



**Congressional Budget Office**

# **Nuclear Power's Role in Generating Electricity**

*Center for Strategic & International  
Studies*

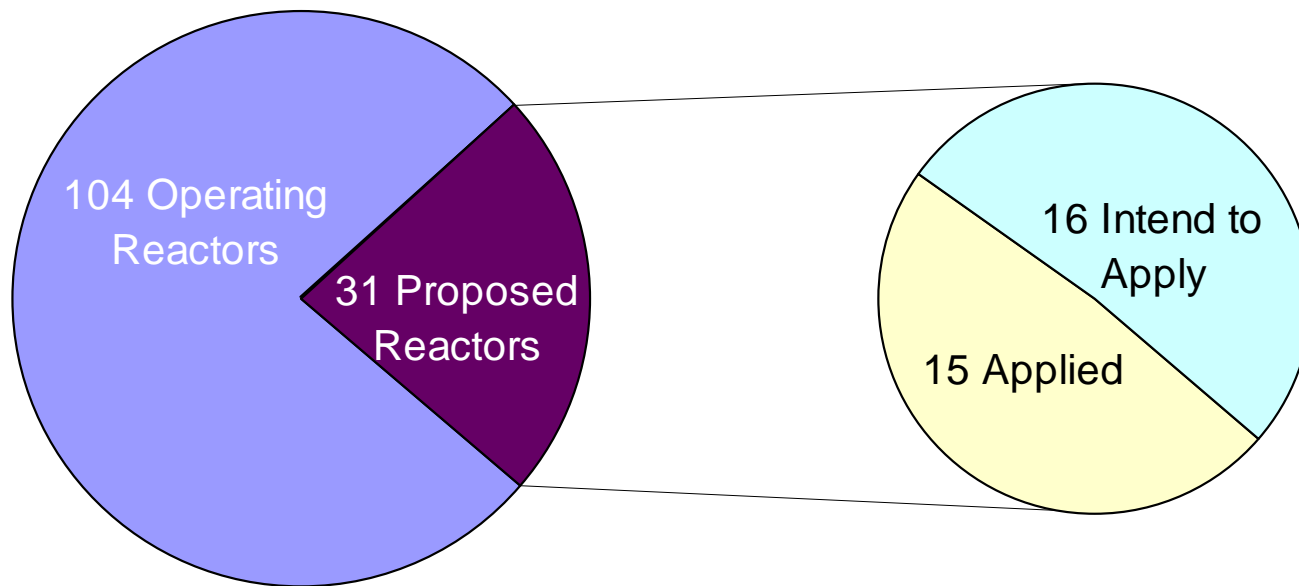
Justin Falk

July 31, 2008



# Future Domestic Demand for Nuclear Fuel

How Many Nuclear Reactors?





## Viability of New Nuclear Power Plants

- New nuclear power plant would be used as base-load capacity
- Demand for base-load electricity has grown steadily with the economy
- Nuclear will compete with other base-load technologies to provide additional capacity or begin to replace existing capacity
  - Conventional fossil fuel technologies
  - Fossil fuel technologies that capture and store carbon dioxide emissions

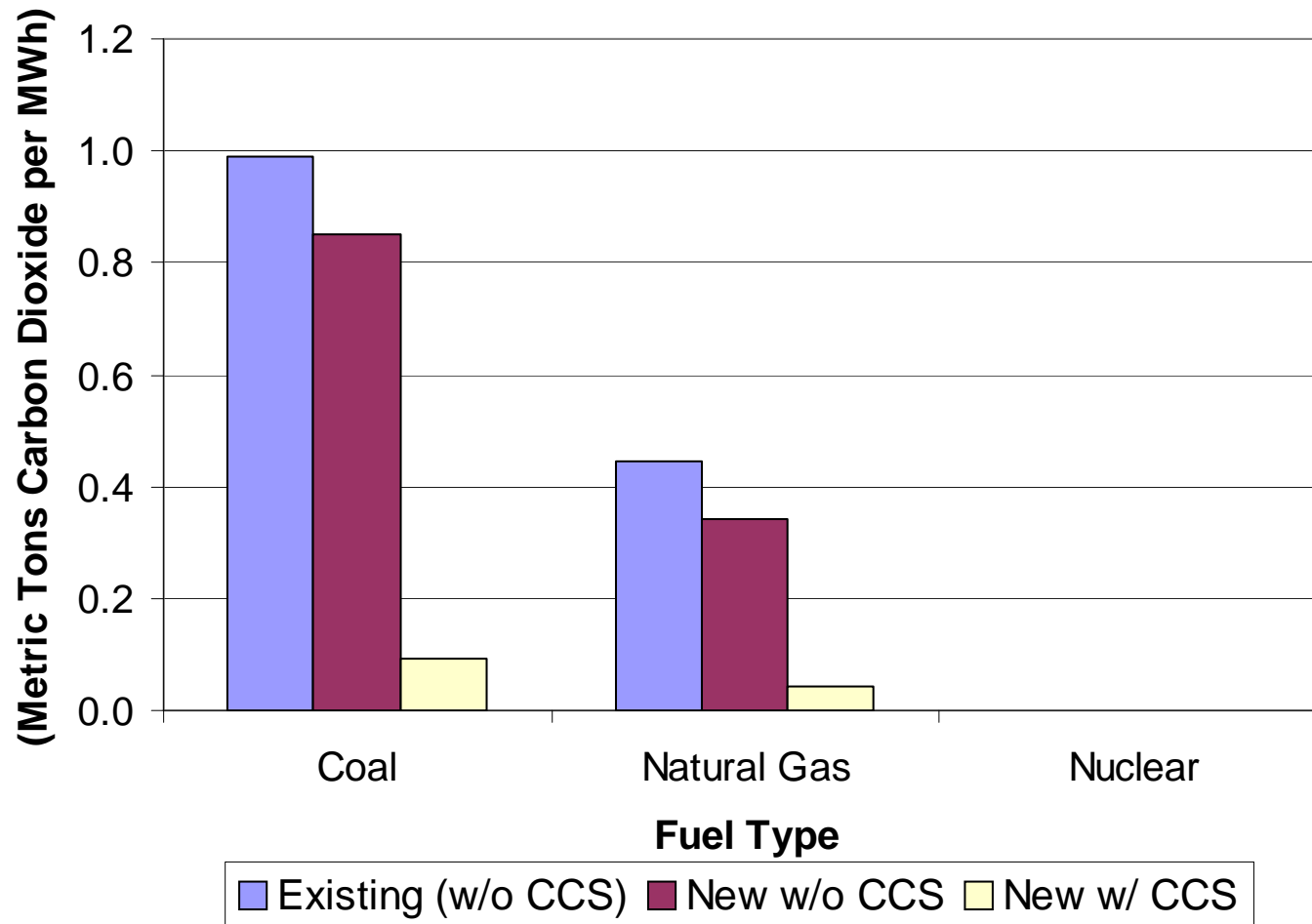


## Relevant Policies and Market Conditions

- Future Carbon Policy
- The Energy Policy Act of 2005
- Market Conditions
  - Construction Cost
  - Fuel Cost
  - Financing

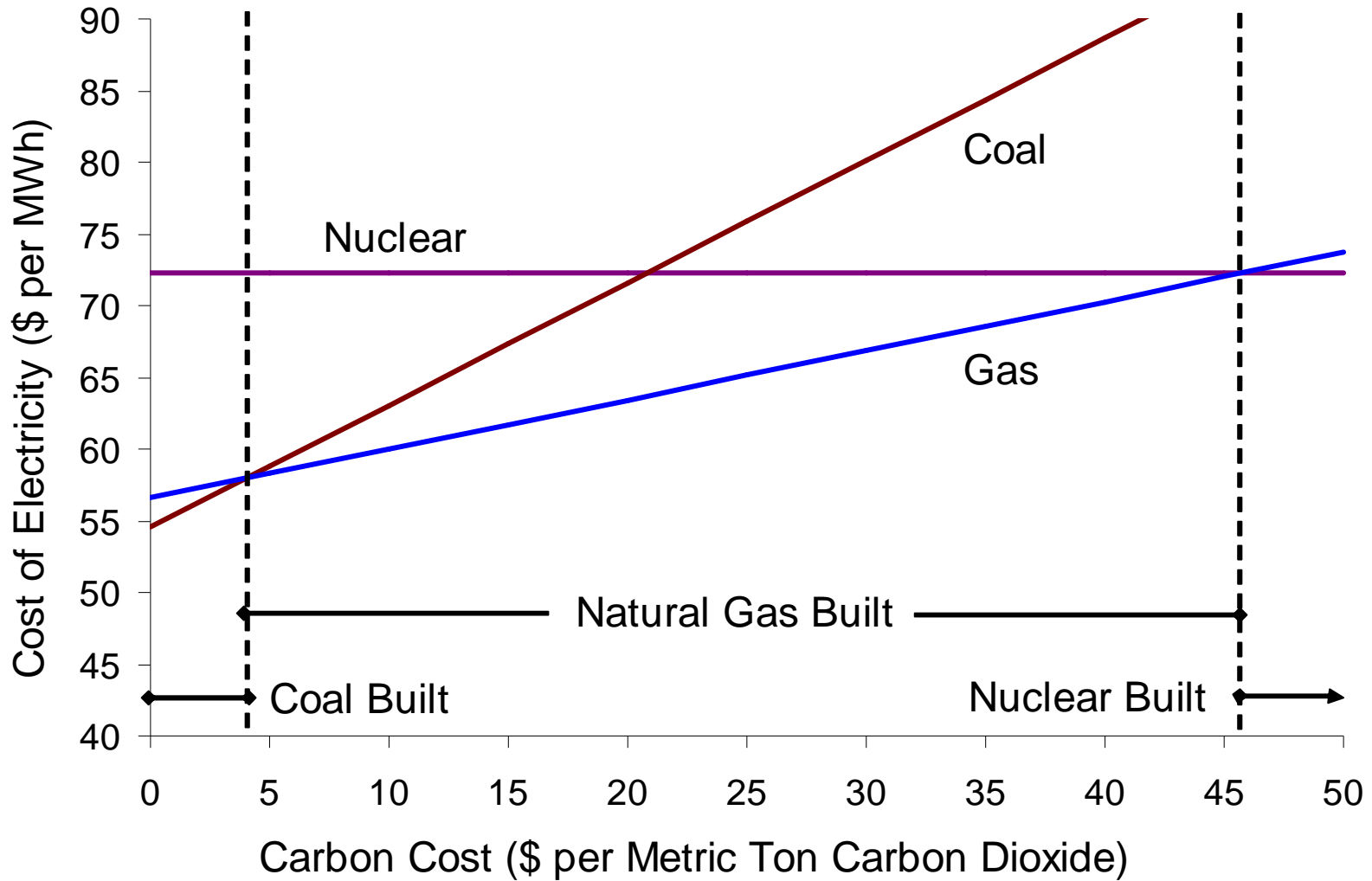


# Carbon Emissions by Technology





## Comparing Newly Built Plants



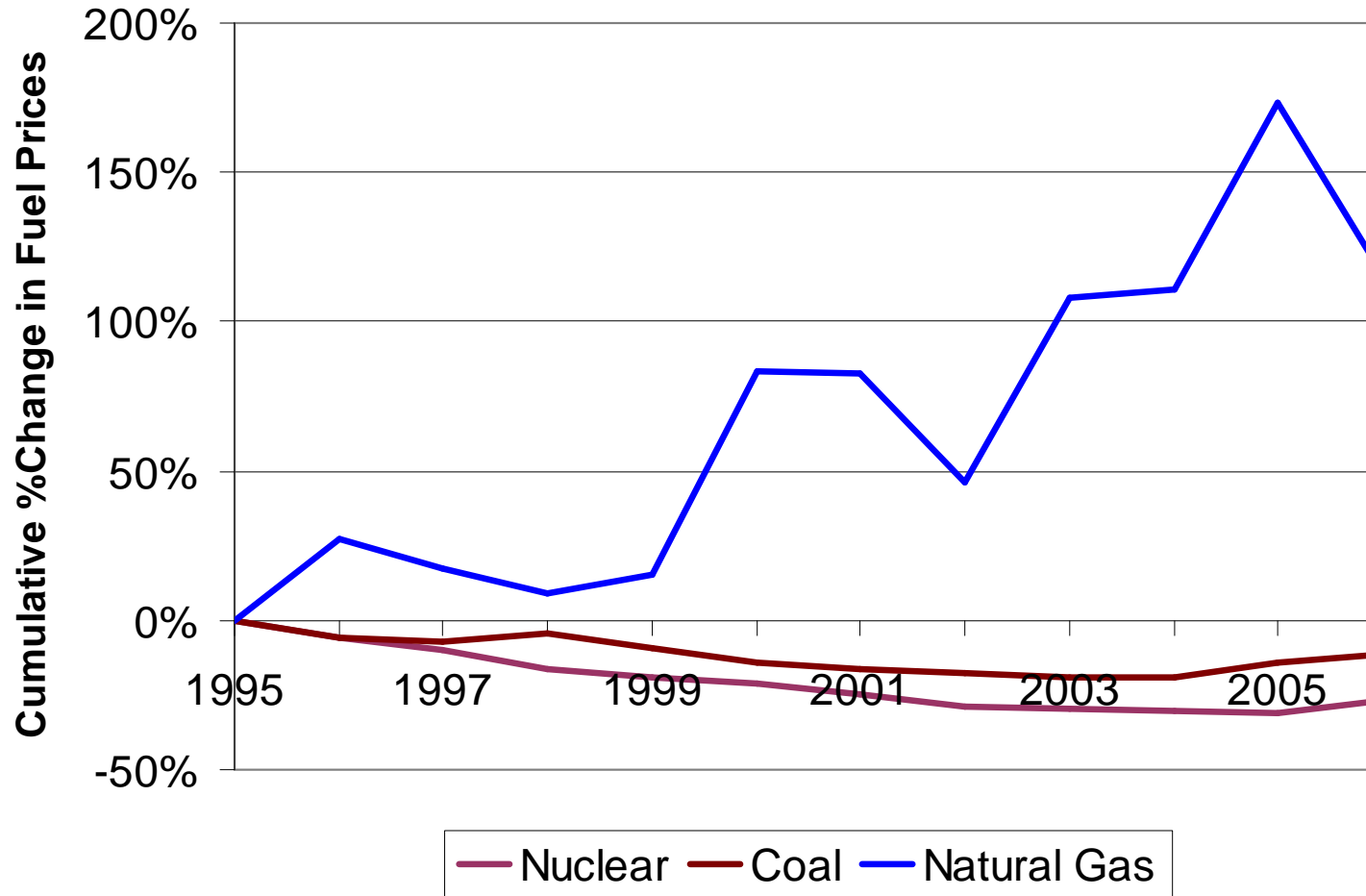


## Uncertainty In Future Market Conditions

- The relative costs of technologies are highly sensitive to plausible variations in the underlying assumptions
- Particular concerns:
  - Will recent surges in costs persist?
    - Fuel cost
    - Cost for construction inputs
  - Are the cost of innovative technologies again being underestimated?

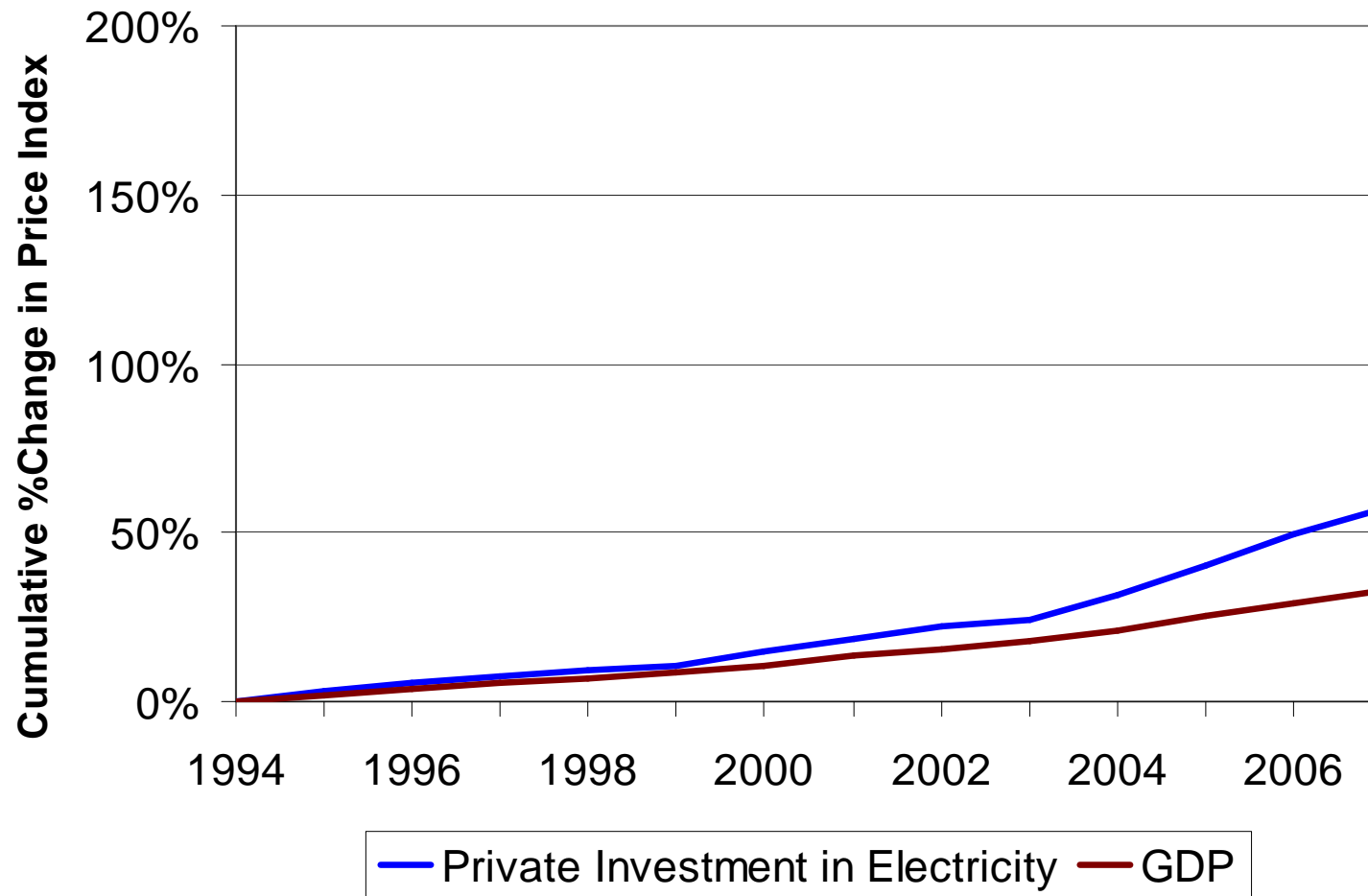


## Volatile Times: Fuel Costs



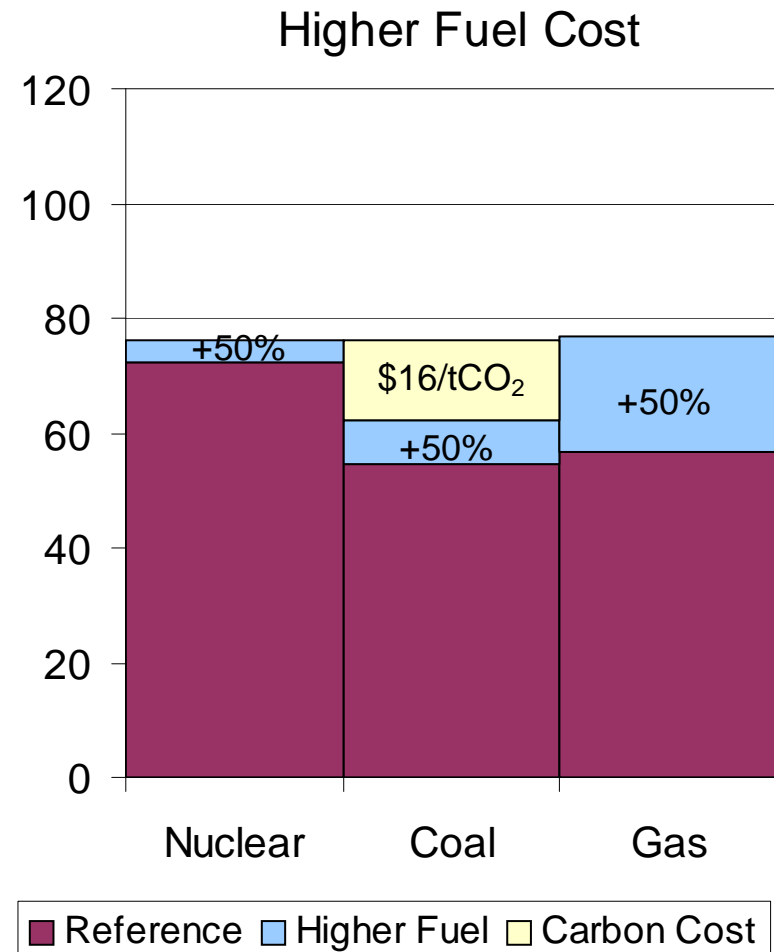
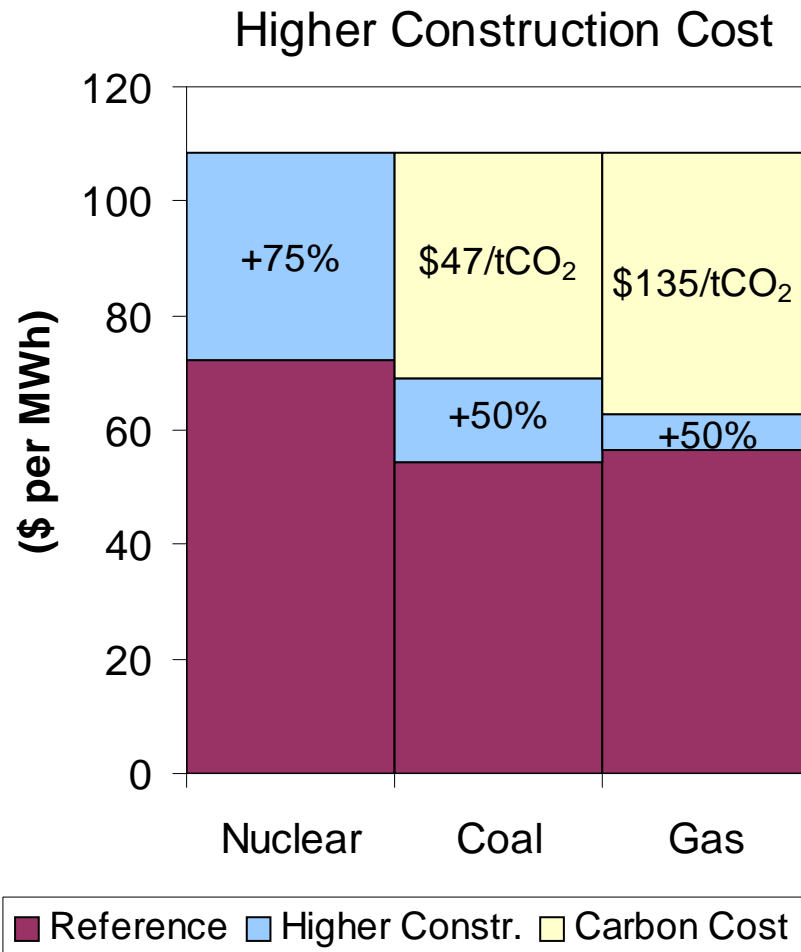


## Volatile Time: Construction Costs





# Market Conditions and the Viability of Nuclear under Carbon Pricing





## Recap

- New nuclear units would become competitive at carbon prices of around \$45 per metric ton
- Even in the absence of carbon pricing, the Energy Policy Act incentives will likely lead to the construction of a few new nuclear units
- Higher construction costs could deter investment in new nuclear units



## More Information on Nuclear Power

The Complete Report is Available On CBO's website at:

<http://www.cbo.gov/doc.cfm?index=9133>

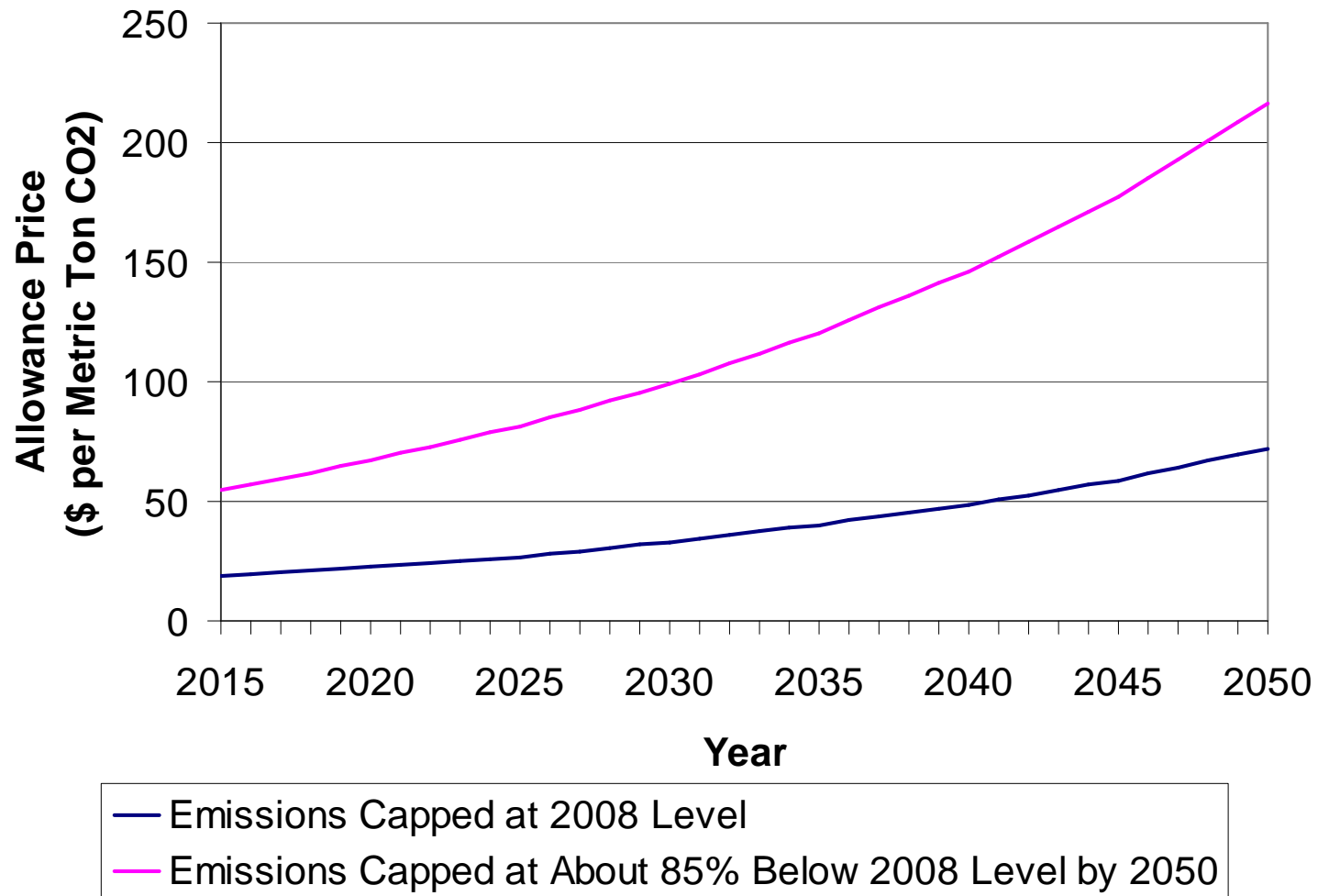


## End of Presentation

- Following Slides are Extra

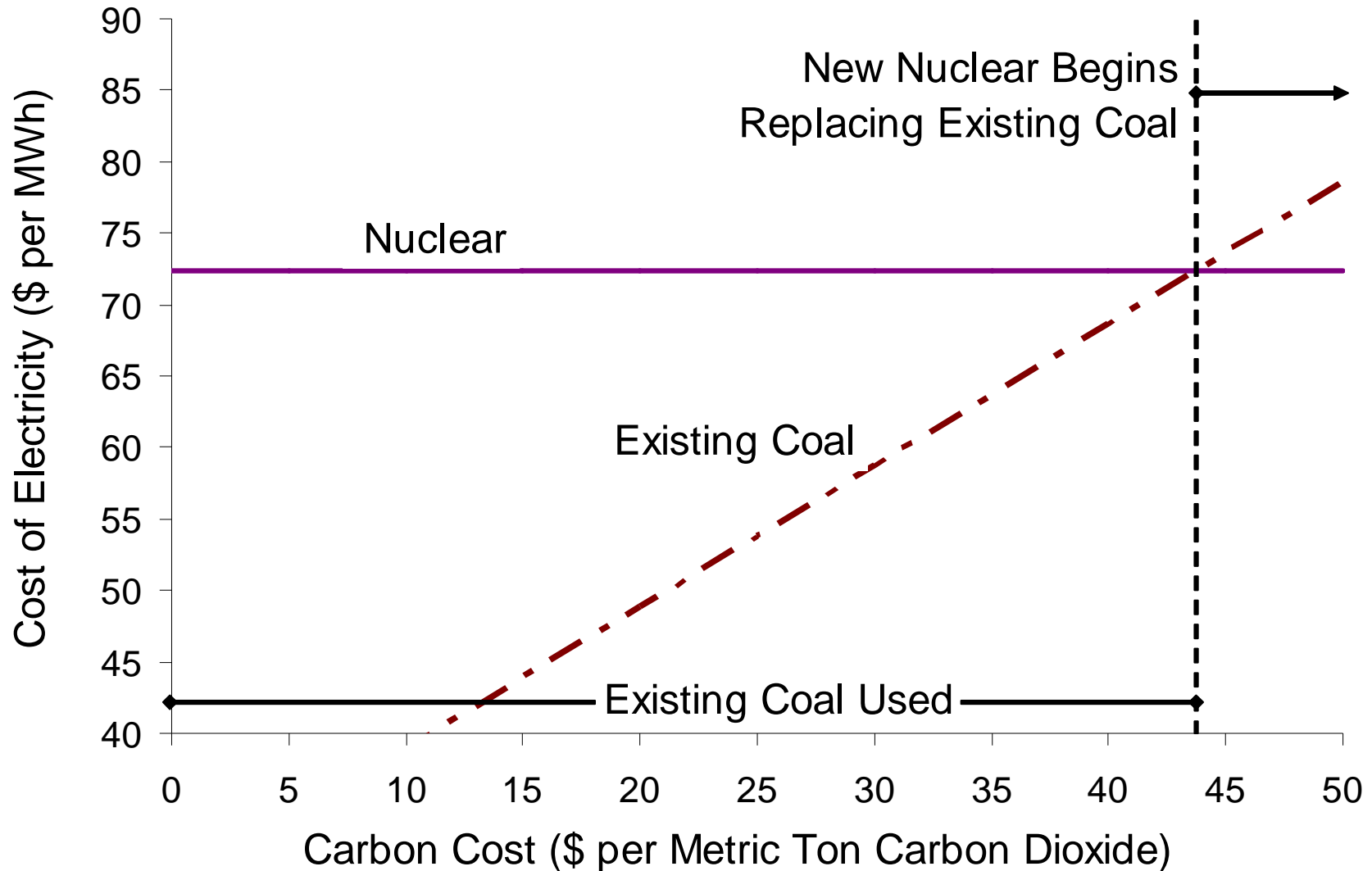


## Carbon Costs by Stringency of Cap





# Comparing New Nuclear Plants with Existing Coal Plants





## Energy Policy Act of 2005

- Largest incentives are loan guarantees and production tax credits
  - \$18.5 billion in loan guarantees through 2011 (could cover 80 percent of construction cost for about 3 units)
  - \$7.5 billion in tax credits
- Other Incentives: Nuclear Power 2010, Standby Support, Limited Liability, Treatment of Decommission Funds



# Cost of Electricity and the Energy Policy Act

