U.S. DEPARTMENT OF ENERGY | Nuclear Energy

Discussion on the Future of Domestic Nuclear Power

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Framing the Discussion

- Where are we now?
- How did we get here?
- Where are we going?
- What does it mean?

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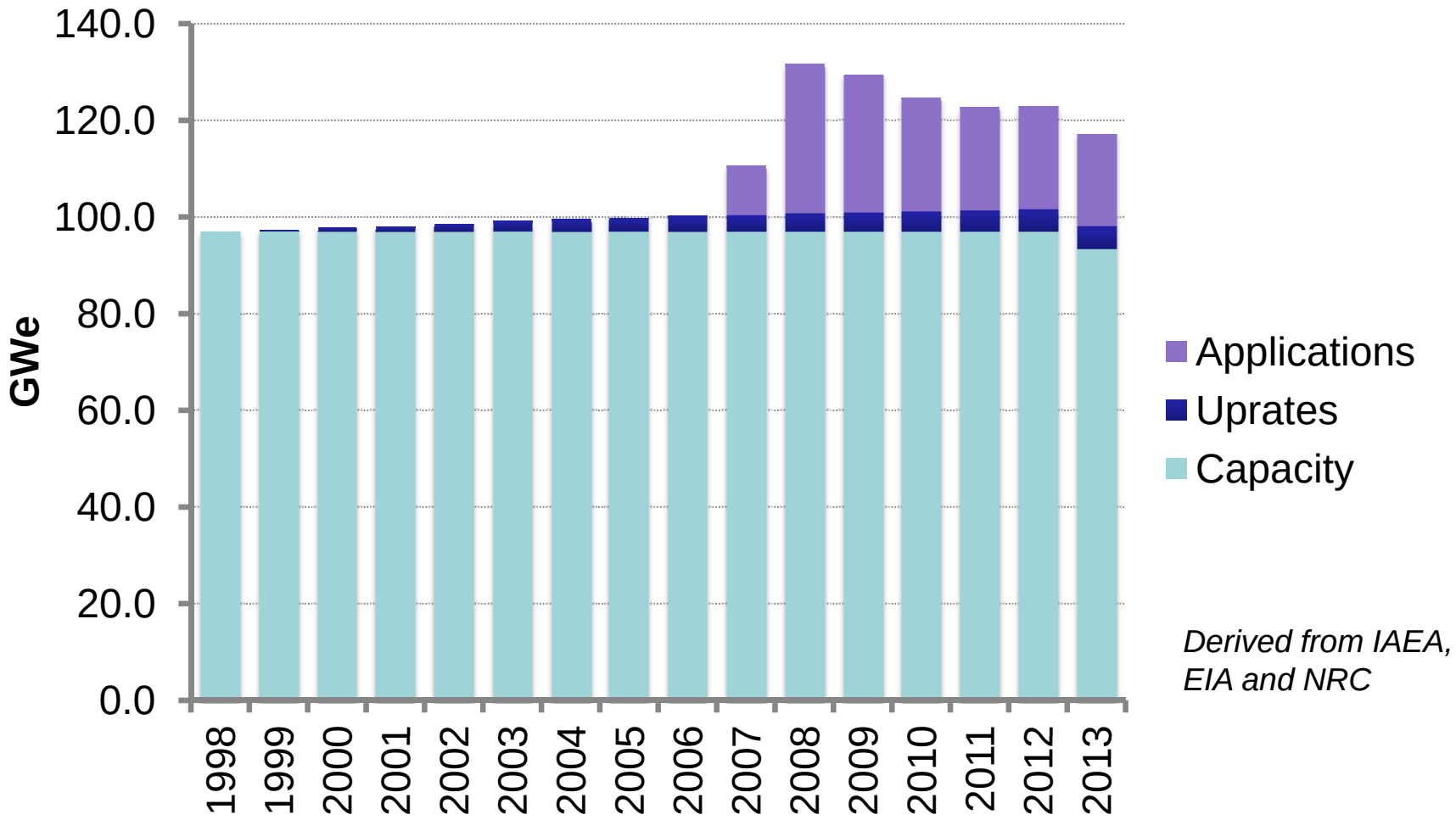
Recent History of U.S. Nuclear Fleet



Derived from IAEA, EIA and NRC

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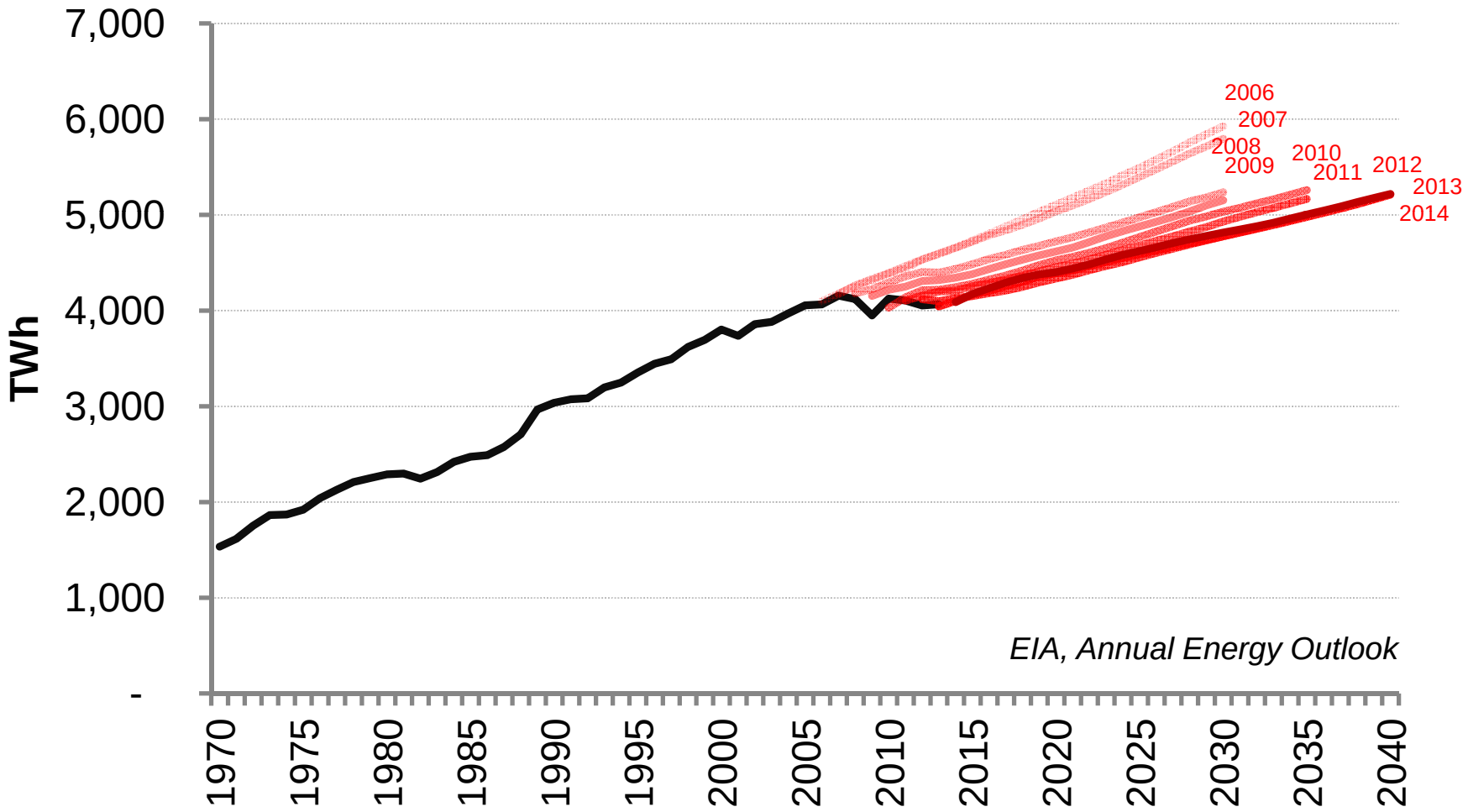
Declining Electricity Demand Forecasts



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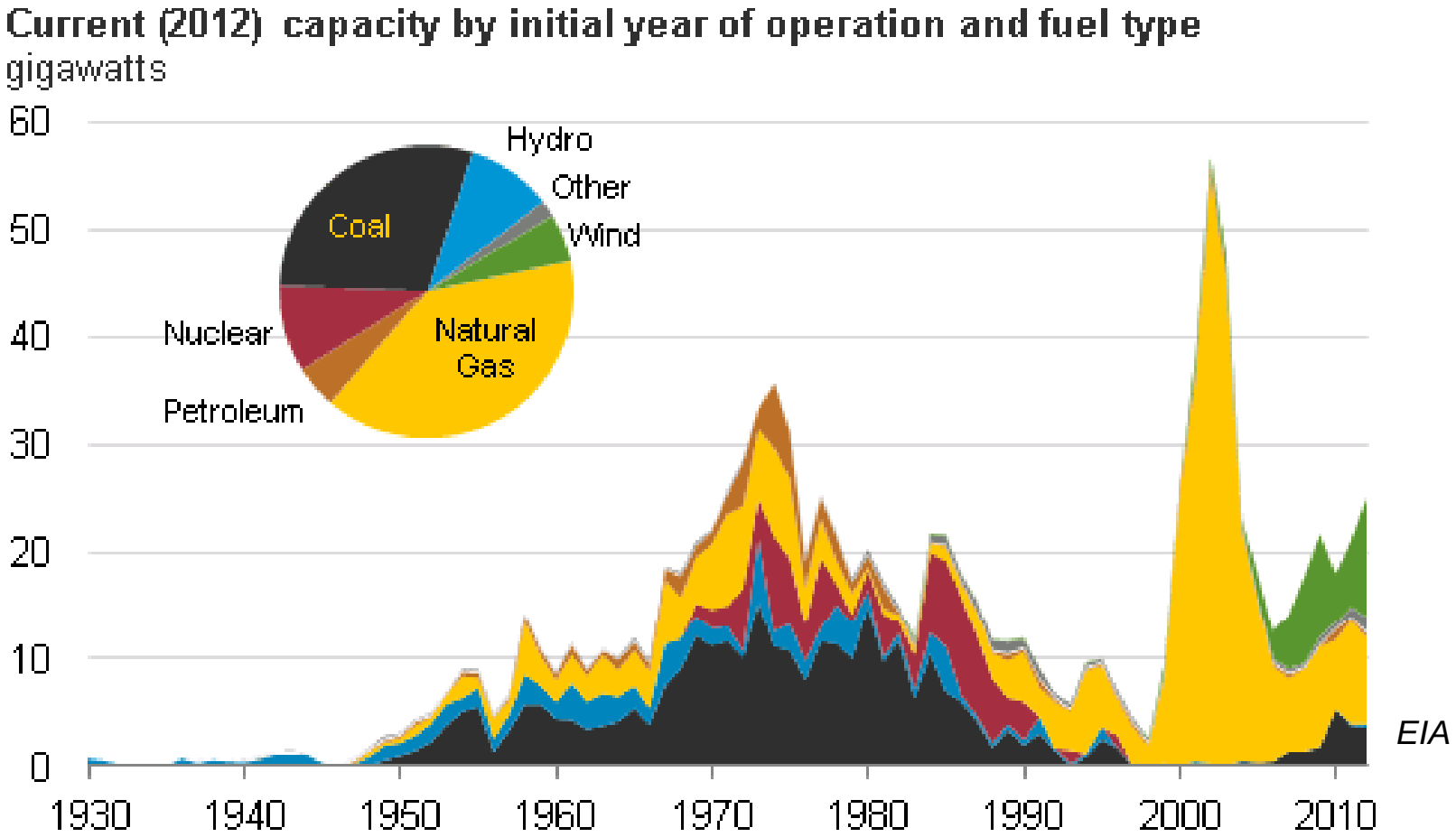
U.S. Electricity Capacity



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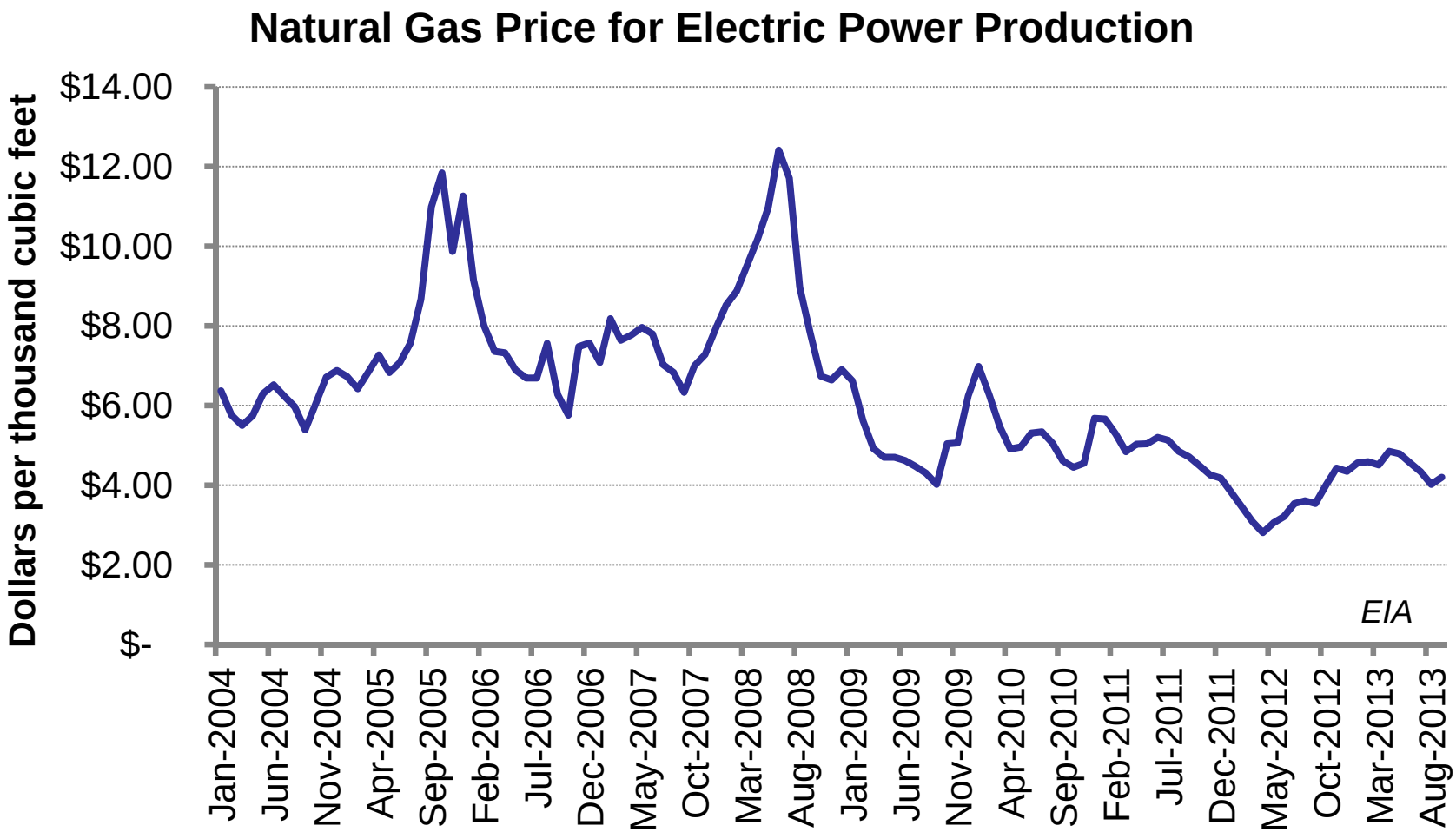
Natural Gas Price in U.S.



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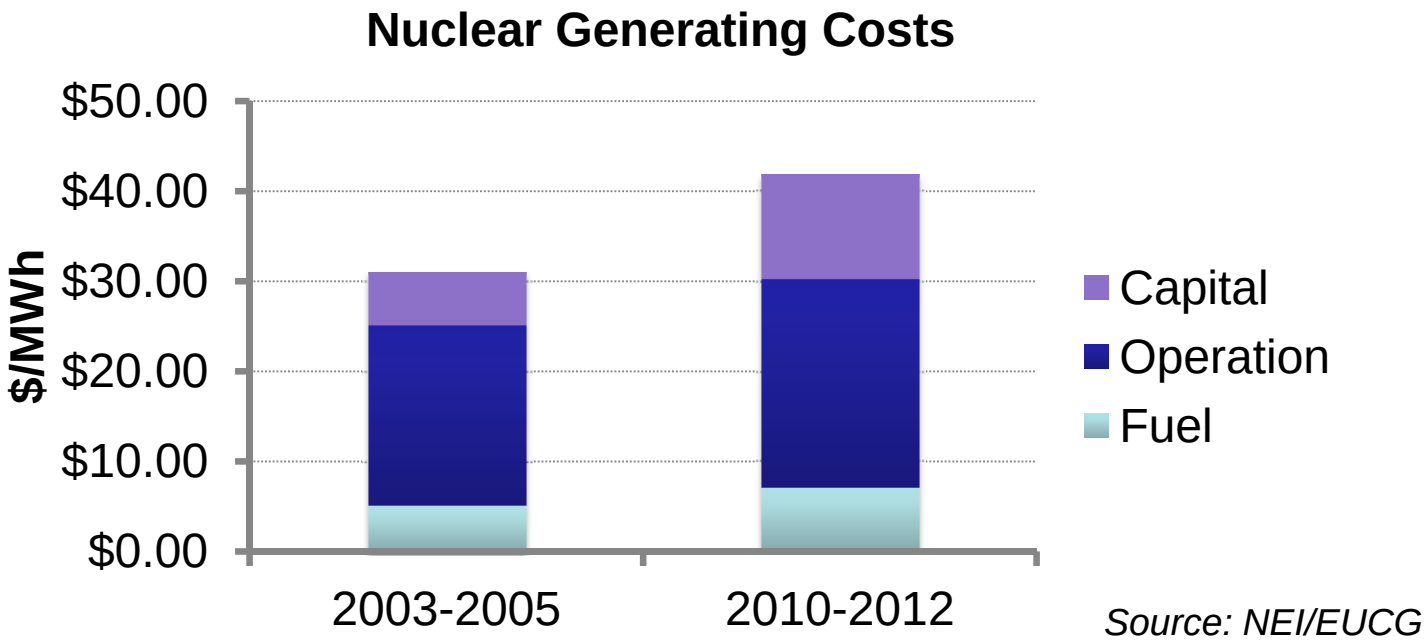
Rising Nuclear Costs



Source: NEI/EUCG

- **The range around these averages can be significant**
  - +/- ~40% from first to fourth quartile
  - Greater variation for single- vs. multi-unit plants, older vs. younger units

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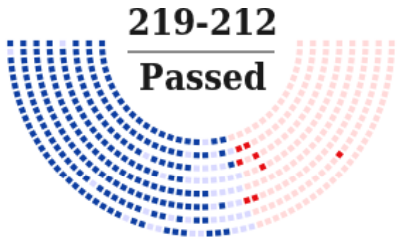
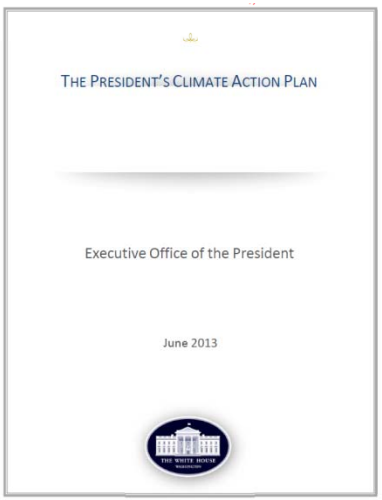
Policy Signals

- **2008 – Reasonable expectation of a carbon policy**



- **Cap and trade bill passed by House in May 2009**
  - Never brought for a vote in Senate

- **2013 Climate Action Plan**
  - Emphasis on Executive actions
  - EPA regulation of GHG emissions from existing power plants



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Impact of Early Retirements on Clean Energy Goals

- **Consider Dramatic Retirement Scenario**
  - One-third of the reactor fleet, ~26 GW, 200 TWh/yr
  - Replacement power estimated to add 125 MT per year
- **Near-term Target: Reduce Emissions 17% by 2020**
  - 2005 emissions from power sector: 2,417 MT
  - Reduction target of 411 MT climbs to 536 MT (30% increase)
- **Long-term Target: 80% Clean Electricity by 2035**
  - Need 2,900 TWh non-emitting power; EIA: 800 TWh of nuclear, 700 TWh of renewable
  - 1,400 TWh shortfall grows to 1,600 TWh with retirements

Meeting energy goals will be challenging.
Retiring nuclear plants early makes the challenge more daunting.

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Closing Observations

- **First retirements in 15 years come at a time of change for the domestic nuclear industry**
  - Weak electricity load growth and inexpensive natural gas results in low power prices
  - Rising costs and insufficient policy signals pressure nuclear in certain regions

- **Key Questions:**
  - How do we assess the valuable attributes of nuclear power (reliable baseload power without emissions) in the face of challenging economic conditions?
  - How does the domestic nuclear industry relate to our international interests and influence?