Energy Policy in America
Where We went Wrong and
Where to Go from Here

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Why the Title is Unfair

• The day to day is actually done well
  – EIA gathers usable data and their forecasts are the best available
  – There is a continuous stream of patents related to energy
  – The lights rarely go dark
  – PUC’s muddle through

• Yet there is no purposeful grand strategy for the long run
Framing Choices for the Policy Issues

• Technology
  – Project Independence by Nixon
  – Nuclear power too cheap to meter by the AEC
  – Lots of technologies DoE

• Economics
  – PIES in the FEA
  – IFFS and NEMS in EIA

• Regulation
  – Oil by the Texas Railroad Commission
  – Interstate pipelines, natural gas, electricity by FPC and FERC
  – Local utilities by the PUC’s
Technology Mindset

- Invention
- Optimism/can do
- Technology viability hangs on specifics, not grand abstractions
- Have 100% control of things (rules in logic controllers, etc.)
- Everything tangible
- See resources in physical terms such as running out
  - Like running out of beer during the fourth quarter
- Clockwork universe
  - That they can control
Economics Mindset

- Numbers must add
  - This really irritates the technofannies and bores reporters
- Price matters
  - Irritates the technologists
  - Doubly irritates the technofannies
  - Motivates the call for subsidies by the crony capitalists
- Think in terms of incentives rather than rules
  - Lawyers hate this
- Resource limits are the same as very high prices
- Deal in invisible abstractions, better known as markets
- Efficiency too often an end goal rather than a means to a better life
- Abstract the world with very rough approximations
- Ignore the detail that makes a market interesting to participants
Legal Mindset

- Rules control behavior
- Punishment the best incentive
- Everything is in absolutes
- Logic prevails, data doesn’t matter
- Lawyers can’t dream (or speculate about possibilities)
  - This is why a successful lawyer in the law business can’t lead a large organization (Citigroup, Dupont, some presidents)
The Fundamental Conflict

• Engineers to economists:
  – You don’t know the technologies
  – You don’t see the possibility in my wonderful toys that will save the world
  – Subsidize this

• Economists to engineers:
  – Markets work
  – Costs matter
  – Don’t bother me with the details, supply and demand curves are enough

• Lawyers to everyone:
  – I’ll pass laws or write rules against this
  – See me in court
Engineers’ Failures

- Ethanol
- Hydrogen
- Oil shale
- No major unsubsidized technologies from DoE research over the past 34 years
- Rules of thumb for running power systems no longer apply
DoE’s Failure

• Push technologies to market too fast (nuclear)
• Too much problem-specific technology and not enough relevant science (could be the nature of the problem)
• “Big science” funding sexy, but relevant?
• National labs exceedingly inefficient because research most effective when done by a community, not by a formal organization.
• The secrecy required for designing and building warheads incompatible with the openness required for science
Economists Failures

• Electricity markets
  – When is an organization more efficient than a market? Overly reliant on markets.
  – Don’t bother me with the technology
  – Too many simple deterministic models with no accounting for risk
  – Actually don’t understand the brutality of markets and expect the players to be nice

• Data analysis too often like reading palms

• Fail to understand the nitty-gritty of how institutions and technologies shape markets
Regulatory Failure

• If 100 rules don’t work, another 10 will fix the problem.
• Process driven
  – The view is that the process determines the outcome rather than the process facilitates reaching the right outcome
  – It is an accident when justice coincides with the law
• Myopic
• After all, they are lawyers
Political Leadership Failures

• No gain if pain
  – CAFE standards preferred to taxes
  – Technology will fix things tomorrow
  – Energy taxes will bankrupt all but the richest
  – What me worry?
• Sprawl enabled by cheap gas is good
• Cities should be torn down and replaced by more single-family houses
• Kill small towns in rural America by taking away their reason for existence
• Be happy, drive to the mall
• Define wellbeing by consumption levels not by happiness
Advocacy Failure

• Imposing their will is more important than achieving consensus
• Use a vocabulary of extremes and believe their rhetoric
• Advocates can’t add—think ethanol
Everyone’s Failure

• Culture taken as given
  – Culture is malleable
  – We have two distinct cultures defined by the resource poor knowledge regions and exploitation regions

• Don’t ask basic questions
  – Why do we live so well?
  – Can Thomas Malthus be right?

• Don’t plan on the power of interest groups
  – Rural electrification abuses
  – Corn farmers
  – Vocabulary of absolutes (gas taxes, parking in Philly)
  – Transition rules become permanent
Some Policy Possibilities

• Look at all policies, not just energy policies to lessen energy use
  – The only good energy policy is a good urban policy
  – Change the economics of transportation to bring back rural communities
  – Rail versus road--what would you pay to get the other drivers around you off the highway?
Some Policy Possibilities, cont.

• End subsidies
  – Suburban sprawl
  – Mortgage subsidies for all houses or at least really large houses
  – Energy technologies

• Make energy prices reflect their social cost
  – Gasoline/oil taxes for more than roads
    • Schools
    • Military
    • Transit
  – Pay for polluting
  – Cut other taxes with the energy-tax revenues

This is a call for models of larger systems than just energy markets
A Feature for All Policies

• Only so much is knowable
  – Known unknowns
  – Unknown unknowns

Make policies robust in the face of unknown futures
Happiness research shows

• Above subsistence consumption doesn’t make people much happier
• Financial security makes people happier
• A sense of family and community makes people happier
• What is a civil society where we don’t have to move far from each other for peace and quiet?

Look for policies that make people happier and consume less, e.g. a value added tax on consumption to pay for Medicare/medical insurance and other tax cuts.

This is not a contradiction and calls for enhanced soft-systems tools and sociological assessments
Education and Discussion

• Better economics courses for engineers with market simulations that make markets concrete to engineers with concrete minds
• Humility and technology courses for economists so that they understand the importance of engineering details that lead to operating imperatives and learn that simple charts and graphs have gotten economists in trouble in the past
• Courses on where legal reasoning fails and data matter—beware of syllogisms
• See if it is possible to create a dialogue between the resource-exploiting regions and the knowledge-driven regions of the country
An Important Rule

- Don’t forget the big picture when doing the day to day
- This is virtually impossible to do
Analytics for Putting Together Complicated Models

- Create an open source modeling community
  - All government-funded models should be available in a database
  - All government-funded models should use generally available off the shelf modeling technologies
  - Develop refereeing protocols so that community members get credit for their work
- More funded research on solution technologies for marrying together heterogeneous models
- Methods for building and solving models with hierarchies of detail
- More forums for assessing models, especially the tribal assumptions in the models that are taken for granted
Conclusion

- Stop defining the energy problem as an energy problem and place it in a larger social/political/institutional/regulatory context
- Focus on culture and cultural differences to achieve consensus
- Build the analytic and communication tools to model the larger system for the big questions such as those about socio-political systems
- Get the details right before acting in areas such as electricity restructuring, LNG, etc., the day-to-day energy issues.
- Model the broad view to comprehend the big picture
- Doing the last two simultaneously is hard both technically and conceptually