



Connected Energy® Demand Management

High-Definition Demand Management for Advanced Distribution Automation.

Connected Energy's (CNRG) turnkey, high-definition demand management solution moves demand management from basic peak load reduction to an operational asset that supports broader electric utility distribution automation initiatives. In addition to peak load reduction, the solution enables a broader set of use cases including operational emergency curtailment, ancillary services and peak load shifting. The CNRG® Demand Management solution includes Predictive Forecasting and Measurement and Verification (M&V) capabilities not previously available in traditional demand management systems. The high degree of flexibility designed into the solution allows utilities to adjust to evolving regulatory requirements, operational needs and customer expectations.

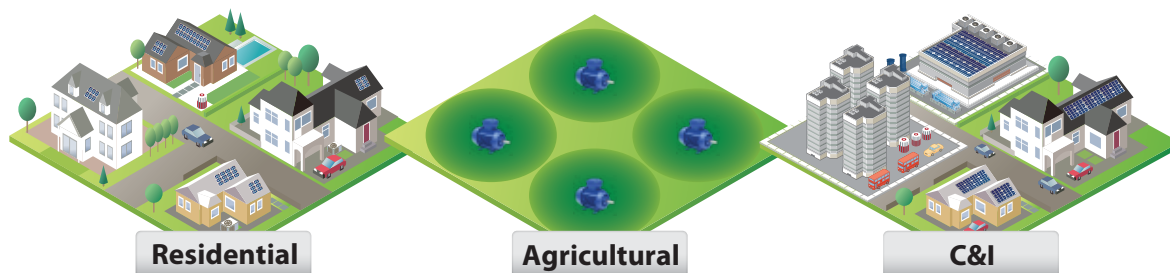
Features & Functionality

- ⚡ Predictive forecasting drive real-time and planning-level business decisions
- ⚡ Real-time measurement and verification (M&V) from on-board metering chip
- ⚡ Supports full range of demand management models
- ⚡ Higher yield per managed load
- ⚡ Demand management for:
 - ⚡ Operational reliability
 - ⚡ Peak load reduction
 - ⚡ Market monetization
 - ⚡ Ancillary services
 - ⚡ Supply/demand balancing



Utility-Centric Demand Management

Connected Energy's utility-centric approach utilizes cost effective real-time cellular communications to change what utilities can do with demand management. Cellular systems can be utilized for targeted and accurate load reduction to reduce stress on overloaded distribution assets, improving operational reliability and energy efficiency. Real-time verification allows demand to be monetized for a higher value, managed as a reserve asset for ancillary services and utilized for supply/demand balancing. CNRG® Demand Management is communication neutral and currently supports multiple communications paths including cellular, Wi-Fi, proprietary AMI networks, fiber, and can support other two-way communications as needed. A single system can leverage multiple communication networks and manage multiple classes of demand resources that drive peak demand such as irrigation pumps (including VFD drives), commercial and industrial motors, air conditioning, electric heating, hot water heating, pool pumps, and EV charging. The same system can also be used to turn the assets back on for valley filling use cases.



Value Drivers for Demand Management

	3rd Party Aggregation	Utility-Centric
Peak Load Reduction	✓	✓
Market Monetization	✓	✓
Operation Reliability		✓
Measurement & Verification		✓
Predictive Analytics		✓
Supply/Demand Balancing		✓
Energy Efficiency		✓
Ancillary Services		✓

Predictive Analytics & Forecasting

System analytics and forecasting capabilities drive real-time and planning-level business decisions.

- ⚡ Utilizing machine learning and artificial intelligence to learn behavior of managed loads and forecast load reduction capacity based on program rules and weather forecast
- ⚡ Improving advanced planning leading to optimized operations
- ⚡ Managing the load curve more accurately to operational, supply, and infrastructure constraints
- ⚡ Retain lost revenue with high precision load reductions
- ⚡ Increasing program value by bidding the maximum amount of peak load reduction and ancillary services
- ⚡ Accurate available on-line capacity forecasts by utilizing learned behavior of connected loads on similar like days.

Predictive Analytics & Forecasting



STATISTICAL
MODELING



MACHINE
LEARNING



VISUALIZATION



PREDICTIVE
BEHAVIOR



REAL-TIME
COMMS



CONSUMER
BEHAVIOR



PATTERN
ANALYSIS



RANKING



DECISION
MAKING



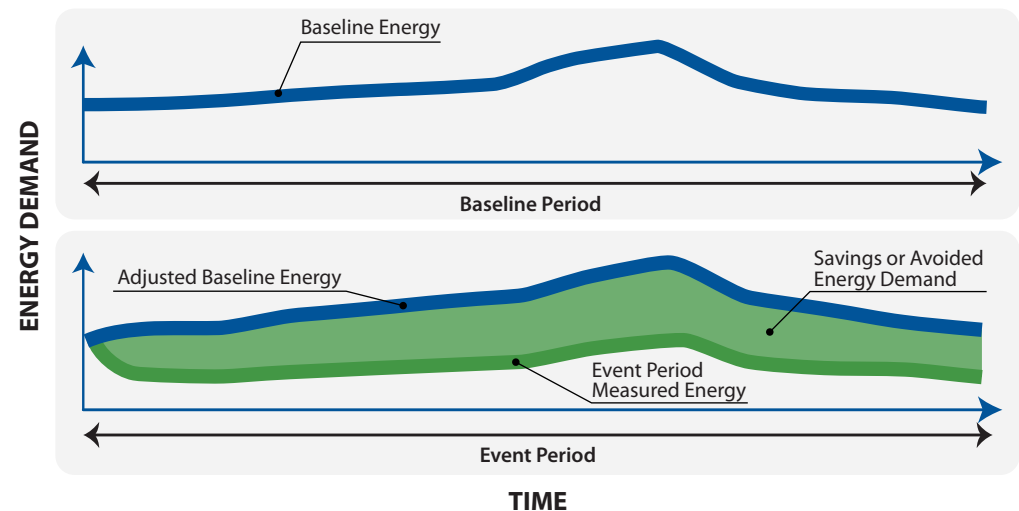
SCENARIO
ANALYSIS

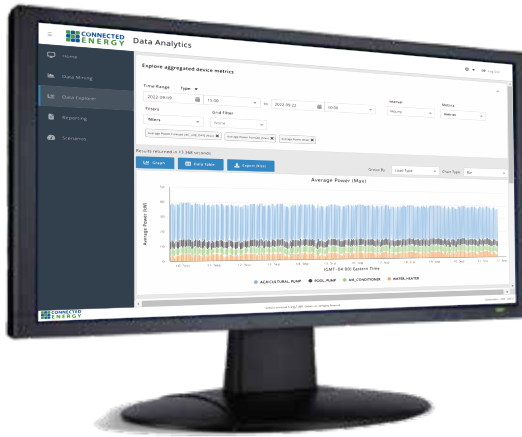
Measurement & Verification

Connected Energy's high-definition demand management solution provides real-time measurement and verification (M&V) of the loads, delivering higher yield from connected loads with high predictability and accuracy.

- ⚡ Reporting actual load reduction, supporting market operator settlement and regulatory reporting requirements, unlike 3rd party aggregation solutions using baseline estimations
- ⚡ Increasing effective yield of managed loads
- ⚡ Enabling Demand Management for Advanced Distribution Automation as an:
 - ⚡ Operational resource for improved reliability and energy efficiency
 - ⚡ Ancillary service with real-time verification
 - ⚡ DER asset for supply/demand balancing

Measurement & Verification





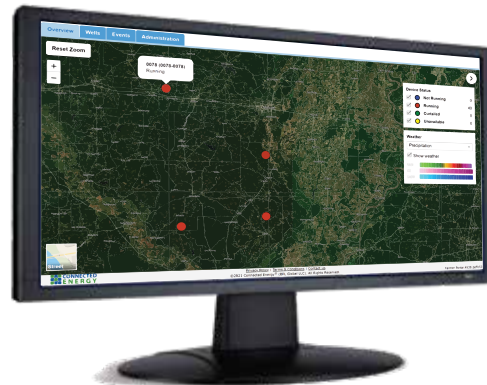
Data Analytics

Analyze specific device data, aggregated data, program reports, and run scenarios on with specific program rules and accurate forecasting. The CNRG® Data Analytics package comes included with any DR program to provide utility customers with enhanced program visibility and optimized program efficiencies.



Farmer Portal

- ⚡ Utility-branded portal provides program participants with program information, remote on/off pump control, advanced weather analytics, opt-out options, and notification preferences.
- ⚡ Farmers save time and money by remotely controlling irrigation pumps through a mobile friendly web portal.



High-Definition Demand Management

CNRG® Demand Management technology allows utilities to:

- ⚡ Manage individual loads for targeted and accurate load reduction
- ⚡ Monitor operating, curtailable and curtailed load in near-real time
- ⚡ Support multiple demand management programs for direct load control, demand response and/or operational management
- ⚡ Pinpoint amount, location and duration of load reduction with precision and verification
- ⚡ Sustain long term system performance through cost effective maintenance driven by detailed system information
- ⚡ Integrate with 3rd party and legacy hardware, communications and home area network (HAN) systems

Turnkey Services

Connected Energy offers turnkey demand management program services for utilities and their customers under the EasyGreen® brand.

- ⚡ **Marketing and Recruitment Services** through an automated enrollment portal with program selection criteria and verification.
- ⚡ **Installation and Maintenance Services** provided for fully integrated single and three-phase load controller technologies.
- ⚡ **Secure Private Cellular Communications** provides reliable real-time two-way network with network propagation studies available.
- ⚡ **Secure Hosting Services** provide SOC 2 Type II certified environment for operating CNRG® Demand Management software
- ⚡ **Event Management Services** with experts scheduling and monitoring entire event duration, with real-time anomaly detection or remediation
- ⚡ **O&M Services** are customized to meet the needs of each utility
- ⚡ **Reporting** feature includes +20 automated reports for anomaly detection, curtailment summary, M&V reports, and many more.
- ⚡ **Incentive Administration** calculates all incentives for qualified participants and issues payments accordingly.

Our fully-integrated solution incorporates single and three-phase load controllers as well as 3rd party hardware solutions.

Connected Energy® Single-Phase Direct Load Controller

- ⚡ Monitor and control residential, commercial and agricultural loads
- ⚡ Integrated metering chip for accurate load measurement & verification
- ⚡ Enables multiple curtailment strategies with predictive forecast
- ⚡ Field proven <1% failure rate with high volume deployments
- ⚡ Secure private network using 4G cellular communications



Connected Energy® Three-Phase Direct Load Controller

- ⚡ Monitor and control 240V and 480V three-phase loads up to 800A for agricultural, industrial and commercial
- ⚡ Integrated metering chip for accurate load measurement & verification
- ⚡ Supports remote start/stop of loads through a secure consumer portal
- ⚡ Field proven <2% failure rate with high volume deployments
- ⚡ Secure private network using 4G cellular communications



Bring Your Own Devices

- ⚡ Support and manage multiple smart thermostat and water heater vendors.
- ⚡ Lowest cost residential Demand Response strategy for utility programs.
- ⚡ Supports strategic recruitment and budget planning with installed customer base searches.
- ⚡ Connected Energy provides a turnkey end-to-end workflow, including:
 - ⚡ Enrollment, Installation Support, Maintenance Support,
 - ⚡ Event Dispatch, M&V, Reporting, and Incentive Administration
- ⚡ Powered by the Connected Energy CNRG® DRMS

Features & Advantages

- ⚡ Temperature rise programs guarantee participant comfort
- ⚡ Pre-cool strategy shifts energy consumption and flattens peak HVAC demand periods
- ⚡ Free participant installed smart thermostat encourages program enrollments.



Smart Thermostats



Smart Water Heaters

- ⚡ Preventative maintenance warns participants of failed/failing heating elements
- ⚡ Pre-heat strategy shifts energy consumption and flattens peak Water Heater demand
- ⚡ Guarantee participants don't run out of hot water during curtailment events