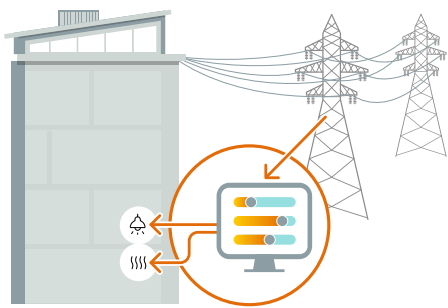


OPPORTUNITY

What are the opportunities for Grid-Interactive Efficient Building (GEBs)?



BUILDINGS ARE DYNAMIC

GEBs respond to real-time grid signals, balancing energy needs with available onsite energy. GEB technology can increase energy efficiency and strengthen resilience.

TECHNOLOGY

How does this GEB Supervisory Control software work?

PREDICTS PEAK DEMAND AND TRIGGERS LOAD FLEXING ALGORITHMS

AI analyzes data from multiple sources to predict peak demand. Rule-based algorithms manage demand response (DR) in stages, shedding or shifting loads using a customized protocol.

M&V

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

NATIONAL LABORATORY OF THE ROCKIES (NLR) assessed the impact of a GEB Supervisory Control technology, provided by Nantum AI, at the Lloyd D. George Courthouse in Las Vegas, Nevada.

RESULTS

How did the GEB Supervisory Control technology perform in M&V?

VALUABLE PROOF OF CONCEPT

One of the first real-world tests of automated GEB control. Testbed site was not ideal. Accurate prediction of peak demand; supervisory control implemented with cybersecurity compliance ¹

3 ADR EVENTS

Implemented three simulated automated DR events. Avg. kW reduction of 8% and savings of 0.14 W/SF. ²

CONTINUOUS DEMAND MANAGEMENT

Results for continuous demand management were inconclusive due to limited usable data. ³

ENERGY SAVINGS

Real-time occupancy and building data used to optimize AHU start and stop and ramps. ⁴



WHOLE BUILDING

4.3%



NATURAL GAS

4.2%



ELECTRICITY USE

5%

DEPLOYMENT

What are the recommendations for deploying a GEB Supervisory Control technology?

HIGH-VALUE POTENTIAL BUT AUTOMATED GEB NEEDS REFINEMENT

- **Known challenges:** First-generation automated GEB software has not yet resolved challenges with occupant comfort and fluctuating building performance. Additional evaluations are recommended.
- **Human-in-the-loop:** First-generation GEBs likely require a human-in-the-loop approach until automated AI strategies are perfected.
- **Strategic goal setting:** Balance objectives (cost, comfort, energy) and adapt automation strategies over time.
- **Comprehensive commissioning:** Test across seasons and times of day. Complete commissioning of an automated GEB solution could take 1 year.
- **Iterative implementation:** Plan for ongoing testing and adjustments, particularly for DR strategies.
- **Leverage energy storage:** Incorporating onsite storage and renewables is key to reducing impact on comfort and enhancing flexibility.
- **Sites:** Best for buildings with flexible temperature control requirements.

¹Field Evaluation of a Grid-Interactive Efficient Building Software Solution, Sean Pachuta, Alicen Kandt, (NLR), Scott Schuetter, Slipstream, September 2026, p. 11 ²Ibid, p. 49 ³Ibid, p. 42 ⁴Ibid, p. 61

