

Energy and American Society— Thirteen Myths

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Preview of the presentation

- What is this book *really* about? (the 13 Energy Myths)
- Exploring one myth (on renewable energy) in greater detail
- Implications for energy analysts and for energy modeling

What is this book *really* about?

Energy and American Society—Thirteen Myths (edited by B.K. Sovacool and M.A. Brown) (New York: Springer Press), xi + 340 pp. (Hardback edition, forthcoming 2007, Paperback late 2007/early 2008)

- Recent energy crises demand innovative approaches
- This book takes on a central quandary in the study of energy and environmental policy: What myths persist in American culture concerning energy?
- This book enrolls twenty-four of the nation's top experts



electric power,
renewable energy,
energy efficiency,
transportation, and
climate change.



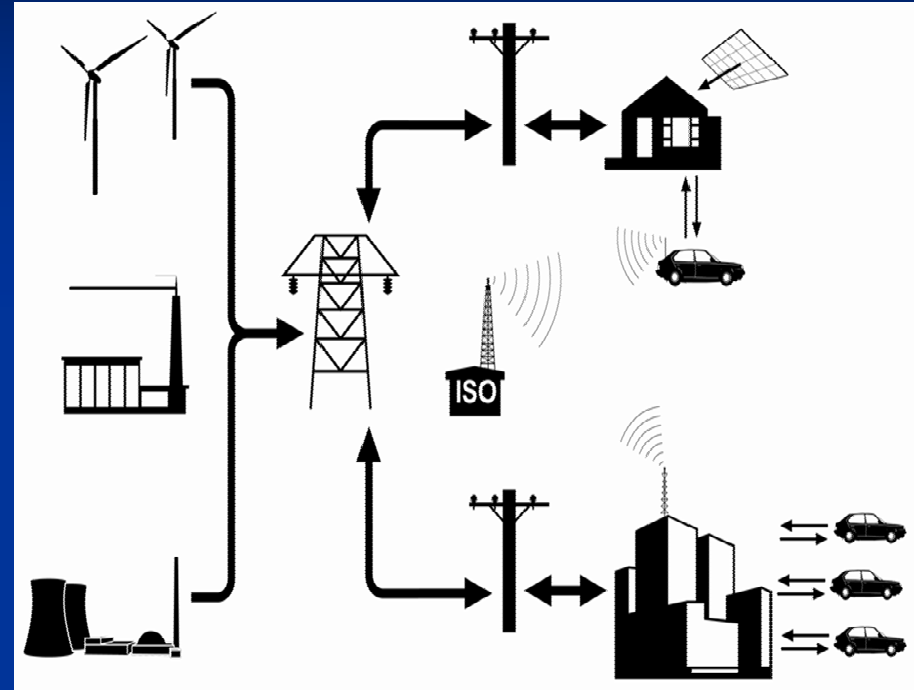
Two Cross-Cutting Energy Myths

- **Today's Energy Crisis is "Hype"**
by Marilyn A. Brown
- **The Public is Well Informed about Energy**
by Rosalyn McKeown



“Oil Security” – Three Energy Myths

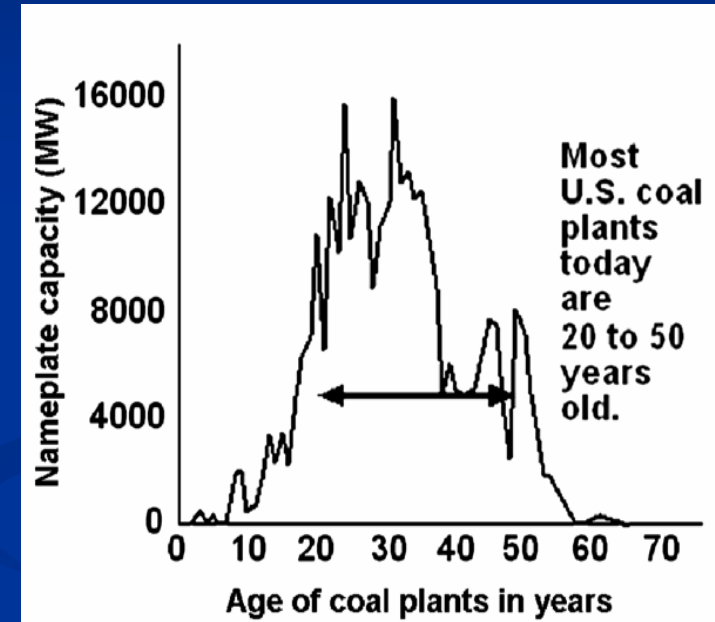
- **There’s Not Enough Land to Feed and Fuel the Nation**
by Lee R. Lynd et al.
- **The Hydrogen Economy is a Panacea**
by Joseph Romm
- **Price Signals are Insufficient**
by Jerry Taylor and Peter Van Doren



The direction of power flows with plug-in hybrid electric vehicles

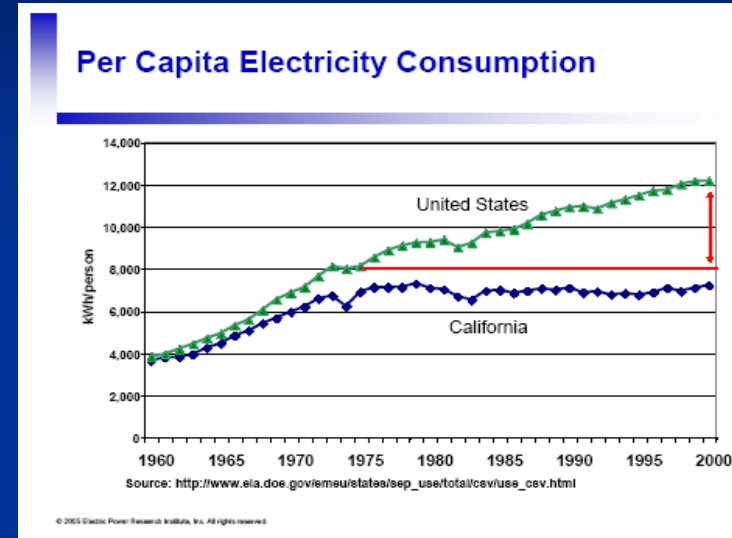
“Electricity Reliability” – Three Energy Myths

- **The Barriers to New and Innovative Energy Technologies are Primarily Technical**
by Benjamin Sovacool and Richard Hirsh
- **Renewable Energy Systems Could Never Meet Growing Electricity Demand in America**
by Rodney Sobin
- **Power Systems are Economically and Environmentally Optimal**
by Tom Casten and Robert Ayres



“Energy Efficiency” – Three Energy Myths

- **Energy Efficiency Improvements Have Already Maximized Their Potential**
by Amory Lovins
- **Energy Efficiency Measures are Unreliable, Unpredictable, and Unenforceable**
by Ed Vine, Marty Kushler, and Dan York
- **Energy R&D Investment Takes Decades to Reach the Market**
by Dan Kammen and Greg Nemet



“Environmental Quality” – Two Energy Myths

- Climate Policy Will bankrupt the U.S. Economy
by Eileen Claussen and Janet Peace
- Developing Countries are Not Doing Their Part in Responding to Climate Change
by Tom Wilbanks

Exploring one Myth in greater detail: the impediments to RET/DG

- Given a host of energy problems, renewable energy technologies seem to have great promise
 - Climate change and externalities
 - Energy insecurity
 - Rising energy prices
 - Dependence on foreign supplies of fuel
 - Reliability and modularity

One would think RETs would be used more. Consider price:

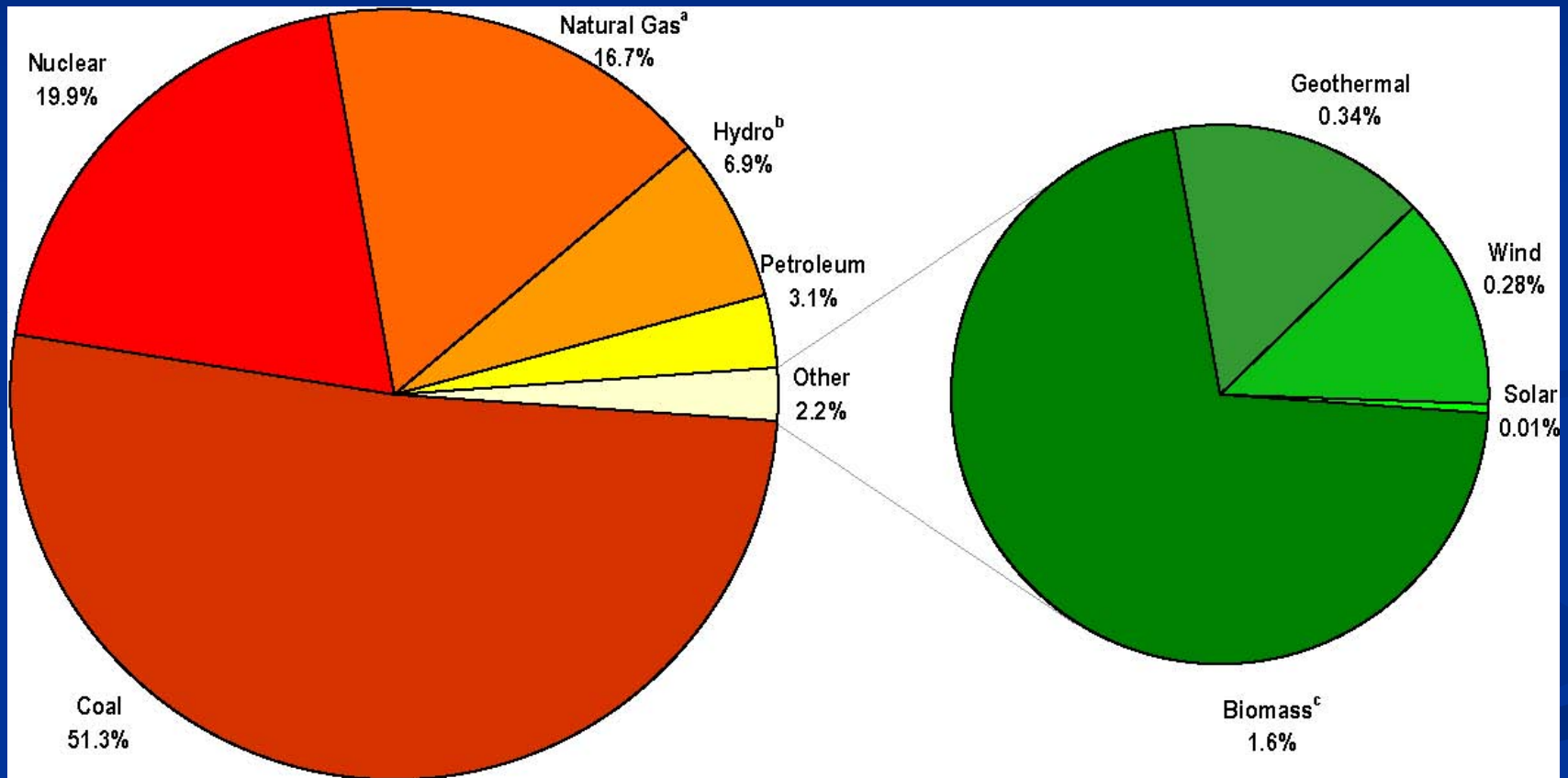
Levelized Cost of Electricity (LCOE) for Fossil, Nuclear, and Renewable Technologies

Technology	LCOE, in 2005 \$/kWh
Wind	\$.028
MSW-Landfill Gas	\$.030
Advanced Nuclear	\$.035
Scrubbed Coal	\$.044
Integrated Gasification Combined Cycle (IGCC)	\$.044
Advanced Combined Cycle Gas/Oil	\$.047
Conventional Combined Cycle (CC) Gas/Oil	\$.050
Biomass	\$.050
IGCC with Carbon Sequestration	\$.059
Advanced Combustion Turbine	\$.067
Advanced CC with Carbon Sequestration	\$.069
Conventional Combustion Turbine	\$.077
Solar, PV (30%)	\$.235
Solar, PV (10%)	\$.310

Source: Karmis et al 2004.
Assumptions:
Prices are in real (inflation adjusted) LCOE with federal tax credits, and assume high capacity factors. LCOE costs include fixed overnight construction costs, variable operations and maintenance charges, and fuel prices.

The paradox: if RETs are so wonderful, why aren't they used more?

U.S. EIA estimate of electricity consumption by fuel source, in 2003 kWh



One possible response: It's the technology

- One answer is that the technology doesn't work, like "going to the moon with 1950s technology."
- Complements a long line of thinking, e.g. electric car, Picturephone, and *Challenger* accident.
- A more sophisticated answer looks at an amalgam of social, political, economic, cultural, and technical components.



Another answer looks at socio-technical impediments:

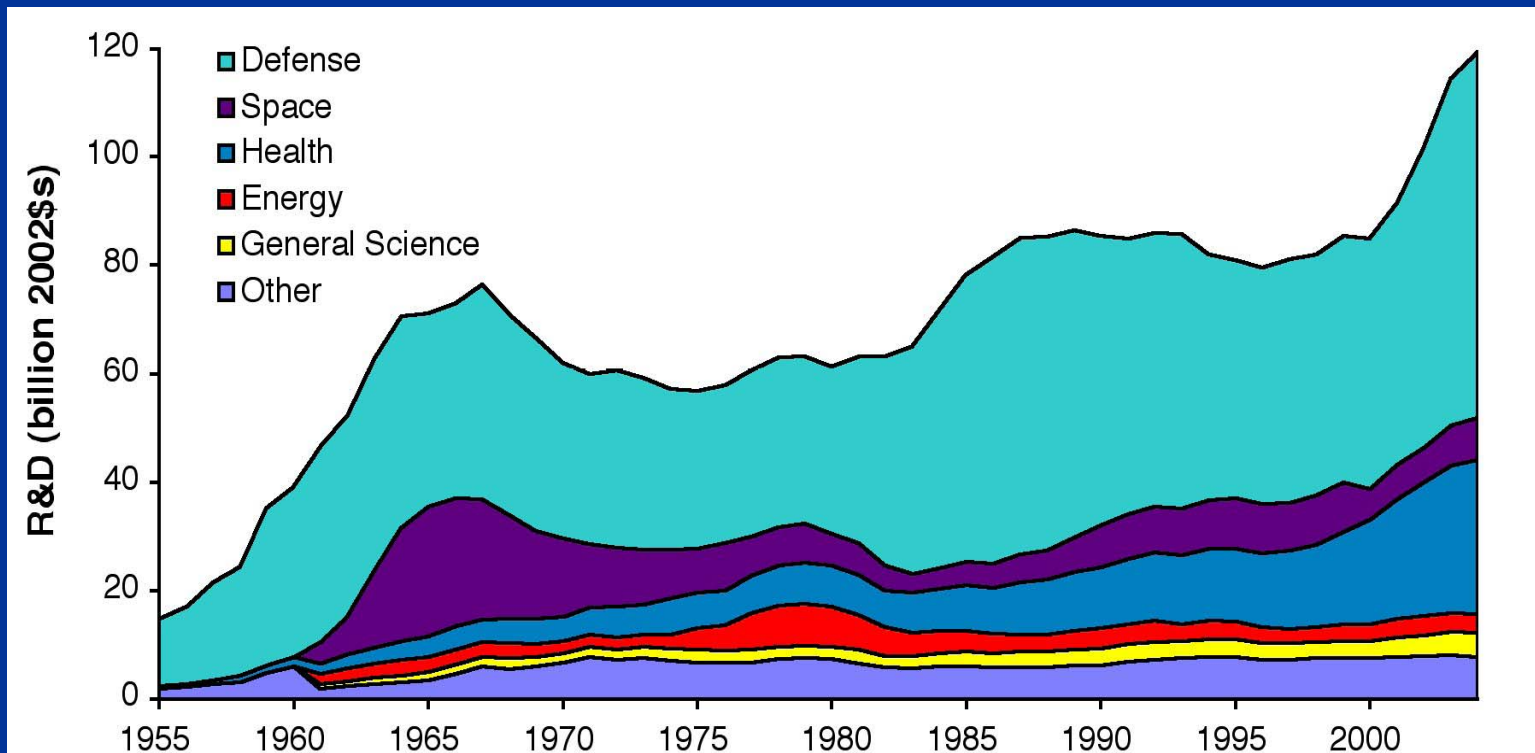
- Misunderstanding about what is needed to generate and distribute electricity;
- Entrenched utility managerial practices that favor large fossil fuel plants;
- Envelopes of familiarity and historical consciousness;
- Distorted electricity markets (lack of real time pricing, inclusion of externalities);
- Inconsistent political support;
- Business practices;
- Aesthetic concerns



That answer suggests that:

- Estimates of technical feasibility must be contextualized
- Society needs to invest more in energy R&D
 - Private funding is diminishing
 - Government spending is concentrated in other areas

U.S. Federal R&D, 1955 - 2002



Implications (1): Forecasts will remain valuable but imperfect

- People are generally unaware of source of electricity and the need to make choices.
- They will resist technologies for a variety of social factors
- Success of energy technologies may depend (to a large extent) on public's understanding (misunderstanding) of entire energy system, not rationality.



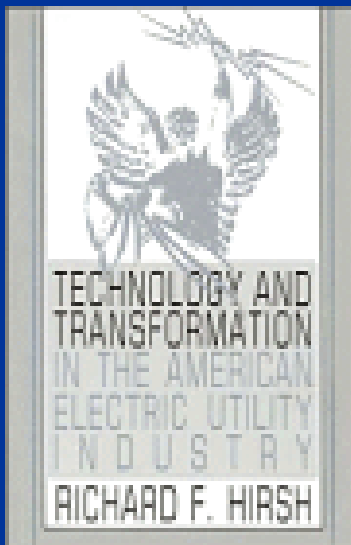
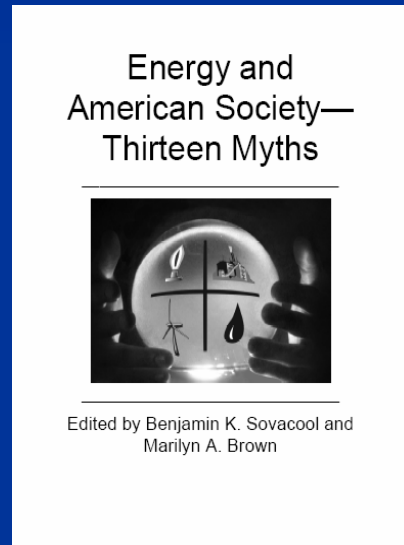
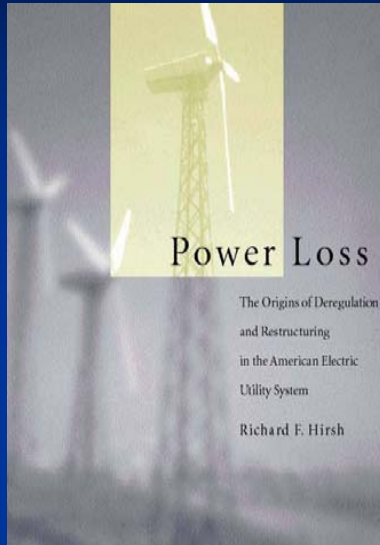
Implications: (2) We need more holistic forms of energy analysis

- Technology Assessment
 - Narrow and disciplinary
 - Stove piping in research and development
- Energy Forecasting
 - Assumes current configuration and works outward
 - Typically ignores history and subclasses
- A Growing Disconnect Between Expert and Public Knowledge Concerning Energy Policy
- Overall, a lack of holistic, interdisciplinary analysis

(3) We need to educate policymakers

- With so much information readily available, how can consumers not be knowledgeable?
- Yet:
 - 70% of flex-fuel vehicle owners don't know their car can utilize alternative fuels.
 - When surveyed about ways to expand the supply of power, many consumers have suggested more outlets in homes.
 - 58% of consumers cannot name a renewable source of electricity.

For holiday reading



Many thanks!