

Learn more about [LSEG](#)



My News

US grids must harness electric vehicle growth to tackle load risks

By Anna Flávia Rochas

March 18, 2025 10:11 AM EDT · Updated March 18, 2025



Industry Insight from Reuters Events, a part of Thomson Reuters.



Feedback

Image:REUTERS/Lucy Nicholson [Purchase Licensing Rights](#)

Summary

Electric vehicle adoption will hike in the coming years and new grid integration tools are needed to help manage peak demand risks.

March 17 - U.S. deployment of electric vehicles (EVs) is expected to grow rapidly in the coming years, alongside soaring demand from data centers, changing how utilities and grid operators manage loads and expand their power networks.

President Trump has removed electric vehicle targets and reduced funding support but experts continue to predict strong growth in EV deployment due to long-term automaker commitments, state-level policies, consumer adoption trends and falling battery prices.

Rabobank estimates EVs will add between 100 and 185 terawatt-hours (TWh) to U.S. electricity demand by 2030, equivalent to 2.5% and 4.6% of the country's total electricity consumption.

Consultancy PwC expects EV adoption in the U.S. to be around 30% of all sales by 2030, mainly driven by manufacturers introducing more affordable EVs to the public. By 2040, EV adoption should be closer to 60% of all U.S. light-duty vehicle sales, with EV load rising from an estimated 24 TWh in 2023 to 468 TWh by 2040.

CHART: Forecast US electricity demand from passenger EVs

Source: Rabobank [Purchase Licensing Rights](#) 

Grid operators also face the growing challenge of intermittent power supply due to rising renewable energy capacity. New grid management measures that allow managed and **flexible EV** charging could reduce the strain on the grid, improving grid reliability and helping to defer the need for network upgrades, according to experts.

Full vehicle-to-grid integration (VGI) will require the participation of automakers, charging companies, utilities and the "seamless interaction" of multiple technologies, from EVs and chargers to grid infrastructure, Jaron Weston, manager of the California Energy Commission's Zero Emission Vehicle Acceleration Branch, told Reuters Events.

EVs' large batteries can work as mobile power generators, supplying energy back to the grid and providing grid services, including load shifting, demand response and peak shaving.

Demand response programs such as time-variable pricing, along with investment in grid modernization to allow bi-directional energy flow, can optimize EV integration and reduce stress on the grid.

"Through vehicle-to-grid integration, electric vehicles represent substantially more potential for grid benefits than any other distributed resource," Weston said.

Grids squeezed

California and Texas already face resiliency challenges, Amit Mathrani, energy transition specialist within the RaboResearch Energy Transition team, said.

In California, peak stress often results from the decline in solar generation during evening hours, while Texas' issues are primarily due to high summer cooling demands and rapid load growth.

California is the leading EV market, accounting for 30% of all vehicles in the country, and along with Nevada has the highest solar penetration rate. Meanwhile, Texas is also seeing rapid EV growth and solar capacity is surging.

[Join hundreds of senior executives across energy, industry and finance at Reuters Events Global Energy Transition 2025.](#)

Peak demand stress could continue or worsen if EV charging and rising power demand go unmanaged, according to Mathrani.

In the U.S. Northeast, higher demand from the electrification of buildings and heating systems coupled with fast adoption of EVs could contribute to a potential shift in the electricity demand profile between 2030 and 2040.

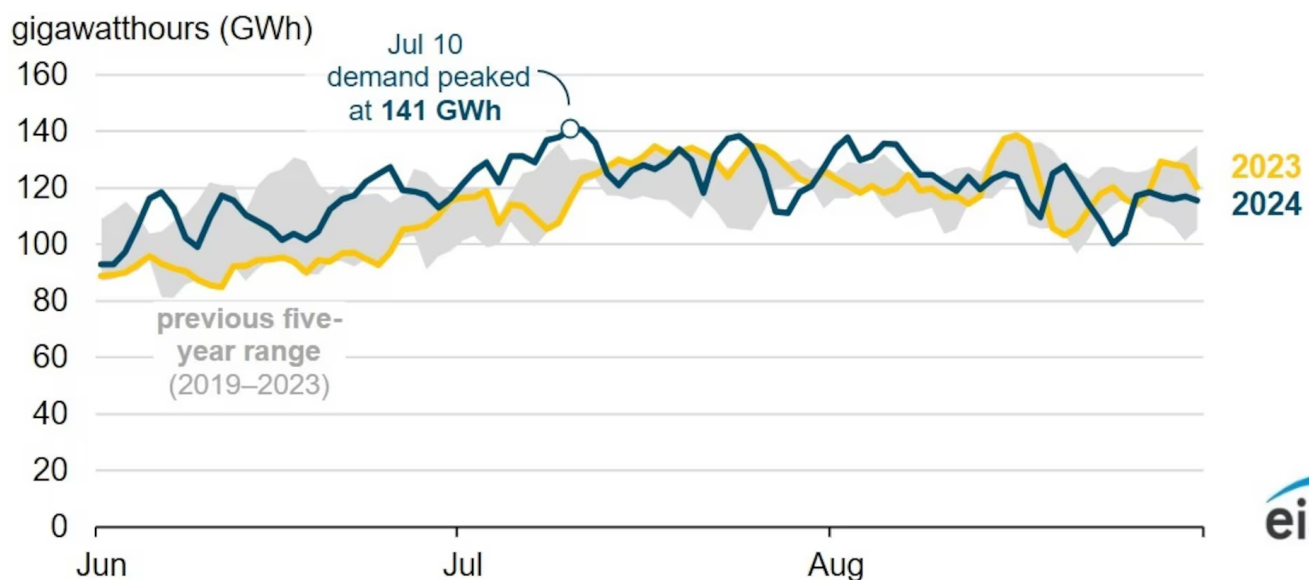
"If we see EVs being adopted at a higher rate, we could go from being a summer-peaking system to a winter-peaking system, where essentially the demand for electricity in the winter will be higher than the demand in the summer," Mathrani said.

"This will occur in the north because of the colder winters and a higher demand from the heating systems in the winter."

Load shifting

California has been using time-of-use electricity rates to shift load and reduce pressure on the grid during peak-load periods, typically between 4 and 9 pm, when residential loads and energy rates increase, according to Timothy Lipman, co-director of the Transportation Sustainability Research Center at the University of California Berkeley. In the hours before that, there is often excess solar supply.

CHART: Peak hourly power demand in Western Interconnection in 2024



Source: U.S. Energy Information Administration (EIA) [Purchase Licensing Rights](#)

The next trend in electricity pricing for load management should be energy prices that would change every hour and will "depend on grid conditions," said Lipman, citing a project he is working on which is part of the California Load Flexibility Research and Development Hub (CalFlexHub), a program funded by the CEC which develops research on load flexible technologies.

In this model, the utility company would provide "day-ahead", "hour-ahead" and even "15-minute ahead" forecasts on grid demand and power prices. The automaker could then provide the car owner with the lowest-cost charging schedule based on how much time it has to charge, which would also help to reduce peak load.

[Surging demand from tech groups is accelerating clean power activity - download our exclusive report](#)

CEC has awarded \$208 million across 10 projects to provide mass adoption of vehicle-to-grid services based on hourly-dynamic rate signals and bi-directional projects, as part of a portfolio of initiatives to support vehicle-to-grid integration over the past decade.

Real-world deployments have demonstrated the technical feasibility of even the most advanced forms of vehicle-to-grid integration, according to CEC's Weston.

To unlock the full value of VGI, the industry needs "continued deployment of widely available economic signals and improved inter-operability standards that underlie VGI services, so drivers only worry about plugging in, and everything else just works," he said.

[For exclusive insights on the energy transition, sign up to our newsletter.](#)

Utilities and grid operators must work with regulatory bodies to approve innovative electricity rate structures and engage customers on the benefits of time-of-use rates, according to Akshay Singh, a partner in PwC's U.S. Automotive Practice.

Through time of use rates and other incentive structures, utilities could largely mitigate the EV impact, Singh said.

"Further, utilities could make use of this aggregate EV load as a virtual energy storage asset," he said. "This would enable an increase in renewable energy utilization and future deployments."

--Editing by Robin Sayles

Suggested Topics:

Energy

Opinions expressed are those of the author. They do not reflect the views of Reuters News, which, under the Trust Principles, is committed to integrity, independence, and freedom from bias. Reuters Events, a part of Reuters Professional, is owned by Thomson Reuters and operates independently of Reuters News.

Purchase Licensing Rights



Anna Flávia Rochas

Anna covers renewable energy and agricultural commodity markets in the Americas and Europe, writing articles for Brazilian, North American and European news outlets.

Read Next

ANALYSIS
India's ethanol drive imperils its push for edible oil self-sufficiency
ago

Energy
NextDecade secures \$1.8 billion from TotalEnergies, GIP for Rio Grande LNG project
ago

Orsted plunges as it seeks \$9.4 billion to cope with Trump's hostility to wind power
ago

Insight
Insight: The airline industry's dirty secret: Clean jet fuel failures
ago

Feedback