

Utility Update

Surface Transportation Board

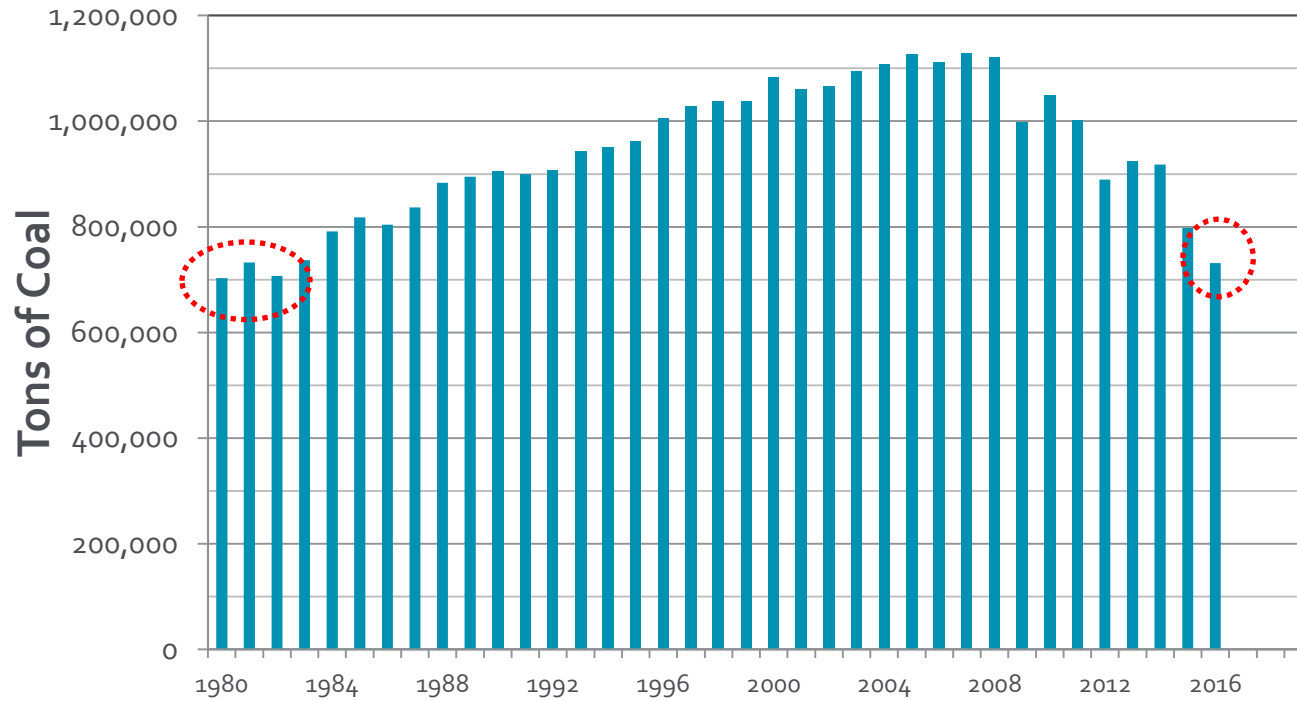
Rail Energy Transportation Advisory Committee Meeting

April 6, 2017

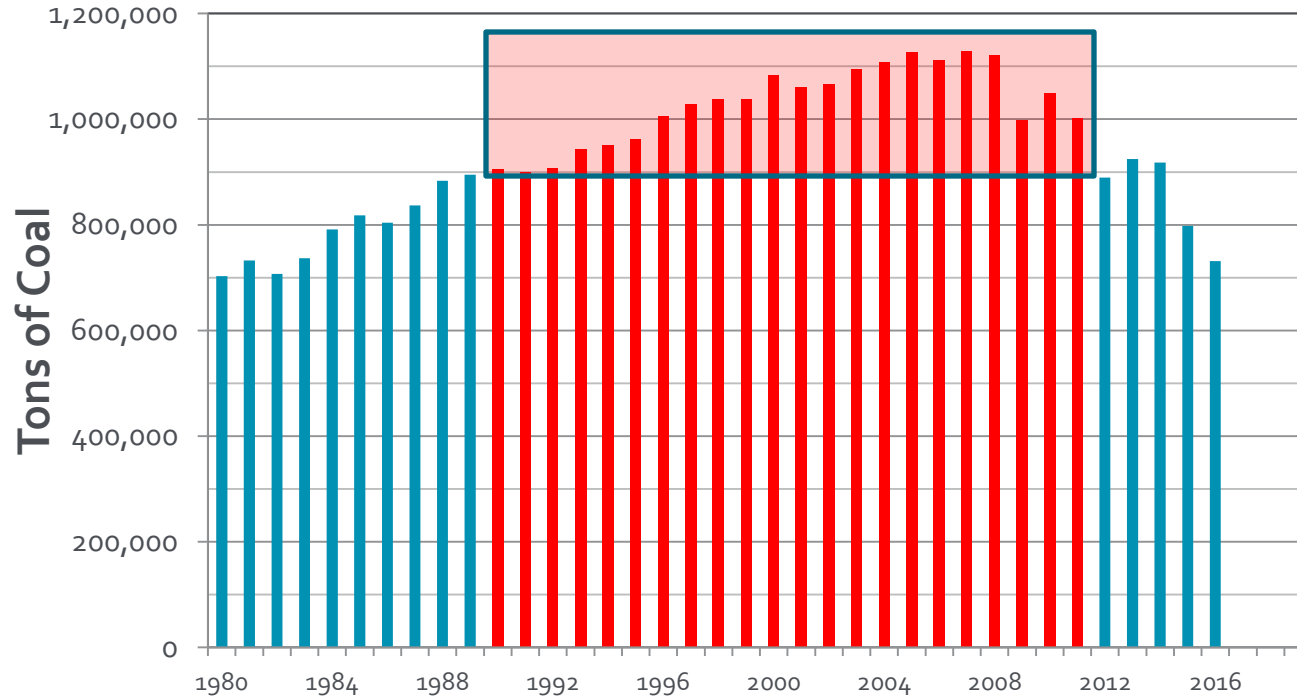
Topics for Discussion

- A macro view at trends in US coal consumption
- Current challenges for coal

Trends in US Coal Consumption

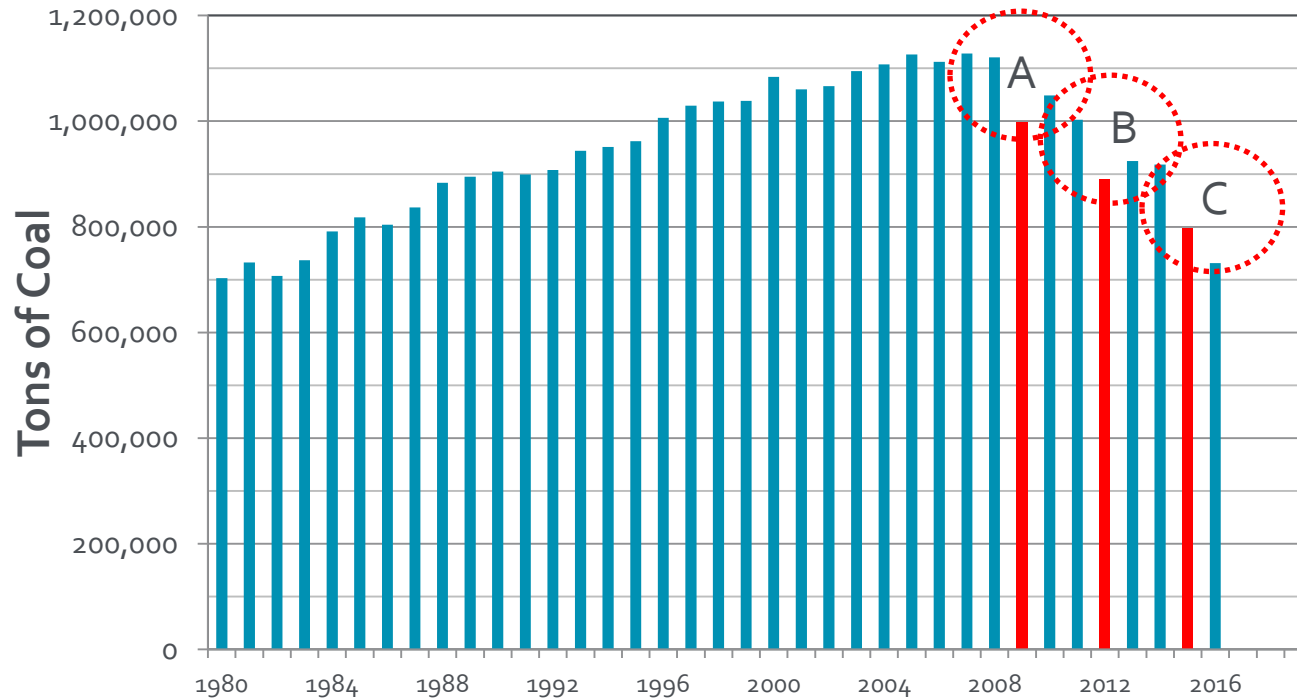


Trends in US Coal Consumption



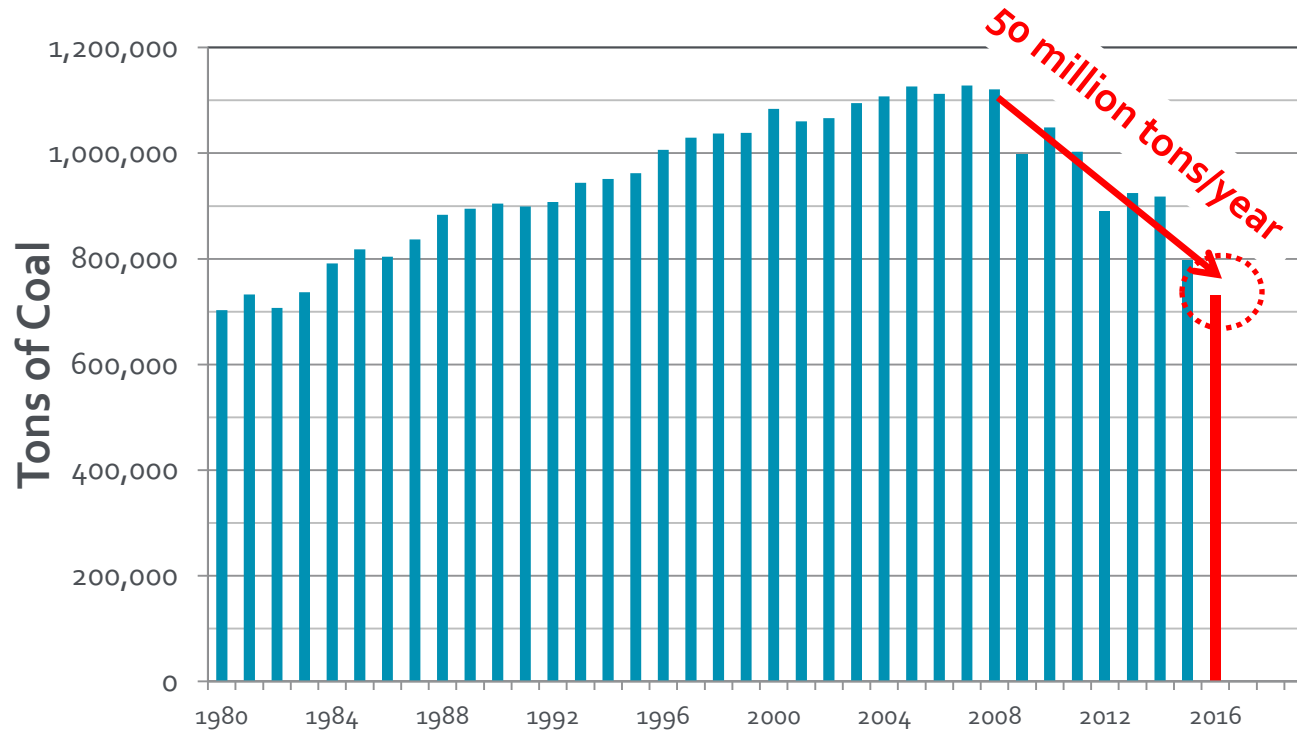
- US Coal Consumption – 900 million tons or greater for 21 straight years (1990 – 2011)

Trends in US Coal Consumption



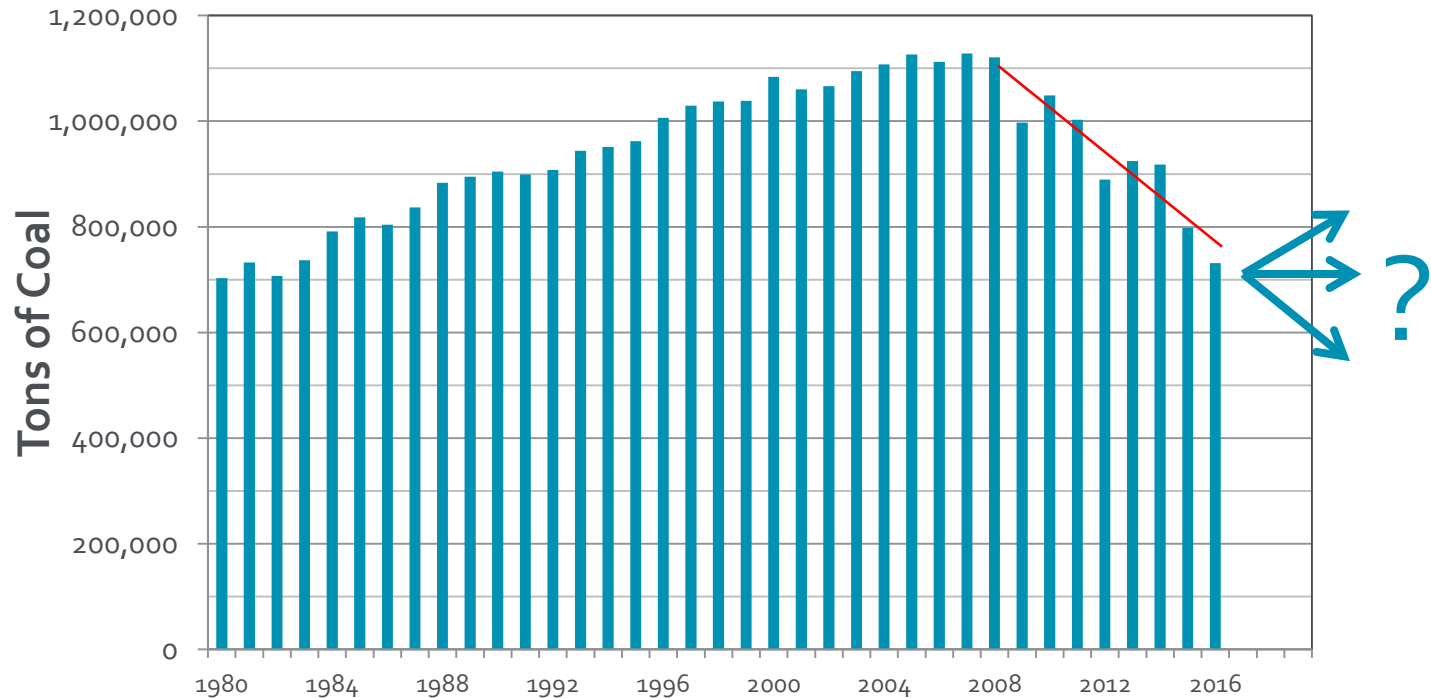
- 900 million tons or greater for 21 straight years (1990 – 2011)
- Consumption has fallen by more than 100 million tons three times since 2008
 - 2009, 2012, 2015

Trends in US Coal Consumption



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- Consumption has fallen by more than 100 million tons three times
 - 2009, 2012, 2015
- In 2010 and 2013 consumption recovered. In 2016 it continued to fall.
 - A 20% drop in consumption from 2014 to 2016.
 - 50 million tons/year since 2008

Trends in US Coal Consumption



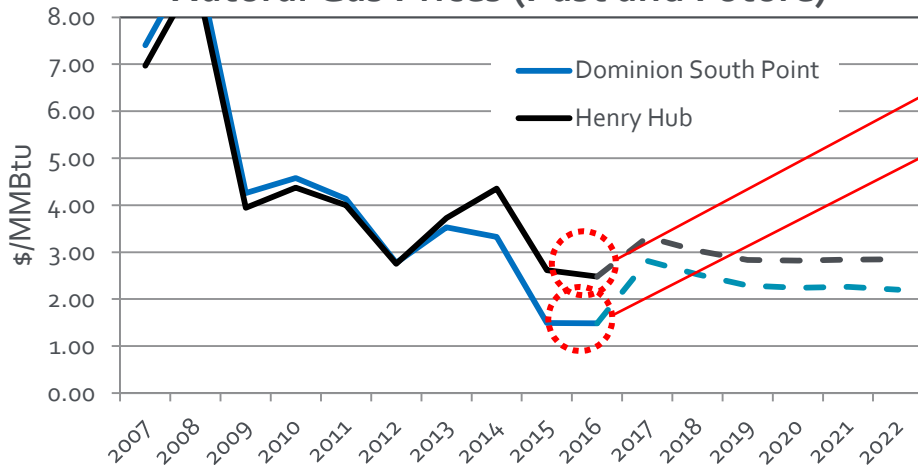
- 900 million tons or greater for 21 straight years (1990 – 2011)
- Consumption has fallen by more than 100 million tons three times
 - 2009, 2012, 2015
- Only in 2015, did consumption continue to fall
 - A 20% drop in consumption from 2014 to 2016.
 - 50 million tons/year since 2008
- What happens in 2017 and beyond?

Current Challenges for Coal

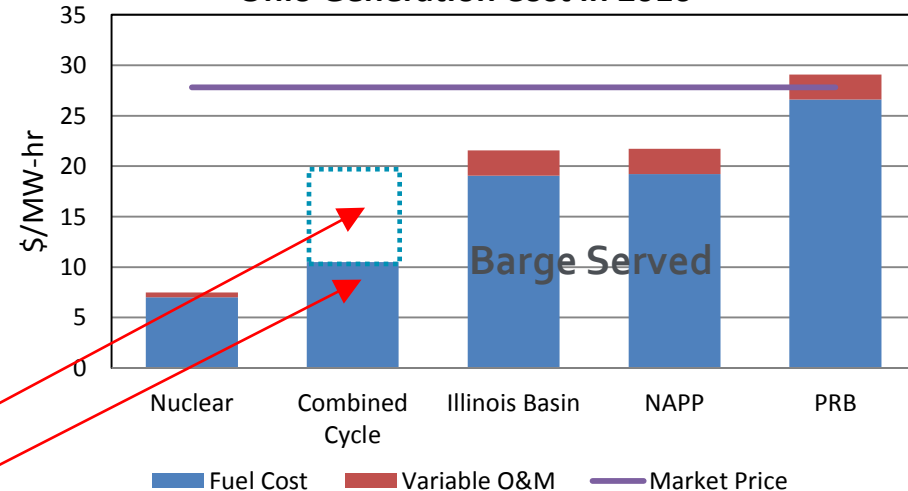
1. Locational pricing of natural gas

- Henry Hub is the natural gas price we talk about
- In many regions, local prices are lower than Henry Hub
- Local/regional natural gas prices drive commitment and dispatch decisions for coal and gas resources.
- One example below.

Natural Gas Prices (Past and Future)



Ohio Generation Cost in 2016



Market Price = AEP Dayton, Around the Clock Price

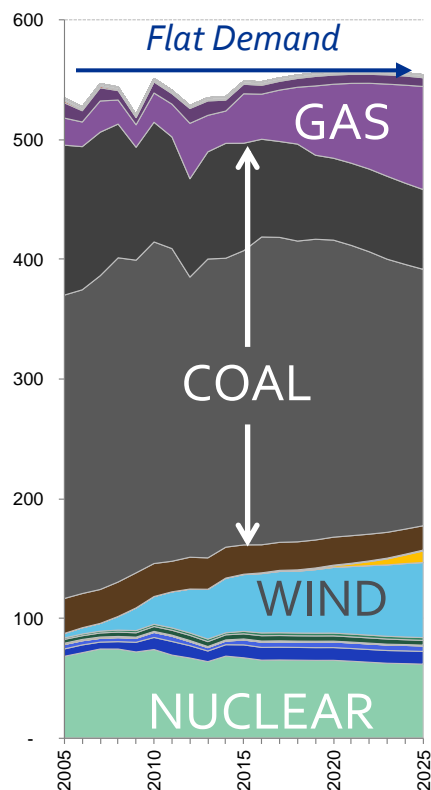


Current Challenges for Coal

2. Market Dynamics are Shifting

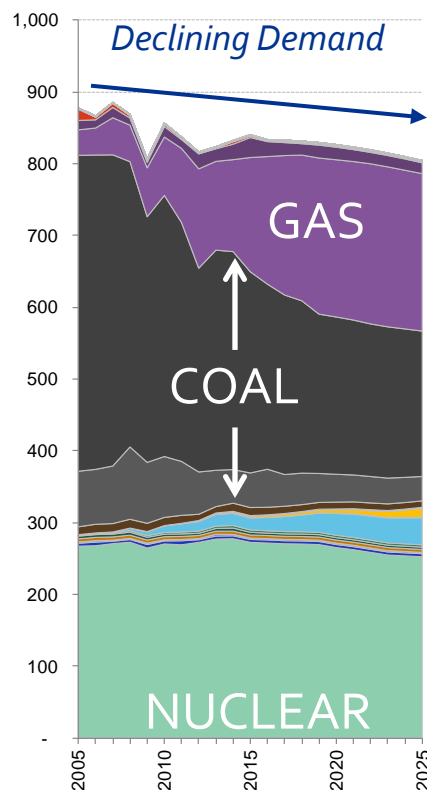
MISO Generation, 2005-25

TWh



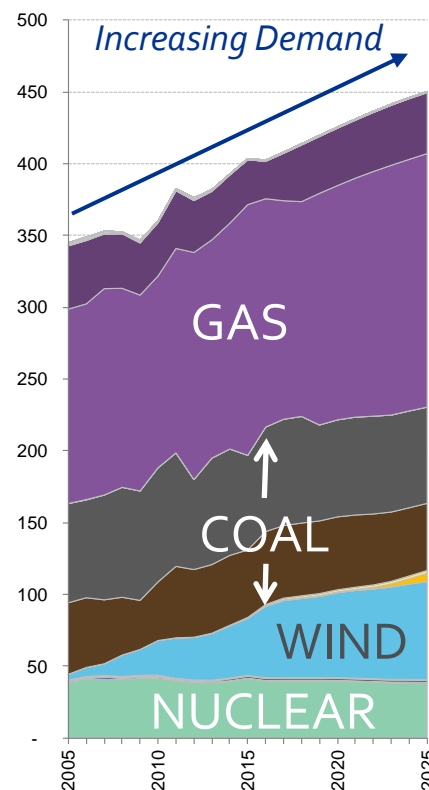
PJM Generation, 2005-25

TWh



ERCOT Generation, 2005-25

TWh



- Other
- Demand response
- Storage
- Oil
- Gas OC
- Gas CC
- Bituminous
- Sub-bituminous
- Lignite
- Solar thermal
- Solar PV utility
- Solar PV rooftop
- Wind offshore
- Wind onshore
- Biogas
- Biomass
- Municipal waste
- Geothermal
- Small hydro
- Large hydro
- Nuclear

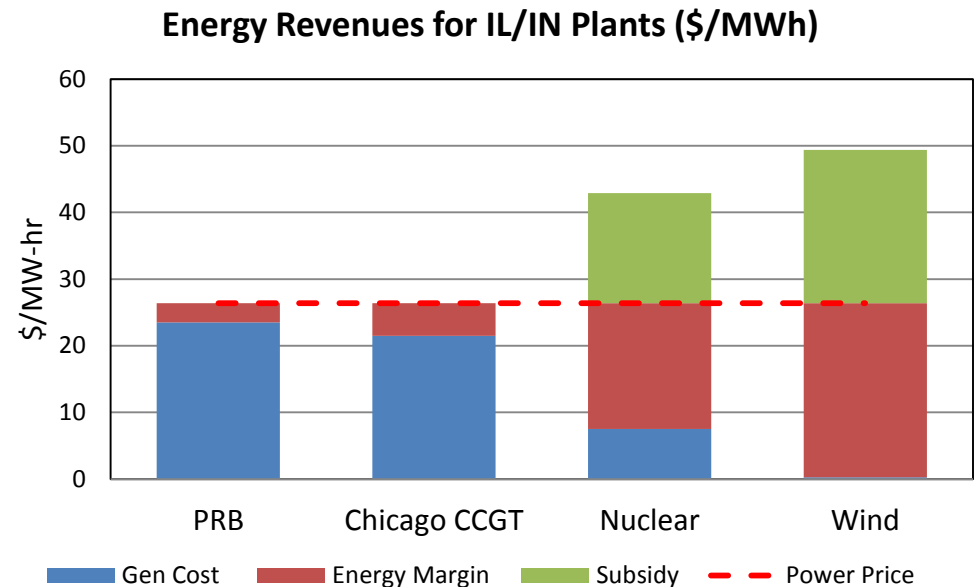
Renewables, natural gas, and uneconomic nuclear displace coal generation

Current Challenges for Coal

3. State and Federal subsidies undermine the effectiveness of competitive markets

Nuclear Subsidy States

- 🔬 Illinois (approved)
- 🔬 New York (approved)
- 🔬 New Jersey (pending)
- 🔬 Connecticut (pending)
- 🔬 Ohio (pending)
- 🔬 Pennsylvania (pending)



Current market prices are not sufficient to cover the fixed and operating costs of some nuclear plants in these states. These State subsidies keep uneconomic nuclear plants operating and displace coal and gas generation.



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