CEE CENTER FOR ENERGY ECONOMICS

Bureau of Economic Geology, The University of Texas at Austin



Beyond the Science AND Economics: The Politics of Global Energy

Dr. Michelle Michot Foss, AAPG 2007

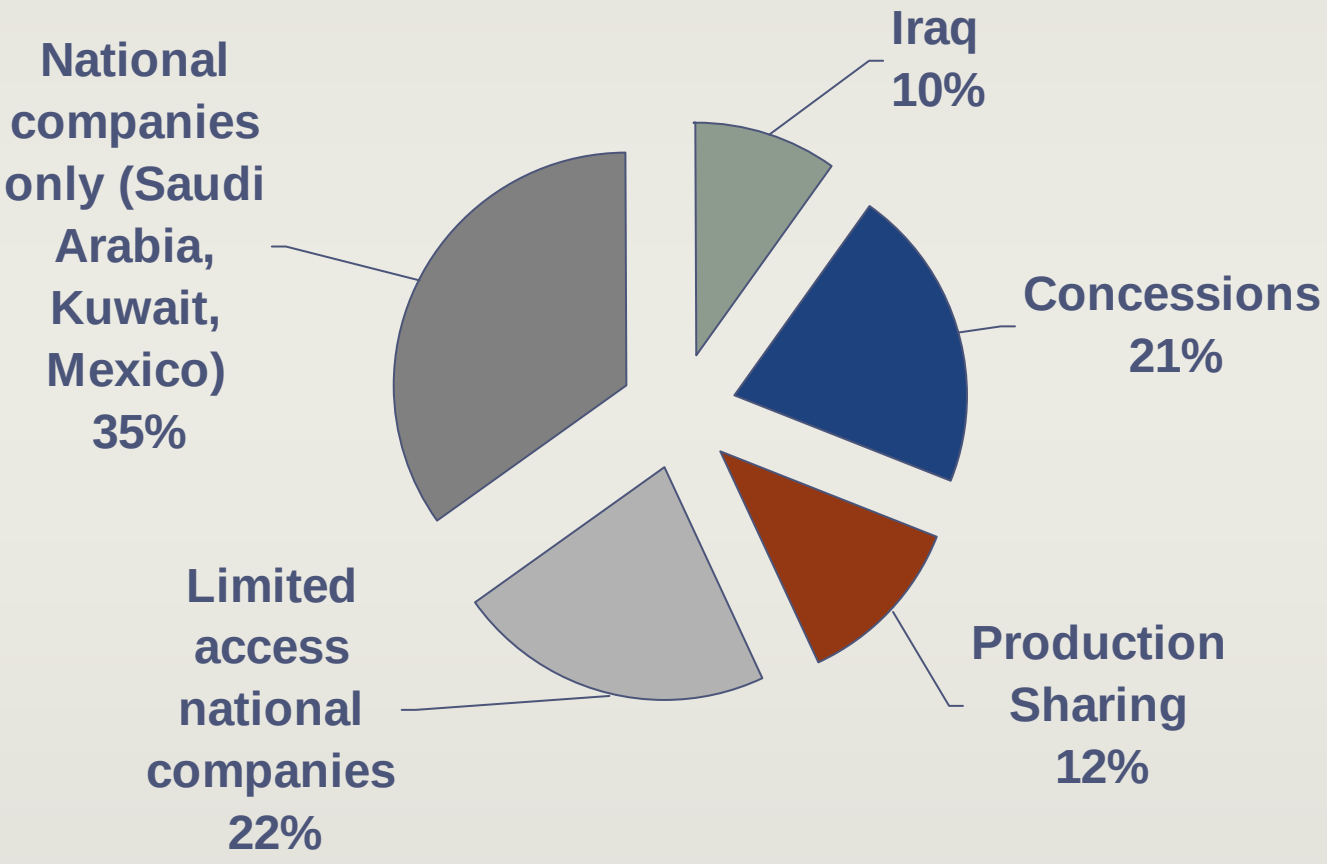
Does Economics Matter?

- People are "profit maximizers"
  - Our calculus is complex, group outcomes may deviate
- People respond to price signals
  - We change the amount *and* kinds of things we demand
- Competition makes a difference
  - As do private transactions costs, frameworks, property rights
- Perception of risk – emotion trumps reason
  - Loss aversion ("losses loom larger than gains")
- Negative information has big impact
- Youngest, oldest more susceptible to new information

Persistent Energy Dilemmas

- Access (resources, infrastructure)
- Energy supply and delivery (pricing and price signals)
- Reliability at what cost? (capacity, storage)
- Risk mitigation (safety, security, acceptance)
- Entry of new technology (timing)
- Environmental protection (future generations)
- Economic, social benefits ("all politics is local")

Access, Competition

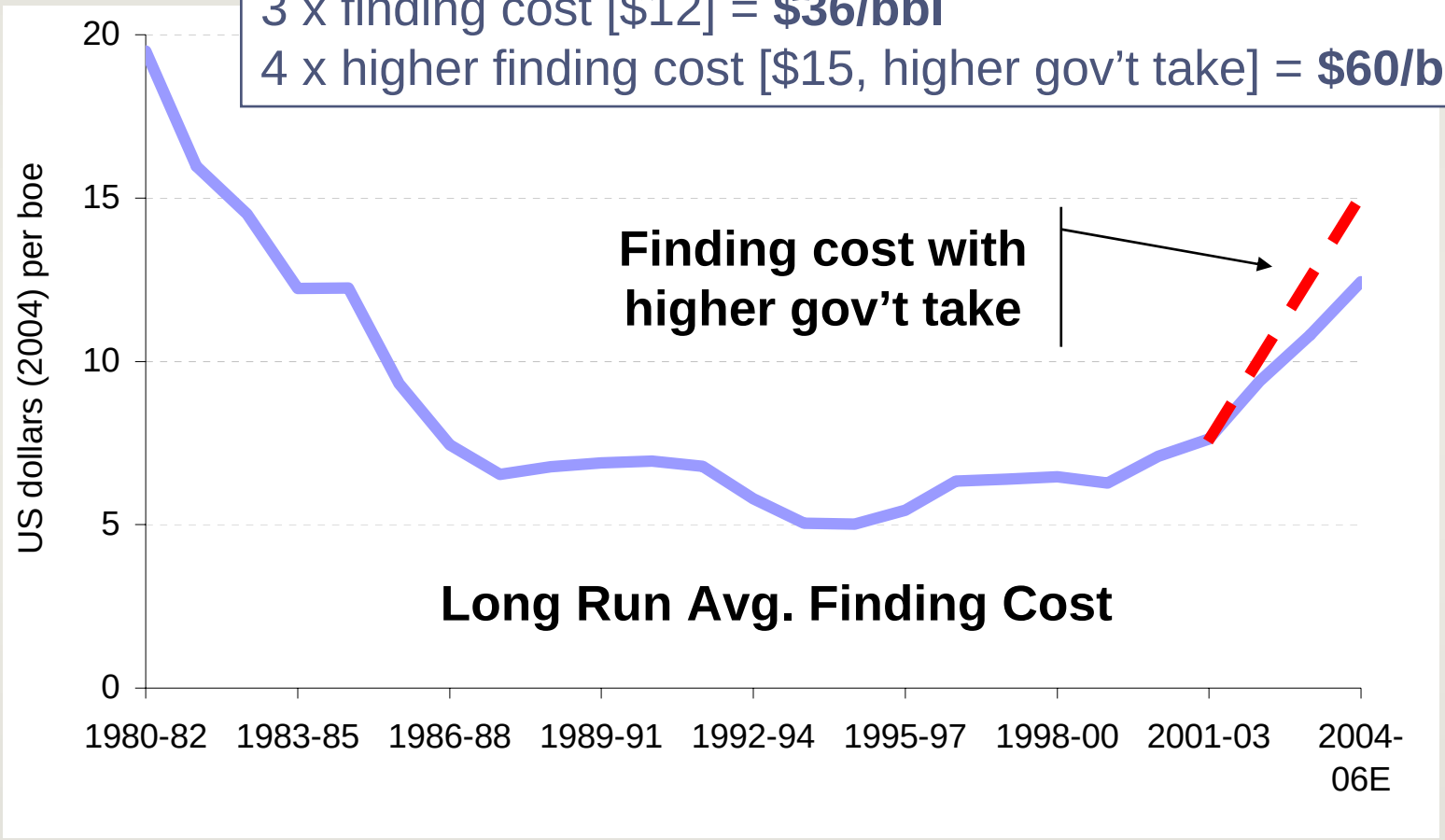


Competition and Performance

Country	Mexico	Brazil	Norway	China
Country Prod. MMBOE	**1,620**	**699**	**1,575**	**1,639**
NOC Production as % of Total	**99%**	**96%**	**55%**	**92%**
Total Sector Contribution, $MM	**55,156**	**14,418**	**44,559**	**22,886**
Total Sector Contribution, $/BOE Production	**34.05**	**20.62**	**28.28**	**13.96**

Pricing

3 x finding cost [$12] = **$36/bbl**
4 x higher finding cost [$15, higher gov't take] = **$60/bl**



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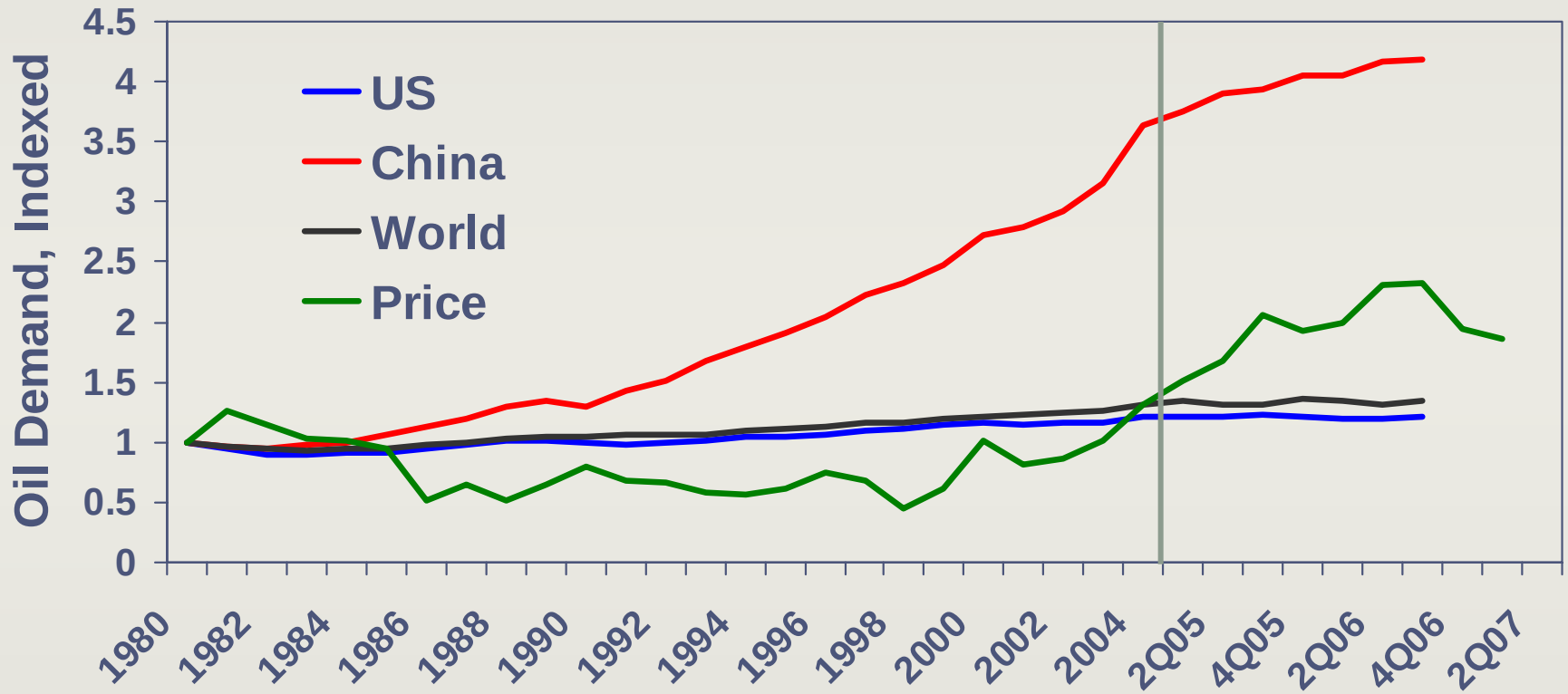
Source: DB Global Markets Research, 2006

Price Signals and Demand



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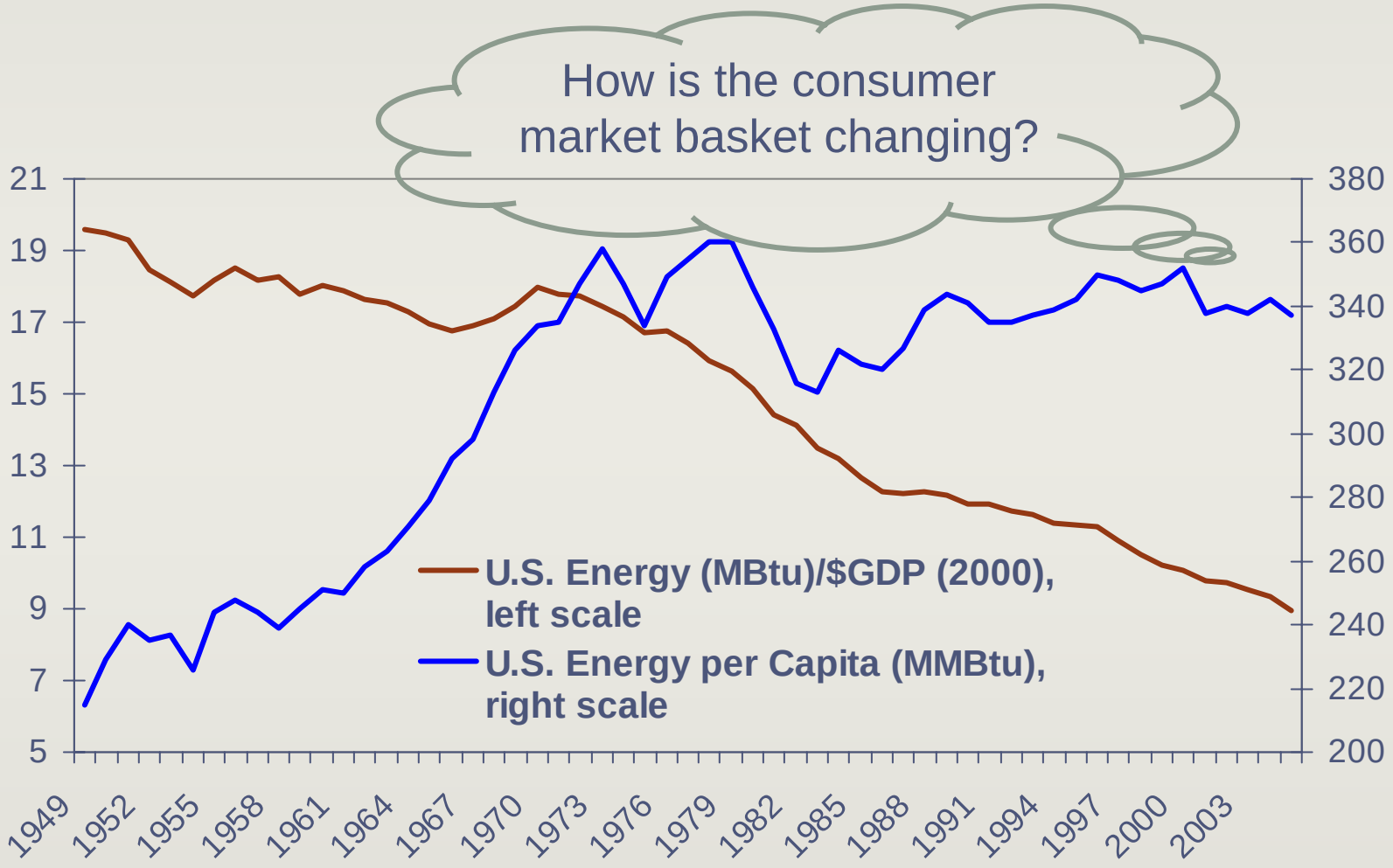
Source: U.S. EIA

Changing the Quantity Demanded



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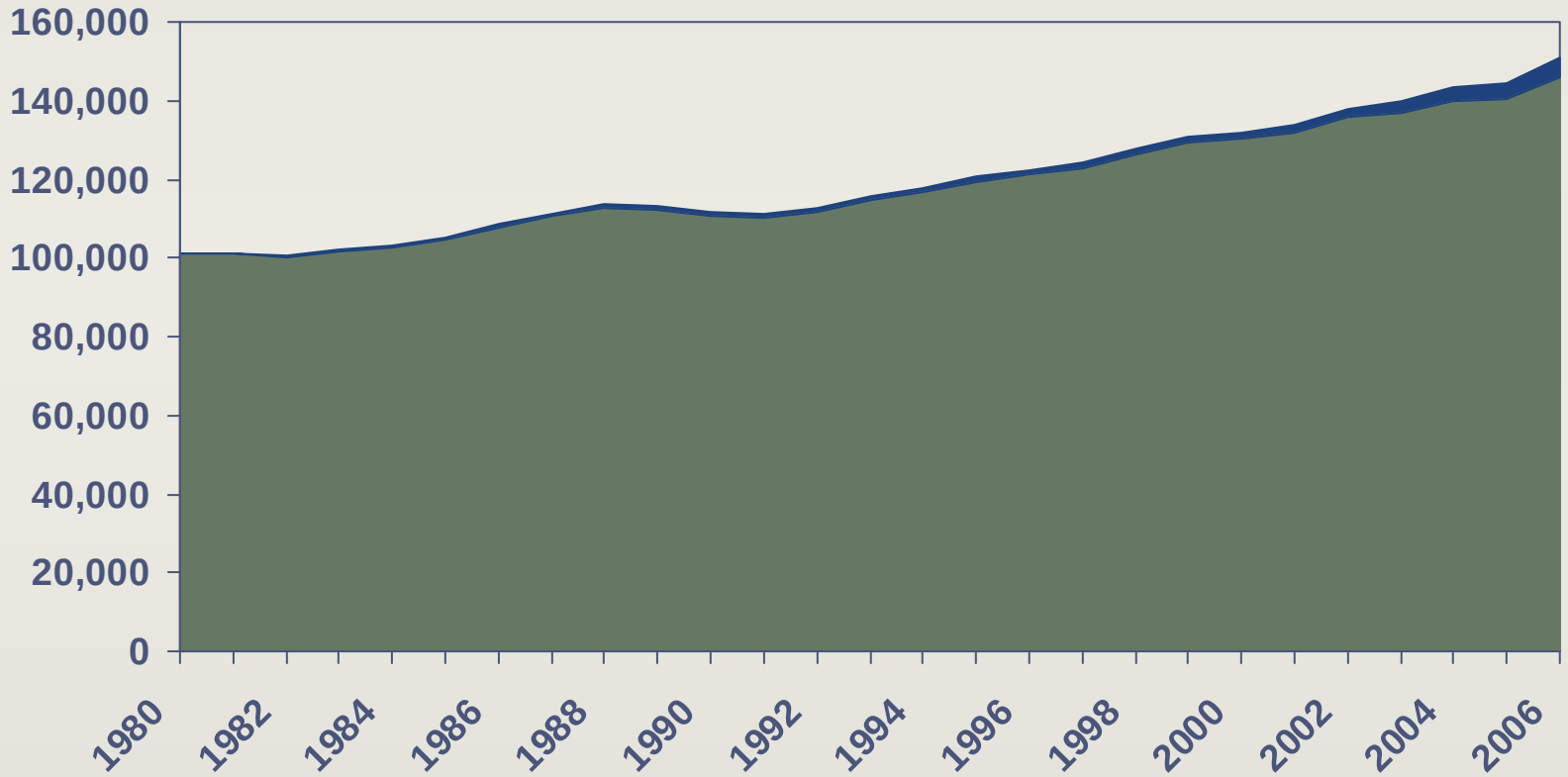
Sources: U.S. EIA

Changing What We Demand, Introducing Competition



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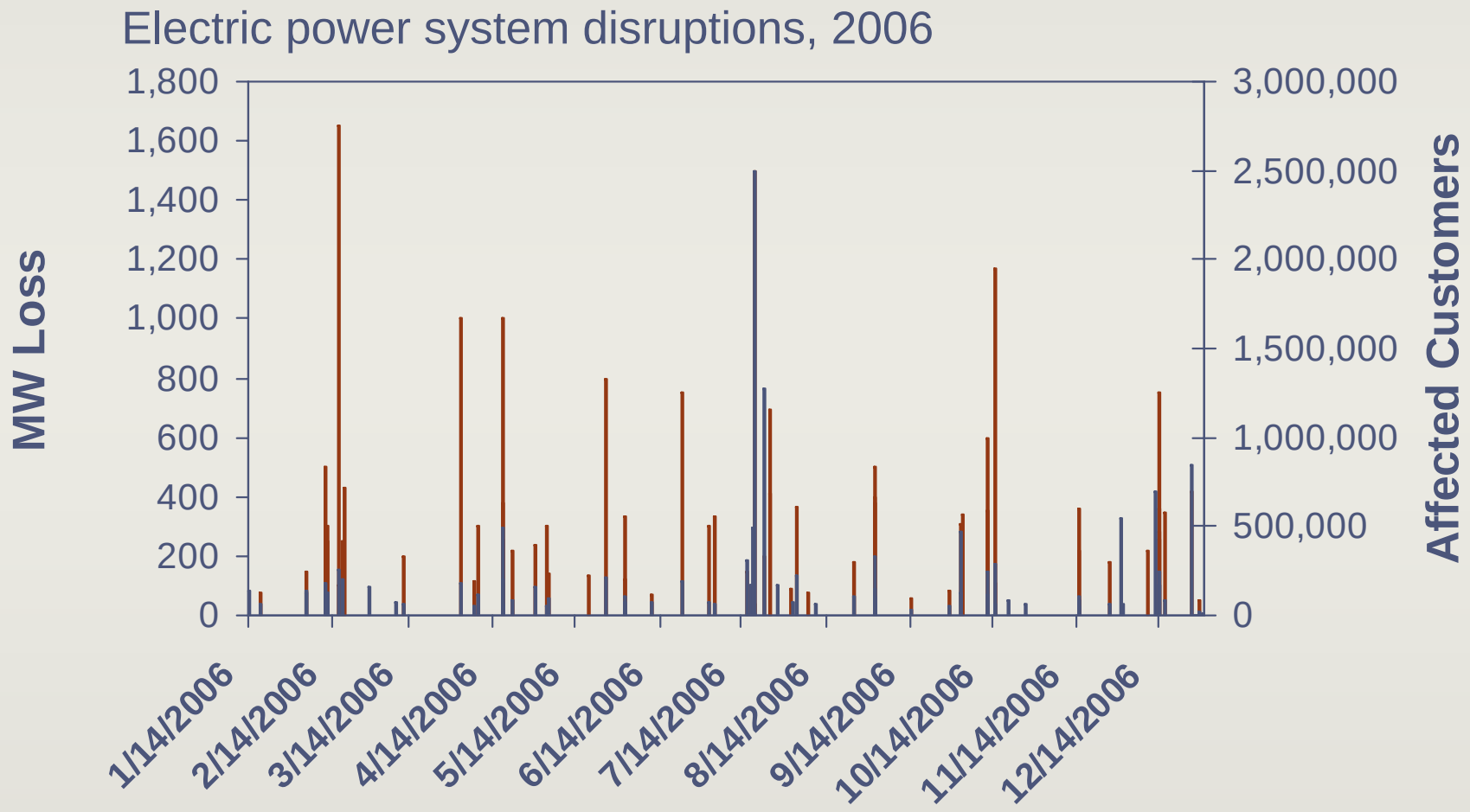
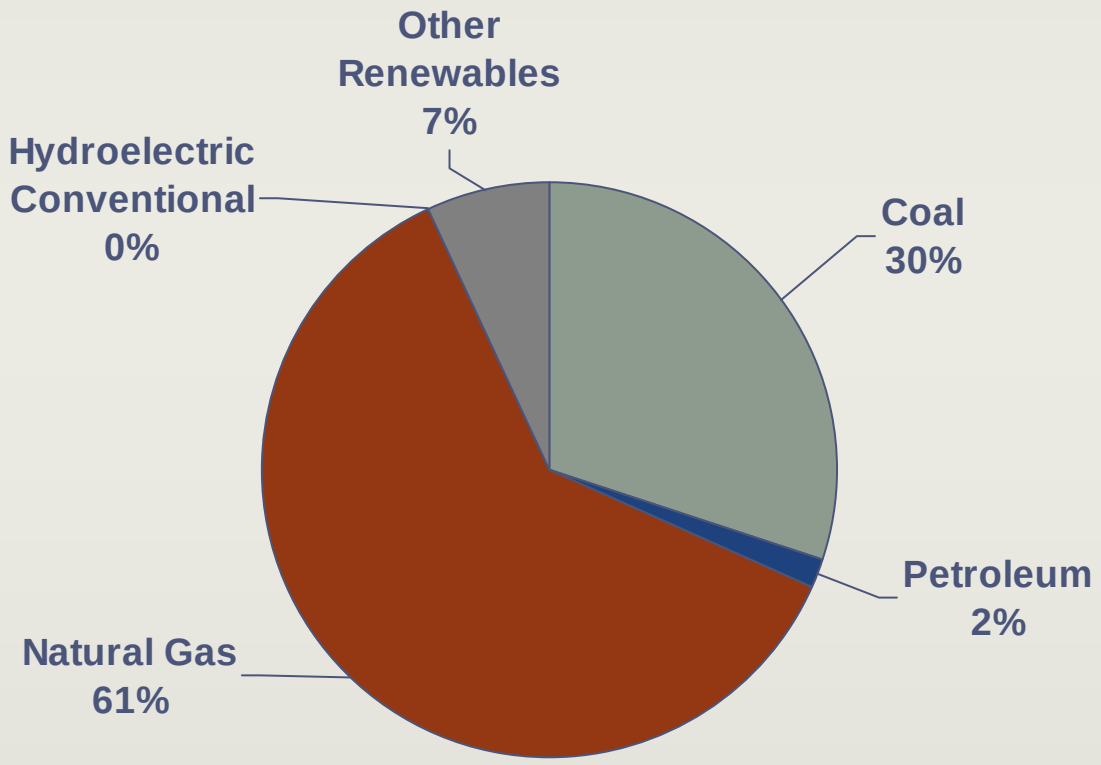
Sources: U.S. EIA, Renewable Fuels Assoc.

Reliability

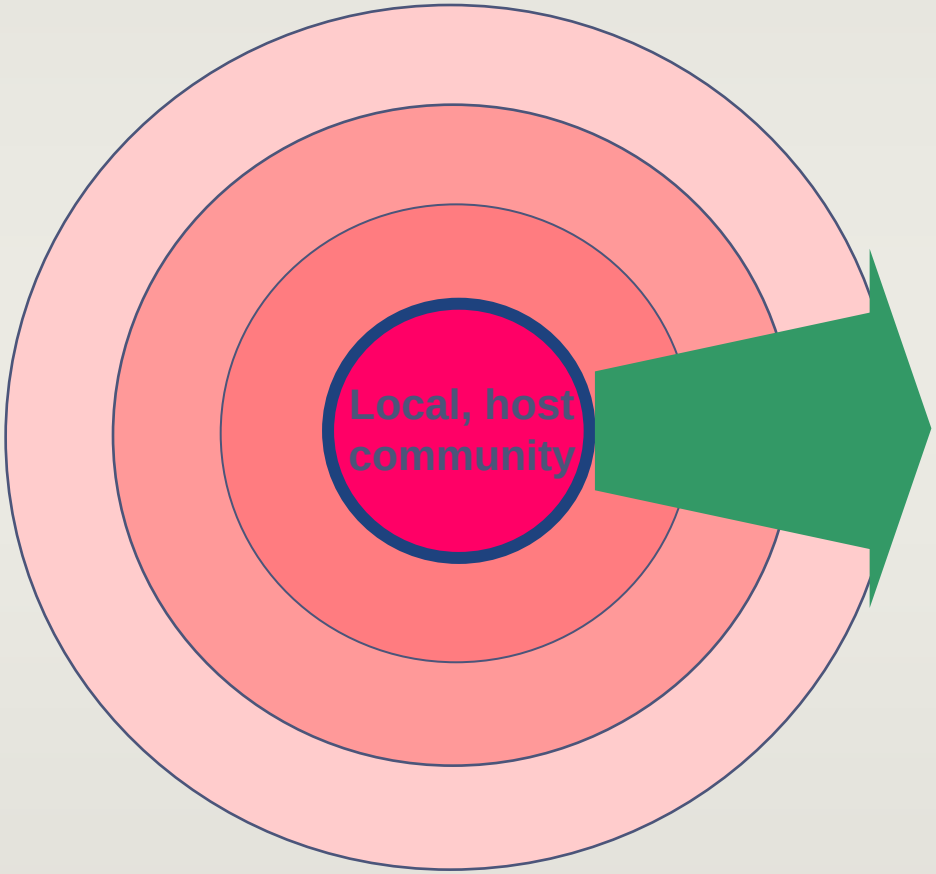


Reliability, Capacity, Implied Storage

Planned nameplate additions, 2006-2010, 94 GW (shares do not add to 100% because of omitted categories)



Mitigating Risk, Finding Local Benefits So That We Can Build



Costs are perceived to be concentrated at the local site and local host community

Benefits of the project are spread across a larger area; local host community may not perceive sufficient benefits to support project

Result: Perception of imbalance; "environmental justice" issue

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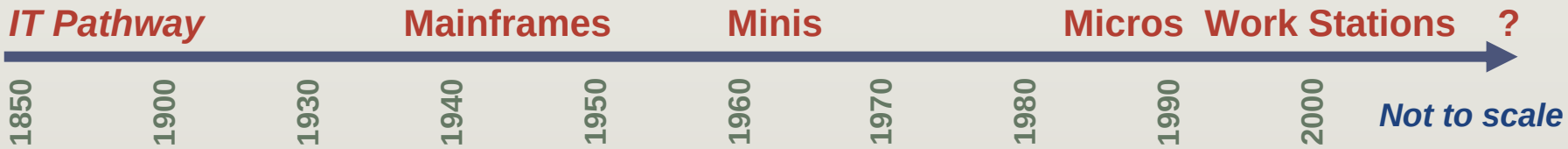
Impact of Technology – Deferring Declines

Oil & Gas Technology Pathway

- *Hydrates? GTL?*
- *Offshore below **10,000ft***
- *4-d seismic, offshore below **5,000ft***
- *3-d seismic, horizontal drilling, measurement while drilling, offshore below **1,000ft***
- *Pipeline trenching and welding, compression, pressure control, metering; national grid develops*
- *Directional drilling, offshore below **250ft** water depth*
- *Long-line pipeline transmission*
- *Advances in drilling, early seismic, **shallow** offshore E&P*
- *Oil discovered at Spindletop (Texas), 1901*
- *Oil discovered in Titusville, Pennsylvania, 1859; natural gas replaces town gas, 1870s*



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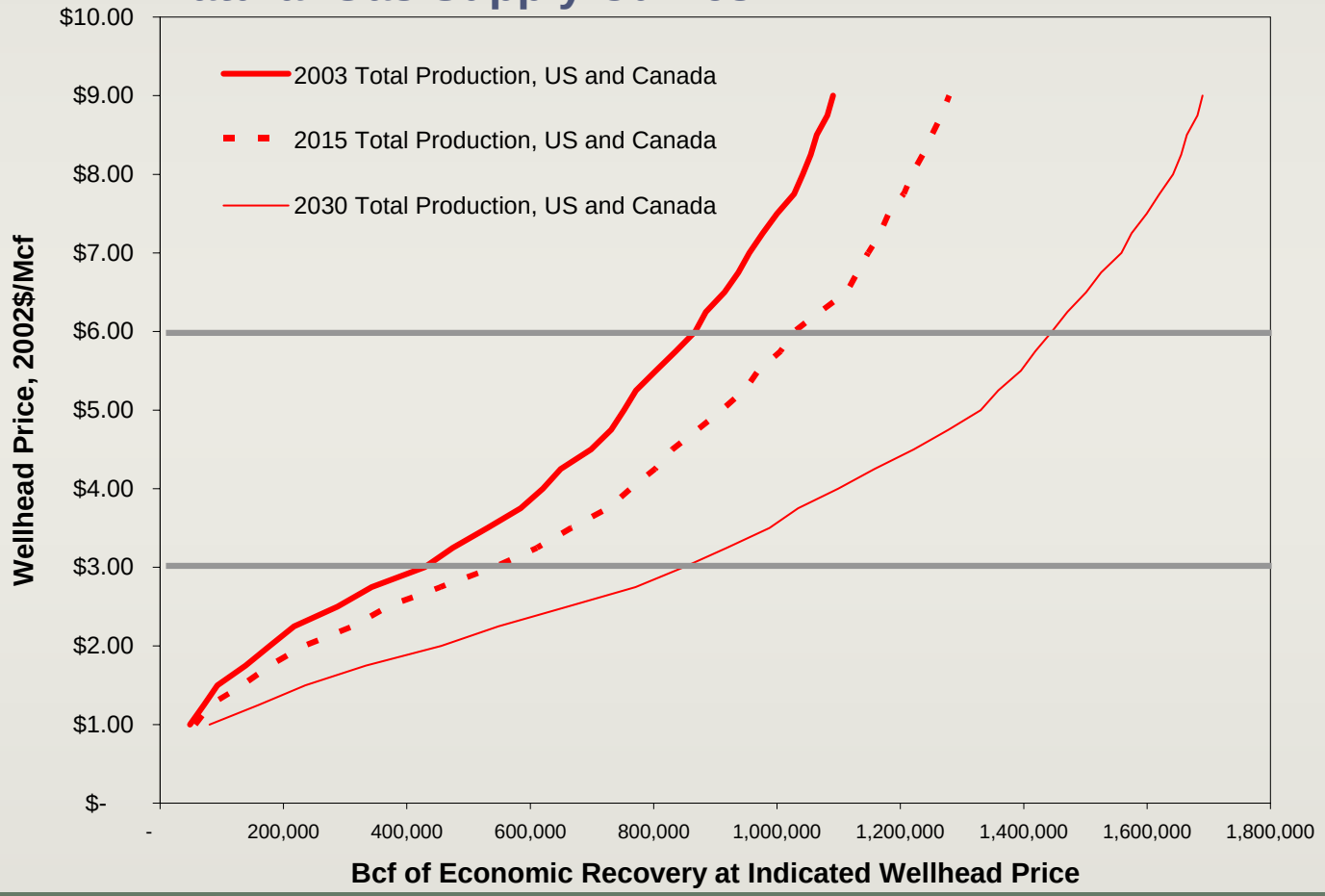
Sources: U.S. EIA, various industry and trade publications

Timing of Technology

Natural Gas Supply Curves



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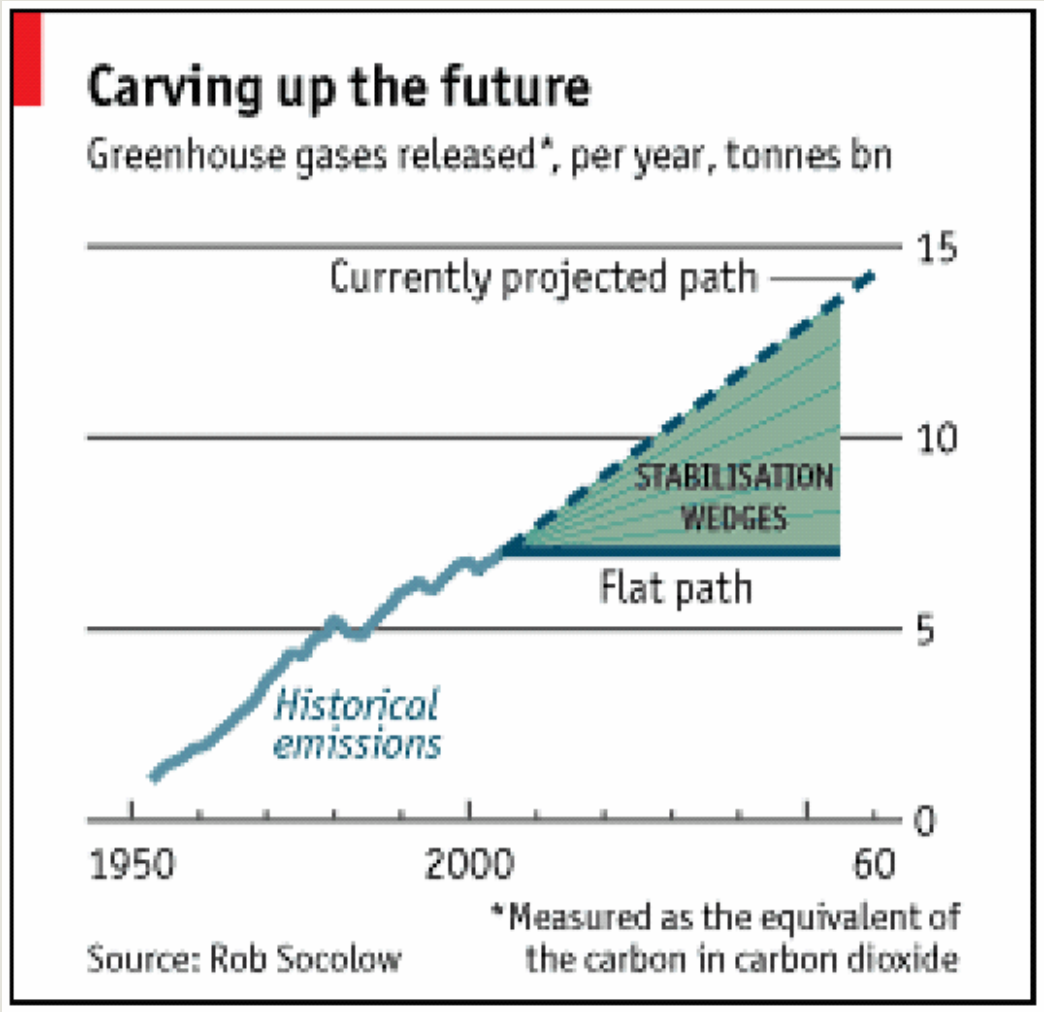
Sources: NPC, 2003

Climate, Future Generations, Uncertainty, and Value from Waiting

Each wedge reduction represents a more rigorous deployment of capital and technology to achieve additional reductions



What Does This Mean for You?

- Supply, demand, price, risk, uncertainty, timing are business variables
- Strategic economic thinking provides clues to underlying trends, ripple effects in the political realm ("policy")
  - Demand, "market basket" restructuring
  - Oil market "contestability" from biofuels
  - Natural gas for electricity reliability
  - Socio-environment and the status quo