



Comprehensive Demand Response: Protecting the Grid, Earning Revenue, and Saving Energy



52nd OTCO Water Workshop March 4, 2014

What is Demand Response



- **PJM is responsible for setting aside each customer's peak demand *plus* a reserve**

- When PJM is in short supply of excess electricity (often in extreme weather) DR is a way for the grid to avoid brownouts & blackouts
- In return for your commitment to be on stand-by (as a last line of defense) users are rewarded with capacity payments based on their Peak Load Contribution Tag.

PJM Interconnection

PJM Interconnection manages the world's largest electric grid. One of PJM's major responsibilities is coordinating the movement of electricity to ensure grid reliability.

PJM Electric Grid Territory

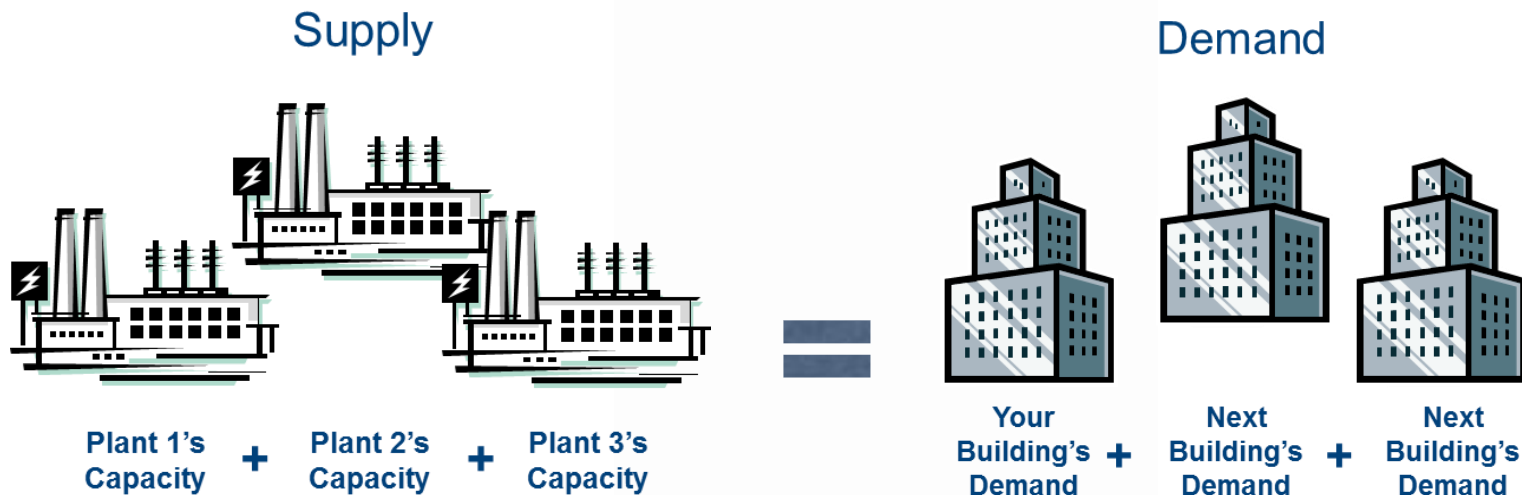


Fast Facts

- **People served:** > 60 Million
- **States served:** 13 & D.C.
- **Peak demand (2013):** 156,435 MW
- **DR capacity (2012):** 9,282 MW
- **DR payments (since 2010):** > \$1.2B

The Electrical Grid Challenge

Because electricity cannot be stored, supply must equal demand at all times. Demand Response provides the grid with a 'line of last defense' for preventing blackouts.



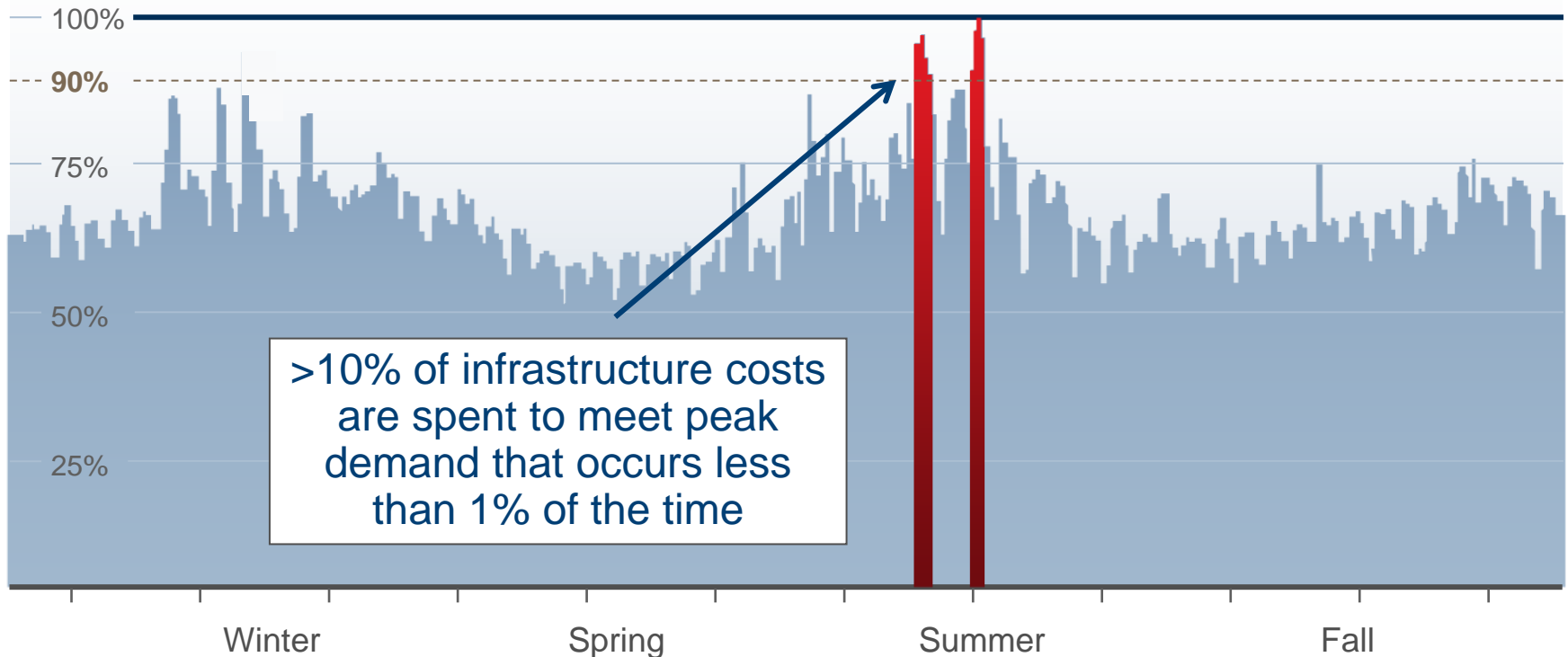
- 1 • **Build generation**
• **Build additional transmission and distribution**

- 2 • **Curtail during critical peaks**
• **Consume less**
• **Shift consumption**

Driving Factor behind Demand Response

Balancing supply and demand on the electricity grid is difficult and expensive. End users that provide a balancing resource are compensated for the service.

Annual Electricity Demand As a Percent of Available Capacity



>10% of infrastructure costs are spent to meet peak demand that occurs less than 1% of the time

Program Guidelines



Program Element	PJM Emergency Load Response Program
Territory	Mid-Atlantic & parts of Mid-West, including: PA, NJ, DE, MD, DC, IL, OH, TN, VA, WV
Demand Response Types	Curtailement and permitted generation
Payments	Capacity Payments (stand-by) which vary by zone & year PLUS Energy Payments (event performance)
Costs	No out-of-pocket costs to participate
Non-Performance Penalties	EnerNOC assumes all risk of non-performance and bears the cost if penalties are incurred
Program Period and Hours	Compliance required June – September from 12 p.m. to 8 p.m. on non-holiday weekdays
Maximum Events	10 per year (average is 1-2 events per year)
Event Notification	2 hours minimum, text, email & phonecall notice
Response Duration	Up to 6 hours
Testing Requirement	1 test event per year only if no emergency event occurs

PJM Emergency Event History

Demand Response resources are called immediately prior to voltage reductions as a last line of defense for preventing brown/blackouts.

Zone	2007	2008	2009	2010	2011	2012	2013	Avg. Length
AEP	-	-	-	-	-	1	1	4h
ATSI	N/A	N/A	N/A	N/A	-	-	5	3h 24m
ComEd	-	-	-	-	-	-	-	-
DAY	-	-	-	-	-	-	-	-
DEOK	N/A	N/A	N/A	N/A	N/A	-	-	-

Demand Response at Your Facility

HOW YOU PARTICIPATE



Curtailment

and/or



Self-Generation

HOW YOU TAKE ACTION



Text alert,
Email or
Phone Call

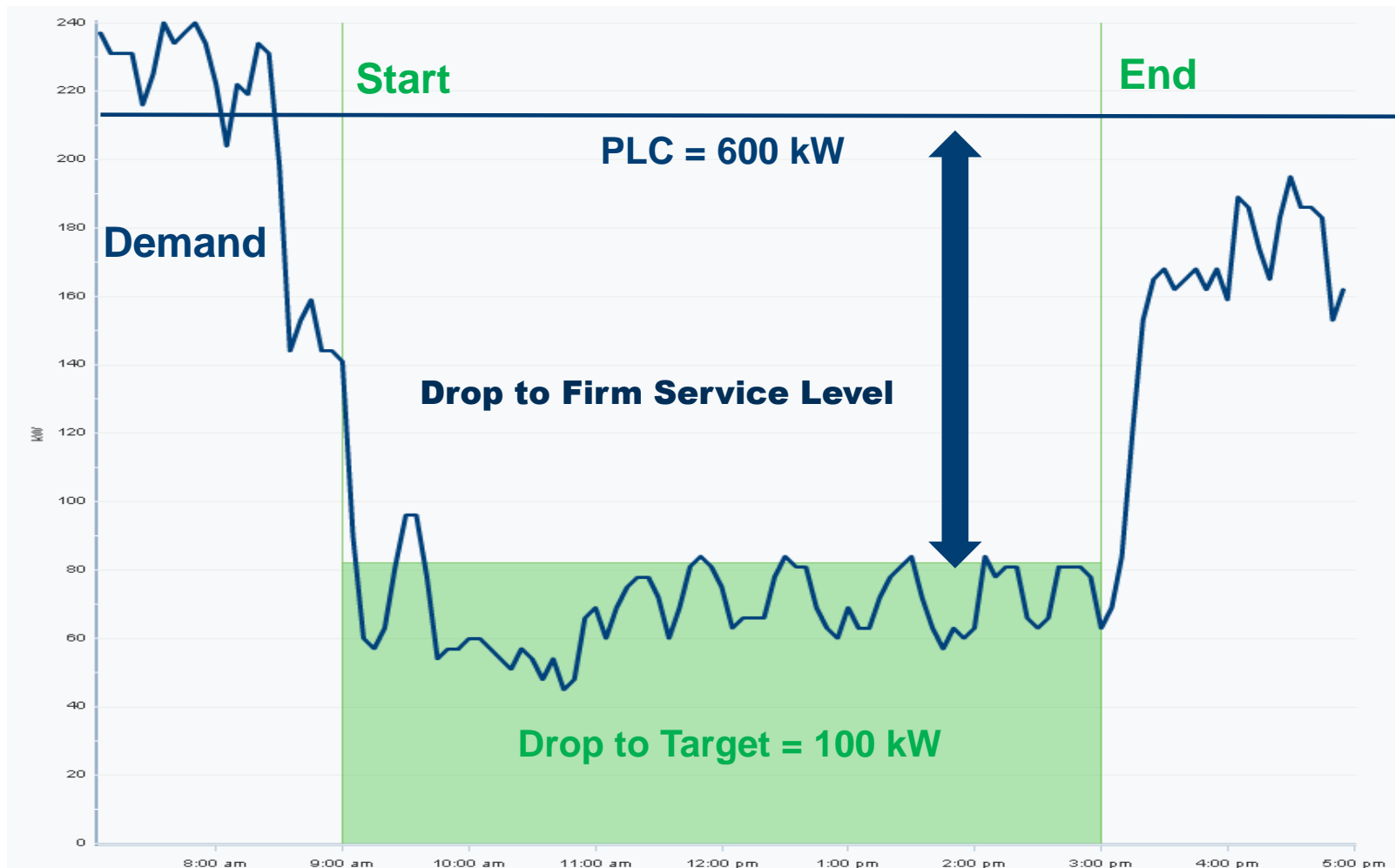


100% Voluntary



Manual and/or
Building Automation

How Demand Response Dispatches Work



Goal – Drop to 100 kW

Payment on your kW – 500 kW or the difference between your PLC and your Drop to Target

Peak Load Contribution Tag (PLC)

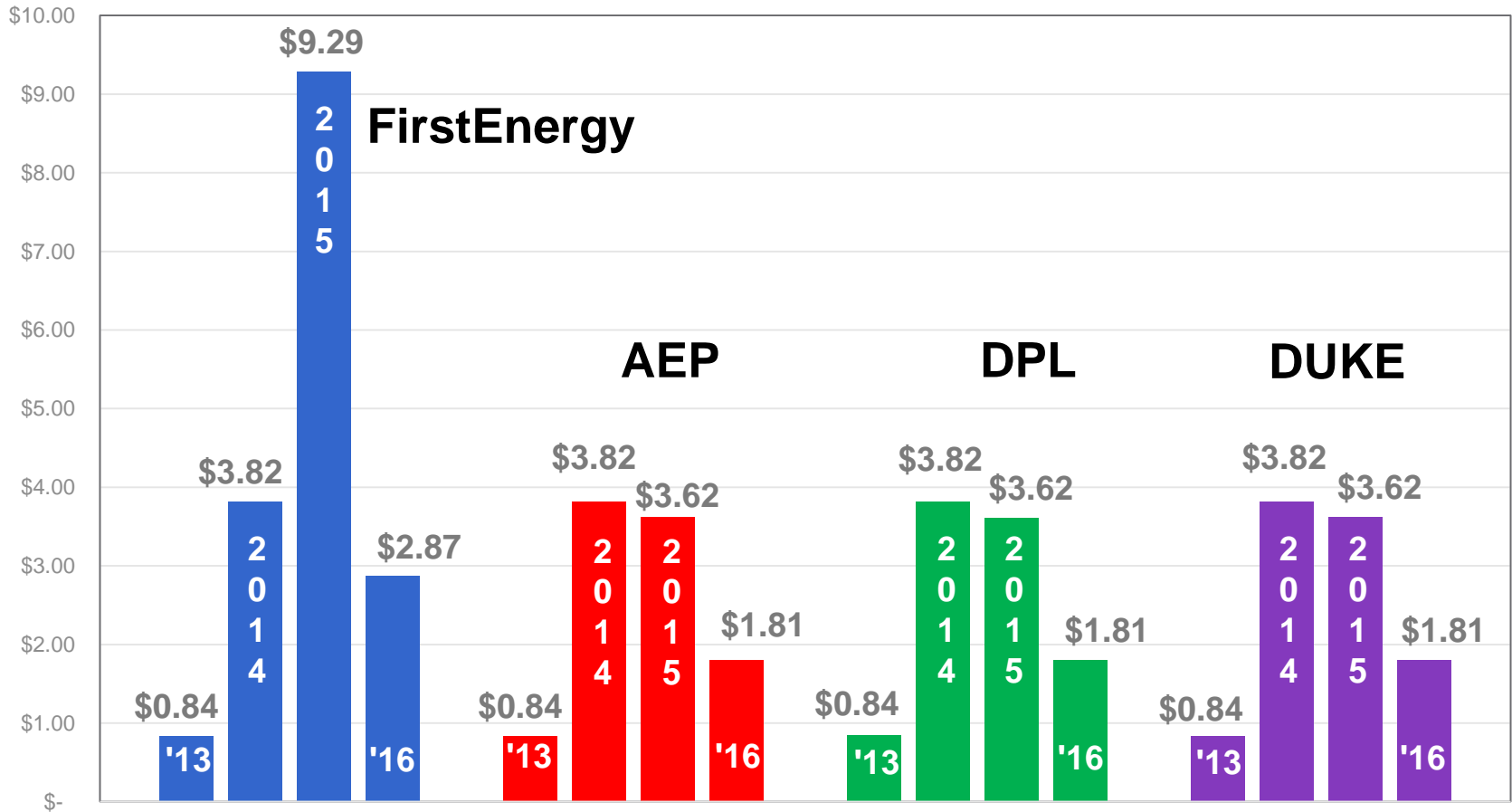
2013 Peak Measurement Days



- PLC is based on your 5 summer peak hours that occur when PJM measures its 5 highest peak summer hours system wide
- 80% of all peak measurements happen in the afternoon 3pm or after
- Reducing your peak will reduce your supply price over time

Auction results - Capacity prices

PJM Auction Results



1

First Energy Customers EnerNoc Demand Response Payments

1 MegaWatt nomination = 1000 kW

Demand Response Estimated Capacity Payments					
BRA Auction Clearing Prices published by PJM					
ATSI - FirstEnergy					
Based on kW reduction of					1000
Year	Yearly \$- MW year	Zonal Capacity Price - \$ per kw month	Program gross estimated payout	Payment to Customer	
2013	\$ 10,121	\$ 0.84	\$ 10,121	\$ 5,061	
2014	\$ 45,797	\$ 3.82	\$ 45,797	\$ 22,899	
2015	\$ 111,491	\$ 9.29	\$ 111,491	\$ 55,746	
2016	\$ 34,474	\$ 2.87	\$ 34,474	\$ 17,237	

AEP Customers Ohio Power & Columbus Southern EnerNoc Demand Response Payments

1 MegaWatt nomination = 1000 kW

Demand Response Estimated Capacity Payments				
BRA Auction Clearing Prices published by PJM				
AEP - American Electric Power				
Based on kW reduction of				1000
Year	Yearly \$- MW year	Zonal Capacity Price - \$ per kw month	Program gross estimated payout	Payment to Customer
2013	\$ 10,121	\$ 0.84	\$ 10,121	\$ 5,061
2014	\$ 45,797	\$ 3.82	\$ 45,797	\$ 22,899
2015	\$ 43,386	\$ 3.62	\$ 43,386	\$ 21,693
2016	\$ 21,670	\$ 1.81	\$ 21,670	\$ 10,835

Dayton Power & Light Customers EnerNoc Demand Response Payments

1 MegaWatt nomination = 1000 kW

Demand Response Estimated Capacity Payments				
BRA Auction Clearing Prices published by PJM				
DPL - Dayton Power & Light				
Based on kW reduction of				1000
Year	Yearly \$- MW year	Zonal Capacity Price - \$ per kw month	Program gross estimated payout	Payment to Customer
2013	\$ 10,121	\$ 0.84	\$ 10,121	\$ 5,061
2014	\$ 45,797	\$ 3.82	\$ 45,797	\$ 22,899
2015	\$ 43,386	\$ 3.62	\$ 43,386	\$ 21,693
2016	\$ 21,670	\$ 1.81	\$ 21,670	\$ 10,835

Duke Energy Customers EnerNoc Demand Response Payments

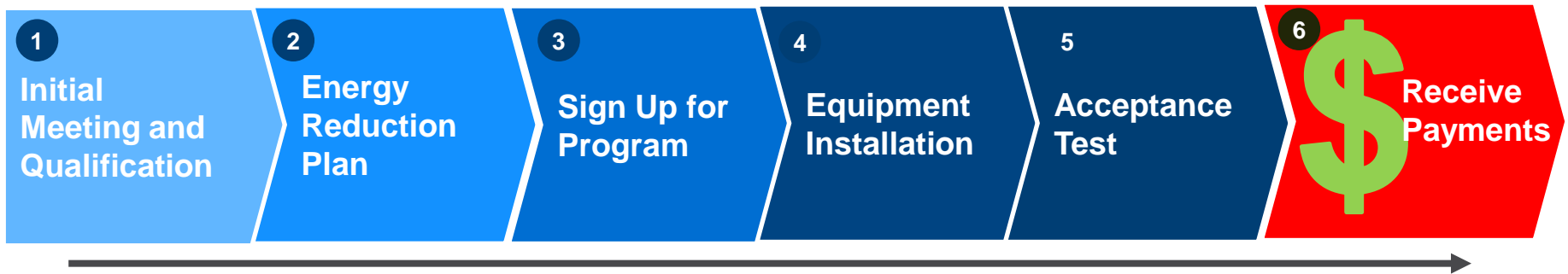
1 MegaWatt nomination = 1000 kW

Demand Response Estimated Capacity Payments					
BRA Auction Clearing Prices published by PJM					
DEOK - DUKE					
Based on kW reduction of					1000
Year	Yearly \$- MW year	Zonal Capacity Price - \$ per kw month	Program gross estimated payout	Payment to Customer	
2013	\$ 10,121	\$ 0.84	\$ 10,121	\$ 5,061	
2014	\$ 45,797	\$ 3.82	\$ 45,797	\$ 22,899	
2015	\$ 43,386	\$ 3.62	\$ 43,386	\$ 21,693	
2016	\$ 21,670	\$ 1.81	\$ 21,670	\$ 10,835	

Simple Enrollment Process

Enroll by early April

Program closes when EnerNoc's capacity commitment to PJM is met



Multiple Reasons to Participate



Earn DR
Payments

- Capacity
- Energy



Protect Your
Operation



Advanced
Meter
Technology



Strengthen the
Electric Grid



Preserve the
Environment

CONTACT INFORMATION

Laura Sherman, CEP

Director of Business Development
North Shore Energy Consulting, LLC

Phone: (440) 665-9491

Fax: (888) 419-6447

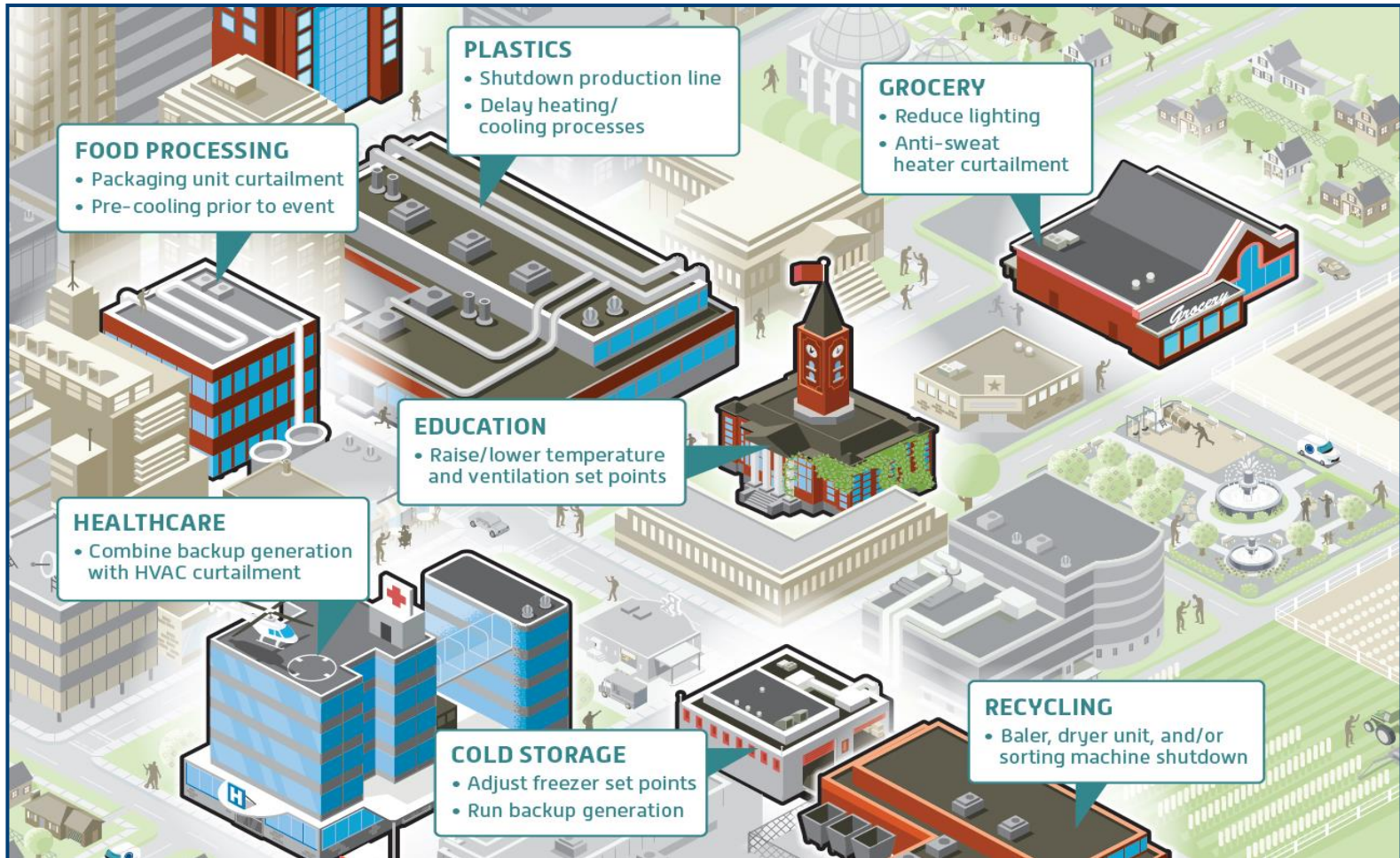
laura@northshoreenergy.com

www.northshoreenergy.com

Addendum

How Demand Response Works

When the electric grid needs resources, PJM “dispatches” EnerNOC’s resources and thousands of facilities across nearly every industry reduce electricity consumption.



Program Guidelines DR = emergency curtailment

Notify



Curtail



Monitor



Restore



Smart meter helps you manage your peaks

- Demand Smart software gives you 5 minute pictures of kW peaks and kWh usage.

Operational Reliability

- Advanced notification of energy emergency—when grid is most fragile

Benefits of Advanced Energy Intelligence Software (EIS)



Visibility
into Real-
time Energy
Usage



Dashboards
and Reports



Text and
Email Alerts

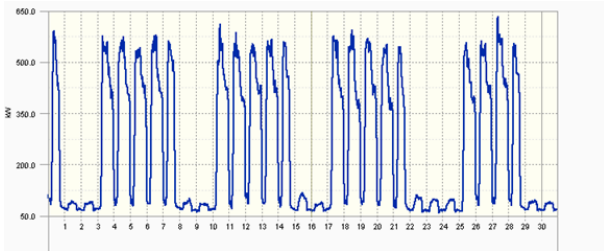


Advanced
Metering
Technology

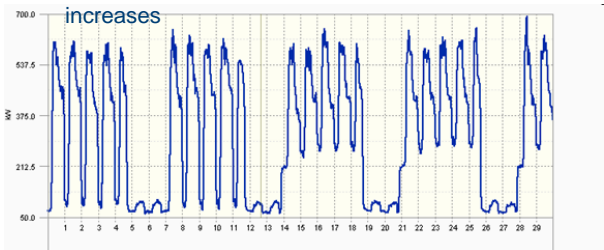
Key Benefit: Greater Value Through Energy Intelligence

Access to More Cost-Savings with PowerTrak

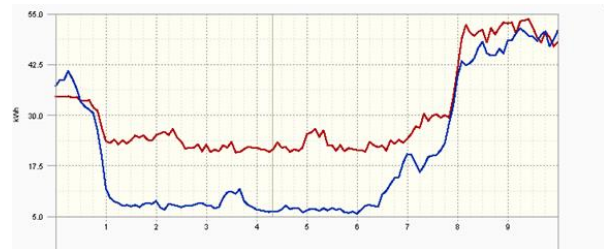
Month 1: Normal consumption pattern



Month 2: In week 3, nighttime baseline increases



Difference in monthly usage: 19,600 kW/hr



Are you wasting energy?

How do you know?

With PowerTrak's detailed, round-the-clock visibility into your facility's energy consumption data, you can:

- **Quickly identify irregularities in consumption**
- **Spot excess usage**
- **Verify the data on your utility bills**
- **Save on energy bills**

Industry Leading Experience

EnerNOC's success is based on the value we've delivered to our customers through demand response and total energy management solutions.

Utilities & ISOs	            
Commercial Office & High Tech	         
Education	          
Food Sales & Production	         
Government	         
Healthcare	          
Manufacturing & Industrial	        
Hotels & Resorts	       

About North Shore Energy Consulting

- Founded in 2008
- 50+ Years of energy expertise
- Services include electricity & gas procurement & Demand Response
- Headquartered in Chagrin Falls
- Dedicated team of Energy Managers
- Licensed in all (13) deregulated states
- 900 Commercial clients
- +1.7 billion kWh under management
- Top regional energy broker in Northeast Ohio
- Affiliated with many qualified suppliers
- EnerNoc's #1 Ohio partner in Demand Response

About EnerNOC

Proven Customer Track Record

- 6,000 C&I demand response customers across 14,000 sites
- 24,000+ MW of Peak Load Under Management, 30-35% is curtailable.
- 2,000 C&I sites with active EfficiencySMART Insight deployments
- Over 500 active EfficiencySMART services projects
- Over \$600 million in customer payments/savings to date
- Simple, risk-free commercial agreements

Full Value and Technology Offering

- Energy management application platform addresses demand and supply-side
- Combine technology, managed services, and market access
- More than \$150 million invested to date in our technology
- 24/7/365 Network Operations Center, real-time metering and web-based monitoring

World-Class Team and Resources

- 700+ employees and growing fast – multiple “top places to work” awards
- Publicly traded on the U.S. NASDAQ (ENOC)
- \$115 million in cash and cash equivalents on balance sheet