

Long-run Prices for Coal and Natural Gas

BSEC
1 July, 2010

Agenda

1. The Issue

2. Resource Economics 101

3. Coal and Natural Gas

4. Conclusion

References

The Issue and Three Hypothesis

- **Climate policy affects fossil fuel demand via leakage**
- **In markets, this should be represented in prices**

Hypothesis:

- **Evolution of prices for coal and natural gas reacts on shocks in the short run, but long-run prices remain stable**
- **Potential for productivity in coal mining can contribute to stabilize coal prices**
- **Given recent figures from IEA and POLES, ample reserves of coal and gas are available until 2030/2050**

Agenda

1. The Issue

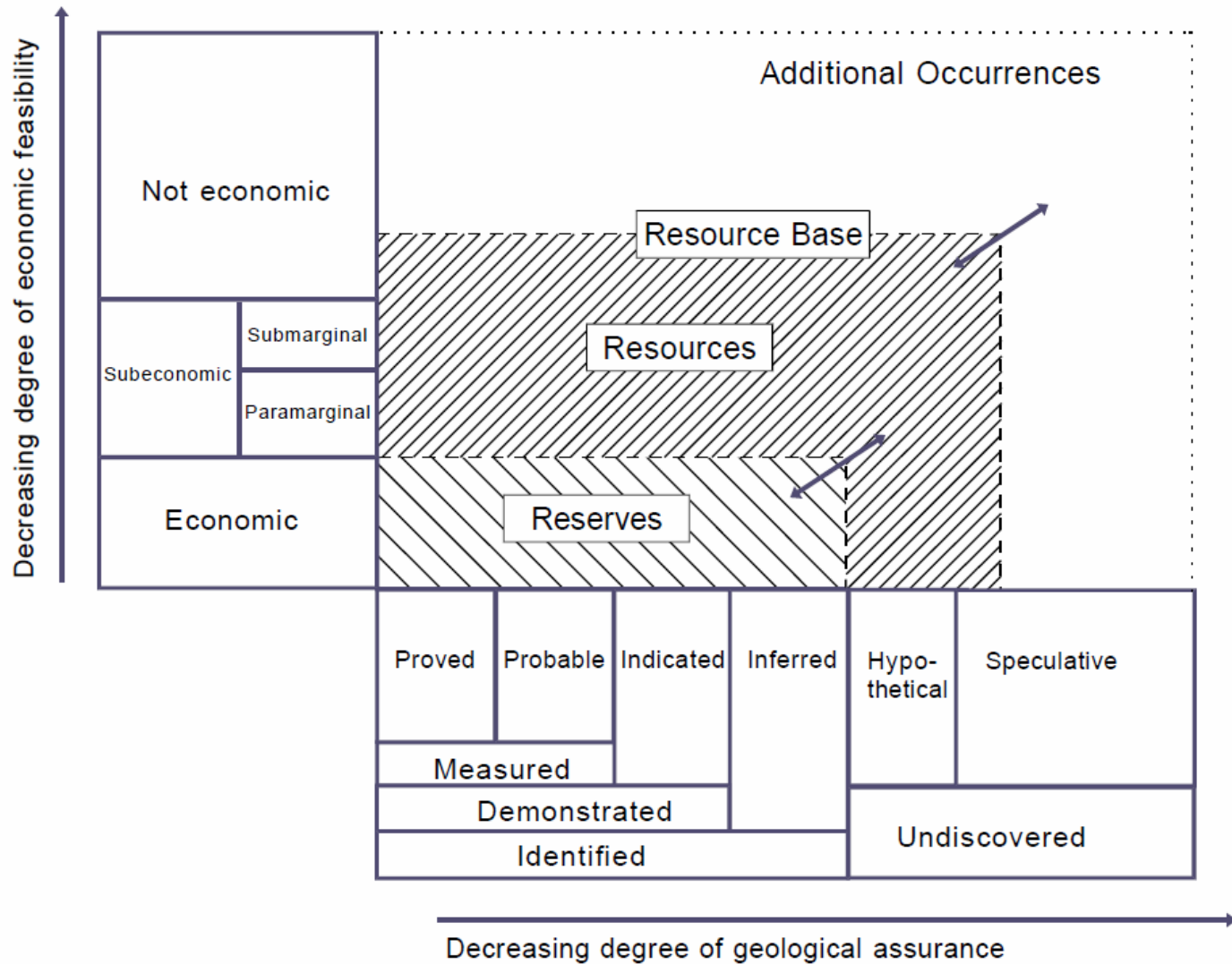
2. Resource Economics 101

3. Coal and Natural Gas

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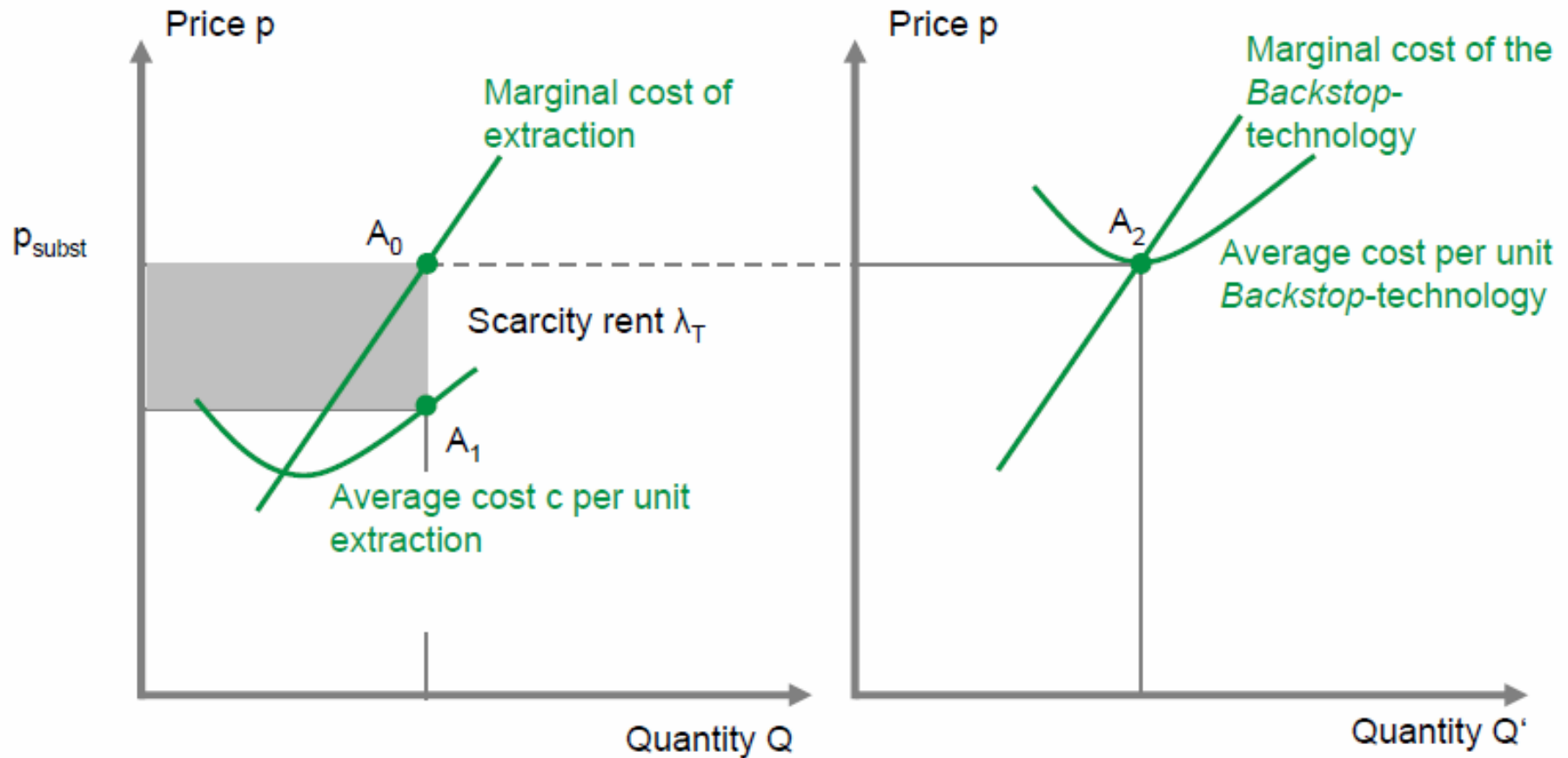
References

Reserves vs. Resources



Source: Rogner, 1997

Backstop Technology = Price Cap on Fossil Fuel Prices



Source: Erdmann, 1995

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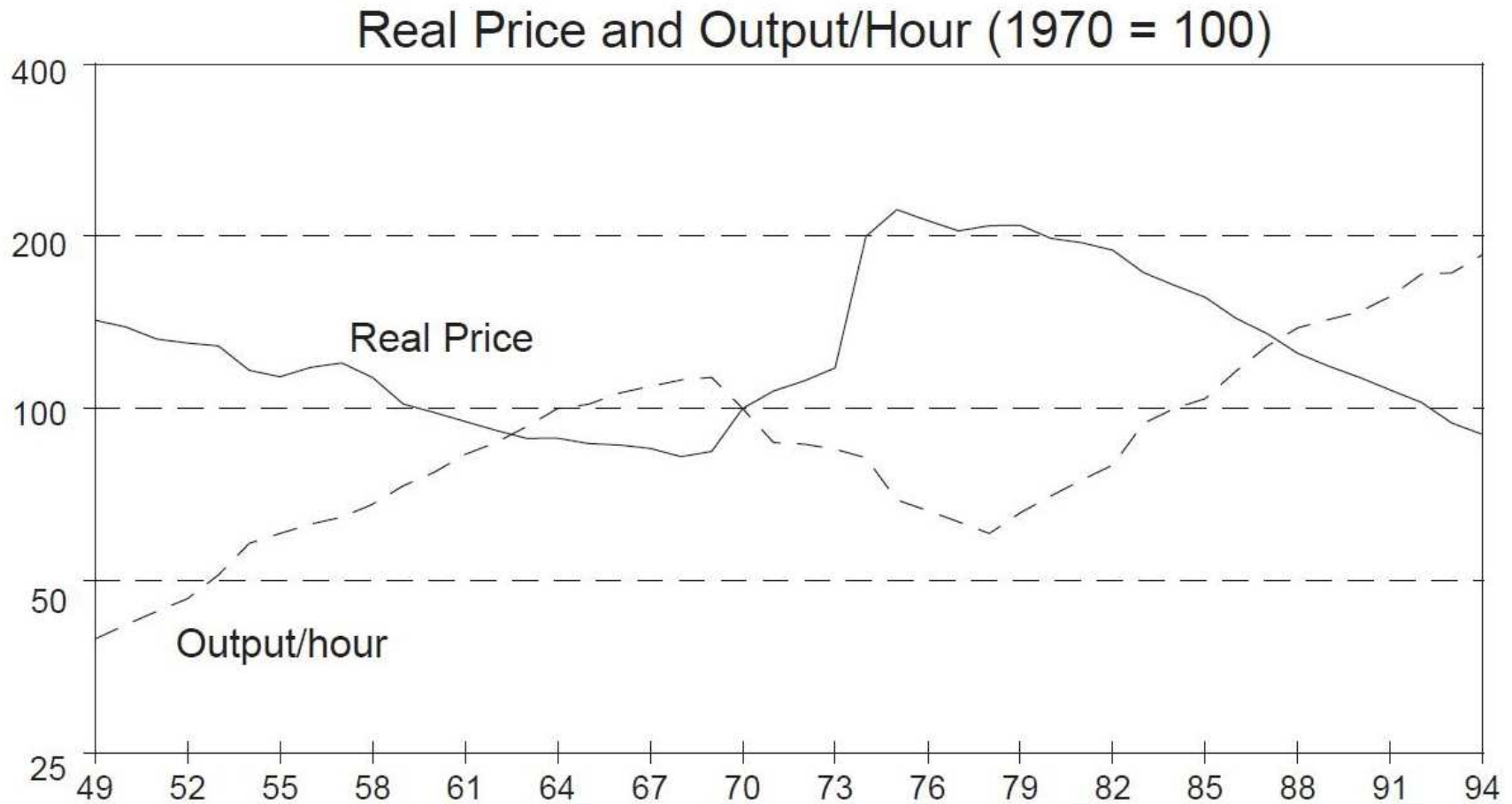
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US Subsurface Mining Productivity (1949 -1994)

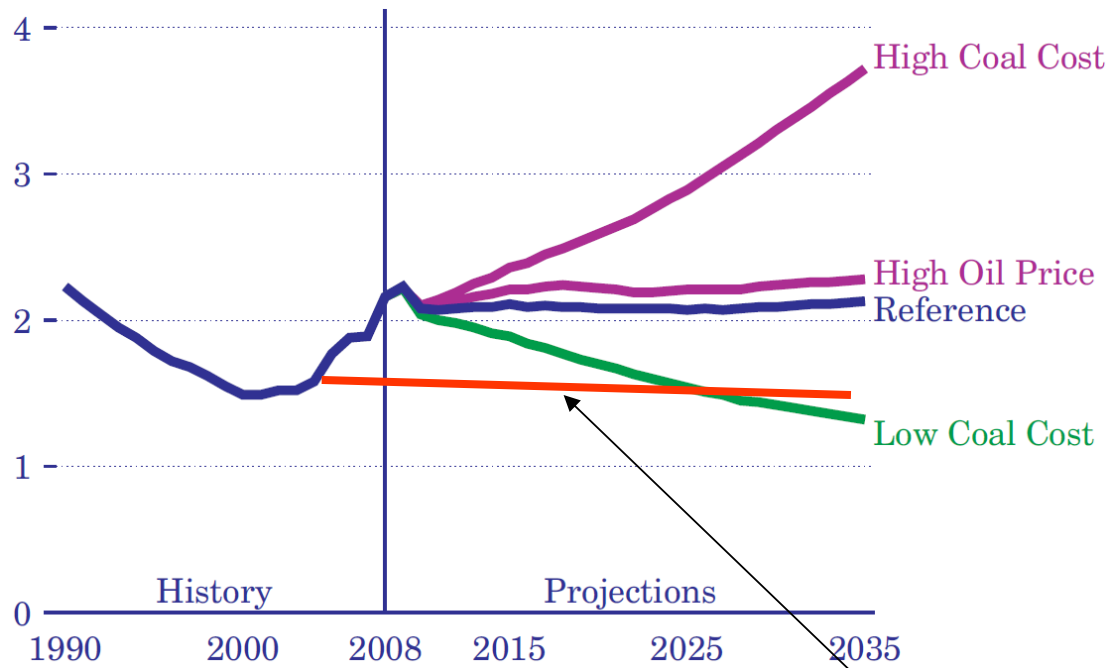


Future rates of technology change and productivity gains are key for future reserve estimation

Source: Prescott (1997)

Forecast Errors in Price Scenarios

Figure 91. Average annual delivered coal prices in four cases, 1990-2035 (2008 dollars per million Btu)

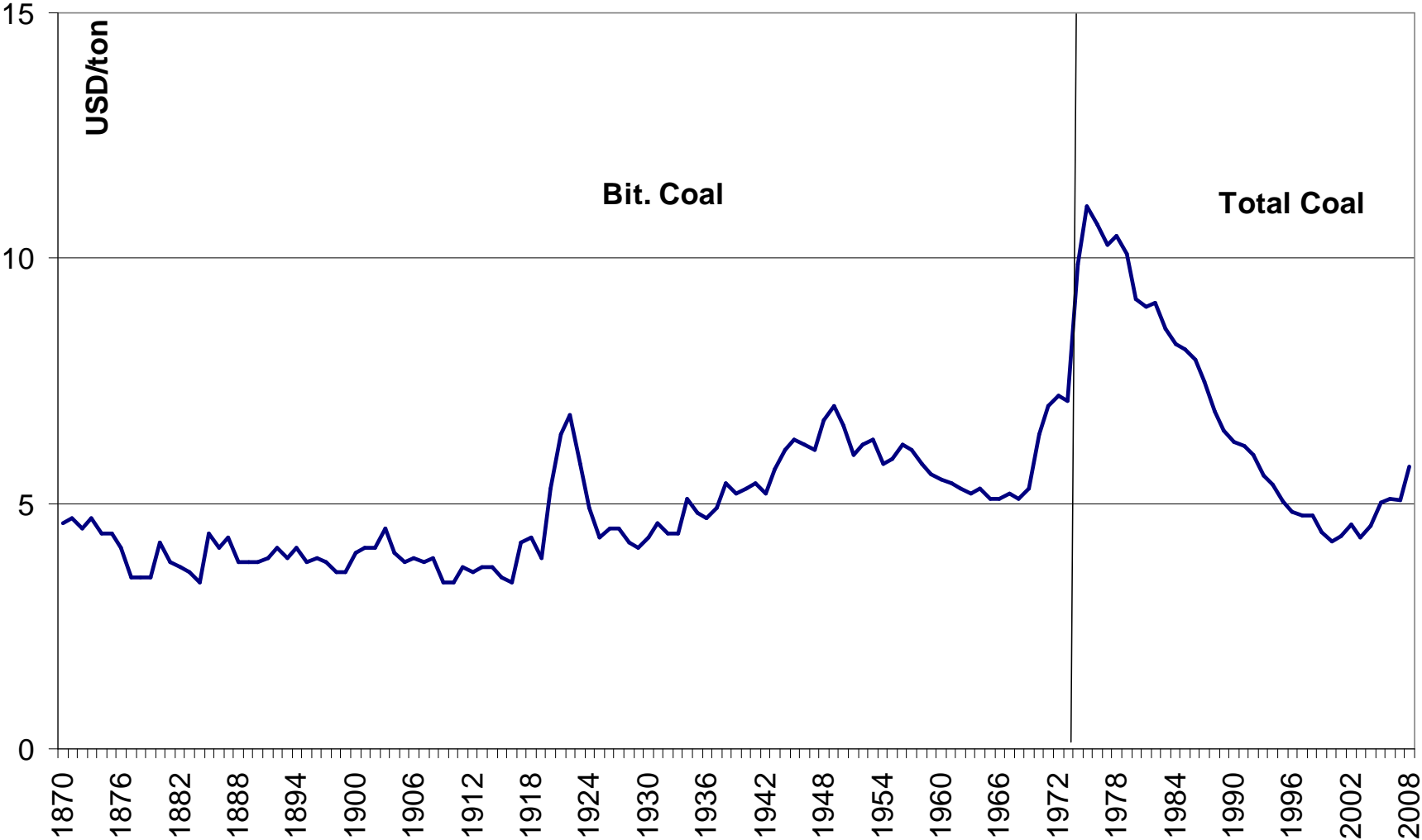


- High coal cost path obtained through different assumptions on productivity, labor and equipment costs.
- This in turn drives a scenario where there is a switch from coal to gas and a drop in coal consumption.
- Is this an example of a dangerous kind of wishful thinking when projecting future fossil fuel costs for climate scenarios?

2004 projection

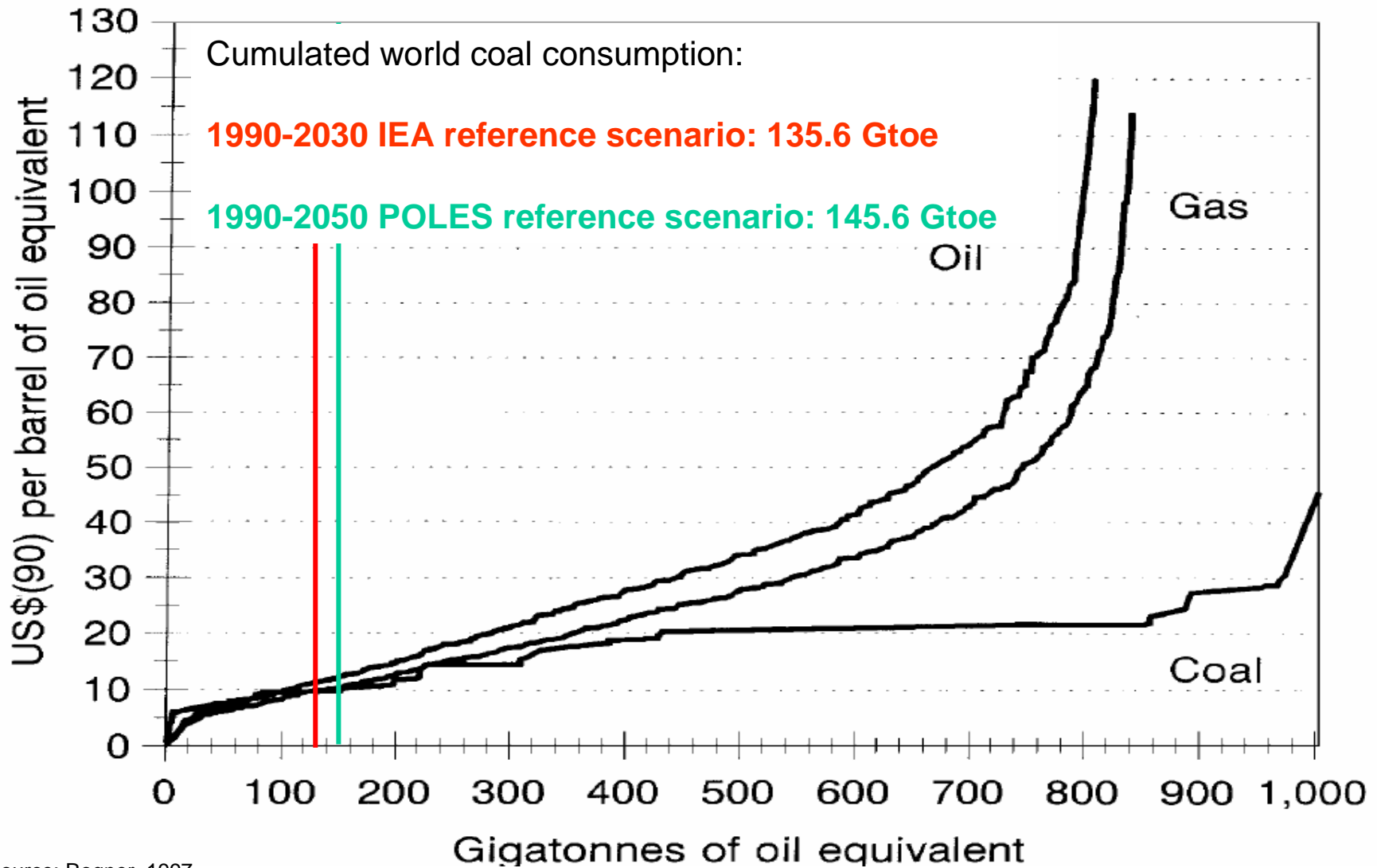
Source: EIA, Annual Energy Outlook 2010

Very Long-term Coal Prices (USA, 1870-2008)



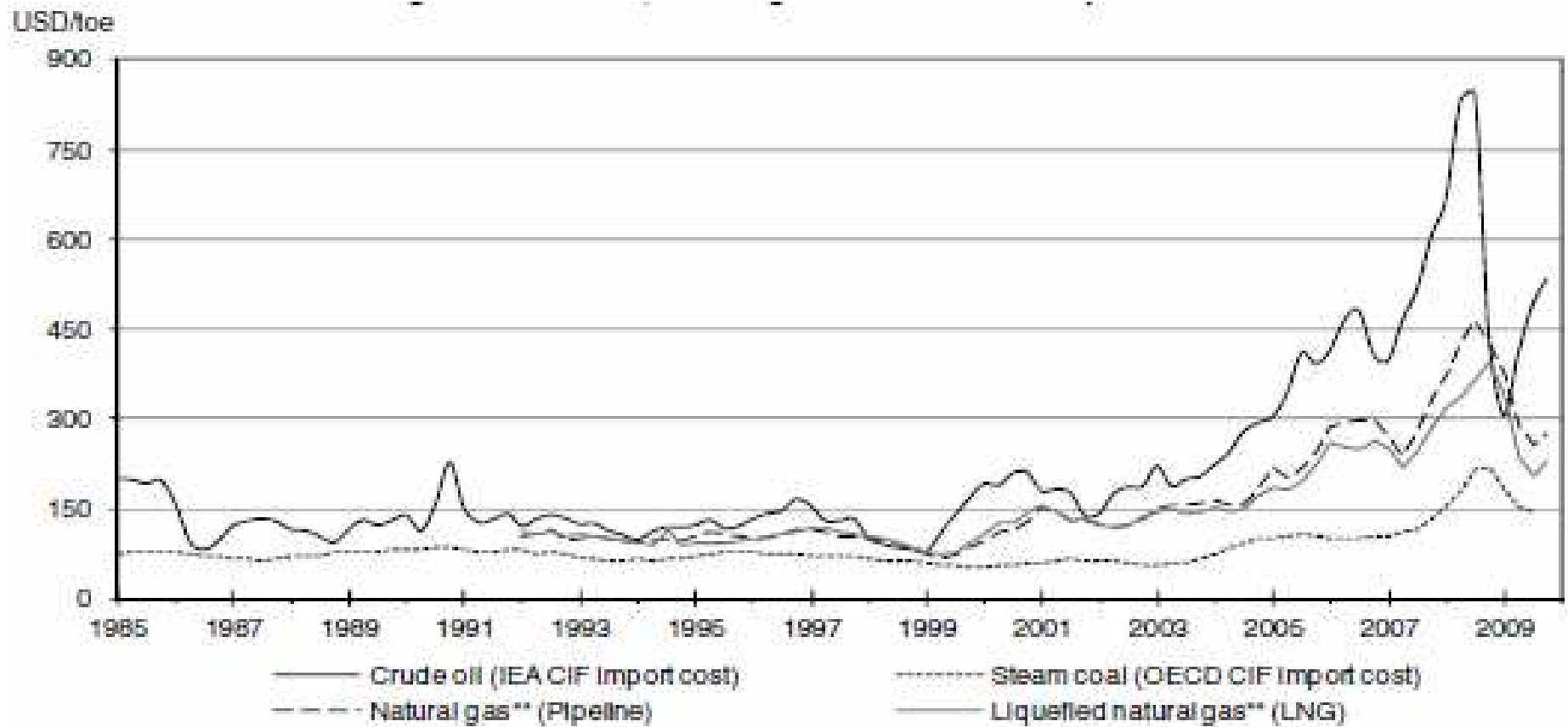
Source: Manthy, 1978 and EIA, 2010

Coal: Ample Supply at Reasonable Cost



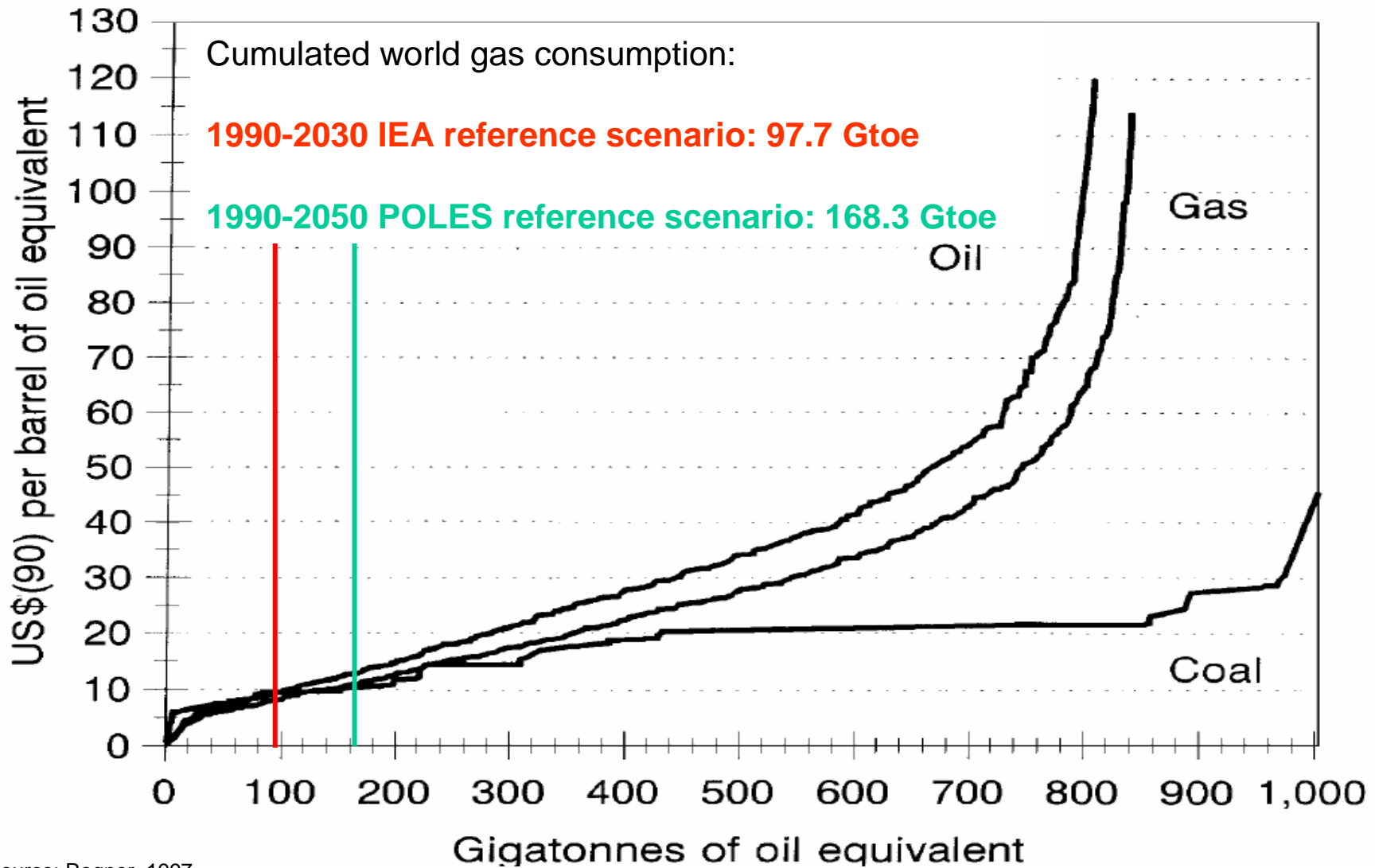
Source: Rogner, 1997

Crude Oil, Natural Gas and Steam Coal Import Costs 1985-2010



Source: IEA, 2010

Gas: Ample Supply at Reasonable Cost



Source: Rogner, 1997

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Conclusions

- Evolution of prices for coal and natural gas stable in the long-run
- Potential for productivity in coal mining will stabilize coal prices
- Ample supplies of coal and natural gas at reasonable prices are available until 2030/2050



Thank you.