



Managing Capacity Costs

Protecting the Grid, Earning Revenue, and Saving Energy

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Managing the High Cost of Capacity Charges

Capacity costs are increasing significantly for all PJM customers

Options:

- **Participate in Demand Response**
- **Reduce PLC by curtailing on Peak Measurement Days**

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

How Capacity Prices are set

PJM's Base Residual Auction

- PJM conducts an auction each May – BRA
- Generators commit their resources into the auction for the delivery year 3 years forward
- All existing generation resources physically located in PJM must bid some generation into the auction
- Energy efficiency and demand response is bid into the auction at the same cost as generation – resources clear at the same price
- Generation resources available affect final price

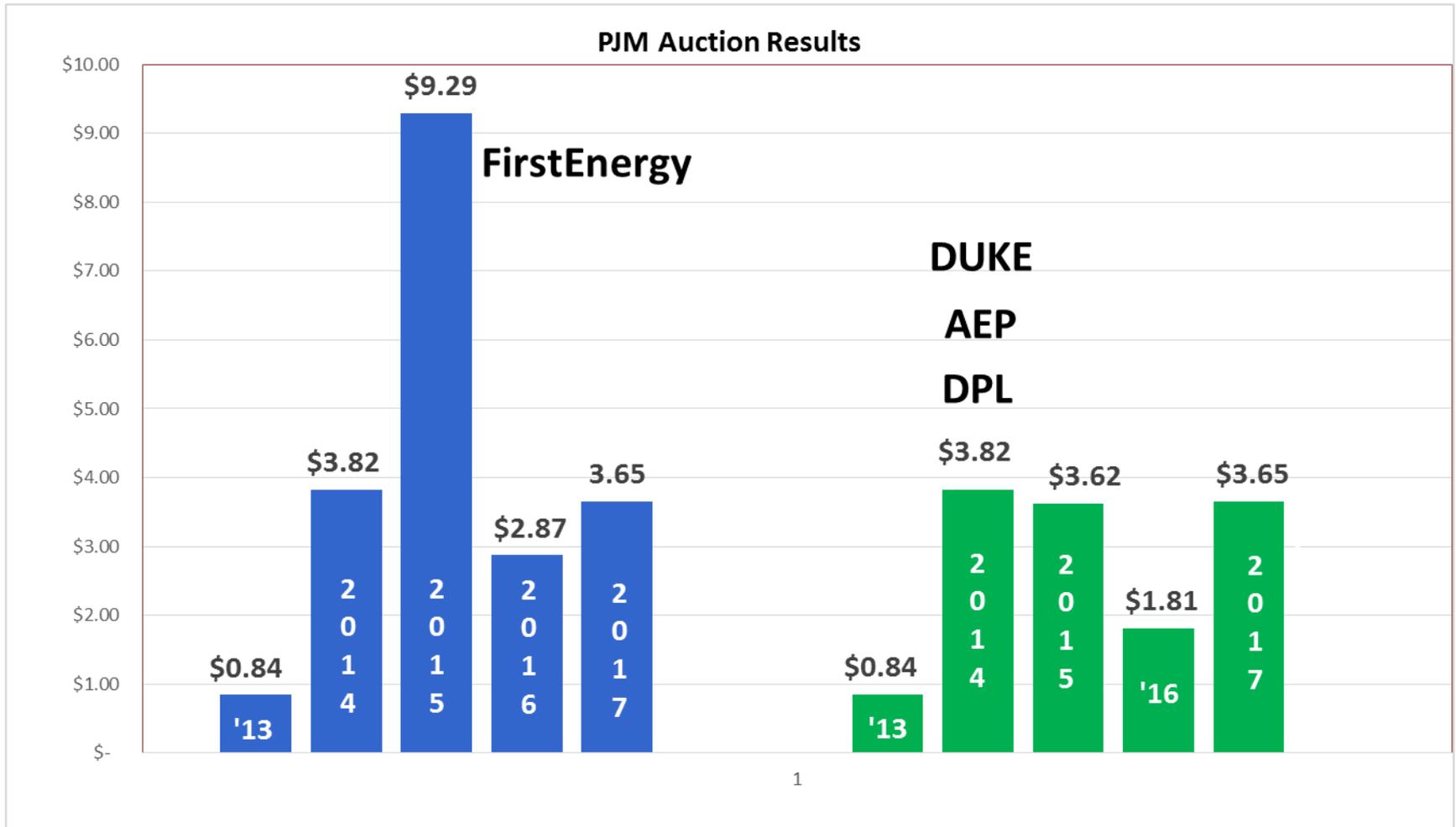
Peak Load Contribution Tag (PLC)

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



Calculate your Capacity Charges



- Need to know PLC tag
- Multiply tag by each month's capacity cost
- Tied back to your supply contract term

PLC X CAPACITY X PJM FACTORS = Capacity costs

Costs/total annual kWh = price per kWh for capacity

Capacity will be as high as 2.5 – 3 cents/kWh for FE customers in 2015

Peak Measurement Alerts for 2014

Managing your PLC



Dates for 2014

July 2
July 7
July 8
July 21

- PJM loads and hot weather indicate a possible peak measurement day
- Alerts can come to you from your energy consultant or supplier
- Usually 10 alerts are sent each summer to capture the 5 peak measurement days
- Plan to curtail energy between 3pm and 6pm to reduce your PLC

What is Demand Response

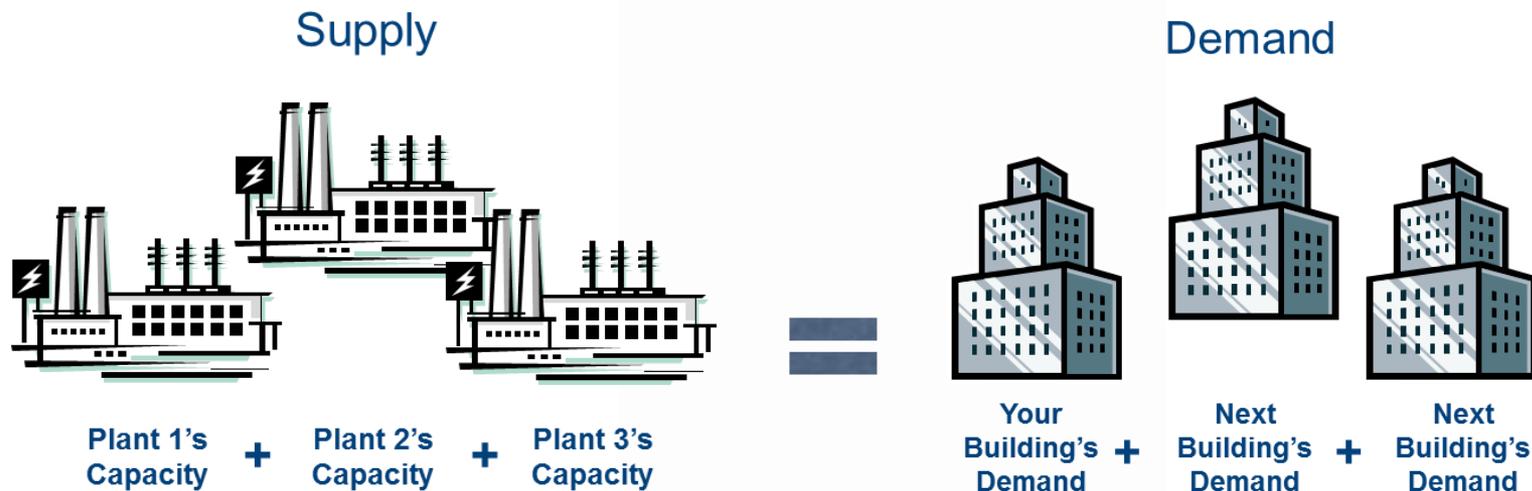


- **PJM is responsible for setting aside each customer's peak demand *plus* a reserve**

- 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.

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.

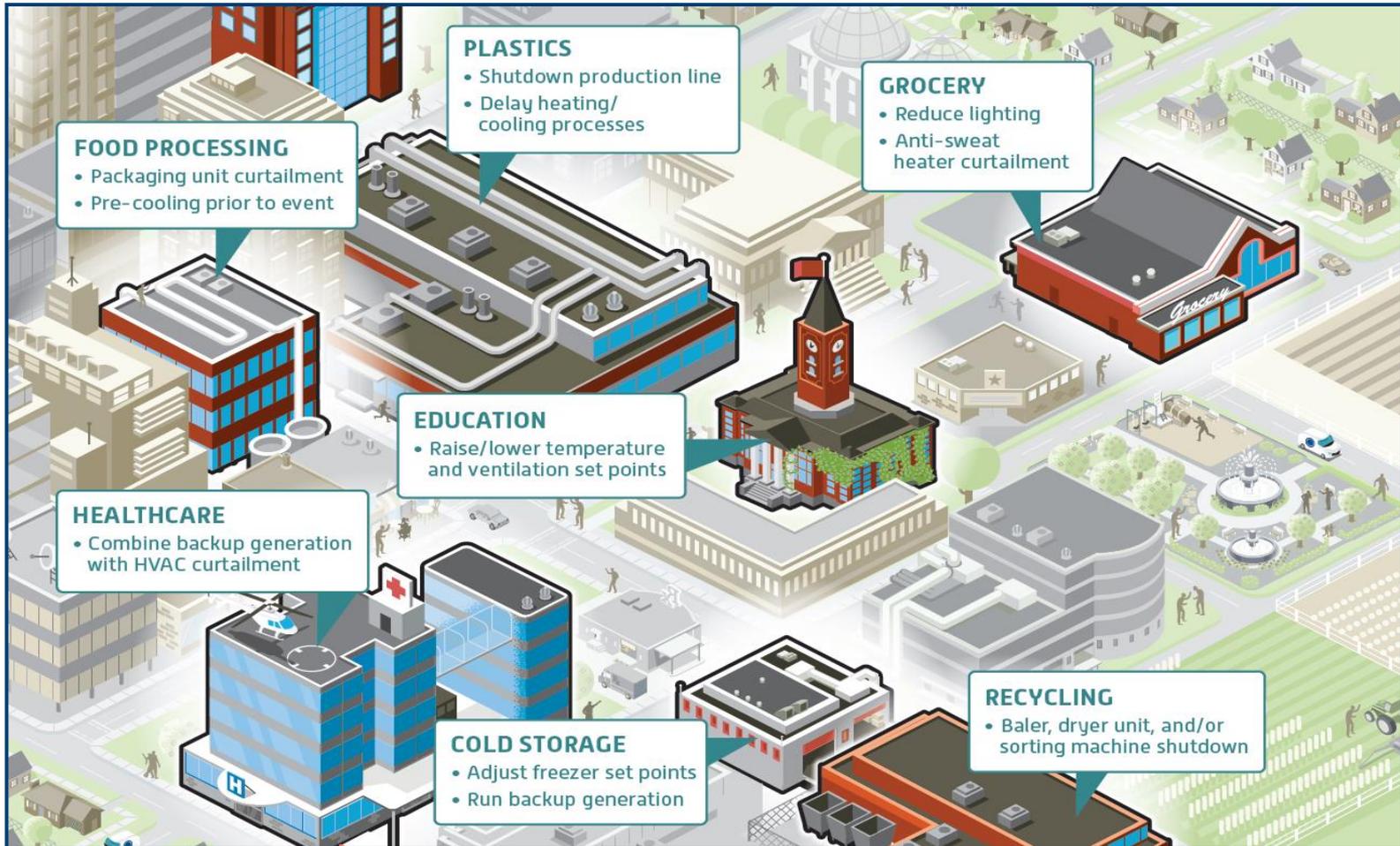


- 1 • **Build generation**
• **Build additional transmission and distribution**

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

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



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	Curtailment 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.

For 2014 no emergency events have been calledyet

Zone	2007	2008	2009	2010	2011	2012	2013	2014	Avg. Length
AEP	-	-	-	-	-	1	1	0	4h
ATSI	N/A	N/A	N/A	N/A	-	-	5	0	3h 24m
ComEd	-	-	-	-	-	-	-	0	-
DAY	-	-	-	-	-	-	-	0	-
DEOK	N/A	N/A	N/A	N/A	N/A	-	-	0	-



Demand Response in the news May/June/July 2014

1. FirstEnergy sues PJM to disallow DR in capacity auction - FE states that steel in the ground is not on par with DR and wants the BRA auction results to be disallowed.
2. AEP wants customers to cover additional costs of running coal plants through a rider on your bill.
3. The U.S. Court of Appeals overturned FERC Order 745 siting that states have jurisdiction over retail markets not the FERC. Large suppliers petitioned the court. Another hearing scheduled.

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

Program Guidelines DR = emergency curtailment

Notify



Curtail



Monitor



Restore



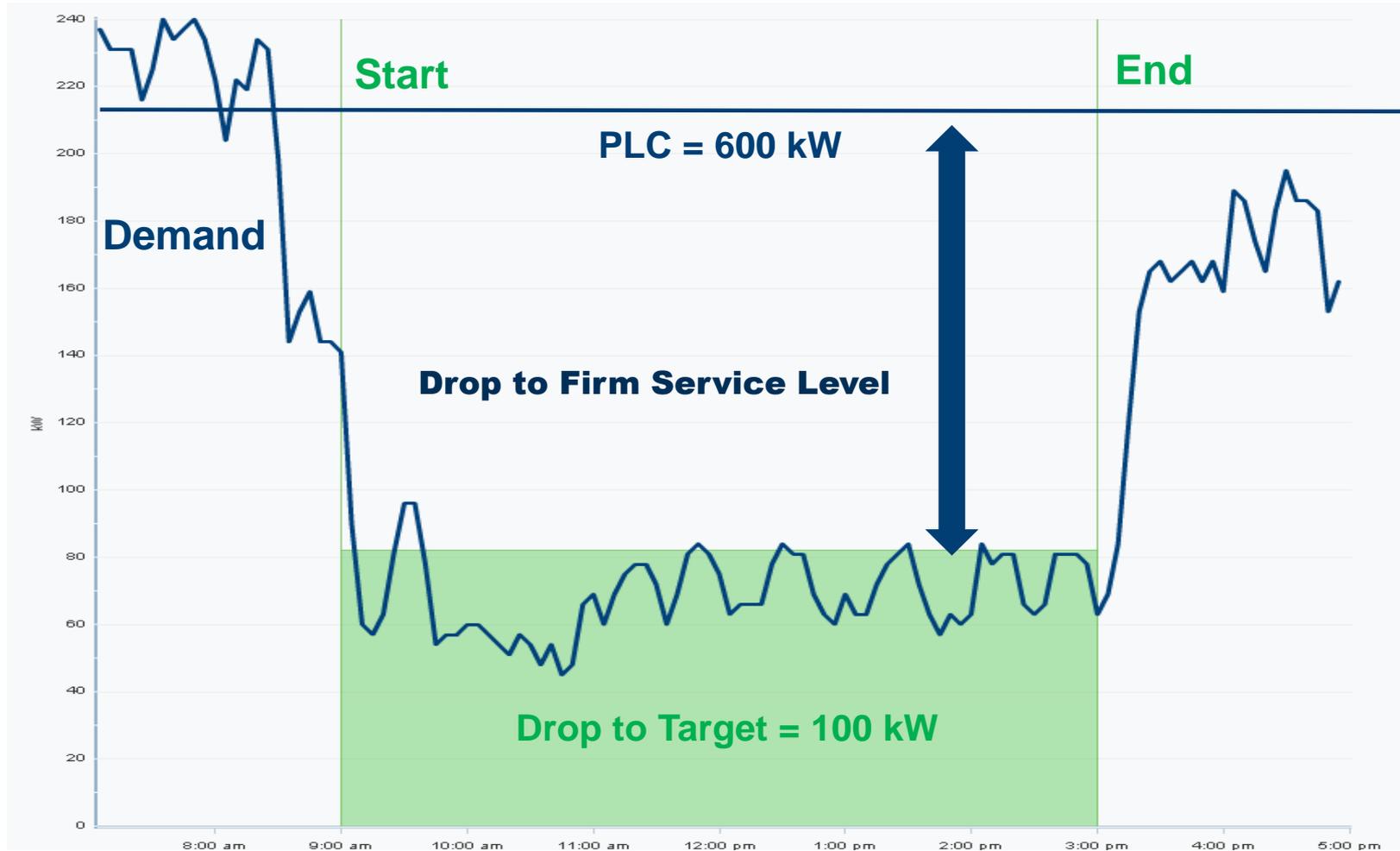
Smart meter helps you manage your peaks

- 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

How Demand Response Dispatches Work

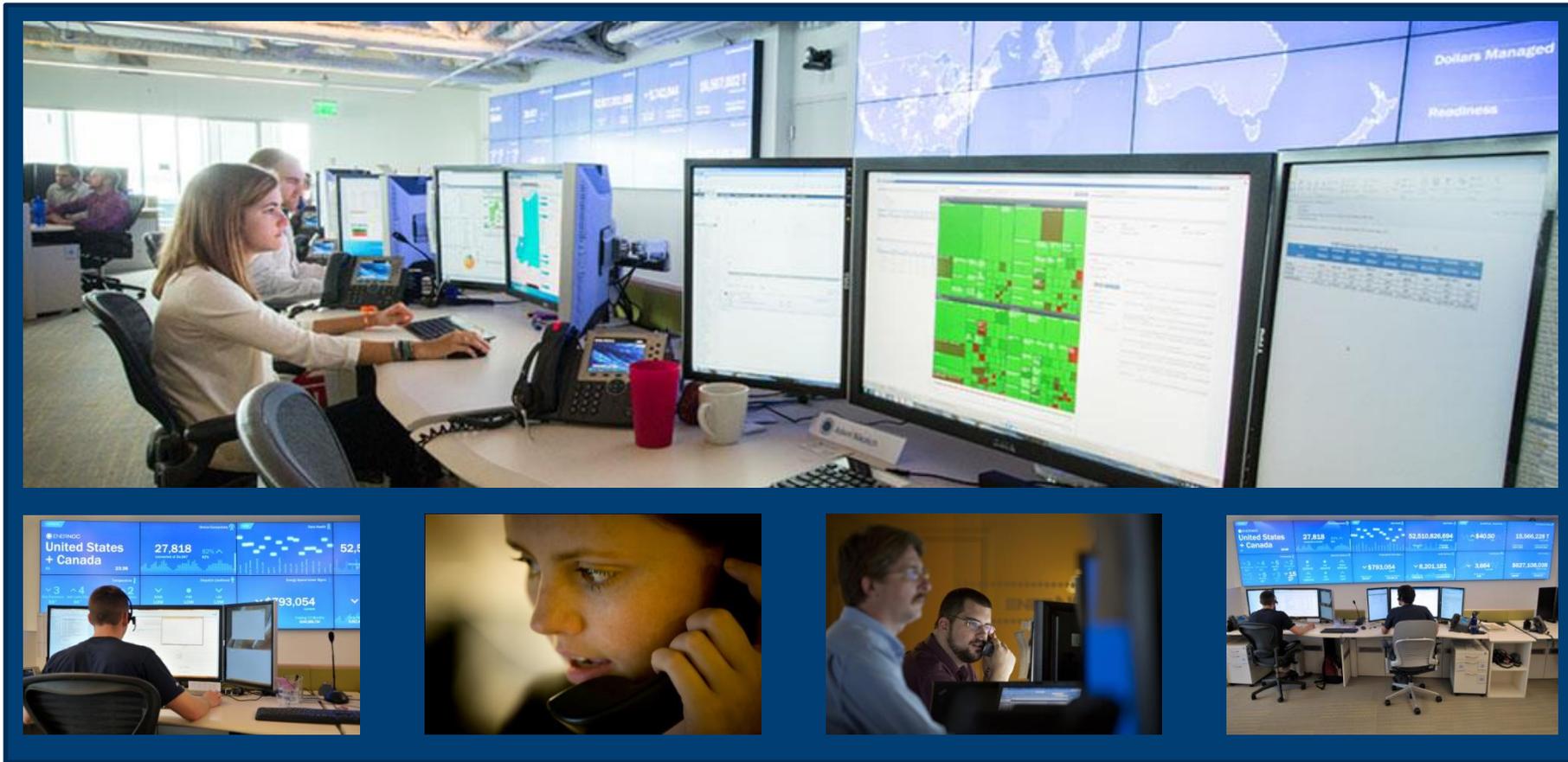


Goal – Drop to 100 kW

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

EnerNOC: Energy Networks Operations Center

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



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	
Jun-13	\$ 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	
2017	\$ 43,770	\$ 3.65	\$ 43,770	\$ 21,885	

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	
2017	\$ 43,770	\$ 3.65	\$ 43,770	\$ 21,885	

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	
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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	
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Multiple Reasons to Participate



Earn DR Payments
- Capacity
- Energy



Protect Your Operation



Advanced Meter Technology



Strengthen the Electric Grid



Preserve the Environment

Benefits of Advanced Energy Intelligence Software (EIS)



Visibility
into Real-
time Energy
Usage



Dashboards
and Reports



Text and
Email Alerts

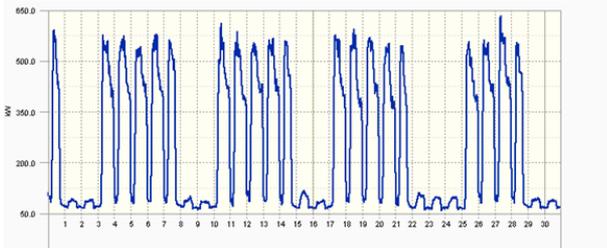


Advanced
Metering
Technology

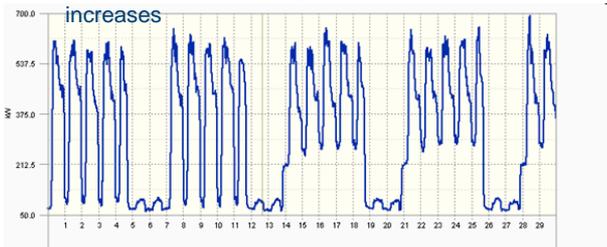
Key Benefit: Greater Value Through Energy Intelligence

Access to More Cost-Savings with PowerTrak

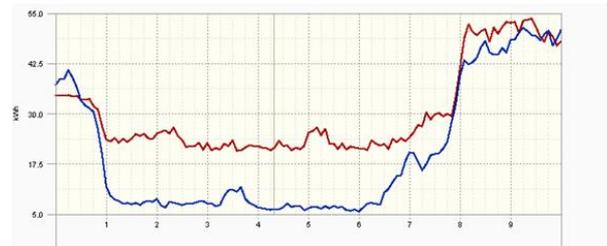
Month 1: Normal consumption pattern



Month 2: In week 3, nighttime baseline increases



Difference in monthly usage: 19,600 kW/hr



Are you wasting energy?

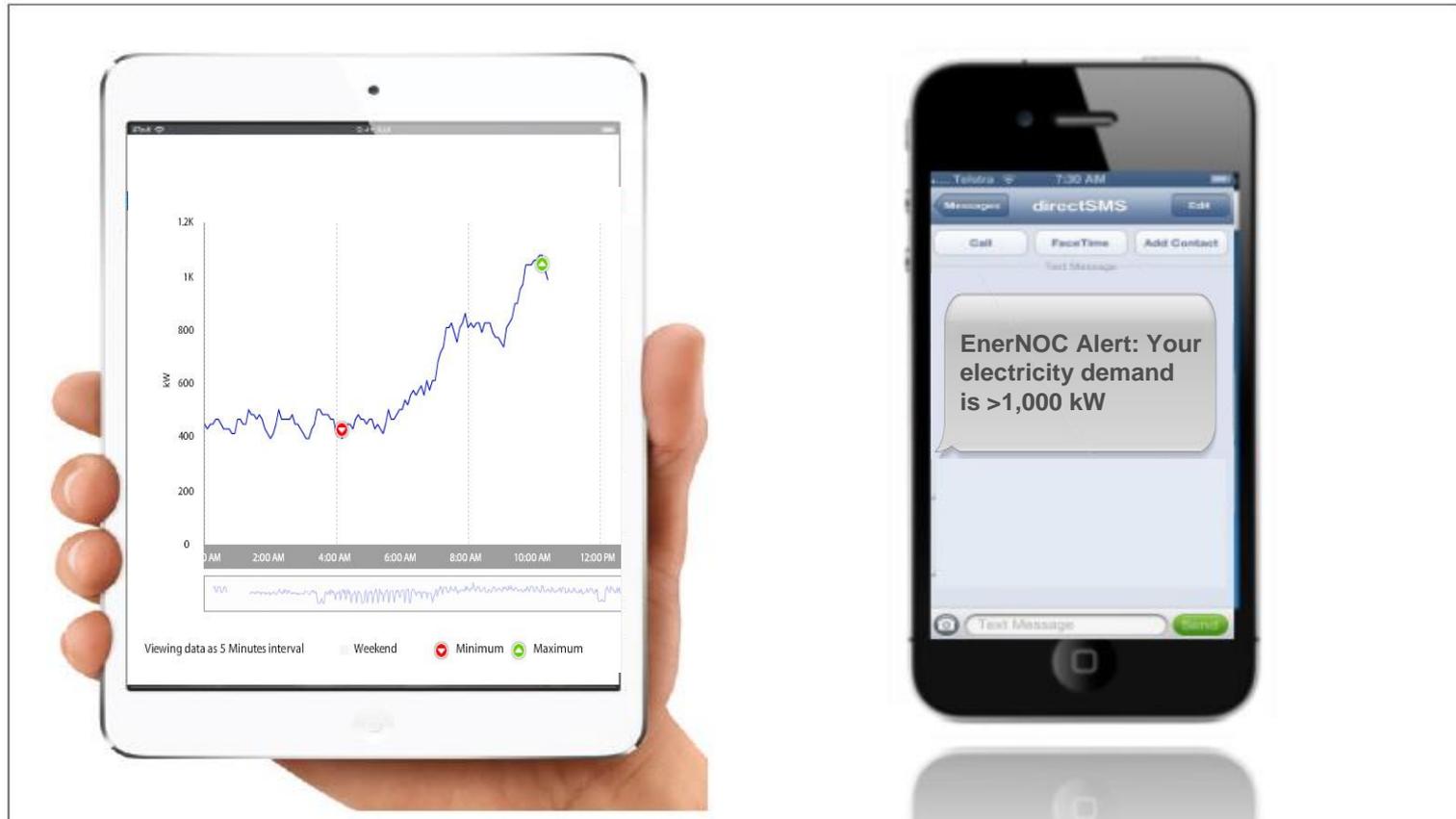
How do you know?

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**

Alerts

Use Insight Meter's alerting function to avoid costly demand charges by receiving e-mail or text alerts as your facility approaches a peak.



Simple Enrollment Process

Enroll by March 15th

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



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