2007 Indiana Renewable Resources Study

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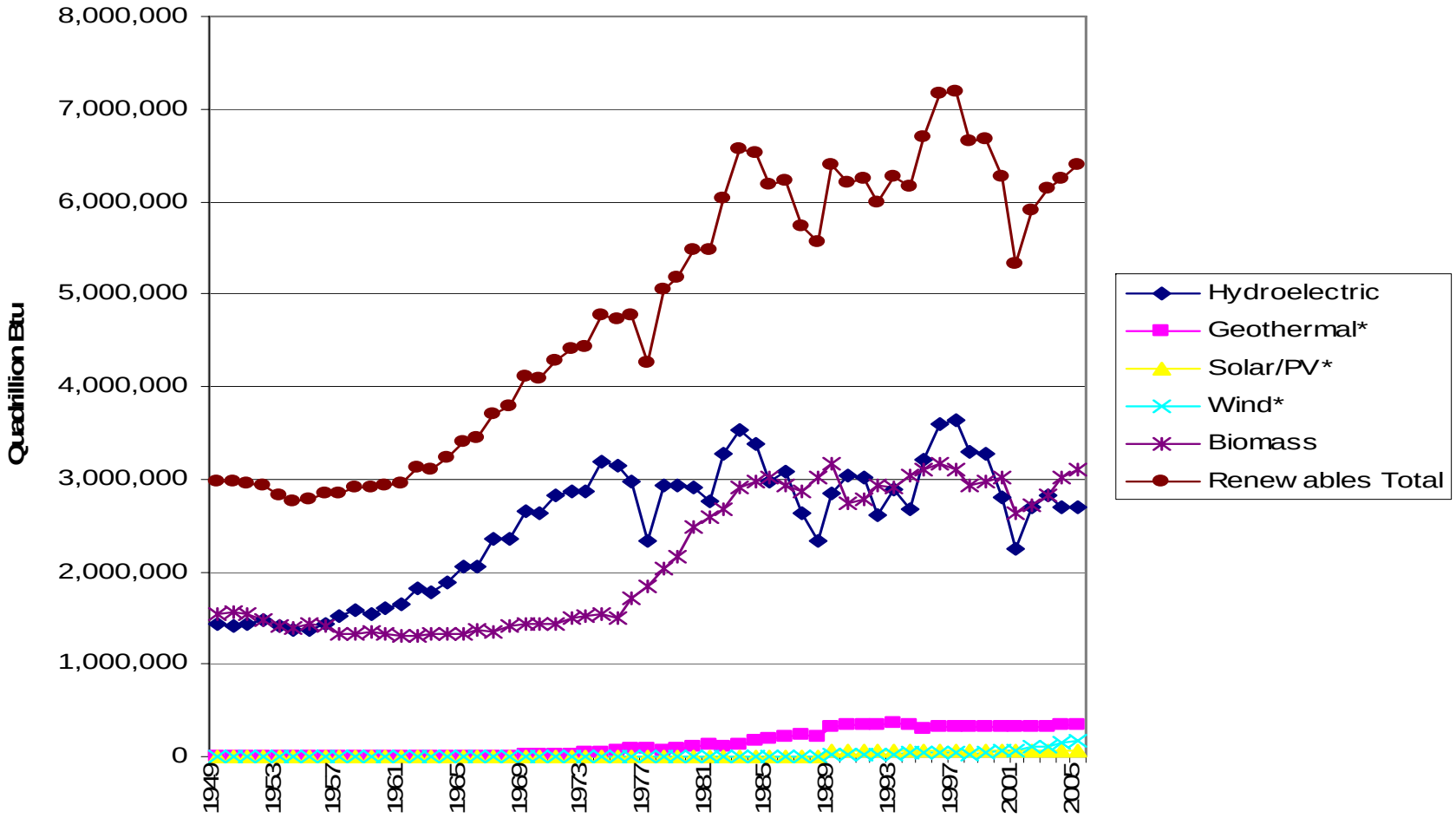
2007 Renewable Resources Study

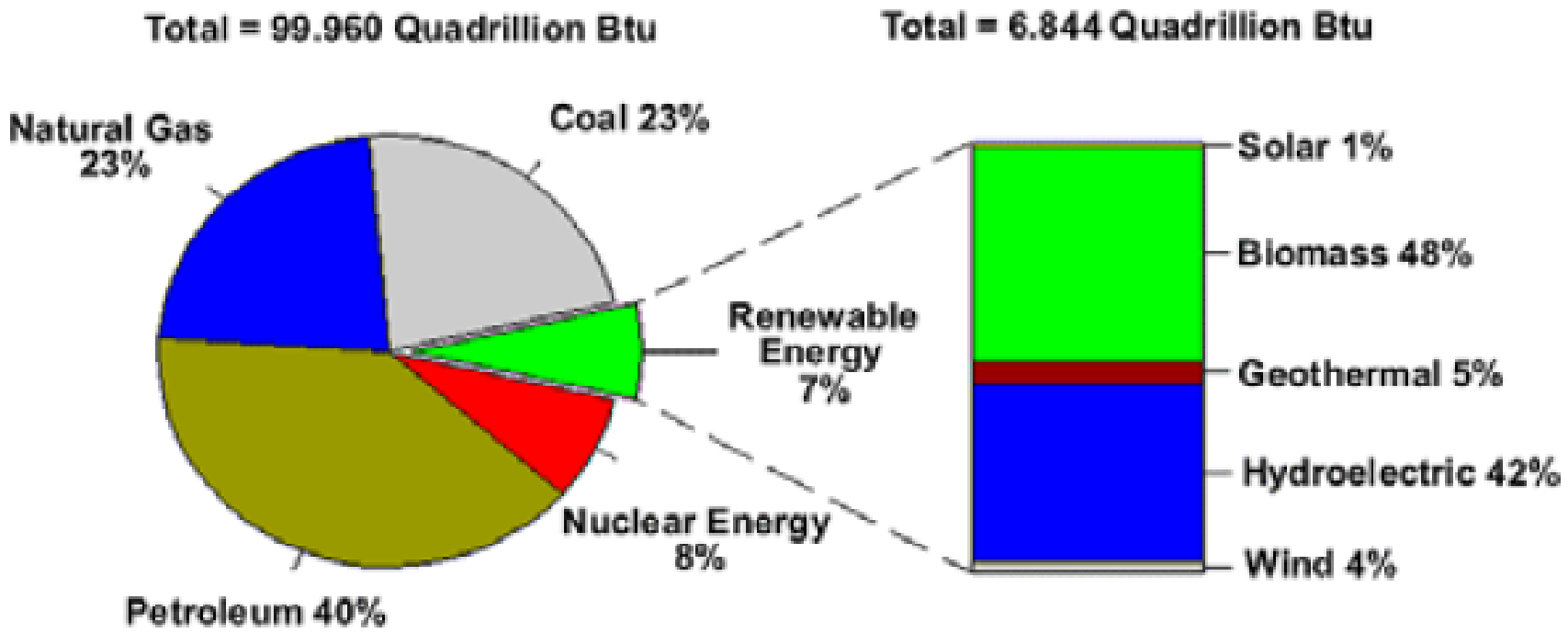
- Renewable energy trends
- Barriers and incentives
- Individual renewable resources
  - wind
  - energy crops
  - organic waste
  - solar/photovoltaics
  - fuel cells
  - hydropower

Historical Renewable Energy in the U.S.



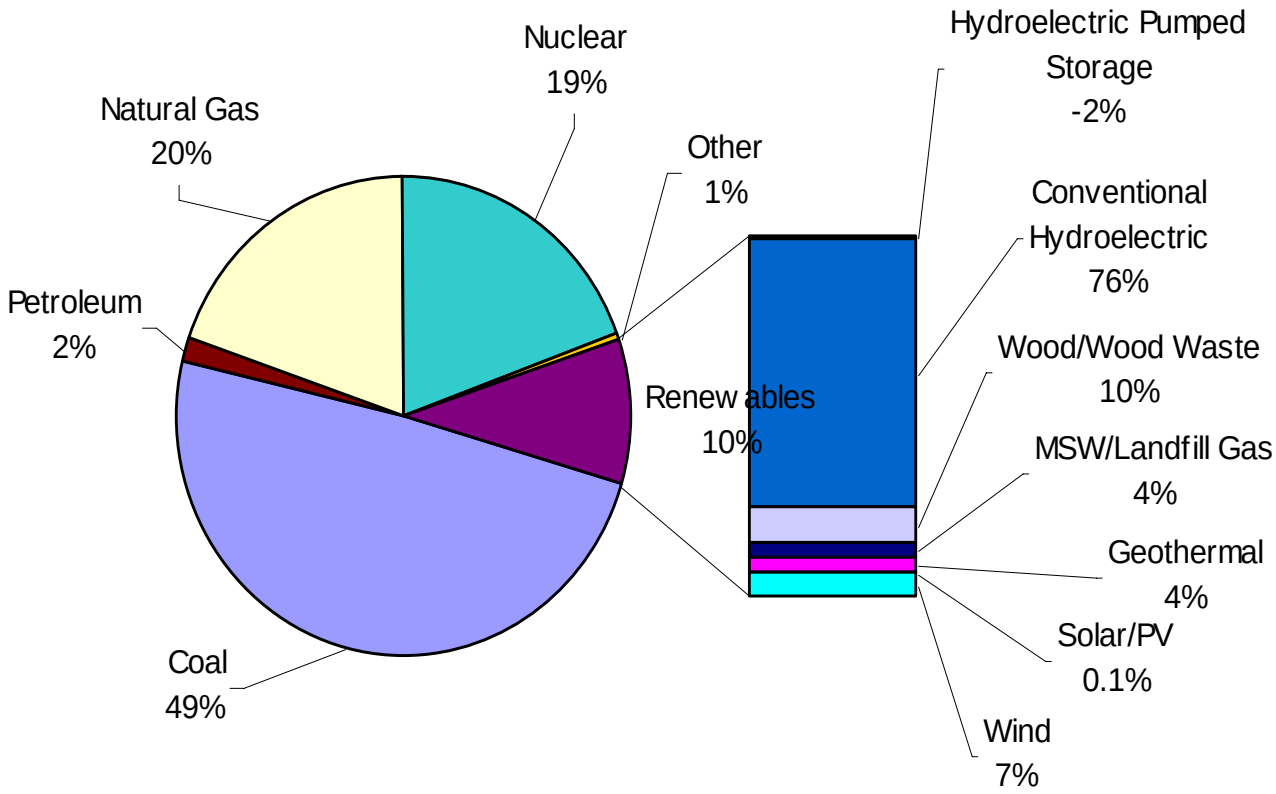
Data for geothermal, wind and solar was not available before 1960, 1982 and 1983 respectively. Source: EIA

2006 U.S. Total Energy Consumption by Energy Source



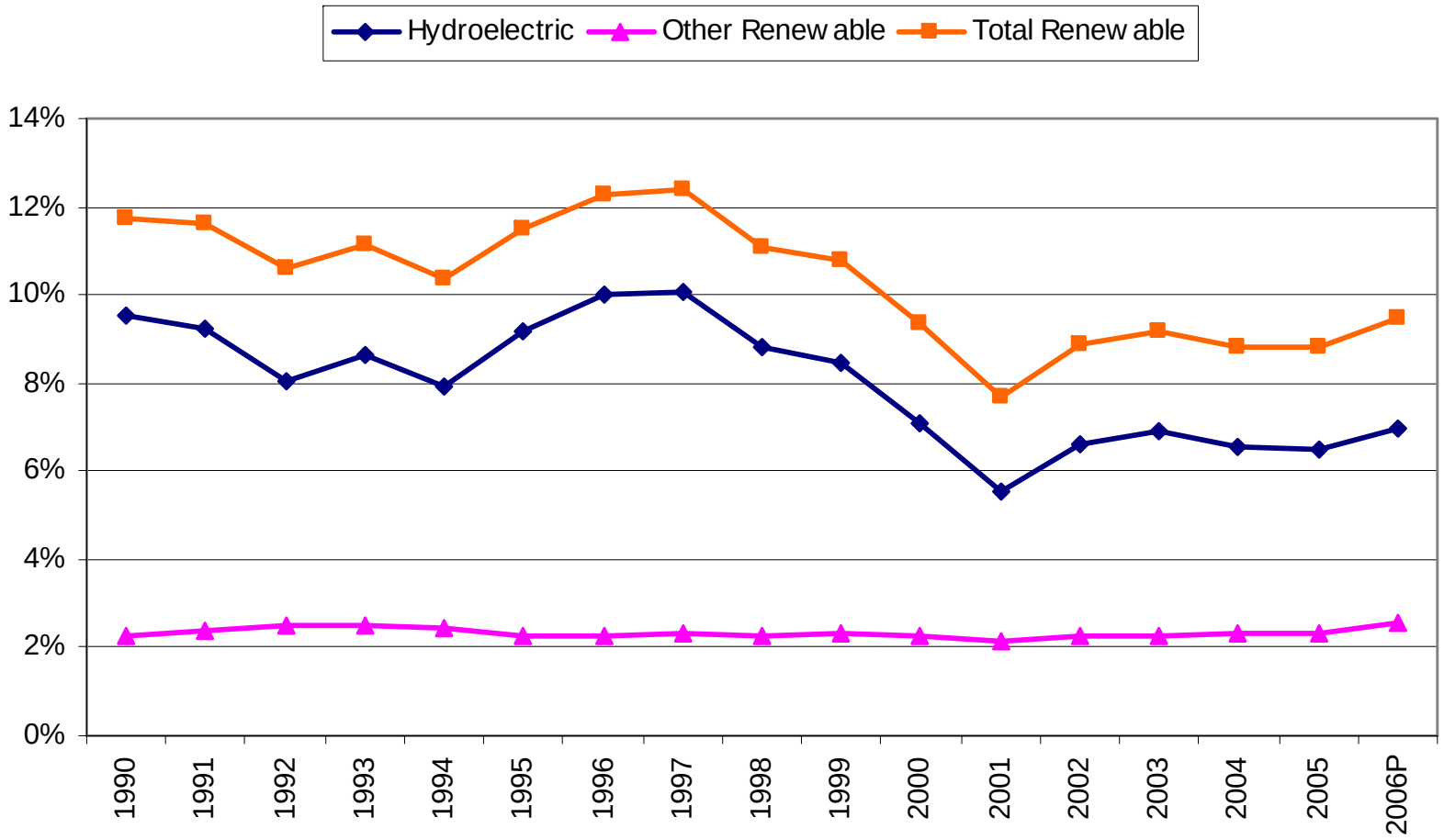
Source: EIA

2006 U.S. Electricity Generation by Energy Source



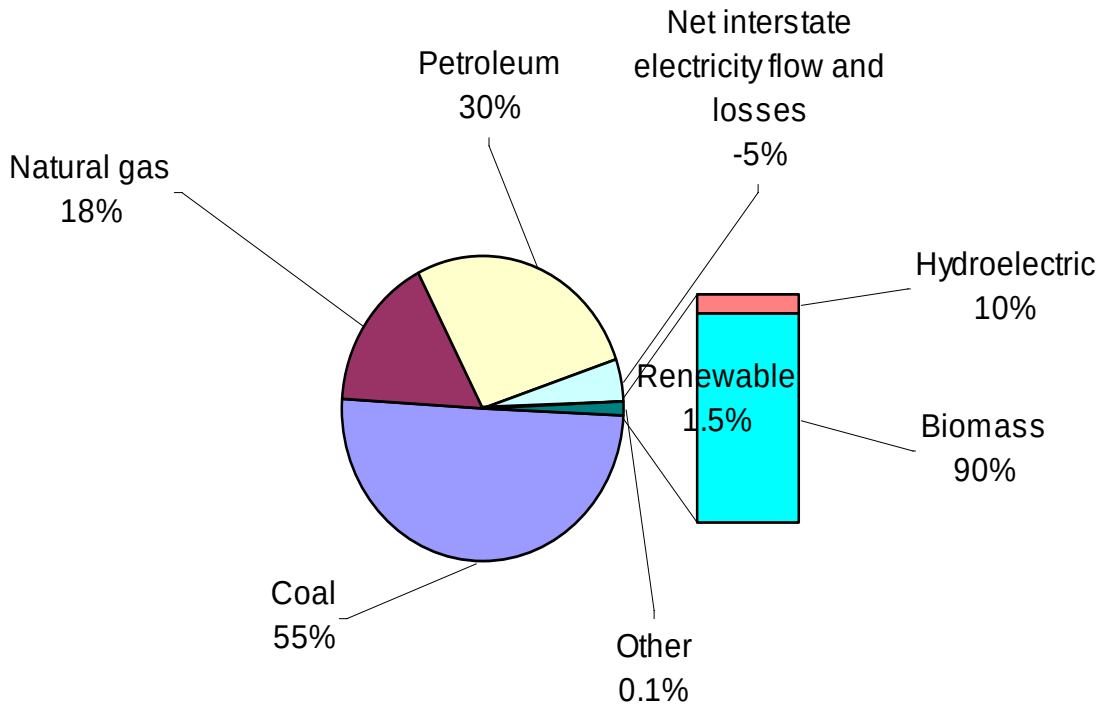
Source: EIA

Renewables Share of U.S. Electricity



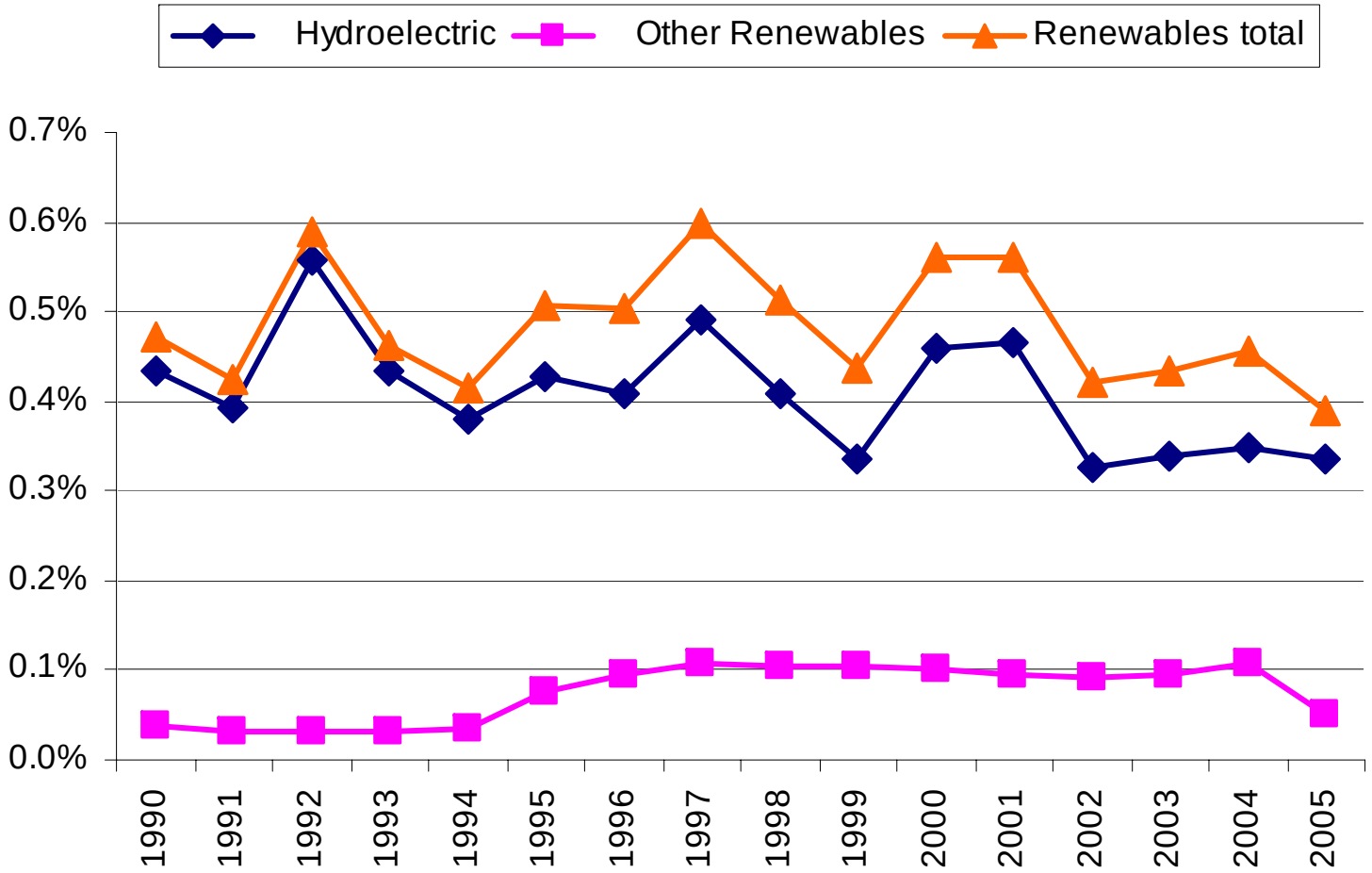
Data for 2006 is preliminary. Source: EIA

2004 Indiana Total Energy Consumption by Energy Source



Source: EIA

Renewables Share of Indiana Electricity



Source: EIA

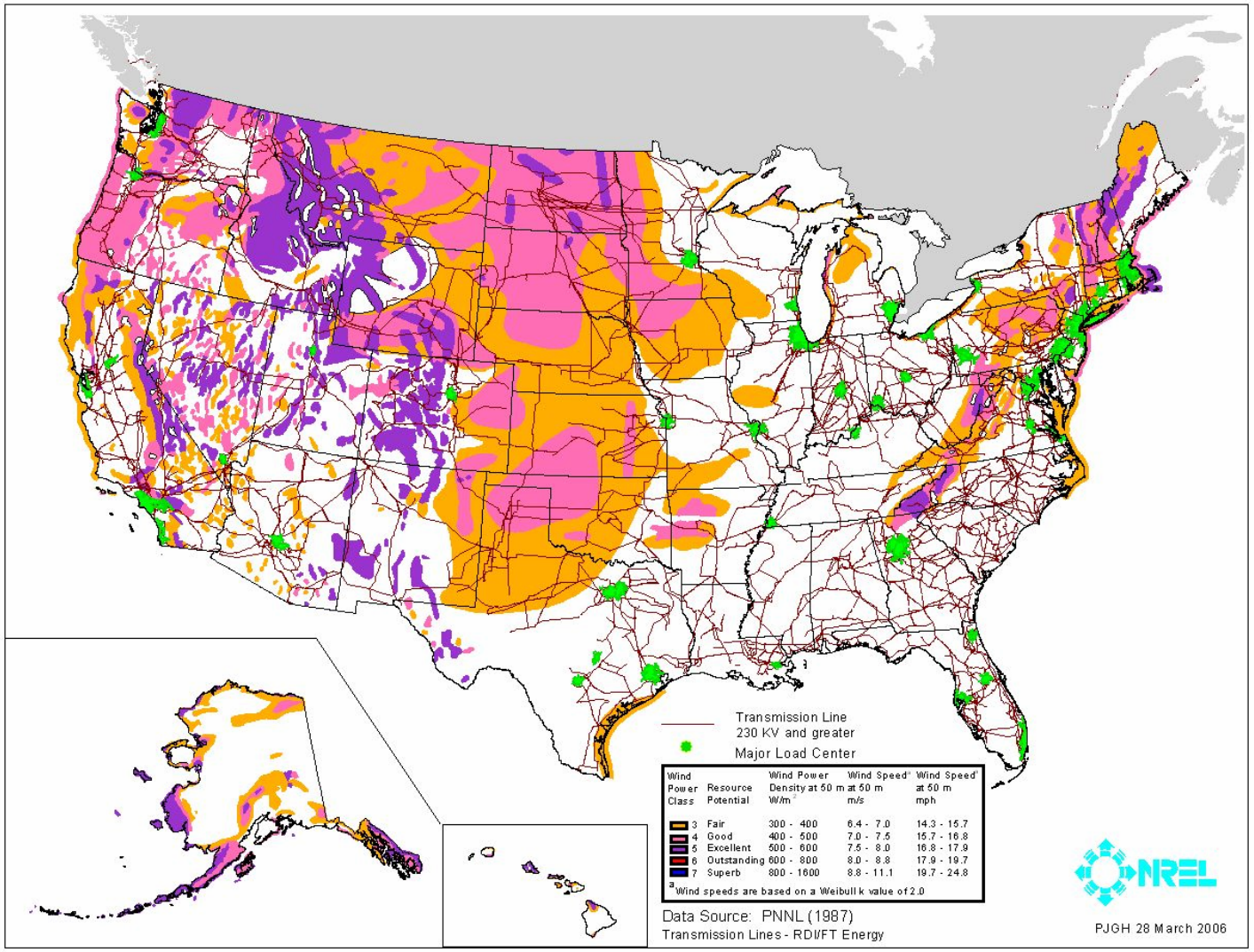
Barriers to Renewables

- Major barrier is cost
  - most renewable technologies have high capital costs
  - Indiana had the 5th lowest electricity rates in the country in 2004, according to the Energy Information Administration (5.58 cents/kWh vs. national average 7.47 cents/kWh)
- Limited resources are also a problem for some technologies
  - solar/photovoltaics, hydropower, wind

Incentives for Renewables

- Federal
  - tax credits and exemptions (production tax credit)
  - grant programs
- State
  - net metering rule
  - grant programs
  - tax credits
  - emissions credits
- Utilities
  - green pricing programs

Wind Resources



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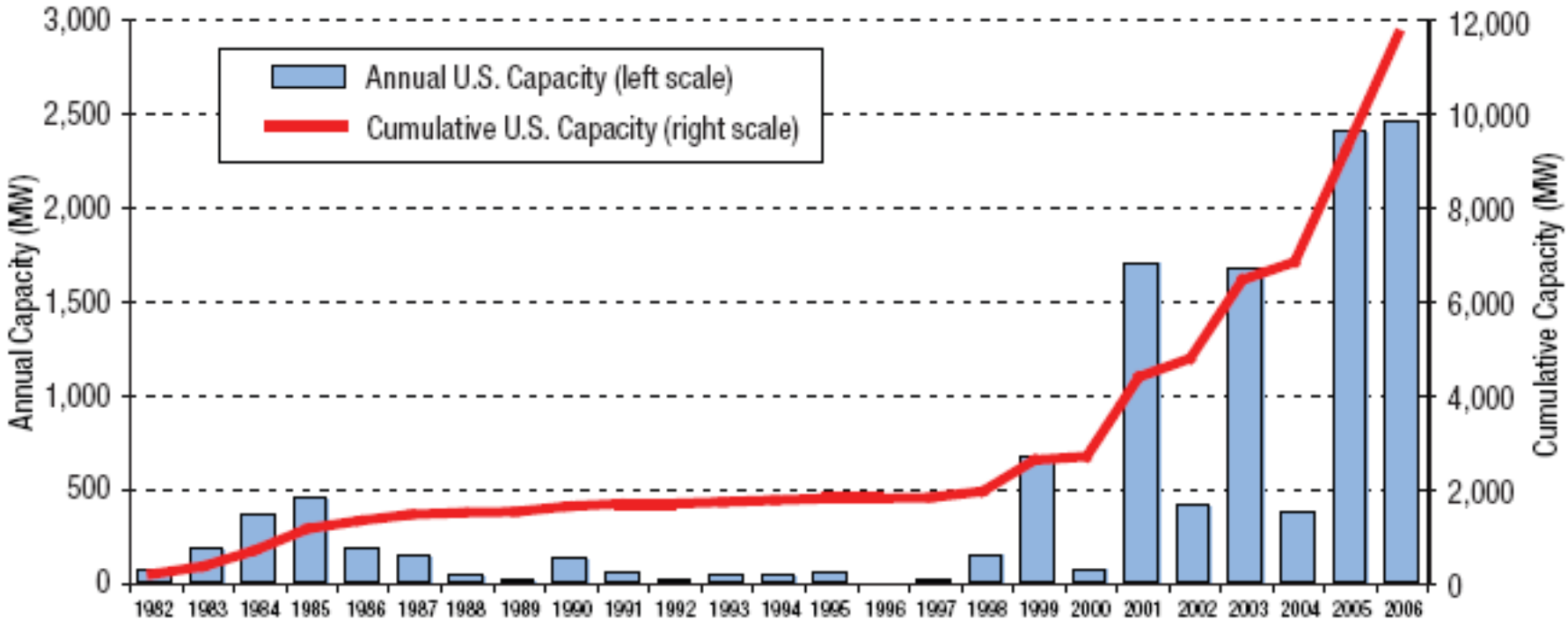
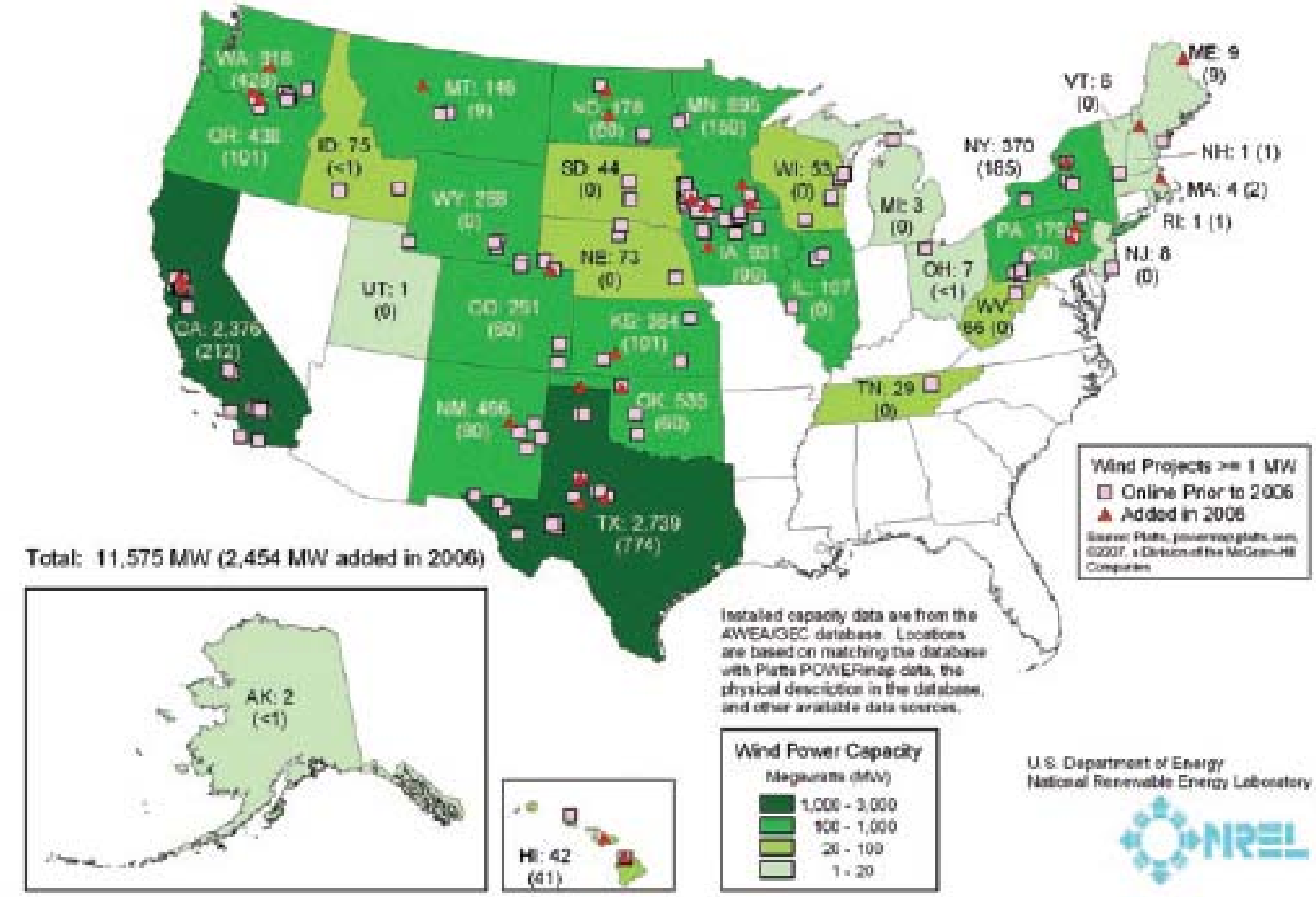
Growth in U.S. Wind Power



Source: AWEA/GEC database.

Wind Power Capacity



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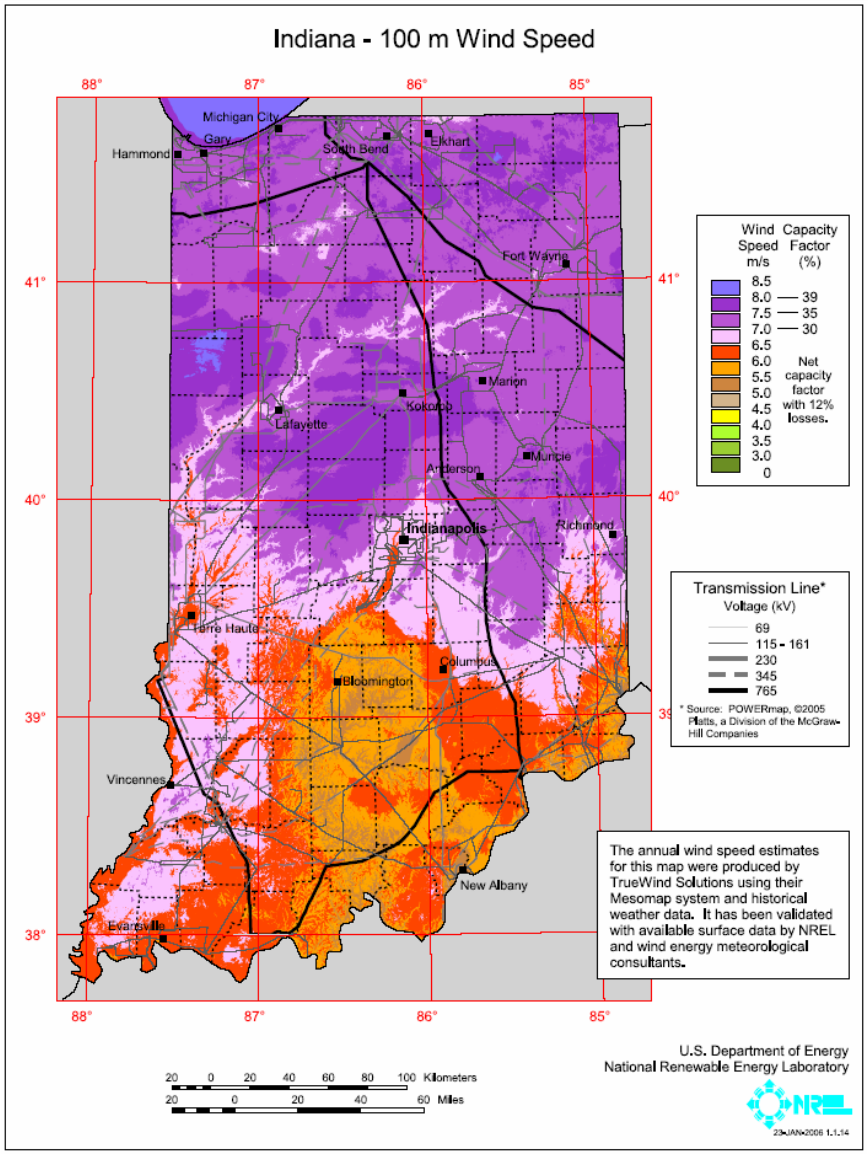
Indiana Wind Power

- Most recent wind map shows some potential areas in the northern half of the state
- 330 MW of wind power expected on line in 2007 in Benton County
  - Benton County Wind Farm (130 MW)
  - Fowler Ridge Wind Farm (200 MW)



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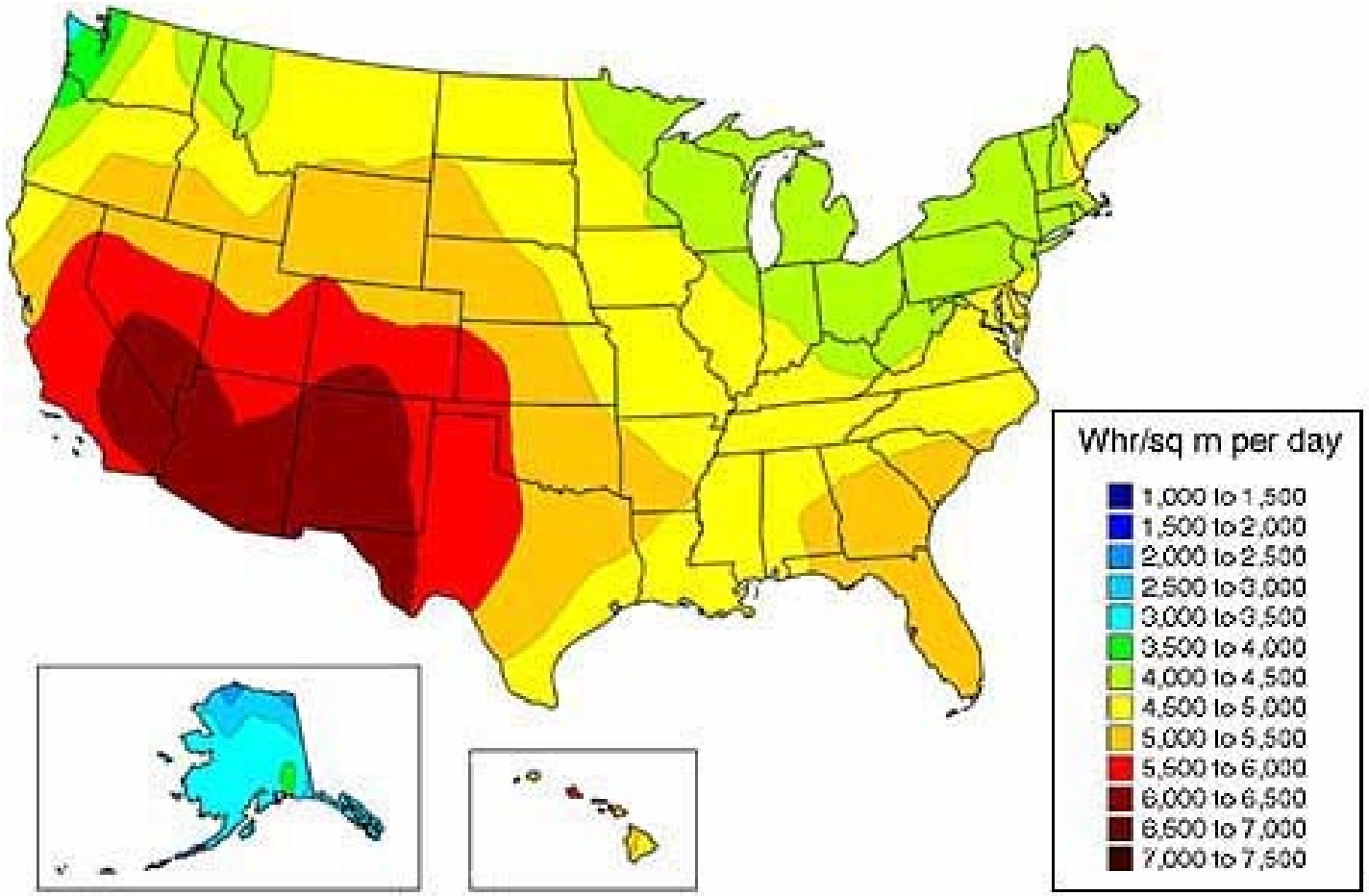
Energy Crops

- Transportation fuels
  - ethanol
  - soy diesel
- Other possibilities
  - fast growing hardwood trees (hybrid poplar/willow)
  - grasses (switchgrass)
- Barriers to be overcome
  - other high-value uses for the land
  - harvesting and transportation costs
  - price of competing fossil fuels

Organic Waste Biomass

- This resource is the single largest source of renewable energy in Indiana
  - primarily due to the use of wood waste
- It is the second largest source of renewable electricity generation in the state
  - landfill gas
  - municipal solid waste
  - animal waste biogas
  - wastewater treatment

Solar Energy / Photovoltaics



Solar resource for a flat-plate collector

Source: DOE

Fuel Cells

- Currently available fuel cells cost about $3000/kW
- This is roughly twice the cost of a large coal plant and about 10 times the cost of a natural gas-fired combustion turbine
- There is a large amount of research being performed to solve some of the problems
  - cost
  - efficiency
  - hydrogen production
  - hydrogen storage

Hydroelectric Power

- Indiana has about 60 MW of hydroelectric generating capacity.
  - mostly run-of-the-river (no dam)
  - largest source of renewable electricity
- The U.S. Department of Energy identified another 66 MW of potential hydropower at existing dams
  - Only about 42 MW was considered viable (spread out over 27 sites)

2007 Electricity Forecast

- SUFG is working on the 2007 electricity forecast
  - consumption
  - prices
  - resource requirements
- Expected to be released this fall

Contact Us

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