

Abundant Natural Gas: Some Implications for Electric Power

Stephen P. A. Brown

Alan J. Krupnick

Margaret A. Walls

Resources for the Future



Abundant Natural Gas

A Bridge to A Low Carbon Future?

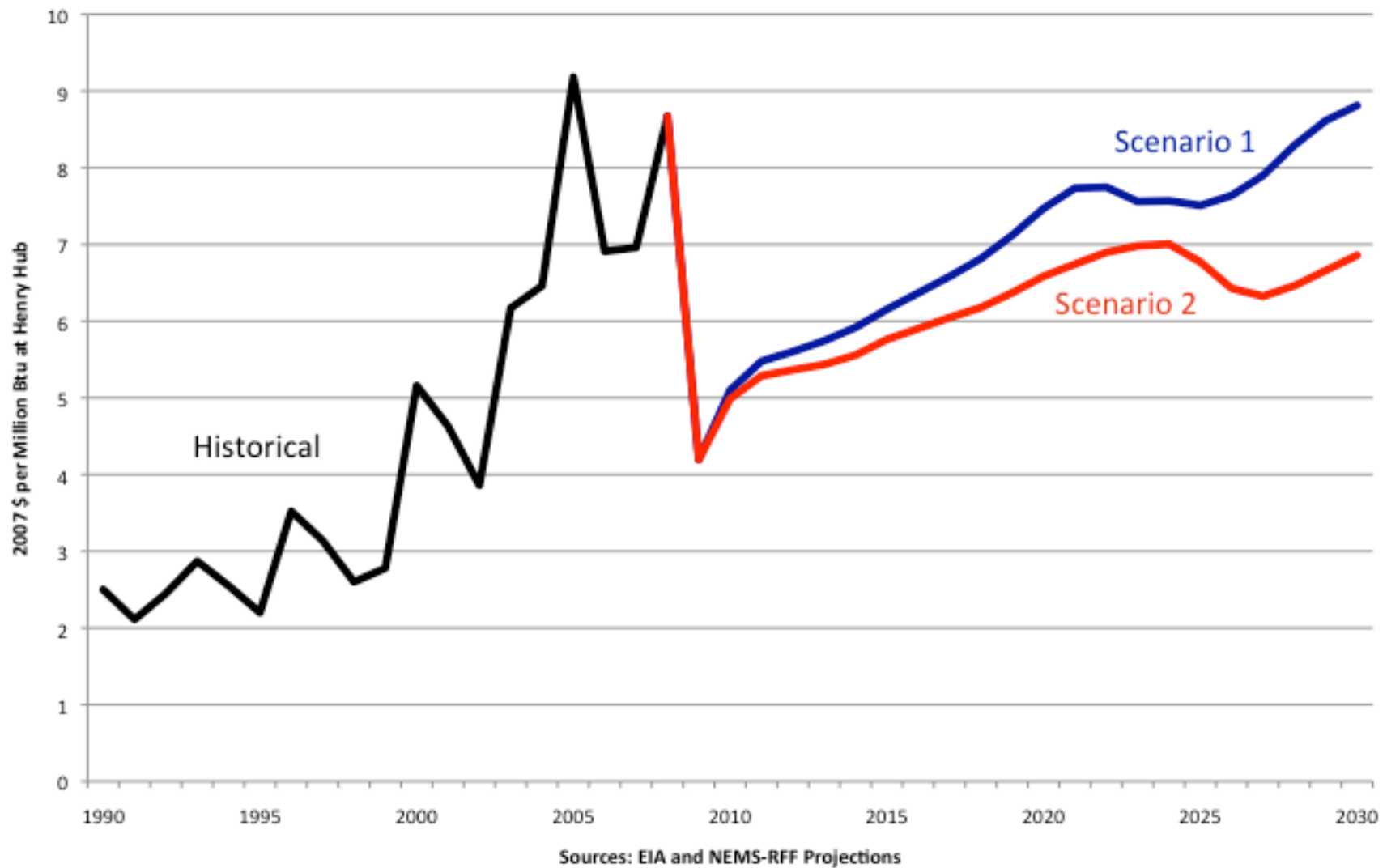
- Not a bridge to a low-carbon future without low carbon policy
 - Reduced energy prices stimulate consumption, increase carbon emissions
- Can help create a bridge to a low-future with low carbon policy
 - Cost of carbon policy is reduced

Five Scenarios

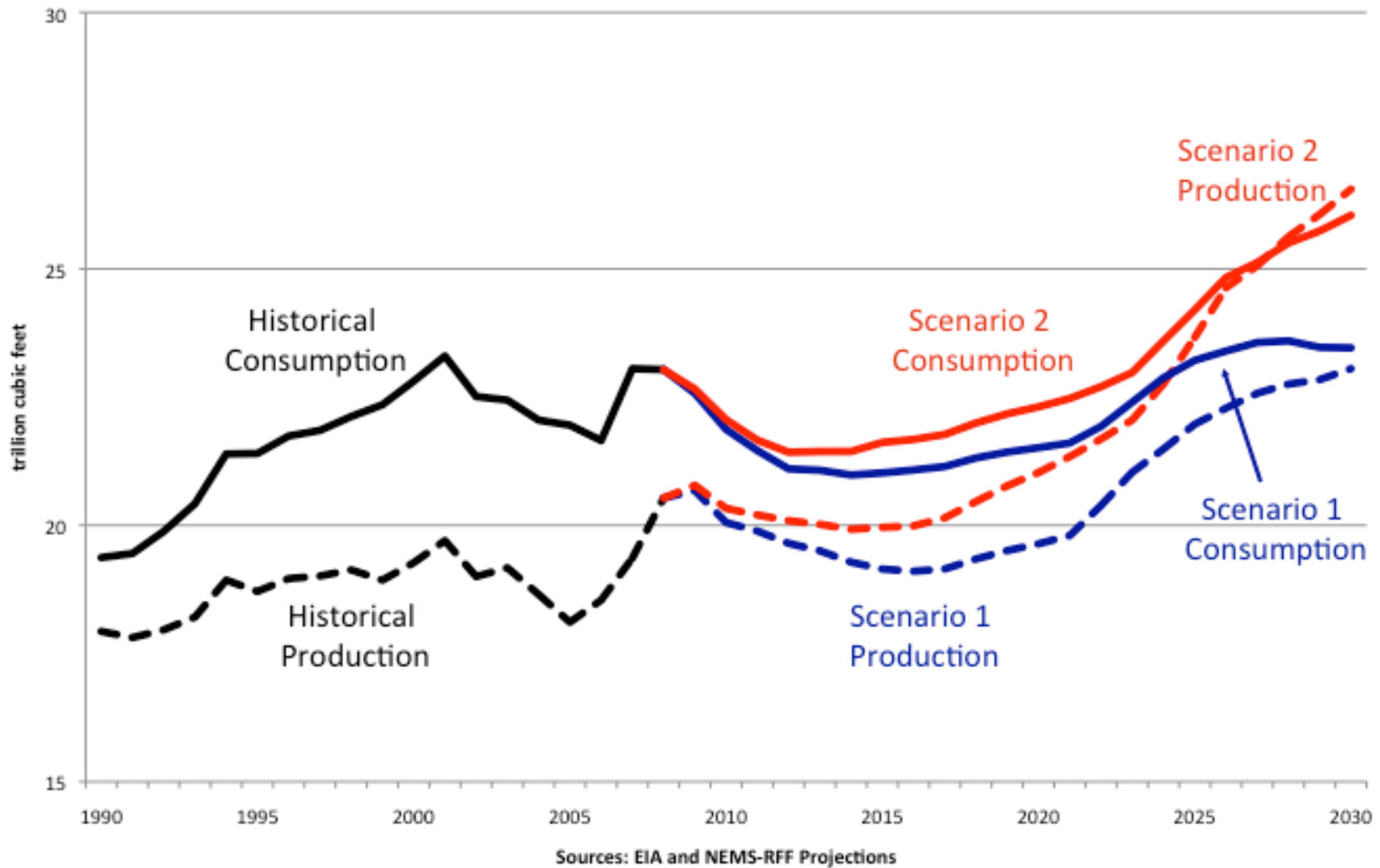
NEMS-RFF

1. Business As Usual, Low Gas
2. Business As Usual, High Gas
3. Low-Carbon Policy, Low Gas
4. Low-Carbon Policy, High Gas
5. Low-Carbon Policy, High Gas, Limited Alternatives

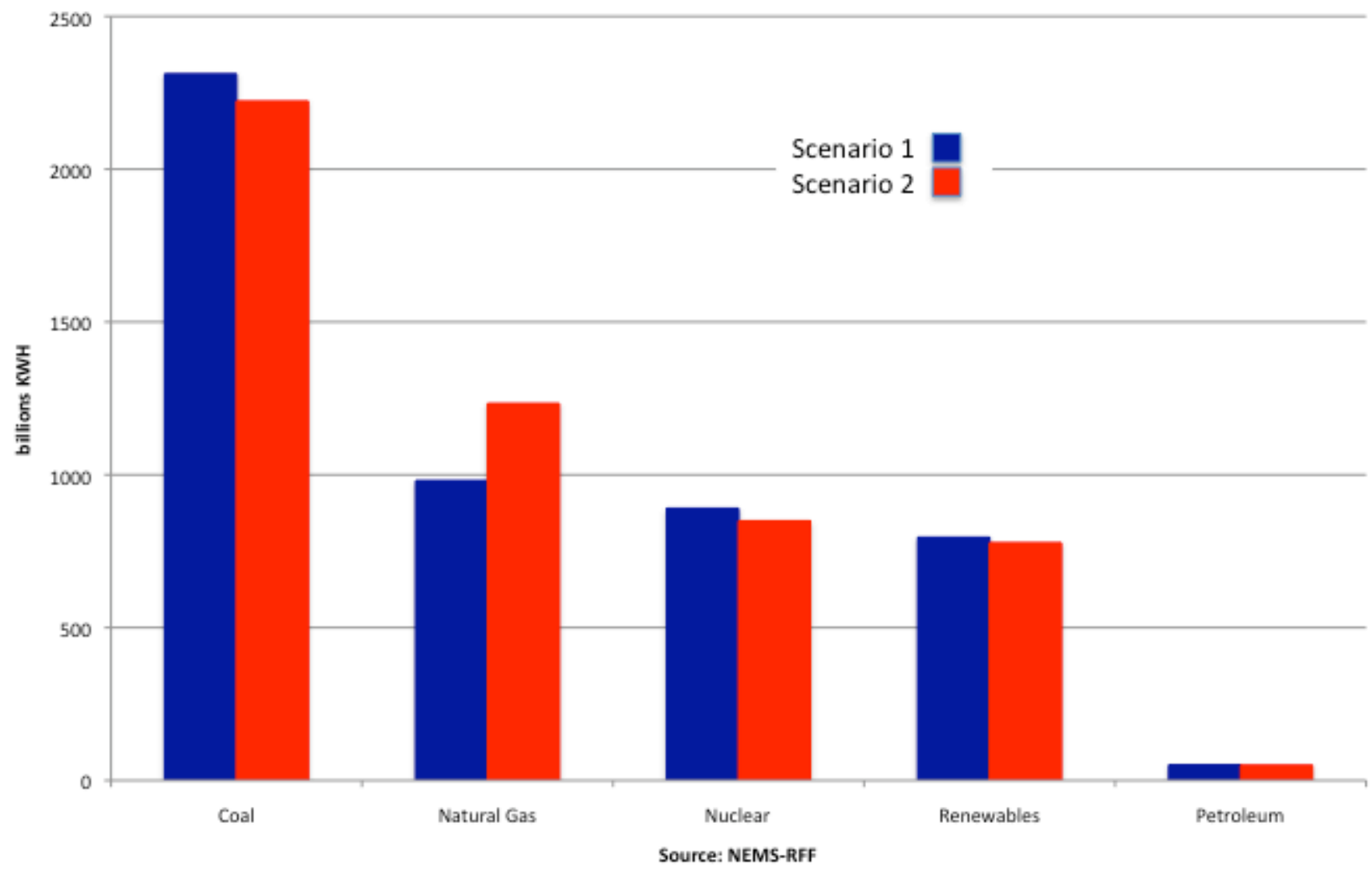
U.S. Natural Gas Prices



U.S. Natural Gas Consumption and Production



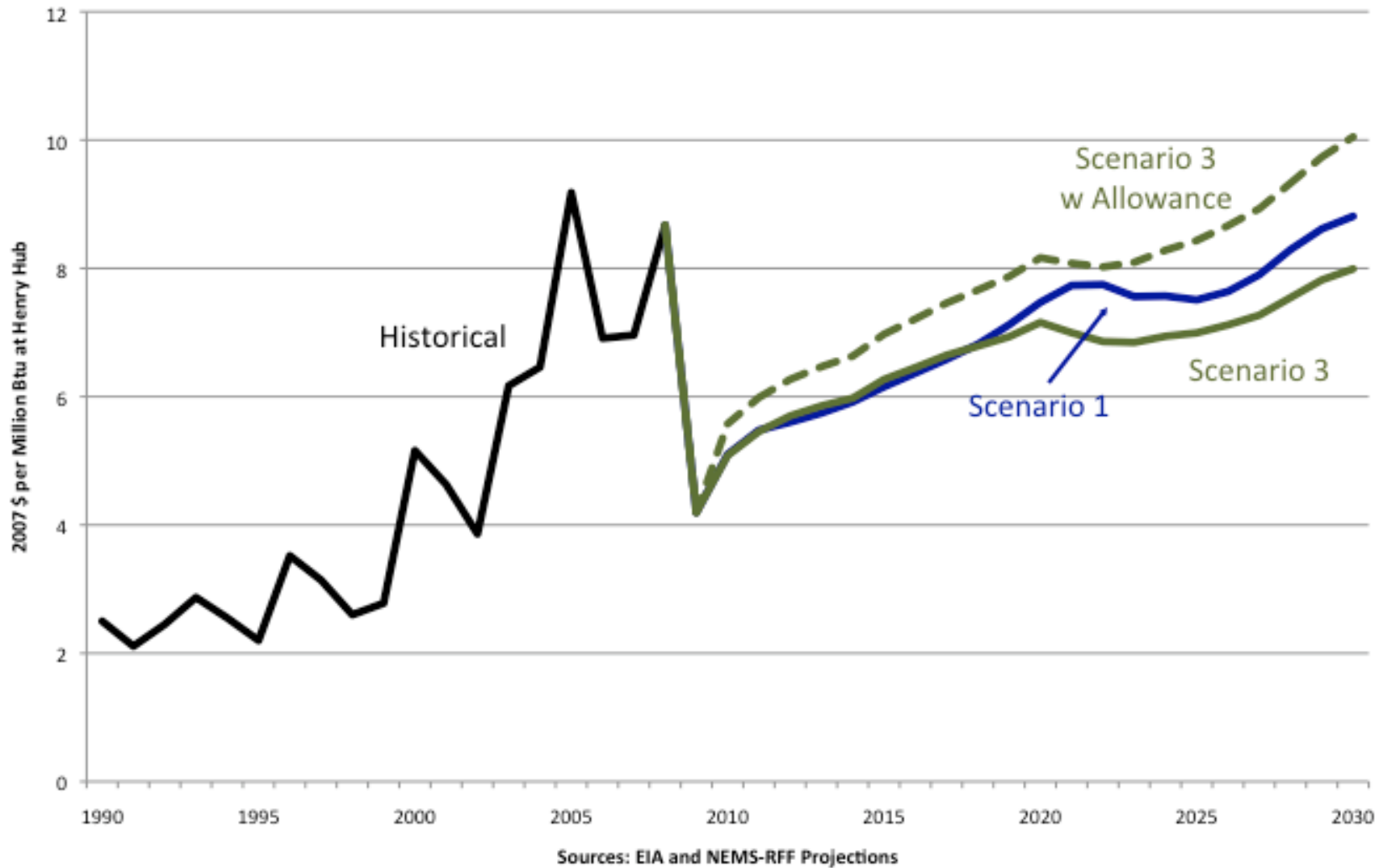
Electric Power Generation by Source, 2030



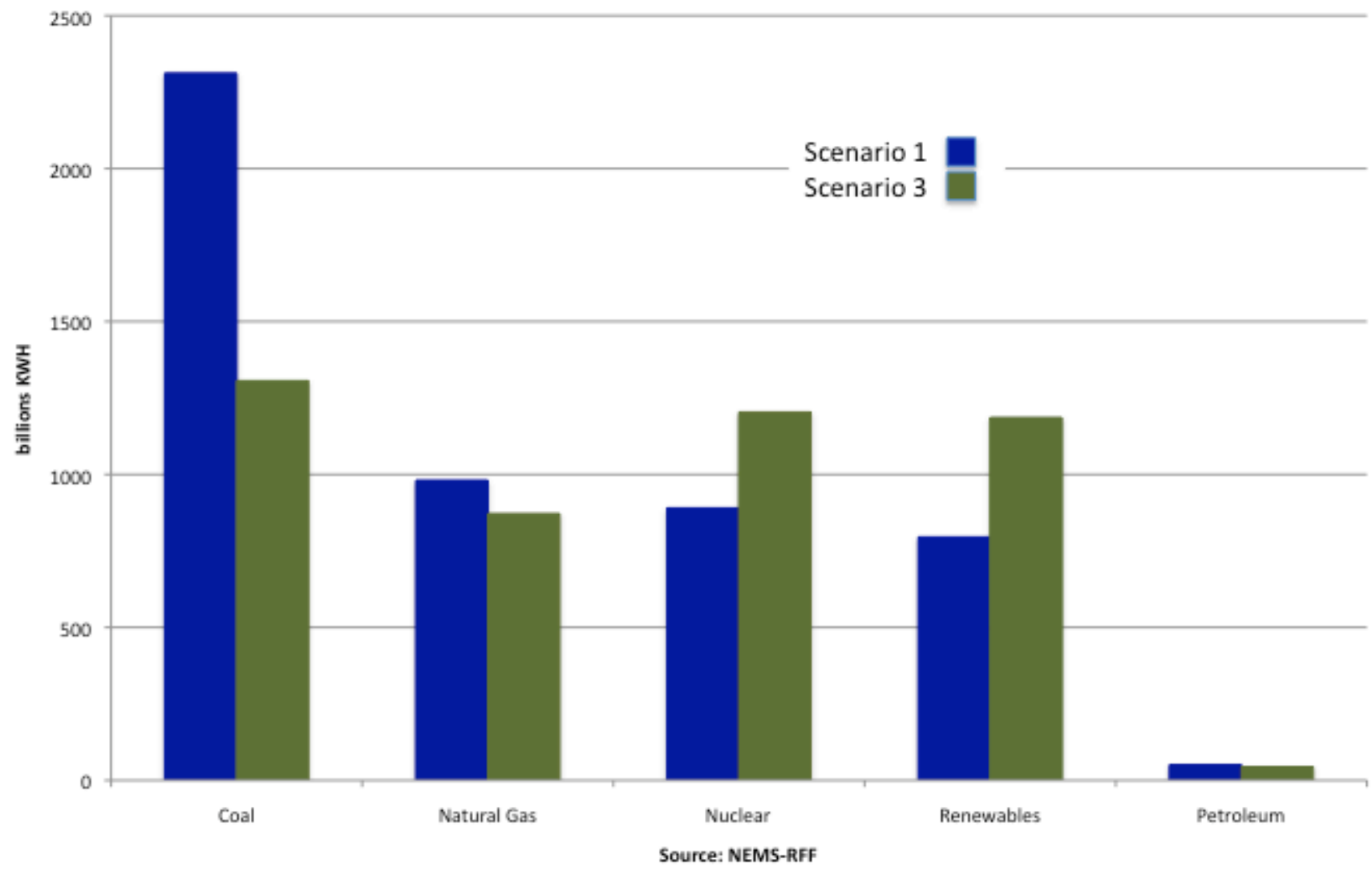
More Abundant Natural Gas

- Increased use in electric power generation
- Natural gas consumption increased in all sectors of the economy
- Prices for all energy sources reduced
- Energy consumption increased in all sectors of the economy—by more than 1 percent
- CO₂ emissions increased almost 1 percent

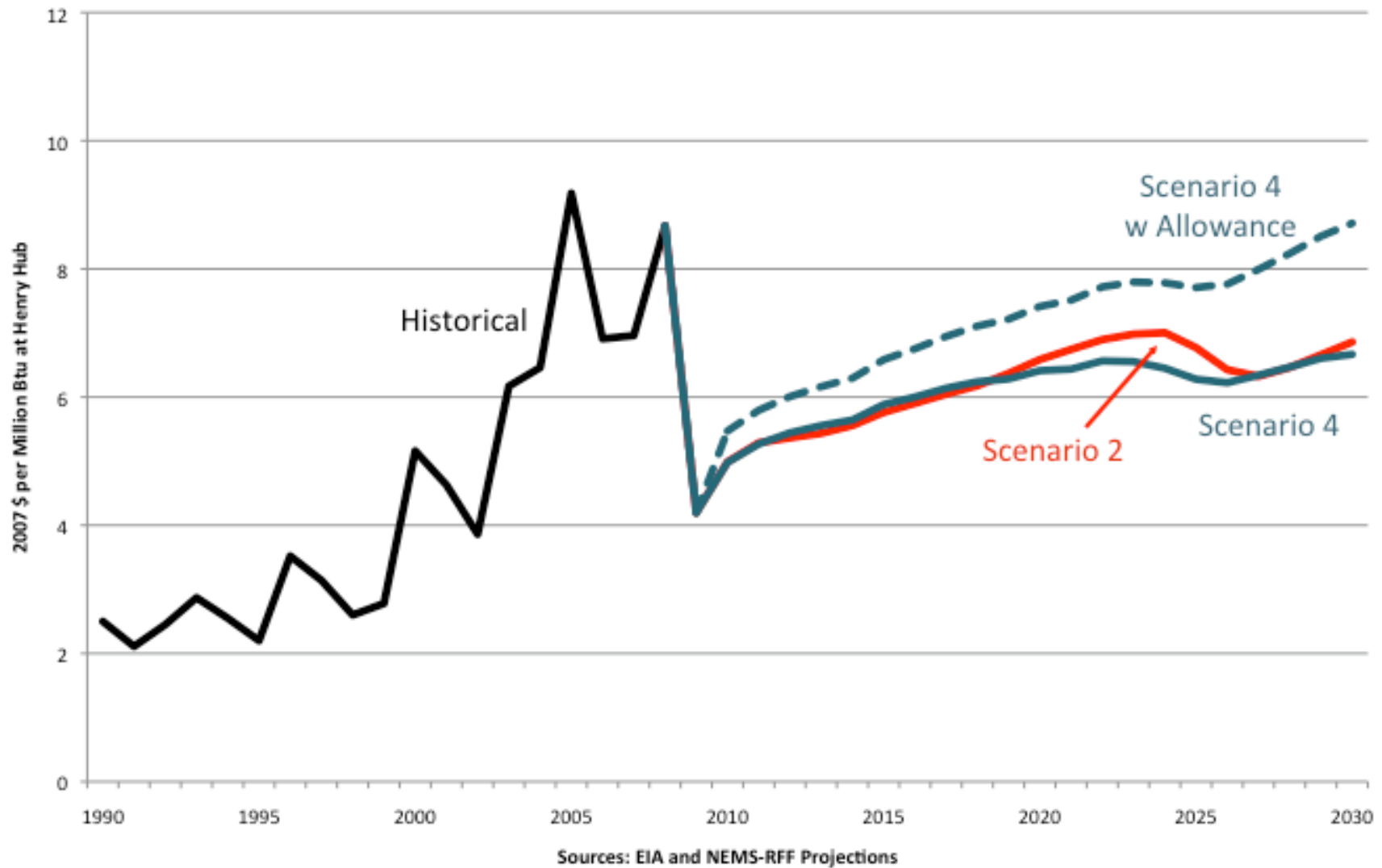
U.S. Natural Gas Prices



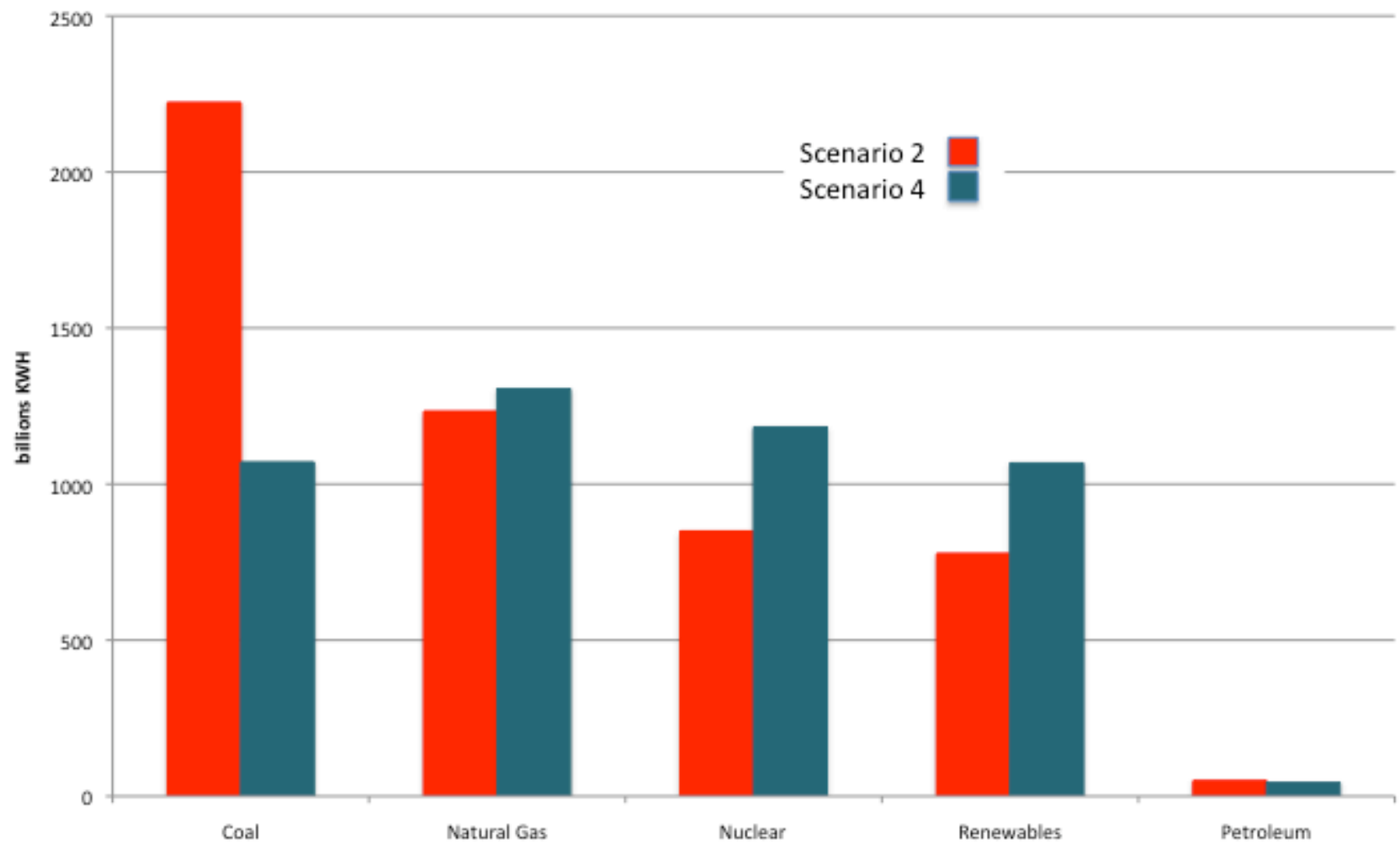
Electric Power Generation by Source, 2030



U.S. Natural Gas Prices



Electric Power Generation by Source, 2030

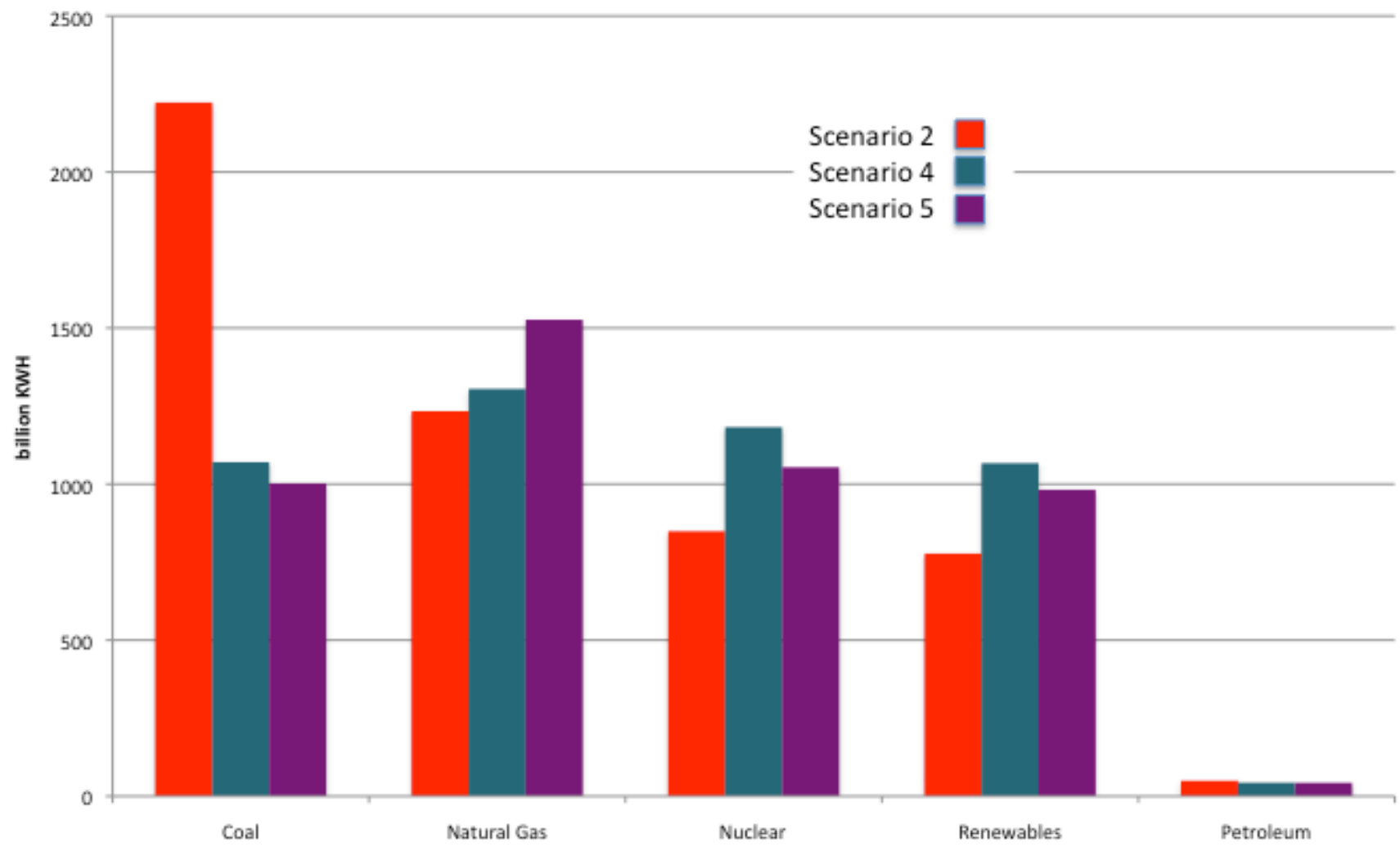


Source: NEMS-RFF

Low-Carbon Policy with More Abundant Natural Gas

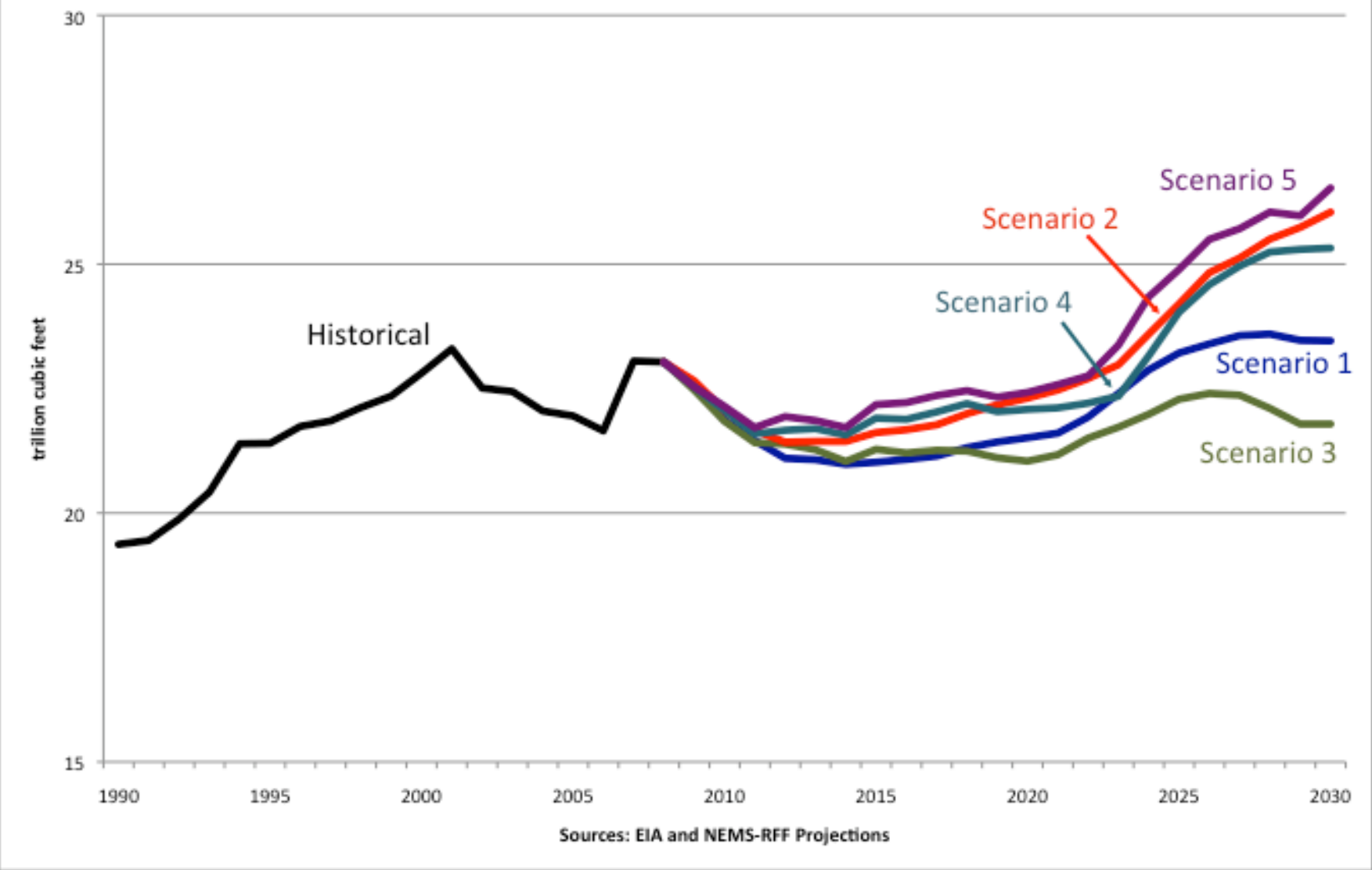
- Natural gas use increased in electric power sector
- Cost of meeting emissions goals reduced
 - Emissions allowance falls about 1 percent
 - PV cost of carbon policy reduced about \$1 billion

Electric Power Generation by Source, 2030



Source: NEMS-RFF Projections

U.S. Natural Gas Consumption



Sources: EIA and NEMS-RFF Projections

Conclusions

- Abundant natural gas can help facilitate a bridge to a low-carbon future
 - Depends on implementation of low carbon policy
- Without abundant natural gas, reducing CO₂ emissions *reduces* natural gas use in electric power sector
- With abundant natural gas, reducing CO₂ emissions *increases* natural gas use in electric power sector
 - Limited nuclear and renewable power further increases natural gas use in electric power sector

