Monthly Retail Choice Regulatory Bulletin

CALPINE ENERGY SOLUTIONS

December 2024

Executive Summary & Introduction

1. In December, a year ago, we warned that declining reliability of the electric grid and load growth driven by data centers would become major forces disrupting the electricity market in 2024. Indeed, as we close 2024 NERC warns that more than half of North America faces a risk of energy shortfalls in the next five to ten years as data centers and electrification drive "explosive" electricity demand and generator retirements threaten resource adequacy. The agency has adopted two new standards to boost extreme weather reliability and three updates to standards focused on critical infrastructure protection and energy assurance.
2. U.S. electricity demand could rise 128 GW over the next five years, driven by data centers and manufacturing growth, according to Grid Strategies. PJM expects its summer and winter peak load will grow by 2% and 3.2% a year on average through 2045, which may not sound like much but look no further than the forecast chart on page 5 to see its longer term impact. To address these issues, PJM has made three filings at FERC related to its capacity market rules.
3. On the transmission side, MISO's board approved a total of $30 billion of transmission projects, including a 765-kV backbone across the RTO's Midwest region, while NYSERDA and Forward Power canceled their Tier 4 Purchase and Sale Agreement.
4. The U.S. Treasury and IRS released final rules for the Investment Tax Credit. The Biden administration will increase Section 301 tariffs on imports of wafers, polysilicon and certain tungsten products from China, effective January 1, 2025.
5. The California legislature passed SB 253, requiring companies with greater than $1 billion in annual revenues to file annual reports publicly disclosing their direct, indirect, and supply chain GHG emissions, but for the first reporting cycle CARB will not take enforcement action for incomplete reporting against entities as long as the companies make a good faith effort.
6. As we look back, 2024 marks a dramatic inflection point for the electricity market where supply and demand diverge and a secular period of "scarcity" has formally commenced. Calpine Retail aims to guide you through what is likely to be turbulent markets in 2025 to meet your energy needs.

1.1 Assessment Approach

Our analysis of the Regulatory risk(s) to our customers is summarized in the rating(s) categories defined below:

Potential Financial Impact to Customer(s):

Symbol	Description
$+	Signifies potential increase in costs
$-	Signifies potential decrease in costs

Magnitude of Risk to Customer(s):

Symbol	Description	Description
	Major Impact	Represents a regulatory or policy change that is in the process of being enacted by Regulators (i.e., PUC, ISO, FERC, EDC) and is expected to result in a meaningful increase in cost(s) to load; likely require immediate action.
	Medium Impact	Represents a regulatory or policy change that is in the proposal process and being sponsored by one or more ISO stakeholders. Most of these Risk's will likely be elevated to RED. Medium Impact issues will require involvement but we expect to have time to coordinate load on these type(s) of issues.
	Actively Monitor	Represents regulatory or policy discussions or trends that may evolve to either RED or ORANGE categories. No immediate action item for load.
	For Your Information	Industry developments or information, while not directly impacting the customer, may be of interest or import to the customer.

2.0 Overall Assessment

We have identified various issues that coalesce with the ratings categories described above. Notwithstanding, these are the Regulatory or Policy issues we consider extremely relevant to our retail customers*. With respect to this Bulletin, the six categories which appear to represent the most significant impacts to retail customers are identified below and categorized according to ISO:

*Where appropriate, we have provided links to articles and other relevant information for reference purposes.

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2.1 Policy

Issue#	Rating	Issue	Impact	Action/Result
2.1a U.S.		**The U.S. Department of Treasury and IRS released final rules for the Section 48 Energy Credit, also known as the Investment Tax Credit (ITC) that will give clean energy project developers clarity and certainty to undertake major investment to develop renewable resources.** The ITC provides a tax credit for investments in qualifying clean energy projects, generally 30% of their cost. U.S. Treasury releases final rules on ITC	The Inflation Reduction Act (IRA) extended the ITC and related Production Tax Credit (PTC) until 2025, at which point the ITC and PTC will switch to a tech-neutral approach with credits that will be available in full for projects beginning construction at least through 2033. But the ITC's effectiveness was limited by the need for recurring short-term and retroactive legislative extensions, creating uncertainty and making it harder for clean energy developers to obtain financing.	The final rules clarify general rules for the ITC and its definitions of property eligible for the credit. These rules retained the core framework of the proposed guidance provided by the Treasury and IRS in November 2023, See Latham & Watkins summary of ITC regulations here for more information.
2.1b U.S.	 **$+**	**The Biden administration will increase Section 301 tariffs on imports of wafers, polysilicon and certain tungsten products from China, effective January 1, 2025.** USTR increases tariffs under section 301 on tungsten products, wafers and polysilicon	Solar wafers and polysilicon imports, and other critical components for solar energy development will now face a 50% tariff rate. Tungsten products, such as bars and sheets, will be subject to a 25% tariff rate.	The move builds on tariff hikes finalized in September including 100% tariff on electric vehicles and a 50% tariff on semiconductors.

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2.1 Policy

Issue#	Rating	Issue	Impact	Action/Result
2.1c CAISO	$+	**As reported in the September 2023 Regulatory Bulletin, the California Legislature passed Senate Bill 253 as part of the state's landmark "Climate Accountability Package."** SB 253 requires companies with greater than $1 billion in annual revenues to file annual reports publicly disclosing their direct, indirect, and supply chain greenhouse gas (GHG) emissions, verified by an independent third-party provider.	In a California Air Resources Board (CARB) Enforcement Notice issued December 5, 2024, CARB recognizes that companies may need some lead time to implement new data collection processes to allow for fully complete scope 1 and scope 2 emissions reporting, to the extent they do not currently possess or collect the relevant information. Accordingly, CARB will exercise its enforcement discretion such that, for the first report due in 2026, reporting entities may submit scope 1 and scope 2 emissions from "the reporting entity's prior fiscal year" that can be determined from information the reporting entity already possesses or is already collecting at the time this Notice was issued.	CARB will exercise enforcement discretion for the first reporting cycle, on the condition that entities demonstrate good faith efforts to comply with the requirements of the law. This enforcement discretion is aimed at supporting entities actively working toward full compliance. Thus, for the first reporting cycle, CARB will not take enforcement action for incomplete reporting against entities, as long as the companies make a good faith effort to retain all data relevant to emissions reporting for the entity's prior fiscal year. Please contact your sales representative to obtain additional information or a copy of the CARB Enforcement Notice.

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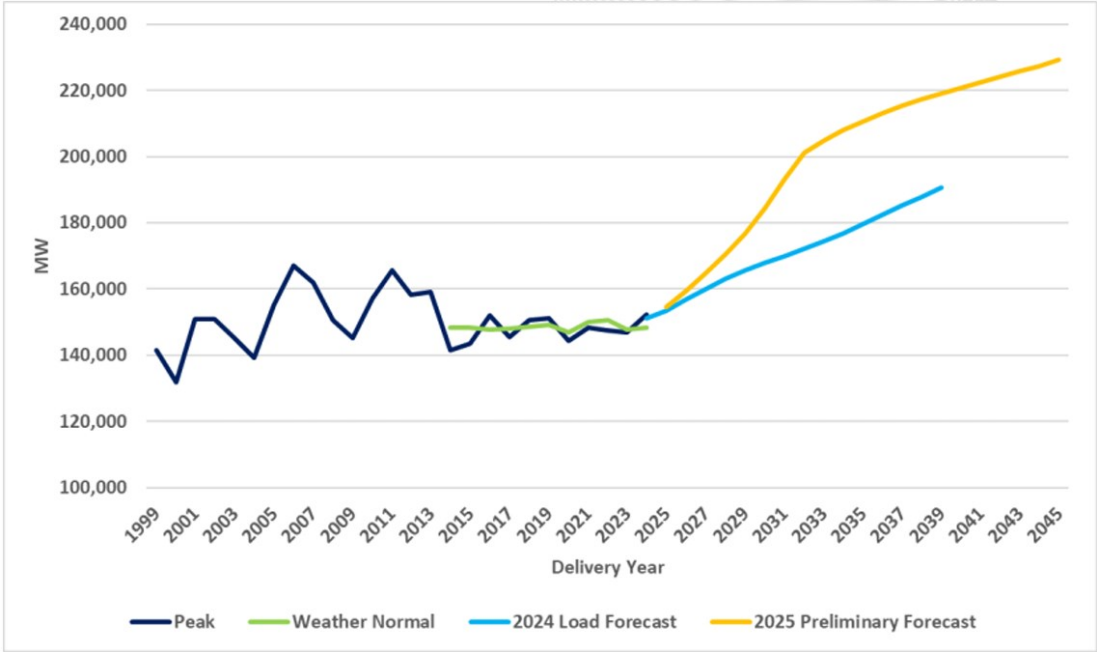
2.2 Capacity / System Reliability

Issue#	Rating	Issue	Impact	Action/Result
2.2a PJM	 	**Largely driven by data center growth, PJM expects its summer and winter peak load will grow by 2% and 3.2% a year on average through 2045, up from 1.6% and 1.8% growth, respectively, in last year's forecast.** That may not sound like much, but by the 2032/33 delivery year PJM expects peak summer load to reach 200 GW, over 45 GW or 29% increase from 2025/26. See the load forecast chart below at right that provides a stark picture of the magnitude of the change, especially compared to the last two decades. **See PJM's preliminary 2025 load forecast here.** The increased preliminary load forecast is largely driven by "large load adjustments" mostly from data centers, totaling 50 GW by about 2032. UD: PJM expects summer peak load to grow 2% a year on average, driven by data centers	This includes 5 GW in new data center load for PPL by 2031, 2.5 GW for ATSI by 2023, and 2 GW for Allegheny by 2033. The areas with the highest expected average annual summer load growth over the next 20 years are Dominion Zone at >5%, PPL at >4%, and AEP at ~4%. **PJM Summer Load Forecast 2024 vs 2025** 	PJM uses its annual load forecast for transmission planning and to determine how much capacity to buy in its capacity auctions. PJM's next capacity auction for the 2026/27 delivery is set for July 2025 *(see our November Regulatory Bulletin, Sec. 2.2a for more)*.

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2.2 Capacity / System Reliability

Issue#	Rating	Issue	Impact	Action/Result
2.2b PJM	 **$+**	**PJM has made three filings at FERC related to its capacity market rules, which the RTO and its stakeholders had been working on since the 2025/26 Base Residual Auction (BRA).** **1. ER25-682-000 Capacity market rule changes applicable for 2026/27 and 2027/28 delivery years:** • Switch to Dual Fuel Combustion Turbine as the reference technology, which provides a capacity auction price cap of around $500/MW-day versus $700/MW-day under a Combined Cycle unit; • Establish a uniform Non-performance charge rate, eliminating the $0 penalty rate for ten zones under the Combined Cycle scenario; • Include the Brandon Shores and Wagner RMR'd units as price takers in the 2026/27 and 2027/28 capacity auctions; and • Remove the reactive service revenue component from Net Energy and Ancillary Services offset.	**2. ER25-785-000 Must Offer and Market Seller Offer Cap changes:** • Implement Must Offer requirement to all resources, including solar, wind and battery storage and create floor for Market Seller Offer Cap (MSOC) at the Capacity Performance Quantifiable Risk (CPQR) rate. This means all solar, wind and battery storage resources must offer into the capacity auctions—but their offer price would at minimum cover their cost to mitigate Capacity Performance non-performance risk. If approved, these changes would apply to all capacity auctions going forward. **3. ER25-712-000 Reliability Resource Initiative (RRI) interconnection rule change:** Allow a limited number of "shovel ready" generating resources (of any technology) into Transition Cycle #2 of the interconnection queue, in order to expedite capacity development. These resources must commit to participate in the capacity auctions for the next 10 years.	These changes, if approved by FERC—together with the increased load forecast driven by data centers *(see Sec. 2.2a of this Regulatory Bulletin)*—create bullish conditions for capacity prices for the 2026/27 BRA. FERC is expected to rule on these filings by mid-February, in time for the changes to be implemented for the 2026/27 BRA. Please contact your sales representative to discuss your options to hedge your price risk.

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2.2 Capacity / System Reliability

Issue#	Rating	Issue	Impact	Action/Result
2.2c NERC	 **$+**	**NERC has adopted two new standards to boost extreme weather reliability and three updates to standards focused on critical infrastructure protection and energy assurance.** **New Standards** **TPL-008-1** focuses on improving how planning coordinators and transmission planners prepare for the potential impacts of extreme heat and cold events; **BAL-007-1** requires balancing authorities to perform energy reliability assessments in order to plan for potential energy emergencies in the near term that account for: • Forecast demand profiles, resource capabilities, and operational limitations including fuel supply; • Energy transfers with other balancing authorities; and • Bulk electric system constraints. NERC advances extreme weather protection, energy assurance, and approves 2025 work plan priorities	**Updated Standards** **CIP-003-11** bolsters the security of small distributed resources by adding controls to authenticate remote users; **CIP-002-8** improves risk identification by addressing proper identification of transmission owner control centers; and **TOP-003-7** ensures that balancing authorities have the authority to collect the data needed to perform the near-term energy reliability assessments.	The standards actions have been filed at FERC for approval.

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2.2 Capacity / System Reliability

Issue#	Rating	Issue	Impact	Action/Result
2.2d NERC	 **$+**	**More than half of North America faces a risk of energy shortfalls in the next five to 10 years as data centers and electrification drive electricity demand higher and generator retirements threaten resource adequacy, NERC said in its 10-year outlook 2024 Long-Term Reliability Assessment (LTRA).** Summer demand is forecast to rise by more than 122 GW in the next decade, adding 15.7% to current system peaks. The 10-year summer peak demand forecast has grown by more than 50% within the last year. NERC has previously warned about the pace of generator retirements but the situation is becoming more urgent as demand forecasts surge and resource additions slow.	**The LTRA expects total retirements to reach 115 GW by 2034, which will largely be replaced by variable intermittent generation.** Peak reserve margins fall below the levels required by resource adequacy requirement in the next 10 years in almost every assessment area. MISO faces a high risk beginning next year, with energy shortfalls in some areas possible during normal peak conditions. SPP and New England face elevated risk, with energy shortfalls possible under extreme conditions beginning in 2025 and 2026, respectively. There are natural gas supply risks in each area, while SPP also faces shortfalls if wind generation falls below expectations.	PJM faces elevated risks beginning in 2026. ERCOT's surging load growth is driving resource adequacy concerns as the share of dispatchable resources struggles to keep pace. Extreme winter weather has the potential to cause the most severe load-loss events for ERCOT. NERC said, "We're seeing demand growth like we haven't seen in decades," and infrastructure is not being built fast enough to keep up with the rising demand. **The "explosive" demand growth is driven by new data centers, building and transportation electrification and new manufacturing and hydrogen fuel plants.** EPSA called for policies that support competitive markets, stating that we cannot rely on integrated resource planning used by utilities and the business model of the last century.

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2.2 Capacity / System Reliability

Issue#	Rating	Issue	Impact	Action/Result
2.2e U.S.	$+	**U.S. electricity demand could rise 128 GW over the next five years, driven by data centers and manufacturing growth, according to a report published by Grid Strategies.** Load growth estimates are based on annual planning reports submitted to FERC by electric balancing authorities and updated with additional data from utilities and planning regions. The latter half of this decade could see 3% annual average load growth, the highest in over forty years. Nationwide demand is now forecast to increase by 15.8% by 2029. GS: Strategic industries surging: driving US power demand	The "shocking" estimate represents a five-fold increase in load growth forecasts over the past two years. Data center growth is the single largest driver, with growth concentrated near Northern Virginia and Pennsylvania (PJM), Dallas (ERCOT), and Atlanta GA. Data centers could use up any and all currently unused grid capacity over the next five to ten years. Thereafter, it remains to be seen whether revenues develop to cover the costs of AI investments made during that time.	Manufacturing growth is the second largest driver, while transportation electrification has been challenged by uncertainty around adoption rates and EV policies. Hydrogen could emerge as a major factor going forward. The largest five-year load increases are expected in PJM and ERCOT, contributing 73 GW of combined demand by 2029. Other areas expecting large demand growth include Georgia Power's territory, the Pacific Northwest region, MISO and SPP.

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2.3 Transmission

Issue#	Rating	Issue	Impact	Action/Result
2.3a MISO	 **$+**	**MISO's board approved the $21.9 billion long-range transmission plan (LRTP) Tranche 2.1 that includes building a 765-kV backbone across the RTO's Midwest region.** The 765-kV lines are expected to total about 1,800 miles, will enable power flows across MISO's central Midwest region that will be needed under different weather patterns, while relieving congestion and resolving local constraints. In its eastern region, the Tranche 2.1 lines will better tie into the existing 765-kV network, unlocking generation and allowing increased transfers into and across the region. MISO: MTEP24 Executive Summary	**As part of the approval, MISO's board also approved $6.7 billion in local projects and a set of Joint Targeted Interconnection Queue projects between MISO and SPP that will cost $1.7 billion, for a total cost of about $30 billion.** MISO estimates that its LRTP Tranche 2.1 projects will produce between $23 billion to $72 billion in net benefits over 20 years through avoided capacity costs, improved reliability and decarbonization.	The regional transmission lines are expected to come online between 2032 and 2034. The Tranche 2.1 portfolio builds on MISO's $10.3 billion Tranche 1 plan, which was approved by the MISO board in mid-2022 and are advancing through various state regulatory approvals. The LRTP Tranche 2.1 projects need to be approved by state regulators.

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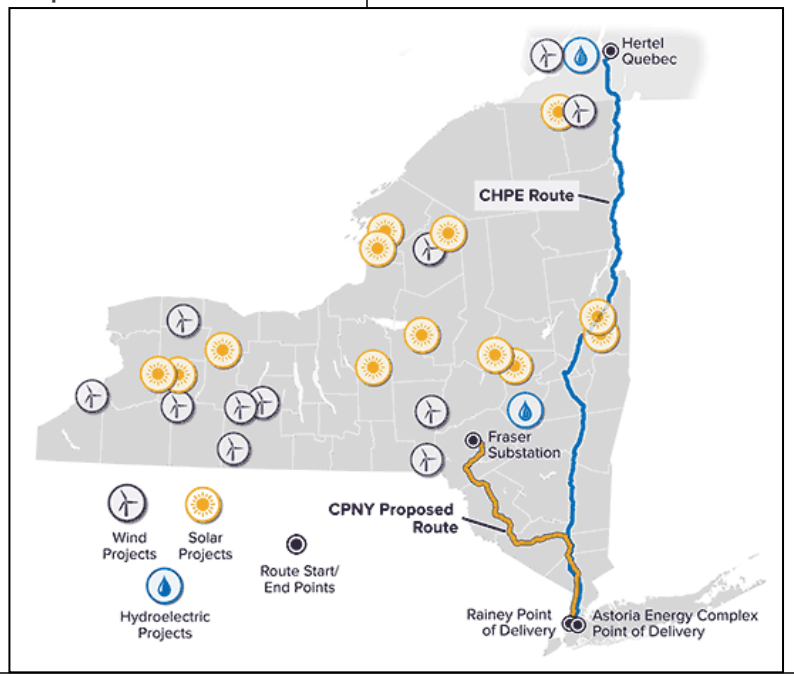
2.3 Transmission

Issue#	Rating	Issue	Impact	Action/Result
2.3b NYISO	 **$+**	**NYSERDA and Forward Power, the developer of the solar and wind projects behind the 175-mile Clean Path New York (CPNY) transmission line into New York City, have "mutually agreed to terminate" the Tier 4 Purchase and Sale Agreement, which was finalized in 2021.** Tier 4 RECs support projects that can deliver renewable energy to New York City. CPNY, a collaboration between the New York Power Authority (NYPA) and Forward Power, a JV of energyRe and Invenergy, had been planned to come online in 2027. The project aimed to bring almost 5 GW of wind, solar and hydroelectric power into New York City, where NYISO says electrification and data centers are contributing to capacity shortfalls by 2033. NYSERDA: Tier 4—New York City Renewable Energy UD: NYSERDA, Clean Path NY developers terminate contracts underpinning 175-mile transmission line	NYISO last month published its 2024 Reliability Needs Assessment, which identified a 17 MW shortfall in summer 2033 for New York City, increasing to 97 MW in summer 2034. Reliability margins could be deficient as soon as 2026 if the Champlain Hudson Power Express (CHPE) transmission project is not brought online by May of that year *(see our September 2023 Regulatory Bulletin, Sec. 2.2b for more on CHPE)*. **Map of CHPE and CPNY** 	Developers broke ground on the 339-mile line in November 2022 and reached 50% completion last month *(see more on CHPE here)*. Despite the cancelation of the Tier 4 contract between NYSERDA and Forward Power, NYPA is moving forward with building the transmission line.

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3.0 Contact Information

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Public/ISO Regulatory Contacts:

- PJM - http://pjm.com/about-pjm/who-we-are/contact-us.aspx
- MISO - https://www.misoenergy.org/AboutUs/ContactUs/Pages/ContactUs.aspx
- NEISO - http://iso-ne.com/contact/contact_us.jsp
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