

A photograph of a clear incandescent lightbulb lying on its side on a document. To the right of the bulb is a small stack of coins. The document has some faint text and a bar chart visible. The entire image has a green tint.

SAVE ON YOUR ELECTRICITY BILL

TIPS TO MANAGE CAPACITY CHARGES

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INTRODUCTION

OVERVIEW OF CAPACITY CHARGES

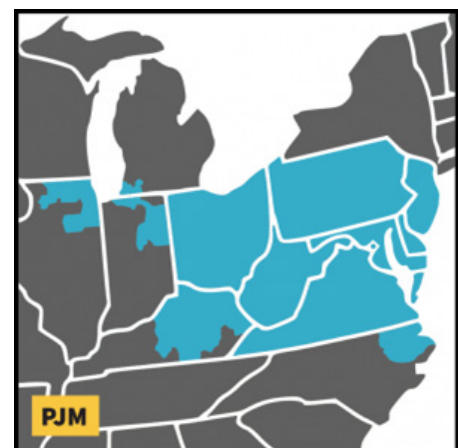
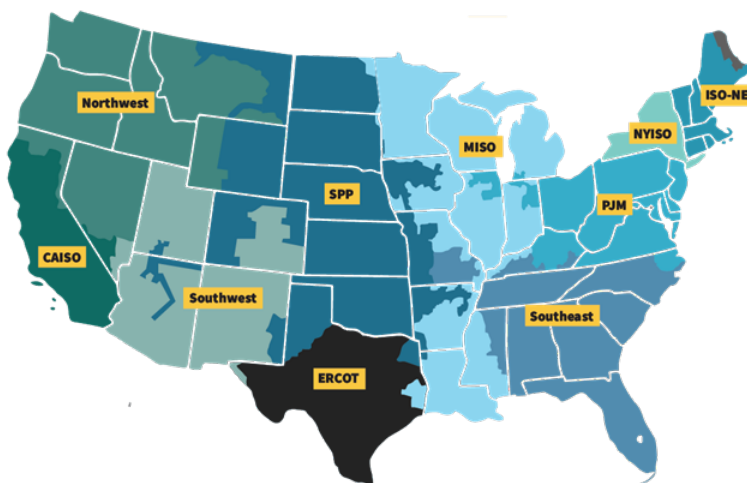
The Capacity Charge is a charge on your electricity bill that represents your expected level of energy usage during periods of high demand, typically on the hottest days of summer. This charge is something that all customers in capacity markets pay, ensuring that the utility reserves enough electricity for everyone when demand is at its peak.

The Capacity Charge covers the costs for the utility to reserve enough electricity supply to meet demand, particularly during peak hours. By reducing your energy use during high-demand hours in the summer, you can lower the Capacity Charge on your bills starting the following year.

INTRODUCTION TO ELECTRIC POWER MARKETS

Regional Transmission Organizations (RTOs) in North America manage the high-voltage electricity grid over large regions. They coordinate and control electricity that flows from power plants to local utilities and to consumers. Their ability to manage the grid across multiple states helps maintain stability and prevent blackouts. For example, during the February 2021 Texas blackout, Electric Reliability Council of Texas (ERCOT) could not get power from other regions because of the isolation of their grid. Over 4.5 million homes and businesses did not have power for days. Additionally, ERCOT utilities do not have a capacity charge. Instead of a capacity market, ERCOT has a capacity reserve margin. This margin is calculated by subtracting the projected peak demand on the grid from the total capacity generation available in Texas. Generators are paid only for the electricity they produce, not for maintaining reserve capacity. While this approach helps keep costs lower, the lack of a capacity market has led to challenges meeting demand during extreme events.

By maintaining reliable electricity delivery, RTOs can help prevent catastrophic events and keep the power flowing when it is needed most. PJM Interconnection is one of the RTOs in the continental United States, serving over 65 million people across 13 states and the District of Columbia. It coordinates the generation and transmission of power, oversees market operations, and facilitates competitive electricity markets. PJM works to provide sufficient electricity by balancing supply and demand and planning for future needs.



UNDERSTANDING CAPACITY MARKETS & OBLIGATIONS

Unlike traditional capital markets where production is driven by demand and profitability, energy generators in regulated markets guarantee enough supply to meet peak demand. This commitment is crucial for maintaining grid reliability and preventing blackouts.

In capacity markets, power suppliers are paid not just for the electricity they produce, but for their ability to produce power when needed. This means they must be ready to generate electricity during peak periods, even if it is not immediately profitable. These markets conduct capacity auctions to secure commitments from generators to be available during future high demand periods. This system ensures that there is always enough capacity to meet peak demand.

CALCULATION & IMPACTS OF CAPACITY CHARGES

Capacity charges in the PJM market are calculated based on the Reliability Pricing Model (RPM). This model uses auctions to determine the price and amount of capacity needed to meet peak demand potential. The primary auction is known as the Base Residual Auction (BRA). During the BRA, power suppliers bid to provide capacity at various prices, and the auction clears at a price that reflects the cost of securing the necessary capacity. The clearing price is influenced by factors such as projected demand, the cost of new generation, and the availability of existing resources.

CALCULATION OF INDIVIDUAL CAPACITY CHARGE RATES

PJM customers' individual capacity charge rates are calculated based on their energy usage during the five coincident peak (5CP) days and hours. These 5CP days are the five highest daily peak loads within the PJM region during the summer months,

typically between June 1st and September 30th. The coincident peak hours are the specific hours during these days when the demand for electricity is at its highest.

DETERMINING PEAK LOAD CONTRIBUTION

Peak Load Contribution (PLC) is a measure of a customer's energy usage during the highest demand hours of the year, which determines their share of capacity charges. For interval-metered accounts, also known as real-time or hourly pricing, the actual measured energy usage during the 5 coincident peak (5CP) hours is used. For fixed-rate accounts, a statistical sample of energy usage is used to estimate the peak load. The PLC represents a customer's proportion of the total peak load so that capacity charges are fairly allocated based on individual contributions to peak demand.

IMPACT ON CONSUMERS

Capacity charges have a significant impact on consumers, affecting residential and commercial customers. For residential consumers, higher capacity charges can lead to increased monthly electricity bills. Commercial and industrial consumers, who typically have larger energy usage, may see more substantial increases in their bills due to higher capacity charges. For example, **the recent Base Residual Auction for the 2025-2026 delivery year resulted in a 750% increase in capacity costs across the PJM region.** This will impact electricity prices starting June 1, 2025, with some residential and commercial customers expecting up to a 29% increase in their monthly energy bills. By understanding and managing energy usage during peak periods, consumers can reduce their capacity charges and mitigate the impact on their bills.

MANAGING & LOWERING CAPACITY CHARGES

STRATEGIES FOR CONSUMERS

Now that we understand how individual PLC and capacity charge rates are calculated, we can begin to explore ways to reduce them. For customers on interval-metered rates, the actual measured energy usage during the 5 coincident peak (5CP) hours is used to determine their rate. **Therefore, the first step is to ensure that you are on a tariff rate that utilizes real-time hourly pricing so that you have more control of the charges.** By monitoring and managing your energy usage during peak hours, you can lower your capacity charges and save on your electricity bills.

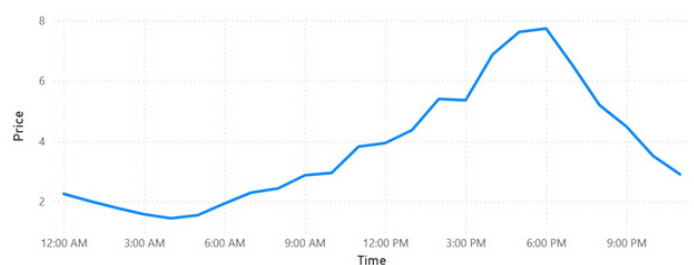
Most utilities in the PJM region offer interval-metered pricing rates, also known as real-time or hourly pricing. This electric supply rate lets consumers pay for electricity at the hourly market price. Hourly prices typically change as demand changes. Higher demand usually results in higher hourly prices. This type of pricing incentivizes shifting energy usage to off-peak times when electricity is priced lower. This has the added benefit of changing consumers' behavior to shift energy use away from peak hours encouraging less energy use during the 5CP hours and reducing a customer's PLC and capacity charge. Additionally, many hourly pricing programs also provide notifications about the best times to shift energy use. Day-ahead capacity guard alerts are sent the evening prior to a predicted peak period if potential PJM system peak loads have been predicted for the following day. The capacity guard alert is a warning of potential peak hours that may be used in the calculation of a participant's capacity obligation and associated capacity charge during the next year. These alerts are issued to help participants reduce their PLC and to help them save money by lowering their capacity charge.

TIPS TO MANAGE ENERGY FOR RESIDENTIAL CONSUMERS:

- **Adjust your thermostat** and consider using a smart thermostat for better efficiency.
- **Do laundry during off-peak hours** when electricity prices are lower. Use cold water whenever possible to reduce water heating costs.
- **Charge devices** like cell phones and cordless tools at night when electricity rates are lower.
- **Run your dishwasher during off-peak hours.** If it has a timer or "delay start" function, use it to start the cycle during lower-priced hours.
- **Schedule Electric Vehicle (EV) charging** to take place overnight during off-peak hours.

Of note, with real-time hourly market prices, electricity can occasionally have negative prices, typically occurring at night when supply exceeds demand. Some generators prefer not to reduce output during these periods, resulting in electricity being offered at prices below zero. **Customers who pay the market price are actually paid to use electricity during these negative-priced hours.** The chart below shows the typical pricing patterns based on average prices throughout the day.

Average Prices Throughout the Day - Summer 2024



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SOCIETAL BENEFITS

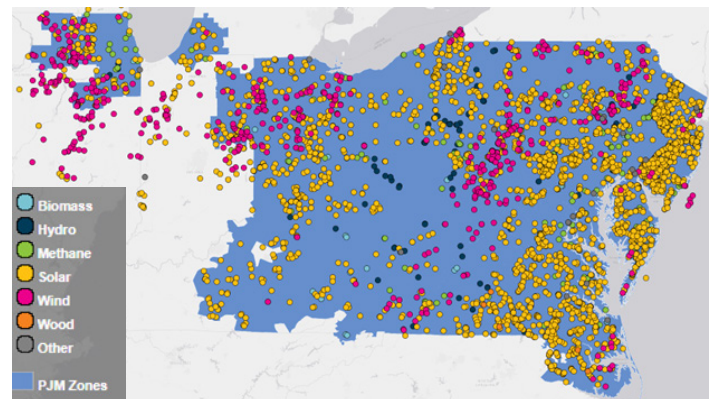
Shifting load and reducing peak system load offer social benefits as well. By lowering peak demand, utilities can avoid or defer costly capacity investments and transmission and distribution upgrades, leading to cost savings for both utilities and consumers. This also enhances grid stability and reliability, lowering the risk of blackouts by smoothing out the demand curve. Additionally, shifting load to off-peak times may utilize cleaner energy sources. Consumers benefit from lower electricity prices and may also receive incentives for participating in demand response programs.

FINAL THOUGHTS

U.S. electricity demand is forecasted to greatly increase over the next decade, driven primarily by data centers and increased electric vehicle adoption. Constructing and interconnecting new infrastructure and generation takes time. When possible, shifting energy to off-peak hours and reducing peak capacity is essential to maintaining grid stability.

There is an increasing requirement for integrating not just more energy sources, but more renewable energy sources to the grid. Ironically, Artificial Intelligence (AI), and the vast computing power it requires, may be part of the cause and solution to the need for efficiently integrating more energy sources into the grid. This map shows the sheer amount of proposed renewable resources under study for interconnection to the grid in PJM. There are strategies underway to leverage AI and machine learning to speed up the integration of these renewable energy resources and help meet the increasing demand for electricity.

Proposed PJM Renewable Energy Projects – April 2025



ABOUT THE AUTHOR

ANDY WAHRER, CSPO is Primera's business and data analytics team lead. His expertise is the result of over 15 years of experience with leadership level reporting, data science, benchmarking investment portfolios, automating processes, and increasing productivity through analytical insights in the utility and engineering industries.