# The New Energy Playbook for Hospitals

## Leveraging Combined Heat and Power (CHP) and Demand Management in an Evolving Energy Market

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Ohio CAT

OHIOCAT.COM

# Speakers

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# Conflict of Interest Disclosure

We have the following perceived conflicts of interest that relate to this presentation:

Caterpillar and Ohio CAT manufacture and sell power generation equipment, including generators and combined heat and power (CHP) systems.
In addition, Caterpillar provides energy services including demand management and energy-as-a-service offerings.

# Energy Landscape Challenges

The Energy Landscape Is Changing

- Rising Transmission Prices
- Increased Economic Opportunities
- Uncertainty of Capacity Markets

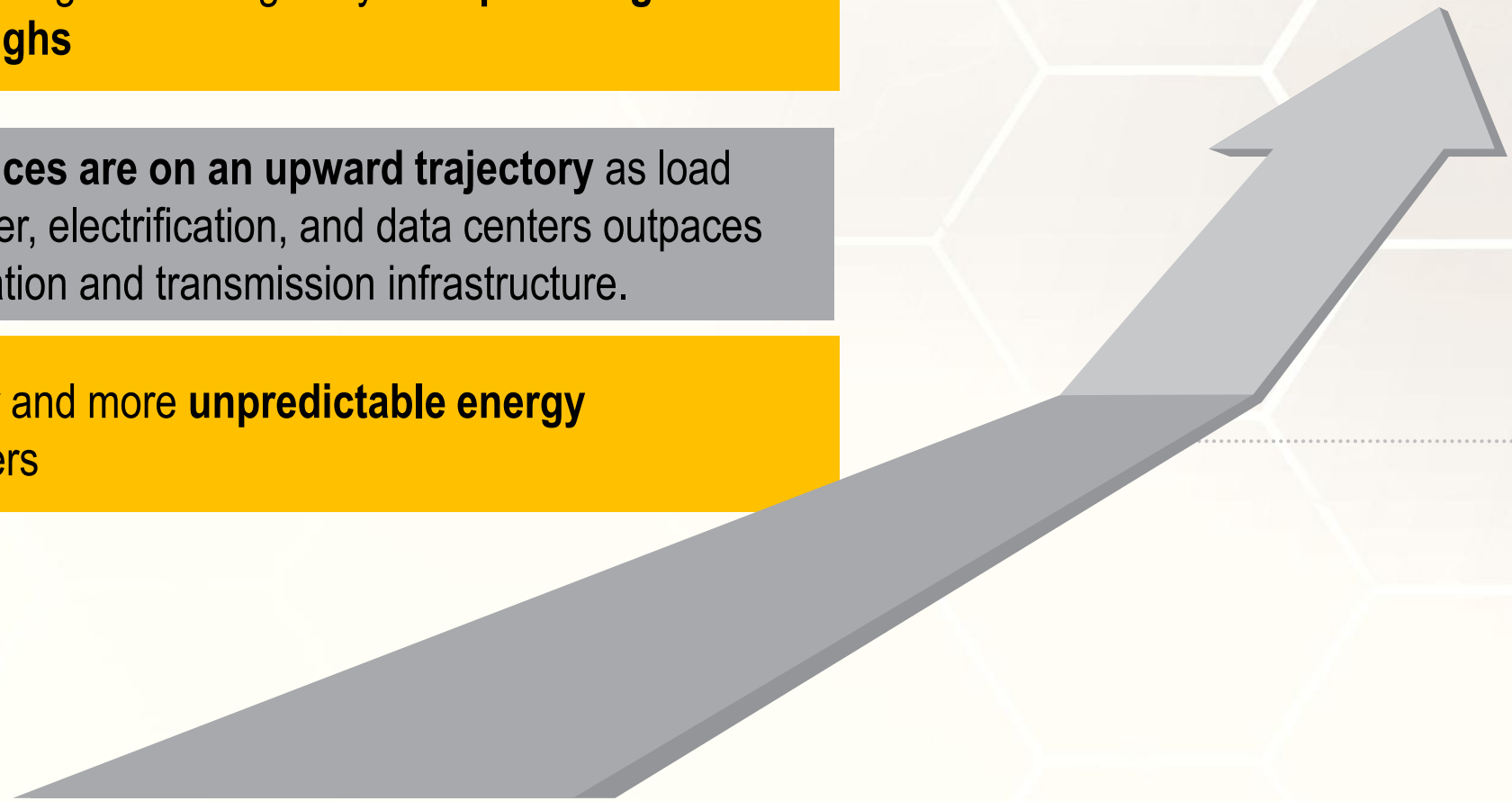
# The New Reality of Customer Energy Costs

2035?

In 2025, demand in regions managed by **PJM pushed grid loads to record highs**

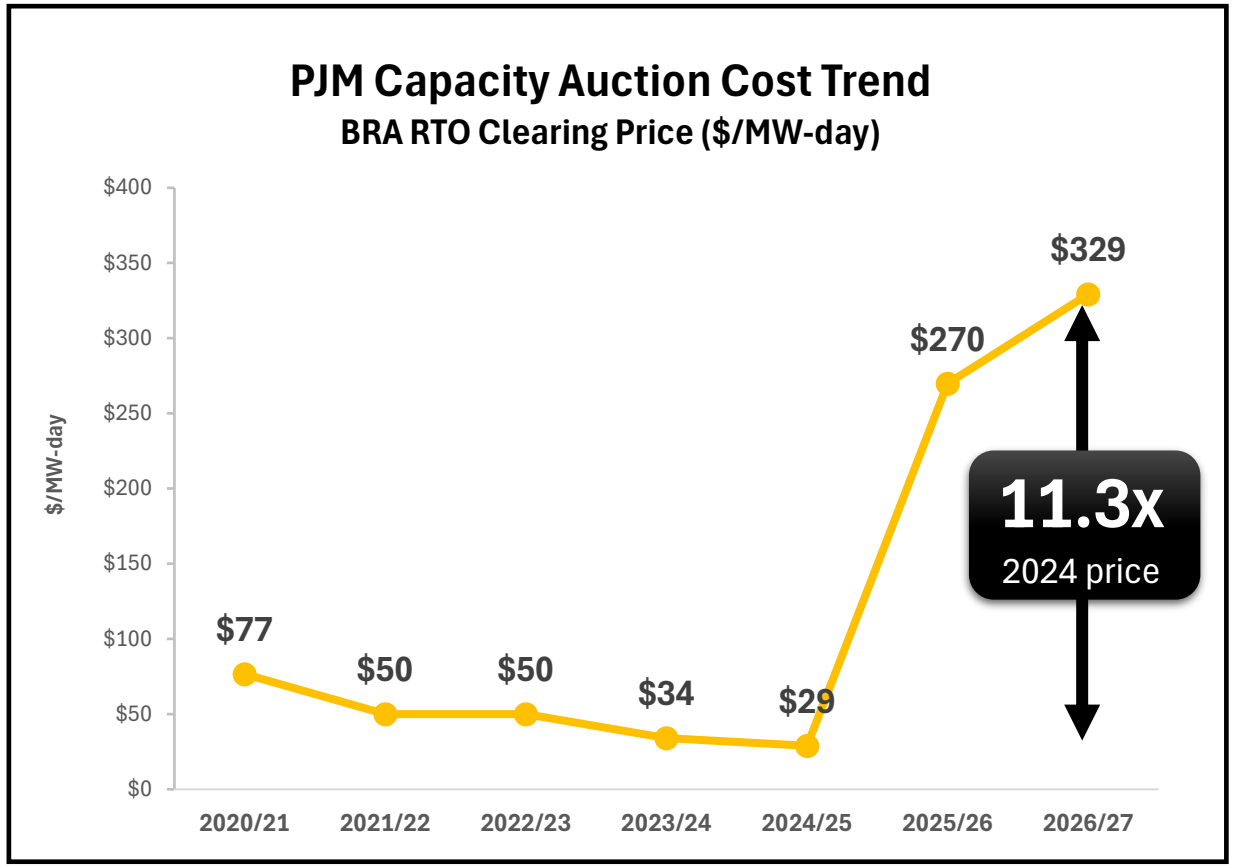
**U.S. electricity prices are on an upward trajectory** as load growth from weather, electrification, and data centers outpaces additions to generation and transmission infrastructure.

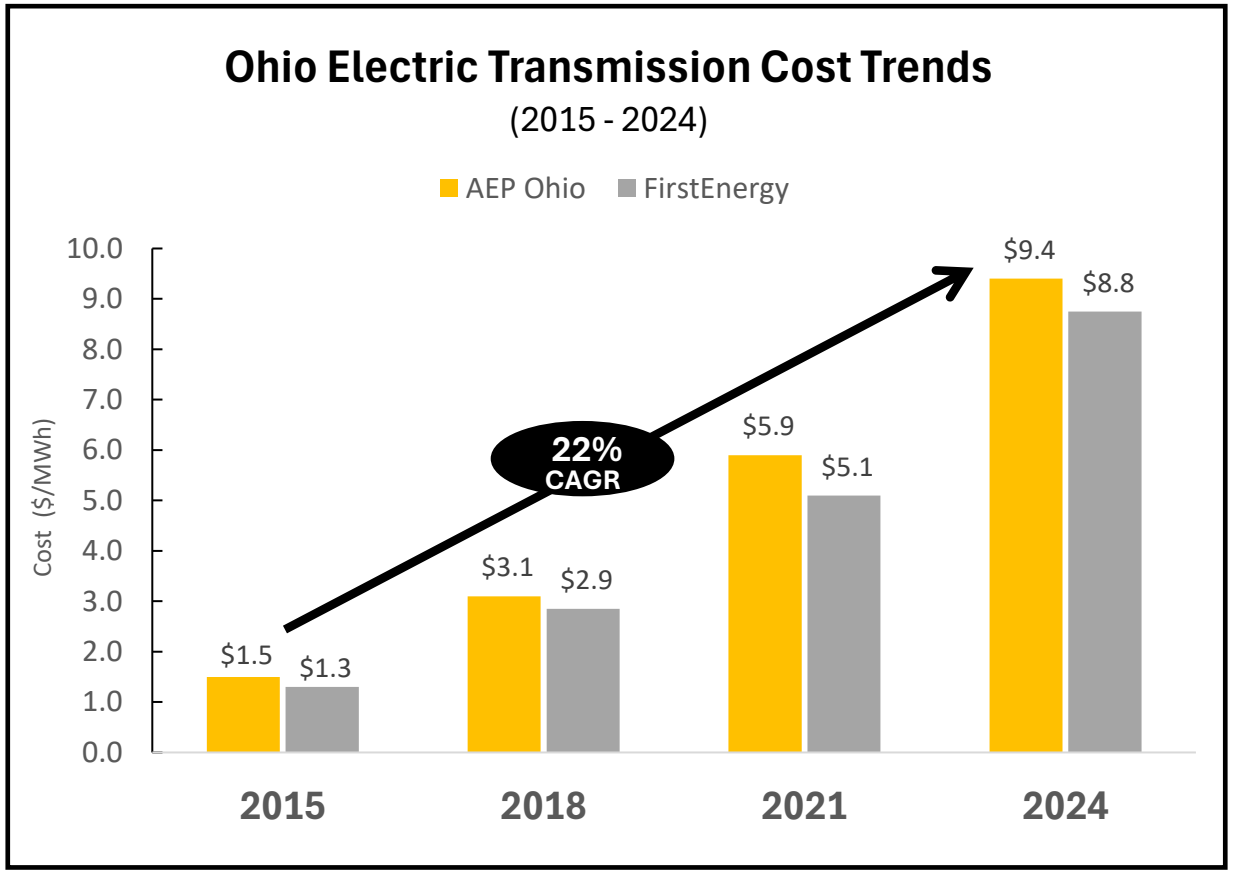
Resulting in higher and more **unpredictable energy spend** for customers



# Why This Matters Now

## Ohio's rising energy costs.....

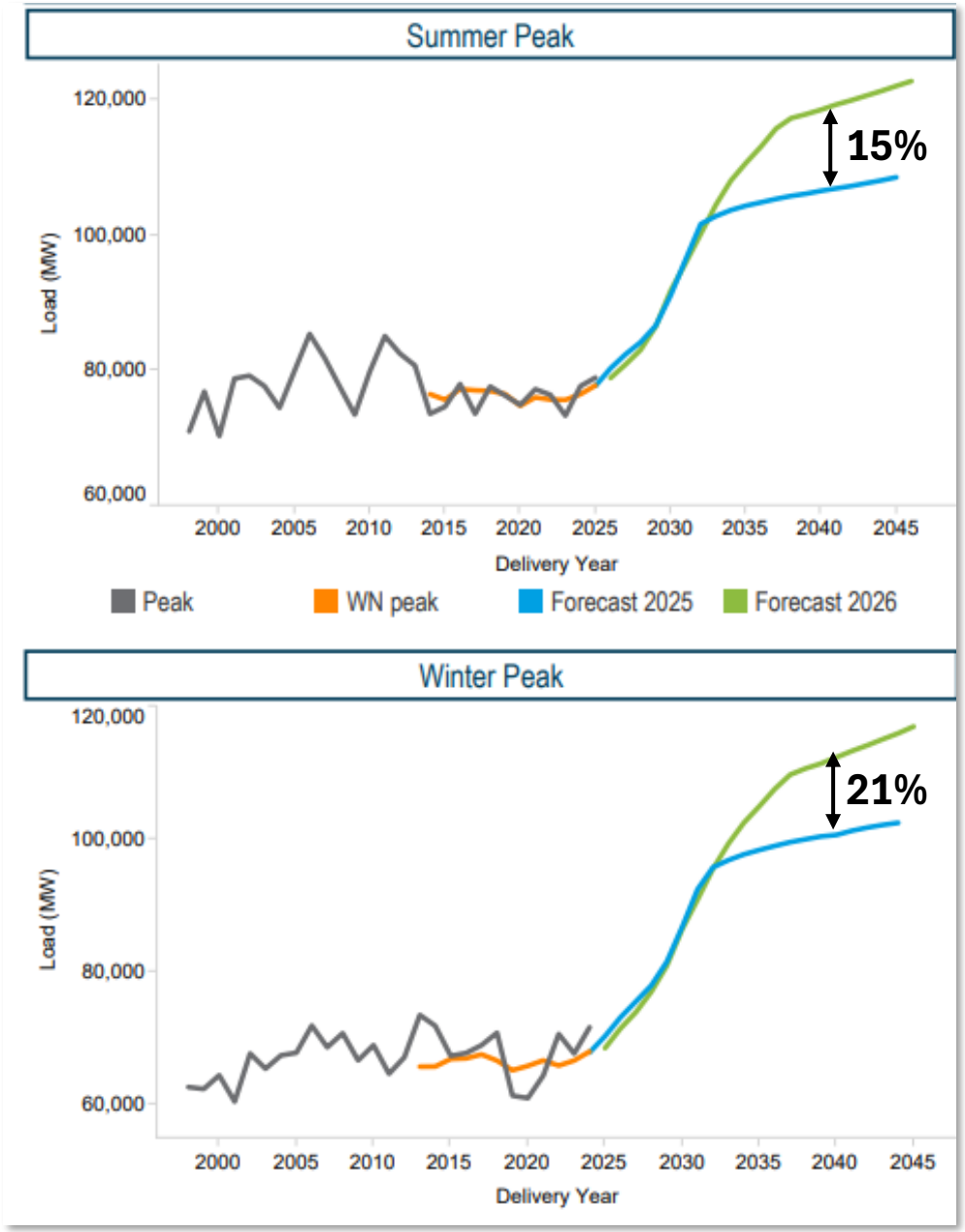



## ...and unprecedented demand on the grid is causing capacity constraints.

Sources: Ohio Manufacturer's Association, AEP Ohio, PJM BRA Auction Results

# PJM Western Zone: Capacity & Transmission Prices




**PJM Western Zone projected load growth over 10 years:**

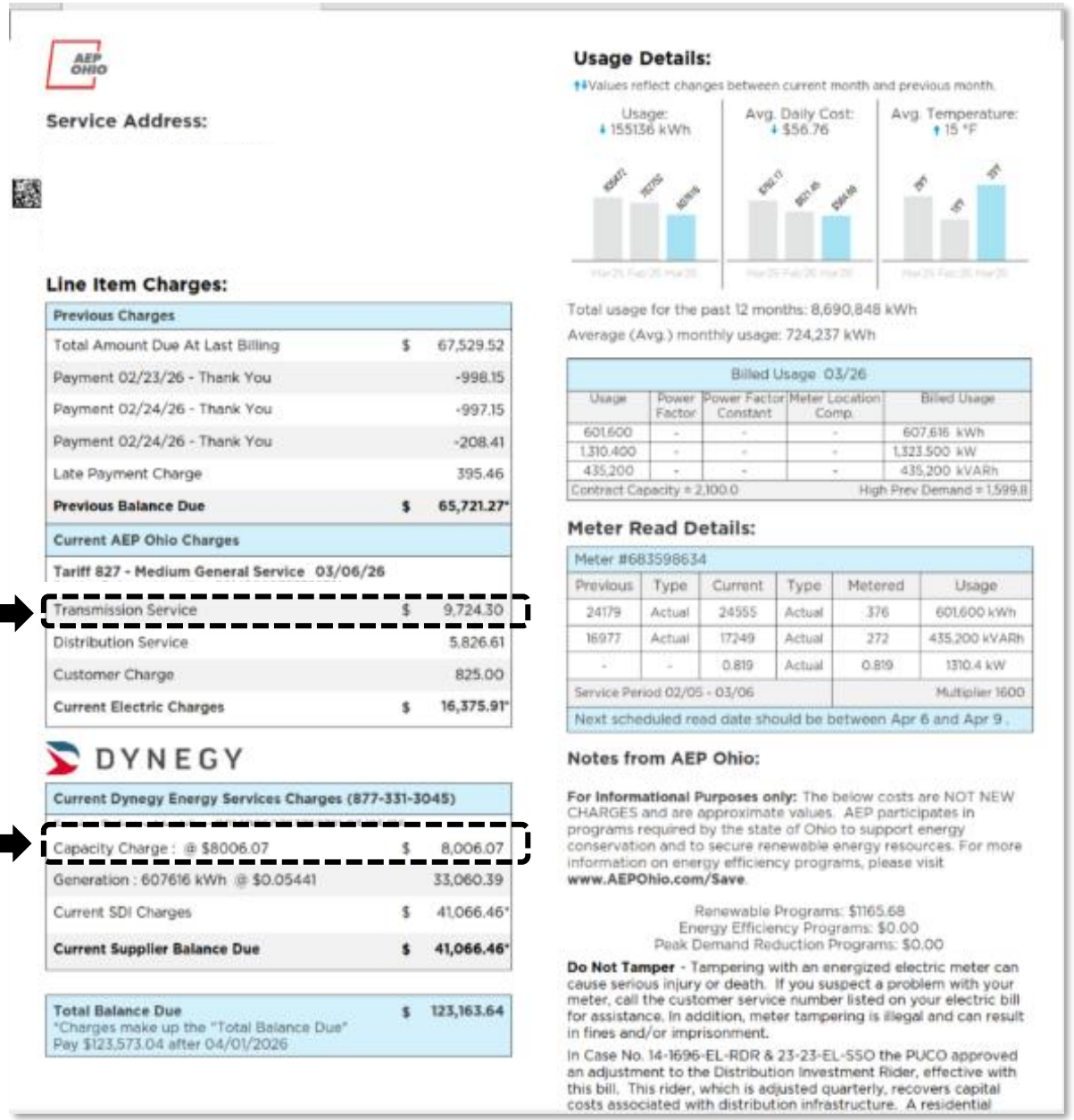
| | |
|---|---|
| Summer Peak Load | **3.7% CAGR** |
| Winter Peak Load | **4.3% CAGR** |
| Net Energy Load | **5.3% CAGR** |

## Why These Numbers Matter

- **Over 8.6 GW of Data Center Electric Service Agreements signed with AEP** in PJM's 2026 forecast – equivalent to AEP Ohio's entire peak demand
- **Ohio winter grid stress** During the Jan 2026 polar vortex, Ohio AEP-Dayton Hub day-ahead energy prices spiked to $1,153/MWh (20 - 40x normal peak)

Sources: PJM 2026 Load Forecast Report; Ohio Energy Report – Jan 2026

# Demystifying your Electric bill



AEP OHIO

Service Address:

**Usage Details:**

Values reflect changes between current month and previous month.

| Usage: | Avg. Daily Cost: | Avg. Temperature: |
|---|---|---|
| ↓ 155136 kWh | ↓ $56.76 | ↑ 15 °F |

Total usage for the past 12 months: 8,690,848 kWh

Average (Avg.) monthly usage: 724,237 kWh

**Line Item Charges:**

| Previous Charges | | |
|---|---|---|
| Total Amount Due At Last Billing | $ | 67,529.52 |
| Payment 02/23/26 - Thank You | | -998.15 |
| Payment 02/24/26 - Thank You | | -997.15 |
| Payment 02/24/26 - Thank You | | -208.41 |
| Late Payment Charge | | 395.46 |
| **Previous Balance Due** | **$** | **65,721.27*** |
| **Current AEP Ohio Charges** | | |
| **Tariff 827 - Medium General Service 03/06/26** | | |
| Transmission Service | $ | 9,724.30 |
| Distribution Service | | 5,826.61 |
| Customer Charge | | 825.00 |
| **Current Electric Charges** | **$** | **16,375.91*** |

DYNEGY

| Current Dynegy Energy Services Charges (877-331-3045) | | |
|---|---|---|
| Capacity Charge : @ $8006.07 | $ | 8,006.07 |
| Generation : 607616 kWh @ $0.05441 | | 33,060.39 |
| Current SDI Charges | $ | 41,066.46* |
| **Current Supplier Balance Due** | **$** | **41,066.46*** |

| | | |
|---|---|---|
| **Total Balance Due** | **$** | **123,163.64** |
| *Charges make up the "Total Balance Due" | | |
| Pay $123,573.04 after 04/01/2026 | | |

| Billed Usage 03/26 | | | | |
|---|---|---|---|---|
| Usage | Power Factor | Power Factor Constant | Meter Location Comp. | Billed Usage |
| 601,600 | - | - | - | 607,616 kWh |
| 1,310,400 | - | - | - | 1,323,500 kW |
| 435,200 | - | - | - | 435,200 kVARh |
| Contract Capacity = 2,100.0 | | | | High Prev Demand = 1,599.8 |

**Meter Read Details:**

| Meter #683598634 | | | | | |
|---|---|---|---|---|---|
| Previous | Type | Current | Type | Metered | Usage |
| 24179 | Actual | 24555 | Actual | 376 | 601,600 kWh |
| 16977 | Actual | 17249 | Actual | 272 | 435,200 kVARh |
| - | - | 0.819 | Actual | 0.819 | 1310.4 kW |
| Service Period 02/05 - 03/06 | | | | | Multiplier 1600 |
| Next scheduled read date should be between Apr 6 and Apr 9 . | | | | | |

**Notes from AEP Ohio:**

**For Informational Purposes only:** The below costs are NOT NEW CHARGES and are approximate values. AEP participates in programs required by the state of Ohio to support energy conservation and to secure renewable energy resources. For more information on energy efficiency programs, please visit **www.AEPOhio.com/Save**.

Renewable Programs: $1165.68
Energy Efficiency Programs: $0.00
Peak Demand Reduction Programs: $0.00

**Do Not Tamper** - Tampering with an energized electric meter can cause serious injury or death. If you suspect a problem with your meter, call the customer service number listed on your electric bill for assistance. In addition, meter tampering is illegal and can result in fines and/or imprisonment.

In Case No. 14-1696-EL-RDR & 23-23-EL-SSO the PUCO approved an adjustment to the Distribution Investment Rider, effective with this bill. This rider, which is adjusted quarterly, recovers capital costs associated with distribution infrastructure. A residential

**Capacity charges make up** **25-35%** of total electric bill for large C&I customers

## What Capacity Charges Mean for your Bottom Line:

- **Peak demand tags** are the specific hours during the year when the grid experiences its highest **coincident peak**
  - Typically: top 5 highest-demand summer hours
- **Capacity charges** – portion of a commercial customer's utility bill that is based on their usage during those tagged peak hours the year prior
- **Peak Shaving** during those high demand hours can significantly lower your utility bill through reduced capacity charges

# Evolving Regulatory Landscape for Emergency Generators

## Federal EPA rules under Clean Air Act

### Pre-2011

Hospitals allowed to use emergency backup generators for grid support and get paid for it

### 2011 Rule Change

EPA clarified interpretation, Non-emergency operations now subject to tier-compliant emissions standards (e.g. Tier 4)

### Post-2011

Most hospitals exited demand response programs due to high EPA air-permit risk

### 2025 to today

New EPA "interpretive guidance" of Duke Energy's PowerShare program, partially restores pre-2011 flexibility. Emergency generators may operate 50-hr per year in non-emergency situations following some guidelines.

**Not yet applicable to PJM or wholesale markets ...but that could change!**

**Momentum is Building:** Industry groups are actively lobbying for expanded use of emergency generators and formal rulemaking, not just guidance

Sources: EPA Regulatory Interpretation to Duke Energy (Feb 27, 2025); Duke Energy PowerShare Program

# Turn Operational Flexibility into Utility Bill Savings

## So what can Hospitals do about it?

**Peak Shaving a 1MW load can deliver** | **$200k+** in annual on-bill savings

### Demand Management

- Install non-emergency **natural gas generators** and **battery storage** that can be dispatched during peak events to reduce demand from the grid while bolstering resilience
- Use **peak prediction services**, like Cat AMP, to forecast when PJM's system-wide peaks are expected
- Leverage **on-site generation for peak shaving** rather than demand response load curtailment that could negatively impact patient care or comfort

CAT AMP Command Center monitors weather, energy market conditions and power generation assets - 24/7

# How On-Site Generation + Energy Services can help

## EQUIPMENT

Install **flexible on-site generation** that can be dispatched for monetization like **standby natural gas generators and/or battery storage**

## TECHNOLOGY

**Energy Services like CAT AMP**:

- Monitor energy consumption across your site
- Predict capacity & transmission peaks and demand forecasting
- Participate in Utility Demand Management programs
- Automatically dispatch your enrolled flexible assets

## SERVICE & SUPPORT

**Backed by:**

- 24/7 command center
- Local dealer support
- Service level agreements

+

**Energy-as-a-Service Financing**

Source: CAT AMP

# Financing Options: How to Pay for it...

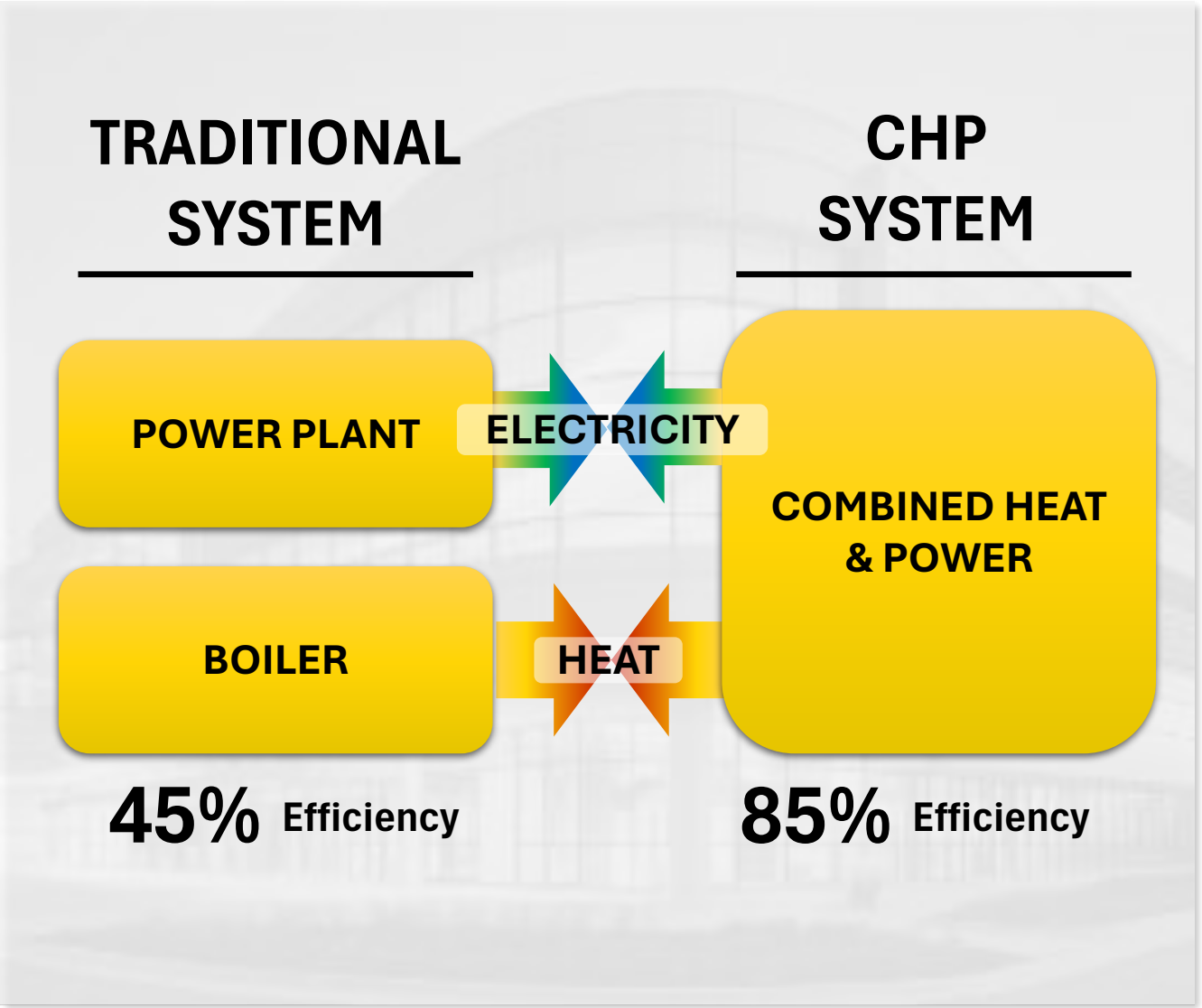
| Various Contract Structures | Financed Option 1 – FIXED FEE | Financed Option 2 – MARKET SAVINGS | Financed Option 3 - HYBRID | Customer Financed |
|---|---|---|---|---|
| **Project Owner** | 3rd Party like CAT | 3rd Party like CAT | 3rd Party like CAT | Customer |
| **O&M Responsibility** | 3rd Party like CAT | 3rd Party like CAT | 3rd Party like CAT | Customer |
| **Customer Payment Source** | **Fixed Annual Payment. No Upfront Cost. (OPEX)**<br>Customer keeps all market savings/revenue generated above the fixed fee | **Market Savings (OPEX)**<br>Project Owner keeps the market savings/revenue generated | **Customized Hybrid: Fixed Annual Payment/ Market Savings Combo**<br>Annual payment customized based on project financials and interests of both parties | **Customer Capital Expense (CAPEX)** |
| **Annual Payment** | ✓ | ✗ | TBD | N/A |
| **Economic Risk/Opportunity through Electricity Market Participation** | ✓ | ✗ | TBD | ✓ |
| **Insulation from Increasing Electricity Costs** | ✓ | ✗ | TBD | ✓ |
| **Added Resiliency with Backup Power** | ✓ | ✓ | ✓ | ✓ |

****Ohio House Bill 15**** enacted Energy Policy Reforms including tax cuts in 2027: 24% → 7% on new CHP, generators & battery storage

# Combined Heat and Power (CHP)

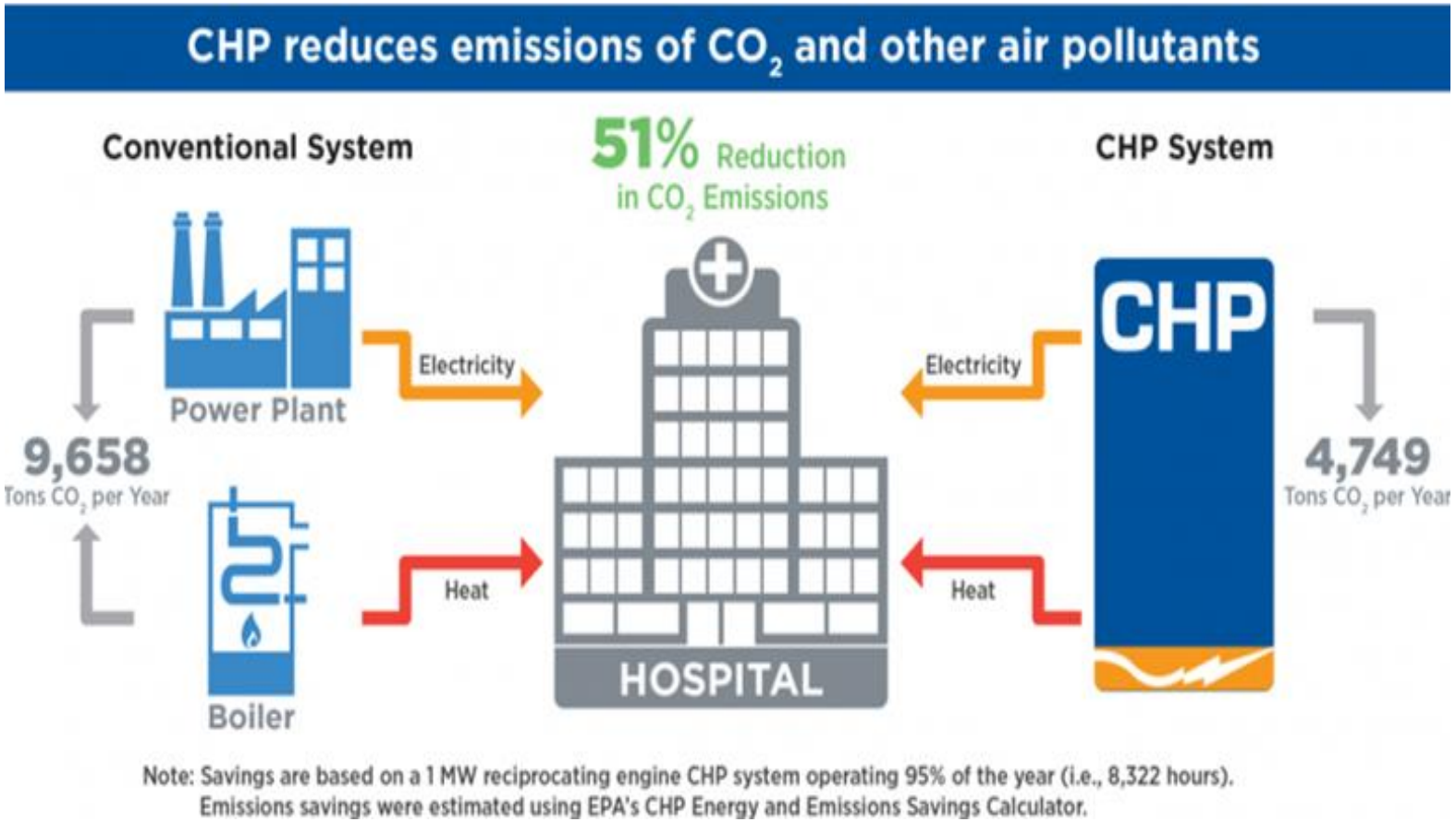
**One engine that powers your building and heats your water – using the same fuel**

# CHP 101 – Generate Two Forms of Usable Energy




- Captures **waste heat** and converts it into useful **thermal energy**
- Hospitals have **constant thermal loads** – ideal for driving chillers and heating water
- **Cogeneration**: simultaneous electricity + heat delivery boosts **efficiency up to 85%**

# CHP for Sustainability – Heat Recovery Loop




- Require **less fuel** per unit of energy output
- On-site generation **reduces transmission and distribution losses**
- Potential to cut $CO_2$ by **>50%**

SOURCE: CHP Alliance

# Resilience That Pays for Itself

## Take control of your energy destiny with CHP

- On-site power generation **you own and control**
- **Operate in island mode** - independent of the grid
- **Continuous electricity and thermal energy** during outages, disasters, and grid disruptions
- Pipeline gas supply remains available when disaster strikes **– reduce reliance on diesel fuel delivery**
- Commercial natural gas rates are relatively low in Ohio $8.24/Mcf, **26% below the national average**

Source: EIA.gov Jan 2026 Commercial Rates

# Bellevue Hospital / NYC Health - Manhattan, NY

- Superstorm Sandy severely damaged the 1,500-bed hospital in 2012, forcing it to evacuate & close for months
- Invested in a CHP system that went **live in April 2026**
- **4MW CHP cogeneration system** (2x) Caterpillar G3516H natural gas gensets that offset 60% of the facilities electricity needs in winter / 40% in summer
- **Integrated with 9MW of existing** emergency generators
- Elevated and flood-hardened to withstand another Sandy-level event
- Generates **32.5 million kWh/year** with 80%+ efficiency
- Projected **$2M+ in annual utility cost savings**
- Multiple hospital CHP projects were funded by FEMA for resiliency in the wake of Superstorm Sandy

**Bellevue Hospital's new cogeneration system**

Source: nychealthandhospitals.org

# New Jersey Hospital CHP Case Study example

## Saint Peter's University Hospital

Non-profit hospital in New Brunswick, New Jersey

Saint Peter's avoids the **peak utility demand charge**, **saving $200,000 to $300,000 per year** in energy costs

<u>Project Financing</u>

$9.2 million CHP project was made possible by:

- **$6.5M grant** from the U.S. Department of Housing and Urban Development for climate mitigation and disaster resilience
- 10-year **$1 million interest-free loan** from PSE&G


**Installing a G3516H 2MW CHP plant**

PSE&G = Public Service Electric & Gas Company – largest utility in NJ

# Five Actions Hospitals Can Take

1. **Explore Flexible Standby Generation**
   Evaluate the financial viability of adding flexible standby natural gas generation or battery storage to participate in demand management programs while boosting facility resilience

2. **Leverage Demand Management**
   Monetize existing non-emergency backup generation through Energy Services like peak shaving to reduce costly capacity and transmission charges - turn idle assets into utility bill savings

3. **Monitor EPA Regulatory Changes**
   Continue to monitor the evolving EPA regulatory landscape regarding use of emergency generators for demand response - rules are shifting and new opportunities may emerge

4. **Invest in CHP for Base Load Power**
   Control your own energy destiny with Combined Heat and Power - generate on-site electricity, avoid escalating grid charges, and recover waste heat for heating, cooling, and hot water at 80%+ efficiency

5. **Research Funding and Incentives**
   Explore grants (FEMA HMGP, BRIC), state incentives (Ohio HB 15 tax cuts), utility programs, and energy-as-a-service financing to reduce capital investment

# Q&A: What Questions do you have?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