates at least 75% of the standard come from wind and solar. Climate and Equitable Jobs Act invests $580 million a year to increase Illinois's clean energy from 9% to 50% by 2040 ***MI also now has a Clean energy standard, which adds nuclear and natural gas generation with CCS to the RPS and requires 80% by 2035 and 100% by 2040. ****RPS compliance in North Carolina can be achieved through energy efficiency and renewable energy credits (RECs) from any state. *****Phase 1 utilities are required to achieve 14% by 2025, 30% by 2030, 65% by 2040, and 100% by 2050 while Phase II utilities are required to achieve 26% by 2025, 41% by 2030, and 100% by 2045. The primary drivers for solar development include existing Public Utility Regulatory Policies Act (PURPA) policy, planned requests for proposal (RFPs), solar resources, solar costs, and the previous state tax credit.

Source: S&P Global

RPS and NEM policy assumptions by state (continued)

State net energy metering assumptions			
State	**Utility/territory**	**NEM cap**	**NEM system size limits (MW)**
DE	All utilities	8% of the capacity needed to meet the electric utility's average Delaware transmission peak demand for the preceding 3 years	For all systems designed to produce no more than 110% of expected aggregate electrical consumptions, subject to limits by rate class: 0.025 (residential), 2 (Delmarva nonresidential), 0.5 (DEC, DEMEC nonresidential), 0.15 (farms on residential rates, waivers possible for larger systems depending on usage)
DC	Potomac Electric Power Co (Pepco)	N/A	For 2024, no more than 200% of the customer's historical 12-month usage
MD	All utilities	3,000 MW	2 or 200% of customer load
NJ	Investor-owned utilities (IOUs), electric suppliers	None****	100% of customer load
OH	IOUs	N/A	Not to exceed 120% of customer annual average load
PA	IOUs	N/A	0.050 (residential), 3 (nonresidential), 5 (microgrids)
WV	All utilities	3% of peak demand during previous year	0.05 (residential), 2 (industrial for large IOUs), 1 (commercial for large IOUs), 0.050 (C&I for small IOUs)
IN	IOUs	1.5% of utility's summer peak load or by July 2022 *******	1
IL	IOUs, retail suppliers	Removed the NEM cap, but included a cap date of December 31, 2024	N/A
KY	IOUs, electric cooperatives except TVA	1% of utility's peak load in prior year	0.045
MI	All utilities	10% of utility average in-state peak load, 50% of which is allocated to systems >20kW but less than 550kW	0.55, or 110% of customer load
NC	IOUs, electric suppliers	N/A	2 (residential customer-owned systems), 1 (commercial systems up to 200% of contract demand)
VA	IOUs, electric cooperatives	1% of in-state peak load	0.025 (residential), 3 (nonresidential), up to 150% of expected demand
TN	N/A	N/A	N/A

Note: *NEM remuneration is a tariff structure under which the utility pays customers for excess generation, up to a given amount. The most common arrangement is "full retail rate NEM," in which excess generation is paid the same volumetric price that the customer pays for electricity; so, exports are effectively netted against grid consumption over a given period (typically one year). **NEG over that period is sometimes paid at a lower rate, often based on the utility's avoided cost. ***Total remaining excess kWh at the end of the calendar year (valued at the generation rate) that amounts to greater than $25 will be refunded as a check to the customer, if less than $25 it will be given as a credit. ****While no mandatory cap exists, it as at the discretion of the NJBPU to cap at 5.8% of retail sales. *****SREC-II replaced the transition program (TREC). ******Virtual meter aggregation is limited to the account holder's meters and only those within two miles of the POI. *******As of July 2022, the Indiana Utility Regulatory Commission has approved four utilities in Indiana to transition from net metering to a new lower rate known as "excess distribution generation" and proposed to instantaneous netting rather than monthly net metering.

Source: S&P Global

RPS and NEM policy assumptions by state (continued)

State net energy metering assumptions

State	NEM remuneration for on-site use or export generation*	NEG remuneration**	Community solar
DE	Retail (For commission-regulated utilities, retail does not include the societal benefits charges). Excess generation credits set to the volumetric supply and distribution service charges for all customers and shall not reduce any fixed monthly distribution charges	Monthly carryover. At the end of the annualized billing period, excess kWh credits shall revert to the electric distribution company and are not reimbursed, credited or otherwise remunerated. Excess kWh credits do not include charges for the societal benefits program	Virtual net metering
DC	Retail	Carries over at retail rate indefinitely, at generation rate for systems over 100 kW***	Virtual net metering (less than 5 MW)
MD	Retail	Credited to customer's next bill at retail rate; reconciled annually in April at the commodity energy supply rate or can be accrued indefinitely	Virtual net metering (less than 5 MW), individual subscriptions capped at 200kW and credits cannot exceed 200% of subscribers baseline annual usage
NJ	As part of the Successor Solar Incentive (SuSI) program: Base $85 SREC-II price ($0.085/kWh), non-residential rooftop < 1MW receives $110, 1-5MW receives $100 SREC-II, non-residential ground mount <1MW receives $90,1-5MW receives $85 *****	Monthly carryover. At the end of the annualized period customer is compensated at the avoided-cost of wholesale power.	Up to 5 MW receives $90 SREC-II ($0.09/kWh)
OH	Less than retail	Credited to next bill at unbundled generation rate (includes energy component but excludes capacity-related compensation	None
PA	Retail	Credited at retail rate for a year, then any leftover excess is credited at generation and transmission portion of the retail rate, but not the distribution	Virtual meter aggregation******
WV	Retail (credits cannot reduce monthly bills below the fixed monthly charge)	Retail, perpetual rollover, no annual true up	Virtual net metering
IN	Full retail through 2047 for net metering facilities installed through 2017 and through 2032 for those installed through 2022; 125% of average energy market price for facilities installed after 2022 or 1.5% cap is met. Per SB 309, retail rate net metering has been phased out by July 2022. As of July 2022, the Indiana Utility Regulatory Commission approved proposals from four utilities for a net billing system with instantaneous netting.	Full retail through 2047 for net metering facilities installed through 2017 and through 2032 for those installed through 2022; 125% of average energy market price for facilities installed after 2022 or 1.5% cap is met. As of July 2022, the Indiana Utility Regulatory Commission approved proposals from four utilities for a net billing system with instantaneous netting.	None
IL	Retail (TOU for customers paying TOU rates)	Credited to next bill at retail supply rate, excess at the end of the annualized period granted to utility.	Virtual net metering
KY	Less than retail	Utility will purchase all electricity produced at the rate set by the PSC, instead of the retail rate	Utility-run program
MI	Retail	Retail for systems <20kW, for systems >20kW, credited at power supply component of rate. Perpetual rollover	None
NC	Retail, for existing. Starting on October 1, 2023 current NEM rider replaced with Residential Solar Choice (Rider RSC) and Net Metering Bridge (Rider NMB). Rider RSC requires TOU Pricing , minimum monthly bills, non-bypassable charges, and grid access fees for systems above 15kW-ac. Rider NMB will be available for a limited number of new customers annually for three years and will not require TOU rates. Customers on Rider NMB can stay on that rate for 15 years, before switching to Rider RSC. Existing net metering customers will be switched to Rider NMB on January 1, 2027.	Carries over at retail rate, granted to utility at beginning of summer billing period. Starting October 1, 2023 customers on the new Riders net exports will be credited at the utilities avoided cost rate on a monthly basis	Utility-run program
VA	Retail	Retail	Utility-run program
TN	N/A	N/A	None

Note: *NEM remuneration is a tariff structure under which the utility pays customers for excess generation, up to a given amount. The most common arrangement is “full retail rate NEM,” in which excess generation is paid the same volumetric price that the customer pays for electricity; so, exports are effectively netted against grid consumption over a given period (typically one year). **NEG over that period is sometimes paid at a lower rate, often based on the utility’s avoided cost. ***Total remaining excess kWh at the end of the calendar year (valued at the generation rate) that amounts to greater than $25 will be refunded as a check to the customer, if less than $25 it will be given as a credit. ****While no mandatory cap exists, it as at the discretion of the NJBPU to cap at 5.8% of retail sales. *****SREC-II replaced the transition program (TREC). ******Virtual meter aggregation is limited to the account holder’s meters and only those within two miles of the POI. *******As of July 2022, the Indiana Utility Regulatory Commission has approved four utilities in Indiana to transition from net metering to a new lower rate known as “excess distribution generation” and proposed to instantaneous netting rather than monthly net metering.

Source: S&P Global

RPS and NEM policy assumptions by state (continued)

State C&I procurement assumptions				
State	**Unbundled energy attribute certificates**	**Virtual power purchasing allowed**	**Renewable energy offerings from utilities or electric suppliers/green tariff**	**Production for self-consumption—net metering**
DE	Allowed	Allowed	Retail choice	Up to 2 MW
DC	Allowed	Allowed	Retail choice	Up to 1 MW
MD	Allowed	Allowed	Retail choice	Up to 2 MW
NJ	Allowed	Allowed	Retail choice	Cannot exceed on-site load
OH	Allowed	Allowed	Retail choice	No size limit
PA	Allowed	Allowed	Retail choice	Up to 3 MW, 5 MW for microgrids
WV	-	Allowed	-	Up to 2 MW
IN	-	-	Green tariff enabled to guarantee sufficient RECS; does not require new build	No size limit under green tariff
IL	Allowed	Allowed	Retail choice	No size limit
KY	Voluntary	-	Green tariff enabled	Up to 45 kW
MI	Allowed	-	-	1 MW
NC	Allowed	Allowed*	Green tariff in development	Up to 1 MW
VA	Allowed	Allowed**	Green tariff enabled	Up to 1 MW
TN	-		-	-

Note: Green tariffs only include programs where utilities build new renewables on behalf of corporate customers. *In specific utilities **for agricultural sites and school districts up to 10 MW

Source: S&P Global

Federal and regional energy storage policy assumptions

Federal and regional energy storge policy assumptions		
Category	**Policy**	**Base case**
Federal	Investment Tax Credit (ITC)	Battery developers have until the end of 2032 to qualify for a 30% ITC, after which is phases down to 26% in 2033, 22% in 2034, and 0% thereafter. If the US CO2 emissions are not 75% below 2022 levels in 2032, the incentives are extended until such a time US emissions meet the threshold, at which point the incentives will begin the two-year phase out.
Regional	PJM capacity market (as applicable to battery)	Assume Minimum Offer Price Rule (MOPR) is revised All other existing market rules, including updated ELCC values, remain in place over forecast period
State/city	Energy storage targets	Remain in current form
State	Tax credits	Remain or expire as currently scheduled
State	Incentives (e.g., rebates)	Assume VA and NJ utilities roll out an incentive program for BTM batteries in effort to comply with state target. Other states remain unchanged

Source: S&P Global

Battery policies by state

Detailed state energy storage policy assumptions		
State	**Energy Storage Target (MW)**	**Tax Credits**
DE		
DC		
MD	750 MW by 2027, 1.5 GW by 2030, 3 GW by 2023	30%*
NJ	2 GW by 2030	
OH		
PA		
WV		
IN		
IL		
KY		
MI	2.5 GW by 2029	
NC		
VA	2.7 GW by 2035 (Dominion), 400 MW by 2035 (APCo)	Energy storage systems greater than 5 MW and less than 150 MW are exempt from sales tax.
TN	2.4 GW by 2028 and 5.3 GW by 2038 (Tennessee Valley Authority)	

Note: *Maryland Energy Administration (MEA) 2018 Energy Storage Tax Credit Program offered 30% tax credit of the total installation costs (up to $5,000 for a residential project and $75,000 for commercial). ** In May 2018, lawmakers passed legislation (S 2314/A 3723) to implement energy storage targets of 600 MW by 2021 and 2 GW by 2030 and requires the BPU to establish a process and mechanism for achieving these targets. ***The regulations instruct APCo and Dominion to construct or acquire 400 MW and 2,700 MW, respectively, of FTM energy storage resources by 2035. ****Indianapolis Power & Light's (IPL) 2019 IRP proposes replacing coal power with renewables and storage, amounting to approximately 240 MW based on an assumed installed capacity of 3 GW.

Source: S&P Global

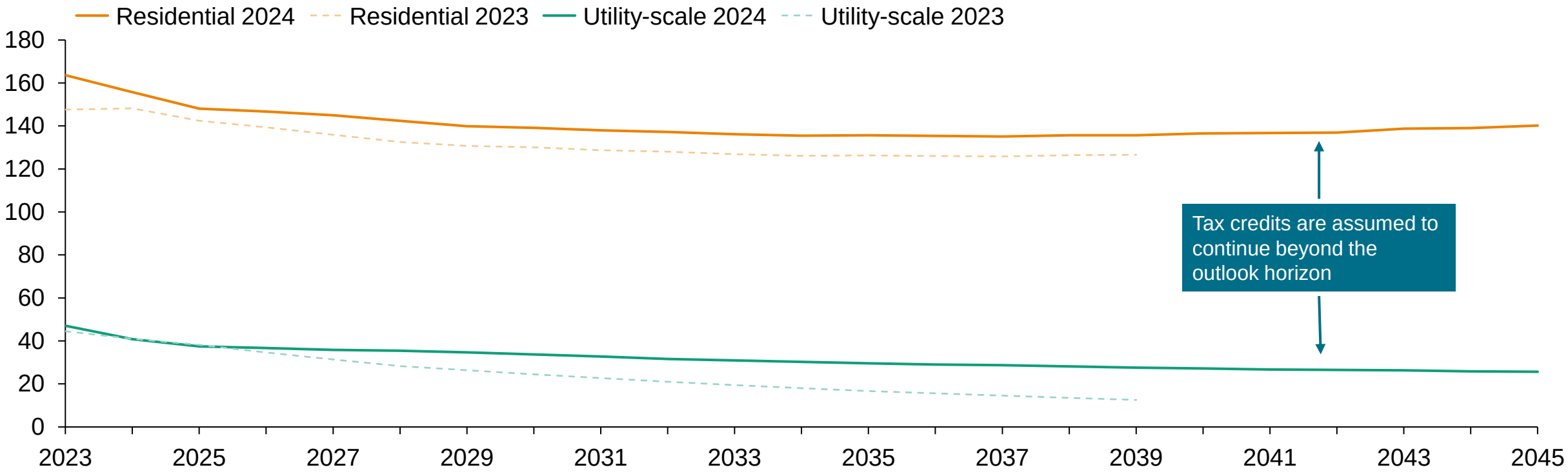
Solar and batteries forecast

S&P Global
Commodity Insights

Solar levelized cost outlooks

Solar PV levelized cost outlook, base case compared to last year

Nominal $/MWh

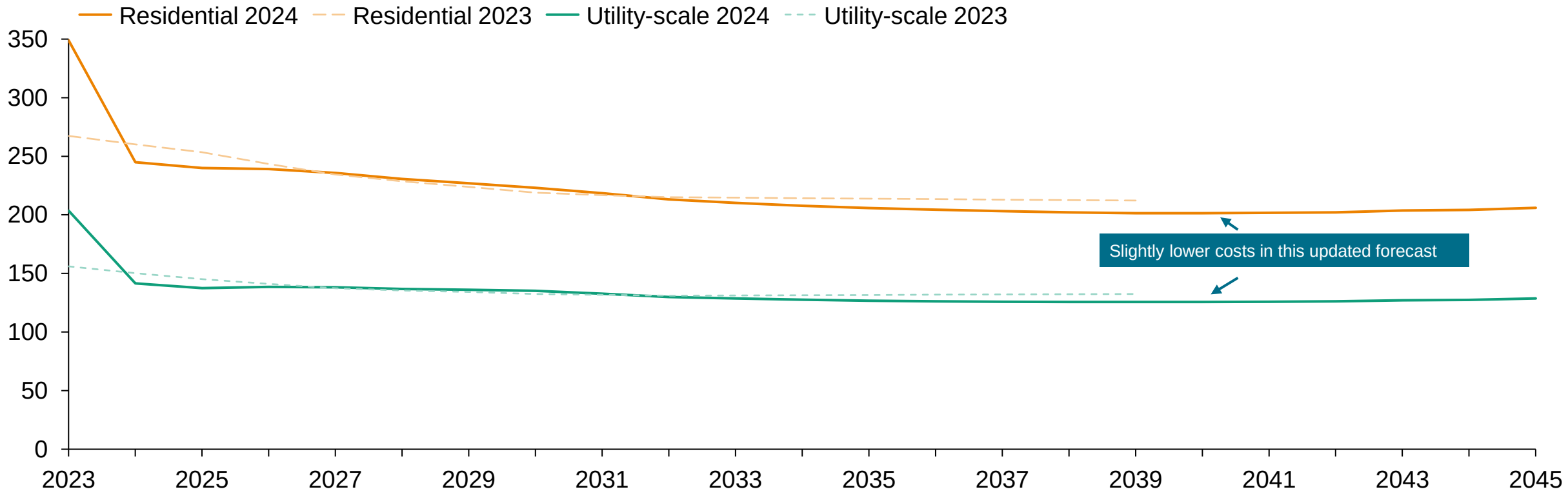


Source: S&P Global

Battery storage levelized cost outlooks

Battery energy storage levelized cost outlook, base case compared to last year

Nominal $/kW-year

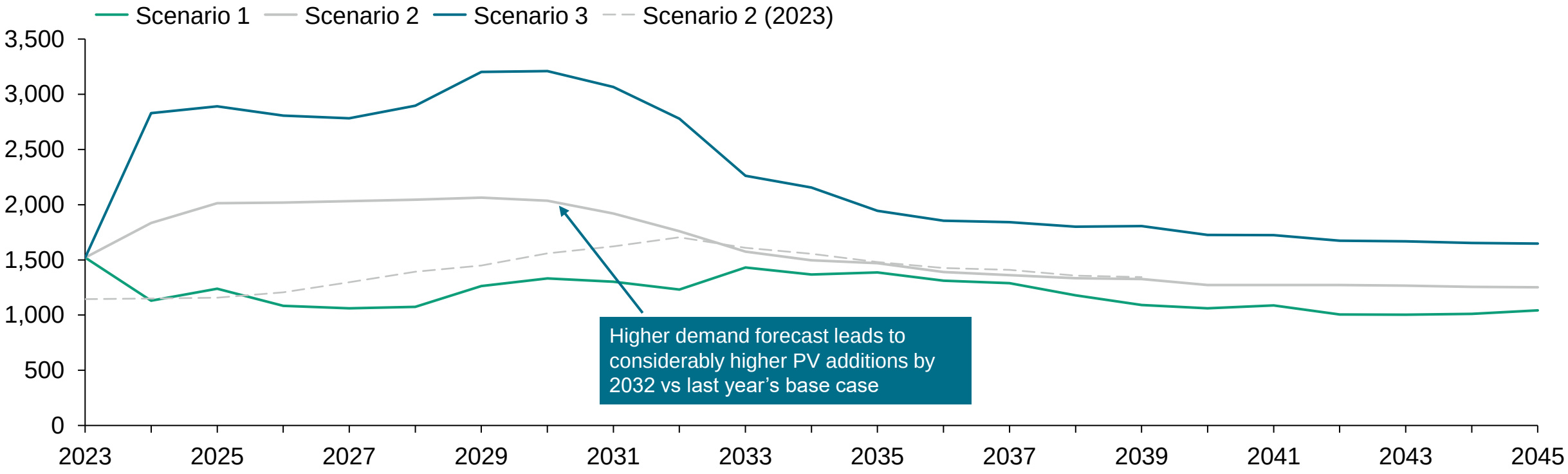


Source: S&P Global
Note: Utility-scale battery is a 50 MW / 200 MWh system. Residential is a 5 kW / 12 kWh system. ITC rate is assumed to be 30%

BTM solar PV capacity additions by scenario

Solar forecasts by scenario, entire state

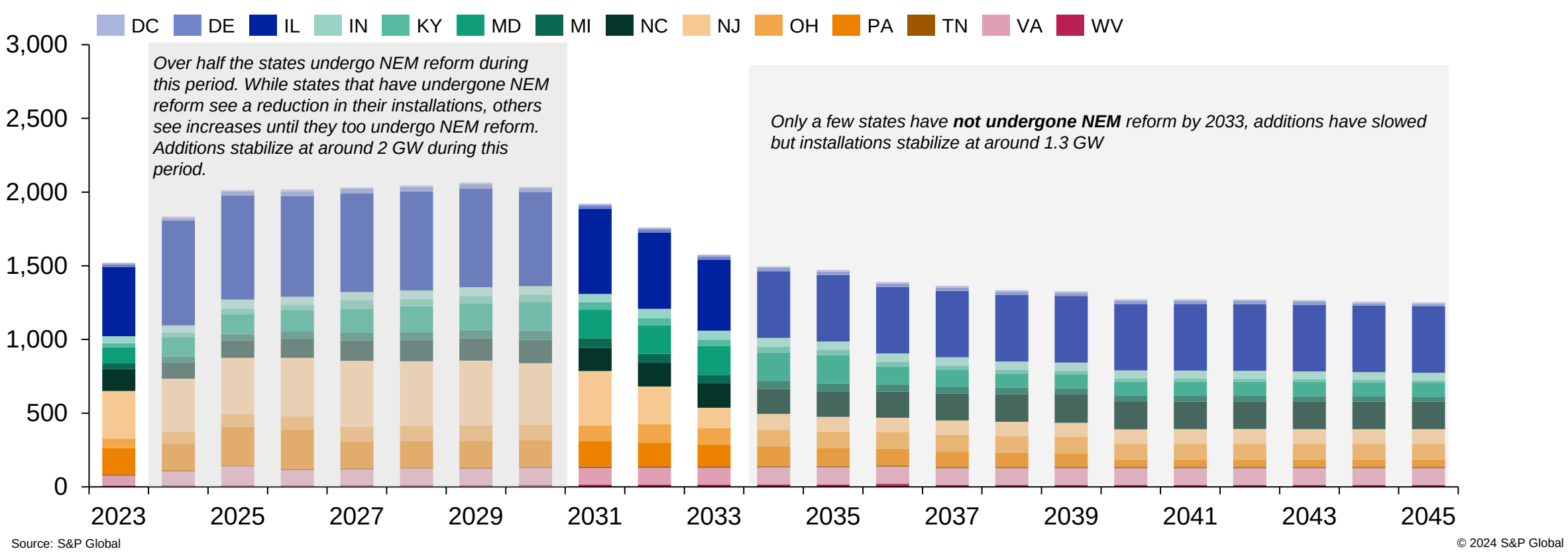
MWkW-year



Source: S&P Global

BTM solar PV capacity additions - Scenario 2:

BTM solar PV capacity additions, entire state

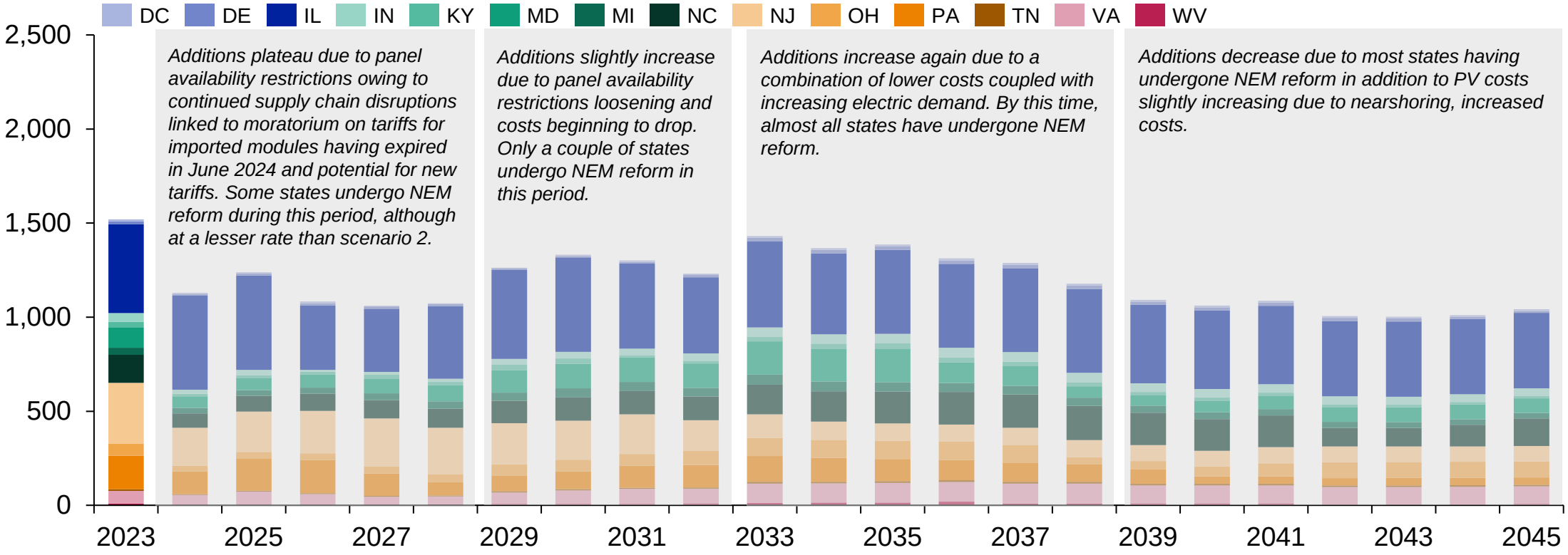


Source: S&P Global

BTM solar PV capacity additions - Scenario 1

BTM solar PV capacity additions, entire state

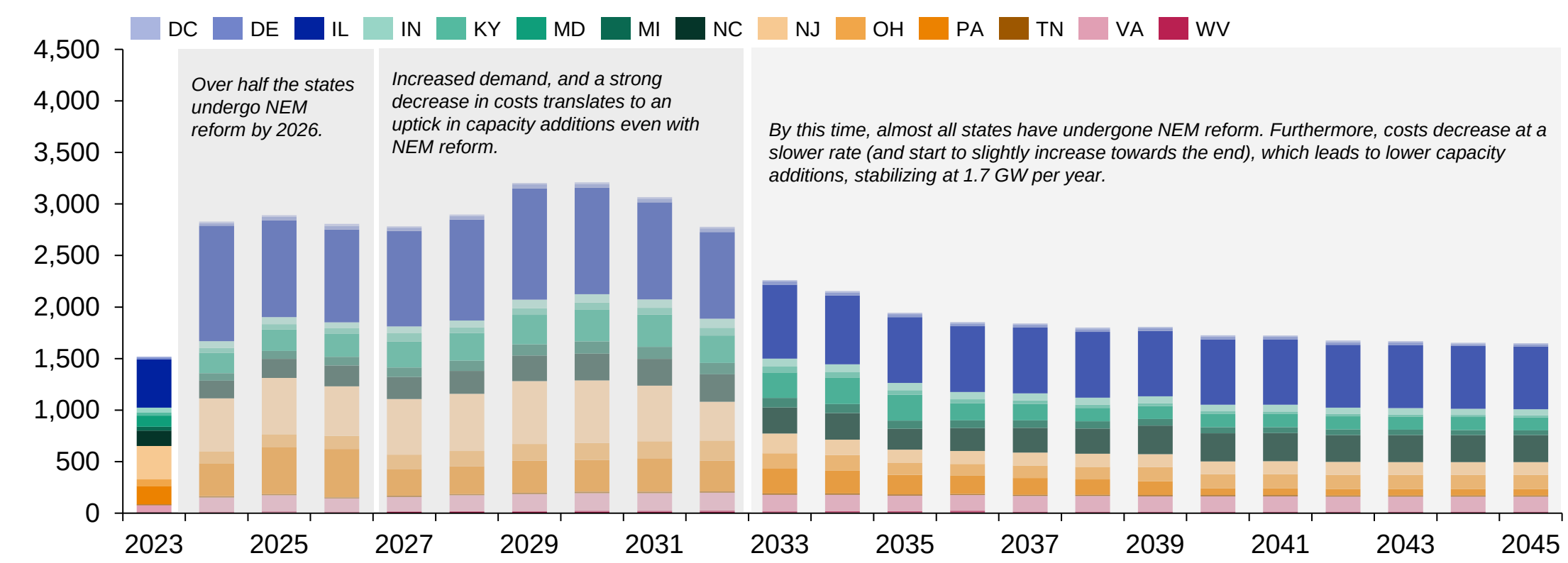
MW



Source: S&P Global

BTM solar PV capacity additions - Scenario 3

BTM solar PV capacity additions, entire state

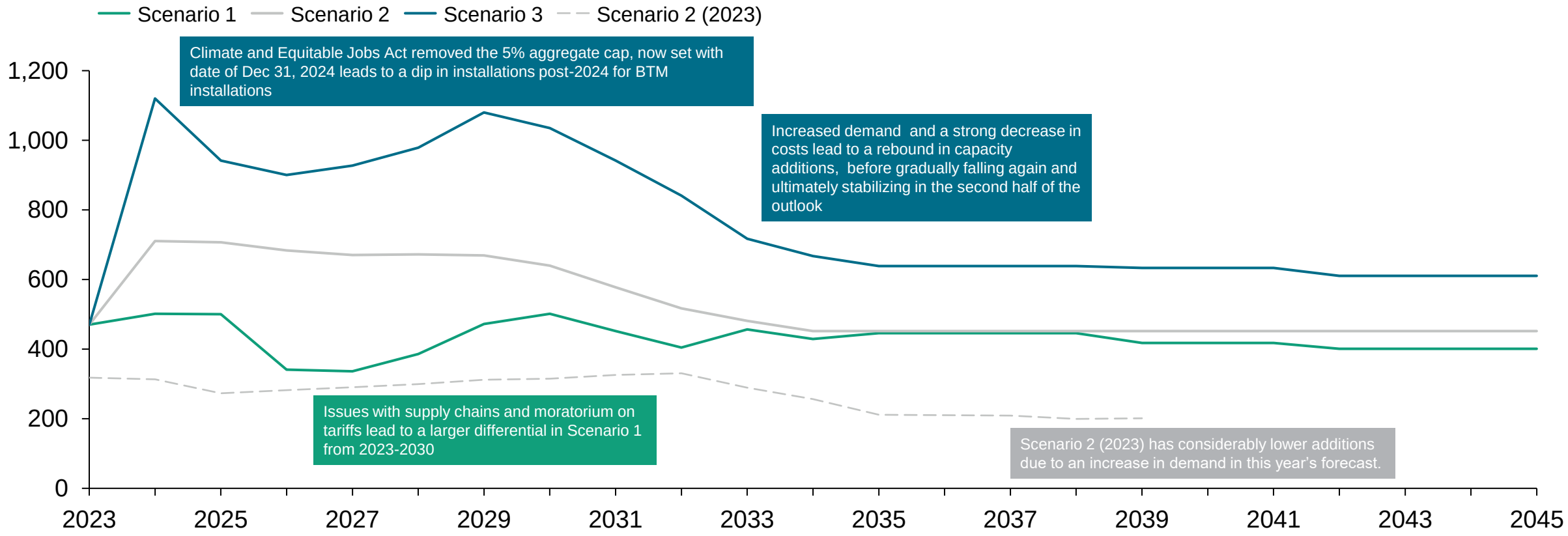


Source: S&P Global

Illinois solar PV BTM capacity additions by scenario

BTM solar PV capacity additions, entire state

MW

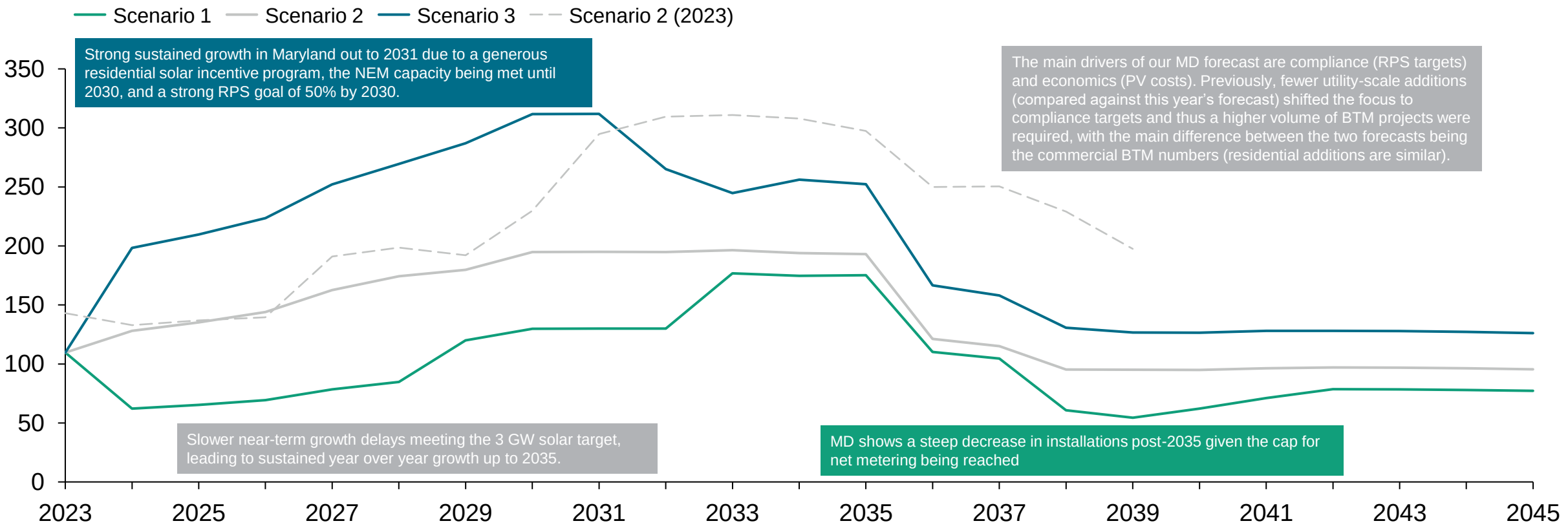


Source: S&P Global

Maryland solar PV BTM capacity additions by scenario

BTM solar PV capacity additions, entire state

MW

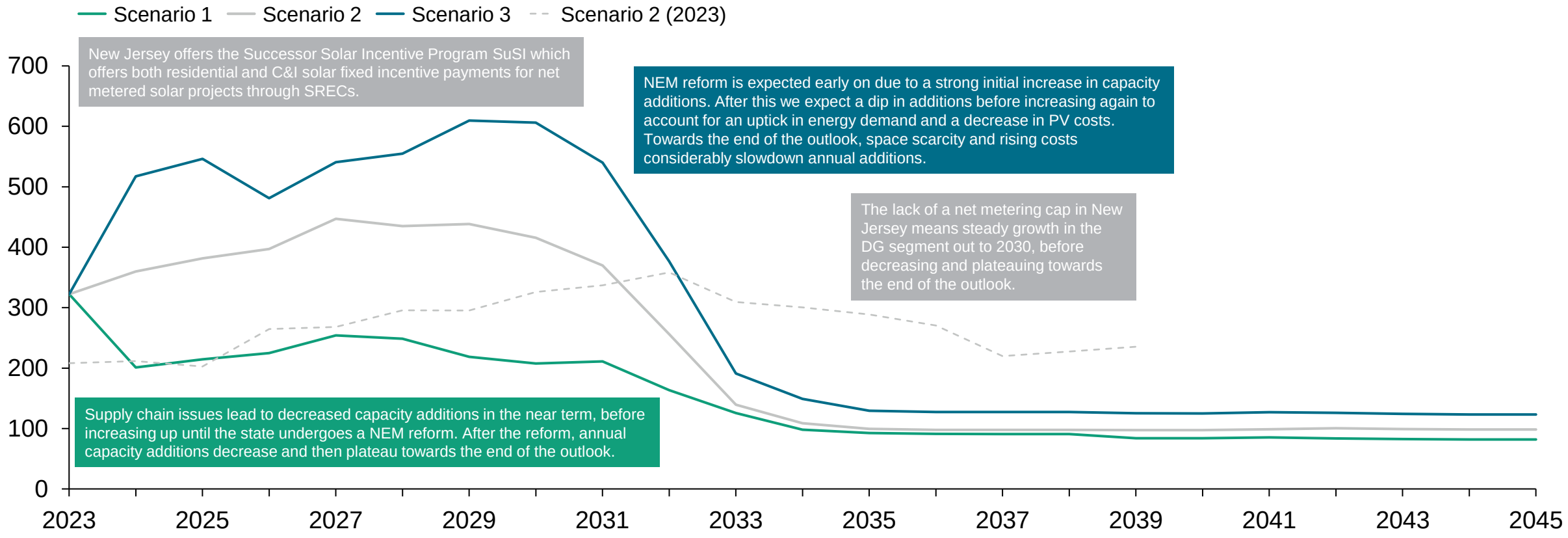


Source: S&P Global

New Jersey solar PV BTM capacity additions by scenario

BTM solar PV capacity additions, entire state

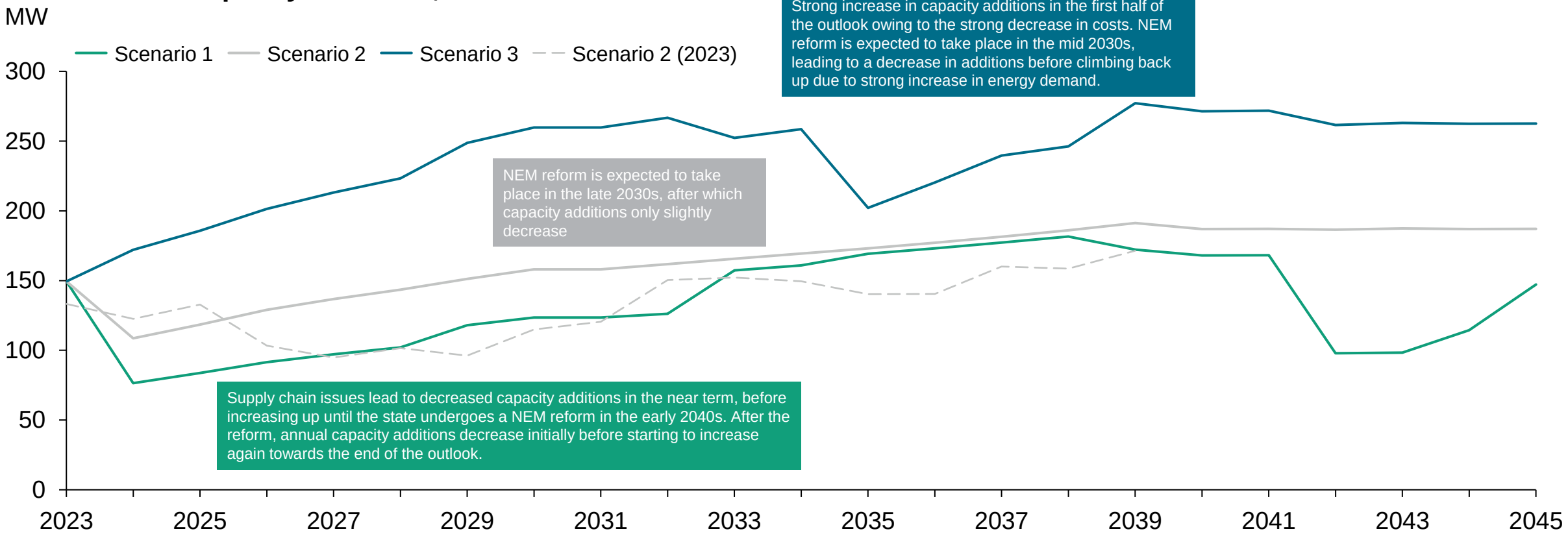
MW



Source: S&P Global

North Carolina solar PV BTM capacity additions by scenario

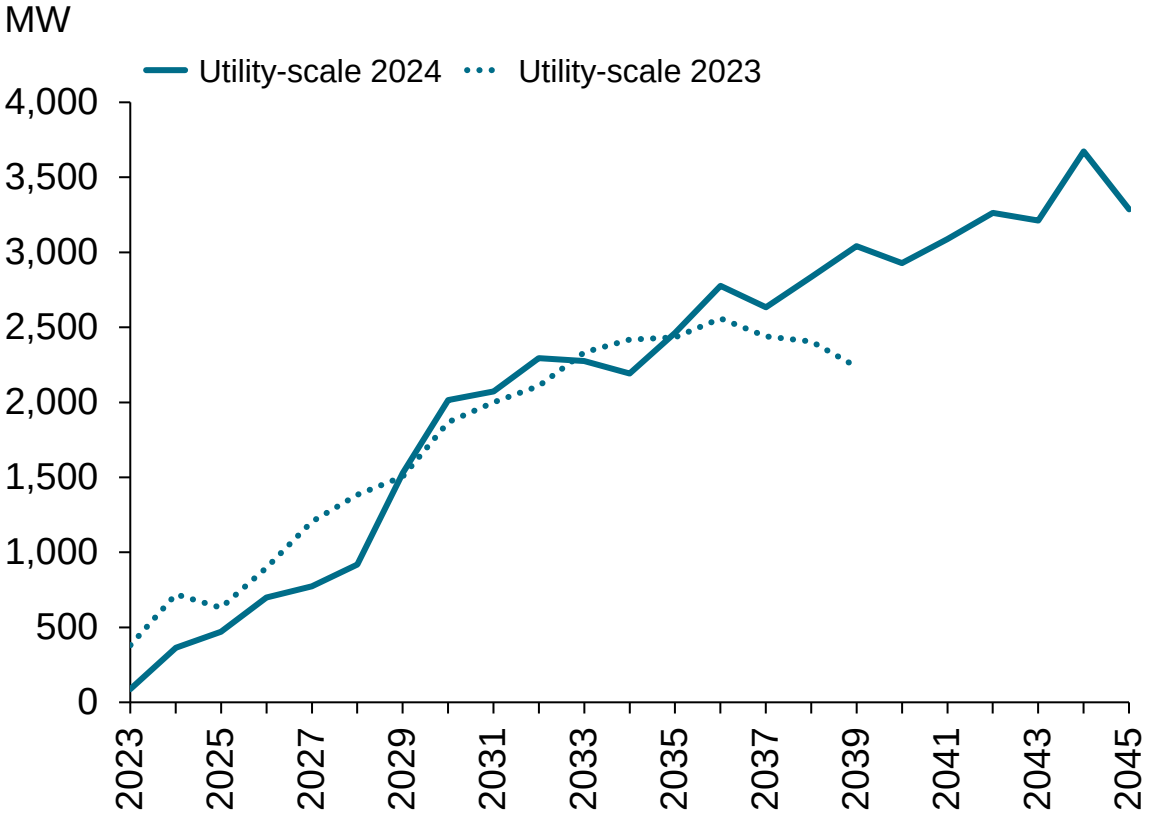
BTM solar PV capacity additions, entire state



Source: S&P Global

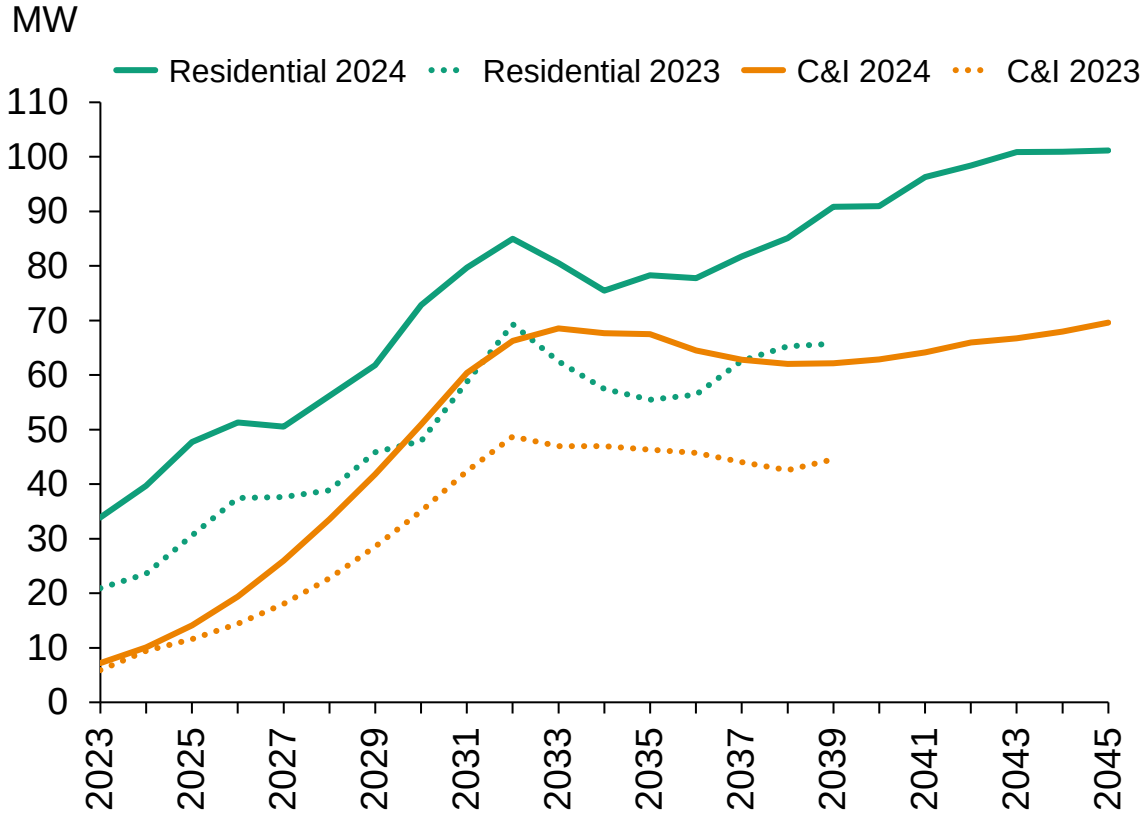
Battery outlook relative to last year (2024 vs 2023)

Utility-scale battery outlook comparison



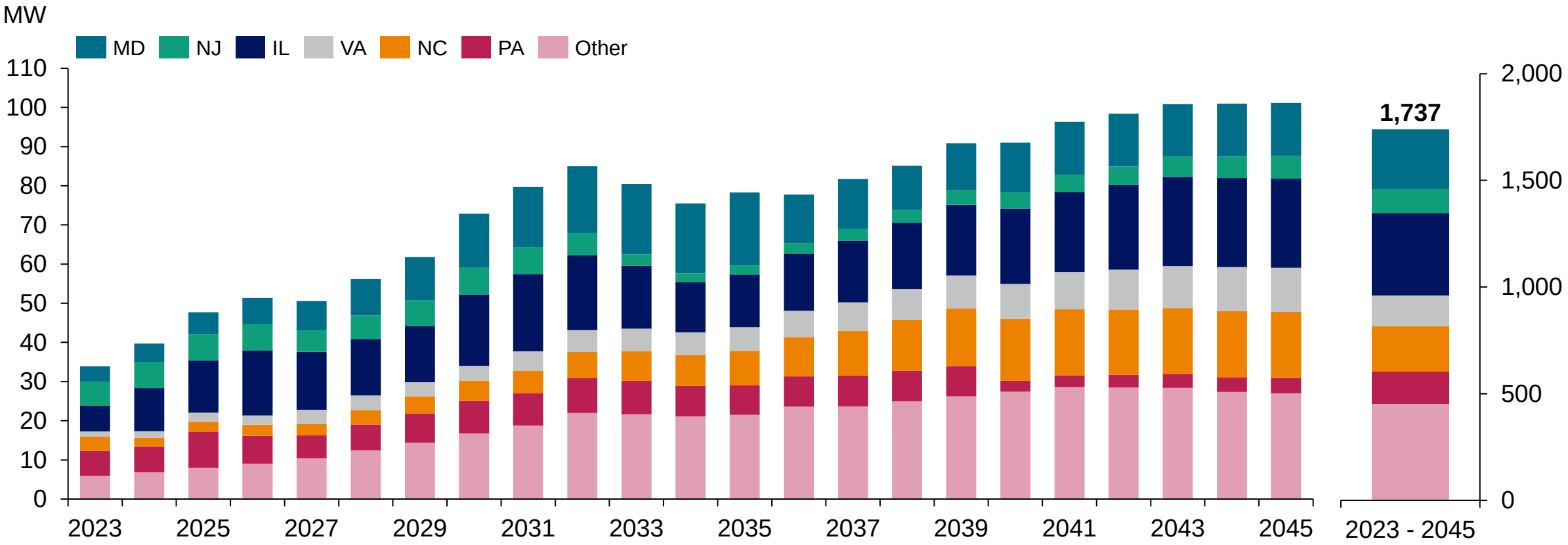
Source: S&P Global

Annual residential + C&I battery additions, entire state



Residential sector battery outlook

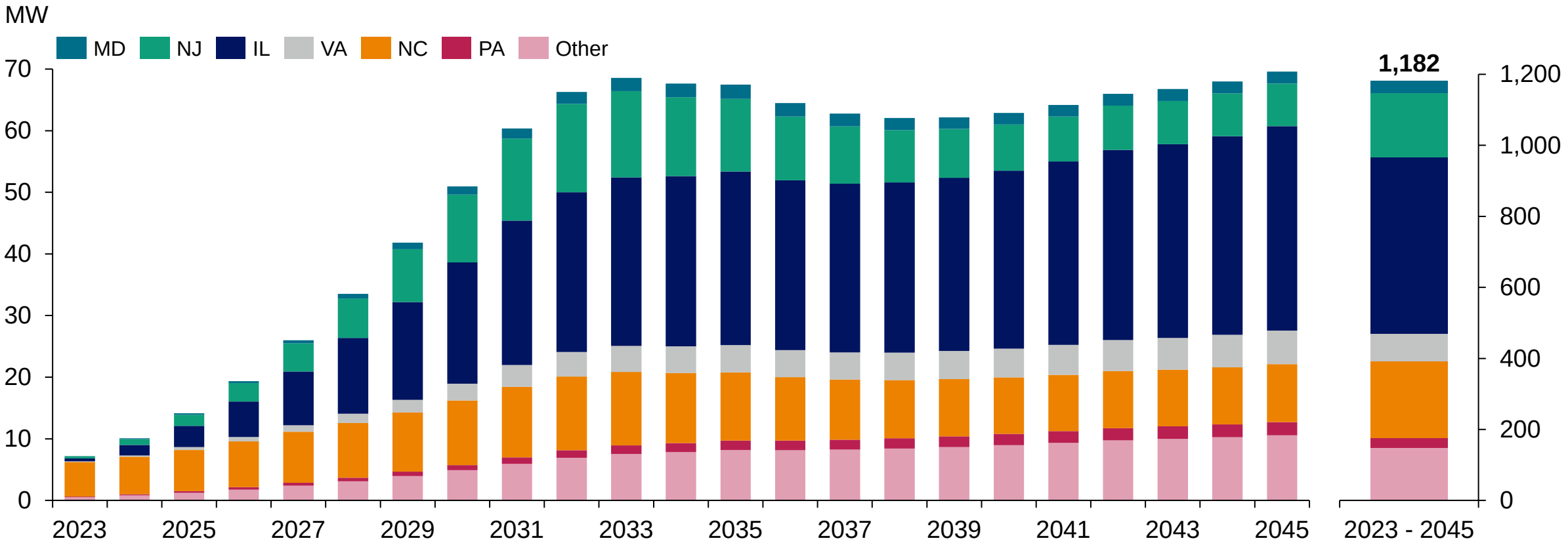
Annual residential battery additions, entire state



Source: S&P Global

Commercial and Industrial sector battery outlook

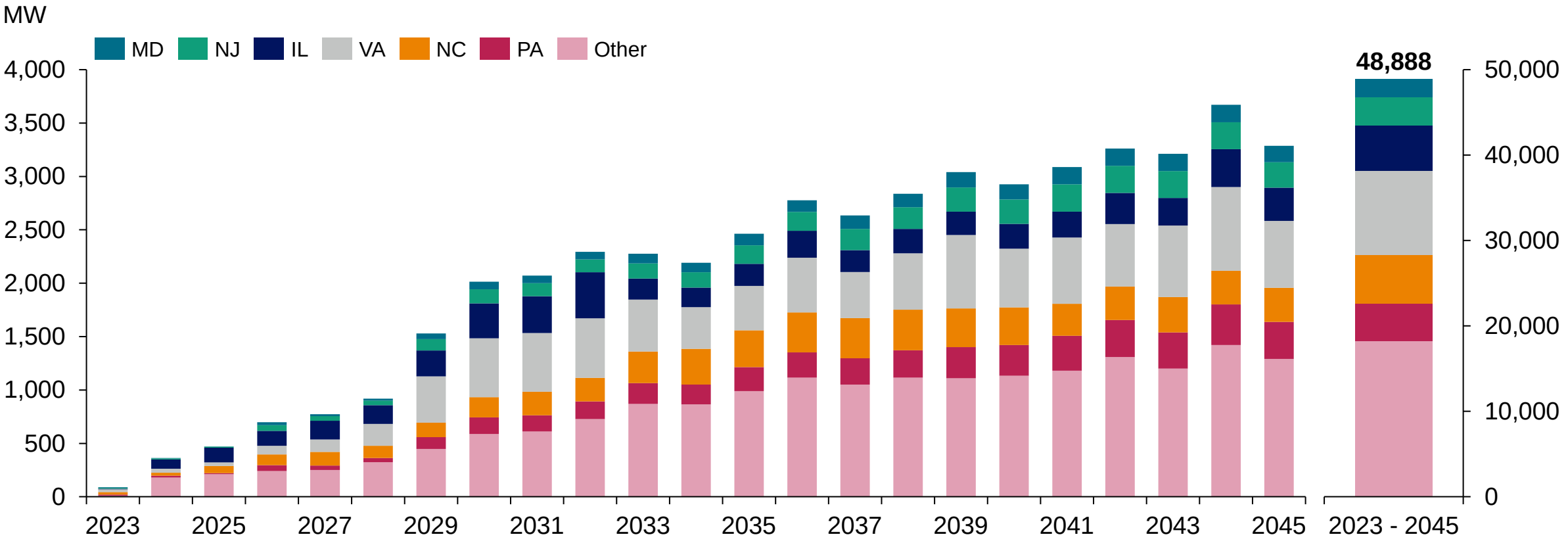
Annual C&I battery additions, entire state



Source: S&P Global

Utility-scale sector battery outlook

Annual utility-scale battery additions, entire state

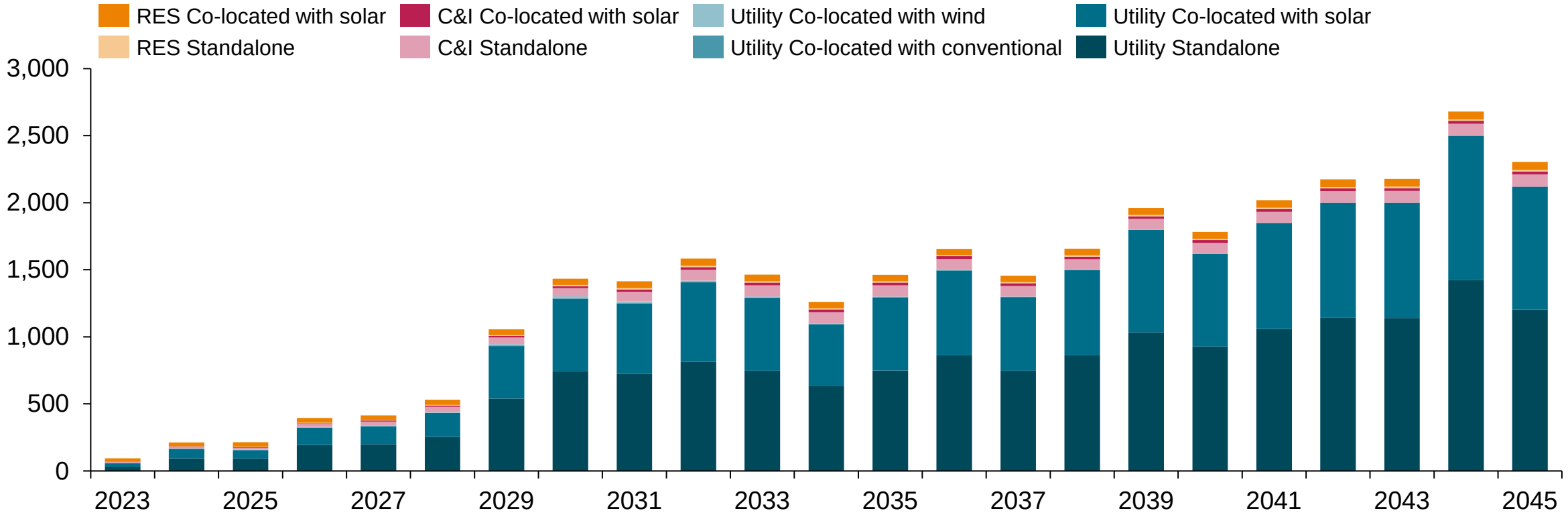


Source: S&P Global

PJM battery outlook by siting

Annual breakdown of total battery additions, PJM territory only

MW



Source: S&P Global

Conclusions for solar and battery forecasts

- **Normalization of supply chains and falling costs lead to steady growth from the mid 2020s through 2030**
  - ITC extension + bonus provisions dramatically improves distributed solar economics, especially >2025 and continues to provide clear pathway for sustained sectoral growth
- **In the PJM region, four states lead the charge – Maryland, New Jersey, Illinois, and North Carolina**
  - Combined they account for nearly 66% of the forecast across the PJM region. Key legislation in these states such as the Climate and Equitable Jobs act in Illinois, coupled with state-specific policies help stimulate growth across all segments.
- **NEM remains a critical policy driver—inevitable reforms to full retail rate NEM are expected to slow, but not halt, DG solar growth**
  - Most key states are expected to reform their NEM policies in the 2024-2030 period as installed capacity hits current legislative caps.
  - However, as experience in other states demonstrates (e.g. California), reforms are likely to balance policy costs against growth incentives, which in our view means reduced export compensation, but only to a level that allows for continued growth.
  - NEM reforms are also likely to support distributed battery storage—common reforms such as TOU and asymmetrical rates create natural incentives for storage, and experience in other states suggests regulators/policymakers may couple those reforms with incentives for flexible load, including batteries.
- **Battery energy storage will also grow much faster in PJM with new federal tax credits (standalone ITC + bonuses)**
  - Utility-scale storage will continue to dominate sector additions owing to high demand, better economics and an easier path to market. Residential and C&I storage adoption will grow considerably faster than last year's outlook owing to improved economics, a higher DG solar and demand forecast driving battery adoption.

Disclaimer

S&P Global Commodity Insights (“SPGCI”) divisional independence. SPGCI is a business division of S&P Global Inc. (“S&P Global”). S&P Global also has the following divisions: S&P Dow Jones Indices, S&P Global Market Intelligence, S&P Global Mobility, and S&P Global Ratings, each of which provides different products and services. S&P Global keeps the activities of its business divisions separate from each other in order to preserve the independence and objectivity of their activities in accordance with the S&P Global Divisional Independence and Objectivity Policy. Client’s receipt of SPGCI reports, data and information under this Agreement may also affect Client’s ability to receive services and products from other S&P Global divisions in the future.

S&P Global Commodity Insights publishes commodity information, including price assessments and indices. S&P Global Commodity Insights maintains clear structural and operational separation between its price assessment activities and the other activities carried out by S&P Global Commodity Insights and the other business divisions of S&P Global to safeguard the quality, independence and integrity of its price assessments and indices and ensure they are free from any actual or perceived conflicts of interest.

Limitation of Advice and Reliance. The Deliverables should not be construed as financial, investment, legal, or tax advice or any advice regarding Client’s corporate or legal structure, assets or, liabilities, financial capital or debt structure, current or potential credit rating or advice directed at improving Client’s creditworthiness nor should they be regarded as an offer, recommendation, or as a solicitation of an offer to buy, sell or otherwise deal in any investment or securities or make any other investment decisions. The Deliverables should not be relied on by Client in making any investment or other decision. Client may not use the Deliverables to transmit, undertake or encourage any unauthorized investment advice or financial promotions, or to generate any advice, recommendations, guidance, publications or alerts made available to its own customers or any other third-parties. Nothing in the Deliverables constitutes a solicitation by SPGCI or its affiliates of the purchase or sale of any loans, securities or investments. SPGCI personnel are not providing legal advice or acting in the capacity of lawyers under any jurisdiction in the performance of Services or delivery of Deliverables.

Contacts

Christopher Wilfong

Director, Power Market Consulting

Christopher.Wilfong@spglobal.com

Diego Garcia

Consulting Principal, Power Market Consulting

Diego.Garcia@spglobal.com

Andres Sanchez

Sr. Consultant, Power Market Consulting

Andres.Sanchez@spglobal.com