

The background features abstract geometric shapes in orange and blue. At the top, there's a large orange semi-circle on the left and a blue triangle on the right. A horizontal orange line runs across the middle. Below this line, there's a large blue semi-circle on the right and a smaller blue triangle on the left. Another horizontal orange line runs across the bottom.

ADVANCED ENERGY ECONOMY (AEE)

What is AEE?

National Association of businesses and industries

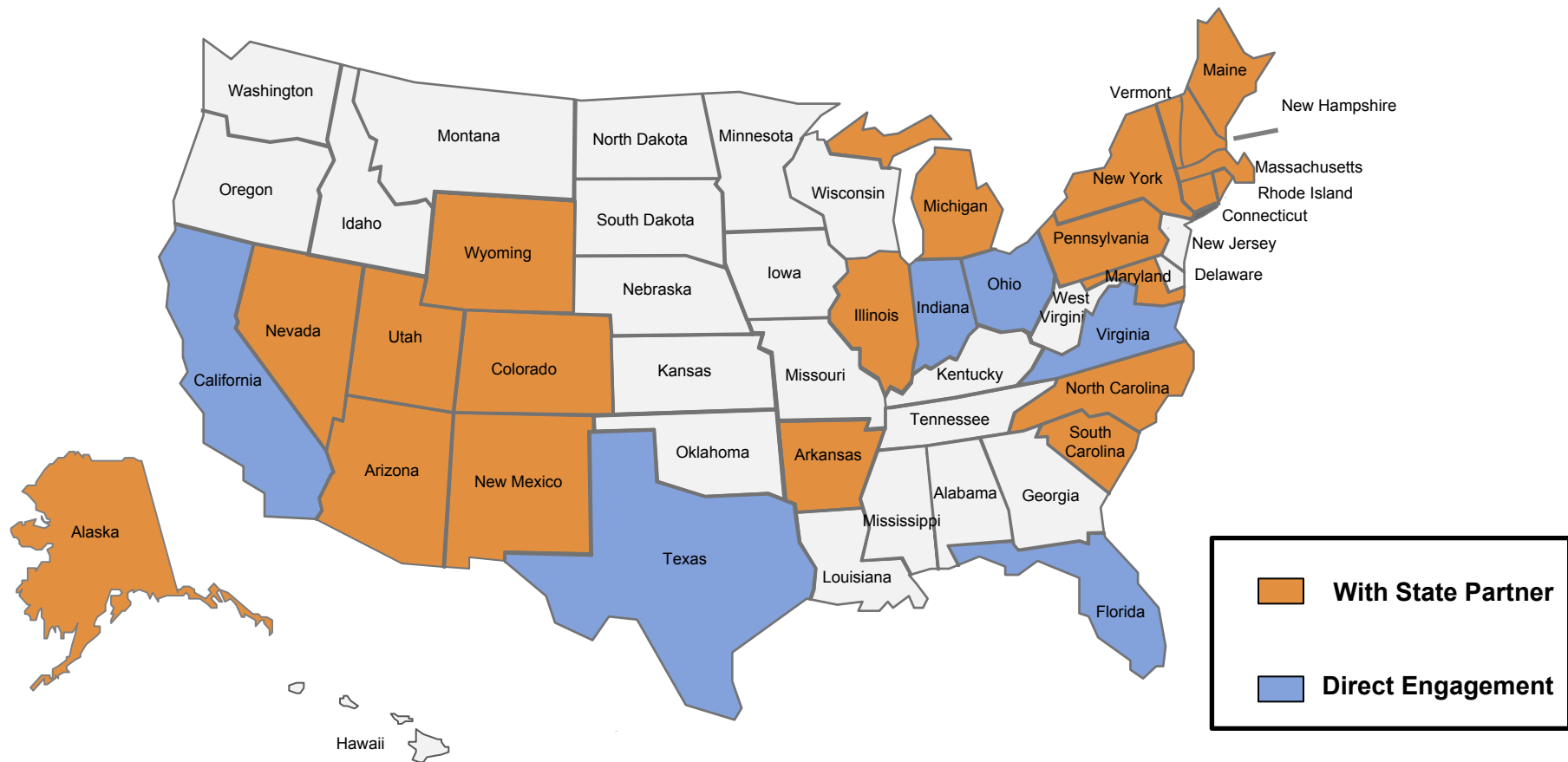
In **27** states -- Over **1000** Companies

Purpose

Make the energy we use secure, clean and affordable.



AEE Engagement in 27 States



Current: 27 states = 66% of U.S. GHG emissions

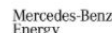


The Power of Many to Transform Policy

Leadership Council



Members



HOW?

Transform public policy

Promote rapid growth of advanced energy businesses

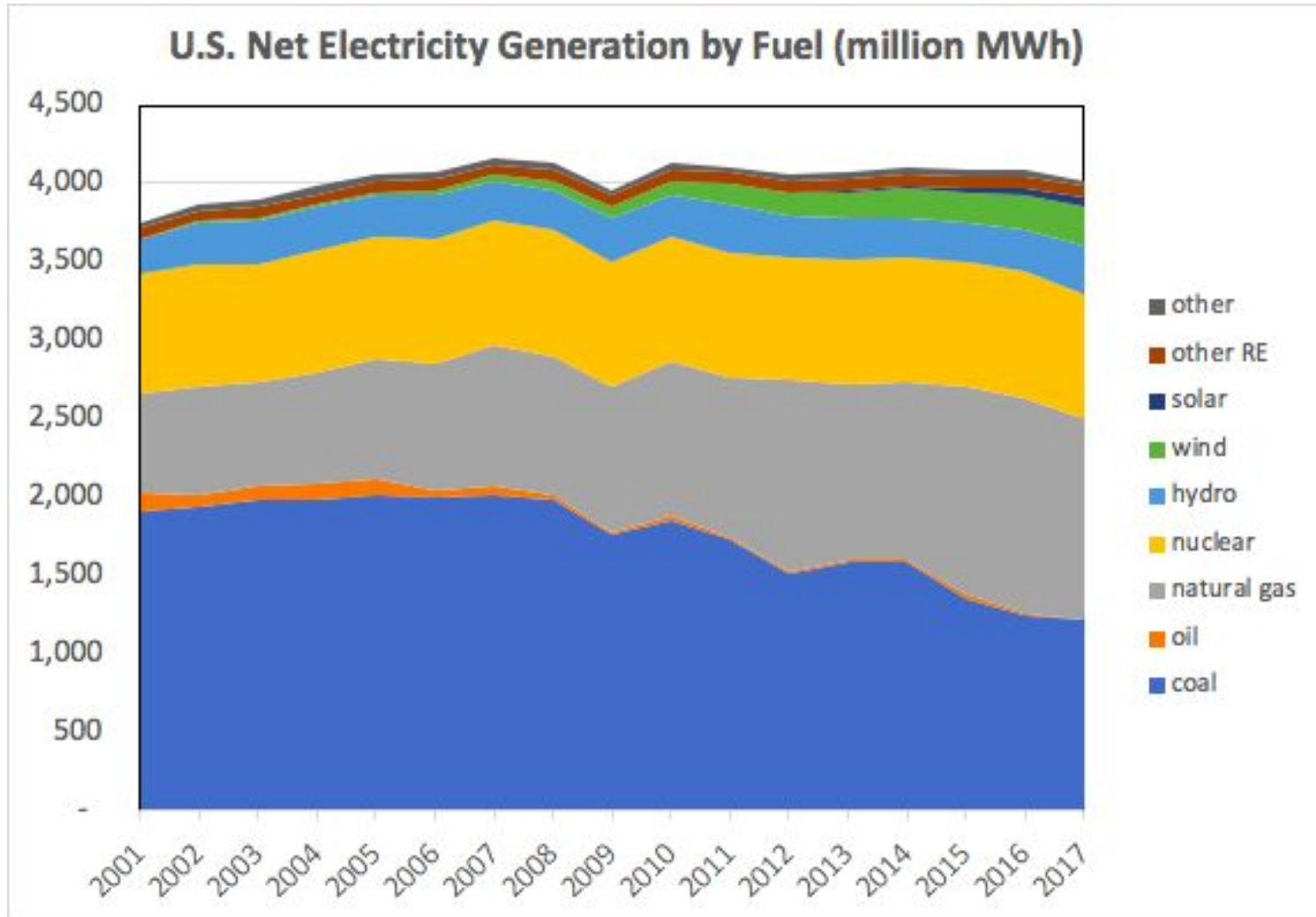
Communicate with key stakeholders and leaders

Identify the broad range of advanced energy options

Best options for Indiana



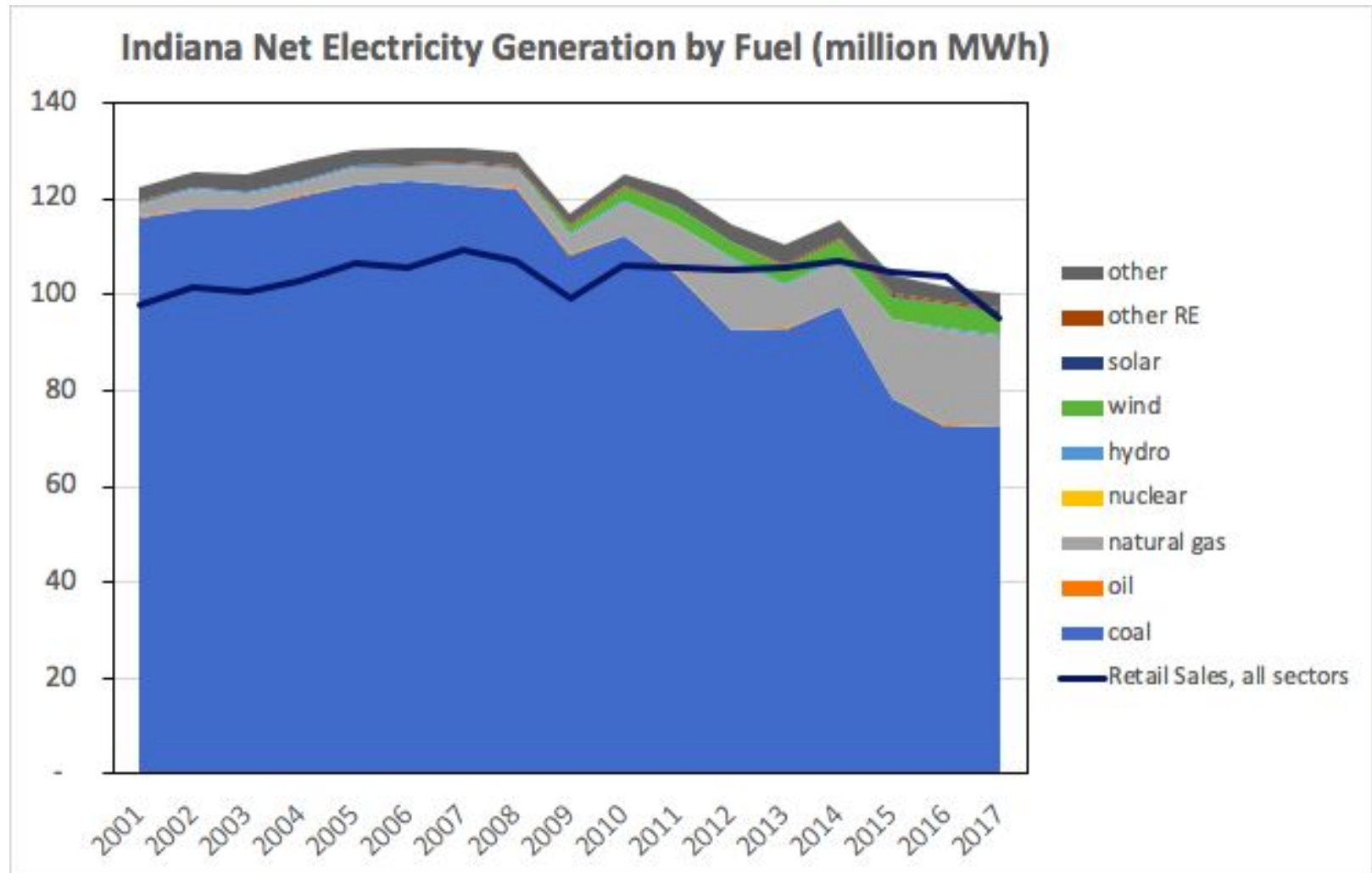
The U.S. fuel mix is changing while total electricity sales are flat



Source: U.S. Energy Information Administration, Electricity Data Browser



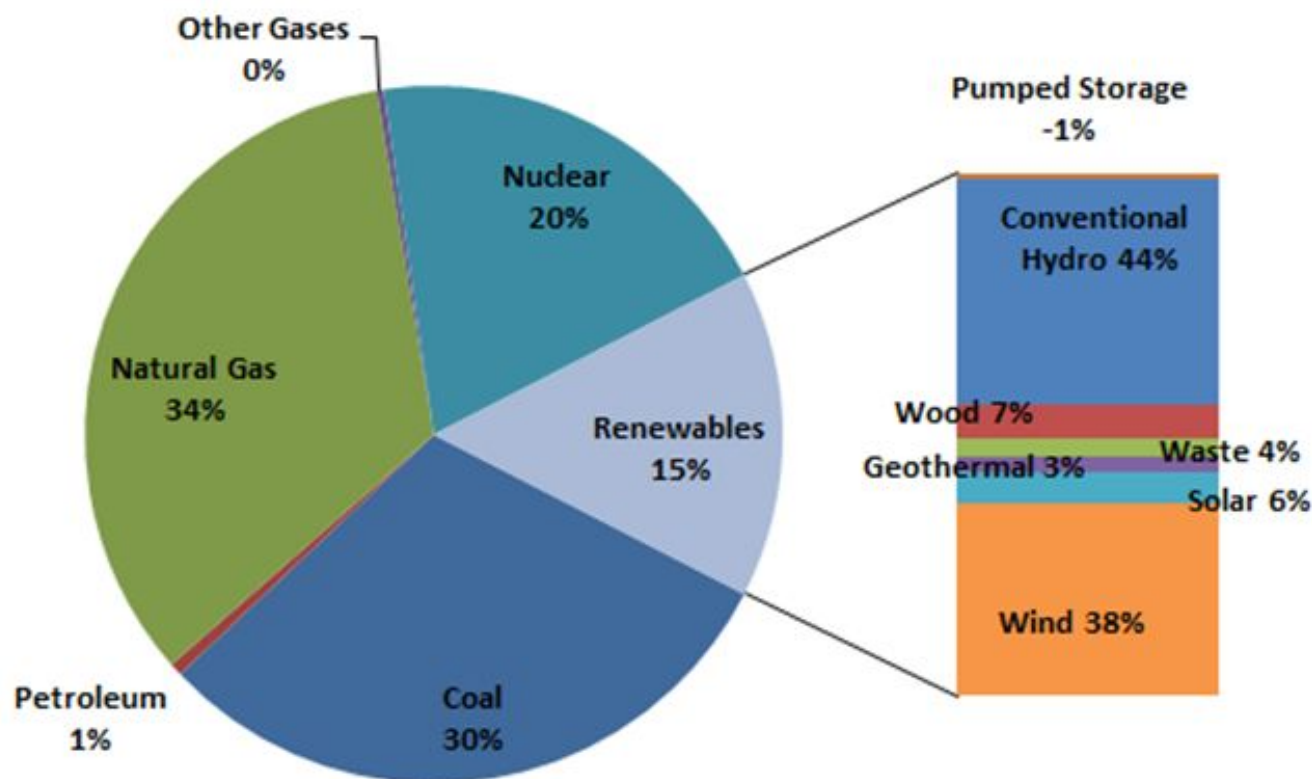
Indiana's fuel mix is also changing as retail sales are flat



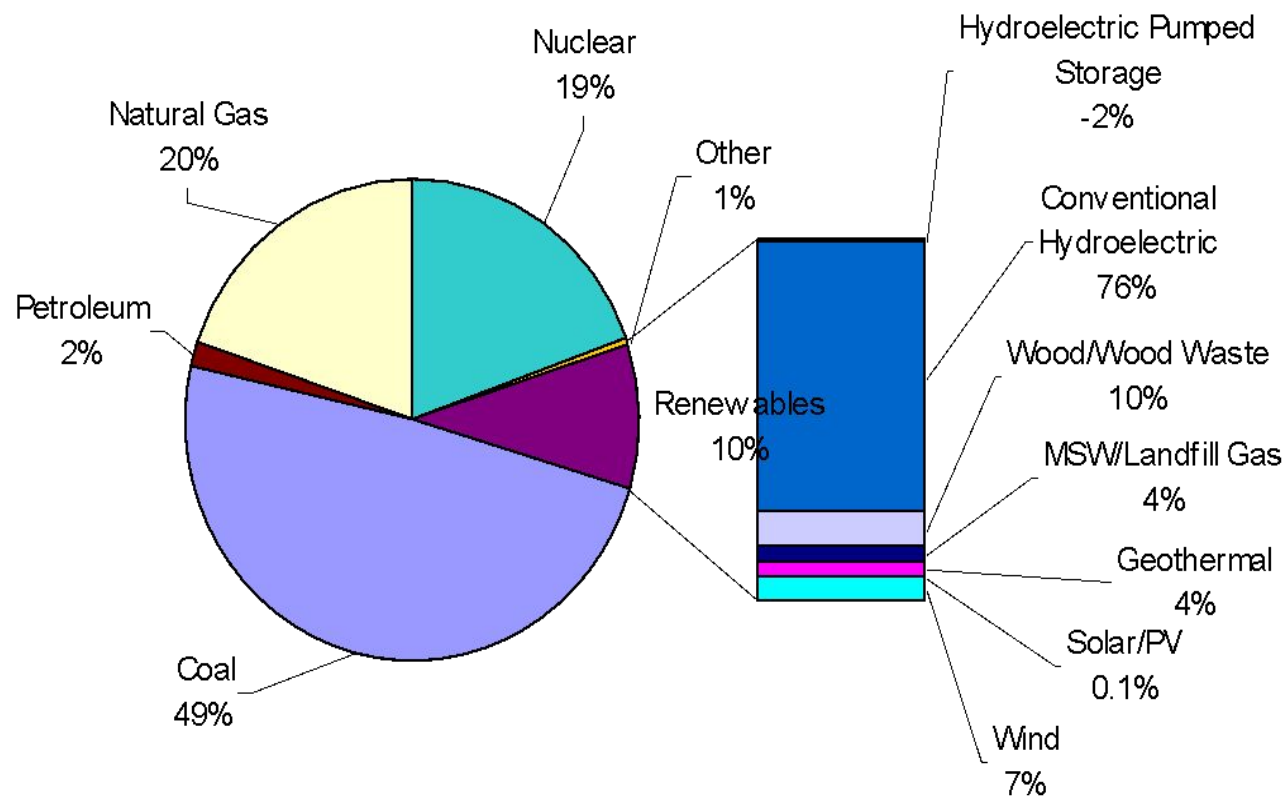
Source: U.S. Energy Information Administration, Electricity Data Browser



2016 U.S. Electricity Generation by Energy Source



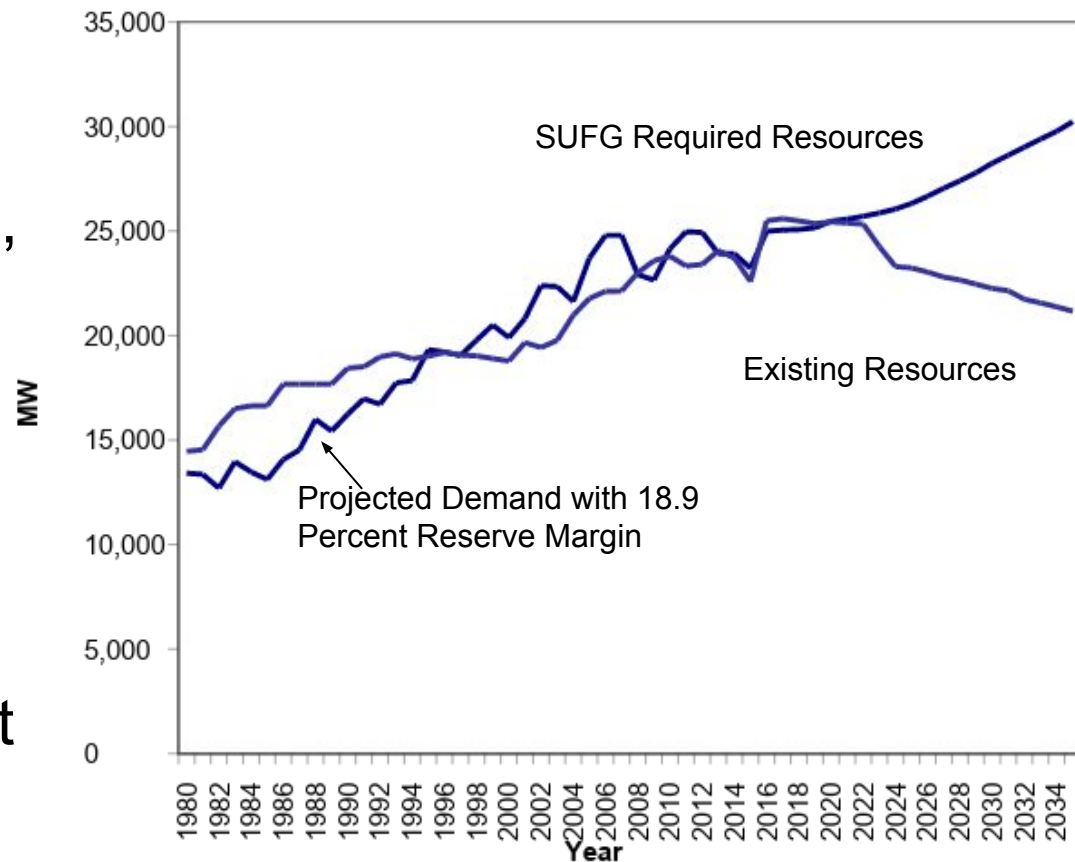
2006 U.S. Electricity Generation by Energy Source



Source: EIA

Indiana Resource Requirements

- Resources may be provided by conservation measures, contractual purchases, purchases of existing assets, or new construction
- Existing resources are adjusted into the future for retirements, contract expirations, and IURC approved new resources



INDIANA OPTIONS

“POTENTIAL FOR PEAK DEMAND REDUCTION IN INDIANA” (FEBRUARY 2018)

10% FOR 1% OF THE HOURS

SHAVE THE PEAKS = \leq \$2.3b OVER 10 YEARS

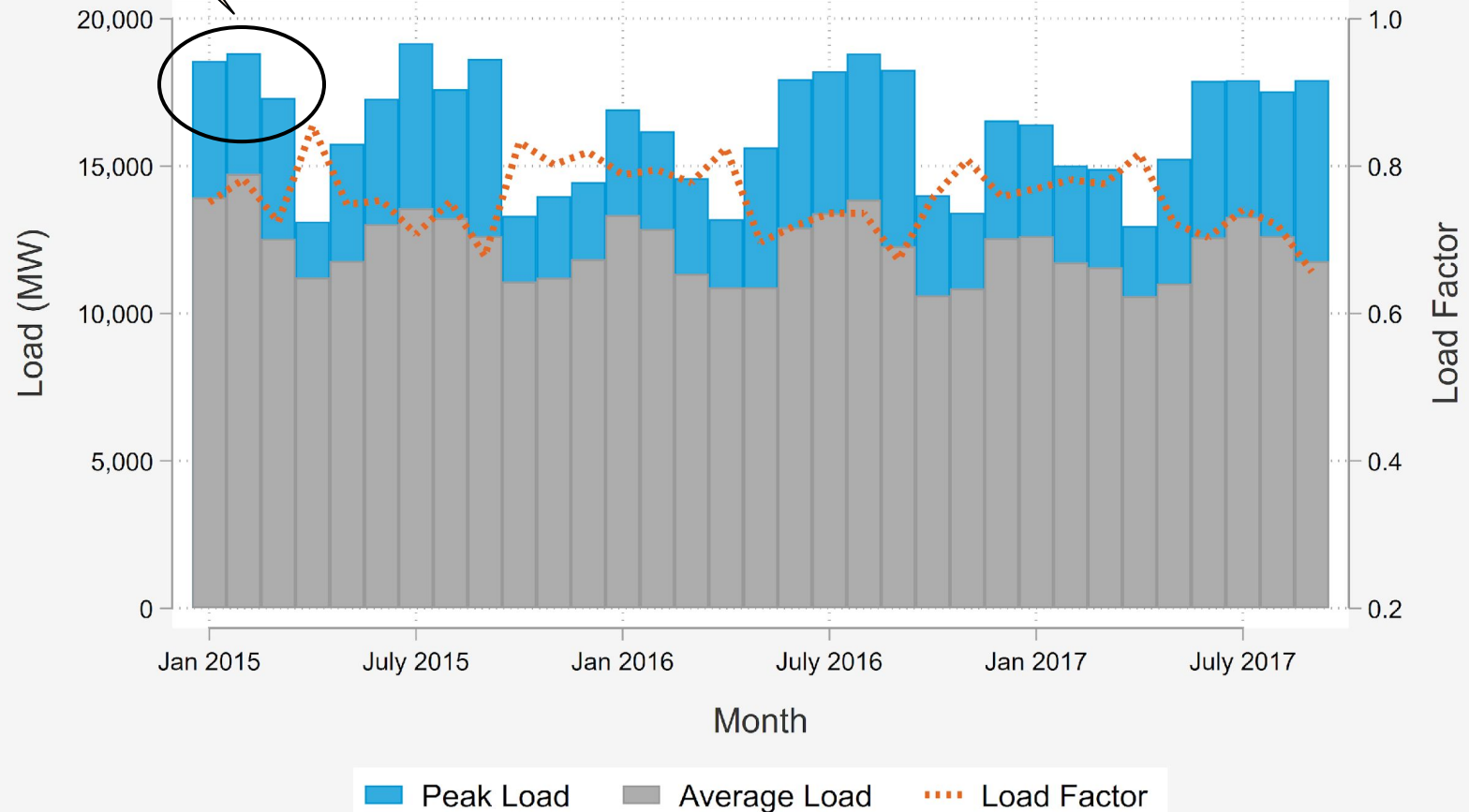
- **C&I LOAD CURTAILMENT**
- **RESIDENTIAL “CONNECTED” THERMOSTATS**
- **BATTERY STORAGE**



Winter and summer peaks are comparable

“polar vortex”

Peak Loads by Month



Report Conclusions

- There is significant remaining DR potential in the **C&I sectors**
- With air conditioning a primary driver of summer peak demand, **connected thermostats** represent a significant opportunity to reduce residential energy use and provide savings
- The potential for cost-effective **battery storage** to produce savings grows as battery costs decrease
- Cost-effective DR and energy storage in Indiana have the potential to generate net benefits ranging from **\$448 million to \$2.3 billion** over 10 years.



MUNICIPALITIES

ENERGY EFFICIENCY - GOVERNMENT BUILDINGS

- **SCHOOLS/LIBRARIES**
- **COURT HOUSES**
- **JAILS/PRISONS**
- **WATER/WASTEWATER**

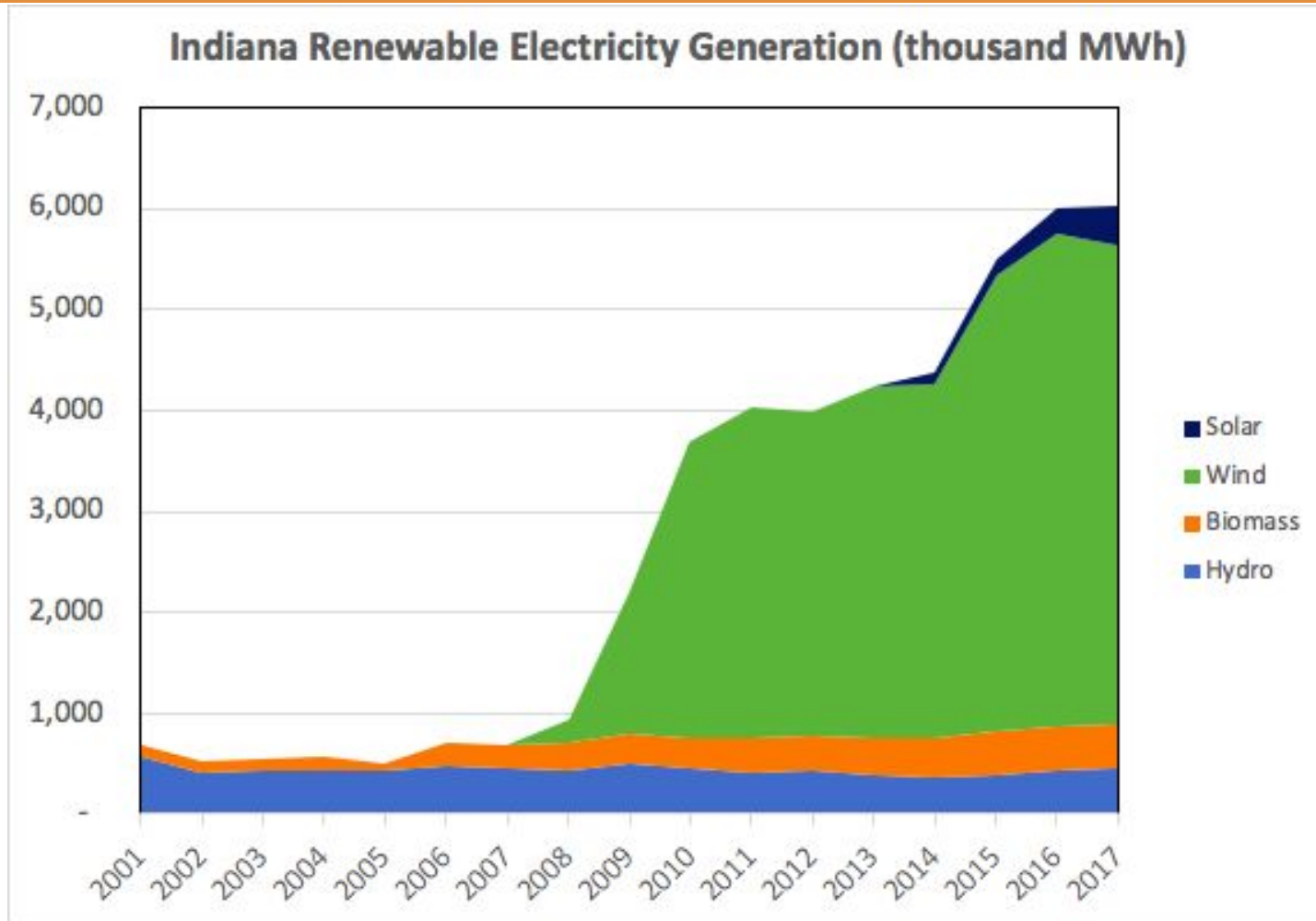
CAPTURE METHANE

MOTOR FLEETS/POLICE/TRASH/PUBLIC WORKS

SECURITY LIGHTING -- LEDs



Although a small share of the mix, RE has grown substantially since 2008



Source: U.S. Energy Information Administration, Electricity Data Browser

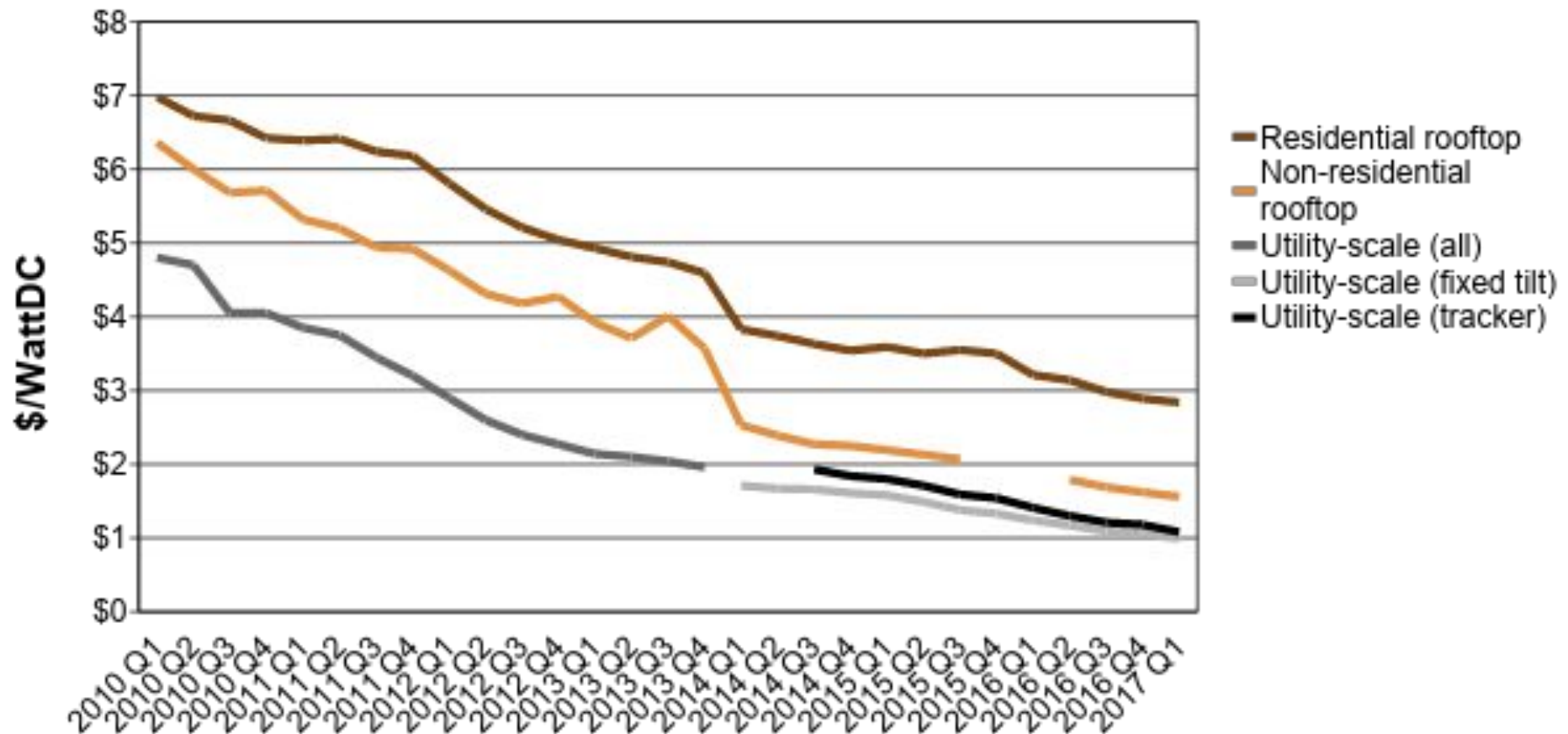
SOLAR

- **TECHNOLOGY ADVANCING**
- **COSTS DECREASING (60% DROP SINCE 2009)
PROJECTED ADDITIONAL 40% IN 10 YEARS**
- **VECTREN 50MW SOLAR; 150,000 PANELS; 300 Acres**
- **REMCs: 12MW/>100 acres**



Solar – Average U.S. System Cost

Solar PV - Average U.S. Installed System Cost



Source: Solar Energy Industry Association and Greentech Media Research, *U.S. Solar Market Insight*, Quarterly (Q1 2010 – Q2 2017).

WIND

- **TECHNOLOGY advancing -- generator efficiency**
- **OVER 1000 TURBINES IN INDIANA**
- **RUSH COUNTY: \$350M PROJECT (APEX CLEAN ENERGY)**
- **REMCs -- over 300MW**



ENERGY EFFICIENCY

COMMERCIAL

LIGHTING/HVAC/REFRIGERATION

INDUSTRIAL

PUMPS/STEAM/AIR SYSTEMS/HVAC/LIGHTING
COMBINED HEAT AND POWER (CHP)

RESIDENTIAL

SMART THERMOSTATS/LIGHTING/WATER HEATERS



ANAEROBIC DIGESTION

2300+ CAFOs IN INDIANA

LANDFILLS

WASTEWATER TREATMENT PLANTS



ELECTRIC VEHICLES ENERGY STORAGE

INDIANA #3 IN AUTOMOBILE PRODUCTION

TESLA “MODEL 3” -- 500,000

VW SETTLEMENT MONEY

2025 -- EV/INTERNAL COMBUSTION PRICE PARITY

AES/IPL AEP/I&M BATTERY STORAGE

RESEARCH

- **CRANE**
- **PURDUE**



AEE Convenes the Advanced Energy Buyers Group to Engage on Clean Energy Policies



The AE Buyers Group is a **business-led coalition** of large energy users **engaging on policies** to expand opportunities to procure energy that is secure, clean, and affordable.



***“CHANGE BEFORE
YOU HAVE TO”***

(Jack Welch)



Thank you!

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