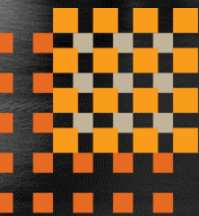




# PJM Demand Response

Fairfax county Water authority



CPower



# Walid Daniel

Utilities and Performance Manager  
Department of Mines, Minerals and Energy

## **DMME Involvement in Demand Response**

### **Recent Competitive RFP**



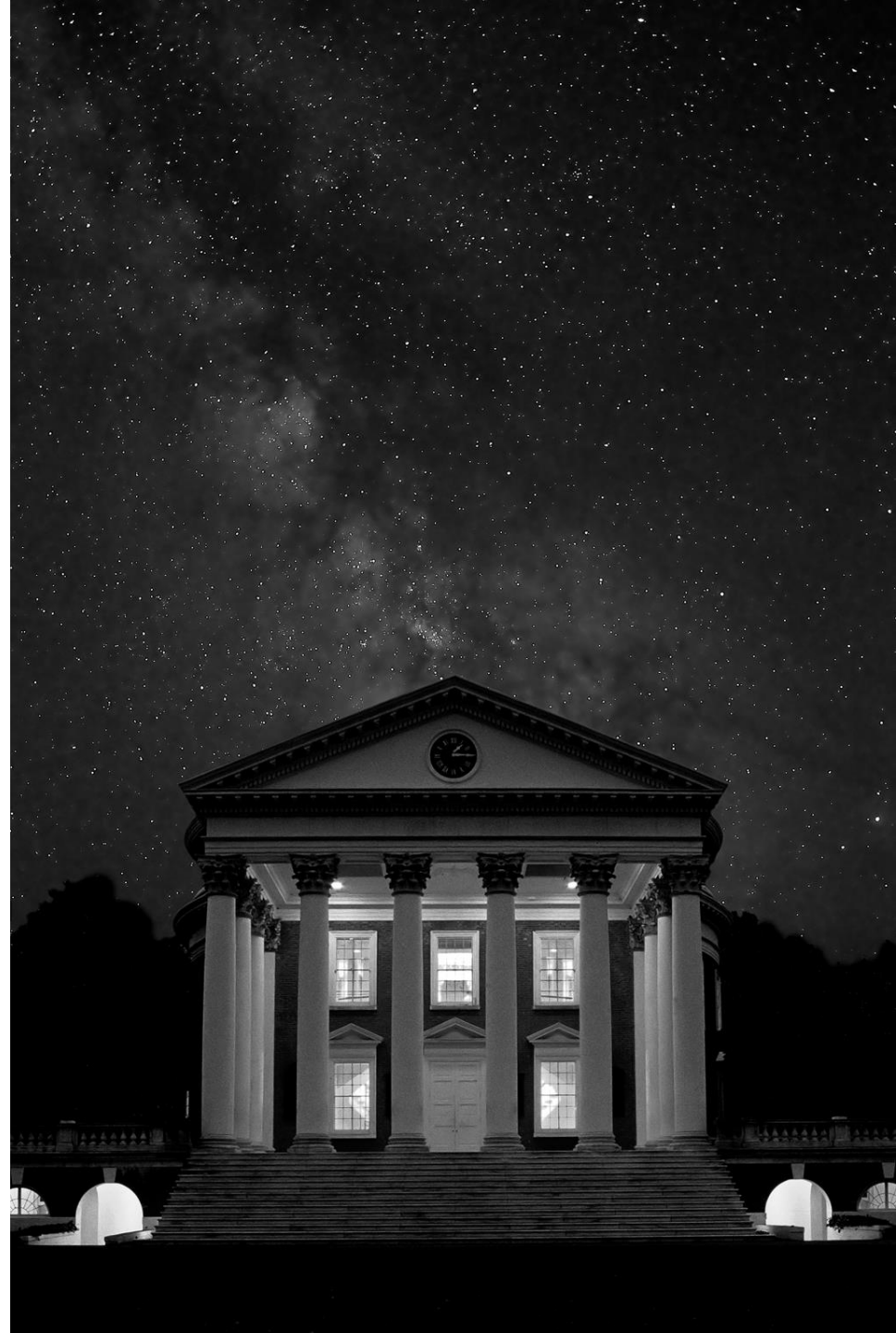


# Leigh Anne Ratliff Account Manager, Commonwealth of Virginia

**10 years in demand  
response, 16 years in  
energy**

**Worked with the DMME  
Demand Response  
contract since 2008**

**Engineering Degree,  
University of Illinois,  
Currently working on  
second masters (Energy  
Regulation/Environmenta  
l Law)**



# Who is Cpower?

- **120 dedicated resources**
- **44+ demand-side programs**
- **3,500 MWs enrolled**
- **15+ utility programs**
- **1,500+ customers, 7,000+ sites**
- **Demand-side solutions including: peak demand management, EE and generator permitting**
- **End-to-end, in-house, full service operations, dispatch and fulfillment**
- **Trusted by several states as the CSP of record**
- **Certified EE M&V provider**



+

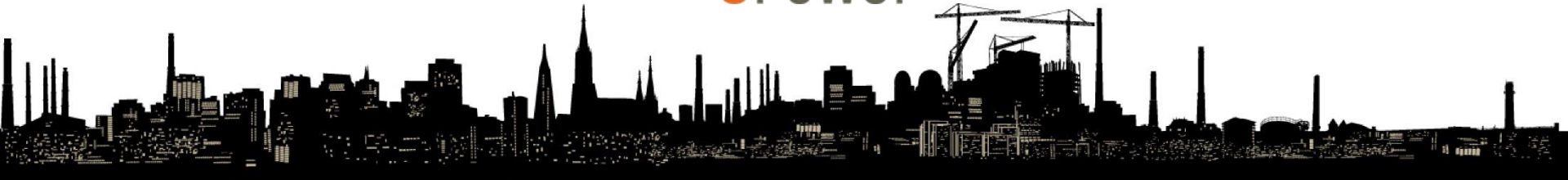


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CPower

# Our history



Built on the best  
Experience &  
expertise



# What makes us different?



FOCUS ON  
THE CUSTOMER

The cpower way

**C**Power is powered by our people.

Focus on the

**We put our customers first. Their success is our success.**

Efficient and fully

**Our systems for enrollment, dispatch and settlements are second to none.**

National experience. Local

**Expertise is national. Our staff is local .**





# Your cpower team



Danielle Bond - Senior Engineer, Jim Rybarczyk - Account Manager, Beatrice Gockley - Act 129 and Utility Programs Manager, Bill Oosterom - Account Executive, Donna Karas - Account Manager, Cathy Smith - Senior Analyst, Mark Steliotes - Account Executive, Jackie O'Mara - Account Manager, Corey Pettingill - Project Manager, Dave Resler - Account Executive, Leigh Ann Ratliff - Account Manager, Dailey Tipton - VP/General Manager, Dann Price - Executive Director, Market Development, Rocco Venuto - Account Executive, Raymond Berkebile - Senior Director of Engineering, Operations, Suzanne Levine - Account Executive, James Disabato - Project Manager, Stephanie Tray - Analyst, Meg Kelly - Senior Director, Energy Efficiency.

**Consider**  
**CPower**  
**your personal**  
**demand-side energy**  
**management guides.**

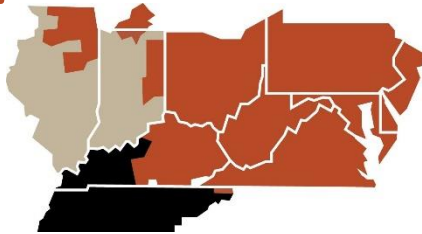


# Engineering support 3 Steps to success

**Dedicated, uniquely qualified engineering staff providing unmatched support to State of Virginia facilities.**

Cpower is the only csp capable of providing support for:

1.



**PJM Demand Response and Demand Management Programs.**

2.



**Demand Response and Demand Management Performance.**

3.



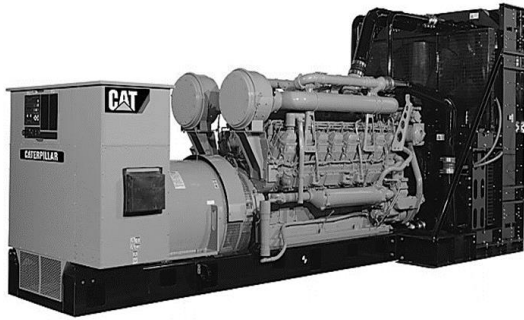
**Energy Efficiency and Peak Demand Management**





# Engineering support for generators and projects

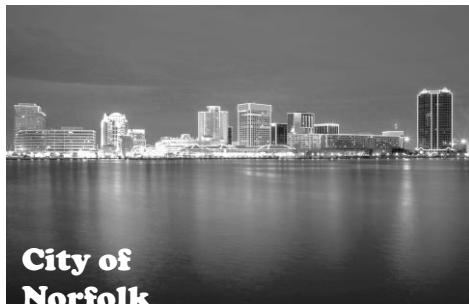
- **Emergency Generators to meet specific EPA and State criteria for DR**
- **Verify generators are compliant, mitigating risk to the State**



## CPower Generator Reviews & Project support:

- **No cost assessment, participation capability, permitting**
- **Analysis of revenues and ROI/payback period**
- **Feasibility reporting**
- **Replacement recommendations**
- **Emission control recommendations**

## CPower Generator Review & project support -- facilities



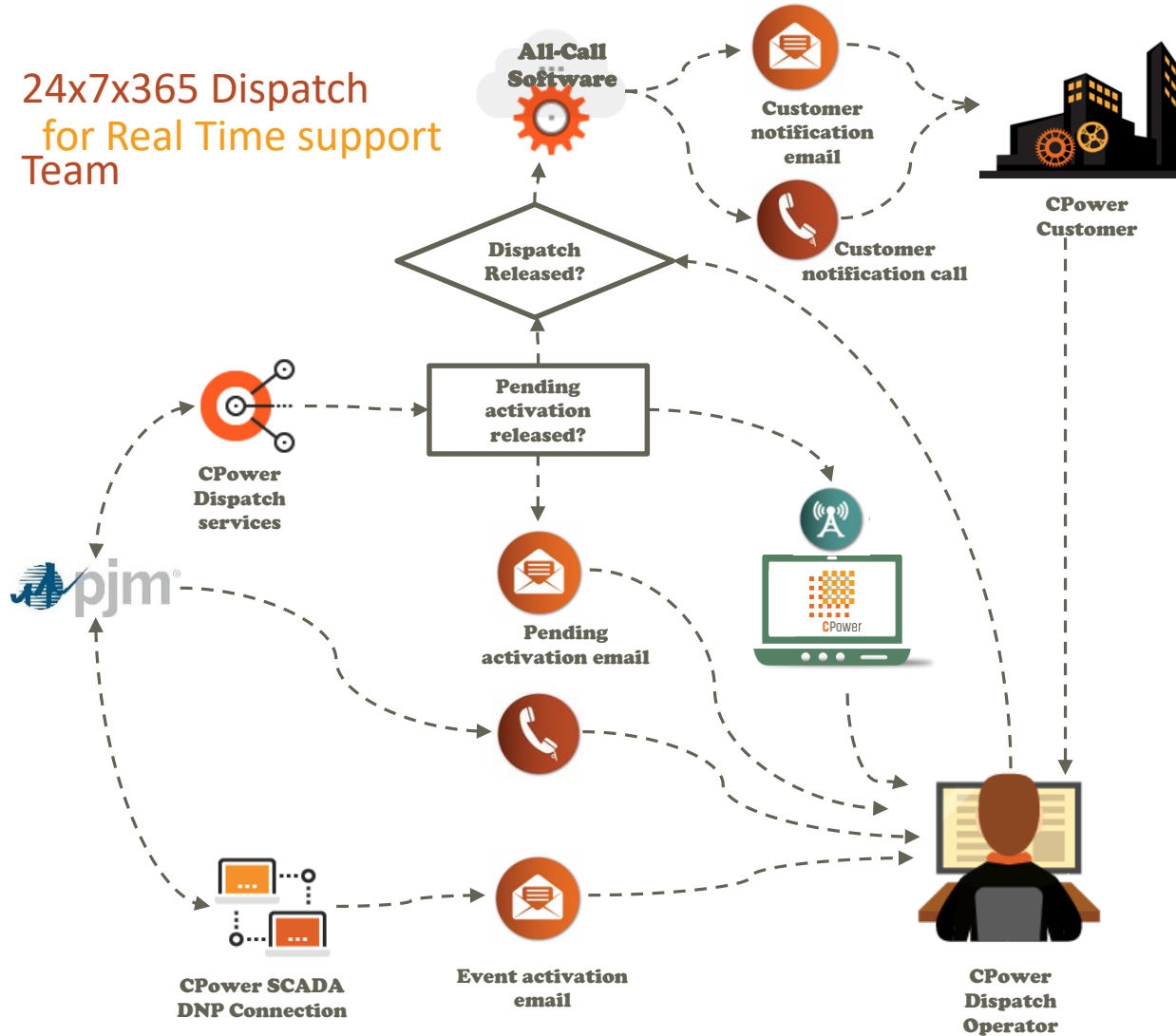
### Other projects and support:

**Town of Leesburg & WWTP | Prince William County | Bridgewater Retirement Center**



# Cpower dispatch operations

24x7x365 Dispatch  
for Real Time support  
Team



- **Five person, dedicated team**
- **One minute heartbeat connection directly to PJM – picks up XML dispatch instructions automatically**
- **DNP connection directly to PJM provides 2 second telemetry**
- **Dialogic All-Call System, with fully redundant back up system to get notifications out quickly**
- **Defined Caller ID & Email address for events and tests**
- **Redundant back up dispatch center at an alternate location for disaster planning**
- **CPower Dispatch facilitates and supports All CPower Programs**



# State of Virginia EDUCATIONAL MATERIALS

A warehouse of helpful  
info  
STATE OF VIRGINIA DEMAND RESPONSE RESOURCES

## HELPING STATE OF VIRGINIA ORGANIZATIONS REDUCE NET ENERGY SPEND THROUGH DEMAND-SIDE MANAGEMENT PROGRAMS

The State of Virginia has organizations that can participate in Demand Management Programs and earn revenue for being available to use less energy when the grid is stressed or save money by reducing energy during peak hours. Participants can also help preserve the environment and keep energy prices stable for ratepayers in Virginia.

CPower offers all of the demand side management programs available in the PJM market, where the State of Virginia resides.

Many people are familiar with the Emergency Capacity programs. These programs call upon energy users to reduce their usage when demand begins to exceed supply. This can happen on extremely hot or cold days or any other type of emergency event that causes an imbalance on the grid. [Learn more about Emergency Capacity Programs.](#)



HOW DOES CPOWER HELP THE STATE?

IN 2016, CPOWER HELPED MORE THAN 82 STATE ORGANIZATIONS GENERATE NEARLY 2 MILLION DOLLARS FOR CURTAILING THEIR ENERGY USE.

**GROWTH YEAR-OVER-YEAR**  
2016 Total Facilities: **82**  
2017 Total Facilities: **135**  
2016 Total kW enrolled: **63,280**  
2017 Total kW enrolled: **78,500**

**TOTAL IN PERCENTAGES**  
kW Enrolled **↑19%**  
Facilities Enrolled **↑39%**

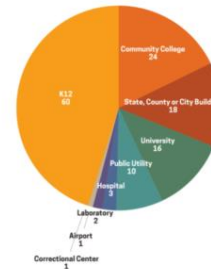
In 2016 there are 135 State entities enrolling more than 78,500 kW for the summer season.

We have processed 420 energy efficiency projects. Many organizations funded these projects with revenues earned from demand response participation.

Energy is forever in motion. At CPower, we never stop moving to get you the results you deserve. Learn how you can join the 135 other State organizations using demand response to meet their energy and sustainability goals.

*"Demand response has been good business for the division. We've been able to help the grid at their busiest times, earn some money, and we use the curtailment test as an opportunity to test some of our critical systems. By being able to find problems in controlled situations, we have prevented them from happening in emergencies. It's been a win all the way around for us from a business, maintenance, and conservation standpoint."* - **Jim Morris, Assistant Director, Environmental and Energy Management, Virginia Beach Public Schools**

2017 CONTRIBUTING SITES



Participants prepare for their annual demand response test.

### NEW TO DEMAND RESPONSE?



CPower will quickly help you understand why demand response is an effective form of energy management, how programs work and how you receive financial incentives. [Learn More.](#)

### CPOWER'S VIRGINIA TEAM



At CPower, we believe that at the heart of successful energy management lies the trust between an organization and its energy team. [Meet your team.](#)

### THE CPOWER WAY



We have a team of energy experts who help you develop your energy strategy and maximize your demand management participation. [Learn about the CPower way.](#)

## Training and Education

### KNOWLEDGE HUB



Demand response contributes more than just sustainability to K-12 public school system. The Virginia Beach City Public School System is on a mission. At the heart of that mission lies a commitment to education, which you expect from the largest school division in southeastern Virginia. What you might not expect is how money earned from participating in demand response



What to expect in the upcoming PJM 2017/18 Demand Response season. A changing weather landscape may bring early summer heat. Although the recent La Nina season is officially over, we are experiencing a Mother Nature hangover as the 2017 Spring season has seen above normal temperatures. As we transition from La Nina to El Nino, we should expect the hotter than normal temperatures to



Choose Your Own Curtailment Adventure: "School's in Session" You're a facilities manager in the public school system. Your district of twelve schools participates in demand response programs annually. Each year, you alternate the six schools that hold summer classes, which presents you with a unique opportunity to earn money through demand response. [Learn more.](#)

## WATCH The State of The PJM Energy Market Webinar

### LEARN ABOUT THE PJM PROGRAMS AVAILABLE IN VIRGINIA.

- **Emergency Capacity** Organizations that participate in Emergency Capacity Programs can earn money for being available to use less energy when the grid is stressed. Participants can also help preserve the environment and keep energy prices stable for ratepayers in the PJM region. [Learn More](#)
- **Sync Reserves** PJM can call on its synchronized reserves to quickly restore the balance between supply and demand. Organizations like yours that participate in the Synchronized Reserve Program can earn money for being on call to help the grid react to short-term disturbances. [Learn More](#)
- **Economic Load Response** Gives participants the opportunity to earn revenue for using less energy when prices in the PJM wholesale electricity market are high. Not only will you earn revenues, you'll also be doing your part to keep electricity prices stable in PJM. [Learn More](#)
- **Energy Efficiency** PJM's Energy Efficiency program pays businesses for permanent load reduction resulting from energy efficiency projects they have completed or will be complete in the future. [Learn More](#)

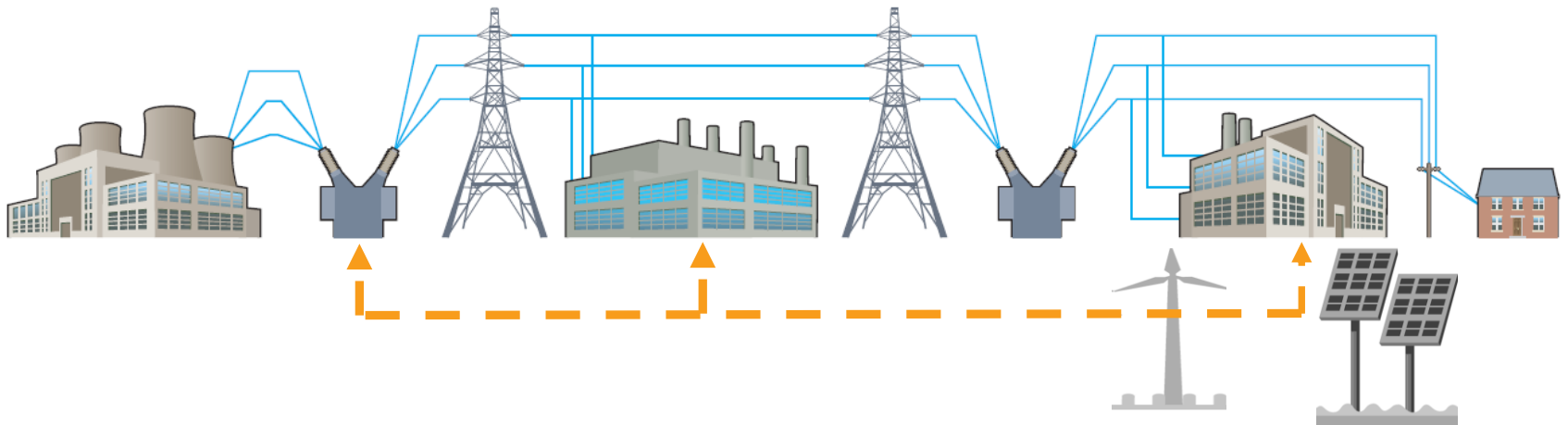
## State of Virginia's Web Portal





# Dmme PARTICIPATING Facilities ACT as Assets in the Electric Grid

**Your facilities can deliver services to the electric system comparable to conventional power generation assets**

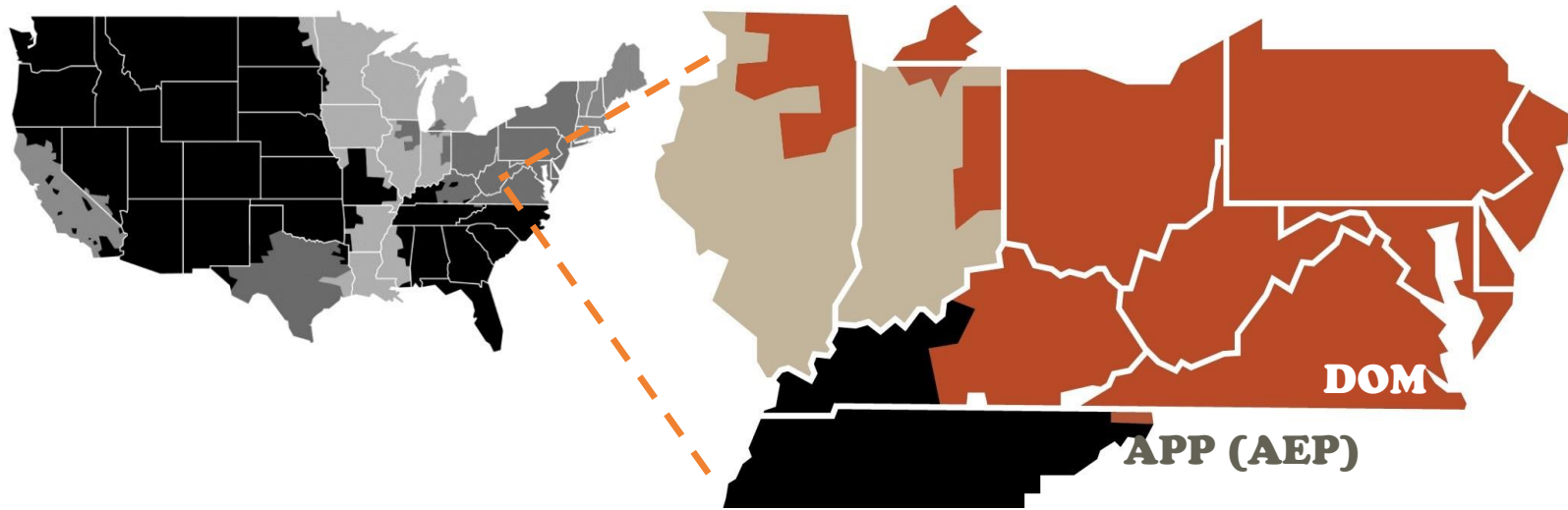


## Demand response

**provides an opportunity for consumers to play a significant role in the operation of the electric grid by reducing or shifting their electricity usage during peak periods in response to time-based rates or other forms of financial incentives\***

*\* U.S. Dept of Energy, 2016*

# What's a PJM?



- **Independent system operator of the electric grid**
- **Controls flow of power reliably**
- **Serves close to 70 million people**
- **Multiple Demand Response Programs**
- **Needs help when grid is at peak demand**

**With the help of demand response and other programs:**

- **PJM has retired 104 generating units with a combined capacity of 10,060 megawatts.**

# How does the PJM emergency program work?

## **C Power\***

- 1. Acquires load data from utility**
- 2. Provides custom facility assessment**
- 3. Assesses generators (if applicable)**
- 4. Provides curtailment ideas**
- 5. Generates load drop suggestions**
- 6. Provides complete financial incentive package**

## **You**

- 1. Decide what works for you**

**\*services provided free per State of VA contract, no obligation, no multi-year contracts**





# Advantages of the DMME demand response program with c power

- 1. No multi-year contracts**
- 2. 85% of full PJM Base Residual Auction plus**
- 3. 75% of Emergency Energy Payment**
- 4. Lengthy Notice before Load Drop Test**
- 5. Overperformance on accounts applied to underperforming**
- 6. No metering requirement**
- 7. No start-up fees**
- 8. Access to all PJM Programs (Synchronous Reserve, Energy Efficiency, Voluntary Economic)**
- 9. We will assure we have enough capacity for you to participate every year**



# What is the commitment for the emergency

Program/Parameter	Base	Capacity Performance
<b>Mandatory Period</b>	Jun – Sep 2018	Year Round
<b>Potential Event Hours</b>	10AM – 10 PM EDT (weekdays excluding holidays)	10 AM – 10 PM, May- October 6AM-9PM, November-April
<b>Dispatch Notification*</b>	30, 60, 120 minutes	30, 60, 120 minutes
<b>Dispatch Duration</b>	Unlimited	Unlimited
<b>Dispatch Frequency</b>	Unlimited	Unlimited

## Important to Note:

Test Requirement

**Mandatory – impacts  
payments**

Client Standby Payments

**% based on commitments &  
performance**

Actual Emergency DR Event

**Supersedes test – impacts  
payment**



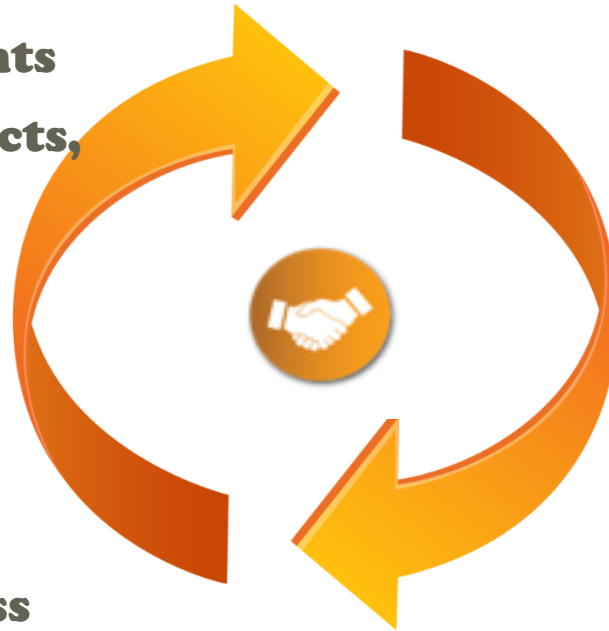
# Typical demand Response Season

## summer:

- **Load drop test, late June**
- **On-Call Period for Events**
- **Update dispatch contacts, payment details**

## Spring:

- **Enrollment Season.**
- **Training and Readiness Webinars.**
- **Town Hall style conference calls.**
- **Communication Test (May/early June)**



## Fall:

- **Season Ends, September 30**
- **Participation reports and post Season Analysis**
- **First payments!**

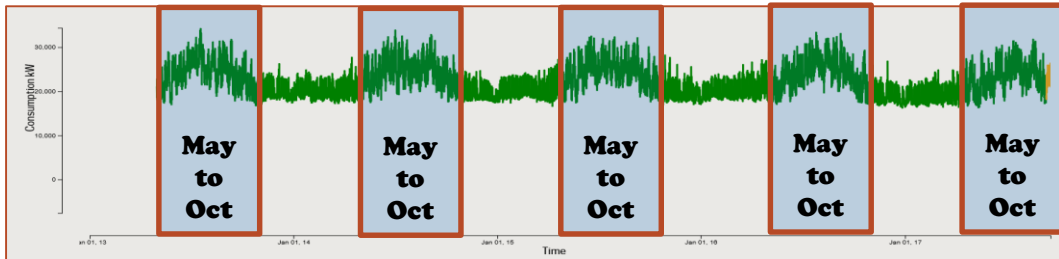
## Winter:

- **New Peak Load Contributions**
- **Facility assessment**
- **Generator report**
- **Dispatch notification extension**

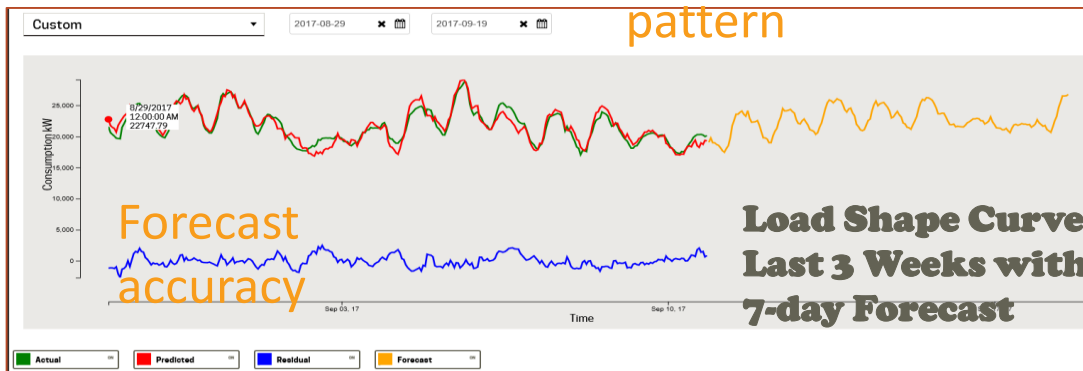




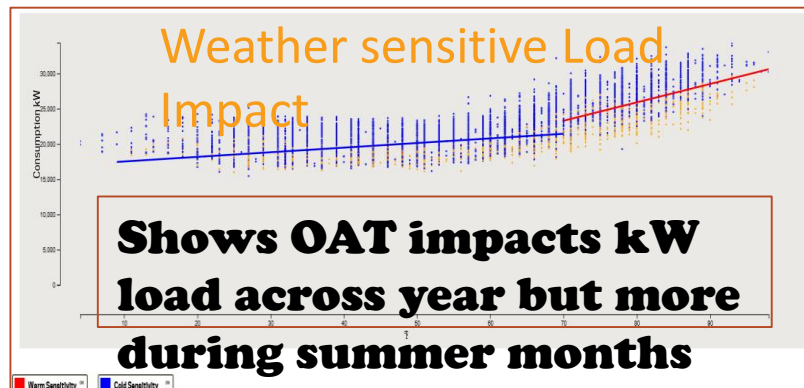
# Cpower advantage, 2020



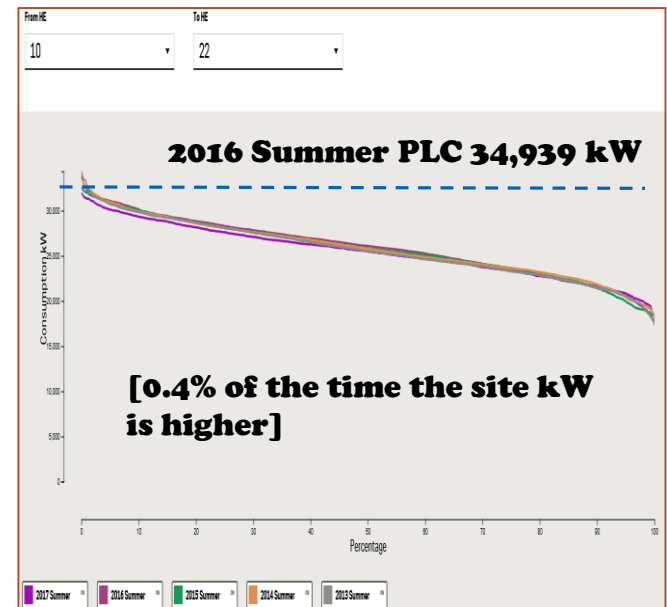
**Load Shape Curve: 2013 - 2017** Consistent pattern



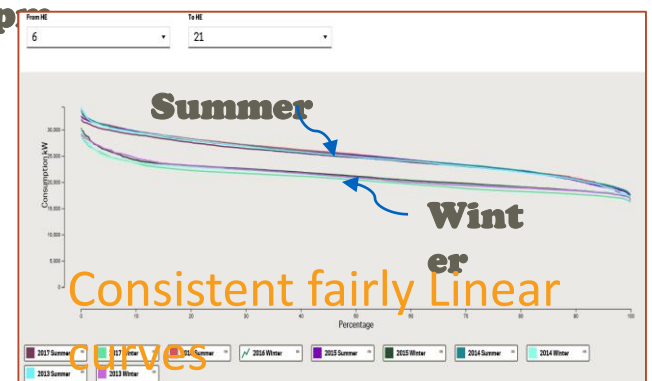
**Load Shape Curves Last 3 Weeks with 7-day Forecast**



**Weather Sensitivity Outside Temp**



**Demand Curves Summer Hrs 10am - 10pm**



**2013-17 Demand Curves Summer & Winter Hrs 6am-9pm**

Cpower  
Quantifies Multi  
Program  
participation



# How we help you succeed: engineering, best practices blogs, case studies

**CPower Engineering team works to provide a number of key services:**

## ONBOARDING

1. **Pre-Contract Curtailment Reviews**
2. **Preliminary Scope Development and Assessment**
3. **Preliminary Cost Estimates for Generator Upgrade and ADR Solution**

## RISK MITIGATION

1. **Generator Evaluation for Compliance**
2. **Air Permit Reviews**
3. **Customer Usage & Baseline Analysis**
4. **Customer Curtailment Strategies Reviews**

## AUTOMATION & EFFICIENCY

1. **Curtailment Plan Development**
2. **Building Automation Analysis**

## WHAT TO EXPECT IN THE UPCOMING PJM 2017/18 DEMAND RESPONSE SEASON AS WELL AS A 2020/21 BRA PREVIEW.

By Dann Price | April 27, 2017



September 2, 2016 | Choose Your Own Curtailment Adventure | David Paradis

## CHOOSE YOUR OWN CURTAILMENT ADVENTURE: "SCHOOL'S IN SESSION"



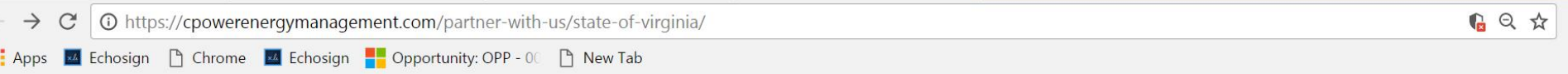
## DEMAND RESPONSE CONTRIBUTES MORE THAN JUST SUSTAINABILITY TO K-12 PUBLIC SCHOOL SYSTEM

By Leigh Anne Ratliff | May 01, 2017



You  
in d  
Read

# Visit Us on the State of Virginia Portal!



WHAT WE DO

PARTNER WITH US

WHO WE ARE

BLOG



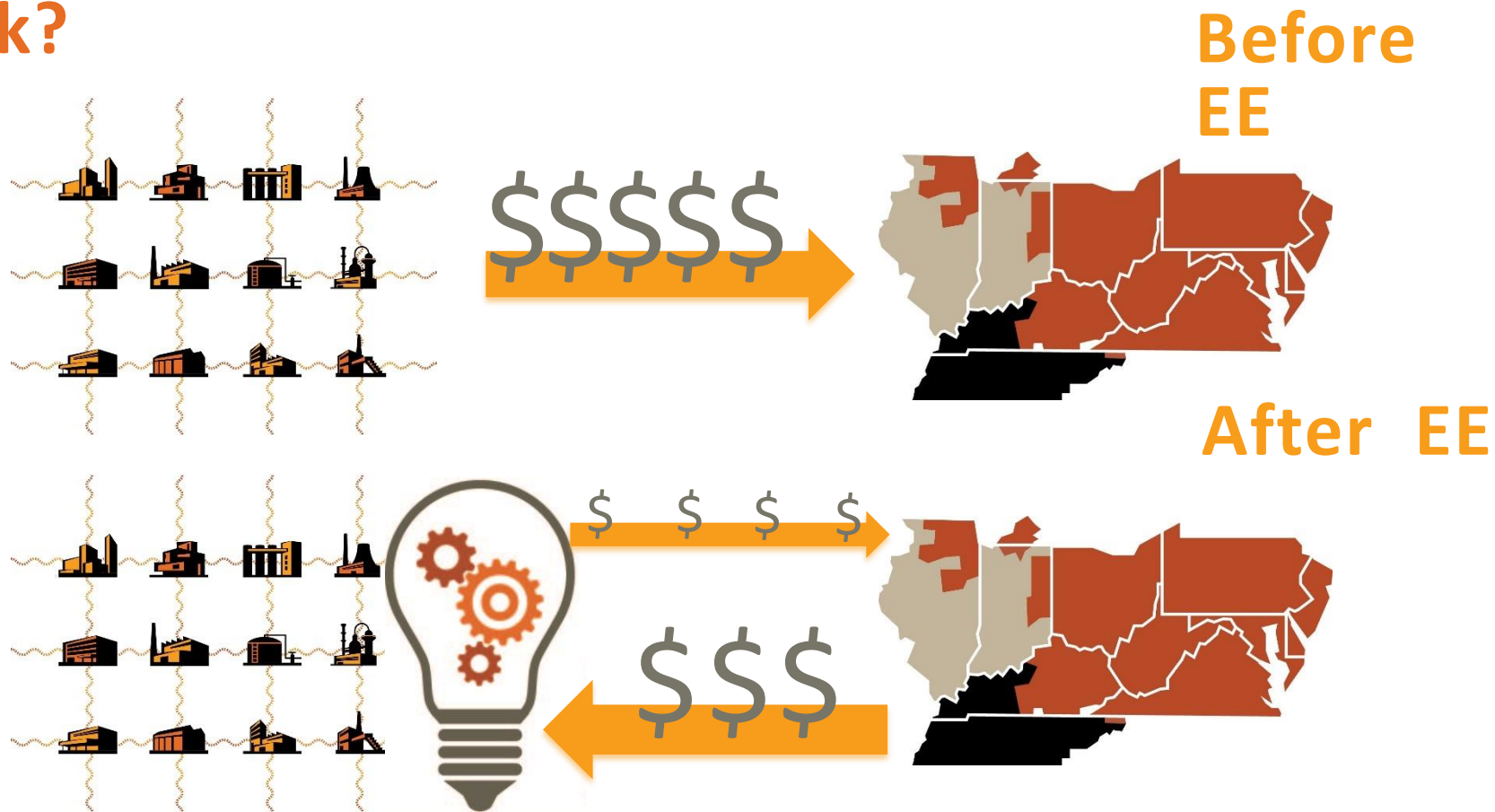
## STATE OF VIRGINIA DEMAND RESPONSE RESOURCES

HELPING STATE OF VIRGINIA ORGANIZATIONS REDUCE NET ENERGY SPEND THROUGH DEMAND-SIDE MANAGEMENT PROGRAMS



In 2016, CPower generated nearly 2 million dollars in revenue through demand response programs for State of VA entities. See our growth in Virginia and hear what participants are saying.

# How does the Energy Efficiency program work?



**PJM will pay for permanent efficiencies – either through upgrades installed at a facility or through efficient new building design.**



# Many small projects, large effect

**24 Participants, multiple facilities**

**In 2016-17, VA participants submitted **420** separate energy efficiency projects including lighting, heat pumps, chillers, and efficiently built new buildings.**

**Close to **7MW** submitted to PJM, equivalent to powering roughly **3500 homes****

# Energy Efficiency – how the payments work

**Energy efficiency projects can pay up to 4 years and the clock starts ticking when the project (or phase of a large project) is finished.**



**Each PJM year begins on June 1**

## EXAMPLES

**A project finished in November 2017 is a 2018 resource, if it were submitted in 2018, it would pay the full, four-year incentive in 2018, 2019, 2020 and 2021.**

**A project that finished in November 2015 was a 2016 resource BUT, it can still begin payments in 2018 and be paid for two of its remaining four years in 2018 and 2019 .**