

# *2023 CLEAN ENERGY RESOURCES REPORT & DRAFT FORECAST INSIGHTS*

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Utilities, and Telecommunications of the Indiana  
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State Utility Forecasting Group

# *CLEAN ENERGY RESOURCES REPORT*

# Renewable Energy & Electricity Generation

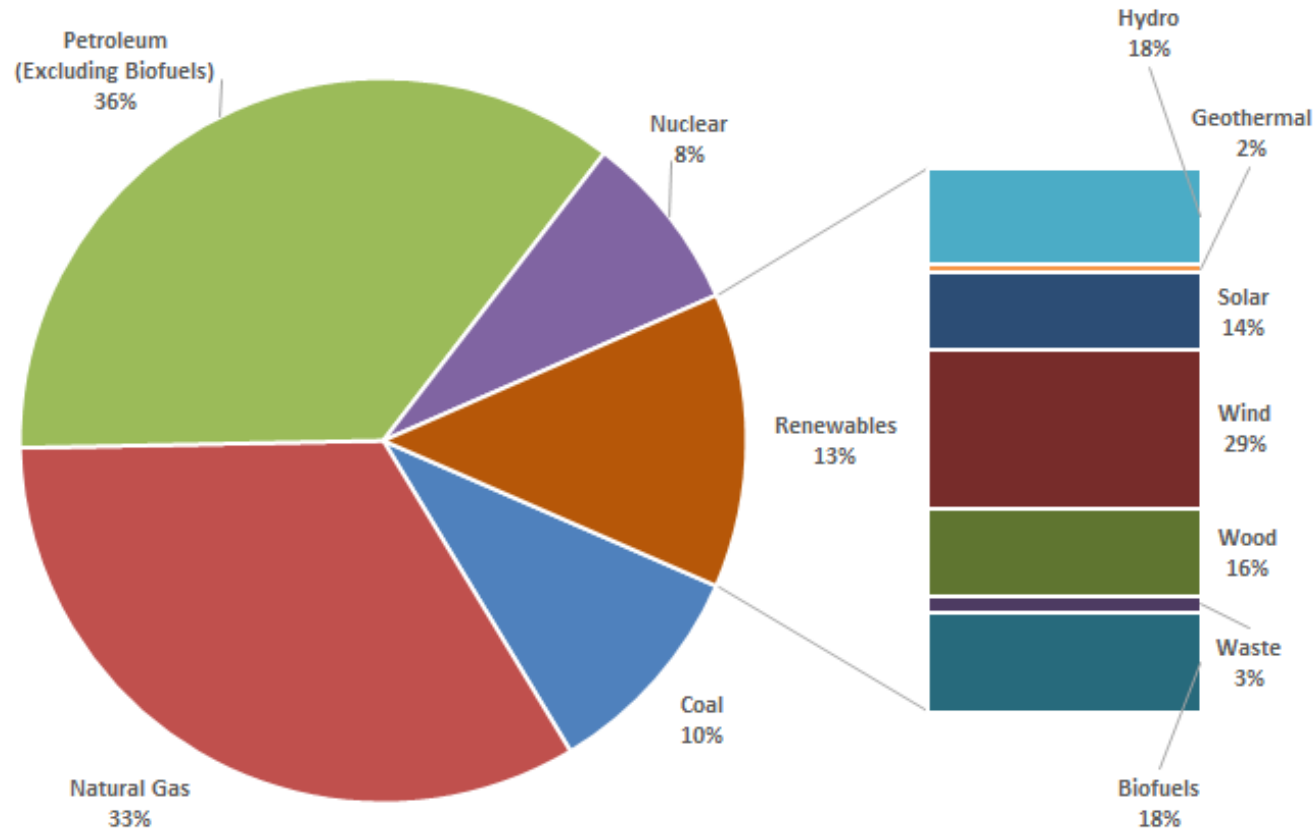
Renewables share of electricity generation is at its highest level

	U.S.	Indiana
Total Energy	13%	7.8%
Electricity Generation	21%	9.8%

- Biomass (including biofuels, wood, and waste to energy) is the largest source of renewable energy locally and nationally
- Wind is the largest source of renewable electricity

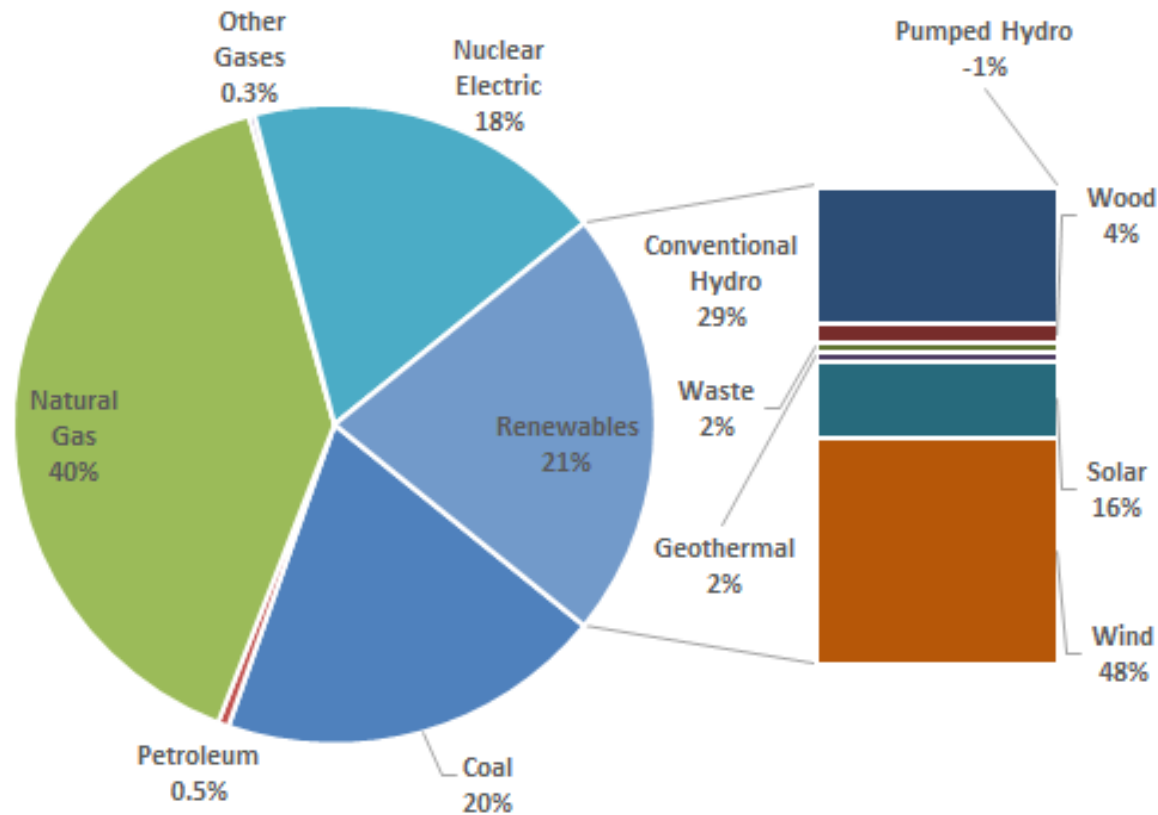
# 2022 U.S. Energy Consumption by Source

Major renewable contributors: hydro, wind, wood, biofuels



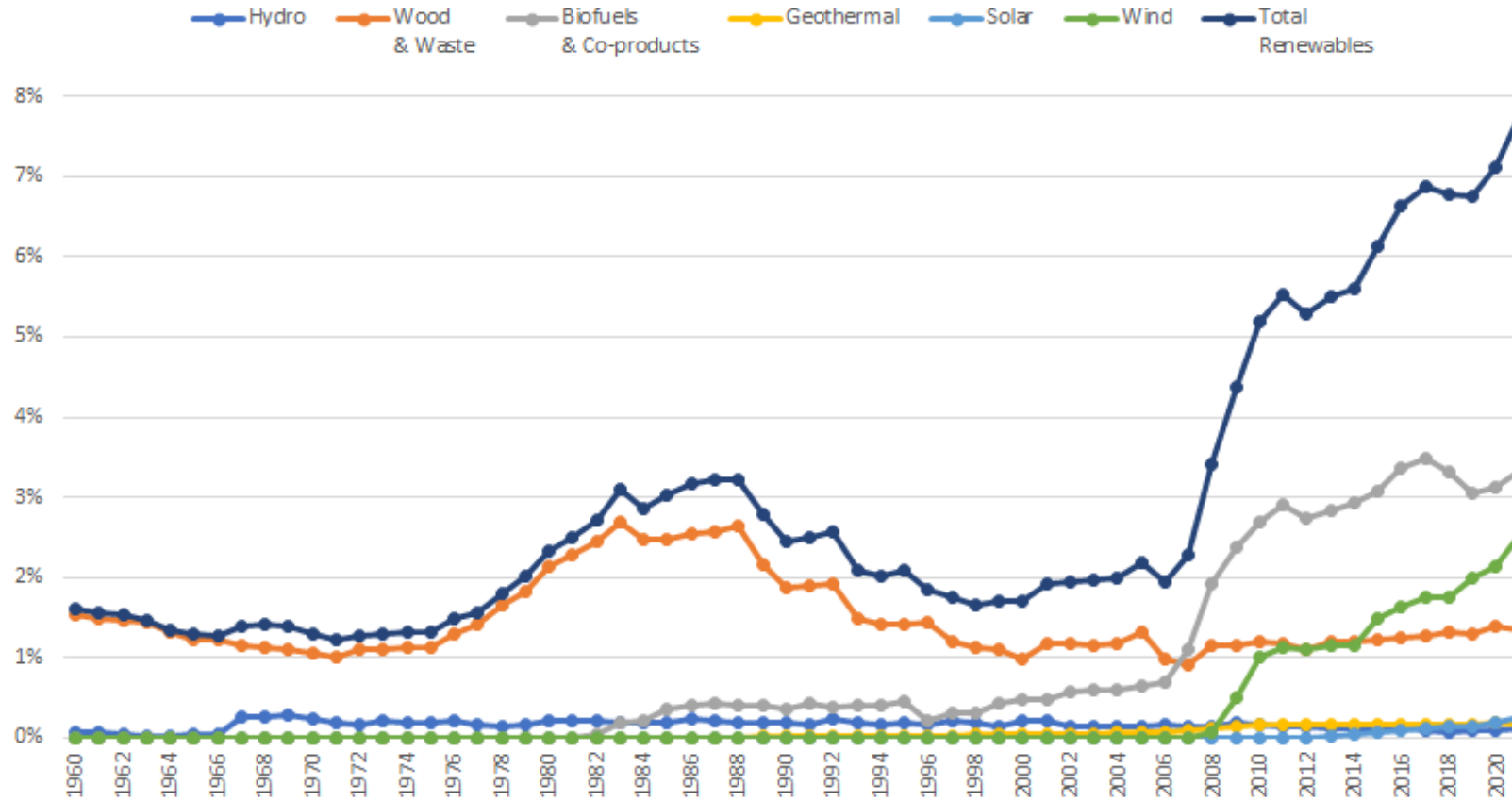
# 2022 U.S. Electricity Generation by Energy Source

Wind and hydro combined produce 80% of renewable electricity



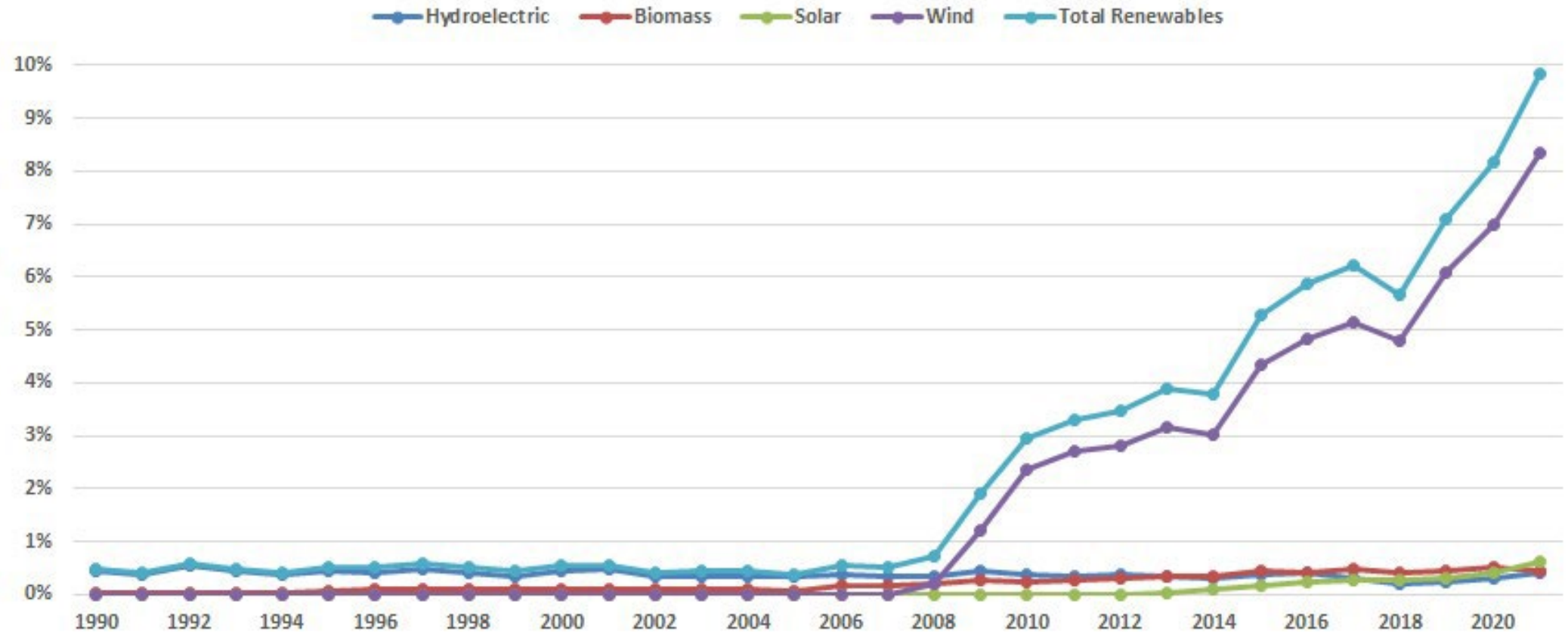
# Renewables Share of Indiana Energy

Biofuels represent 43% of renewable energy in Indiana; wind 33%



# Renewables Share of Indiana Electricity Generation

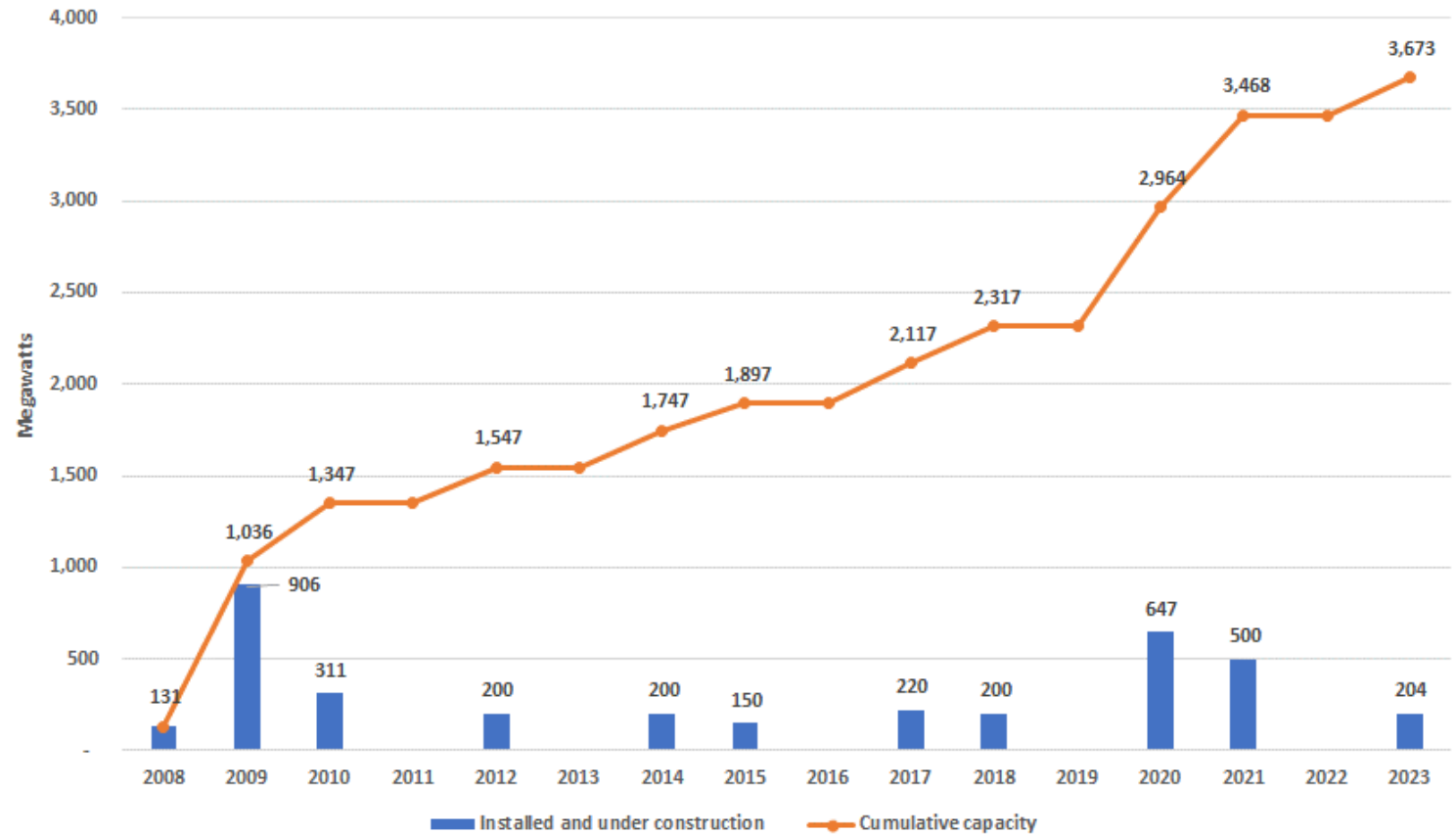
Wind provides 85% of renewable electricity in Indiana; 8.3% of all electricity



# Indiana Wind Generating Capacity

Indiana ranks 13<sup>th</sup> in the country for wind capacity

- Over 3.6 GW of capacity online by the end of the year
- Indiana utilities have purchased power agreements (PPAs) for about 2.1 GW of wind; 75% of which is in Indiana
- Amazon, Facebook and Walmart have 349 MW of virtual PPAs in Indiana





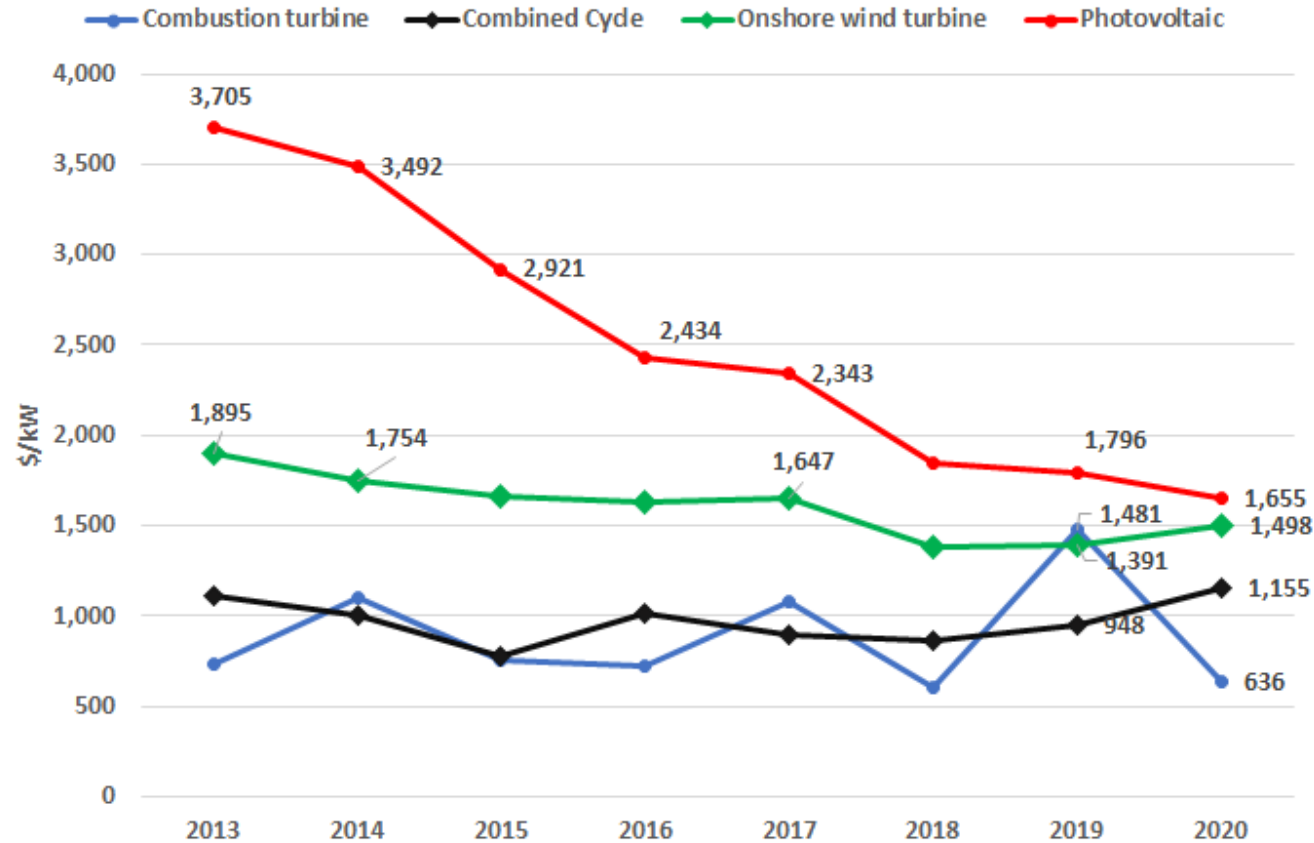
# *Indiana Photovoltaics Generating Capacity*

PV is expected to grow substantially

- SUFG is aware of over 1.3 GW of currently installed PV in Indiana
- 6 utility-scale solar farms totaling nearly 1.7 GW are under construction
- 35 additional projects totaling almost 6.4 GW have received some form of IURC approval but have not commenced construction
  - Certificate of need or approval of PPA for Indiana utilities, waived jurisdiction for merchant facilities
- 6 merchant projects totaling over 1.1 GW have pending cases before the IURC

# Average Construction Costs on New Generation

## Wind and solar costs continue to decrease



# Organic Waste Biomass in Indiana

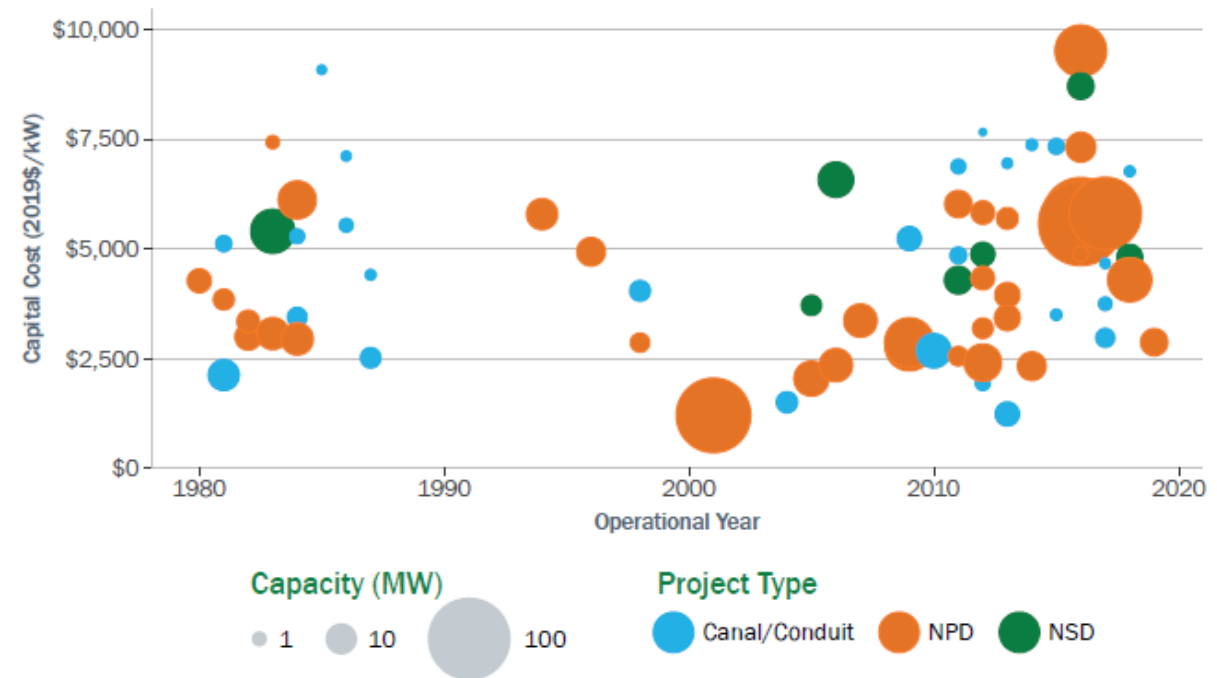
## 3<sup>rd</sup> largest source of renewable electricity

- Landfill gas
  - 18 landfills can generate about 65 MW
- Animal waste biogas
  - 6 digesters produce about 110,000 MWh annually
  - 5 digesters produce compressed natural gas for transportation use
- Municipal solid waste
  - District heating in Indianapolis
- Wastewater treatment
  - Cities of West Lafayette and Jasper
- Wood and wood waste

# Hydroelectricity

Capital intensive; cost is very site specific

- 62 MW of existing hydropower in Indiana
- DOE estimates there is the potential for 454 MW of additional capacity at existing dams
  - 2/3 of that is at the Myers and Newburgh locks on the Ohio River



NPD = Non-powered dam; NSD = New stream-reach development

# *Additional Sections*

## Other sections of the report

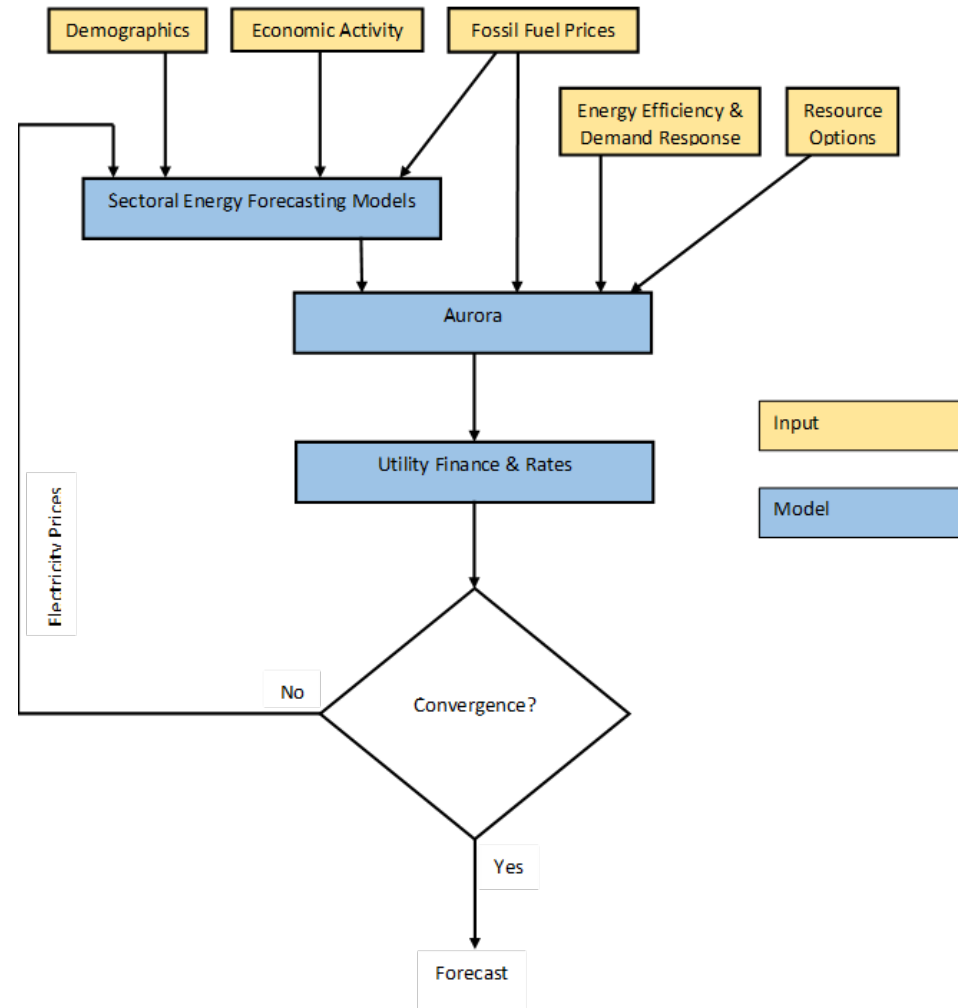
- **Dedicated Energy Crops**
  - Perennial grasses, woody crops and annual crops grown for energy production
  - Not in wide-scale production currently
  
- **Solar Thermal Energy**
  - Capture of solar energy in the form of heat
  - Outside of regions with substantial direct sunlight, primarily used for water and space heating
  
- **Underground pumped storage**
  - Added in 2022 per SEA 147
  - SUFG is not aware of any operating underground pumped storage facilities in the world

# *PRELIMINARY FORECAST INSIGHTS*

# 2023 Indiana Forecast is in Process

We do not have specific results yet

- Model calibration complete
- Troubleshooting is believed to be complete
- Base case model runs have been started, but are not finished
- After finishing base case, we need to do the low and high cases



# *Forecast Modeling System Enhancements*

Improving the models is a continuing goal

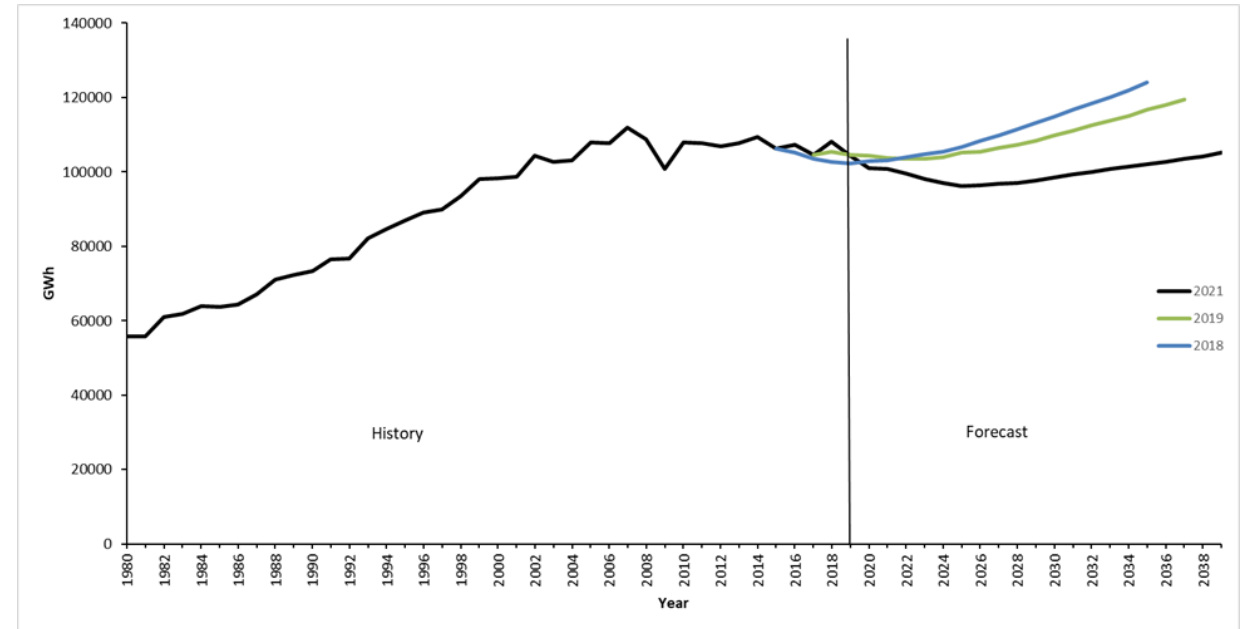
- Incorporating the MISO seasonal capacity construct
- Modeling the impacts of the Inflation Reduction Act of 2022
- Modeling of electric vehicles
- Modify treatment of utility long -term debt to prevent front-loading of costs
- Improved modeling of unaffiliated municipal and cooperative utilities



# 2023 Forecast Initial Indications

## Electricity sales

- Load looks to be fairly constant in the first 5 years before rising for the next 15
  - Overall sales look to be somewhat higher than in the 2021 forecast and lower than the 2019 forecast
  - Sales to the residential sector grows fastest



From 2021 forecast

# 2023 Forecast Initial Indications

## Real electricity prices

- Similar to the 2021 forecast, prices look to increase in the first 5-6 years, then level off
  - Short-term price increase looks more moderate than in previous forecast

# 2023 Forecast Initial Indications

## Future Resources

- The optimization model is selecting a mix of natural gas (both combustion turbines and combined cycle options), solar and wind, with a smaller amount of batteries
- New coal and nuclear options have not been selected
- Natural gas capacity is added throughout the forecast
- A significant amount of solar capacity is added in 2032 to take advantage of the tax credits before they expire

# *THANK YOU*

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