TVA-EnerNOC Demand Response

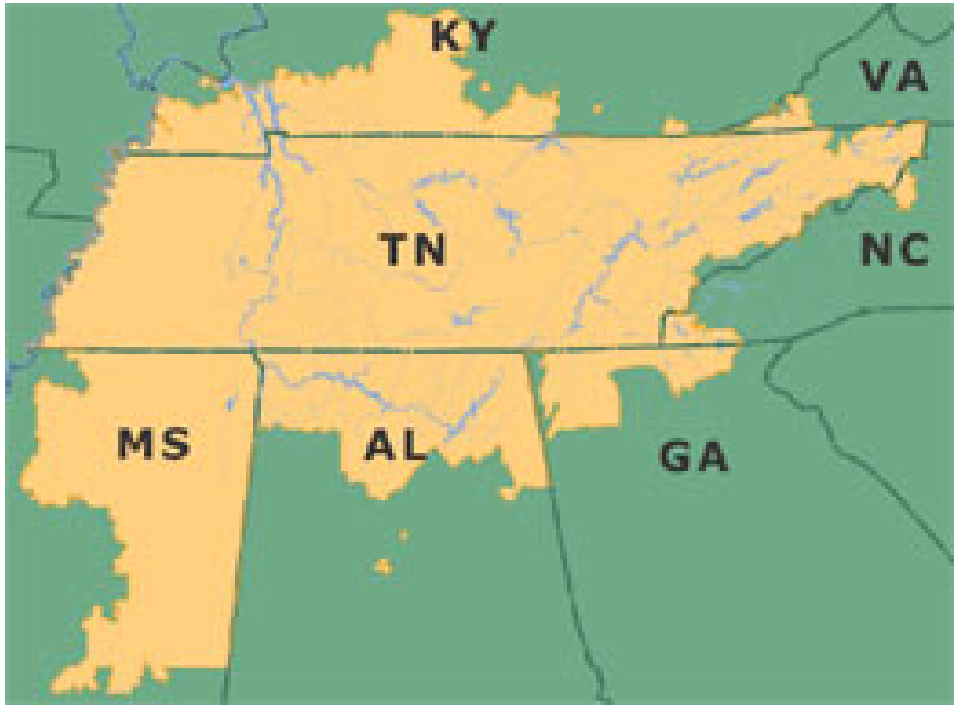
MLGW Key Accounts

December 6, 2012

Tennessee Valley Authority

The Tennessee Valley Authority is a federal corporation and the nation's largest public power company

TVA Electric Grid Territory



- People served: 9 Million
- States served: 7

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The TVA-EnerNOC DemandSMART Program

Phase I of the TVA –EnerNOC DemandSMART program was launched in 2008, with nearly 100 TVA Power Distributors participating.

TVA Statistics	
Peak Demand	33,482 MW
Service Territory	80,000 square miles
Total Utilities in Territory	155
Total Customers Served	8.8M

About the Tennessee Valley Authority (TVA)

- Responsible for keeping electricity reliable and affordable for your community
- For the past 8 years has led a 99.999% reliability

EnerNOC Program Information	
# of PDs Participating	104 (out of 155)
Count of Customers	973
Count of Sites	386
MW Enrolled In Program	288
Event Performance	101%

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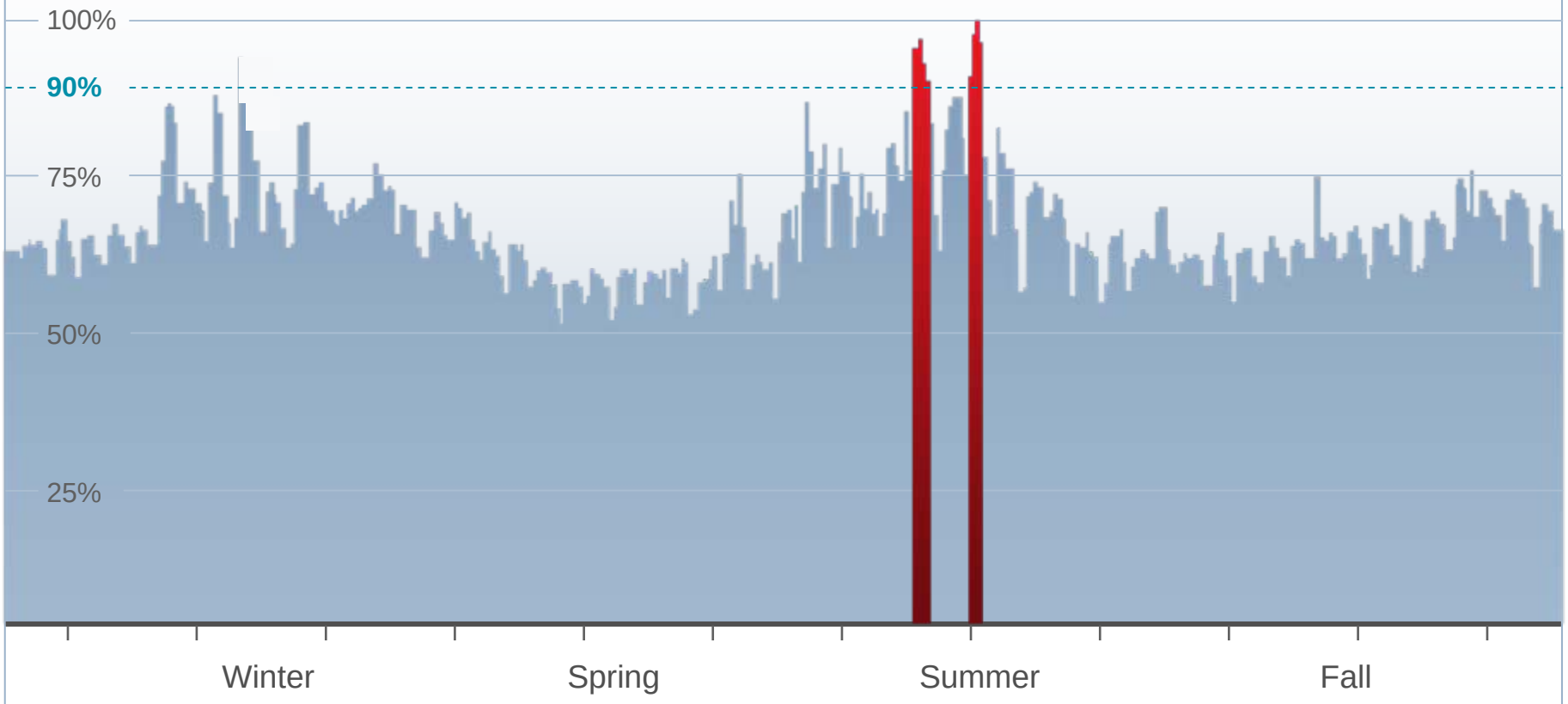
Why Demand Response?

Balancing supply and demand for TVA is difficult and expensive. By participating in demand response you are paid for reducing your energy at peak times, and helping TVA maintain reliable and affordable electricity.

Annual Electricity Demand As a Percent of Available Capacity



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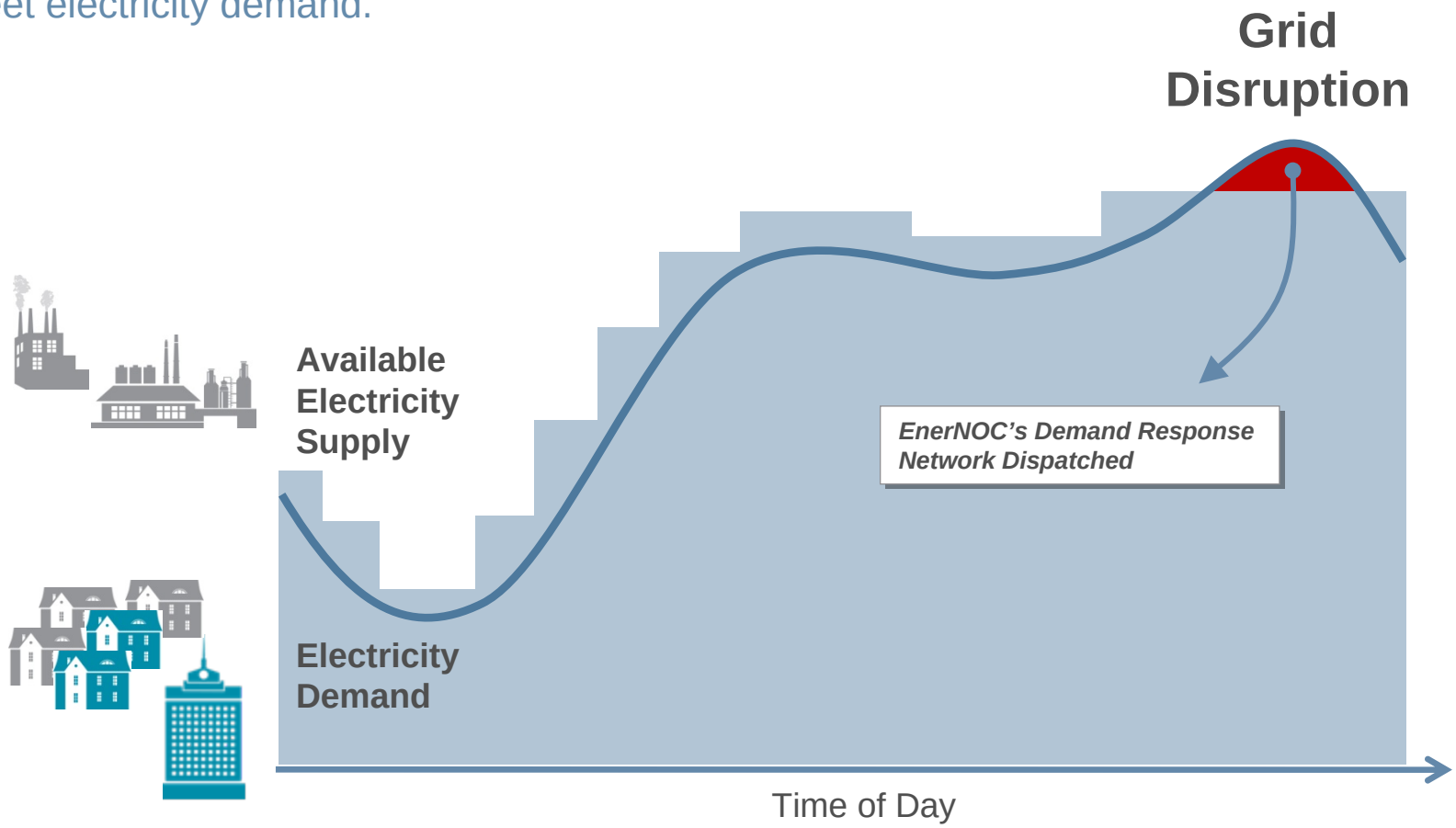
Problem: Balancing Supply and Demand

Every second of every day, TVA must ensure that there is enough electricity supply to meet electricity demand.



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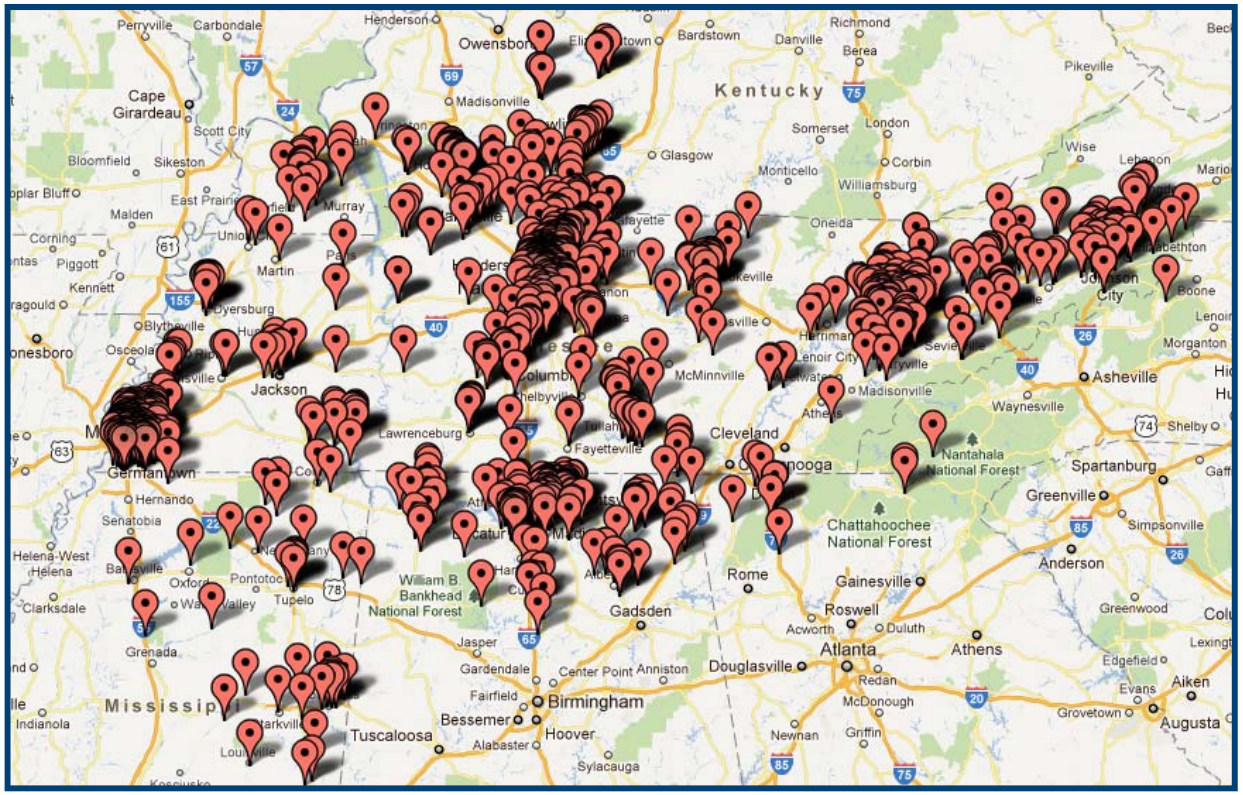
EnerNOC Customer Footprint

EnerNOC currently has 973 sites enrolled in the TVA region. Current customers reside in all of the 7 TVA states.

"For us, DR has turned out to be really easy, we simply make some adjustments, monitor carefully during the event, and reset our refrigeration settings when it's over."

- Benny Phillips
Facilities Manager



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The Benefits of Demand Response

Earn Payments

Manage Your Energy

Protect Your Operation

Protect Your Community

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Demand Response at Your Facility

HOW YOU PARTICIPATE

Curtailment

HOW YOU TAKE ACTION

Automatic

or

Manual

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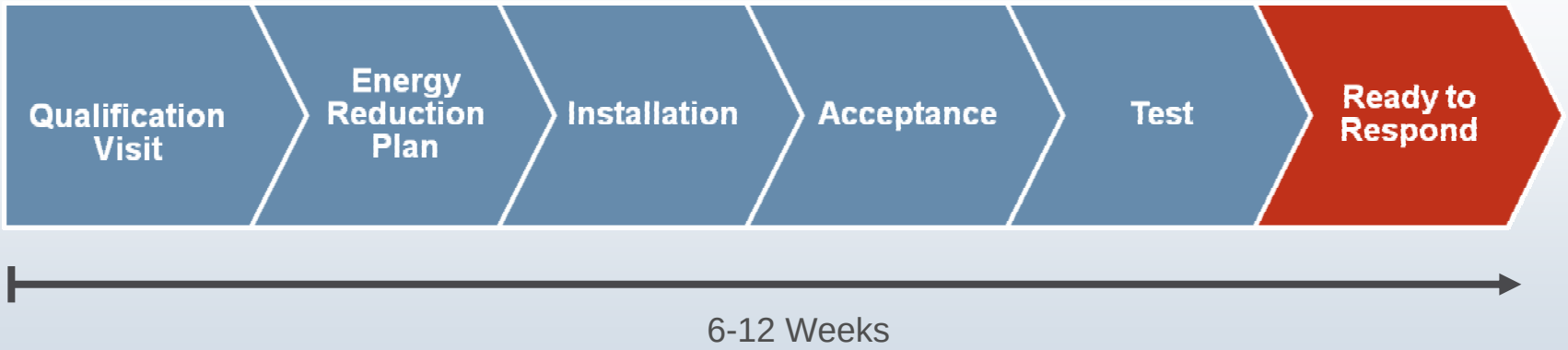
Simple, No-Cost Implementation

EnerNOC's implementation process is designed to be fast, cost-effective and scalable with an emphasis on customer satisfaction and support.



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TVA-EnerNOC Program

Program Name	TVA-EnerNOC Demand Response – **Phase II**
Eligible Customers	Customers behind participating Power Distributors (Utilities) who are not on an interruptible rate
Demand Response Types	Curtailment
Capacity Payments	Yes - $22/kW-yr
Energy (Event) Payment	**Energy payments** equal to product of heat rate and gas index, currently **$40-50/MWh** **$225/MWh or more for emergency energy**
Program Period	Year-round; Summer (April – October), Winter (November – March)
Program Hours	Summer: 12PM – 8PM CT Winter: 5AM – 1PM CT
Maximum Events	**Peak Events**: 40 economic hours, in lieu of peaking power plants (Three events called in 2012. Average duration: 3.5 hrs.)
Minimum Enrollment per Site	100 kW
Event Notification	30 minutes minimum (average notice: 2 hours)
Response Duration	2 – 8 hours (average duration: 3.5 hrs)
Event Frequency	Events can be called up to 40 hours a year, no more than 6 times per month or 2 consecutive days
Technology	All participating customers receive free, near real-time 5-minute metering

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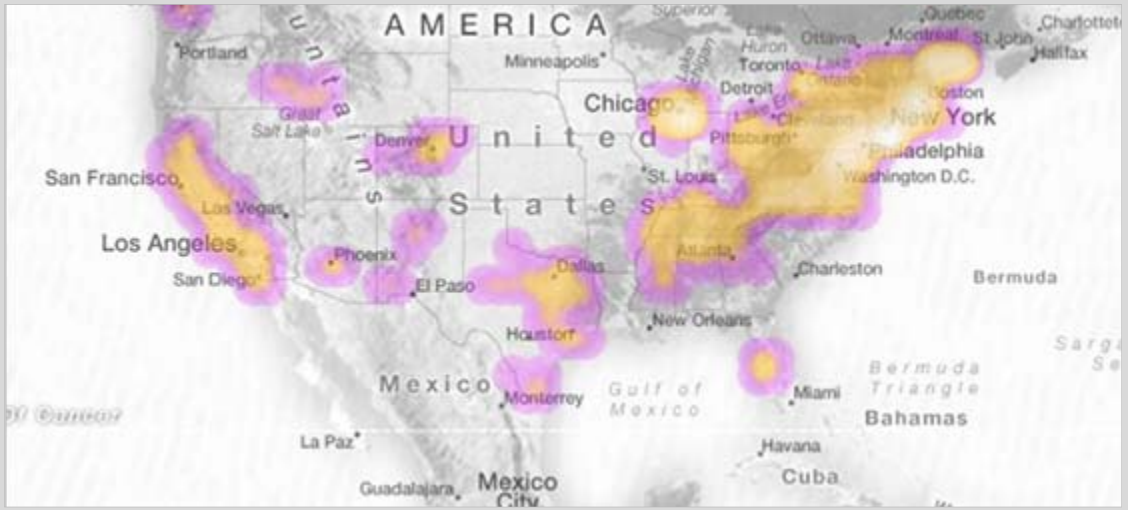
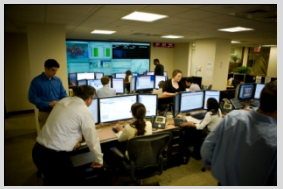
EnerNOC: Energy Network Operations Center

EnerNOC's state-of-the-art Network Operations Centers in Boston and San Francisco actively monitor all sites on a 24/7/365 basis to ensure successful event performance.





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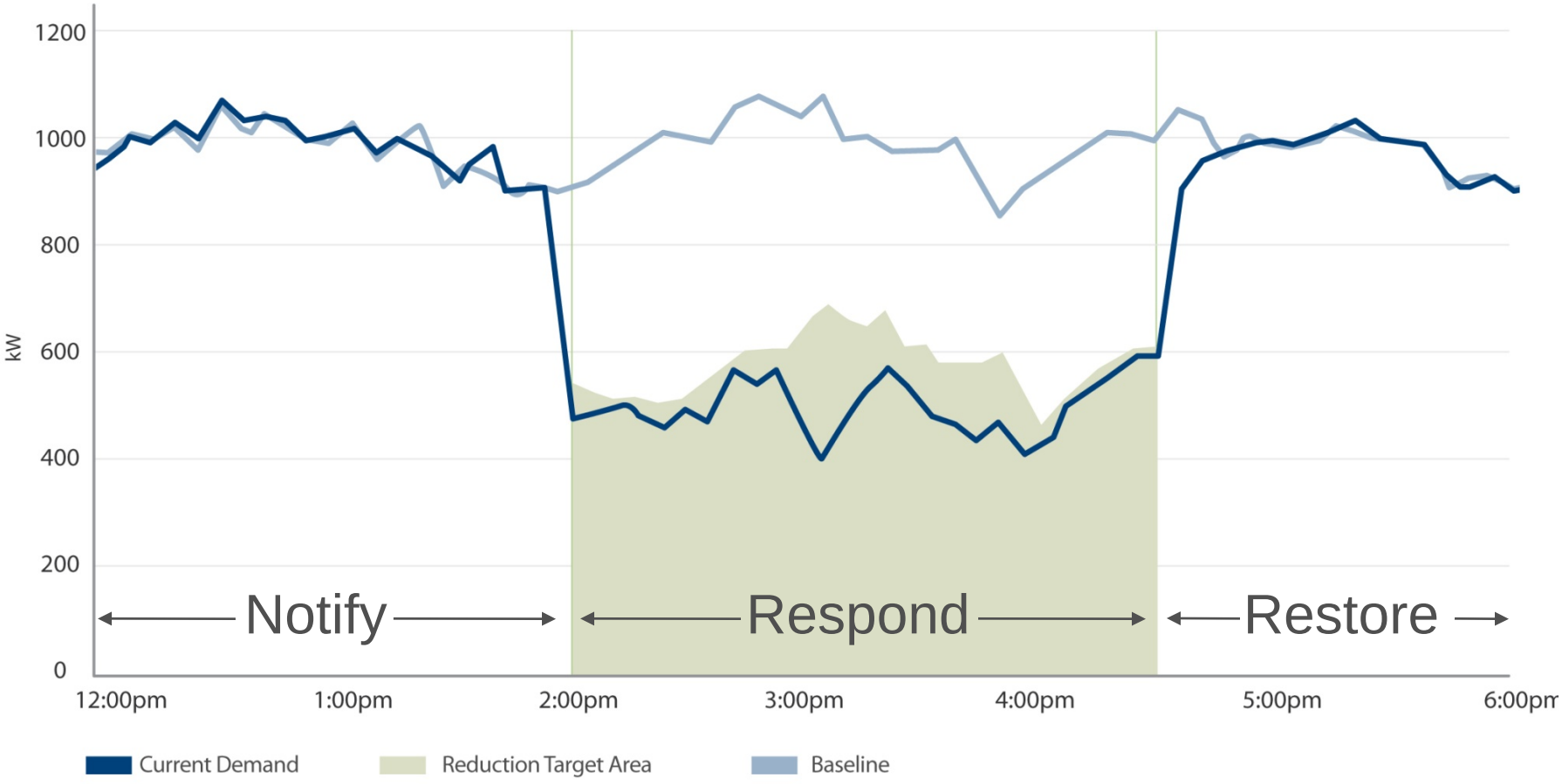
How Demand Response Events Work



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Maximizing Event Performance

The value in demand response is only realized through sound execution. DemandSMART drives bottom line impact through revenue assurance and maximization.

Event Underperformer:
Coaching Needed

The NOC event staff identifies an underperforming site and coaches them through their energy reduction plan in order to **maximize their DemandSMART payments.**

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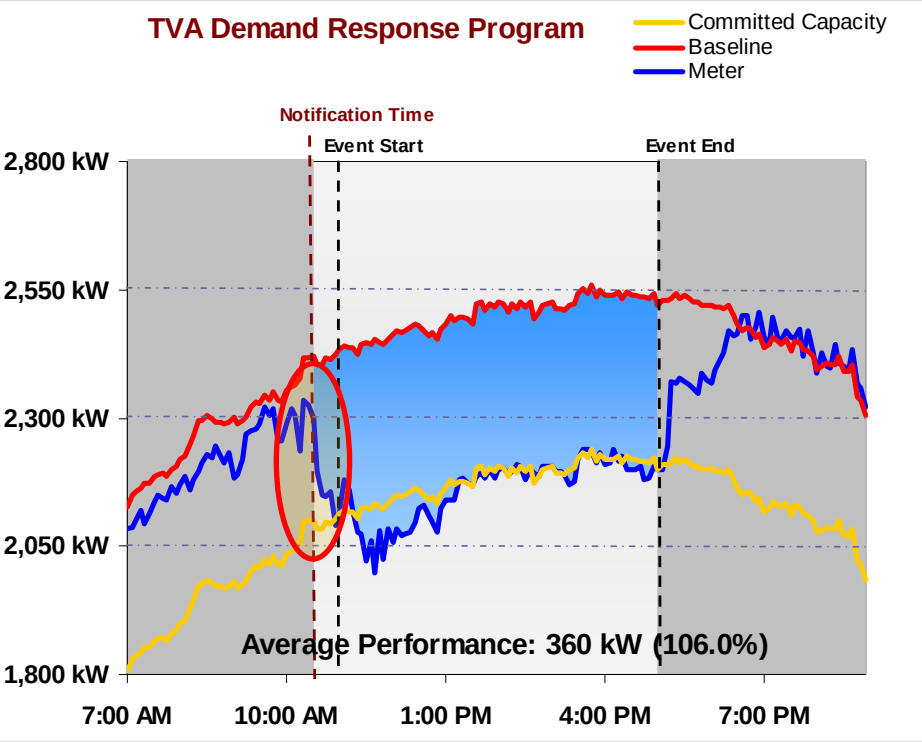
TVA Demand Response: 30 Minute Ramp Period

The TVA DR performance measurement is designed to incentivize quick response
Participants are given a 30-minute ramp period to achieve full committed load reduction

Although performance is not required during the 30-minute ramp period, load reductions count toward energy and capacity performance



Period	Committed (kWh)	Perf - Ramp (kWh)	Perf - No Ramp (kWh)
30-min ramp	N/A	121	0
12:00 PM	340	366	366
1:00 PM	340	371	371
2:00 PM	340	329	329
3:00 PM	340	319	319
4:00 PM	340	324	324
5:00 PM	340	332	332
Total	2,040	2,163	2,042
Performance		106.0%	94.4%

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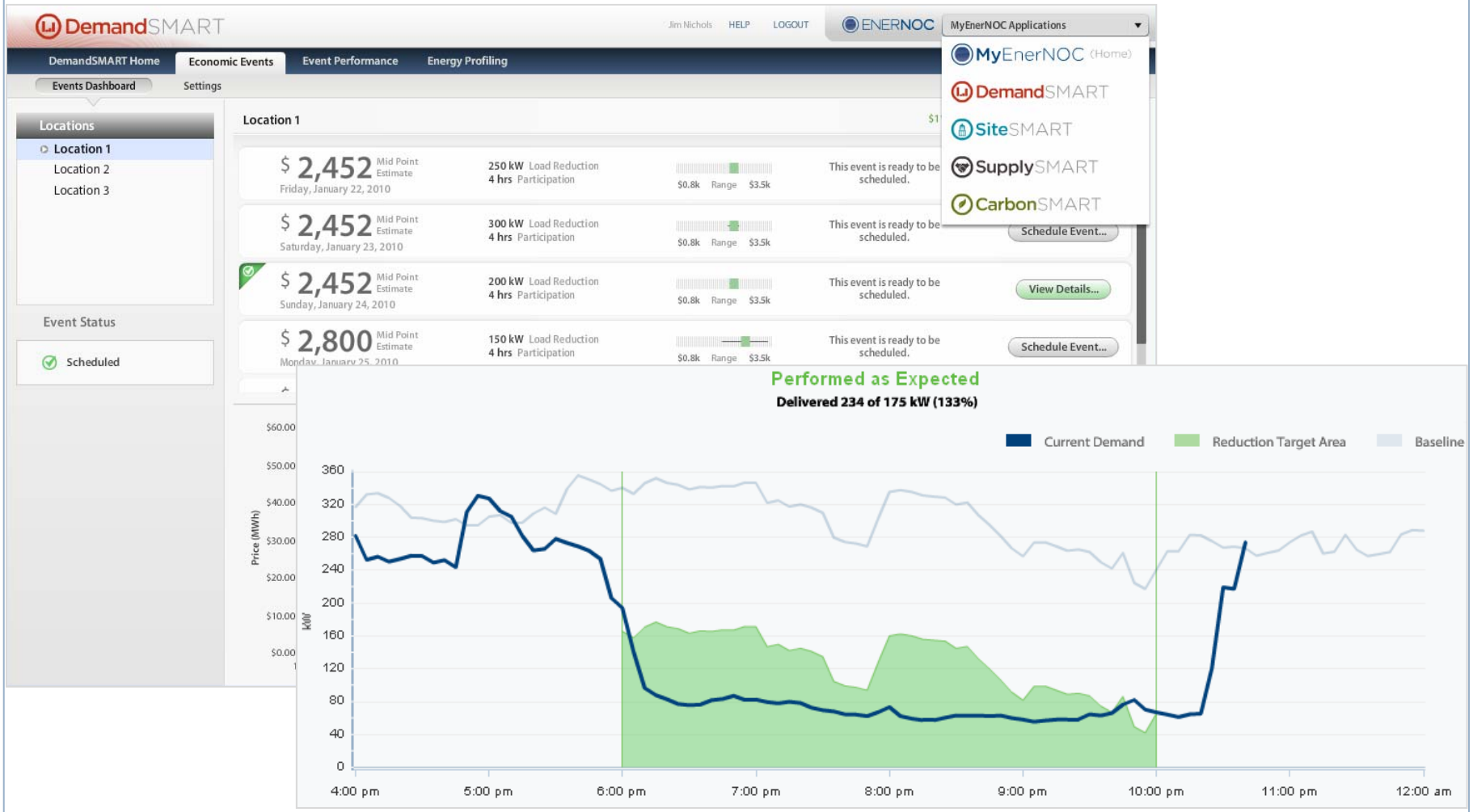
Real-Time Visibility with DemandSMART



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DemandSMART: A Driver of Additional Value

DemandSMART provides an energy management tool available 24/7/365 to provide greater insight into energy use

Scalable, web-based platform that gives you:

- Near real-time, 5-minute energy data
- Data specific for each meter and/or facility with full aggregation of your sites/meters
- 3 years of storage
- Easy export of data to Excel
- The ability to compare energy use on multiple days, weeks, months, etc.

Measurable financial benefits include:

- Manage peak demand
- Identify phantom loads
- Monitor DR event performance to maximize payments during events
- Compare different facilities or operations to identify energy outliers

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Example: Reduce Peak Demand

Reduce Peak Demand

Peak demand charges are often a significant portion of a businesses monthly energy spend and can average between 15-40% of the bill. DemandSMART can be used to find the peaks, lower them, and generate significant annual savings on your electricity bill.

Execution:

1)A customer's peak demand charge was determined monthly by the single highest peak demand during a 15-30 min period.

2)The customer used DemandSMART to monitor historical consumption and pinpoint their monthly peak demand periods.

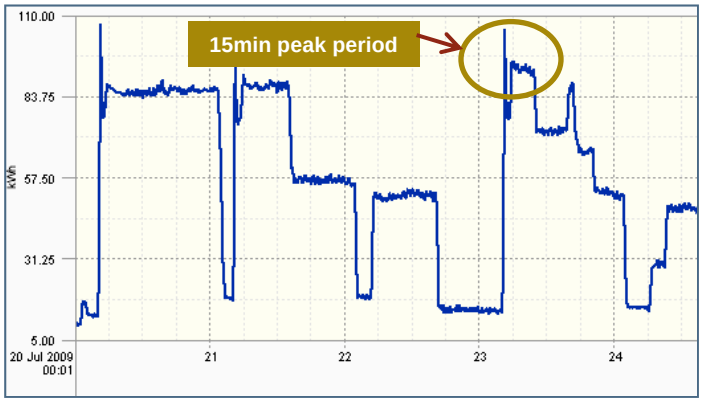
3)By doing this they were able to identify the drivers of electricity consumption during those peak periods and revise their processes during those times to limit their consumption and lower their monthly peak demand.

Financial Impact:
$5,000 Annual Savings

This customer's average monthly peak demand was 750 kW, which they were successfully able to reduce by 10%, or 75 kW, using DemandSMART.

This 10% reduction translated to approximately $5,000 in annual savings.

DemandSMART Screenshot



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Example: Eliminate Phantom Loads

Eliminate Phantom Loads

Phantom loads – those loads that go unnoticed and draw power when they shouldn't – costs businesses thousands or tens of thousands of dollars every year.

Execution:

1)Phantom loads exist at almost every business – from equipment left on during non-production hours to weekend loads that should have been turned off.

2)This customer used DemandSMART to identify 50 kW in phantom load that was running on the weekends and at night for a total of nearly 4,500 hours a year.

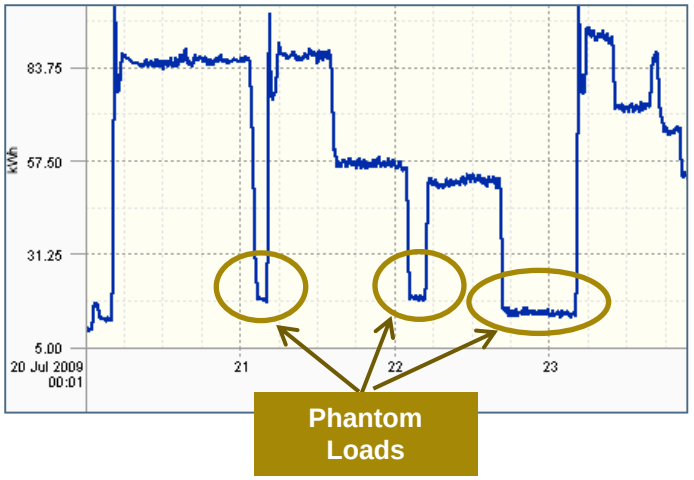
3)After identifying the phantom load they were able to identify the source equipment and reduce the load to zero.

Financial Impact:
$19,000 Annual Savings

By eliminating 50 kW running 4,500 hours a year this customer saved over $19,000 annually ($0.086/kWh rate).

Additionally, they were able to save the expense of a paid employee who came in for a few hours every weekend to check for running equipment (and had missed these loads!)

Demand SMART Screenshot



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Customer Case Study

Grocery co-op earns cold cash with demand response

Associated Wholesale Grocers adjusts its refrigerated storage to reduce energy use and earn money for co-op members

"DR makes a big difference to our bottom line. As a co-op, the more we save, the more we can pass long these savings to our members."

Benny Phillips, Facilities Manager

Industry	Food Storage
Location	Nashville, TN
Program	TVA-EnerNOC Demand Response
Power Distributor	Nashville Electric Service
DR Strategy	Curtailment only
Primary Curtailment Strategy	Refrigeration set point adjustments
Annual Payments	Approximately $25,000

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EnerNOC's Public Relations Offerings

"We use DR events as a chance to do additional training for our staff. So we get an opportunity to improve operations—while reducing our sizable electric bill."

BILL DIMENTO,
Director of Manufacturing and Regulatory Affairs

High Liner Foods

Our goal is to help maximize exposure for our customers through a full-scale public relations campaign that includes:

Media Campaigns

- Build awareness with key journalists in the business media, energy trades, and industry publications.

Event Participation

- Invitations to present with EnerNOC at leading industry conferences.

Testimonials

- Showcase your story in different marketing communications.

Case Study

- Demonstrate why you partnered with EnerNOC, how it impacts your business, and what the benefits are.

Customer/Employee Marketing

- Receive posters, email templates, website language, and more to communicate to your customers and/or employees about your energy management effort

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Curtailment Case Study: Primary School

A public school system at multiple locations shuts down rooftop package units, heat pumps, and wall mount classroom units.

Equipment	Curtailment Plan	kW Reduction
HVAC	• (7) 4 ton package units • (7) 3 ton package units • (4) 15 ton package units • (9) 10 ton rooftop package units • (123) 3 ton class room split units • (4) 30 HP heat pumps • (97) wall-mount classroom units • (5) roof-top units; total of 36 tons of cooling • (12) roof-top units for a total of 75 tons of cooling	975 kW
	Total Curtailment	975 kW

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Curtailment Case Study: City Government

A government building turns down lighting, chillers, and air handlers.

Equipment	Curtailment Plan	kW Reduction
HVAC	• Shut down both 120-ton chillers and all 4 associated compressors • Slow down 3 large air handlers to 25% through EMS in security office • Turn off both 300-ton chillers (usually only 1 running) • Shut down auditorium air handlers (2 x 50 tons) through EMS • Shut off all other air handlers (5 x 20 tons and 4 x 10 tons)	200 kW
Lighting, Fans, Compressors	• Turn off hallway lights using night setback switches in security office • Put garage lights into nighttime mode (50 x 150-watt high pressure sodium) • Shut off all lights and raise temp. set point in City Council Room • Send internal email to city hall staff asking them to turn off lights, raise temps, etc. •Turn off all 300-watt flood lights in auditorium (a few from emergency circuit will remain on) • Turn off half to 3/4 of lobby and hallway lighting (44 x 400-watt bulbs, and 22 x 250-watt bulbs)	200 kW
	Total Curtailment	400 kW

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Curtailment Case Study: Commercial Property

A shopping mall reduces temperature set points using its Siemens EMS.

Equipment	Curtailment Plan	kW Reduction
HVAC	• Turning off some units and implementing temperature set backs at select return air zone sensors (typically 76-77ºF) through the Siemens EMS	350 kW
	Total Curtailment	350 kW

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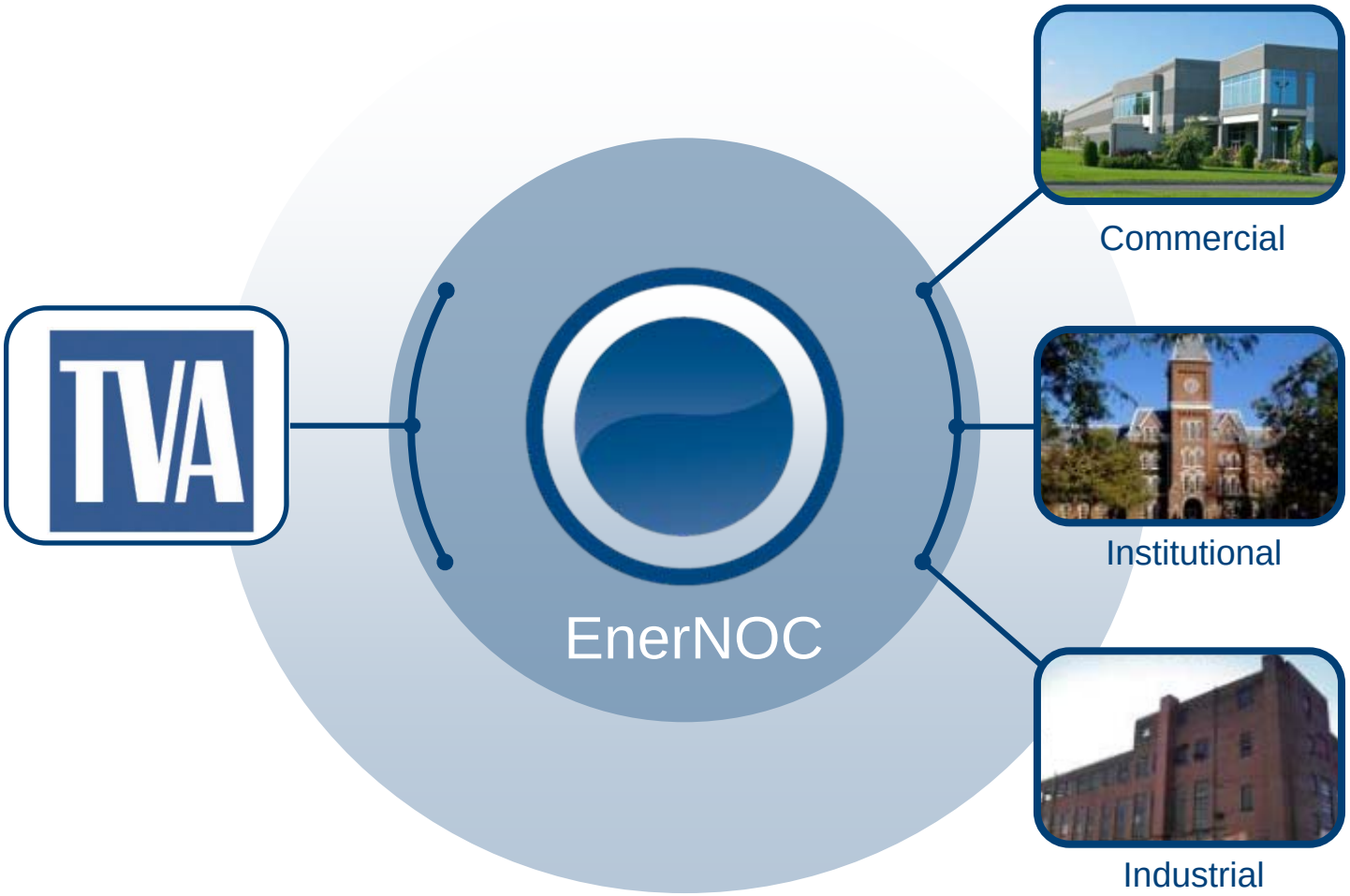
EnerNOC Creates the DR Opportunity For You



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And Delivers Value at Every Step of Our Process

EnerNOC provides:

1. **Customized energy reduction plans**
2. **Simple, no-cost implementation**
3. **Maximum event preparedness and performance**
4. **Maximized payments and revenue assurance**

Commercial

Institutional

Industrial

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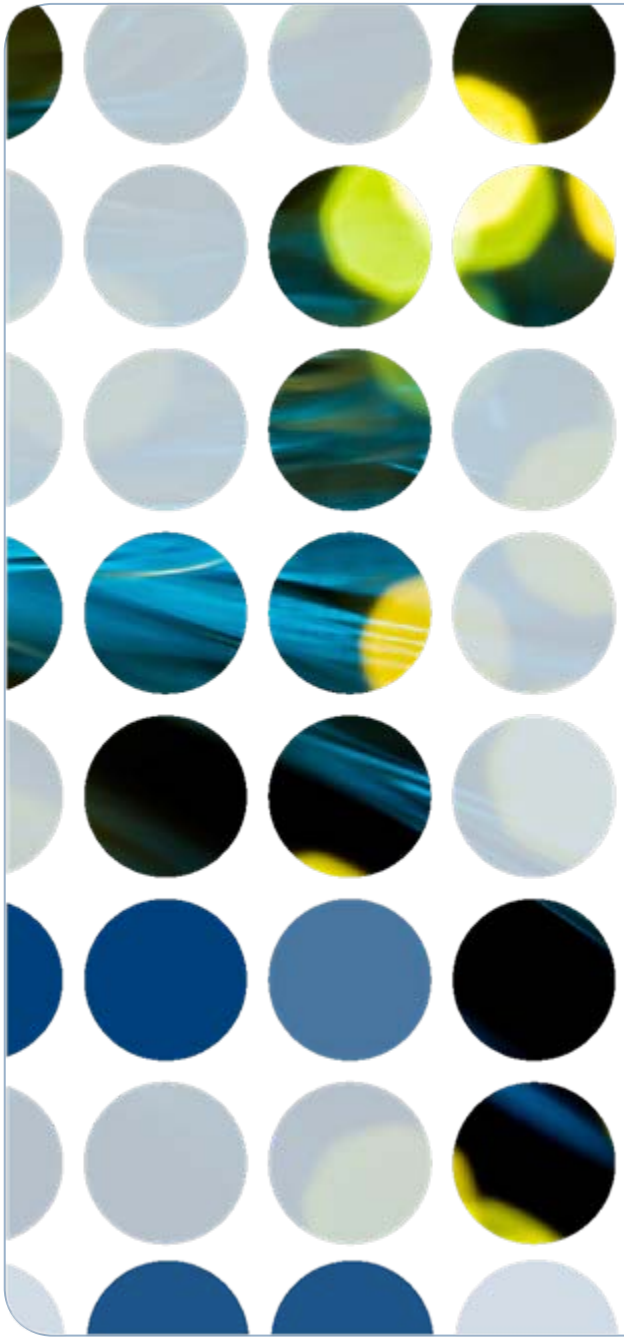

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