2024 RENEWABLE ENERGY RESOURCES REPORT AND 2023 & 2025 FORECAST INSIGHTS

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Renewable Energy & Electricity Generation

Renewable electricity growing steadily

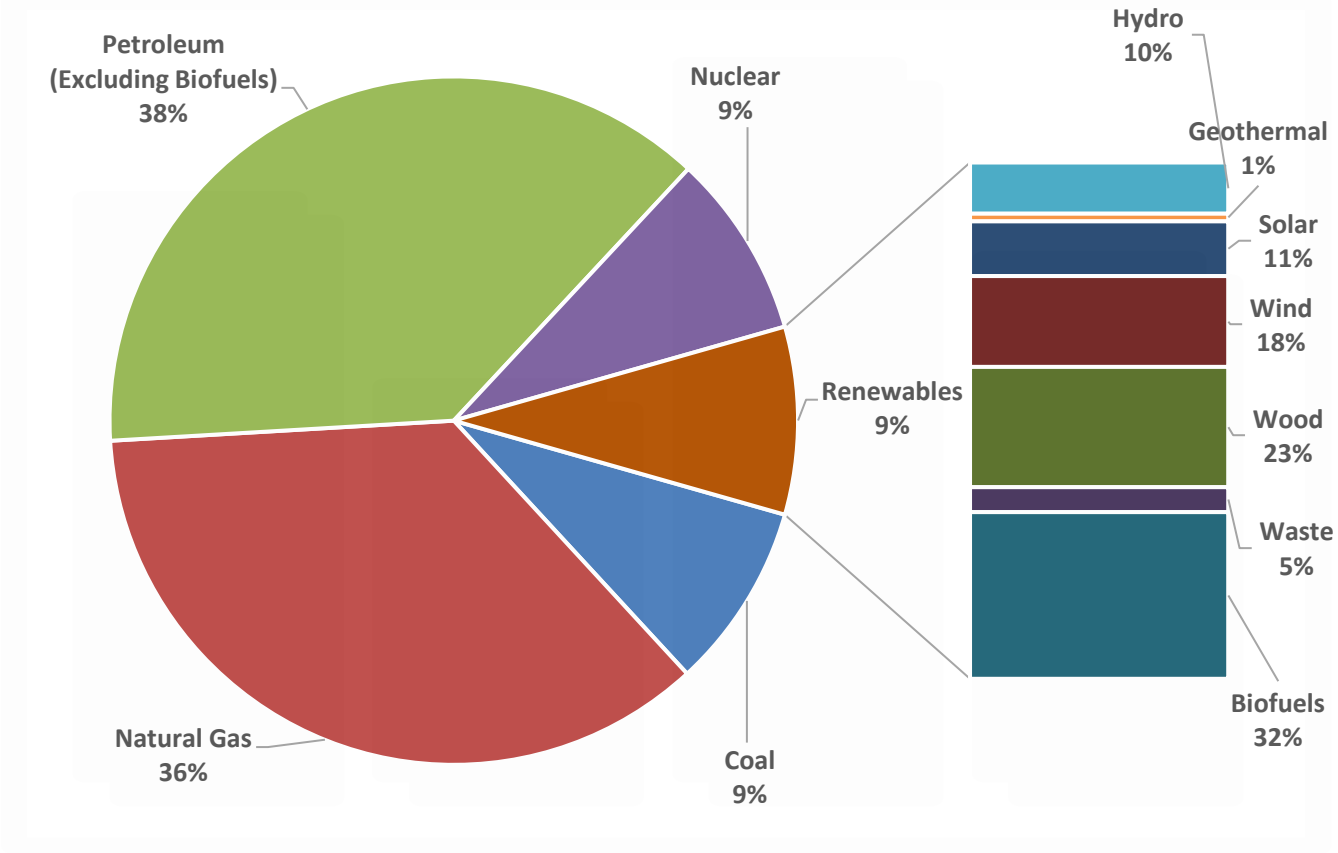
	U.S.	Indiana
Total Energy	9%	7%
Electricity Generation	21%	12%

- Biomass is the largest source of renewable **energy** locally and nationally (including biofuels, wood, and organic waste)
- Wind is the largest source of renewable **electricity**
- Solar is a rapidly rising source of renewable **electricity**

Data source: EIA

2023 U.S. Energy Consumption by Source

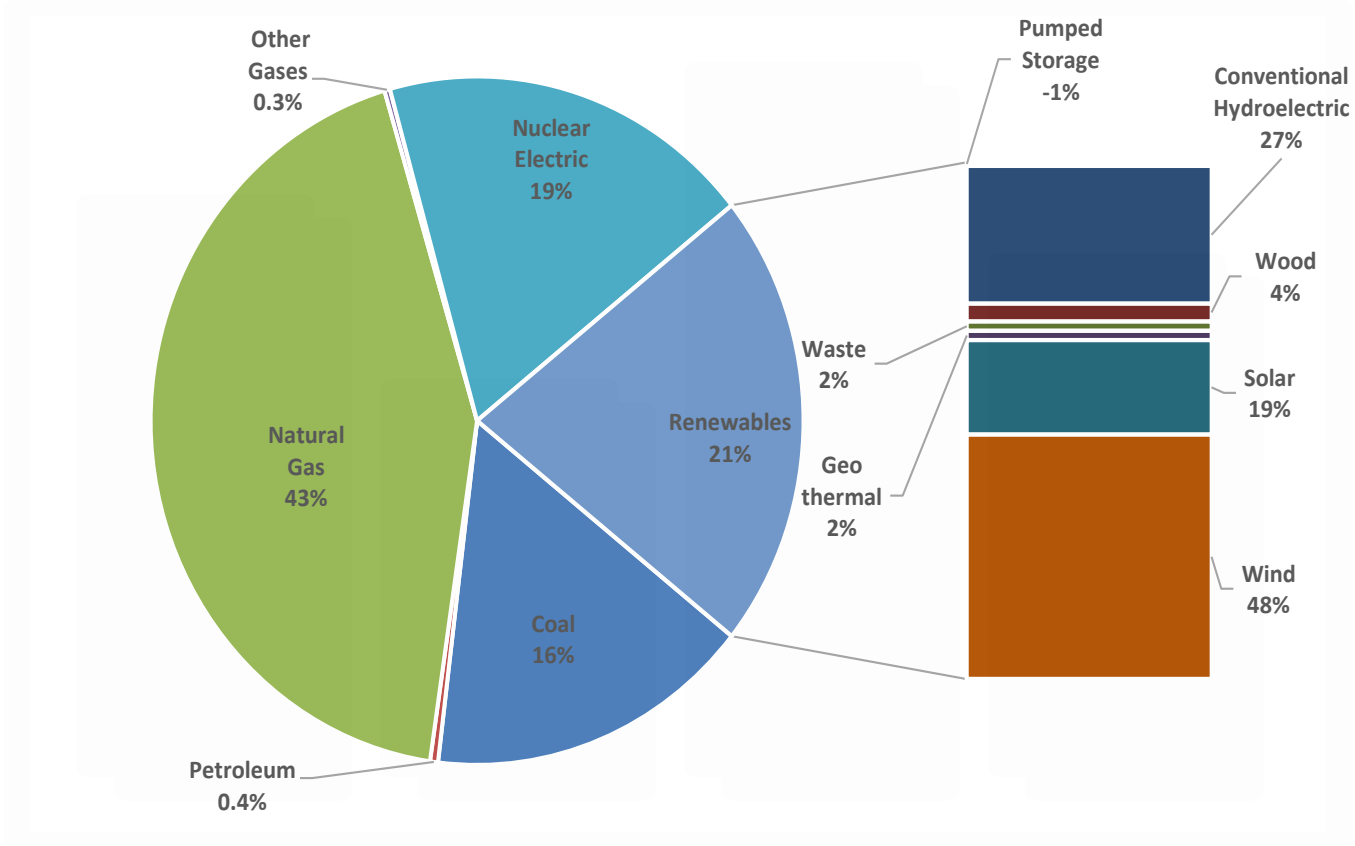
Major renewable contributors: Biofuels, wood, wind



Data source: EIA

2023 U.S. Electricity Generation by Energy Source

Wind, hydro and solar combined produce 93% of renewable electricity



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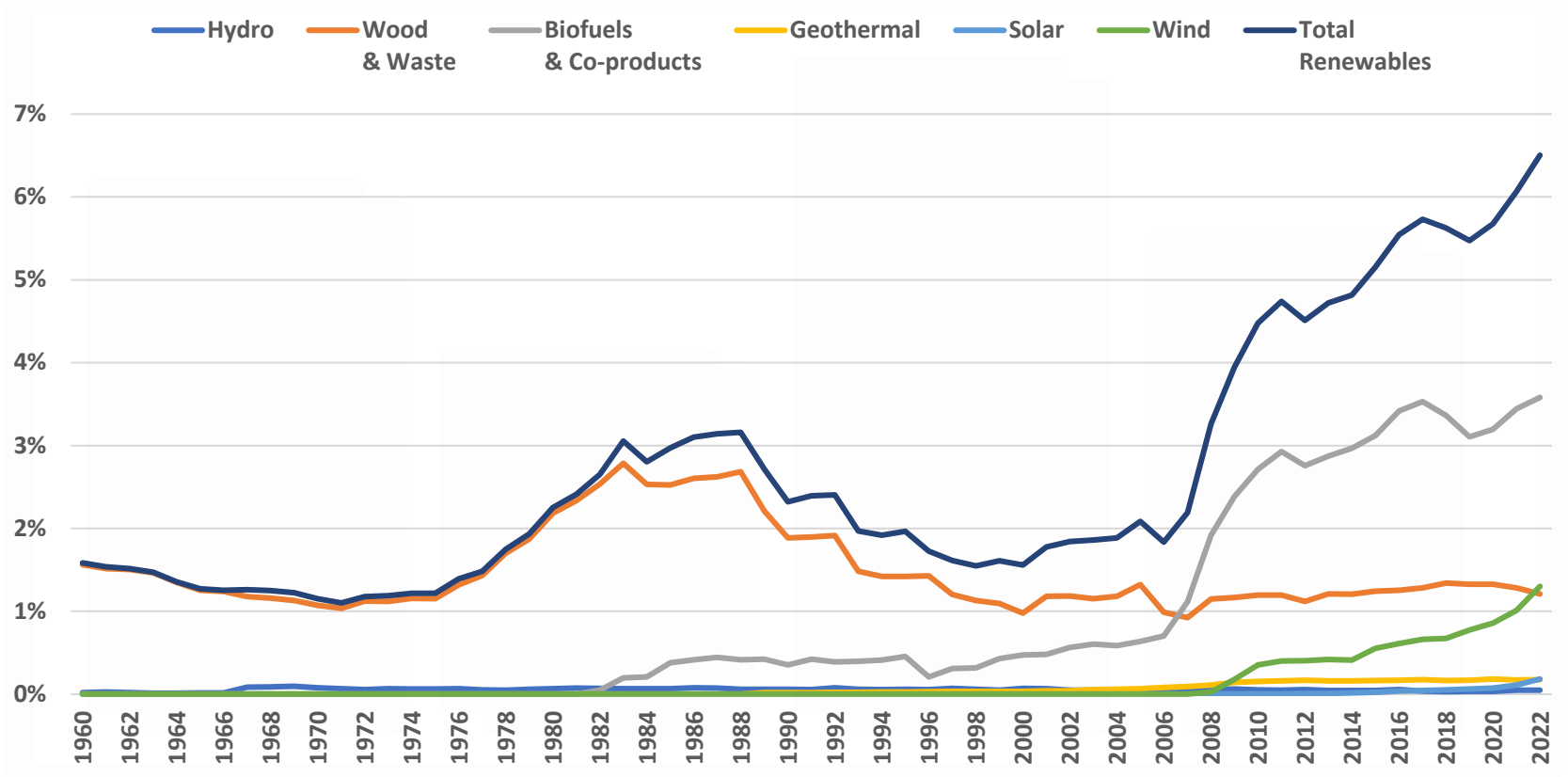
Data source: EIA

Renewables Share of Indiana Energy

Biofuels represent 55% of renewable energy in Indiana; wind 20%, solar 2.8%



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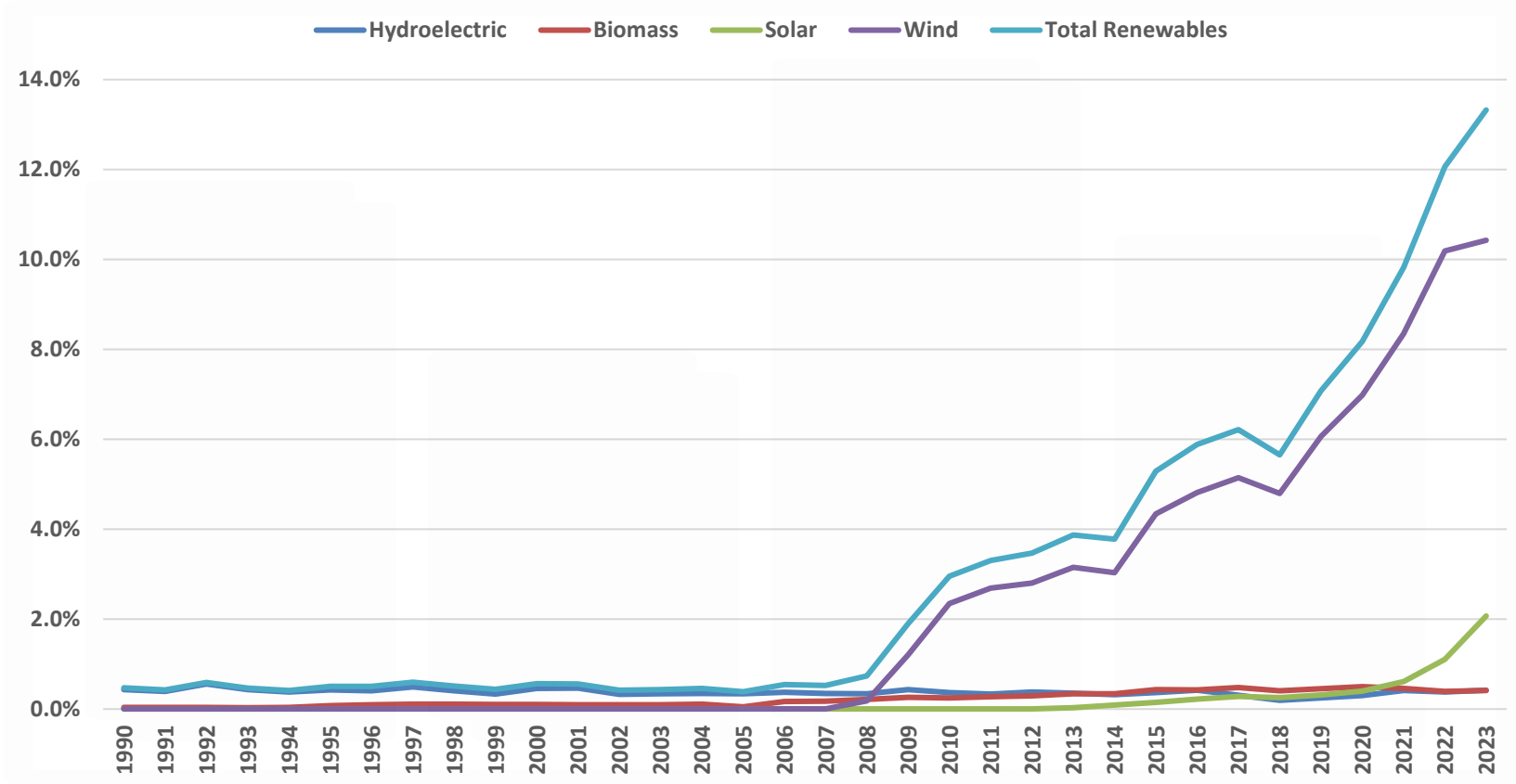
Data source: EIA

Renewables Share of Indiana Electricity Generation

Wind provides 10% of electricity generated in Indiana; Solar 2 %



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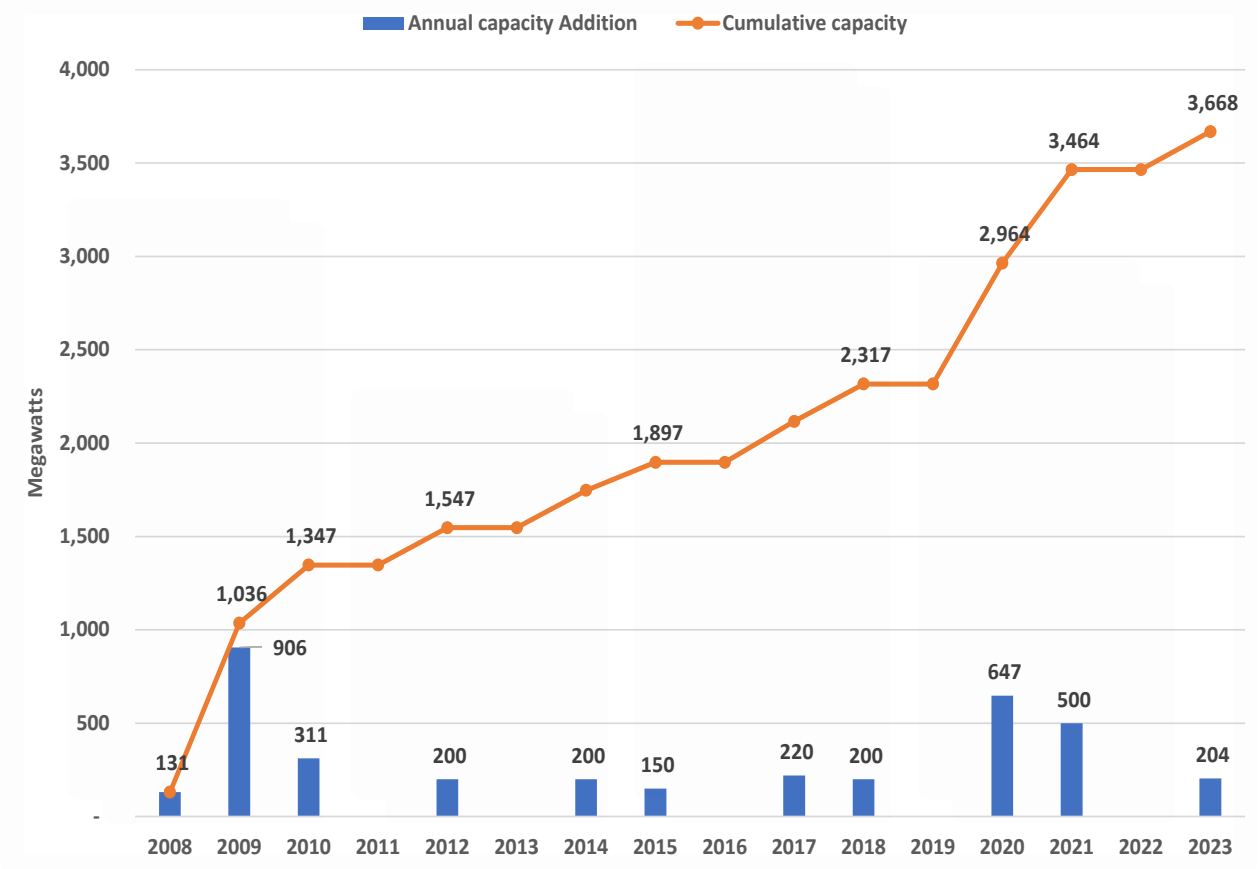
Data source: EIA

Indiana Wind Generating Capacity

Indiana ranks 12th in the country for installed wind capacity

- 3.7 GW of capacity online by the end of 2023
- Indiana utilities have purchased power agreements (PPAs) for about 2 GW of wind; 75% of which is in Indiana
- Amazon, Facebook and Walmart have 349 MW of virtual PPAs in Indiana



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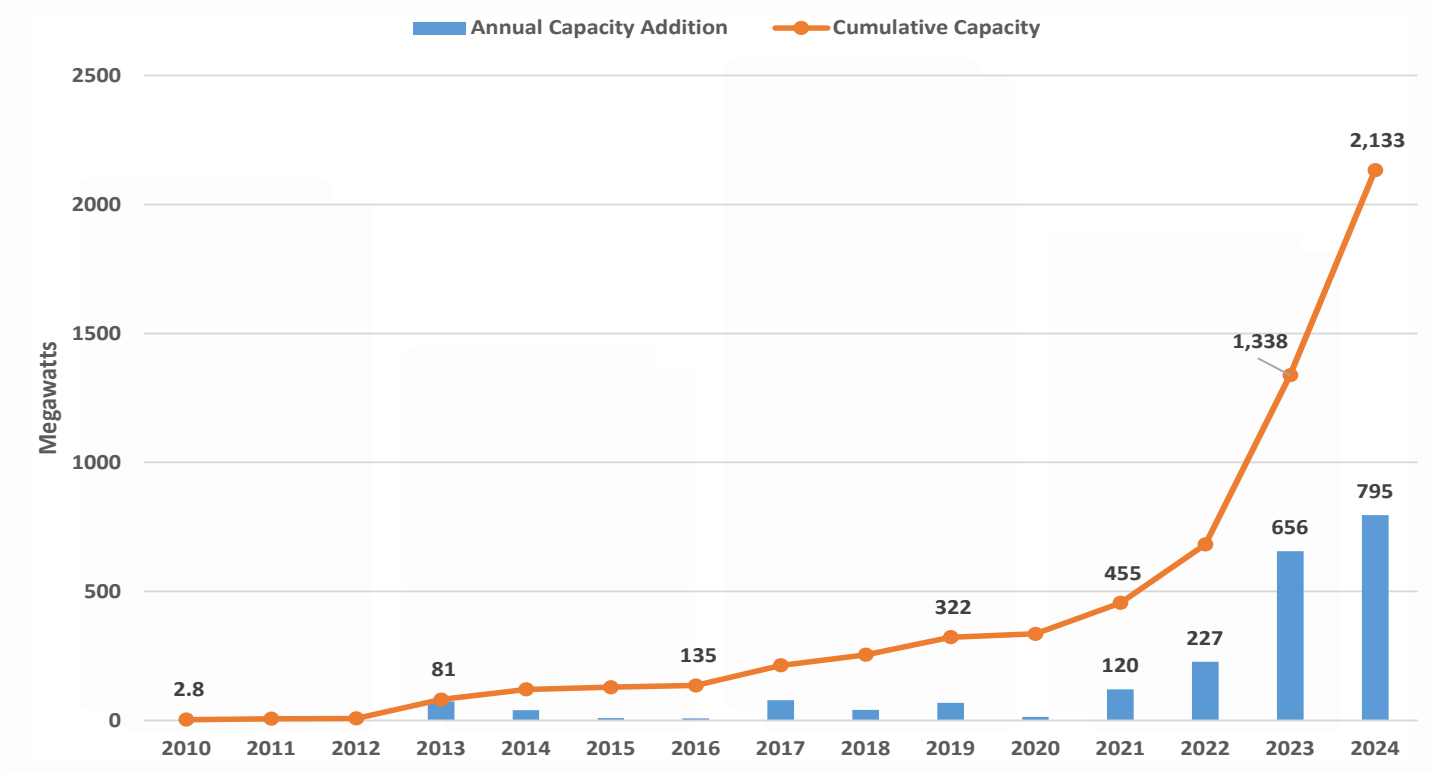
Data sources: IURC, EIA

Indiana Solar PV Generating Capacity

Solar PV rapidly growing source of renewable electricity

- 2 GW installed
- 2 GW under construction
- 6 GW more proposed
- PV on track to overtake wind in installed capacity



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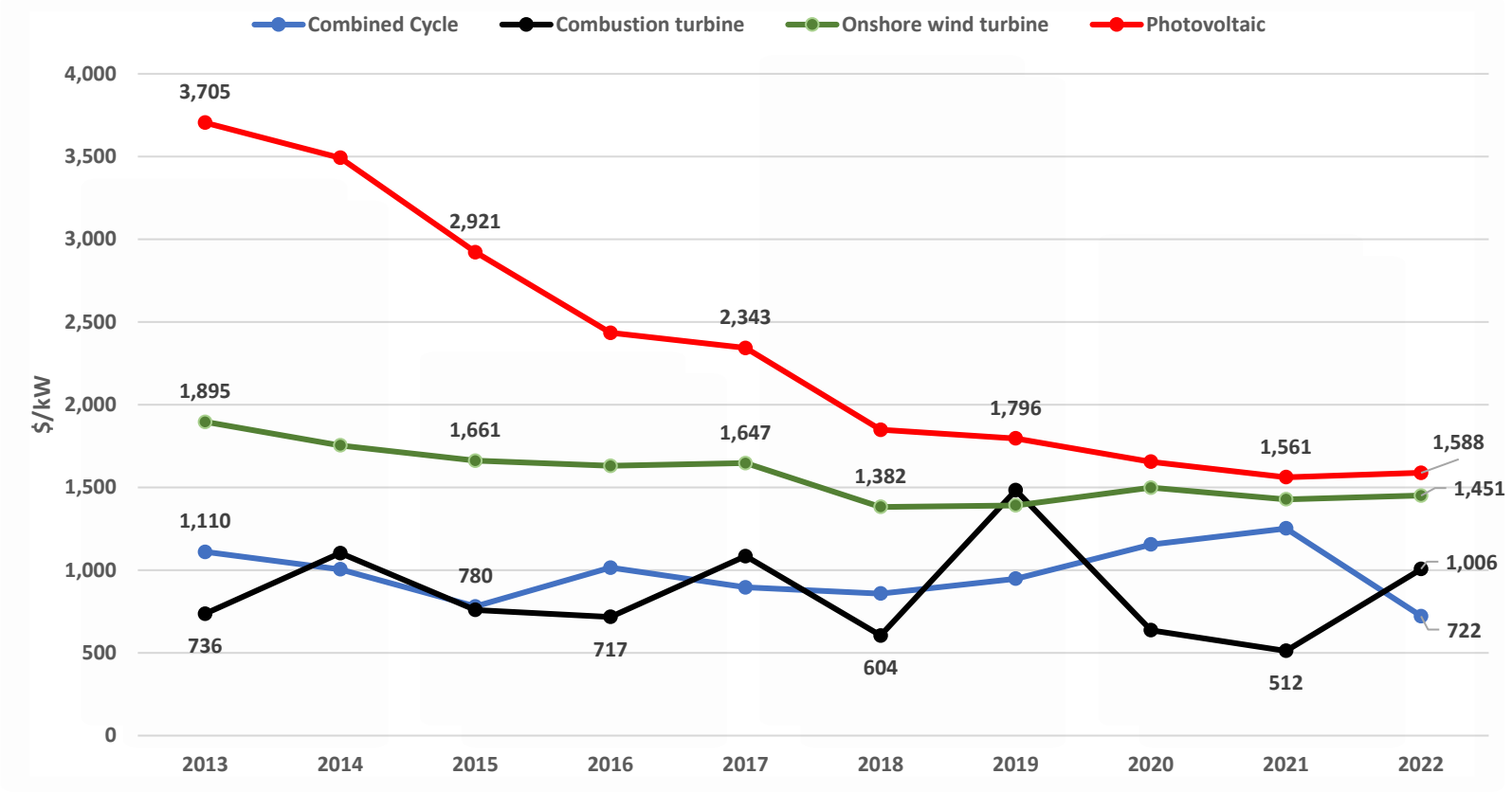
Data sources: IURC, EIA

Historical Average Construction Costs of Generation

Wind and solar capital costs have decreased



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Data source: EIA

Organic Waste Biomass in Indiana (Chapter 4)

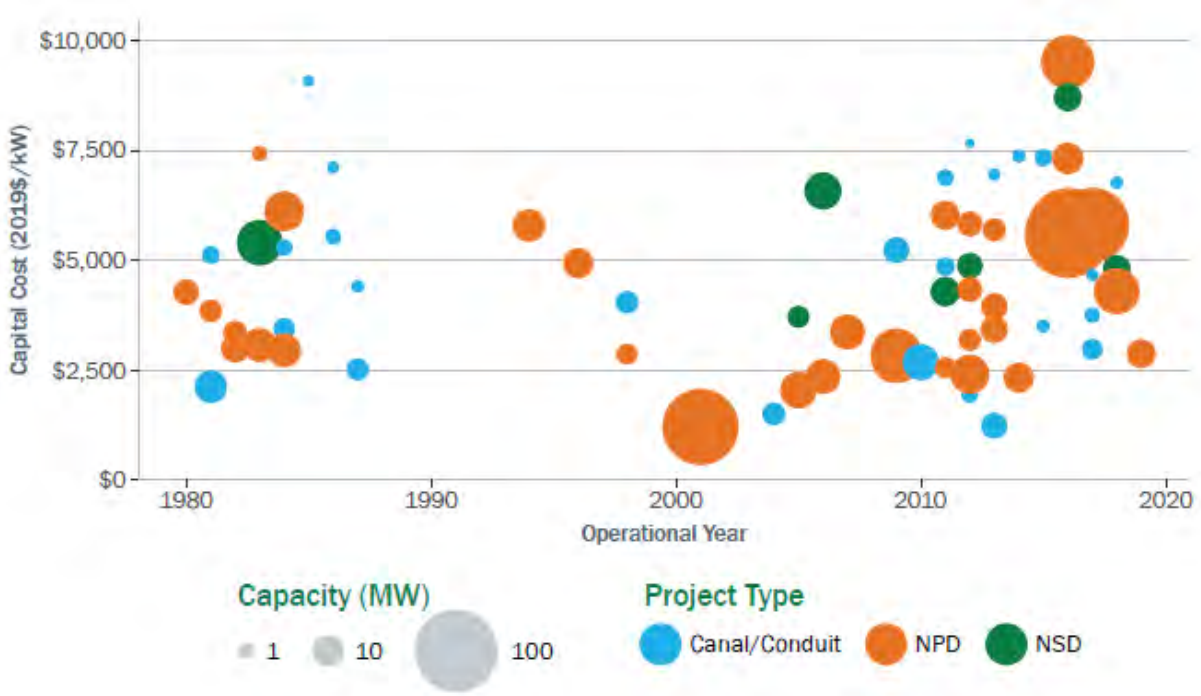
3rd largest source of renewable electricity

- **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 (Chapter 7)

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

Source: DOE

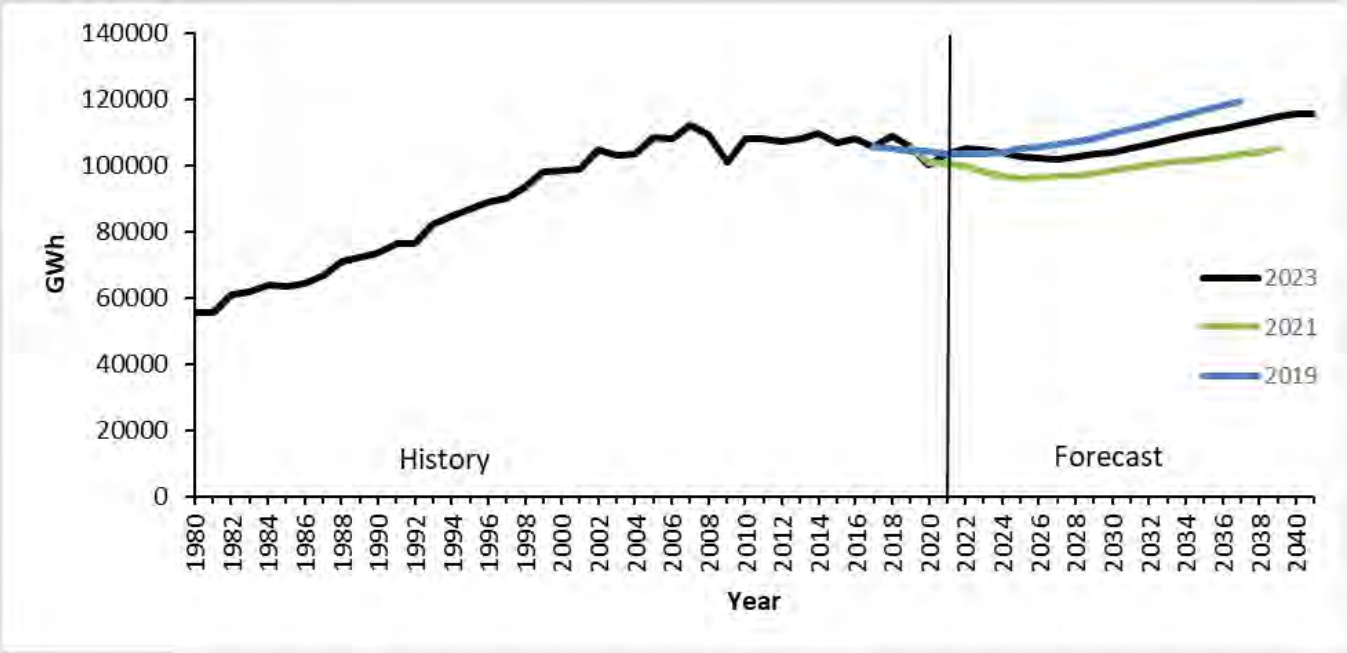
Additional Sections

Other sections of the report

- **Dedicated Energy Crops (Chapter 3)**
  - Perennial grasses, woody crops, and annual crops grown for energy production
  - Not in wide-scale production currently
- **Solar Thermal Energy (Chapter 5)**
  - 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 (Chapter 8)**
  - Added in 2022 per SEA 147
  - SUFG is not aware of any operating underground pumped storage facilities in the world

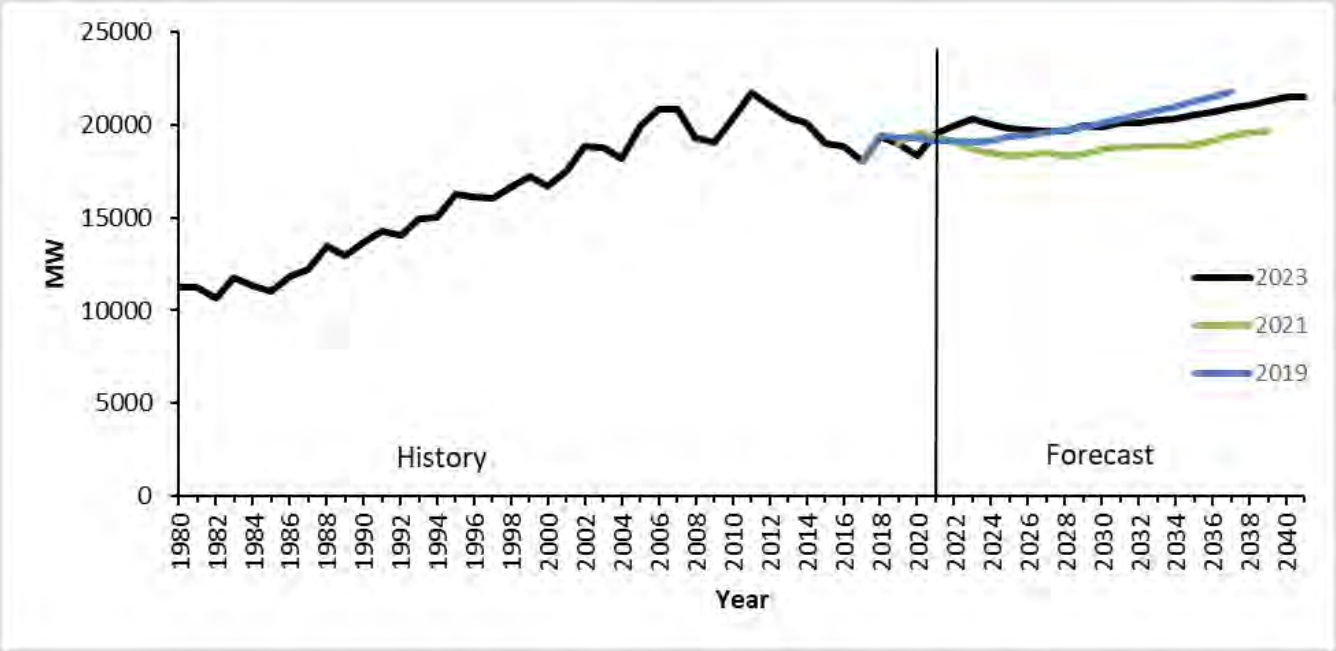
2023 & 2025 FORECAST INSIGHTS

Indiana Electricity Requirements



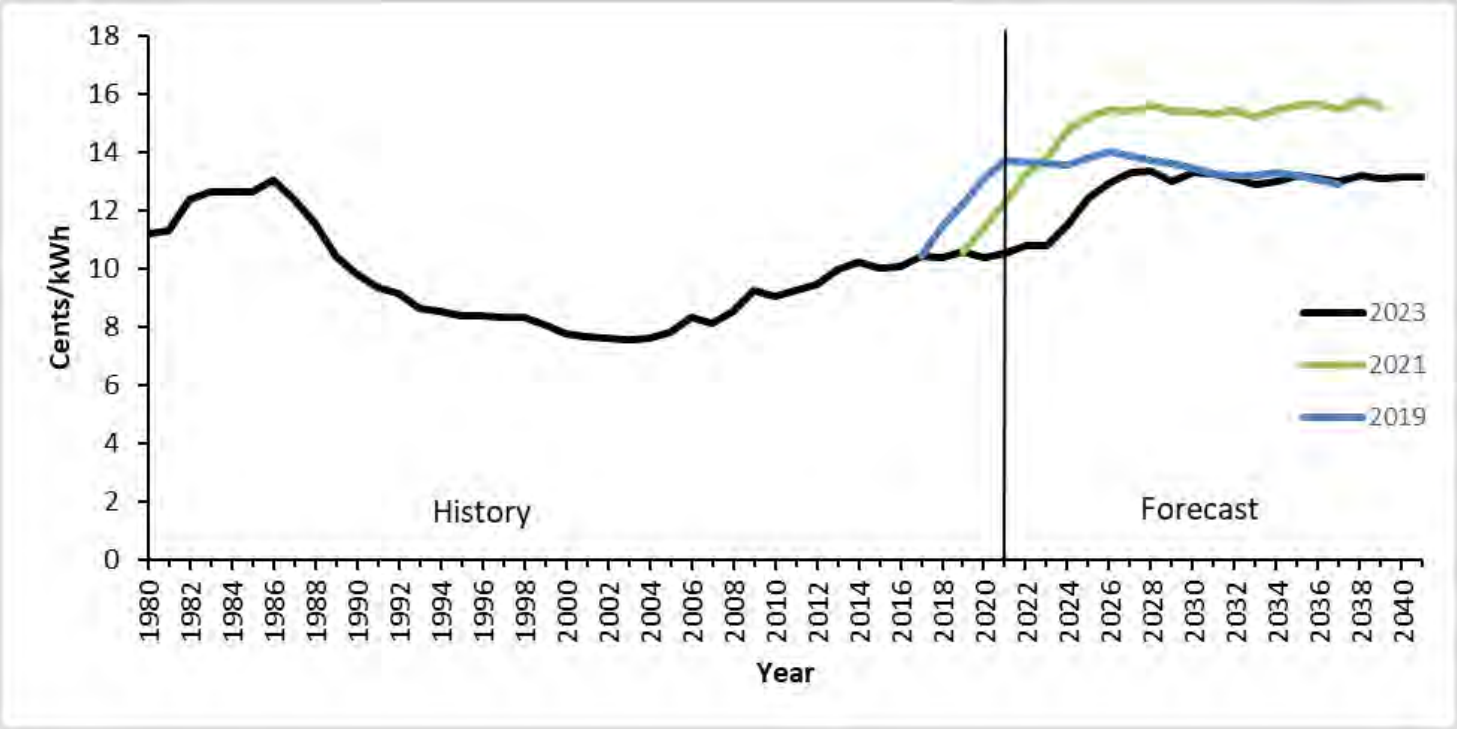
- Retail sales by investor-owned and not-for-profit utilities
- Includes estimated transmission and distribution losses
- Growth rates
  - 2023 forecast: 0.51% 2021 forecast: 0.21% 2019 forecast: 0.67%

Indiana Peak Demand Requirements



- Prior to 2017, peak demand projections were reduced by the amount of demand response
  - now, DR is treated as a resource
- Growth rates
  - 2023 forecast: 0.40% 2021 forecast: 0.02% 2019 forecast: 0.60%

Indiana Real Price Projections (2021 $)



- Effect of inflation removed
- Includes the cost of new resources
- Includes the cost of T&D upgrades

2025 Forecast: What's new?

- Load growth driven by data centers and other large loads will be factored into the forecast as appropriate, and the scale of these additions is highly significant.
  - NIPSCO is projecting an additional 2600 MW by 2035 in its new IRP reference case, more than doubling the current peak, and the possibility of an additional 6000 MW (on top of the 2600 MW) by 2035 in its "emerging load sensitivity."
  - Indiana Michigan Power projects in its IRP presentations that data centers and other large loads will more than double their current peak over the next 5-6 years, with more additions likely after that.
  - Duke Energy Indiana's "high load scenario" in their IRP presentations include approximately 1400 MW for large loads over the next decade.
  - Four utilities have responded to SUFG data requests with confidential information on future large load additions.
- Hybrid solar/battery will be modeled as a new resource option for the first time.
- MISO's proposed D-LOL methodology will be incorporated into the seasonal construct to the extent possible if approved by FERC.
- EPA's CO_2 Rule 111 will be modeled to the extent possible if it remains the law.

THANK YOU

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