

OPPORTUNITY

How many U.S. states have utility market ICAP charges?

21 STATES HAVE INSTALLED CAPACITY (ICAP) CHARGES¹

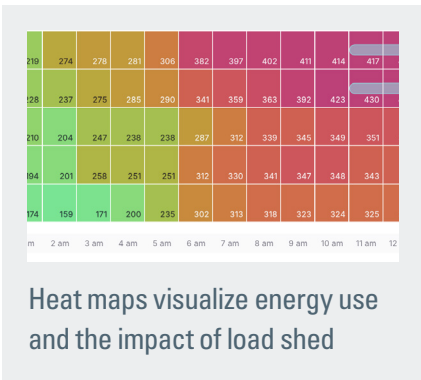


TECHNOLOGY

How does the Operator-in-the-Loop Grid-interactive Efficient Building (GEB) technology work?

OPERATORS RECEIVE RECOMMENDED ACTION ALERTS

- Machine-learning algorithms predict daily peak building demand
- Alerts, based on grid and weather data, predict ICAP charges
- Demand response (DR) alerts, in response to utility-called events. Technology facilitates participation in DR programs through utility signal integration and DR aggregation.



M&V

Where did Measurement & Verification (M&V) occur?

PACIFIC NORTHWEST NATIONAL LABORATORY (PNNL) assessed the impact of an operator-in-the-loop GEB technology, provided by Logical Buildings, at a Federal office building in Newark, NJ

RESULTS

How did the Operator-in-the-Loop GEB technology perform in M&V?

ACCURATE PEAK DEMAND PREDICTION

20% reduction in demand. Day-ahead alerts for ICAP charges. No reduction in monthly peak demand. Staff found it challenging to respond within a 15-minute window.²

1-DAY INSTALLATION

with minimal cyber-security mitigation requirements. LoRaWAN wireless signal communicated through dense walls.³

O&M ACCEPTANCE

Staff preferred operator-in-the-loop over an automated system.⁴

Positive Return on Investment

Payback less than 1 year based on capacity savings and 3-year subscription

Initial Site Engineering Study (\$15K over 3 years)	\$5,000
Installation (\$4K for on-site metering equipment and electrician, over 3 years)	\$1,333
Annual Subscription (3-year subscription required)	\$6,000
Monthly Peak Demand Reduction (not realized)	\$0
ICAP Capacity Reduction (115 kW/yr)	\$7,847
ICAP Transmission Reduction (91 kW/yr)	\$12,662
Simple Payback	< 1 year

DEPLOYMENT

Where does M&V recommend deploying an Operator-in-the-Loop GEB technology?

CONSIDER FOR FACILITIES WITH DEMAND CHARGES & ON-SITE STAFF

Prioritize buildings with:

- Energy use intensity (EUI) greater than 40 kBtu/SF/year
- ICAP charges
- Uneven load profiles to maximize GEB savings potential

¹Understanding Energy and Capacity in Wholesale Markets , NRG Energy, July, 6, 2023, p. 2 ²Operator-in-the-Loop Grid-Interactive Efficient Building Evaluation, Michael Myer, (PNNL), September 2024, p. 7 ³Ibid, p. 7 ⁴Ibid, p. 7