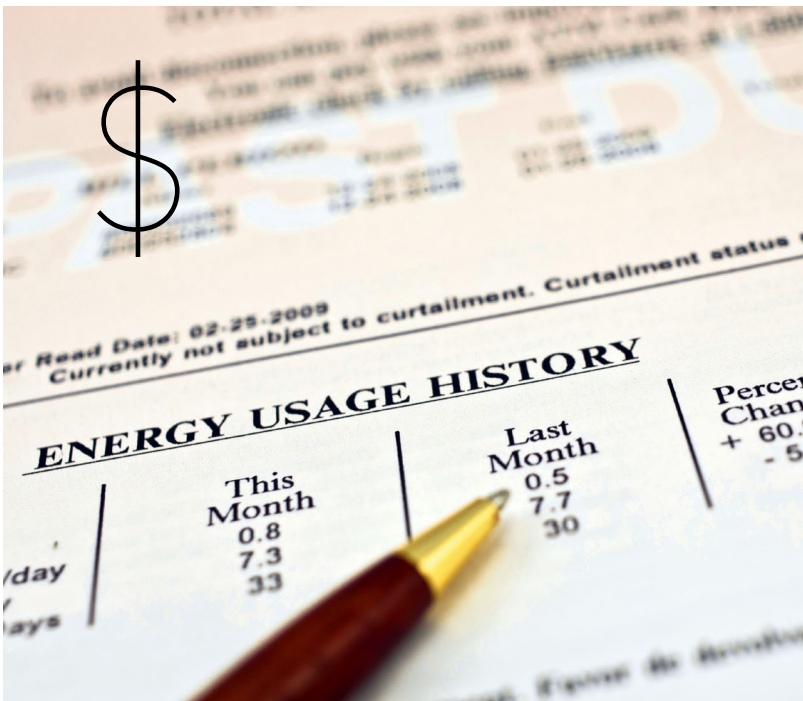


Demand Response Types, Programs, and Trends



Types of Demand Response

1. Economic Demand Response - customers can get paid to participate in economic demand response programs
2. Automated Emergency Demand Response - customers can work with a partner or aggregator to automate their participation. The partner automates enrollment, strategy development, event execution, and reporting. This approach applies to all building types, from residential to small commercial to large buildings.
3. Environmental Demand Response - customers can use operational flexibility and power resilience to meet their sustainability goals. Reducing energy when the grid is at its dirtiest and get paid or get the reduction certified as carbon offsets for a measurable reduction of their carbon footprint.



ERCOT and NRG DR Financial Incentive Programs

ERCOT Emergency Response Service

Emergency Response Services (ERS) decrease the possibility of a system-wide load-shedding event by paying qualified scheduling entities (QSE). ERCOT secures and selects eligible loads and generators (including aggregations of loads and generators) to be available for deployment in an electric grid emergency. The selected QSEs either reduce consumption or increase generation across the grid. These participants committed to a specific amount of megawatts (MW) within ten to thirty minutes, thereby preventing or alleviating an actual or anticipated Energy Emergency Alert (EEA) event.

Responsive Economic Dispatch

NRG's Responsive Economic Dispatch (RED) program is a simple and easy solution to monetize energy consumption during periods of high demand. RED offers a pathway to energy savings and improved business metrics for organizations, no matter their current energy plan.

- Receive day-ahead notifications of energy reduction opportunities.
- Participate and earn bill credits without having to worry about performance penalties.
- Get access to our experience and market expertise. We develop a reduction action plan that details ways to reduce energy usage to meet kW reduction commitments for curtailing Load.



4 Coincident Peak Program

The 4CP program allows participants to lower their electricity bills' transmission cost of services charges. How the program works is that participants reduce their energy consumption on a single day during a specific period in June, July, August, and September. ERCOT refers to these as "15-minute peak events". The cost reductions are applied during the following year.

Demand Response Market Trends

Engagement in Commercial and Industry Sectors is Growing

In the commercial sector, the Load from commercial buildings' heating, ventilation, and air conditioning (HVAC) is correlated with extreme weather temperatures and peak intervals on the grid. The EIA states that the average breakout for end-use electrical consumption in commercial buildings is HVAC... 33%.

While peak loads are often associated with hot summer days, extreme cold snaps call for extra heating from HVAC and water heating systems. A decrease in solar generation during a cold snap adds to supply shortages. HVAC curtailment offers a considerable opportunity for grid capacity and reliability during times of extreme temperature.

As for the industrial sector, software tools and solution methodologies of industrial energy models are working to curtail energy demand. For example, studies have shown that cement manufacturing plants have great potential to provide peak-shaving and load-shedding in cement mills. The results were up to 10% and 16.9% reduction in energy and power consumption costs. Aluminum smelting plants are another example providing up to 34.2% and 20.70% reduction in energy consumption cost and power consumption.

Curtailment reliability and the convenience of automated demand responses are key selling points in demand response programs. Automating demand response makes load curtailment more predictable and reliable for grid operators.

Rapid Expansion of Distributed Energy Resources (DERs)

DERs, such as solar, electric vehicles, and storage, will continue to grow. In addition, the HVAC load will continue to fluctuate and drive short-term grid capacity improvements in 2023.

A recently published report by Guidehouse Insights projected that flexible DER capacity, revenue, and implementation spending in the C&I sectors are expected to experience moderate growth through 2031. By the end of 2022, Guidehouse Insights expects nearly 78 GW of total flexible C&I DER capacity. This capacity will likely grow by an average compound annual growth rate (CAGR) of 14.7% to 268.4 GW by 2031.

A Shift from Energy Reduction to Carbon Reduction

Corporate ESG goals and reporting affect curtailment when the grid is dirtiest to reduce carbon emissions and leverage carbon accounting equivalencies. Companies actively combine automated building controls with carbon accounting reporting by adjusting building performance to energy cost savings, utility signals like demand response, and carbon emissions.

Common Business and Grid Goals

Commercial businesses, industrial clients, and utilities share business and grid goals due to common pain points from increased energy demand, electrification trends, and rising energy costs. Businesses that have yet to engage with energy-efficiency assessments and demand response options are now searching for cost-reduction opportunities. Utilities are committed to providing reliable service. The mission is a sustainable energy future.

WPI and Generac Industrial Power

WPI has been an industrial distributor of Generac energy systems for over 30 years. We provide innovative power solutions for various commercial, industrial, and life-critical applications. With diverse generator options, high-tech mobile products, and cutting-edge transfer switches and accessories, we ensure power is always available to businesses - on top of a high-rise office building or a manufacturing facility.

Contact WPI today to learn more about how we can help you with Demand Response and Practical Power Resilience™.

[PracticalPowerResilience.com](https://www.practicalpowerresilience.com)

Rising Energy Costs, Business Disruption, and Costly Inventory Loss

Top of mind for business owners in Texas is the freeze ERCOT experienced in February 2021 and, in California, the ongoing threat of rolling blackouts. In general, there is an increased awareness of grid-interactive solutions available to businesses. Business owners are interested in participating in grid stability. In addition, utilities are offering more demand response program opportunities, increasing their program's incentives, and, in some cases, turning participation into new revenue streams.



Utility DR Incentives Inspire Grid-Interactive Technology Deployment

Typically, DR programs target the industrial sector. The commercial industry is becoming a potent DR curtailment partner. Utilities are incentivizing tech deployment to commercial customers with smart device programs that can save 13% in energy costs on average.

