

Initial Comments of AECC  
Re: Proposed GHG Rule –  
Appendix A  
Increased Cost

# **Analysis of Cost of EPA's Proposed Clean Power Plan**

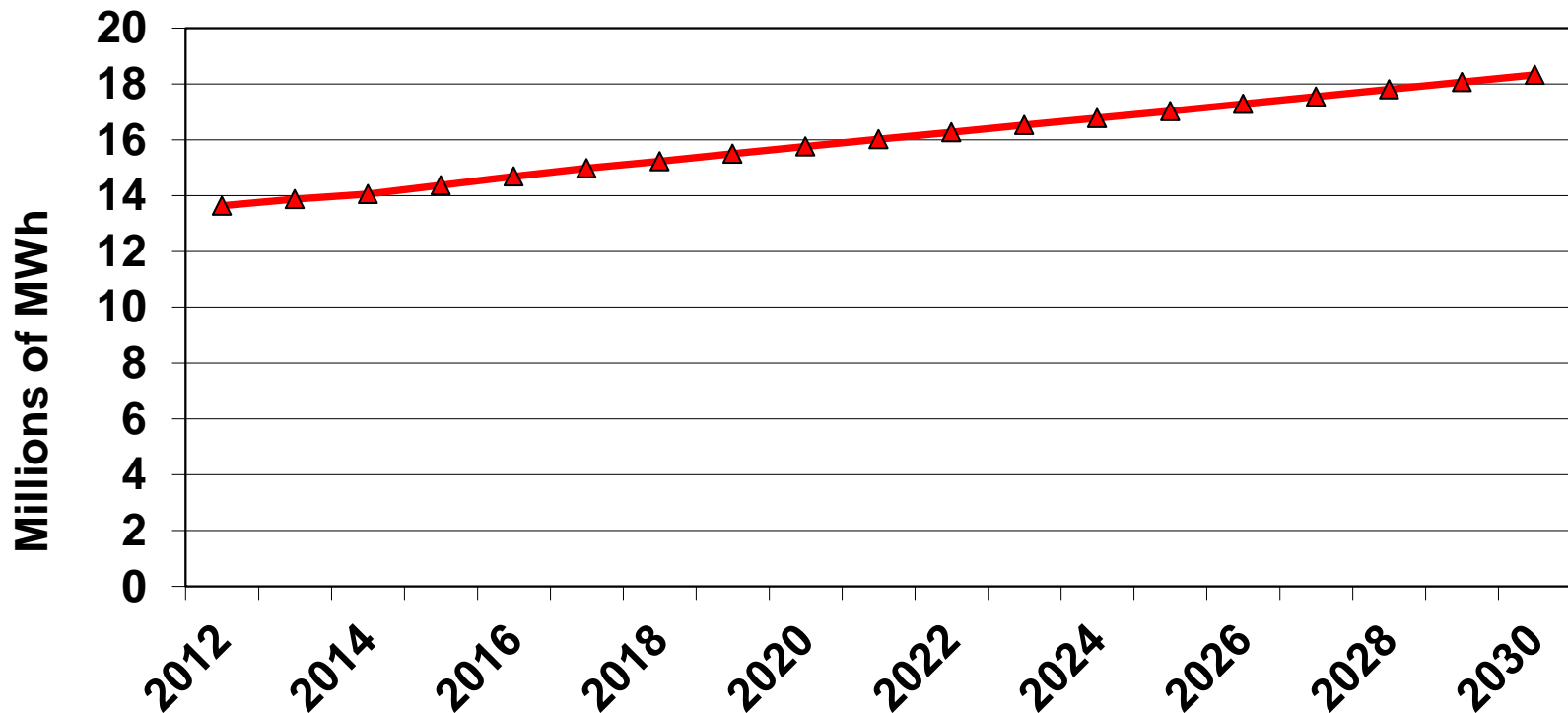
- **AECC Generation Serving AECC Load**
- **“Primary Scenario”:**
  - **Reference Coal Plant Retired in 2020 (worst case)**
  - **Gas Combined Cycle Built to Replace Coal Plant**
  - **Gas Combined Cycle Dispatched Ahead of Coal**
  - **325 MW (1,000 GWh) of Arkansas Wind Added**
  - **Gas Price and Gas Combined Cycle Cost Unaffected by Clean Power Plan**
- **Sensitivity Cases**
  - **\$1/MMBtu Higher Gas Price**
  - **2020 Gas Combined Cycle Capital Cost 50% Higher**

# **Analysis To-Date Does Not Include:**

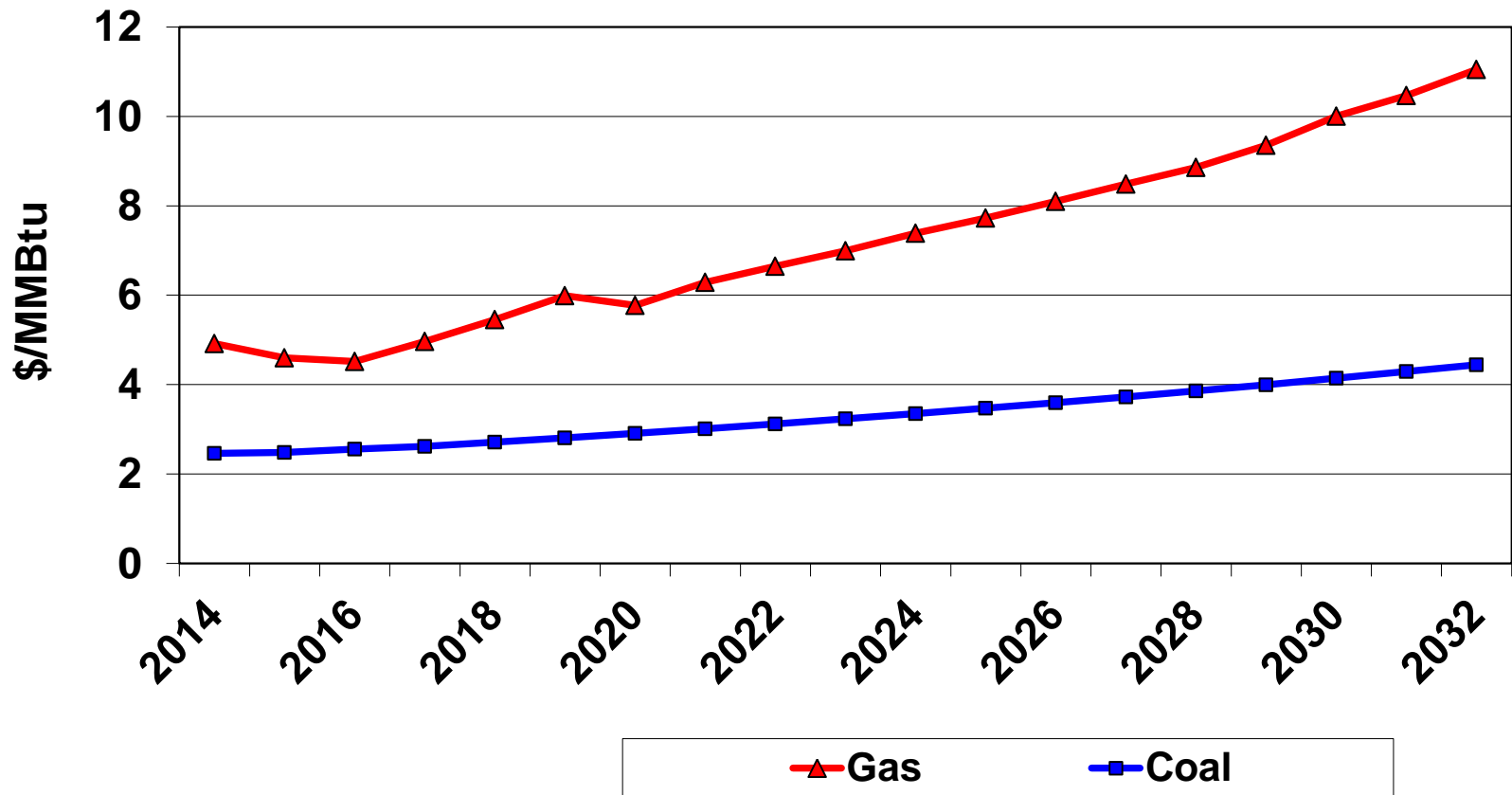
- **State-wide or Regional Analysis**
- **Increased Energy Efficiency**
- **Increased Gas Infrastructure or Gas Transportation Costs**
- **Increased Electric Transmission Rates**
- **Analysis of Reliability Impacts**

# Load Forecast

## AECC Energy Sales to Members



# Fuel Price Forecasts



Gas forecast after 2018 based on the forecast from the Energy Information Administration

July 21, 2014

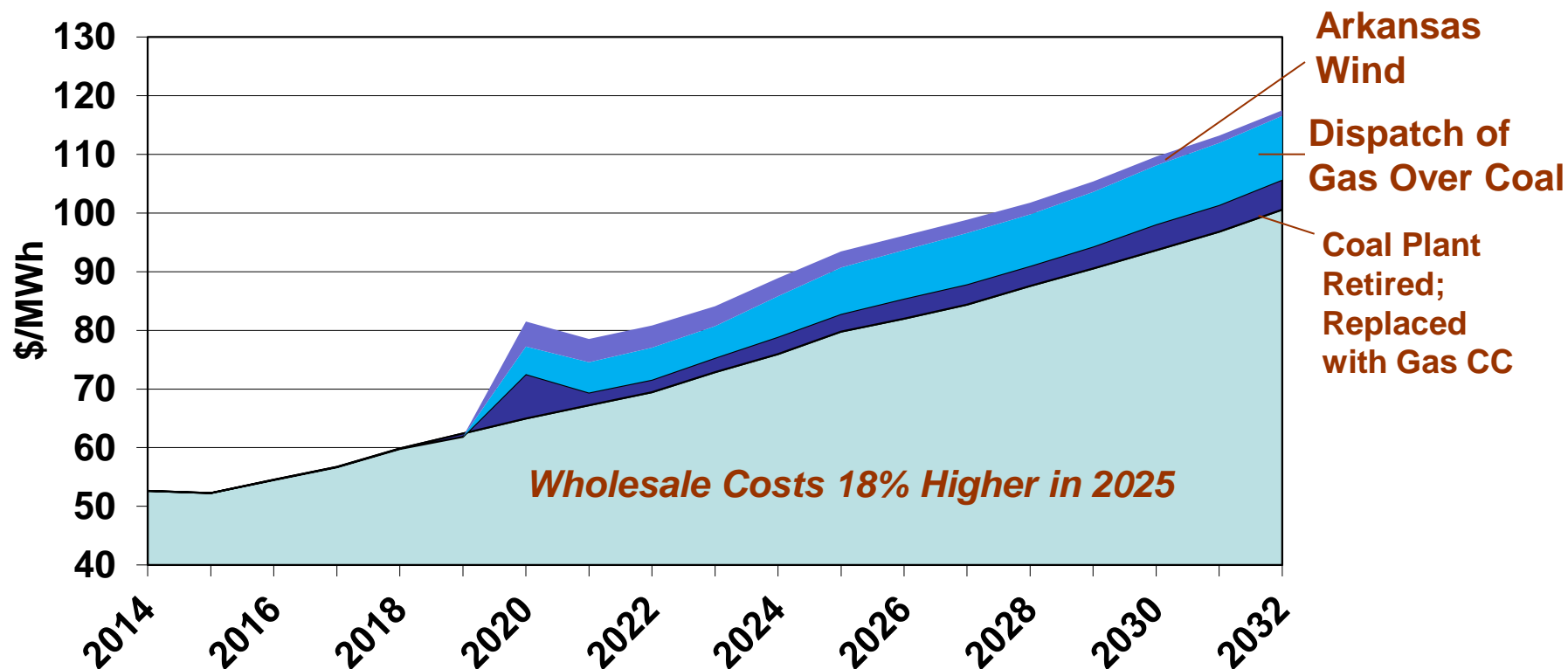
Initial Comments of AECC Re:  
Proposed GHG Rule - Appendix A

# Arkansas Wind Assumptions

- **35% capacity factor**
- **325 MW built, providing 1,000 GWh**
- **Capital cost of \$2,205/kW** (2012\$, Energy Information Administration)
- **Capital cost in 2020 is \$852 million**
- **First year (2020) cost is \$111/MWh**
- **No costs added for transmission**
- **No benefit assumed for wind capacity**
- **No federal or state tax credits assumed**

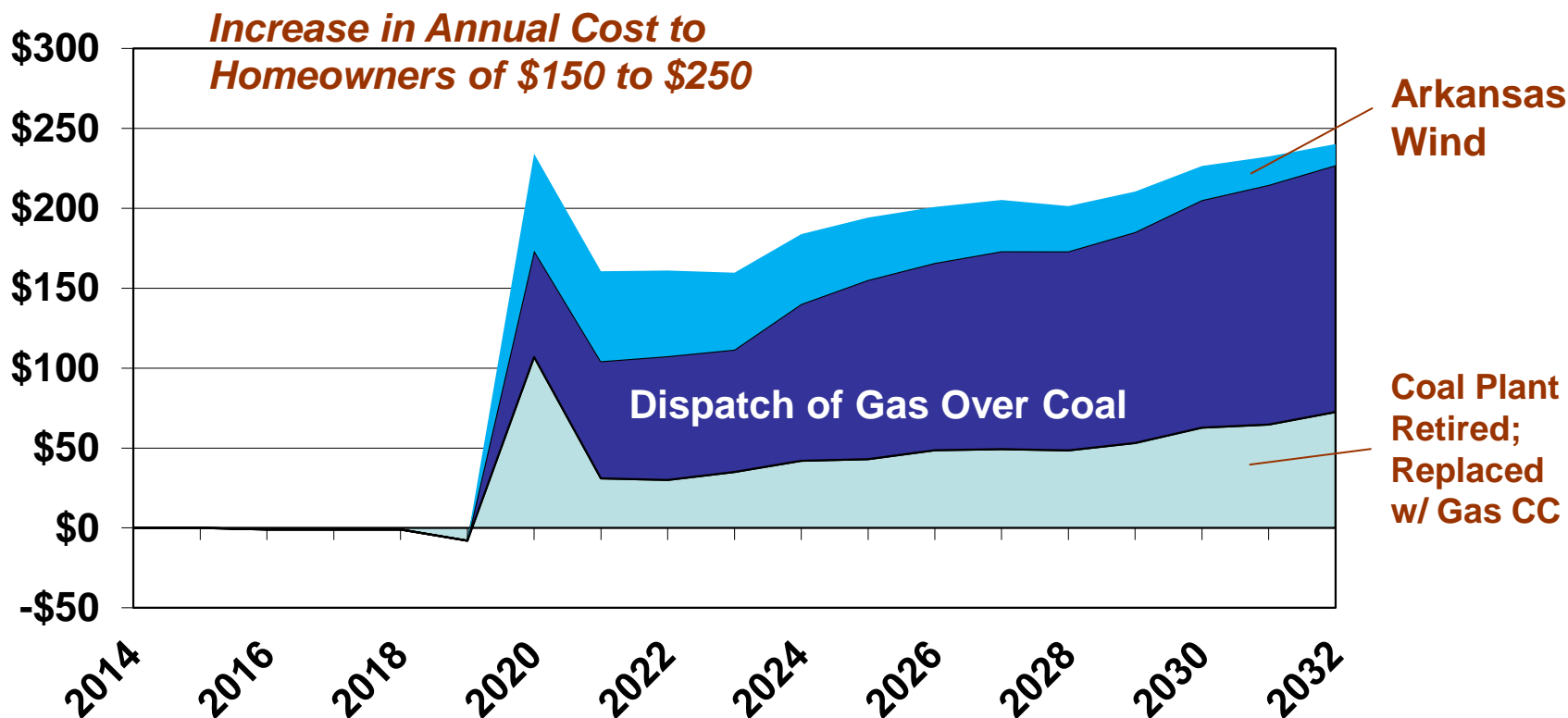
# Wholesale Power Costs per MWh

## Effect of Clean Power Plan, “Primary Scenario”



2020 cost includes write off of \$106 million  
of undepreciated portion of Coal Plant

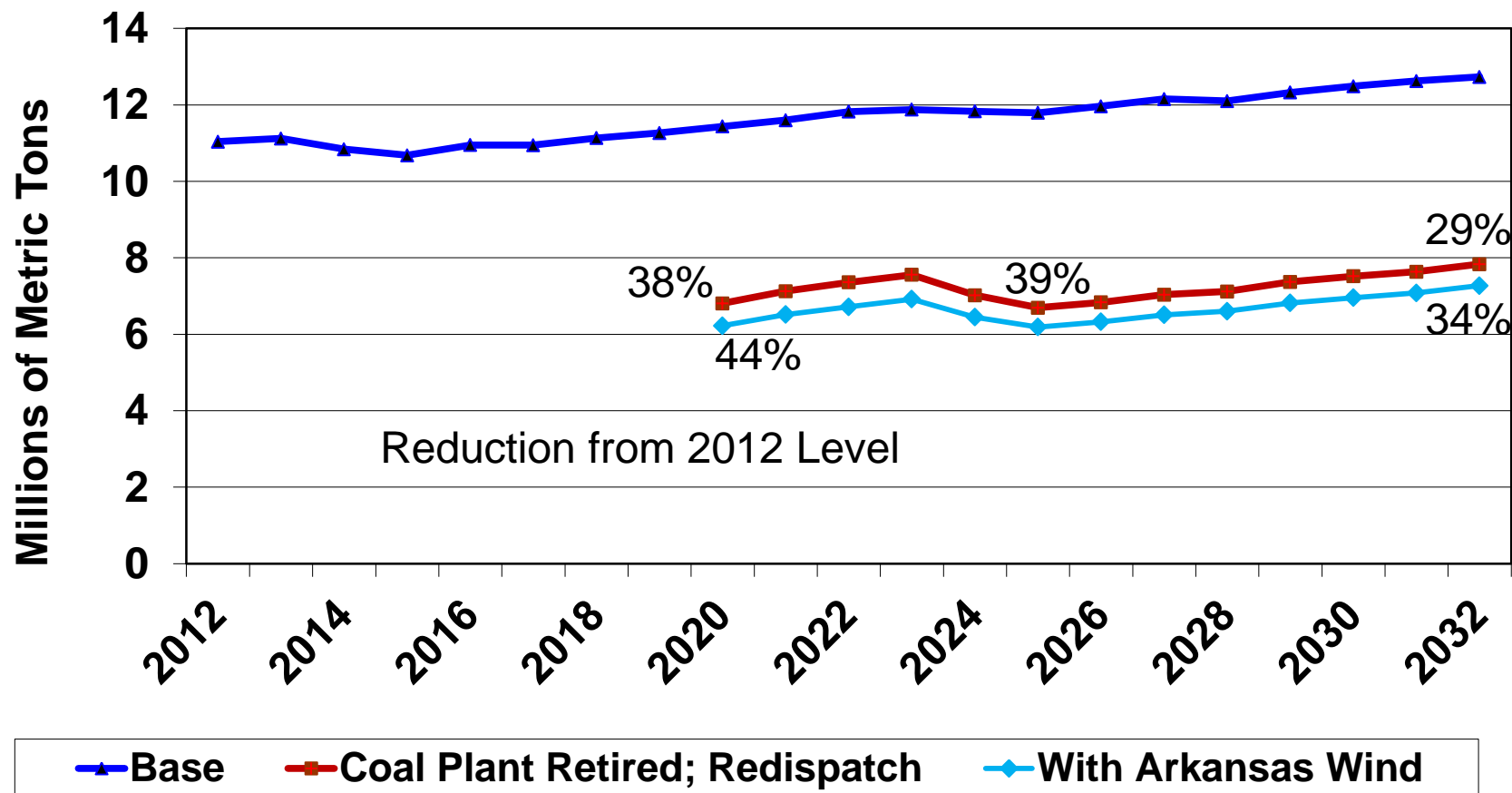
# Increase in Annual Residential Cost Effect of Clean Power Plan, “Primary Scenario”





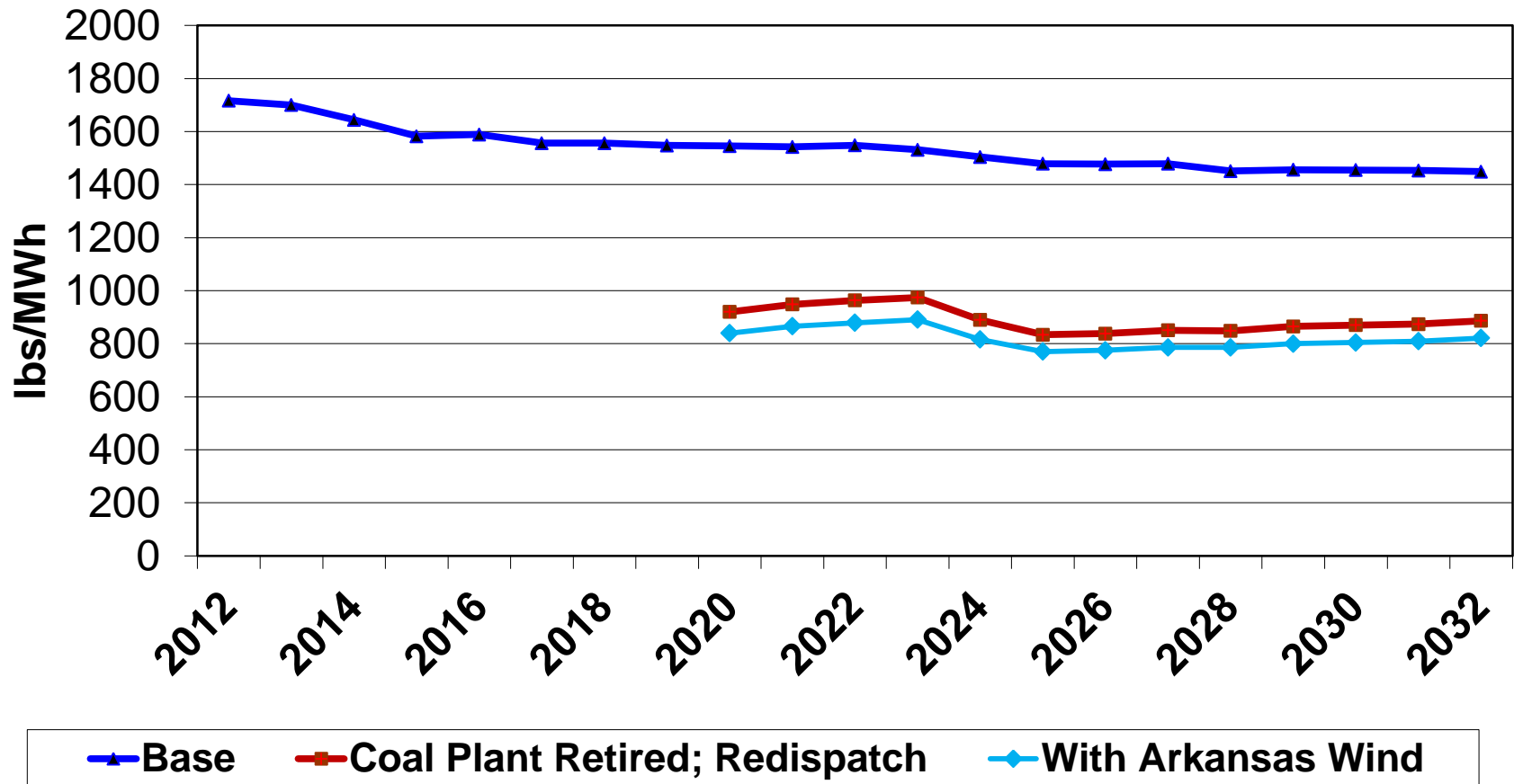
# CO<sub>2</sub> Emissions, Metric Tons

## Effect of “Primary Scenario”

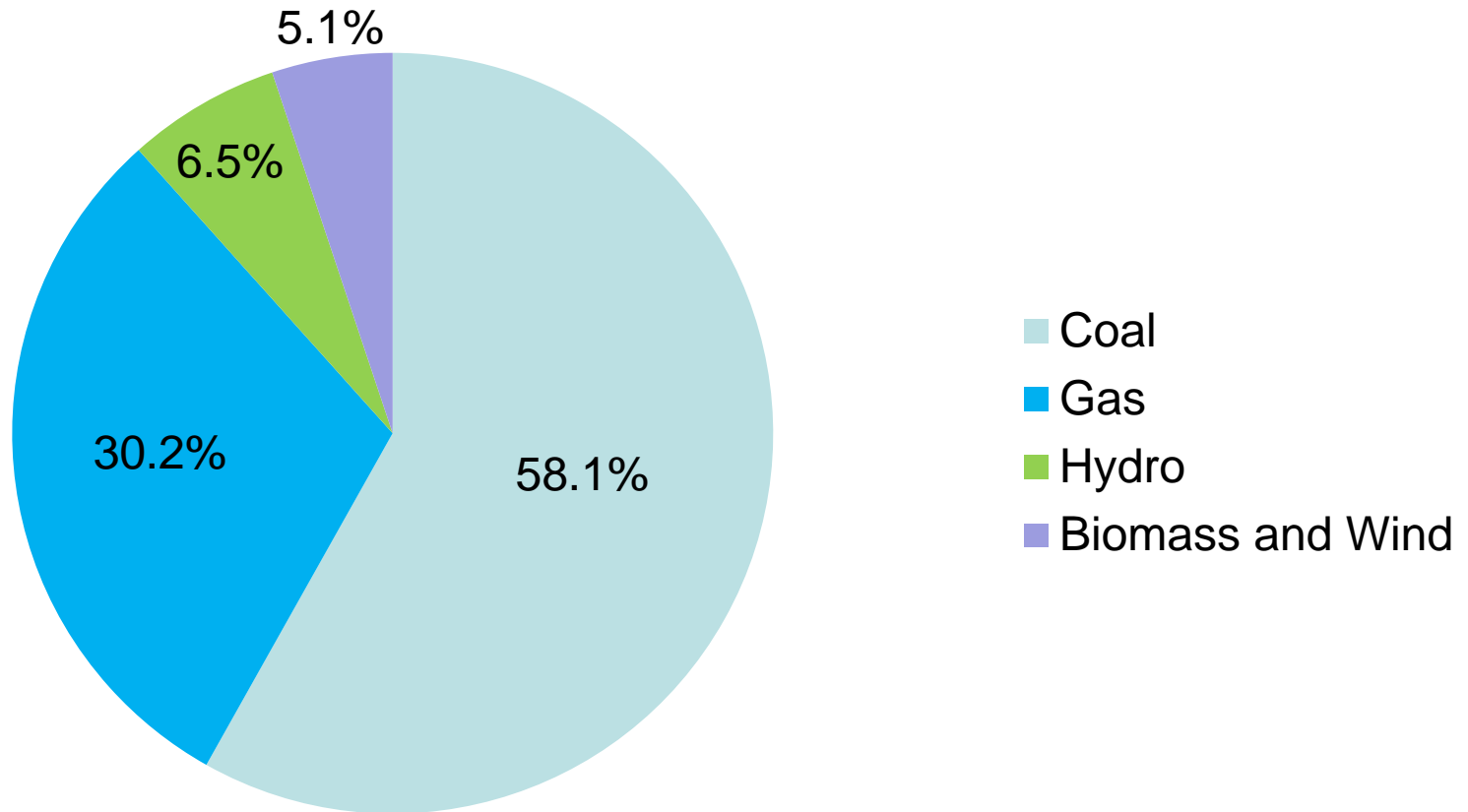


# CO<sub>2</sub> Emissions, lbs/MWh

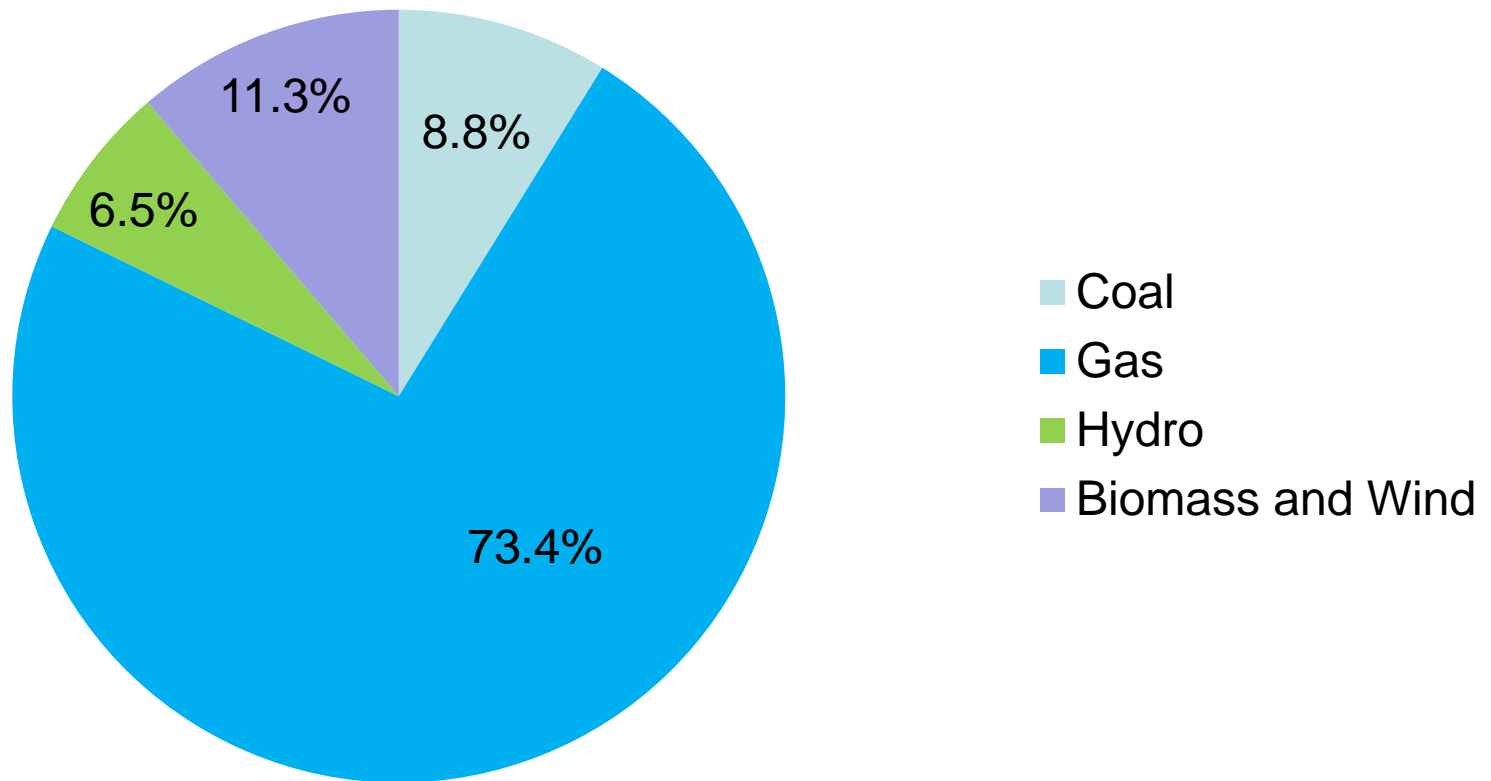
## Effect of “Primary Scenario”



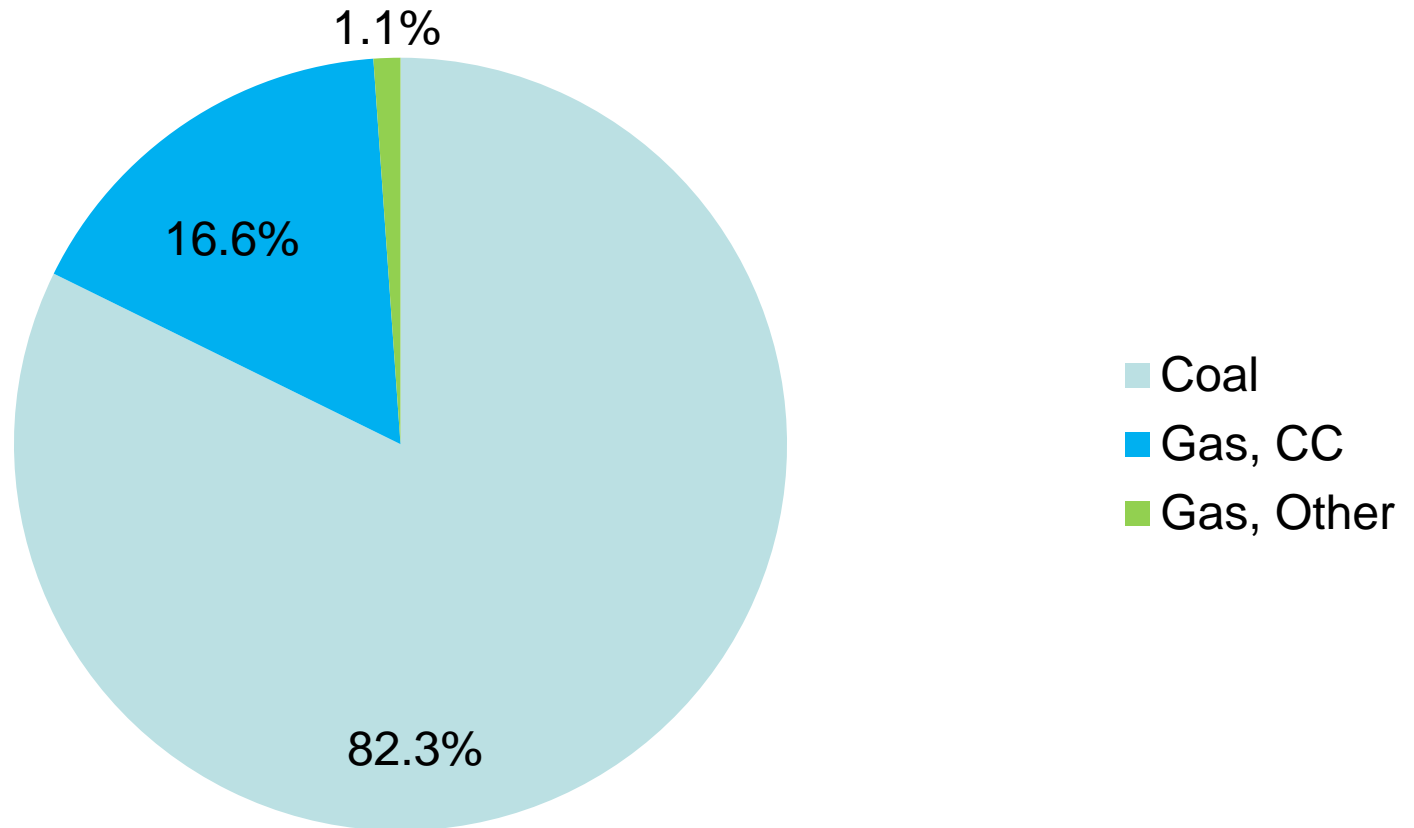
## 2020 Generation Mix, Base Case



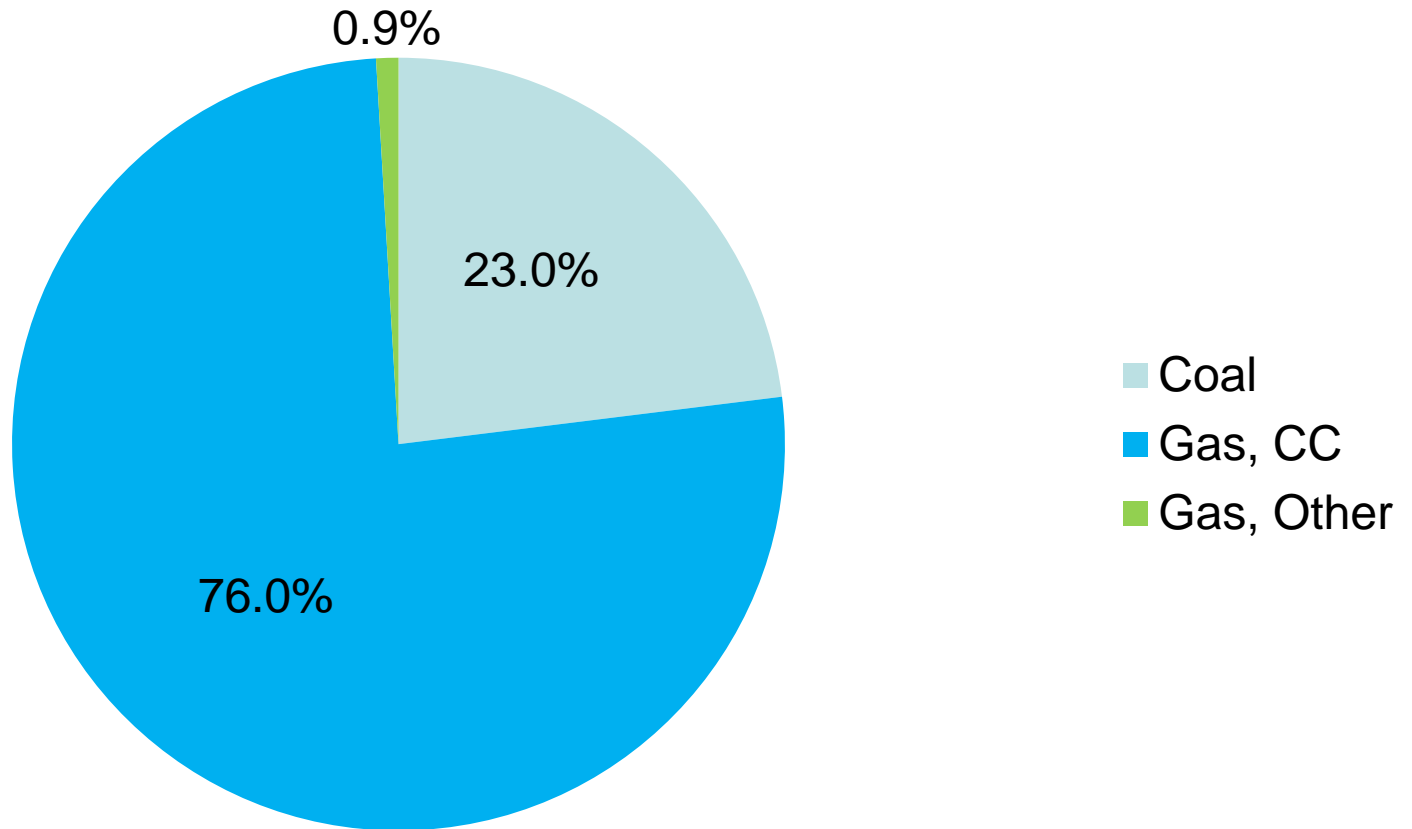
# 2020 Generation Mix “Primary Scenario”



## 2020 Source of CO<sub>2</sub>, Base Case



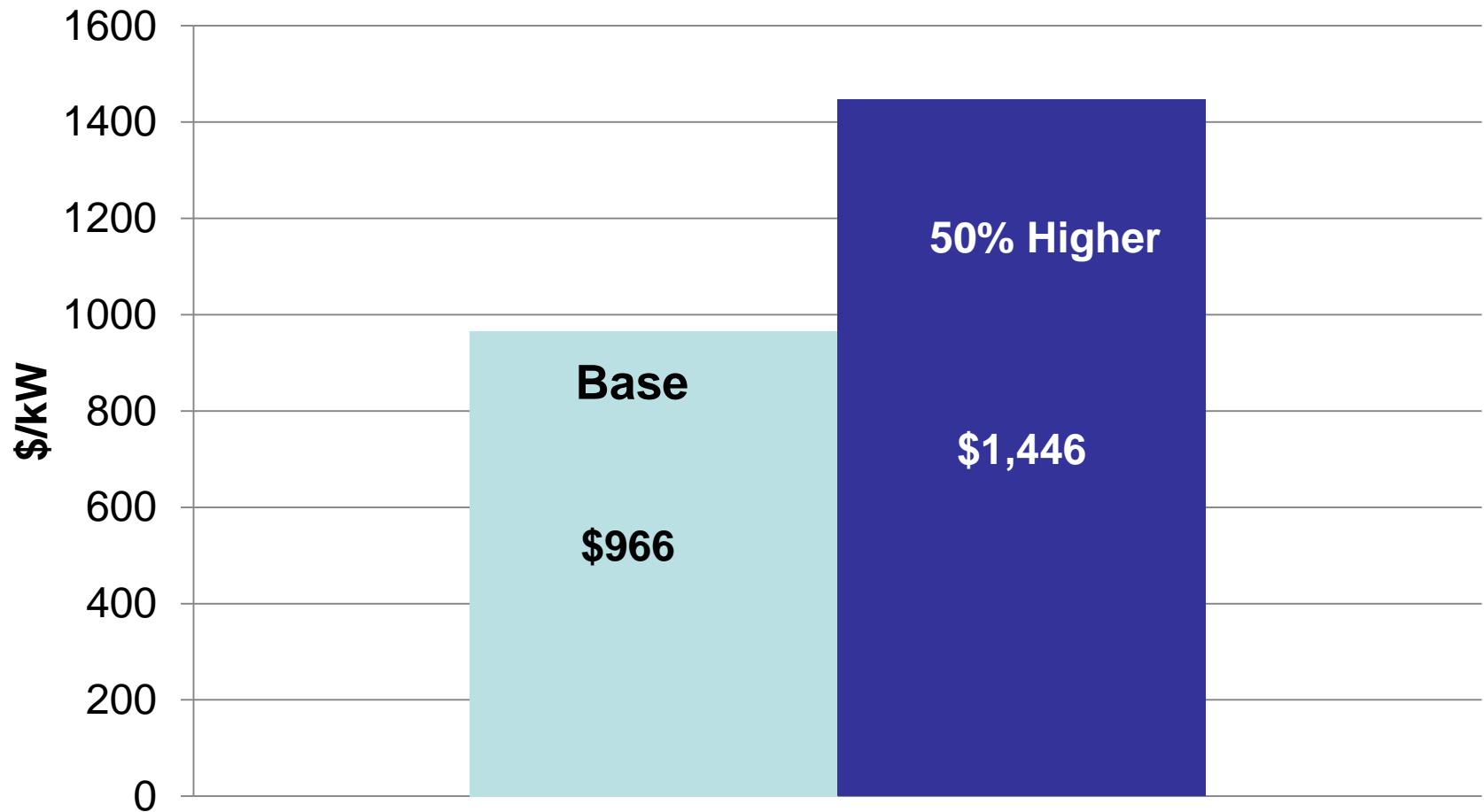
## 2020 Source of CO<sub>2</sub> “Primary Scenario”



# Sensitivity Cases

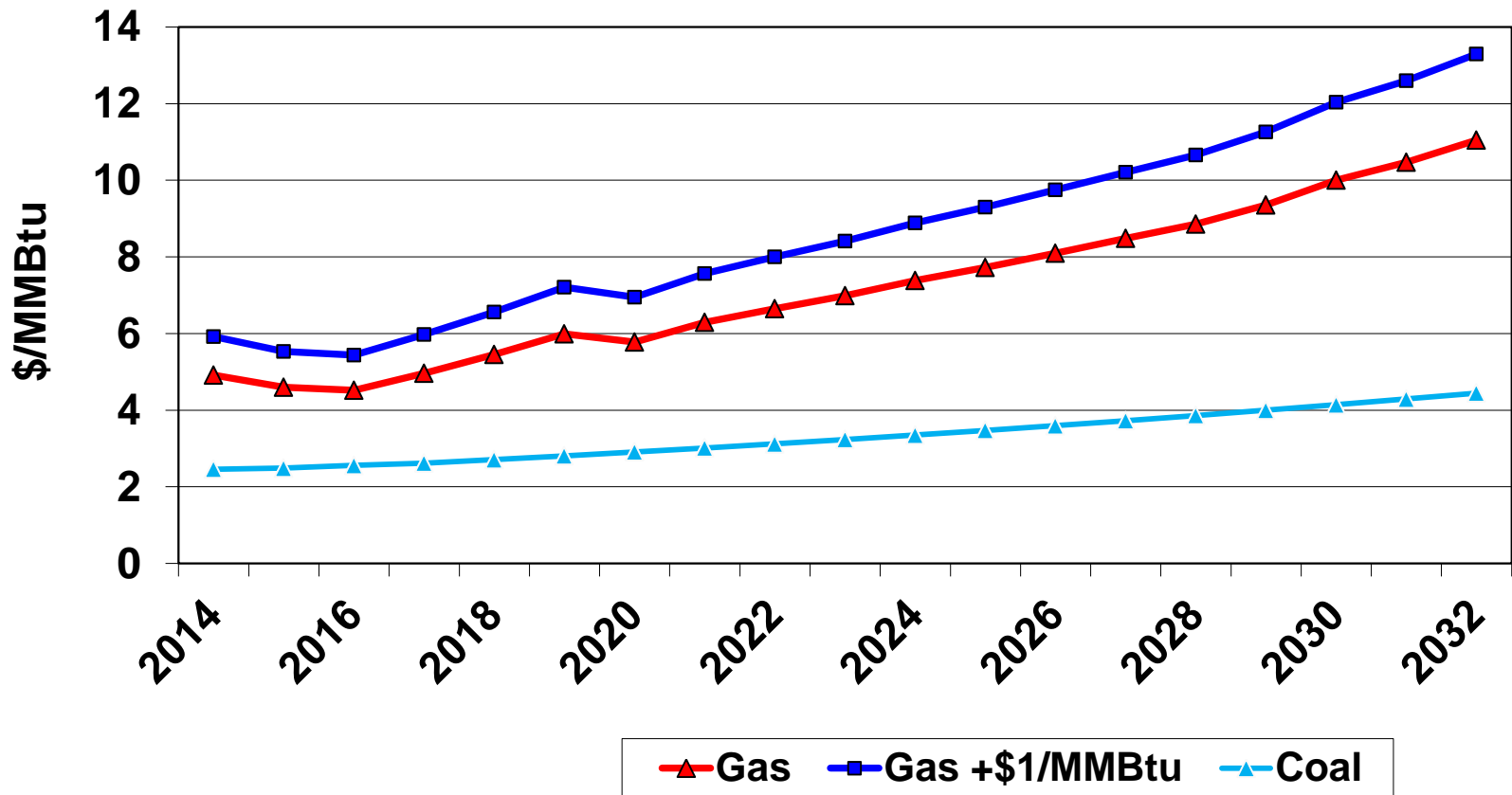
- The Clean Power Plan will result in a significant need for new gas combined cycle capacity to replace retired coal plants. Sensitivity case has **capital cost of 2020 gas combined cycle plant 50% higher.**
- The Clean Power Plan will require electric utilities to rely more heavily on gas, including the dispatch of gas ahead of coal. Increased gas demand will increase price. Sensitivity case has a **gas price increase of \$1/MMBtu.**

# Combined Cycle 2020 Capital Cost (\$/kW)





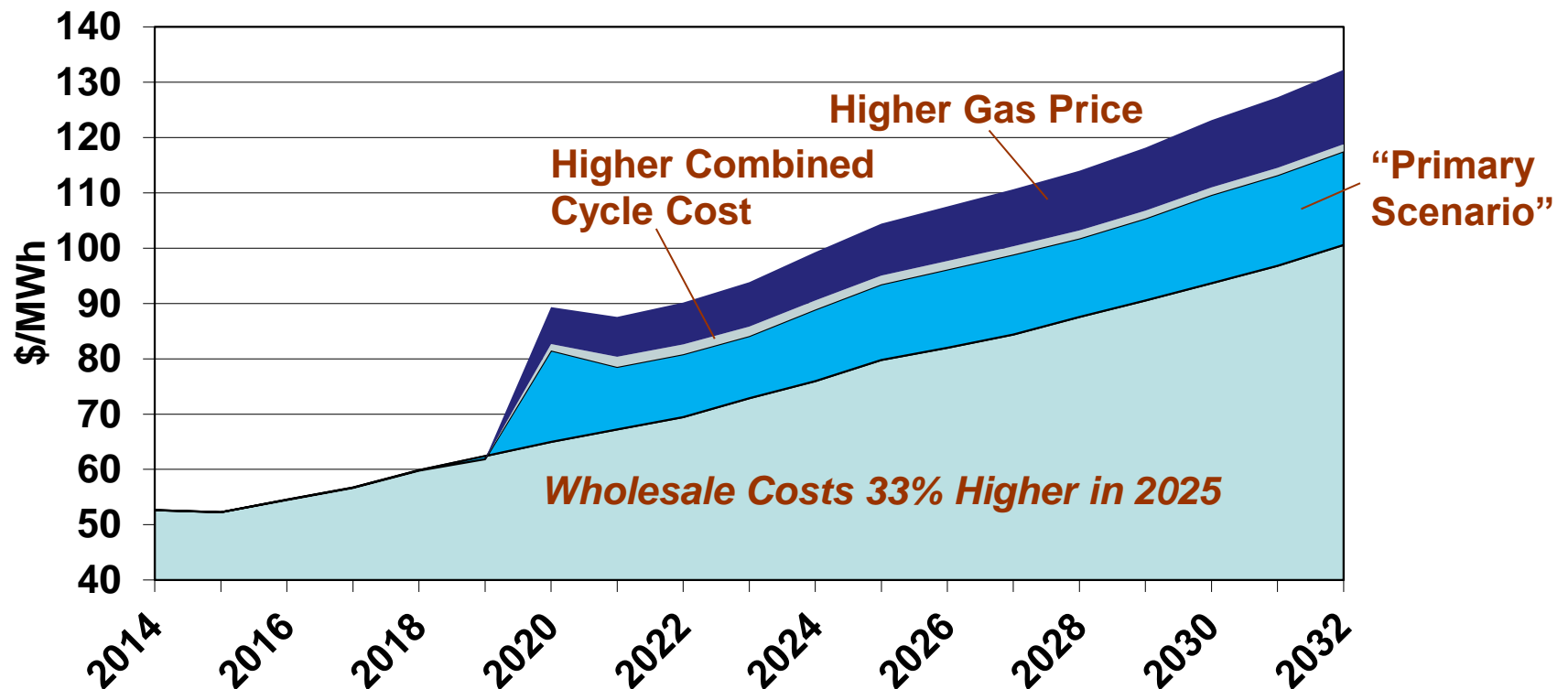
# Fuel Price Forecasts



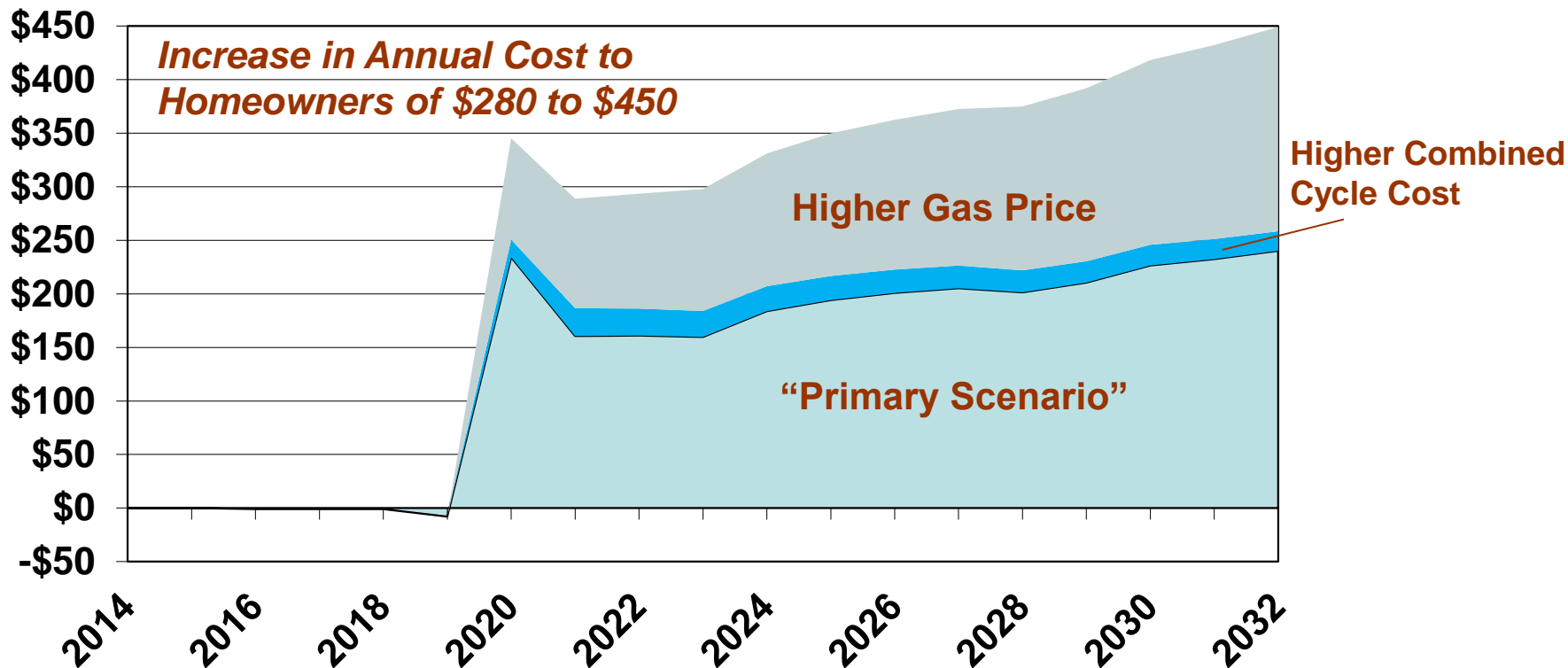
Gas forecast after 2018 based on the forecast from the Energy Information Administration

# Wholesale Power Costs per MWh

## Potential Effect of EPA's Clean Power Plan



# Increase in Annual Residential Cost Potential Effect of EPA's Clean Power Plan



# Improved Efficiency of Coal Plants?

- **EPA: Increase coal plant heat rate efficiency by 6%**
- **6% increase is not physically possible – 1-2% increase is more realistic; however, any increase is limited by EPA New Source Review concerns**
- **A 1-2% improved efficiency across AECC's portion of Arkansas' coal fleet will range in cost from \$4 million to \$60 million**
  - **The primary difference in costs relate to whether or not efficiency upgrades are exempt from New Source Review**

# Energy Efficiency

- **EPA: Energy efficiency (EE) growth of 1.5% / year from 2020-2029**
- **AECC has strongly promoted EE since 1963 – unfortunately EE benefits prior to 2020 will not count toward meeting the Clean Power Plan goals**
  - **AECC currently budgets about \$1.5 million/year for seminars/education programs, model homes, and the weekly “Home Remedies” radio show**
  - **Distribution cooperatives provide EE loans, EE lighting, and energy audits**

# Energy Efficiency

- **It is extremely difficult to determine and verify the effectiveness of EE programs on total energy consumption.**
- **AECC will continue to research the cost of future EE to our ratepayers.**