



# Decarbonization

## Business Case for Investing in Sustainability

28<sup>th</sup> Annual  
Ohio Energy Savings & Management  
Conference





*Alternate title:*

# Why is this worth so much...?

**Reason #1:  
Because they said so.**

**Walmart**



# Sustainability Layers

Word choice matters

Sustainability (ESG)

Environmental

Social

Governance

Environmental Sustainability Attributes

Climate Change

Pollution & Resources

Water Security

Biodiversity

GHG Emissions

Scope 1

Scope 2

Scope 3

Scope Components

Fossil Fuels  
Refrigerants

+

Purchased Electricity

+

Indirect Sources

=

CARBON FOOTPRINT

Solutions

Refrigerant Management  
Electrification

+

Energy Efficiency  
Renewable Energy

+

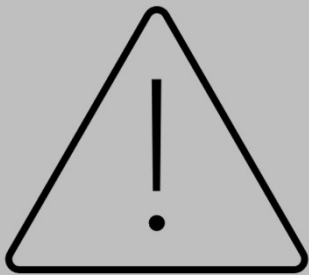
Embodied Carbon

=

Decarbonization



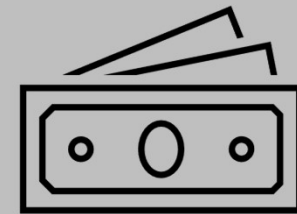
## Why Energy Decarbonization



Remove business risk



Create shareholder and brand equity

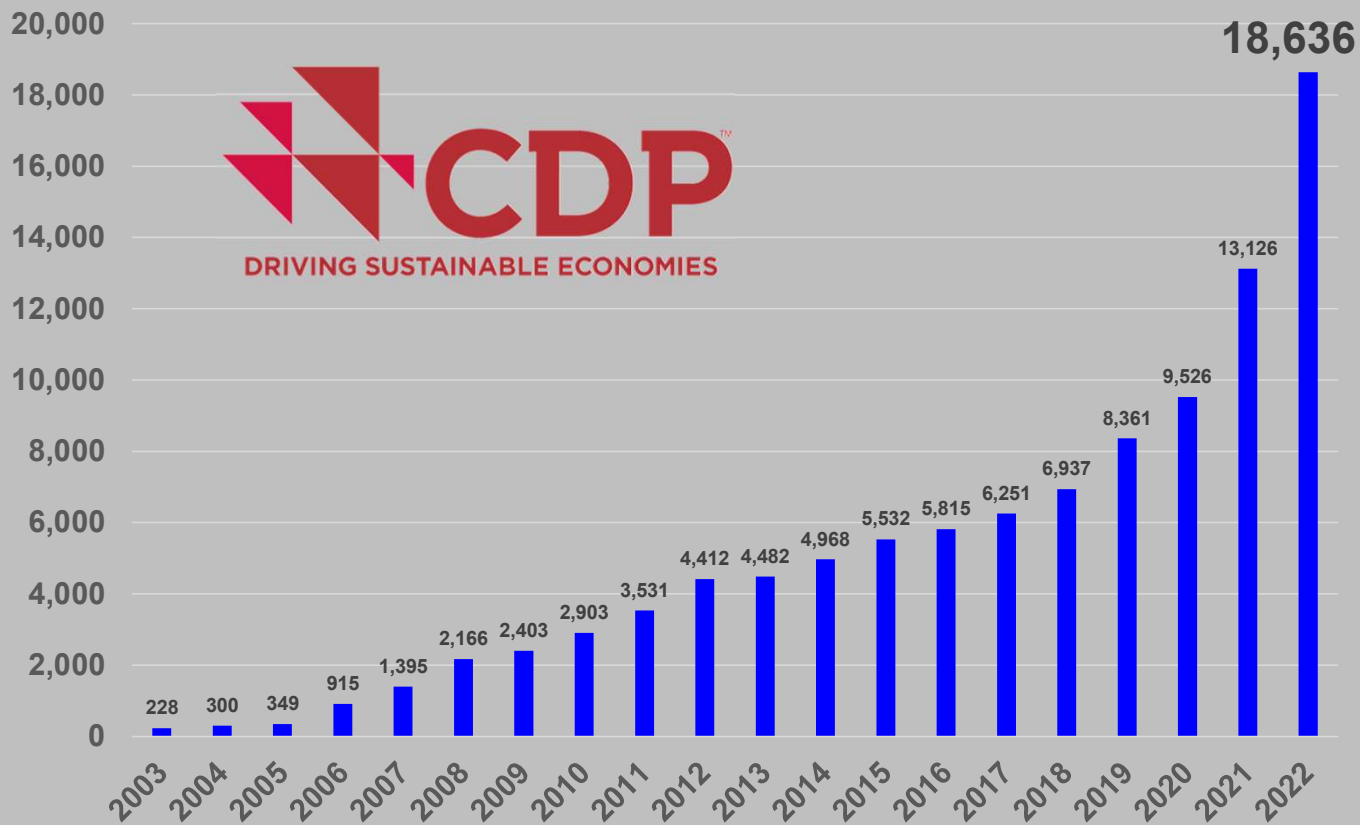


Reduce operational costs

Elevate outcomes by going beyond traditional energy projects



## Corporations are leading the way



## CDP Grading Scale

283 of the 18,636 disclosing companies in 2022 received an A rating on Climate Change (1.5%)

Leadership: A, A-  
Management: B, B-  
Awareness: C, C-  
Disclosure: D, D-  
Non-Disclosure: F

## A-List Outperforms the Rest of the Market



### *Financial Performance*

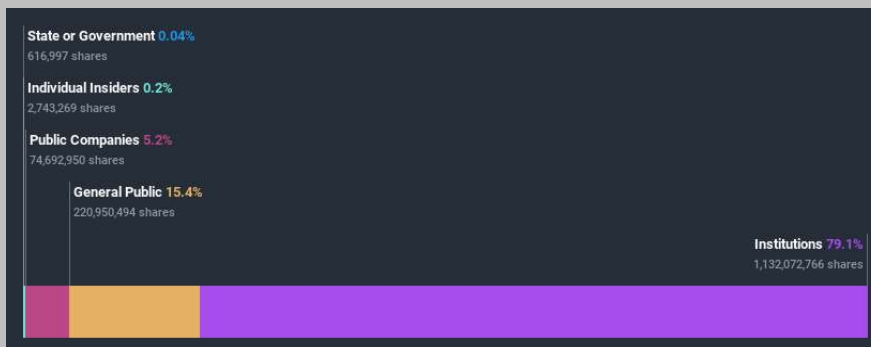
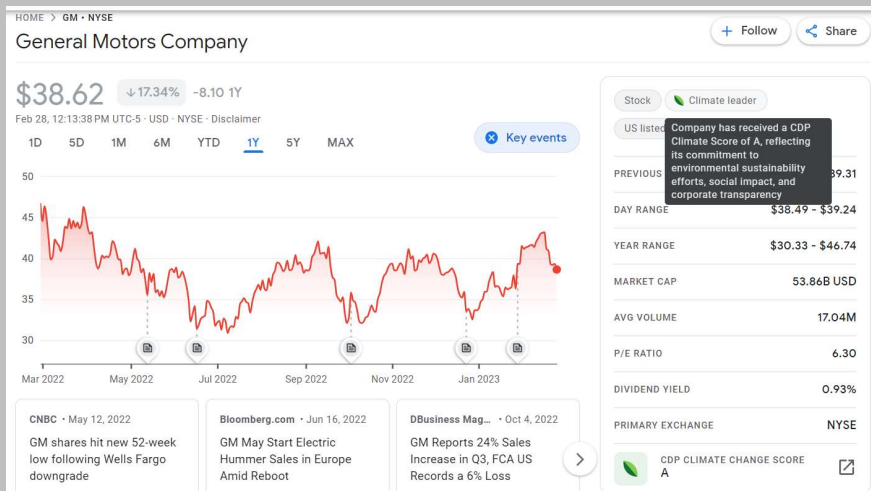
**200** of the **13,126** companies that filed CDP disclosures on Climate Change received an 'A' Rating

These companies outperformed the reference index by

**5.8%**

per annum  
from 2011 to 2021

## Reason #2: Institutional Investors are Driving Change



**Blackrock owns 10.9% of Outstanding GM Stock**

“There is no company whose business model won’t be profoundly affected by the transition to a net zero economy – one that emits no more carbon dioxide than it removes from the atmosphere by 2050...As the transition accelerates, companies with a well-articulated long-term strategy, and a clear plan to address the transition to net zero, will distinguish themselves with their stakeholders – with customers, policymakers, employees and shareholders – by inspiring confidence that they can navigate this global transformation.”

Larry Fink – CEO, Blackrock  
in his 2021 Letter to CEOs





# Stages of Corporate Decarbonization

- 1 “We are getting pressure from investors and we need to set a goal.”
- 2 “We have set a decarbonization goal, but we have no idea how we are going to achieve it.”
- 3 “We are working towards our goal, but we could use help with X”

## Current Tailwinds to Decarb Programs



Rising Energy Costs

Inflation Reduction Act

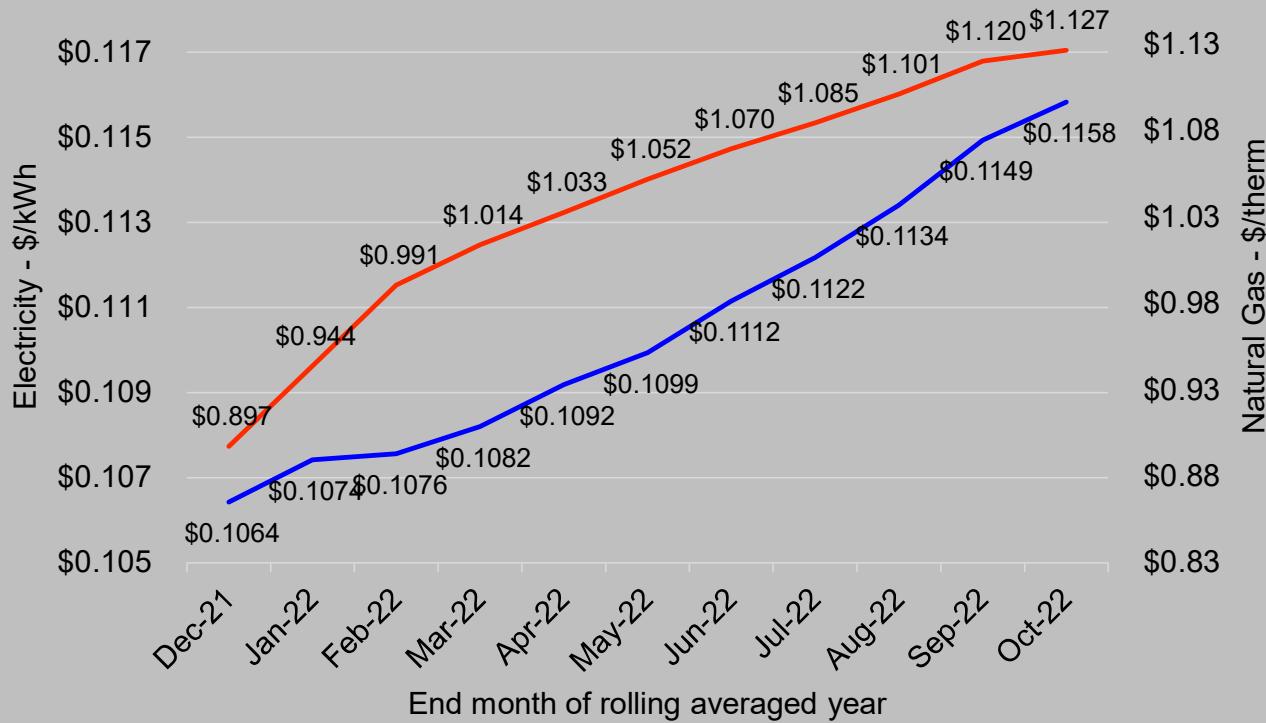
ESG Pressures and Ambitions

Regulations and Compliance



# Energy Price Inflation Illustration

Energy Cost Intensities - Rolling Annual Average



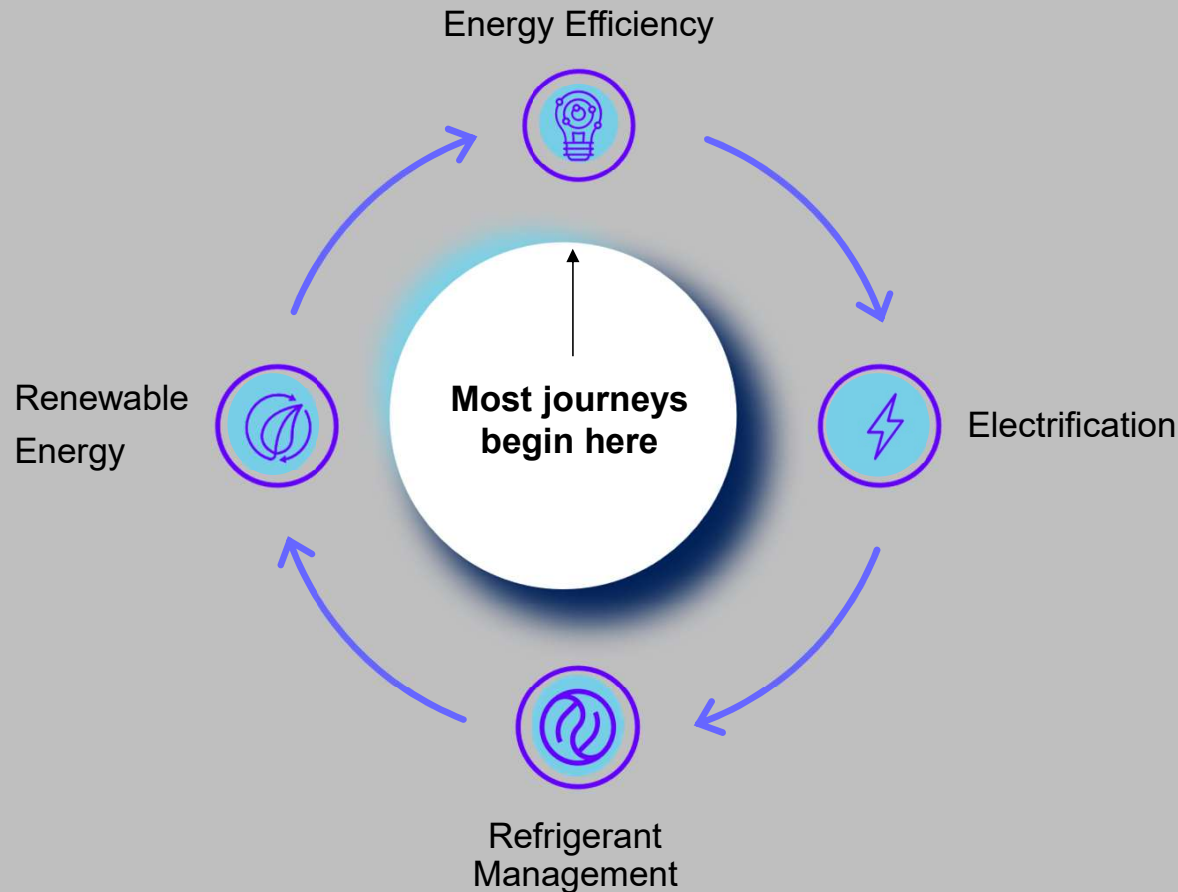
This illustrative client example, with 100+ locations across the United States has experienced a:

**8.5%**  
increase in  
Rolling 12 month  
Electricity prices

**22.73%**  
increase in  
Rolling 12 month  
Natural gas prices

From December 2021 – Oct.  
2022

# Corporate Decarbonization Pillars



## Drivers Impacting Business & Financial Investment Decisions on Decarbonization

- *Volatile Energy Markets*
- *Emissions Reduction*
- *Resiliency*
- *Regulatory Compliance*
- *Legislative Uncertainty*
- *Technological Advances*



## Reason # 3: Today's Workforce & Consumers are Picky

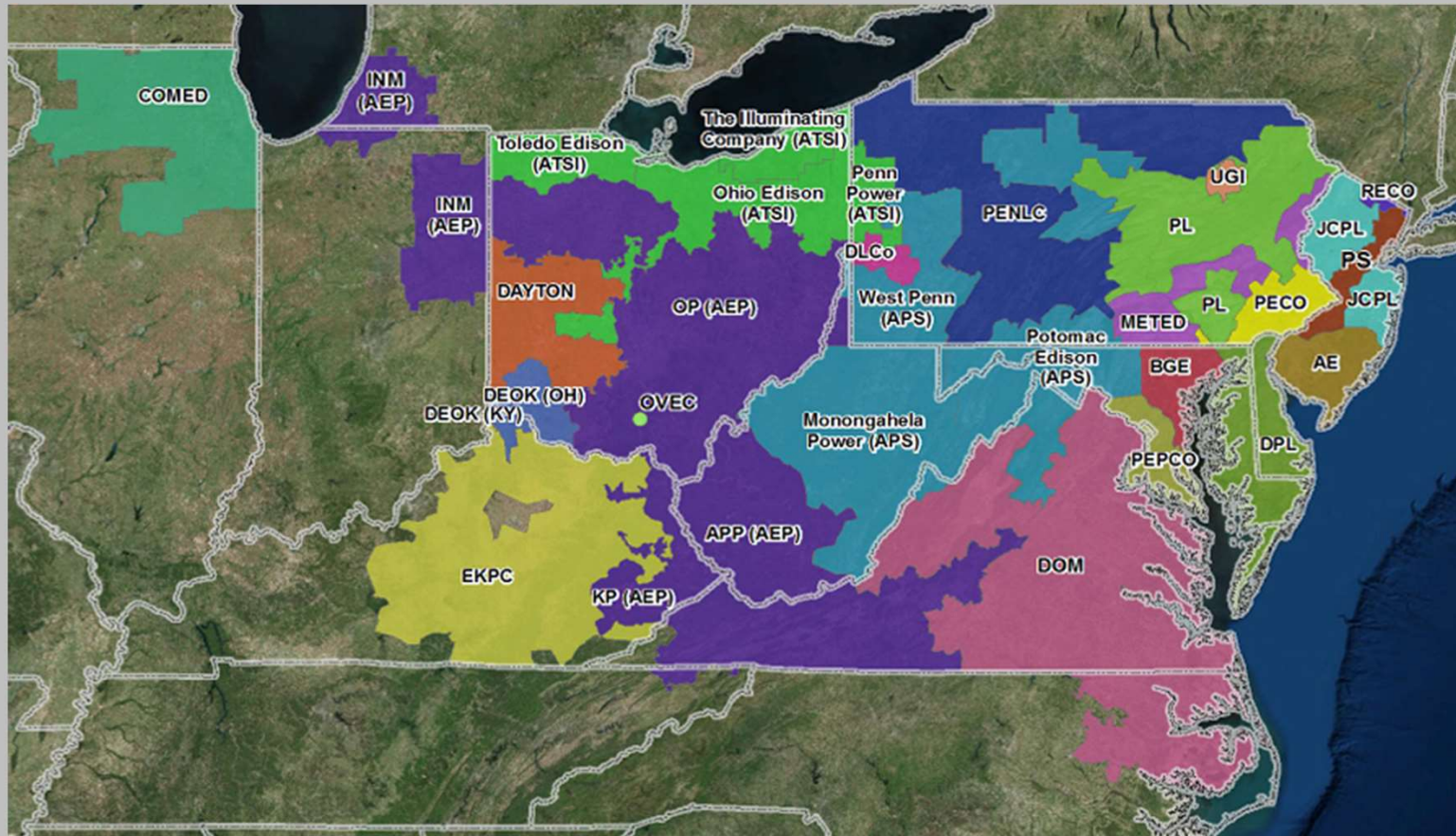
**78%** of MBA Students surveyed in 2022 reviewed their employer's environmental policy before accepting a position

**80%** of the Fortune 500 have a published CSR Report

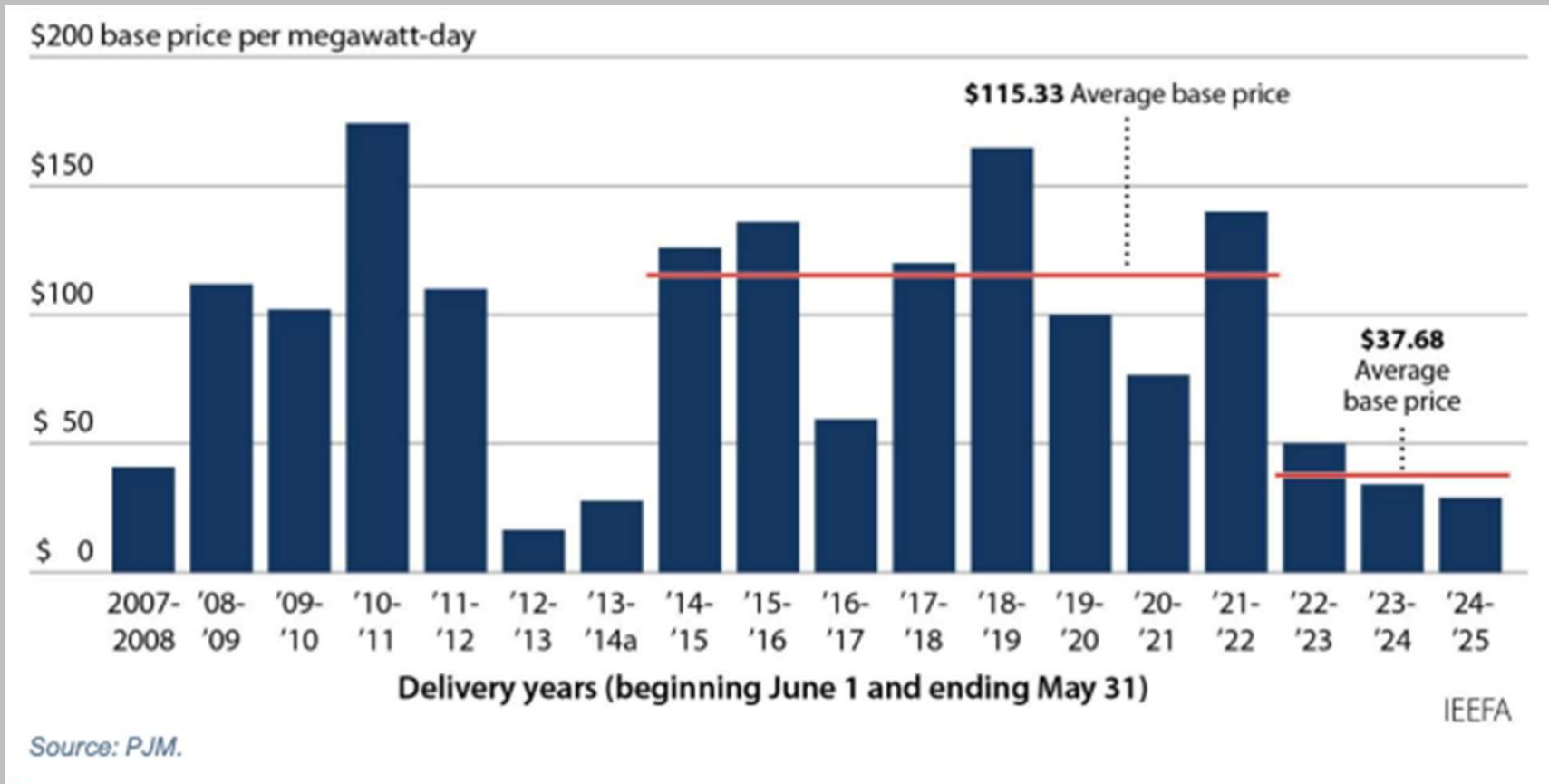
**39%** of consumers actively seek companies providing eco-friendly products & services



# Decarbonization and the Electric Grid

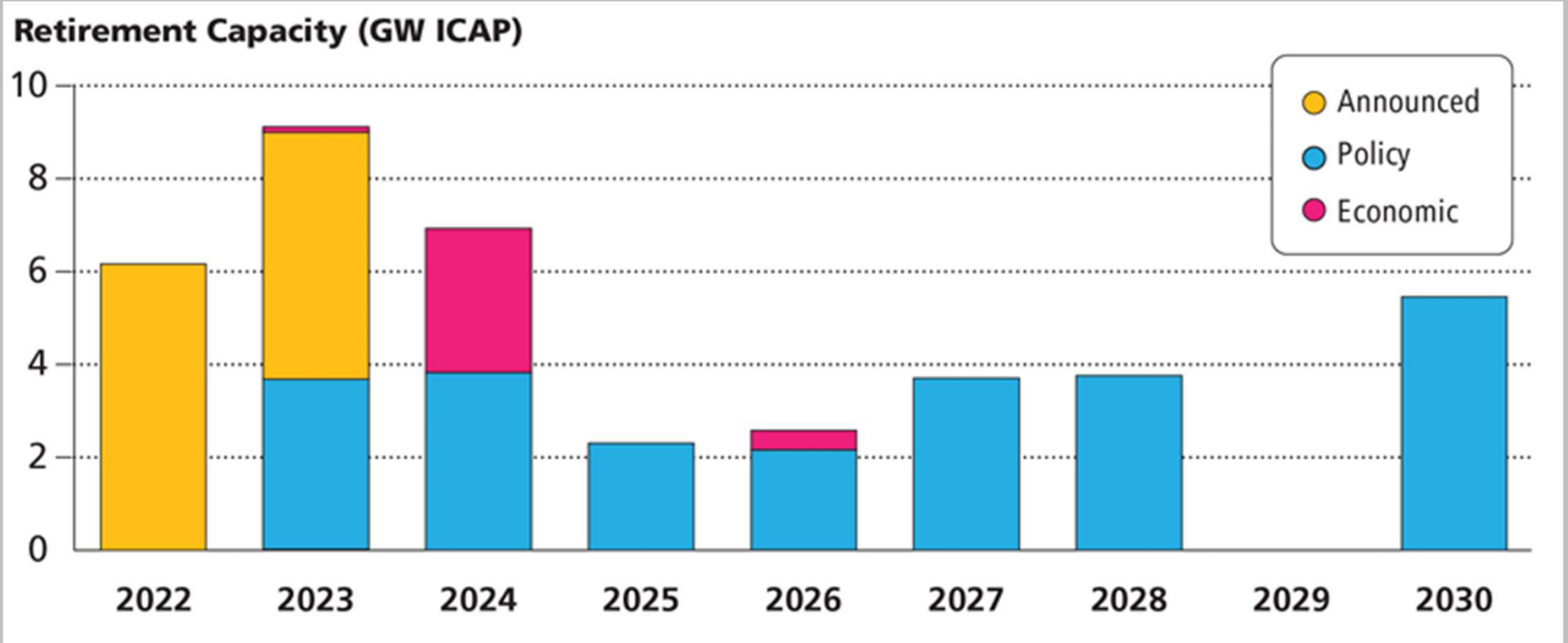


# Decarbonization and the Electric Grid










# Decarbonization and the Electric Grid



# Decarbonization and the Electric Grid

Balance Sheet Summary (2022–2030)				
<p><b>Retirements</b></p> <p><b>40 GW</b></p> <p>60% Coal 30% Natural Gas 10% Other</p> 	<p><b>New Entry Wind/Solar<sup>6</sup></b></p> <p><b>Low =</b> 48 GW-nameplate / 8 GW-capacity</p> <p><b>High =</b> 94 GW-nameplate / 17 GW-capacity</p> 	<p><b>New Entry Standalone Storage</b></p> <p><b>Low =</b> 3 GW</p> <p><b>High =</b> 4 GW</p> 	<p><b>New Entry Thermal</b></p> <p><b>Low =</b> 4 GW</p> <p><b>High =</b> 9 GW</p> 	<p><b>Load Growth</b></p> <p><b>2023 Forecast =</b> 11 GW</p> <p><b>Electrification Forecast =</b> 13 GW</p> 
<p>Unless otherwise noted, thermal capacity values are expressed in ICAP, without adjustment for EFORD.</p>				

## Decarbonization and the Electric Grid – Energy Efficiency and Demand Response

Delivery Year	2021/2022	2021/2022	2022/2023	2022/2023	2023/2024	2023/2024	2024/2025	2024/2025
Data	Offered	Cleared	Offered	Cleared	Offered	Cleared	Offered	Cleared
	UCAP	UCAP	UCAP	UCAP	UCAP	UCAP	UCAP	UCAP
Coal	53,444	47,531	45,754	39,230	37,164	31,811	35,114	31,532
Distillate Oil (No.2)	3,254	3,155	3,178	2,897	2,894	2,855	2,776	2,674
Gas	78,863	76,164	85,562	79,329	85,217	81,643	85,469	83,258
Nuclear	32,541	21,898	31,944	26,140	31,960	31,960	31,835	31,629
Oil	5,218	3,955	2,674	2,527	2,350	2,269	2,493	2,220
Solar	644	589	2,633	2,096	2,945	2,935	4,234	4,232
Water	7,239	6,760	6,917	6,749	6,375	6,375	6,137	6,137
Wind	1,551	1,526	2,595	1,839	1,608	1,416	1,396	1,396
Battery	-	-	-	-	16	16	36	36
Hybrid	-	-	-	-	-	-	10	10
Other	1,419	1,318	1,205	1,168	1,185	1,185	1,153	1,153
Demand Response	12,114	11,353	10,604	8,903	10,652	8,631	10,334	8,180
Aggregate Resource	-	-	484	386	511	511	503	503
Grand Total (w/o EE)	196,288	174,249	193,551	171,263	182,875	171,605	181,491	172,961
Energy Efficiency	2,955	2,832	5,057	4,811	5,471	5,471	8,417	7,669
Grand Total (w/EE)	199,243	177,081	198,608	176,073	188,346	177,076	189,908	180,630

# Decarbonization and the Electric Grid



## Today's Outlook

As of 11:43 a.m. EPT



**94,193**  
current load  
(MW)



**107,587**  
forecasted peak  
(MW)



**\$22.63**  
RTO LMP (\$)



**Shortage Pricing**



**Preliminary Performance Assessment Interval**

## Tomorrow's Forecast



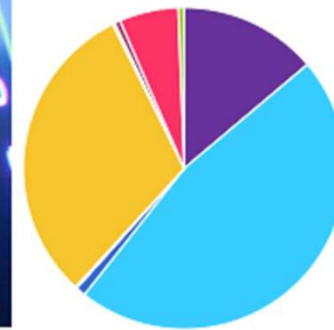
**111,798**  
peak (MW)

## Generation Fuel Mix

As of 10:00 a.m. EPT

All Fuels

Renewables



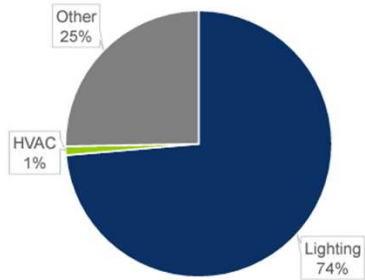
- Coal
- Gas
- Hydro
- Multiple Fuels
- Nuclear
- Oil
- Other Renewables
- Solar
- Wind

Total: **102,490 MW**  
Renewables: **8,280 MW**

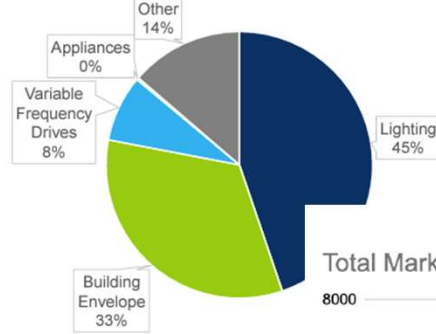
# Energy Efficiency Resources (EER)



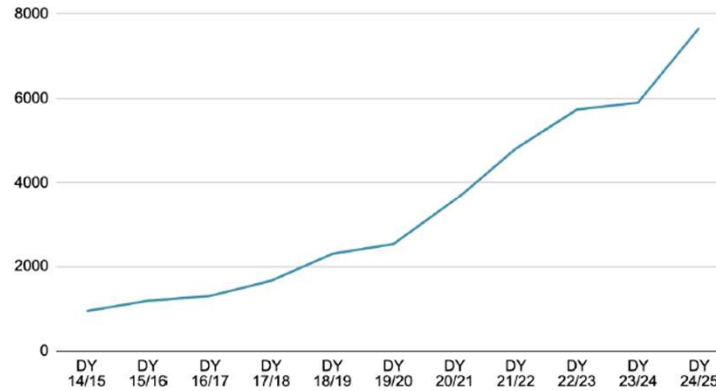
EE Project Types 2019/2020 BRA



EE Project Types 2024/2025 BRA



Total Market EE Cleared by DY (MW)



DY	Total EE
DY 14/15	943.4
DY 15/16	1189.6
DY 16/17	1300.3
DY 17/18	1662.9
DY 18/19	2296.3
DY 19/20	2528.5
DY 20/21	3569.5
DY 21/22	4806.2
DY 22/23	5734.8
DY 23/24	5896.4
DY 24/25	7668.7



# Energy Attribute Certificates (EAC)

## Energy Attribute Certificate

Amount	1 Kilowatt-hour
Energy Resources	Battery Storage
Dispatch Date	January 1, 2024
Dispatch Time	7:00 PM
Location	Texas (32.80, -97.60)
<hr/>	
Operation Start Date	December 1, 2023
Utility	Oncor
Balancing Authority	ERCOT
Emissions Intensity	408.9kg CO2/MWh
Other Attributes	Low/Moderate Income Community

## Available EACs

GRID ^	TERM	HOUR(S) (EST)	AVERAGE CARBON INTENSITY (KGCO2/MWH)	CATEGORY	SOURCE	PRICE PER MWH	AMOUNT	PRICE
CISO	2023-07-01 - 2023-07-02	9PM	226.3	Demand Response	Commercial	\$36.33 / MWh	20.64 kWh	\$0.75
CISO	2023-07-15 - 2023-07-16	9PM	245.0	Demand Response	Commercial	\$39.17 / MWh	79.91 kWh	\$3.13
CISO	2023-07-17 - 2023-07-23	6PM	212.2	Demand Response	Commercial	\$33.98 / MWh	127.41 kWh	\$4.33
CISO	2023-07-18 - 2023-07-24	10PM	264.4	Demand Response	Commercial	\$42.29 / MWh	490.89 kWh	\$20.76




# Energy Efficiency Incentives

The screenshot shows the UtilityGenius website interface. At the top, there is a navigation bar with the UtilityGenius logo on the left and links for Admin, Search Rebates, Why UtilityGenius?, API Pro, Pricing, Resources, and My Account on the right. Below the navigation bar is a search bar with the text "Search ...". To the left of the search bar are two buttons for "USA" and "Canada", and a "Select State ..." dropdown menu. A large map of the United States is displayed below these elements, with various states shaded in different shades of green. To the right of the search bar is a promotional banner for "UtilityGenius: Expert" with a lightbulb icon and the text "Our most powerful subscription yet" and "Featuring multisite capabilities, access to all DLC manufacturers for project scoping."

This screenshot shows a more detailed view of the UtilityGenius website. The navigation bar is identical to the previous screenshot. Below it, the text "viewing utilities in Ohio" is displayed above a dropdown menu set to "Ohio". A map of the United States is shown with Ohio highlighted in dark green. To the right of the map is a "State Utilities" section. This section includes a callout box that says "Access the following features with Pro:" followed by a list of features: "Filter by Technology to see rebates for a product category across all utilities", "Custom program information", and "Free EV rebate reports". There is also a "See a demo!" button. Below this, there are three tabs: "Prescriptive", "Instant", and "Custom", with "Prescriptive" selected. A "Viewing:" dropdown menu is set to "Primary Utilities". At the bottom, a list of utilities is shown, each with a small icon representing its technology type: "Ohio Edison Co" (LED, CTRL), "Cleveland Electric Illum Co" (LED, CTRL), "The Toledo Edison Co" (LED, CTRL), and "AES/Dayton Power & Light Co" (EV).

# Energy Efficiency Incentives



## Ohio School District

*Address*  
7440 Liberty Road

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*City* Solon      *Zip* 44139      *State* Ohio

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*Building Type*  
Education

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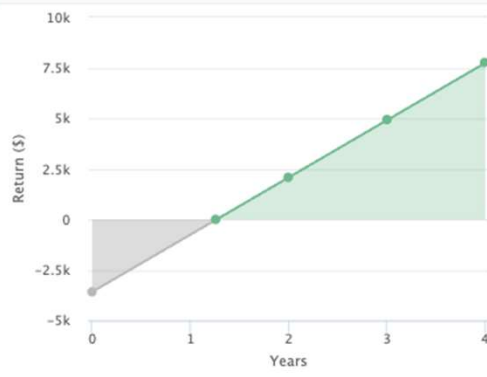
*Utility*  
Ohio Edison Co

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[Edit Building](#)

Archive

<b>Project Cost</b>	\$5,000.00
<i>Equipment</i>	\$5,000.00
<i>Labor</i>	\$0.00
<i>Other</i>	\$0.00
<b>Cost of Waiting / Year</b>	\$2,832.00
<i>Energy Savings</i>	\$2,832.00
<i>Annual Maintenance Cost</i>	\$0.00
<b>Utility Rebate</b>	\$1,416.00
<b>Time to Payback</b>	1.8 Years
<b>Time to Payback</b> <small>(With Utility Rebate)</small>	1.3 Years
<b>CO2 Reduction Equivalency</b>	20.1 Tons



## Building Rebates


For more information about this utility [click here](#)

LED      [36 Categories Incentivized](#)    \$0.00-\$15.00 <

CTRL      [5 Categories Incentivized](#)    \$0.00-\$25.00 <

### Connected Projects

# Energy Efficiency Incentives



Services ▾
Products & Solutions ▾
Training & Support ▾
Industries ▾
About ▾

Find Your Trane Rep

Trane Commercial HVAC > Decarbonization > Trane Commercial Equipment Rebate Finder

## Trane Equipment Rebate Finder


Find available commercial and industrial prescriptive rebates on select Trane equipment in your area. This rebate finder only covers Trane's commercial unitary, ductless, and applied equipment. It does not include rebates for lighting, controls, demand response programs, custom rebates or any other systems/services rebates.

Please contact the utility/rebate program manager for details on rebates that are not listed here.

How to Use the Rebate Finder
+

**Category \***

Air Cooled Unitary Air Conditioner (Packaged)

**Utility \* **

West Penn Power Company

**BTUH Range \***

Select BTUH Range

**Zip Code**

Zip Code

**State**

Pennsylvania

**Program Type**

Prescriptive

Check out the menu on the left for more advanced search options!

Product Search

1 to 10 of 2,253

Product	Series	Rebate	BTUH	EER	IEER	Utility
R(A,X)06000(F,4,5)2**A*2*	INTELLIPAK	\$5875	705000	11.3	16.2	Utility
RE060(C,D,E,F)A(F,4,5)2**A*2*	INTELLIPAK	\$5875	705000	11.1	16	Utility

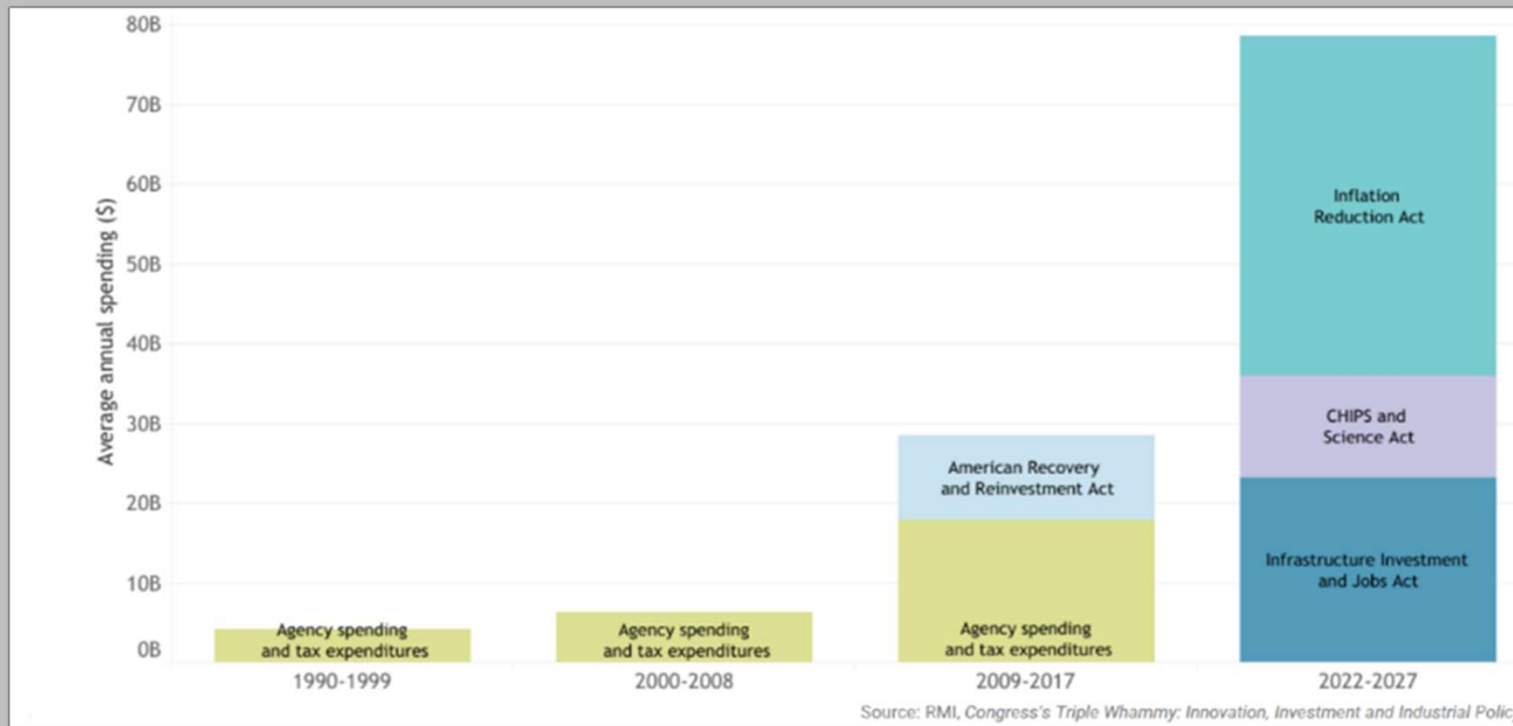
# Timing is Everything

*Technological & Legislative Alignment Create Opportunity*

Inflation Reduction Act

# Federal Climate Spending

Over the next decade, spending on climate will more than triple historic levels based on federal appropriations and authorizations dedicated to clean energy technologies.



# Investment Tax Credit

## Section 48: Energy Investments

Long-standing **tax credit** for private and non-taxable entities

Historically for qualified “energy property,”

incl: solar, fuel cells, microturbines, geothermal heat pumps and combined heat and power

Expanded to incl. **thermal energy storage property** – defined as:

Property comprising a **system** which:

- (I) is directly connected to a **heating, ventilation, or air conditioning system**,
- (II) removes heat from, or adds heat to, a **storage medium for subsequent use**, and
- (III) provides energy for the heating/cooling of the interior of a **residential or commercial building**

*Increased incentive credit values intended to promote investment in qualifying assets (energy property)*

### Updated Investment Tax Credit

Base Rate	<b>6%</b>
Meets Domestic Content Requirements**	<b>2%</b>
Meets Energy Communities Requirements***	<b>2%</b>
Prevailing Wage & Apprentices Hours requirement multiplier	<b>5x</b>
<b>Total Potential Credit Value</b>	<b>6% - 50%</b>



# Local Funding Sources

## Ohio Air Quality Department Authority

*Clean Air Improvement Program*

Bond financing with tax exemption provisions for investments in cleaner, more efficient technologies such as pollution control, energy efficiency, and renewable energy.



## Ohio Energy Loan Fund

Low-interest rate loan for qualifying projects that meet certain energy saving criteria



## Other Sources

Grants, Green Banks, Private Foundations



# Federal Grant & Loan Programs

## Renew America's Schools

Competitive Grant for qualified renewable energy & energy efficiency improvements  
Administering Agency: Office of State and Community Energy Programs (Dept of Energy)  
<https://www.energy.gov/scep/renew-americas-schools>

## Renew America's Nonprofits

Competitive Grant for qualified renewable energy & energy efficiency improvements  
Administering Agency: Office of State and Community Energy Programs (Dept of Energy)  
<https://www.energy.gov/scep/renew-americas-nonprofits>

## Rural Energy for America Program

Guaranteed Loan financing & Grants for renewable energy and energy efficiency improvements  
Administering Agency: USDA Rural Development (Dept of Agriculture)  
<https://www.rd.usda.gov/programs-services/energy-programs>



# Building a Better, Resilient & Sustainable Future

IRA  
Credit  
\$588K



West Branch Local School District is investing in their learning environment and building infrastructure and will see operational savings of over **\$216,000** per year.

-  Energy Management Controls
-  LED Lighting Upgrades
-  Building Envelope Upgrades
-  New Boilers
-  New Chiller
-  New Roof Top Units
-  STEM Programs



- **Enabling a Clear Sustainable Path**

Decarbonization Program Structure

Enterprise-level collaboration between Trane and an organization with low carbon ambition to implement scalable, mission-aligned outcomes through proven programmatic pathway development.

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### Program Pathways

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#### **Education**

Across stakeholder groups



#### **Solutions**

That align to Enterprise priorities



#### **Procurement**

That enables speed and scale



#### **Funding**

to align with balance sheet



#### **Reporting**

To validate and amplify outcomes