



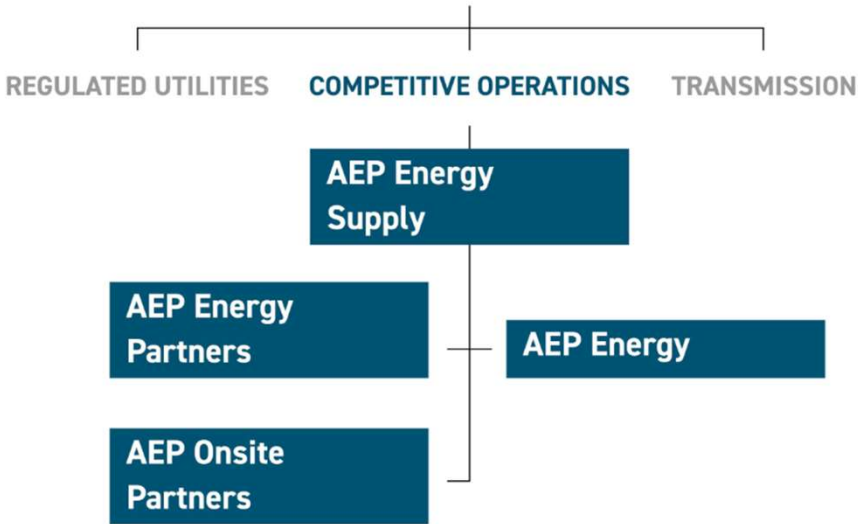
An AEP Company

Backup Power Generators: I Know the Benefits, But How Do I Offset the Costs?



About Us

American Electric Power



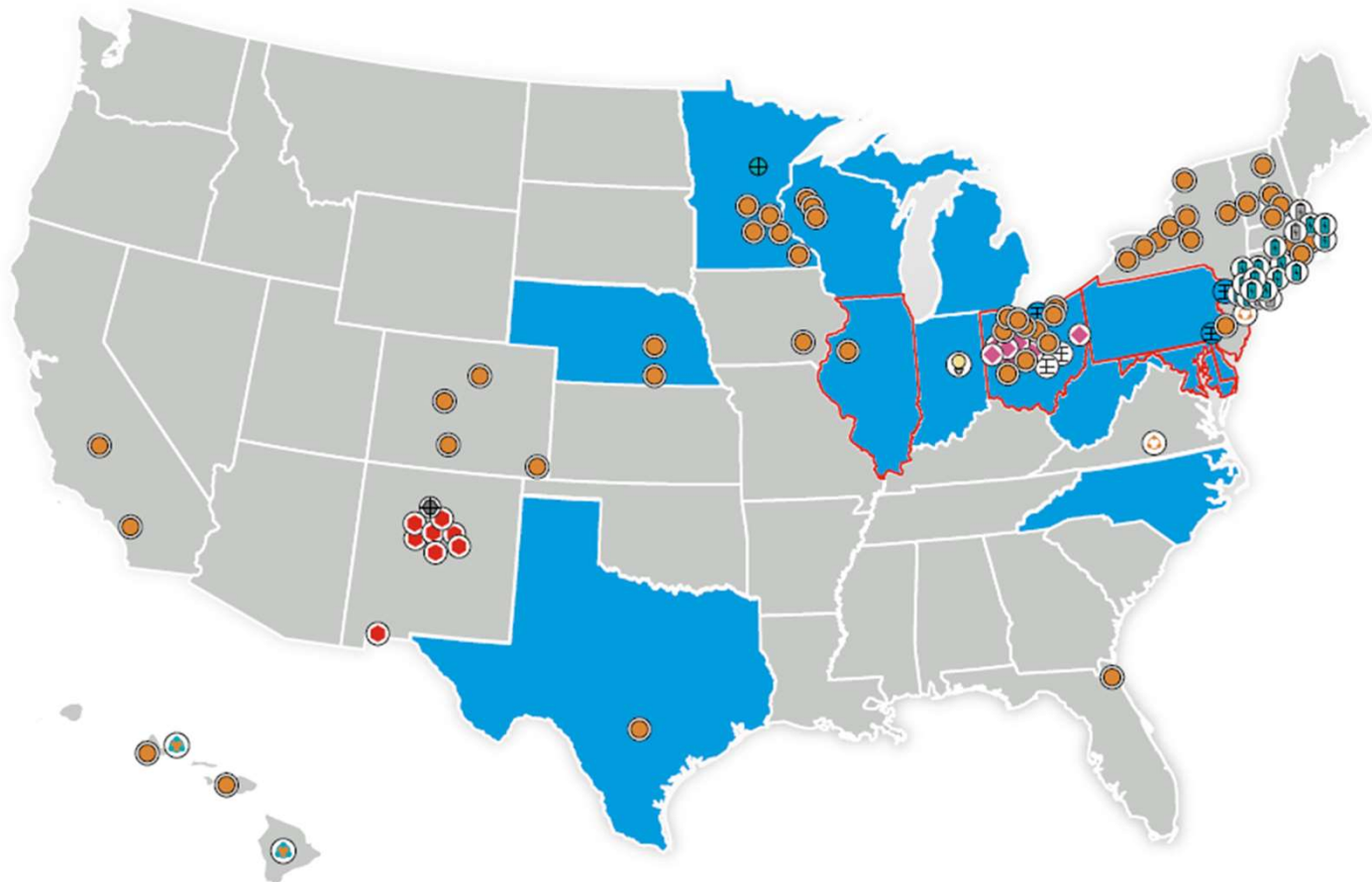
- AEP OnSite Partners is a leading provider of behind-the-meter solutions
- Assist our customers in electric resiliency, cost saving, and decarbonization strategies
- Technology Agnostic
- Provide Technical expertise, market knowledge, and investment capital for a geographically diverse array of energy projects



Cuyahoga County Animal Shelter, OH



About Us



Distributed Scale Assets

- Solar (Active) - 52 Sites | 122 MW
- Solar (Planned) - 1 Site | 6 MW
- Fuel Cell (Planned) - 4 Sites | 2 MW
- Fuel Cell (Active) - 17 Sites | 8 MW
- Station (Active) - 7 Sites | 1075 MVA
- Station (Planned) - 0 Sites | 0 MVA
- Solar (Active) Joint Venture - 8 Sites | 89 MW
- Solar (Planned) Joint Venture - 1 Site | 34 MW
- Engine (Planned) - 2 Sites | 5 MW
- Engine (Active) - 3 Sites | 16 MW
- Energy Efficiency - 1 Site | NA
- Solar/Storage (Active) - 2 Sites | 1 MW
- Battery Energy Storage System (Planned) - 0 Sites | 0 MW
- Battery Energy Storage System (Active) - 2 Sites | 20 MW

Retail Commodities

- Service Territory

Wholesale Commodities

- Service Territory



Agenda

- I. The Case for Reliability
- II. Offsetting Costs
- III. Technology Decision
 - I. Decarbonization
- IV. Why 3rd Party Ownership
- V. Q&A



Battery Project – South River, NJ

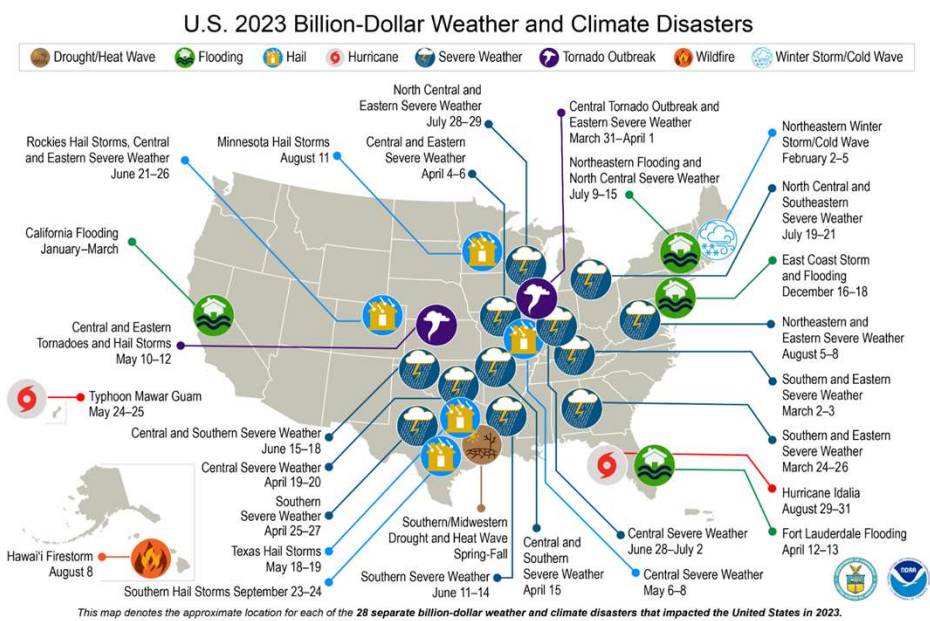


Peaking Generation – Retail Distribution Center - PA

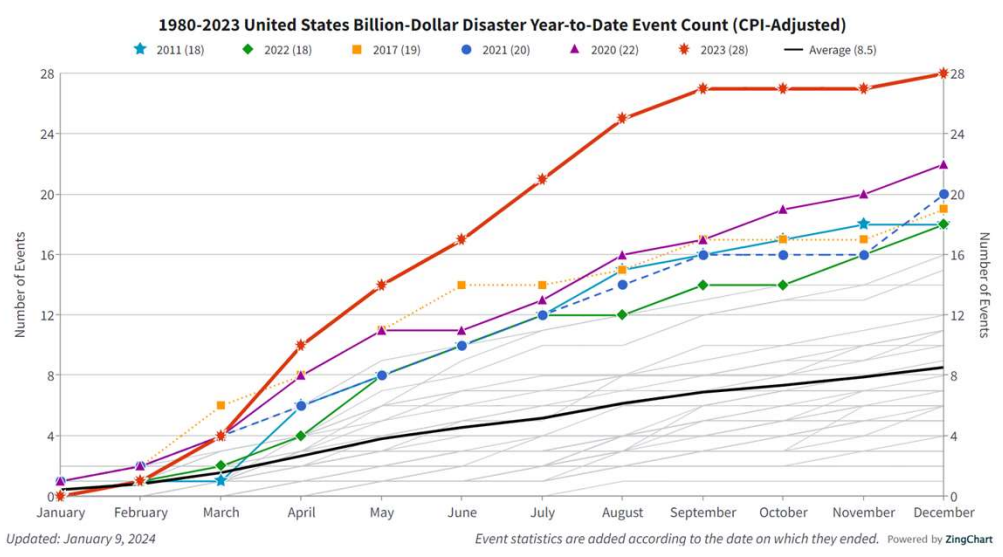


Extreme Weather Events Impacts to Reliability

There are numerous examples pointing to the increased severity and frequency of extreme weather events that impact grid reliability and cost billions on restoration efforts.



Record setting 28 separate billion-dollar weather events that impacted the United States in 2023



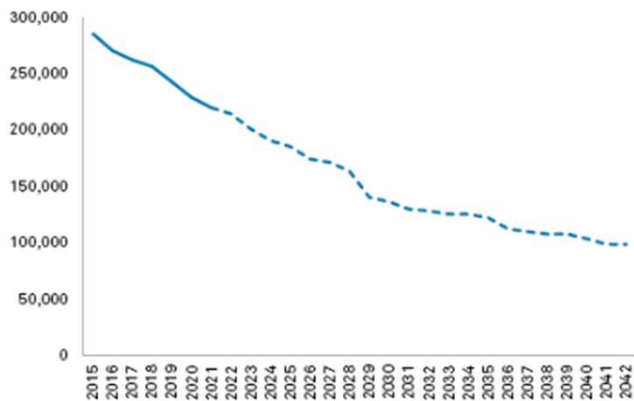
Average of last 6 years is over double the historical average. 18-20 events per year is becoming the norm.



Energy Shift – Fossil Retirements Replaced with Renewables

How will power reliability be impacted as the grid shifts to more renewable generation resources?

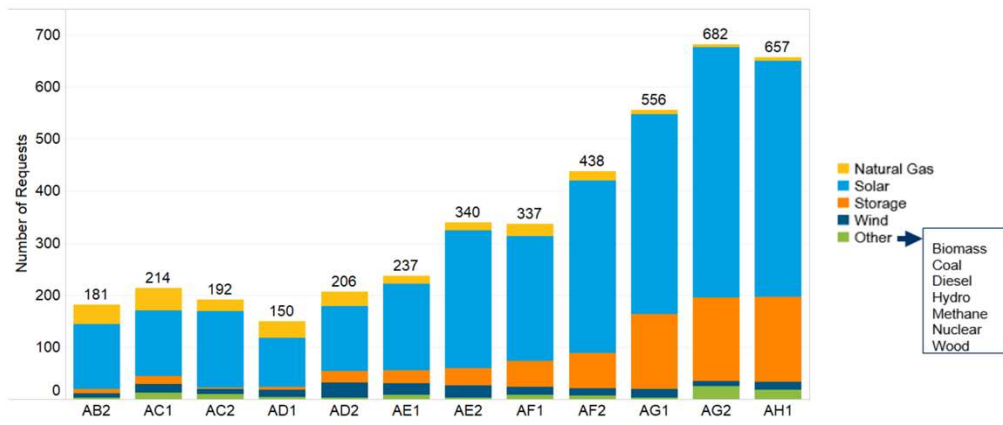
Remaining installed coal capacity (MW)



Data compiled Jan. 20, 2022.
 The dotted portion of the line represents projected remaining coal capacity based on annual planned retirements.
 Source: S&P Global Market Intelligence

Coal Retirements Planned to Continue

PJM Generation Interconnection Requests



Nearing Approval/ Decision → Expecting Decision in 2025-2027

New Generation Mainly Renewable

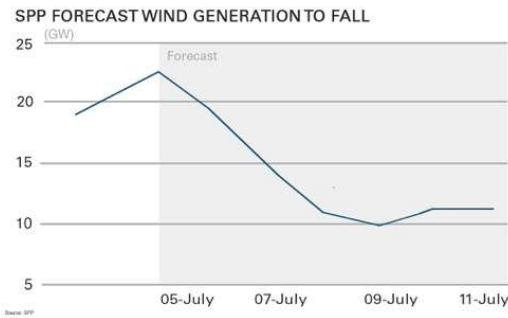
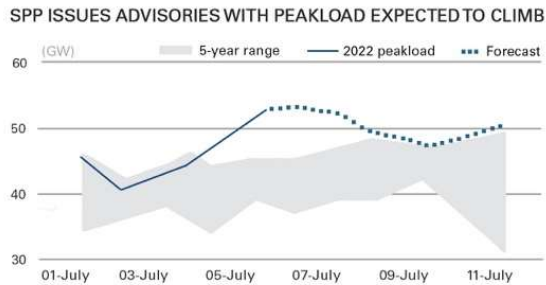
- Biomass
- Coal
- Diesel
- Hydro
- Methane
- Nuclear
- Wood



Reliability of the Grid Under a Renewable Energy Portfolio

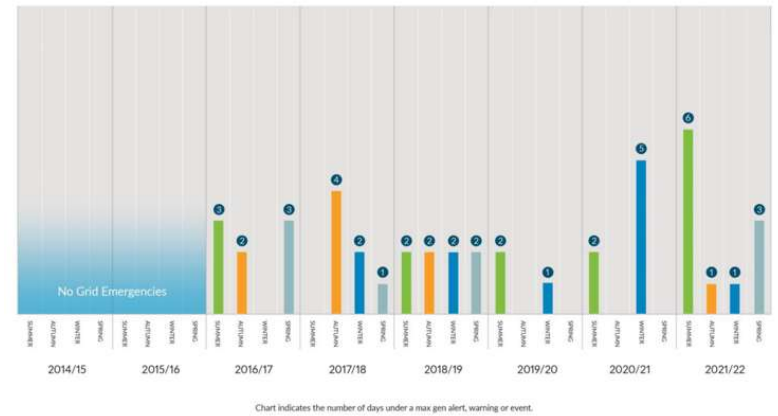
Questions are being raised as to whether the increased extreme weather events, paired with increased injection of renewables are causing stress on the grid.

SPP & MISO emergency alerts 7/6/22 – 7/8/22



SPP and MISO have declared conservative operations for all or part of their footprints due to hot weather, high loads, and **wind forecast uncertainties**.

MISO emergency events increases (FERC filing)



Source: Midwest Independent System Operator, Inc. filing at the FERC in Docket No. ER22-495-000 regarding implementation of availability-based Seasonal Accredited Capacity ("SAC") for certain resources in MISO's annual Planning Resource Auction



Economic Indicators and Resiliency Actions

Historic grid interruptions from extreme weather events and restoration capital spend are driving investments in resiliency which may lead to increased utilization of dispatchable resources to assist the grid in emergency events.

Economic Indicators

ERCOT cost of electricity during winter storm URI

“Texas Ratepayers Are Being Saddled With Nearly \$38 Billion In Excess Energy Costs From Winter Storm Uri” – Forbes article written by Robert Bryce June 11, 2021

Expectation of Increasing Capacity Pricing in PJM

[“FERC-approved changes will likely put upward pressure on capacity prices in most parts of PJM”](#)

ERCOT Policy Changes

Emergency Responsive Service - June 2022 funding increased by 50%

Performance Credit Mechanism – Current proposal intended to provide financial incentives to generators who perform during emergency events

Resiliency Actions

Biden Administration Announces \$3.9 Billion to Strengthen America's Power Grid

Administered by the Grid Deployment Office and funded by the Bipartisan Infrastructure Law, the GRIP program enhances grid flexibility and resilience against growing threats of extreme weather and climate change

City of Columbus Climate Action Plan and Resiliency Hubs

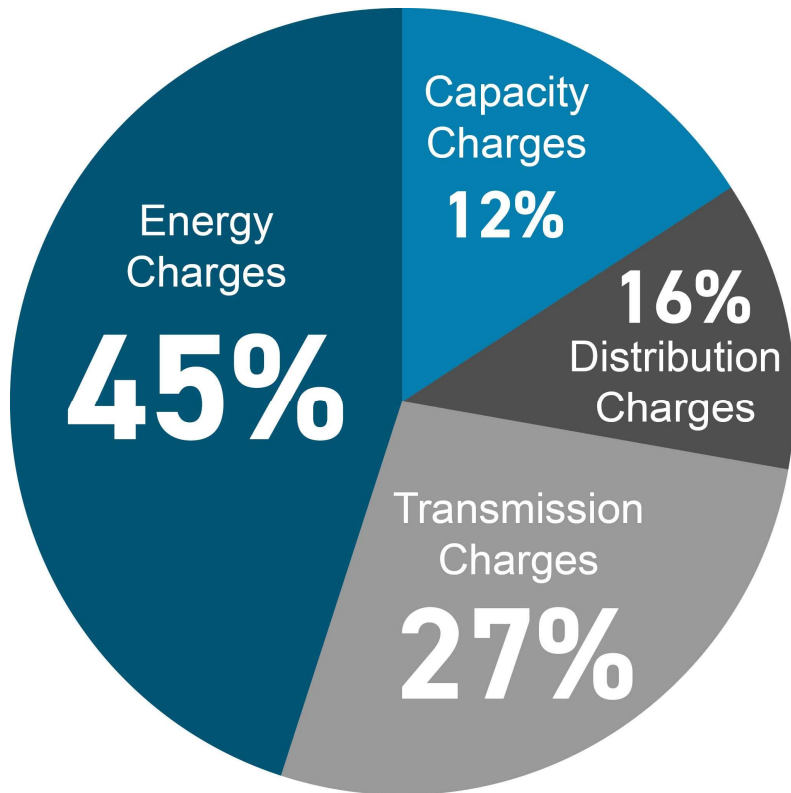
Deploy capital to build microgrids at community centers within 15 min walk for all residences, providing backup power sources to power community heating and cooling centers during natural disasters

Texas Emergency Preparedness Plans

Senate Bill 3 requiring emergency preparedness plans for water utilities



Typical Breakdown of an Industrial Electric Bill



Common Line-Item Names

- Distribution
- Generation Capacity
- Peak Demand Charge
- Transmission
- Transmission Service Charge

Backup generation can help reduce many of these billing components!



Typical Breakdown of an Industrial Electric Bill

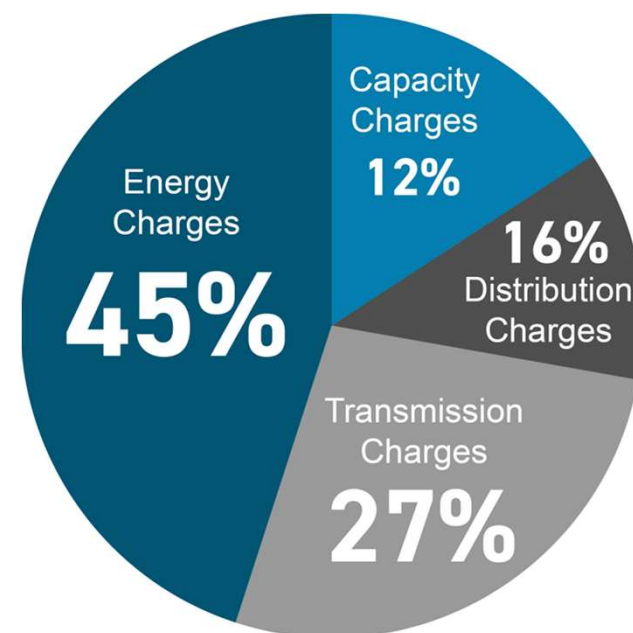
Capacity Charges in PJM

- Mechanism to provide reliability and ensure adequate generation capacity
- Based on your organization's Peak Load Contribution (PLC), which is set annually and is based on your energy usage during PJM system peak hours

Transmission Charges in PJM

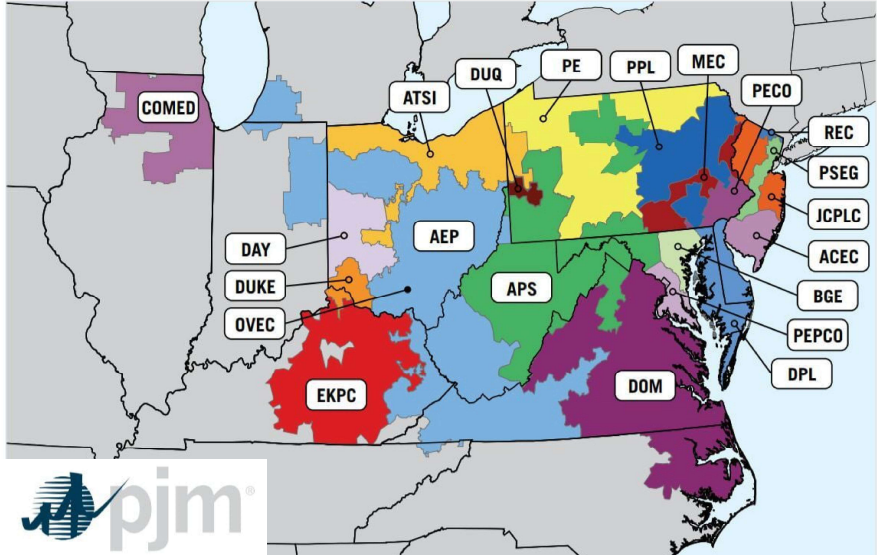
- Mechanism by which transmission owners recoup their annual costs and meet capital recovery requirements
- Based on your organization's Network Service Peak Load Contribution (NSPL), which is set annually and is based on your energy usage during peak hours

[How Can Backup Generation Help?](#) Run your asset to reduce your grid usage during peak times





PJM Service Territory and 2023 Coincident Peaks



Legend

- ZONE**
- Allegheny Power Systems (APS)
 - American Electric Power Co., Inc. (AEP)
 - American Transmission Systems, Inc. (ATSI)
 - Atlantic City Electric Company (ACEC)
 - Baltimore Gas and Electric Company (BGE)
 - ComEd (COMED)
 - Dayton Power and Light Company (DAY)
 - Delmarva Power and Light Company (DPL)
 - Dominion (DOM)
 - Duke Energy Ohio and Kentucky (DUKE)
 - Duquesne Light (DUQ)
 - East Kentucky Power Cooperative (EKPC)
 - Jersey Central Power and Light Co. (JCPLC)
 - Metropolitan Edison Company (MEC)
 - Ohio Valley Electric Corporation (OVEC)
 - PPL Electric Utilities (PPL)
 - PECO Energy (PECO)
 - Pennsylvania Electric Company (PE)
 - Potomac Electric Power Company (PEPCO)
 - Public Service Electric and Gas Co. (PSEG)
 - Rockland Electric Company (REC)

PJM 5 CPs – 2023 Hours

- July 5, 2023 5 PM to 6 PM
- July 27, 2023 5 PM to 6 PM
- July 28, 2023 5 PM to 6 PM

- September 5, 2023 4 PM to 5 PM
- September 6, 2023 5 PM to 6 PM

These are the five hours during the summer of 2023, when PJM saw their highest demand of electricity for the entire RTO.



PJM – Transmission and Capacity Costs

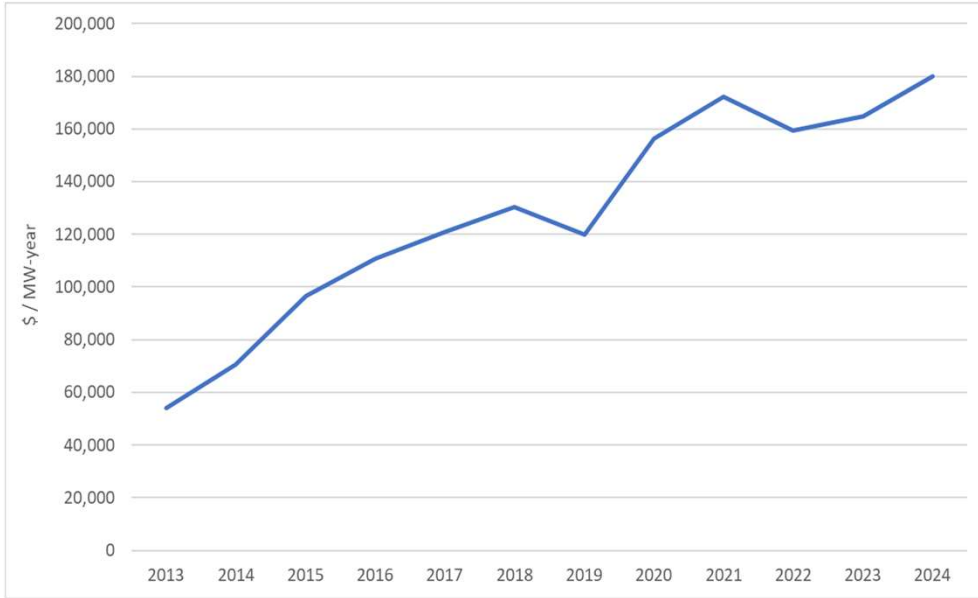


Transmission and capacity charges in 2024 range from **~\$50K** to **~\$220K per MW**

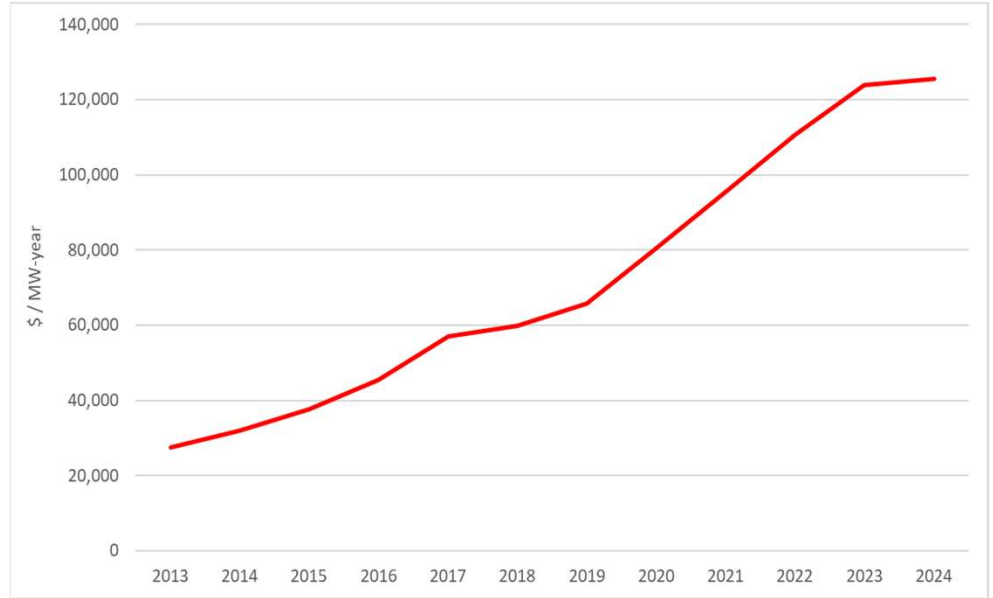
Zone	Transmission (2024)	Capacity (5 yr Ave)	Total
PSEG	\$180,897	\$41,230	\$222,127
AEP	\$125,466	\$24,288	\$149,754
PPL	\$104,360	\$31,041	\$135,401
AECO	\$91,559	\$39,498	\$131,057
ATSI	\$87,624	\$25,605	\$113,229
MetEd	\$73,260	\$31,041	\$104,301
PennElec	\$73,260	\$31,041	\$104,301
Delmarva,ODEC	\$55,166	\$40,854	\$96,020
Dominion	\$68,271	\$24,288	\$92,559
Duquesne	\$63,330	\$24,288	\$87,618
RECO	\$46,076	\$39,498	\$85,574
BGE	\$46,400	\$34,853	\$81,253
ComEd	\$39,796	\$37,806	\$77,602
JCPL	\$37,937	\$39,498	\$77,435
PEPCO	\$42,655	\$31,007	\$73,662
Duke	\$40,717	\$29,062	\$69,779
PECO	\$25,648	\$39,498	\$65,146
EKPC	\$34,784	\$24,288	\$59,072
Dayton	\$32,781	\$24,288	\$57,069
APS	\$17,115	\$24,288	\$41,402



Historical Transmission Costs



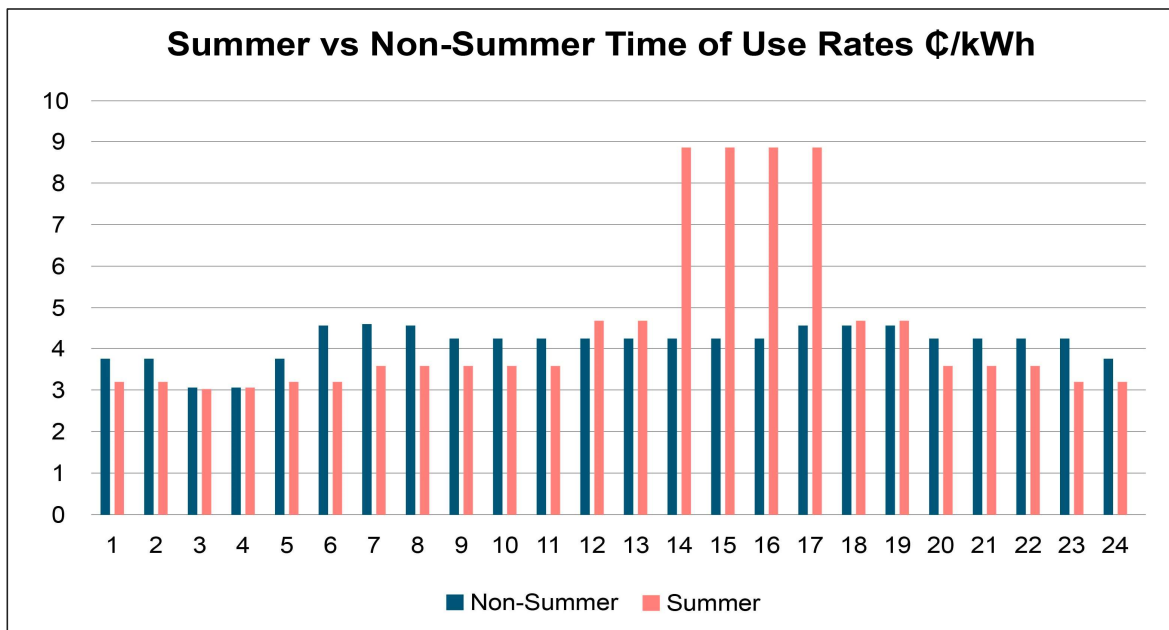
PSEG Transmission Rates
2013 to 2024



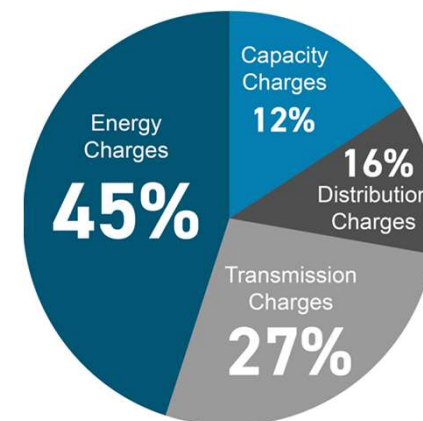
AEP Transmission Rates
2013 to 2024



Backup Generator Costs vs Utility Energy Charges



- On-site generation allows more control over your energy costs
 - Taking advantage of TOU rates
 - Shielding from high \$/MWh index rates
 - Avoiding volumetric distribution costs



- The time of use rate goes up to nearly 9¢/kWh from 2-6 PM.
- If the all-in cost to run your generator is less than this, then it is cheaper to generate electricity yourself

(Some) Ancillary and Demand Response Programs

PJM

Regulation

- Used to control small mismatches between load and generation

Reserves

- Makes up for generation deficiencies if there is loss of a large generator

Economic Demand Response

- Pays you to reduce electricity demand during high-priced hours

ERCOT

Regulation

- Used to control small mismatches between load and generation

Responsive/Contingency/Non-spin Reserves

- Makes up for generation deficiencies with each product meeting a specific need/duration

Emergency Response Service

- Pays you to be available deployment in an electric grid emergency

MISO

Regulation

- Used to control small mismatches between load and generation

Supplemental/Non-spin Reserves

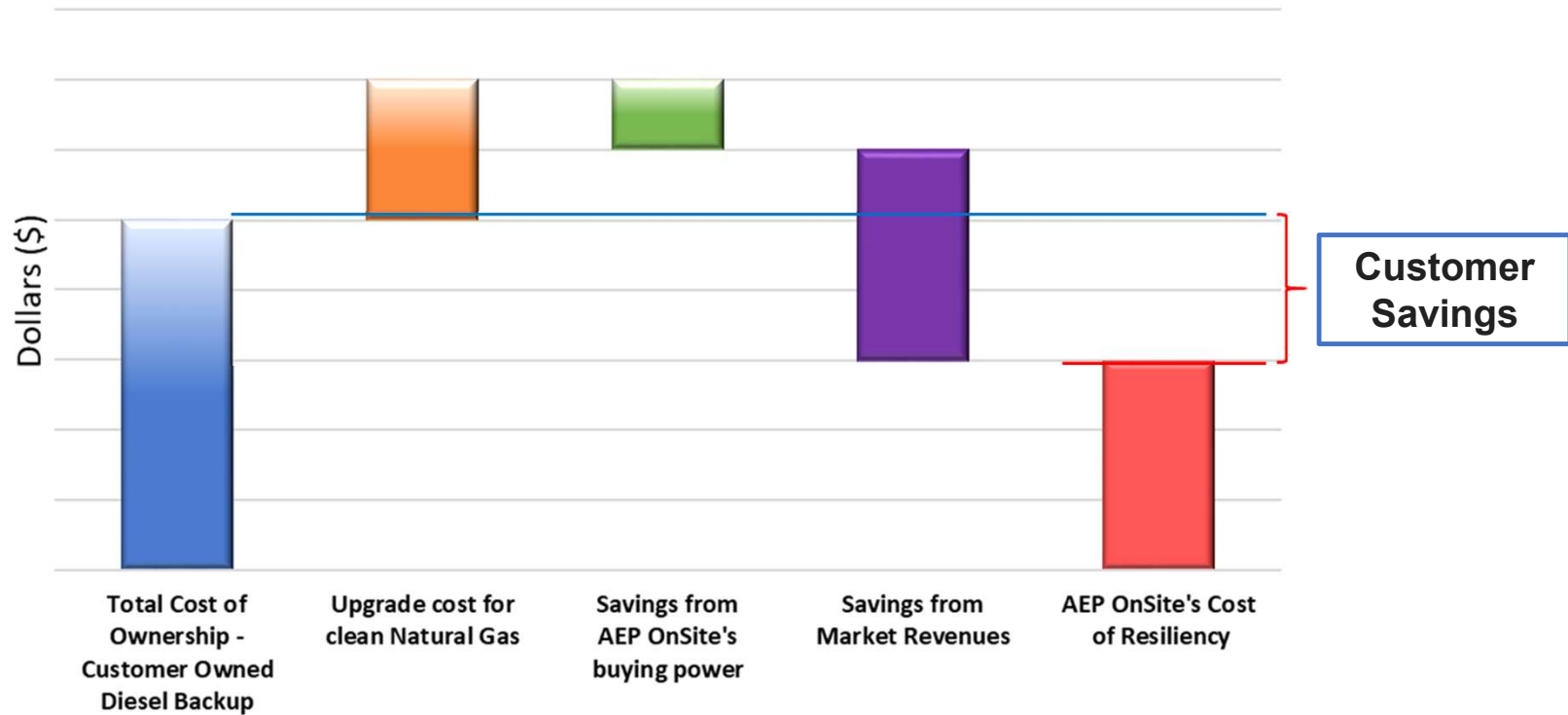
- Makes up for generation deficiencies with each product based on synch status with the grid (10m response)

Demand Response

- Pays you to be available deployment in an electric grid emergency



Why does this make sense? - Natural Gas Example

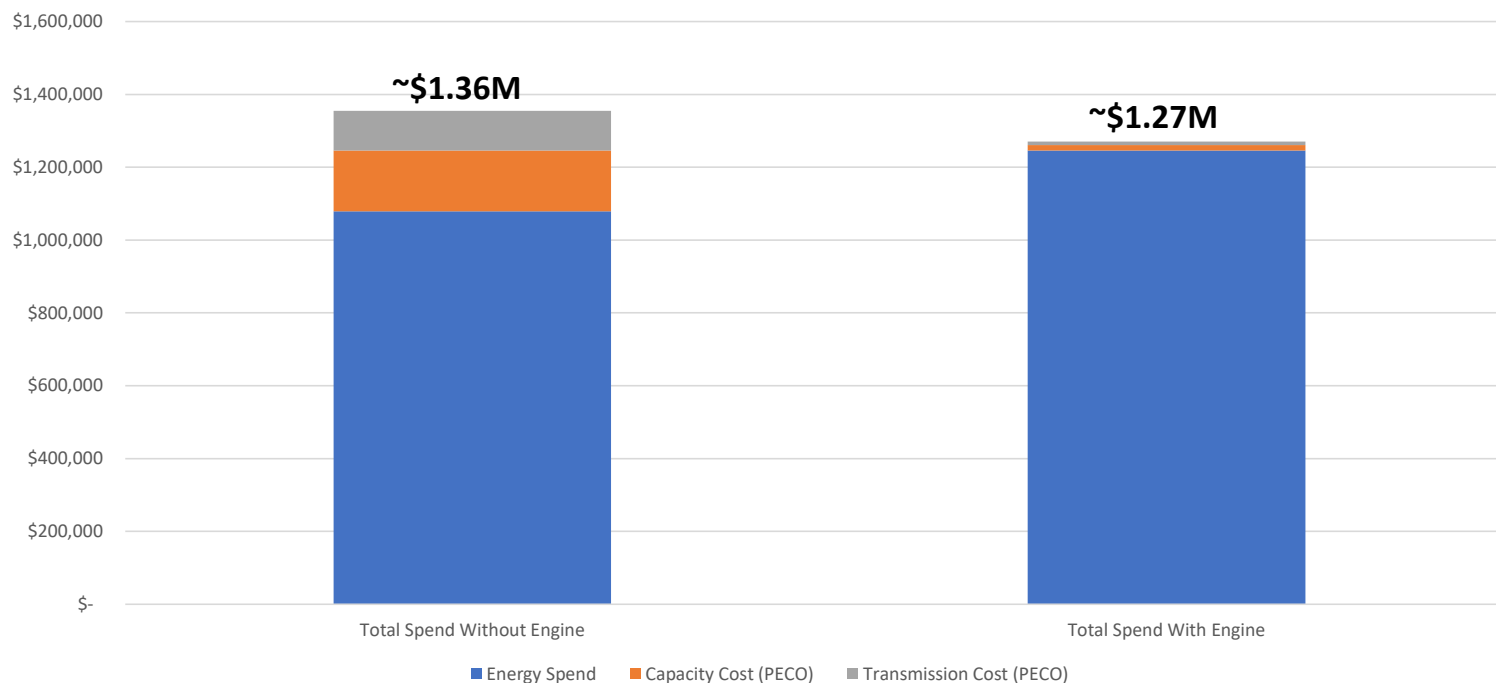


Combining AEP OnSite's buying power and market expertise results in **customer savings** versus the cost of a traditional back up power system.



Real Example – Retail Distribution Company in PECO

Energy, Capacity, Transmission Total Spend 2022 & 2023



- Partnered with our sister company, AEP Energy, to wrap the capital recovery of a natural gas engine into a long-term supply deal
- Engine used to reduce capacity and transmission tags
- Provides long term price certainty and protection from increasingly expensive billing components

Cost savings can be achieved even in a utility territory with relatively low transmission rates!



Resiliency Solutions High-level Overview

AEP Energy can drive your resiliency strategy and engineering the right solutions to meet your needs to overcome operational, risk and economic factors.



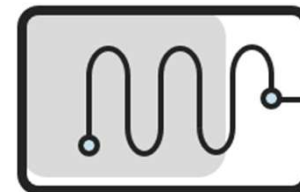
Backup Generators

- Short-term critical infrastructure supply and/or long-duration backup power supply for commercial and industrial use
- Dispatchable capabilities and cost-effective depending on resilience need
- Natural gas backup generation (size and cost vary) has carbon emissions



Battery Storage

- Short-term critical infrastructure supply and support for onsite renewable energy generation
- Cost-effectiveness varies based on key variables
- Zero-carbon resiliency solution



Fuel Cells

- Long-term asset as long as a fuel source is available
- Provides baseload power supply reducing the reliance of purchasing electricity from the grid
- Economic trade offs balancing cost solution vs. Lower-carbon emissions

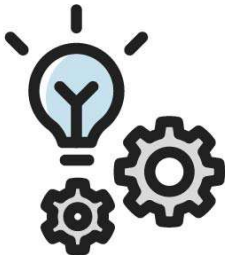


Resiliency-as-a-service vs Do-It-Yourself



Free Up Capital for Other Investments

AEP Onsite Partners provides the investment capital. Your facility has more capital to invest in activities that provide you with greater returns.



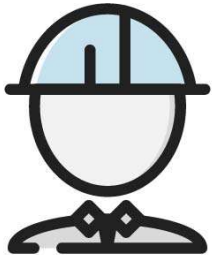
Free Up Maintenance for Other Tasks

Maintaining and servicing a backup generator may not fit into the normal routine and skill set for your technicians. AEP Onsite Partners takes this on.



Energy Market Management

AEP Onsite Partners is actively participating in the energy markets to maximize the economic benefit of the generator.



Permit Compliance and Management

Running a generator for economic purposes requires certain permitting and compliance. Let AEP Onsite Partners manage that.



Resiliency-as-a-Service – Is it for me checklist



Some need for Resiliency

How much are your operations interrupted when the power goes out?



1/2 MW to 1 MW+ of Energy Need

What is the peak electrical demand for your facility?



Multi Site Resiliency Need

Chain of retail or grocery stores, for example.



High Load Factor

Utilization of asset for market participation is maximized when large and consisted loads are available.



High Electricity Costs

Obviously the higher these costs are, particularly transmission and capacity, the better the business case.



Availability of Ancillary Programs

What programs does your utility provider offer to resiliency assets? ERCOT, MISO & PJM



An **AEP** Company

Questions?



How to Get in Touch

Dan Smies

Managing Director of Business
Development & Strategy
dbsmies@aepes.com | 920-268-7444

Sean Handel

Business Development Manager
sthandel@aepes.com | 419-345-9634



Follow AEP Energy on:



[LinkedIn](#)



[Facebook](#)



An **AEP** Company

Thank you!

