

# 2014 Indiana Renewable Resources Study

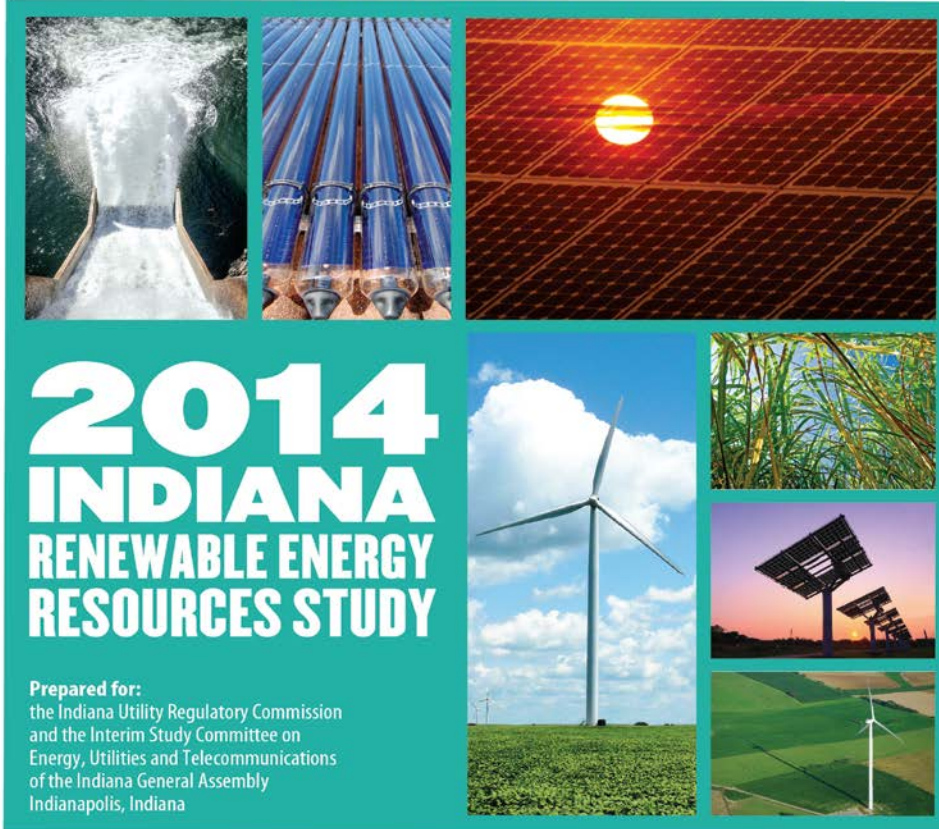
Presented by:

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Purdue University

Presented to:

Interim Study Committee on Energy, Utilities, and  
Telecommunications  
Indiana General Assembly

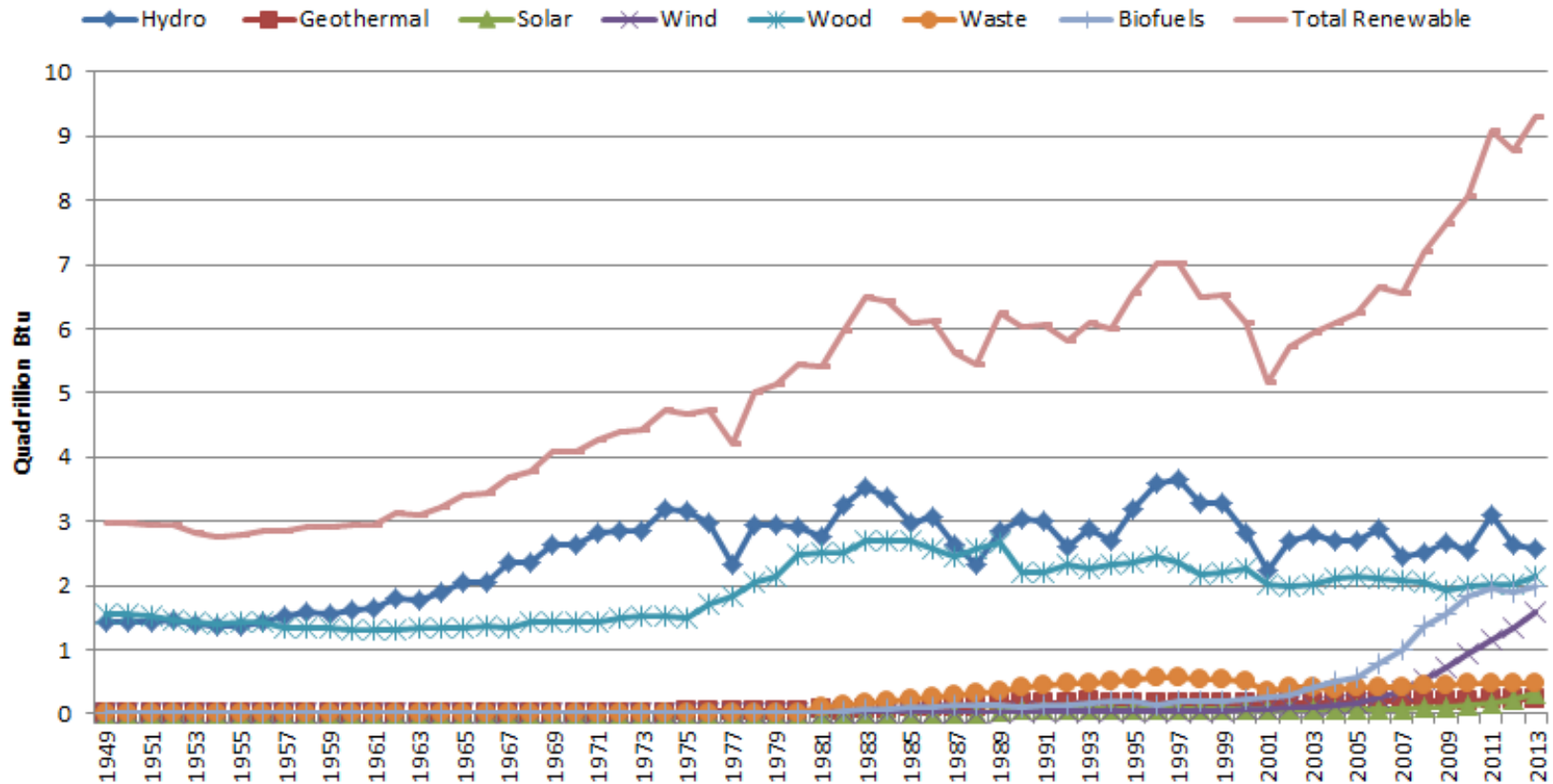
September 23, 2014



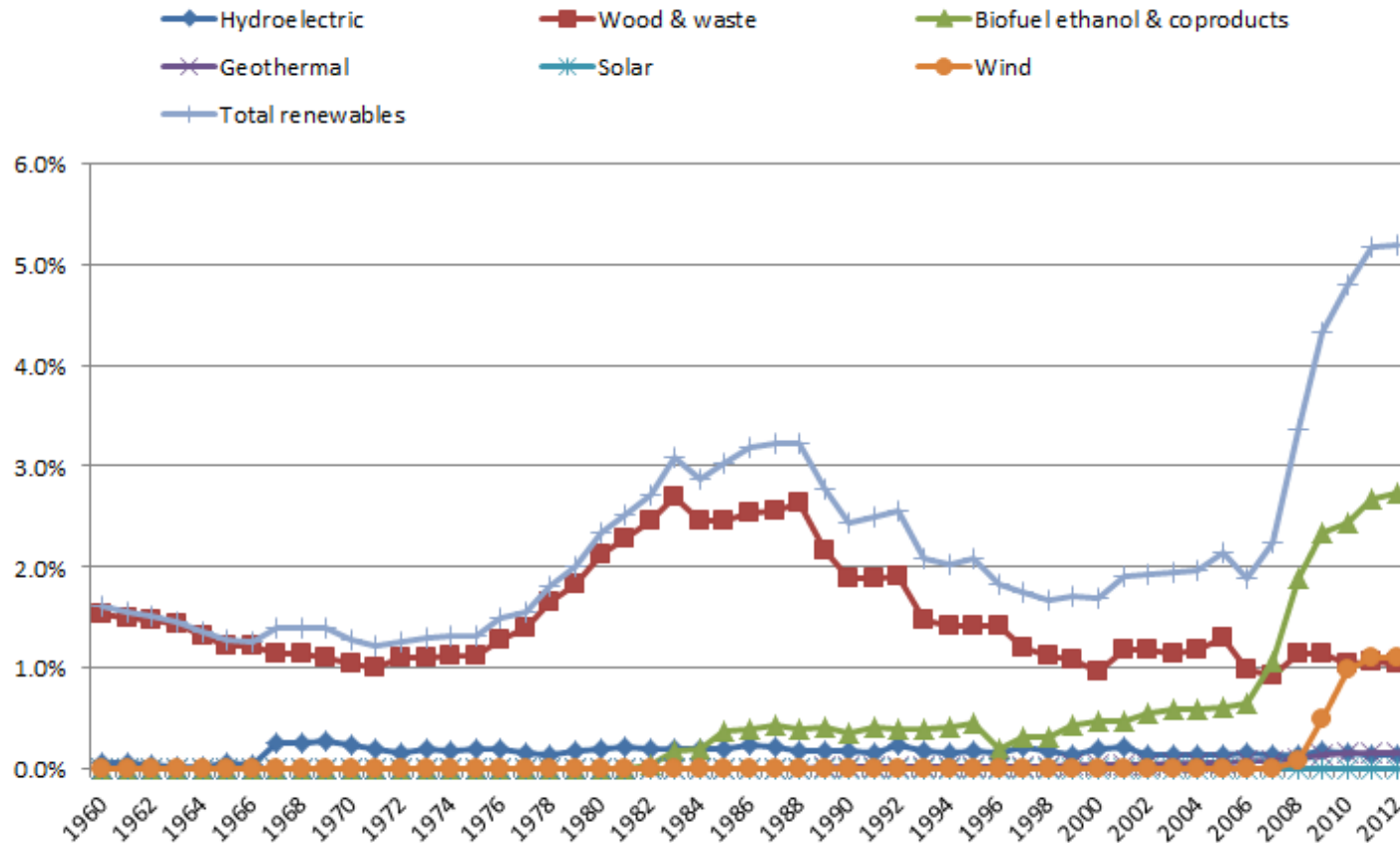
# 2014 INDIANA RENEWABLE ENERGY RESOURCES STUDY

**Prepared for:**  
the Indiana Utility Regulatory Commission  
and the Interim Study Committee on  
Energy, Utilities and Telecommunications  
of the Indiana General Assembly  
Indianapolis, Indiana

# Renewables Share of U.S. Energy Consumption

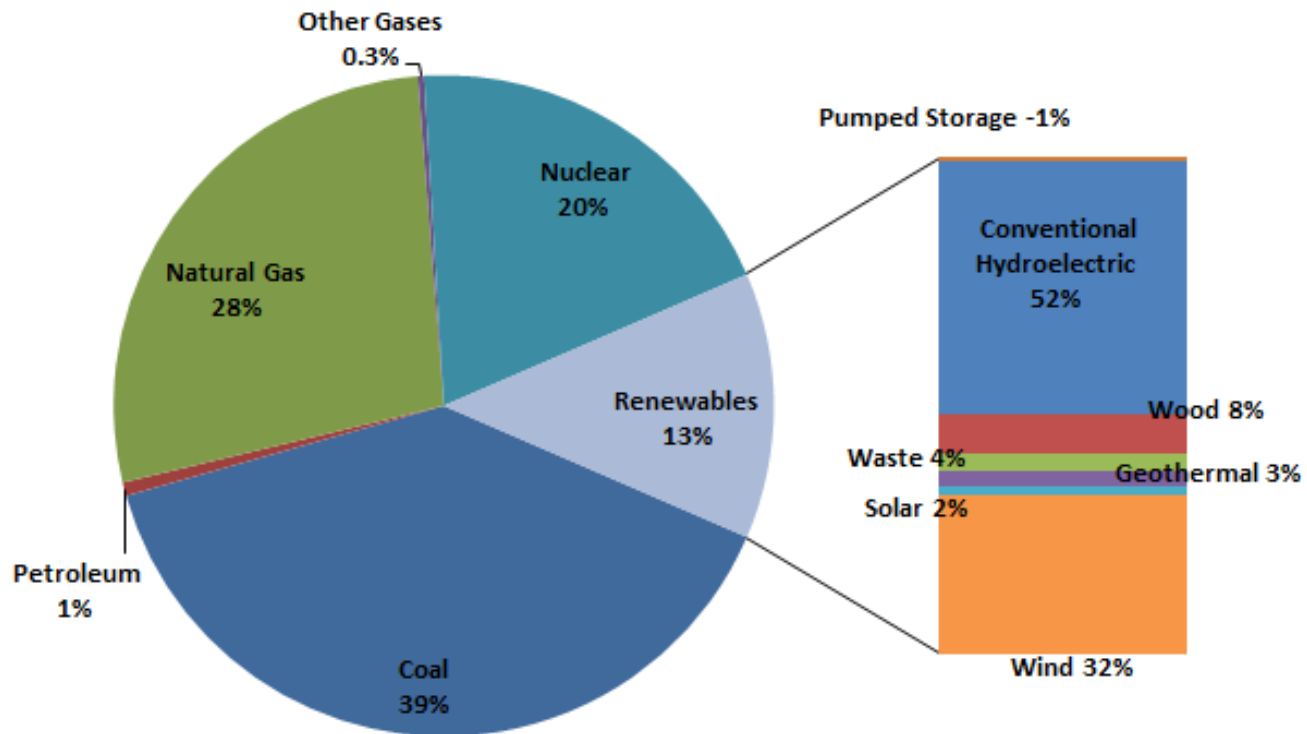


# Renewables Share of Indiana Energy Consumption<sup>1</sup>

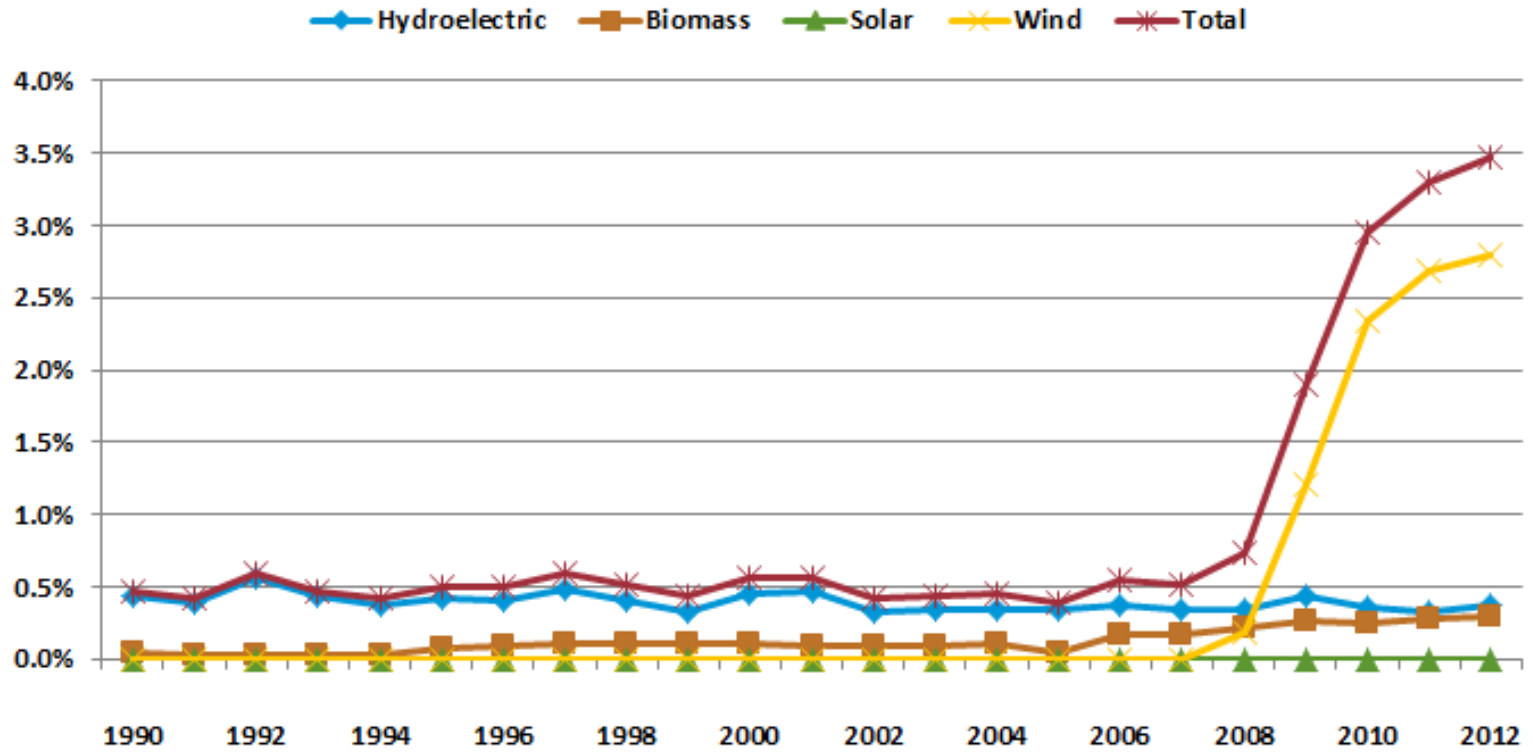


<sup>1</sup>This slide is a corrected version of the slide presented

# 2013 U.S. Electricity Generation by Energy Source



# Renewables Share of Indiana Electricity Generation

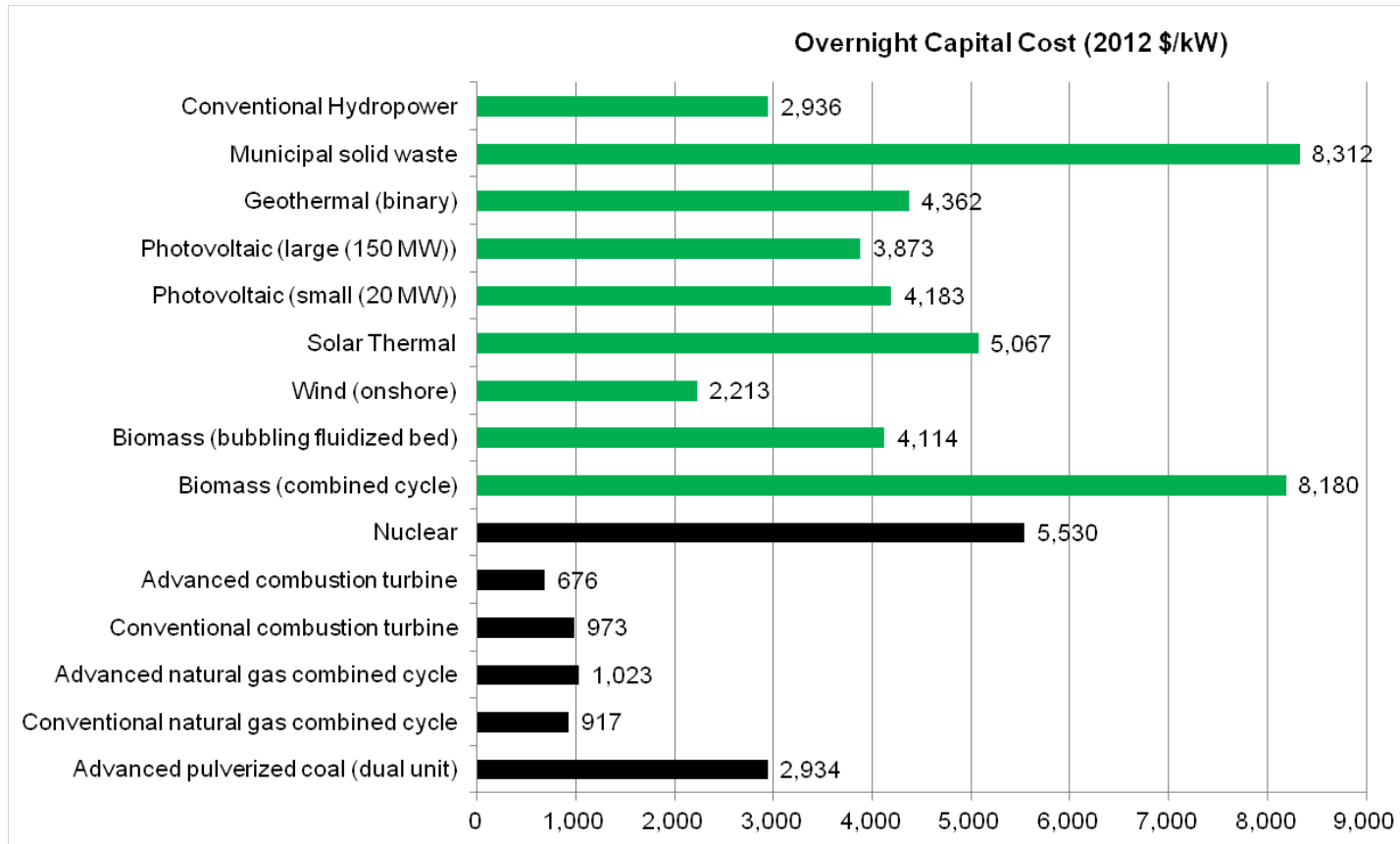


# Barriers to Renewables

- Major barrier is cost
  - Most renewable technologies have high capital costs
  - According to EIA Indiana's average electric rate in 2012 was 8.29 cents/kWh vs. the national average of 9.84 cents/kWh
- Limited availability for some resources
  - Solar/photovoltaics, hydropower
- Intermittency for some resources
  - Solar/photovoltaics, wind

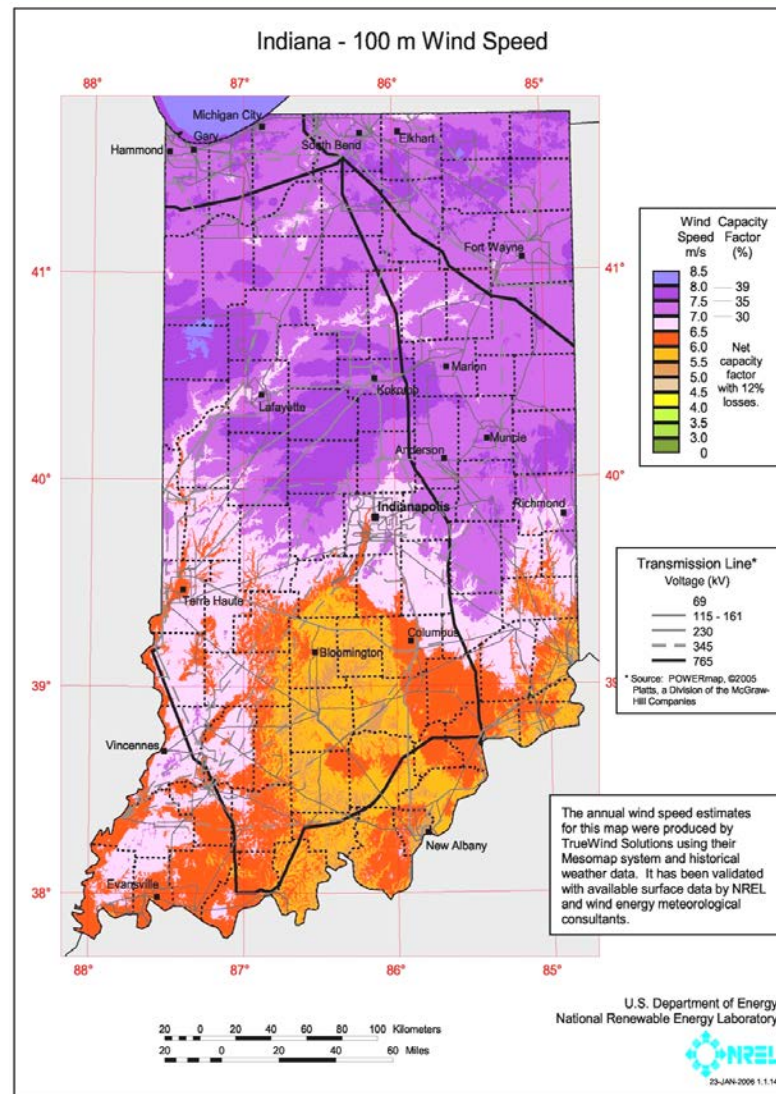
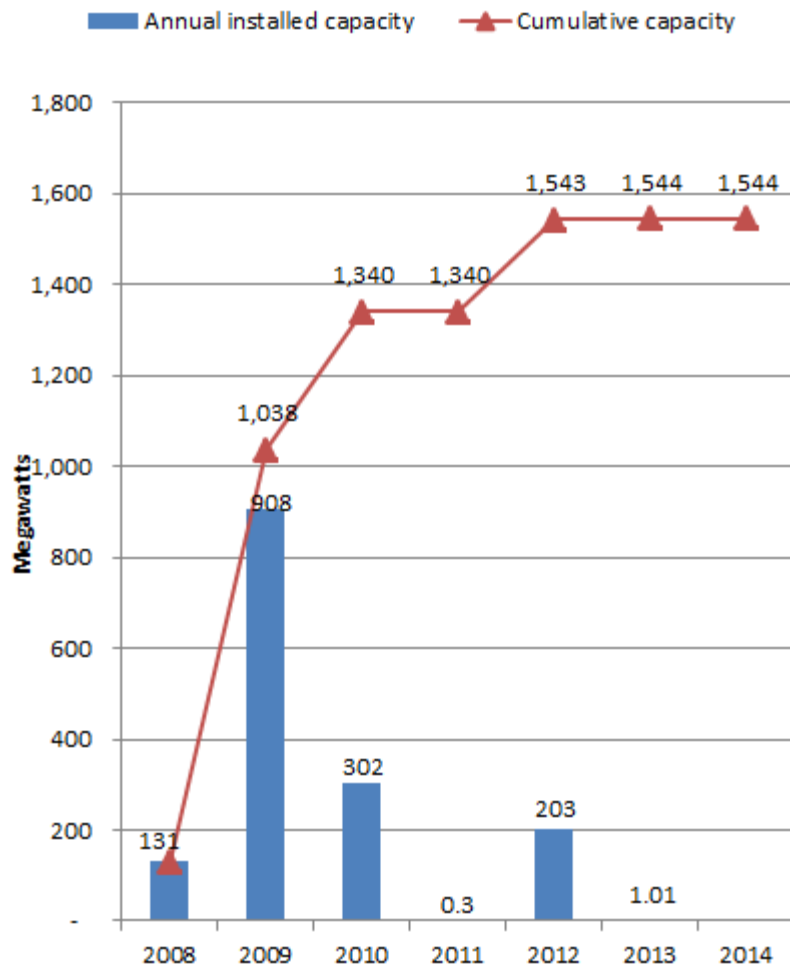


# Capital Costs for Various Generation Sources





# Wind



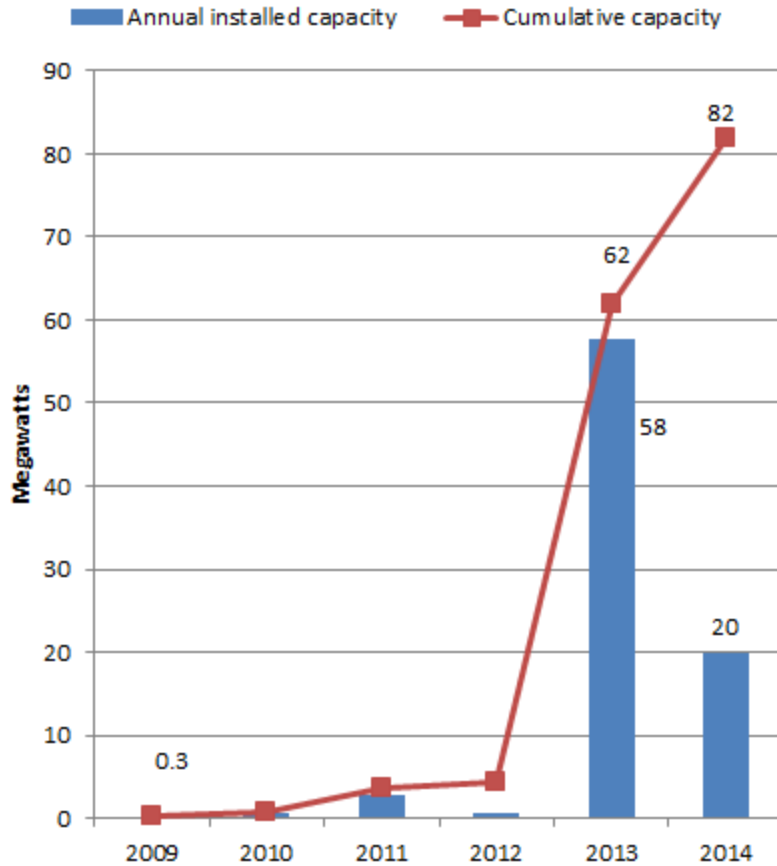
# Energy Crops

- Transportation fuels
  - Ethanol
  - Biodiesel
- Other possibilities
  - Fast growing hardwood trees (hybrid poplar/willow)
  - Grasses (switchgrass)
- Barriers to be overcome
  - Other high-value uses for the land
  - Price of competing fossil fuels
  - Harvesting and transportation costs

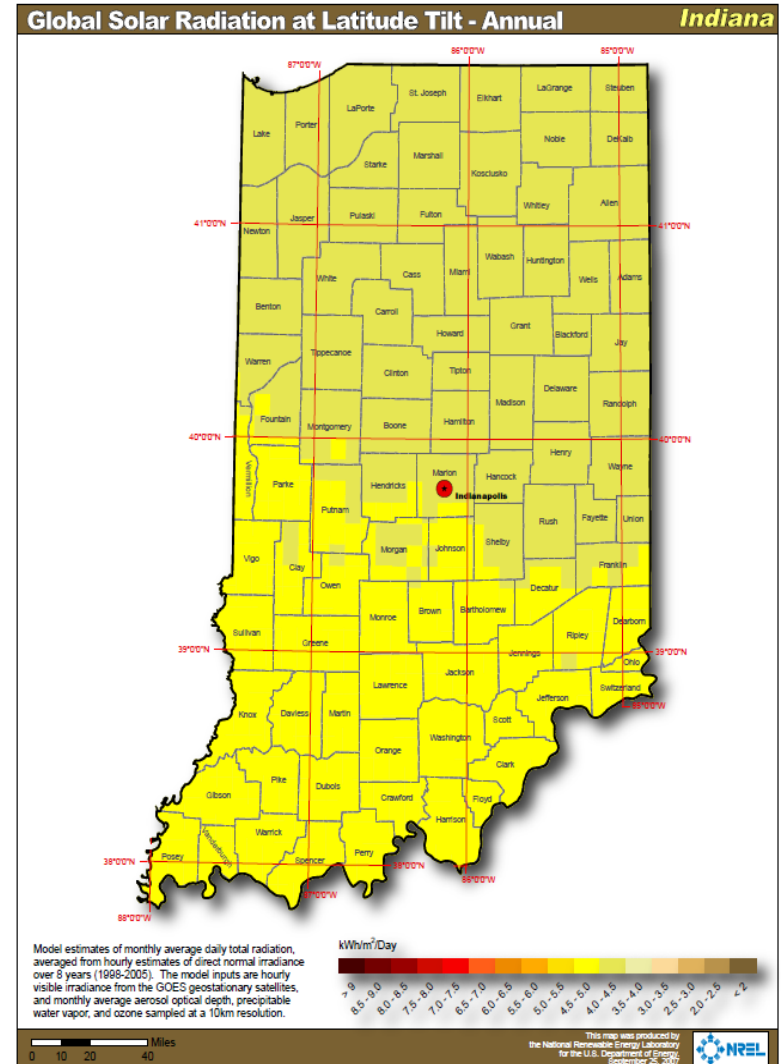
# Organic Waste Biomass

- Until 2007, this resource was the largest source of renewable energy in Indiana, primarily due to the use of wood waste
  - Now 3<sup>rd</sup> behind ethanol and wind
- It is the 3<sup>rd</sup> largest source of renewable electricity generation in the state
  - Landfill gas
  - Municipal solid waste
  - Animal waste biogas
  - Wastewater treatment

# Solar Energy



Photovoltaic capacity in Indiana



# Photovoltaics

- Growing rapidly in Indiana
- 351 installations totaling over 81.8 MW of capacity
  - Franklin Township (Indy Solar I&II) (26MW)
  - Indianapolis Airport (12.5 MW)
  - Decatur Township (Indy Solar III) (11 MW)
- 78 MW commissioned in 2013 and 2014
- Feed-in tariffs have large PV capacity committed
  - IPL 98 MW
  - NIPSCO 15 MW

# Hydroelectric Power

- Indiana has 73 MW of hydroelectric generating capacity.
  - mostly run-of-the-river (no dam)
  - 2<sup>nd</sup> largest source of renewable electricity
  - Likely to drop to 3<sup>rd</sup> when PV production is fully accounted for
- American Municipal Power is constructing an 84 MW facility at the Cannelton Locks on the Ohio River
  - expected to be operational in 2014

# Further Information

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