Virtual Power Plants mean reliable and affordable electricity for Minnesotans

40%-60%

Costs are up to 60% less when peak demand is met by VPPs

$50

Annual savings to Xcel customers

Virtual Power Plants (VPPs) compensate customers for sharing their distributed energy resources like batteries, smart thermostats, electric vehicles, and flexible water/space heating with the grid. Utilities and aggregators can use **Virtual Power Plants to reduce peak demand quickly and lower costs for every one,** instead of building costly "peaking" power plants and wires to meet a small number of highest-demand hours.

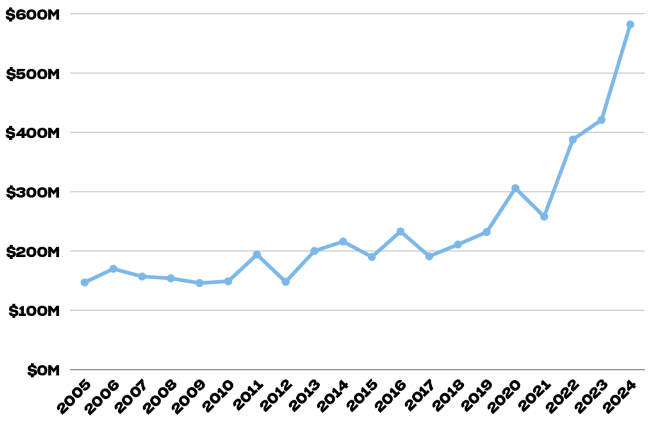
Minnesota utilities are projecting demand growth over the next 10–15 years, including large loads like data centers. Xcel Energy's Resource Plan for Minnesota projects peak demands will increase from 9,309 MW in 2024 to 12,414 MW in 2040.

At the same time, Minnesotans' electricity rates and bills are going up. Xcel Energy's current Minnesota electric rate case request totals a 13.2% increase over two years.

Virtual Power Plants are the only resource that can come online fast enough at scale to be the solution Minnesota needs now!

This table demonstrates how **annual distribution system upgrades are increasing at a faster rate in recent years.** This happens as a result of increased demand and grid electrification, and the costs are passed on to ratepayers.

Annual distribution system investments by Minnesota utilities



Source: FERC Form 1. Amounts adjusted for 2024 dollars.

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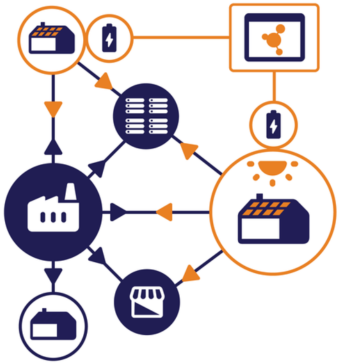
VPPs save Minnesotans money

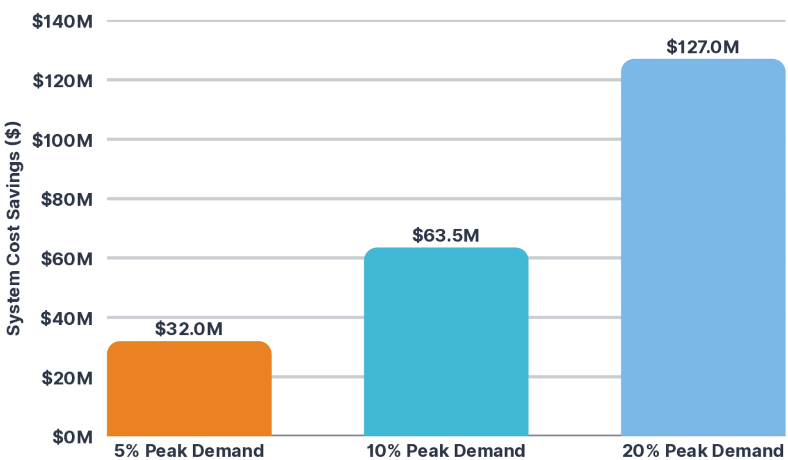


Brattle's "Real Reliability of VPPs" analysis finds that **the net cost to provide resource adequacy from a Virtual Power Plant is roughly 40%–60% less** than the cost of conventional alternatives. This means that after netting out the costs of energy system impacts, transmission, distribution, ancillary services (all explained on page 3), that a VPP is signifcantly more economical than a natural gas peaker plant.

VPPs savings would be $63.5m a year

The chart below illustrates how much a VPP could save when compared with typical gas peaker plants meeting peak demand. Based on Brattle's study in 2022, we scale the estimated savings from Brattle's analysis to estimate savings under different 2030 peak demand scenarios being met by VPPs. **This would save ratepayers in Xcel $50 per year in a 10% peak demand scenario.**

Potential system cost savings of a VPP in Minnesota



Brattle: Real Reliability Of VPPs Appendix

Estimates based on 2030 projected peak demand of 10,470 MW.

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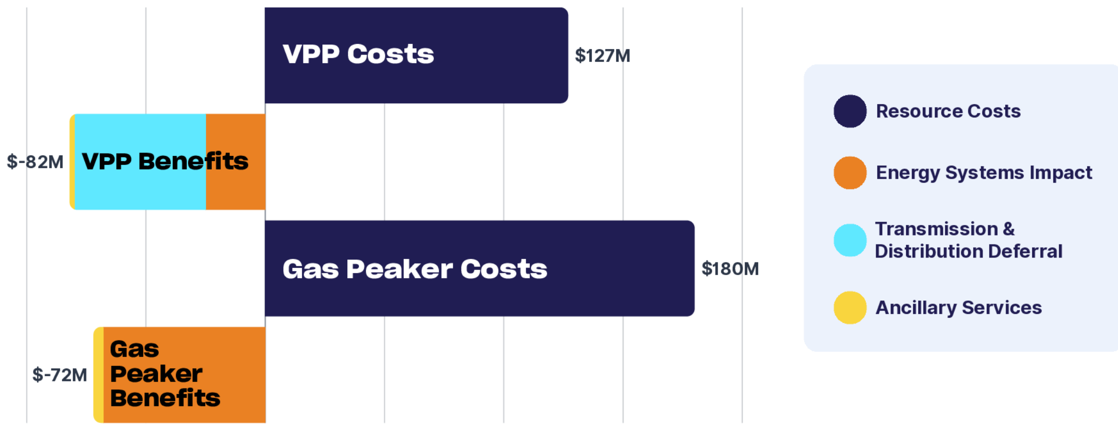
Virtual Power Plants cost less to run

The net cost of a VPP in a 10% scenario would be approximately $44M per year, while the net cost of a the same amount of gas peaking plants would be $108M. Taking the 10% peak demand scenario, we can break down the system costs and savings as shown below. The resource costs of a 1,047 MW VPP would be $127M, but are offset by savings in energy systems impact, ancillary services, and transmission and distribution upgrade deferrals totaling about $82M.

System costs & benefits of a VPP vs. gas peaker plant meeting 10% of 2030 peak demand



In the chart a negative "system cost impact" represents cost savings attributed to the VPP resource. We present costs as positive values because the Brattle study focuses on estimating the total cost of resource adequacy.

Costs and benefits breakdown

- **Resource costs:** Capital expenditures, fuel, operations and maintenance for the gas peaker and battery, and it includes all utility incurred costs for the VPP.
- **Energy systems impact:** Net change in system fuel and variable operations and maintenance costs due to the addition of the new resource.
- **Transmission and distribution deferral:** Deferred cost of investing in the transmission and distribution grid due to strategic siting of distributed resources.
- **Ancillary services:** Value associated with operating the resource to provide realtime balancing services to the grid.

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