N A R U C
National Association of Regulatory Utility Commissioners

NARUC Staff Surge Call – Forecasting Load Growth: Assumptions and Risks, February 10, 2025

Summary

Public utility commissions across the country are focused on the potential for load growth in their states driven by electrification, growth of information technology, and other sources. Building on discussions held during NARUC's Annual Meeting last November, this Surge Call offered staff an opportunity to discuss the load forecasts they see from utilities, the risks associated with under- or over-estimation, and how to increase the accuracy and usability of forecasts. Participating states answered questions such as:

- Do you think utilities' current forecasts are underestimates or overestimates?
- Are you worried more about the risks and consequences of overbuilding or underbuilding?
- What actions have been effective to encourage or require evolving load forecasting practices to be more robust and adapt to changes in the electric industry and electricity usage?

Minnesota

Minnesota outlined its early-stage efforts to understand the impact of data centers on load forecasting. Due to updated sales forecasts driven by data centers, utilities have revised resource plans with meaningful increases in planned capacity additions. The Commission has asked utilities to list large load projects the utility knows about, and their forecasted energy and demand needs by year. In Minnesota, many of the proposed data center projects are on gradual timelines, for example expecting to come online in 2028 but not reaching full capacity until 2035. Utilities generally use econometric analysis to develop several load forecast scenarios or sensitivities. There is interest in expanding use of probabilistic models and statistical techniques to help manage uncertainty. There are concerns about overbuilding capacity for speculative loads; in the recent past some data center projects have "fallen through" or relocated out of state. There are also concerns about overbuilding due to data centers coupled with Minnesota's 100% carbon-free electricity standard by 2040, and questions about the effect that high load factor customers will have on the resource mix. On the other hand, there is interest among state policy makers in welcoming data center companies who have carbon-free goals of their own and who might be attracted to Minnesota if the state has lower-carbon electricity. The Commission has initiated a proceeding with one utility to evaluate developing a new rate class or sub-class for super large customers to better balance these opportunities and risks.

Arizona

Arizona noted that forecasting data center load growth remains speculative, given uncertainties like fluctuating data center load estimates and emerging technologies such as Deep Seek.

Arizona has three major utilities, and they collaborate closely on generation and transmission planning, as what happens to one utility often affects the other. The Commission suggested that utilities provide annual updates. Arizona utilities were criticized for overestimating growth in previous iterations of their IRPs but now there's a concern they are underestimating. More robust stakeholder involvement might improve the accuracy of load forecasts. Arizona noted how, although overbuilding raises costs for ratepayers, the consequences of underbuilding, such as blackouts, could be more severe. Underbuilding poses a significant health risk, particularly in Arizona's extreme summers, which can result in life-threatening conditions if power outages occur.

New Jersey

New Jersey highlighted challenges in PJM's territory, as their overall load forecast for 2030 had increased by 16,000 MW from the previous year. However, three of New Jersey's four utilities either saw no change or slight decreases in their load forecasts in 2024. Only one utility reported a significant 6% increase in its projections for 2030 and more beyond that; they have requested a "large load adjustment."[1]

New Jersey noted a lack of standard approach in PJM utilities for forecasting large loads, how potential future load is discounted, how load might be phased in over time. PJM tries to reconcile differences but there are still gaps. It is difficult to account for the potential effect of tax incentives for data centers or for load that is "shopping" locations and states. There are risks to overbuilding (leading to unnecessary transmission costs) and underbuilding (resulting in higher capacity market prices in constrained areas). New Jersey has suggested a potential solution could be for states to develop new standards for electric utilities to help ensure consistency in their forecasting methods. New Jersey believes addressing the complexities of load forecasting is increasingly important given their role as an input in transmission planning, especially in long term planning through FERC Order 1920.

Questions and discussion:

Do states develop independent long-term forecasts for each utility they regulate?

Participants discussed whether states develop their own independent long-term forecasts. Ohio was highlighted as an example, where a statutory requirement mandates the Public Utilities Commission to forecast a 20-year load trajectory using historical data and time-series models. In contrast, Minnesota and Arizona rely on utility-provided forecasts, often complemented by updates and stakeholder input.

Should state legislators pass laws requiring large load entities (e.g., data centers) to notify utilities of their intent to build?

[1] A large load adjustment is an expected change in load not predicted by traditional economic forecasts or captured by energy and capacity markets. For example, while PJM forecasts their expected load, there may be large load additions that they cannot easily predict. EDCs have visibility into load that is expected to interconnect in their area and can request that PJM include this load in its forecast. Data center load, for example, has been the majority of recent large load adjustments in PJM.

The uncertainty of data center development emerged as a recurring theme. Minnesota does not independently forecast speculative loads and relies on electric service agreements to assess the likelihood of projects. New Jersey's approach included analyzing data center load adjustments within PJM but this was challenging due to limited visibility into speculative projects/ service requests.

Arizona raised the concern of utilities investing in infrastructure for data centers only to have these facilities relocated, leaving ratepayers stranded with stranded costs. One suggestion was to have legislative measures or contractual obligations to help ensure data centers contribute to the infrastructure costs they incur.

How can utilities balance confidentiality and stakeholder involvement?

States emphasized the need for confidentiality and stakeholder involvement. Arizona, in particular, requires utilities to involve stakeholders in IRP processes. New Jersey highlighted recent PJM efforts to increase transparency by holding public meetings on large load additions. Meanwhile, the Minnesota Commission is exploring whether to initiate a centralized docket to evaluate forecasting benchmarks and risks.

What are the risks in forecasting renewable energy generation availability, i.e., what generation is actually coming online, particularly in light of data center growth?

Speakers discussed the difficulties of forecasting renewable generation. Minnesota takes a risk-balanced approach, running multiple sensitivity analyses and planning for diverse scenarios. For New Jersey, their goals are primarily in the area of solar, wind, & storage, as well as EVs. But issues related to siting and transmission capacity contribute to uncertainty and determining what gets built or not built. It is also important to understand WHERE load and resources are built. Arizona utilities have already reached their RPS standards for solar; thus, utilities are considering a range of options, including nuclear and gas, in addition to significant solar and battery investments. The Minnesota commission has given utilities a lot of flexibility to procure new solar or wind resources.

Do utilities face issues with load interconnection queues limiting transmission service queues?

For New Jersey, PJM is in the middle of a transition process for its interconnection queue towards cluster studies, with the goal of bringing as much generation online as possible. However, there is currently not enough generation capacity, which is a key concern for resource adequacy. PJM has a stakeholder process to help address this issue. One of the key initiatives is the *Resource Reliability Initiative*. This initiative aims to accelerate projects that are further out in the queue but are deemed by PJM to be closer to coming online. This initiative is currently pending at FERC.

Additionally, PJM has created a process for transferring *CIRs* (Capacity Interconnection Rights) from deactivating generators to new generators replacing them at the same Point of Interconnection (POI). This process was recently filed.

Have states seen an increase in large load requests/data centers that utilize behind-the-meter renewable generation?

New Jersey has programs that encourage rooftop or community solar and battery installations but have not seen large-load customers fully take advantage of them. Similarly, Minnesota has a lot of solar and a new VPP program, but they have not seen data centers or large loads paired with such systems. They do want to encourage pairing batteries with BTM solar generation, but this is in very early stages. Arizona has seen significant solar and battery investments but little interest in behind-the-meter solutions for large loads.

How are forecasters reacting to the implications of emerging technologies like Deep Seek for data center loads?

While Deep Seek has recently made headlines [as having the potential to dramatically reduce the computing power and therefore energy consumption of training large AI systems], the utilities in Arizona, Minnesota, and New Jersey have not changed their load forecasting assumptions. They also expressed uncertainty about the implications of new technologies like Deep Seek.