An Energy-Efficiency Workshop and Exposition
Orlando, Florida

A National Perspective on Restructuring

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Disclaimer:

The views in this presentation are not represented to be official positions of the U.S. Department of Energy or the National Renewable Energy Laboratory

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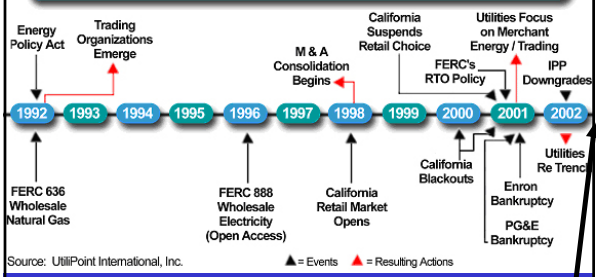
Special Acknowledgments:
Energy Information Administration
Standard and Poor's
Utilipoint

My presentation will:

- Present a quick review of electric policy and energy fundamentals.
- Discuss electric power transformation.
- Discuss electric restructuring – provide a retrospect and offer some predictions.
- Discuss Standard Market Design.
- Discuss economic and energy events over the past few years.

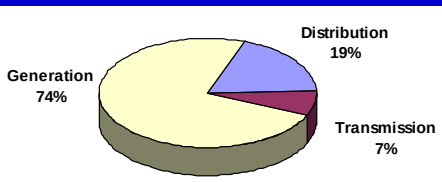
But first, by way of introduction……..

Recent Dislocation Events in the Energy Industry



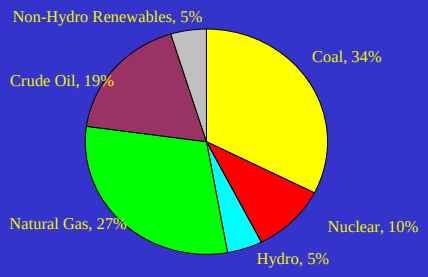
East Coast Blackout 8/14/03

Average Embedded Cost of U.S. Electricity by Function

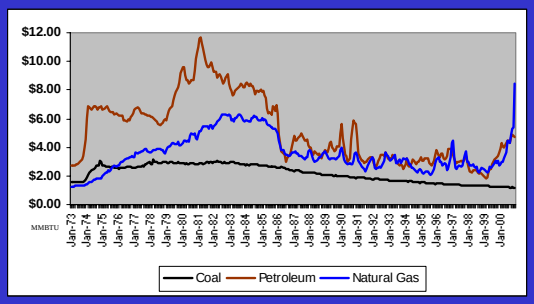


Source: USEIA. 1995

U.S. Energy Production by Fuel Source



Comparison of Fossil Fuel Costs

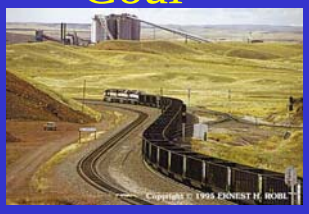


Planned Nameplate Capacity Additions by Energy Source, 2002 through 2006 (Megawatts)

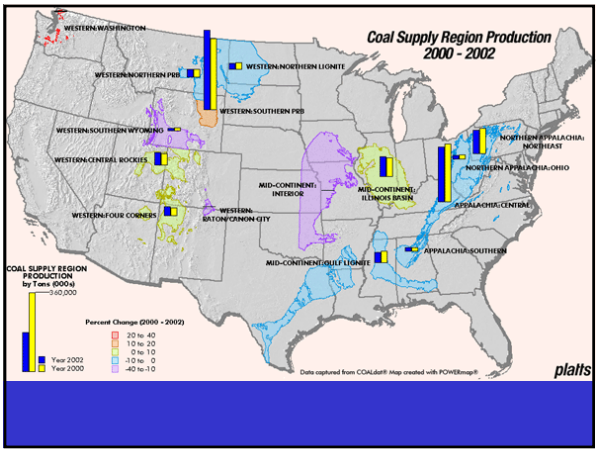
Energy Source	2002	2003	2004	2005	2006
Coal [1]	669	1,714	60	4,624	2,011
Petroleum [2]	1,119	356	1	213	386
Natural Gas	84,979	103,629	69,525	38,437	10,437

Energy Information Administration, Form EIA-860, "Annual Electric Generator Report," and predecessor forms.
Report Released: March 2003

Coal



Fuel of choice – 1960-1980
Haul coal to power station or
Transmit power from mine-mouth plant to load centers.



About 90 percent of recent power projects have been gas-fired. But the price volatility raises the prospect that companies may want to diversify their generation mix and turn increasingly to coal-fired plants.

Today, the price of coal is about a half to one-third the price of natural gas. If such a price spread continues, a newly constructed modern coal power plant could likely cover its fixed costs and reward shareholders.

The challenge, however, for a new coal power plant is its much higher upfront costs and lengthy construction cycle.

But if natural gas prices remain high over the long-haul, as many analysts predict, coal may once again become a viable fuel for new power plants.

About 70 coal-fired projects are now under consideration around the country.

Even places like Florida, which must import coal, are taking a close look at the economics of coal-fired generation.

Elevated gas prices stand in direct contrast to the stable cost of coal, which cuts the risks to generators and their lenders.

Nuclear Power

No new reactors ordered since 1978.
Many have been decommissioned.

To facilitate nuclear development, Congress could pass a measure that would guarantee about $30 billion in loans to nuclear power plant developers, all to offset the high, upfront capital costs that are preventing them from taking risks.

It coincides with another bill to re-authorize the Price-Anderson Act that has limited nuclear power operators' liabilities risks since 1957 to $9.3 billion.

Excerpts from Standard & Poor's 2003 Report
"Time for a New Start for U.S. Nuclear Energy?"

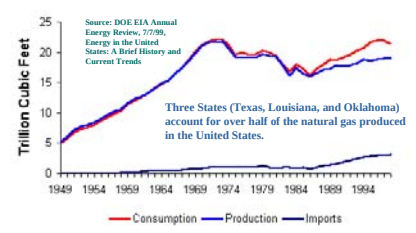
"The nuclear industry's legacy of cost growth, technological problems, cumbersome political and regulatory oversight, and the newer risks brought about by competition and terrorism concerns may keep credit risk too high for even (federal legislation that provides loan guarantees) to overcome."

S&P "has found that an electric utility with a nuclear exposure has weaker credit than one without and can expect to pay more on the margin for credit."

"Federal support of construction costs will do little to change that reality. Therefore, **were a utility to embark on a new or expanded nuclear endeavor, S&P would likely revisit its rating on the utility**."

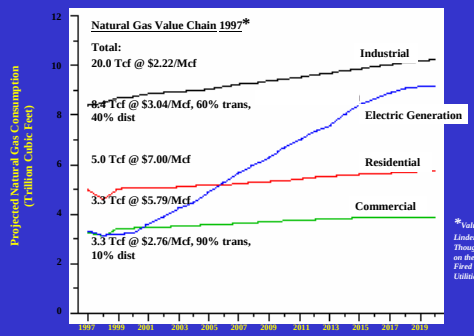
Natural Gas

Natural Gas Production Vs. Consumption



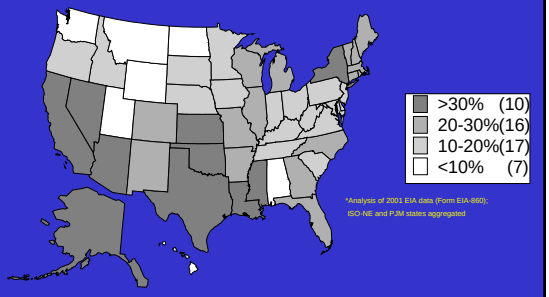
The United States had large natural-gas reserves and was essentially self-sufficient in natural gas until the late 1980s, when consumption began to significantly outpace production.

Major Increase in Demand for Natural Gas-fired Generation

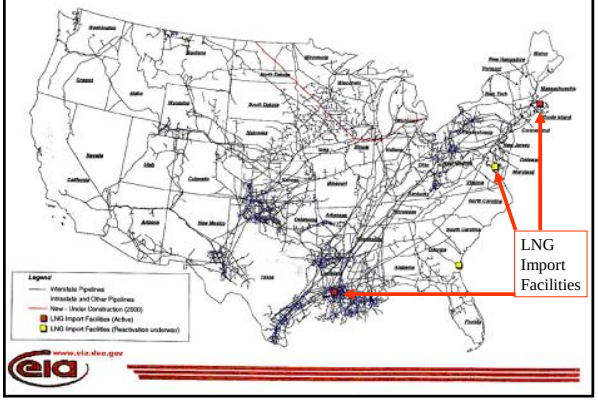


*Value Chain Source: Linden, H. R., "Fuel for Thought: Some Questions on the Future of Gas-Fired Generation", Public Utilities Fortnightly, 12/99

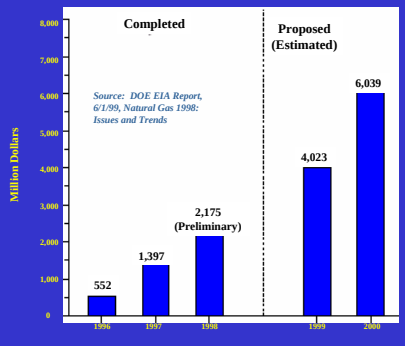
Natural Gas Fired Plant Capacity (GW) as Percent of Total*



National Natural Gas Pipeline Network 2000



Annual pipeline investment reached $6 billion in 2000 - a substantial increase



Pipeline Capacity

Market forecasts indicate a 34 percent increase in natural gas consumption over the next 10 years, from about 22 trillion cubic feet a year to 30 trillion cubic feet annually. But the gas can't get to its delivery points unless more pipelines are developed.

Pipeline utilization rates have grown nationally from 68 percent in 1990 to 72 percent in 1997.

In the Northeast and in California, this capacity factor is closer to its limit- 100 percent in some areas- indicating an urgent need for more pipelines.

Natural gas price volatility

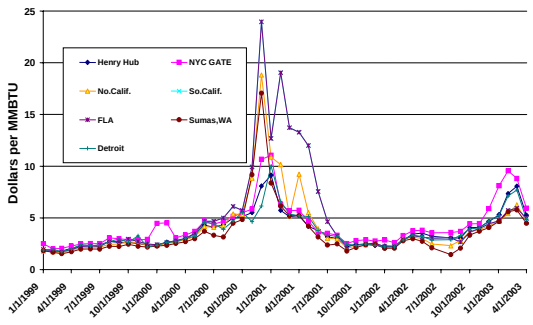
Even for an industry long accustomed to high price volatility, the last few years have been a wild ride:

- In 2000, spot-market prices quadrupled in less than nine months peaking at $8.72/MMBtu in January 2001.
- Less than three months later prices began to plummet - dropping below $2.00/MMBtu even before the September 11th terrorist attacks.
- In March of 2002, prices again unexpectedly sky-rocketed for the second time in 18 months.

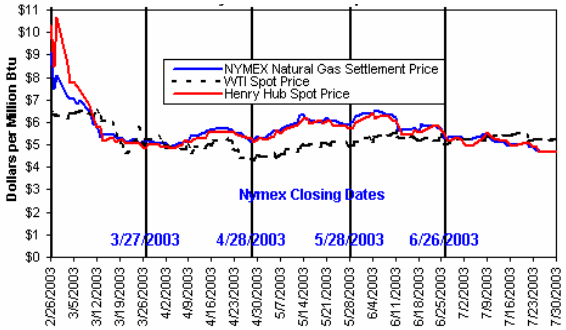
Natural gas price volatility

- 8/19/03 prices is $5.10/MMBtu
- Prices spiked in February 2003 to $9.50/MMBtu
- Futures price for Sept/Oct delivery ~ $4.70/MMBtu
- Contributing factors – weather, low gas storage (currently 12% below the 5 year average), inadequate pipeline capacity, new generation using natural gas.

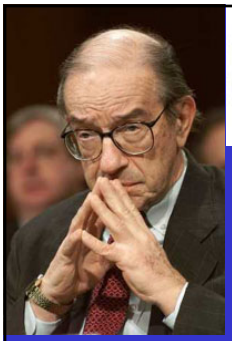
Selected Natural Gas Spot Prices



Recent Natural Gas Prices – 2/26/03 to 7/30/03



Note:The West Texas Intermediate crude oil price, in dollars per barrel, is converted to $/MMBtu using a conversion factor of 5.80 MMBtu per barrel. The dates marked by vertical lines are the NYMEX near-month contract settlement dates.



He's concerned

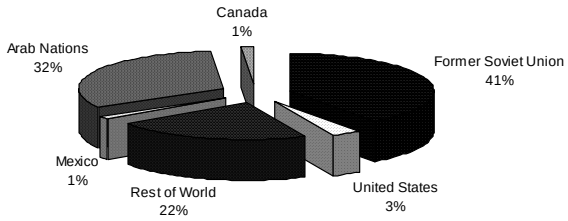
Testimony of Chairman Alan Greenspan

Natural gas supply and demand issues

Before the Committee on Energy and Commerce, U.S. House of Representatives

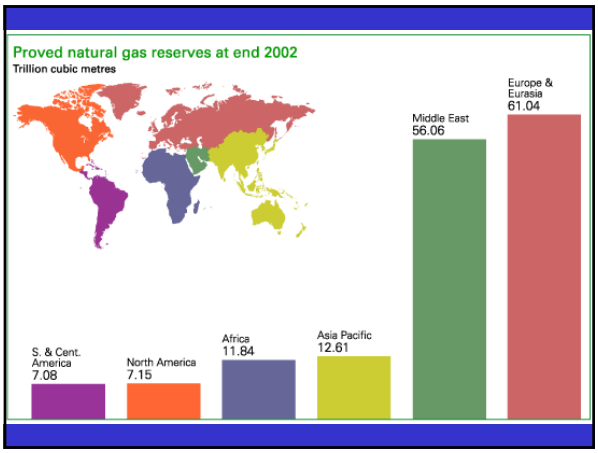
June 10; then again on July 10, 2003

Global Natural Gas Reserves



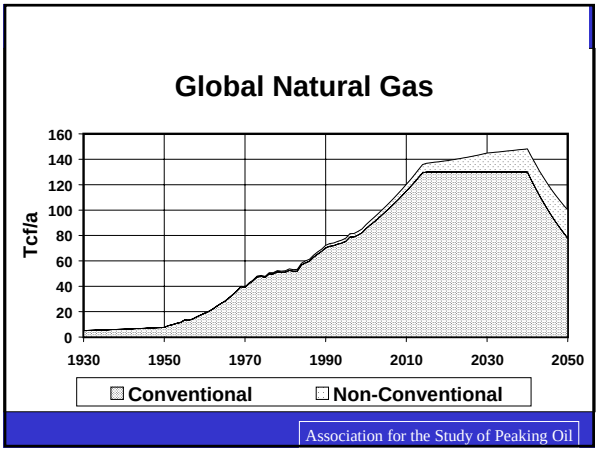
Source: Energy Information Administration, International Energy Outlook 1997

Proved reserves of natural gas are generally taken to be those quantities that geological and engineering information indicates with reasonable certainty can be recovered in the future from known reservoirs under existing economic and operating conditions.



Qatar has more natural gas reserves than North and South America combined.

Qatar is third in terms of world natural gas reserves after a 1980s discovery of the world's largest known non-associated offshore gas field.



Conventional wisdom: Drill for more gas, in environmentally sensitive areas.

Can we expect to drill and pipe our way out of this?

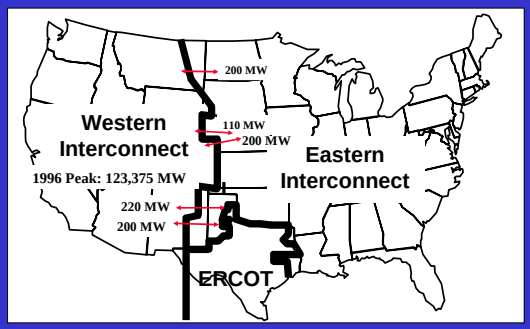
"Access to world natural gas supplies will require a major expansion of LNG terminal import capacity. Without the flexibility such facilities will impart, imbalances in supply and demand must inevitably engender price volatility. As the technology of LNG liquefaction and shipping has improved, and as safety considerations have lessened, a major expansion of U.S. import capability appears to be under way."

-Testimony of Federal Reserve Board Chairman Alan Greenspan
Before the Committee on Energy and Commerce,
-U.S. House of Representatives, June 10, 2003

"An LNG fireball can blow through a city, creating a very large number of ignitions and explosions across a wide area. No present or foreseeable equipment can put out a very large LNG fire. The energy content of a single standard LNG tanker (one hundred twenty-five thousand cubic meters) is equivalent to seven-tenths of a megaton of TNT, or about fifty-five Hiroshima bombs."

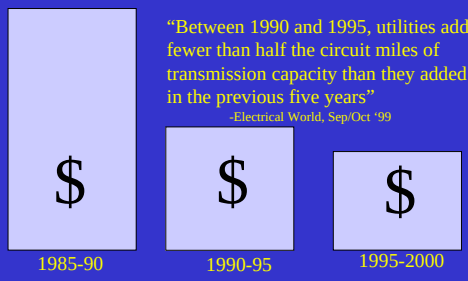
Transmission

Three "Separate" U.S. Electric Grids



- **60 Hertz frequencies are slightly different between the grids**
- **Less than 1% of the W. Interconnection can come from, or go to, the East**
- **Three separate electric markets**

Utility investment in transmission



"Between 1990 and 1995, utilities added fewer than half the circuit miles of transmission capacity than they added in the previous five years"
-Electrical World, Sep/Oct '99

Source: Cambridge Energy Research Associates

– Transmission and distribution (T&D) expenditures are at early 1960's levels

– T&D spending has not kept pace with inflation since 1970 annual spending is, in fact, over $10 billion less than in 1970

– Transmission-specific expenditures have dropped dramatically since 1970, with current spending more than 65% less than in 1970

– Much of the existing transmission infrastructure is well over 30 years in age

– Total capital expenditures by the electric utility industry are currently at late 1950's levels, and more than $50 billion less than in the early 1980's

Why so little investment in Transmission?

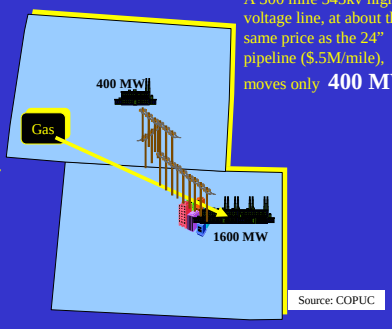
Pipes versus wires

Pipes vs. Wires

Pipeline versus **Transmission Line**

A 300 mile 24" gas pipeline transports 250 MMcf/day, the energy equivalent of **3200 MW,** which is equivalent to the energy to fuel **1600 MW** of Combined Cycle power

A 300 mile 345kv high voltage line, at about the same price as the 24" pipeline ($.5M/mile), moves only **400 MW**



Source: COPUC

Pipes vs. Wires

Interstate Gas Pipelines:
Federal government exercises authority that requires landowners to yield.

Electric Transmission Lines: Utilities must fight NIMBY on either a county-by-county basis, or less often, on a state siting council basis. (National Energy Plan proposes to change this.)

Help on its way?

After the 8/14/03 blackout, expect that a fire will be set under all those who have responsibility for electric grid operations and expansion.

The debate will be:

Government?

Private enterprise?

Regional debates – low cost states not wanting their electrons flowing to high cost states.

More gridlock?

Help on its way?

FERC's Commissioners recently voted unanimously to offer 1.5 percentage points greater returns to transmission owners, if they agree to SMD's terms.

Investor-owned utilities would have the right to earn an additional 50 basis points on their transmission investment if they join a regional transmission organization (RTO).

But will this be sufficient incentive to transmission companies?

Restructuring

"When the Laws of Economics and the Laws of Physics collide, Physics wins – always. No other industry is more dependent on the Laws of Physics."

"Yet those immutable laws have been ignored by policy makers in their rush to create and manipulate 'markets' in electric power. The Laws of Physics have been subordinated to the Laws of Economics.

Worse, policy makers are *still* convinced they can fix what's wrong by fiddling with market structure. But they manage only to make things worse."

- Correspondence from George Loehr 8/14/03

How to think about restructuring

Generation	**Transmission**	**Distribution**
Competitive	Natural Monopoly	Natural Monopoly
?????	Regulated	Regulated

Should Utility-Owned Generation be Deregulated?

- Will a competitive marketplace result in consumer benefit?
- Lower rates?
- Technological innovation?
- Will the result be effective competition?
- Or unregulated monopoly?

But this is not the way most players were thinking about it.

Most were intrigued with:

"How can **you** profit from the coming deregulation of the electric power industry?"

The typical political horse trading that happened when states started to restructure:

Utilities got their dream come true: deregulation.
Consumers got legislatively mandated rate freezes and reductions for a few years, then "all bets are off."
Industrial, large commercial customers got choice of suppliers.
Oil and gas industries enter electric markets.
Renewables and low-income got revenue stream for a few years, then "all bets are off."
Free marketeers got "open markets."

"Deregulation" of Electric Power 1970- 1995:
Largely an academic debate.

But then, starting in 1994 – California:

- The "bellwether" state
- Slow to emerge from the early '90s recession
- The "800 pound guerilla" in the Western Interconnection
- One of the few states without rules that the PUC must be bi-partisan.
- Commissioners weak on engineering and utility knowledge, strong on economics.

"First state out of the chute."

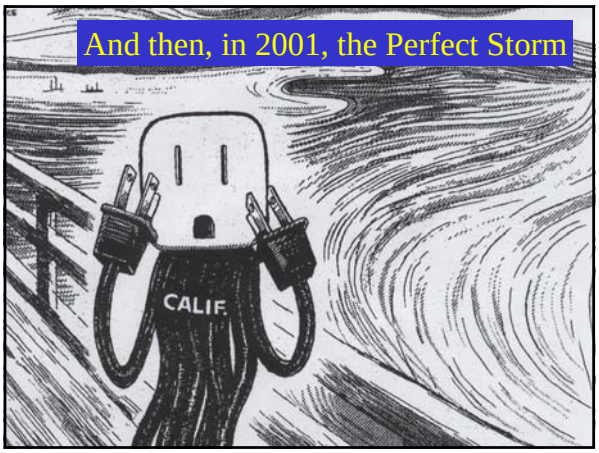
Then, shortly after passage of the the 1996 Telecommunications Policy Act, politicians discovered that the electric sector ("the last remaining monopoly") is larger than the telecommunications sector. And with that, they uncovered a fresh opportunity for large sources of campaign contributions.
"Let's consider restructuring the electric power industry."

1996-2000 – The train is leaving the station. All aboard!!

Back to California:
Everything seemed to be going just fine, until Enron and Enron wannabes figured out how to game the California deregulation rules. They simply employed the oldest trick in the book: "strategic withholding of capacity."

And the PUC structure that would normally be there to stop the gaming had put themselves out of business, with the mantra: "Let the market decide."

And then, in 2001, the Perfect Storm



On who's watch?

Gov. Pete Wilson

At the signing ceremony of AB 1890, Wilson called the initiative "landmark legislation" that would "guarantee" lower rates.

The inheritor

The Term-Eliminator?

AB 1890 sailed through the state legislature in 1996 without a single "no" vote.

"Only in California."

A less well-known example: Montana Power

May 1997 – Montana Gov. Marc Racicot signs deregulation bill, after Montana Power, the largest corporation in the state, "rolls" the legislature.

Dec. 1997 - Montana Power sells generation plants to PPL.

March 2000 - Montana Power announced it will divest all of its energy businesses and Touch America will remain as the surviving company.

August 2000 – Touch America paid 4 top execs a total of $5.4 million.

August 2003 – Stock price is now less than $1 (from high of $60). Touch America is in bankruptcy.

And now.

A handful of states, including Arkansas, Montana, Nevada, New Mexico and Oklahoma, are considering delay.

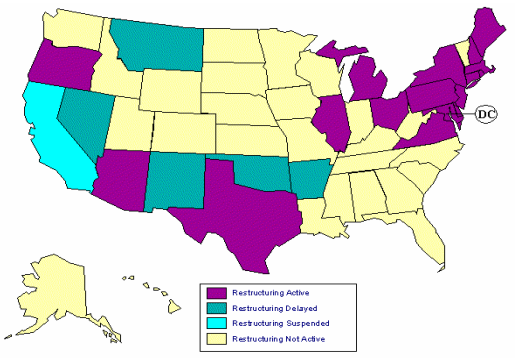
California has completely reversed itself.

Virginia will likely wait a few years to see how deregulation will unfold in other states. Regulators there want to see the effect on reliability and pricing.

The central focus among all skeptics will be whether the new systems produce an overall benefit to consumers or whether deregulation and electricity are anathema to one other.

Go Forward

Retreat



http://www.eia.doe.gov/cneaf/electricity/chg_str/tab5rev.html

All eyes are on Texas. Will it be a shining example or another disappointment- like Pennsylvania?

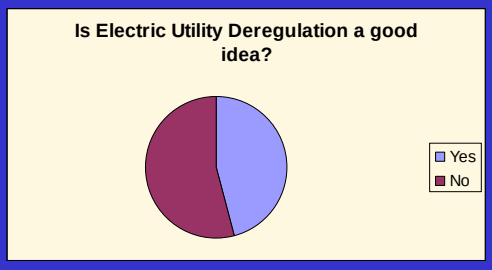
If California arguably set back deregulation by five years or more, Texas has the potential to partially erase the damage.

But Texas is so unique- it is relatively isolated from the other grids and markets. The wholesale markets are not even regulated by the FERC.

Is it
"Flawed deregulation?"

or
"Is deregulation flawed?"

Association of Energy Engineers
Survey
Opinion on deregulation



AEE 2003 Survey

Standard Market Design

FERC's role in creating a more efficient wholesale electric market.

States concerned about balance of state/role responsibilities.

The SMD Vision: a unified transmission grid

An open, single and flexible transmission structure with an allowance for regional discrepancies would force electric prices down and diminish the possibility of manipulating the system.

In 2002 FERC created a 600-page document that called for a "standard market design" so that buyers and sellers of electricity can easily transact business across geographic boundaries—a far cry from the conflicting rules that now govern the use of interstate transmission facilities. The result of such a hodge-podge of rules is investor uncertainty and a lack of power supplies in certain areas, which FERC says has compromised reliability.

A crucial aim of the proposal is to generate new investment in generation, transmission and distribution.

Many SMD Issues

FERC authority in question
Transmission pricing
Congestion management and locational marginal pricing
Regional planning
Market power monitoring and mitigation
Long-term resource adequacy
FERC Order No. 888/889
RTO Order (Order No. 2000)
Independent Transmission Providers (ITPs), Independent Transmission Companies (ITCs)
Locational Marginal Pricing (LMP)
Establish a standardized transmission service and wholesale electric market design

Concerns Regarding SMD

- FERC's expansion of authority into what were State decisions
- Dismantling of State customer protections
- Use of the PJM Interconnection as its model
- It has been suggested to implement SMD in only a few areas of the country to test the rule before putting it in place nationwide. This would allow Federal regulators the opportunity to learn from that experience.

Differing Views Regarding SMD

In November 2003, over 200 parties filed comments on the SMD.

The proponents and opponents were largely aligned according to their position on restructuring.

Opposed:

- Munis, coops, residential consumers, some IOUs

Favored:

- Merchant power plants, some IOUs, transmission developers, large industrial customers, free marketeers.

Major utility responses to SMD-related legislation

"The wisest course of action is no action at this time on any comprehensive electricity legislation, or on SMD-related provisions until FERC's proposals are fully explained and understood. We urge you to take time to review the failed deregulation attempts of recent years and adopt a new approach, one that brings reliability and stability to an industry in turmoil." **- Glenn English, CEO, National Rural Electric Cooperative Association**

"Many in our industry are concerned that federal electricity legislation would add to the industry's challenges in these financially turbulent times if it would decrease regulatory flexibility or increase the uncertainty and costs of providing affordable electric service to our customers." **- Allen Franklin, CEO, Southern Co., testifying on behalf of the Edison Electric Institute**.

SMD Under Attack – Change the Name

Adopting a popular tactic of changing names when trouble looms, the FERC re-dubbed the besieged SMD the Wholesale Power Market Platform.

In a 30-page White Paper released in late April 2003, the FERC outlined what it intends to adopt in the final rule, which is expected later this year.

Regional flexibility and increased participation from state and local authorities are heavily emphasized in the new document.

In the White Paper, FERC identifies "market issues that lend themselves to regional solutions without compromising the integrity of a solid market platform."

In light of opposition-- concessions:

FERC will now rely on regional state committees to shape the market design features, giving State commissions flexibility and decision-making power on issues such as transmission planning and resource adequacy so as to not infringe on state jurisdiction. FERC among other important issues will:

- Direct all public utilities to join RTOs or ISOs
- Not extend FERC jurisdiction over the transmission rate component of bundled retail sales;
- Not require that firm transmission rights be auctioned, and
- Will allow regional state committees to work out their own timetables for implementation of, among other issues, energy markets and market monitoring.

June 2003- US Senator Pete Domenici agreed to bow to the concerns of Western and Southeastern senators to ensure the Senate bill includes an electricity title, as the Administration has requested. The agreement represents the fourth version of electricity language proposed by Domenici in the span of two months.

It quickly became apparent that reaching a compromise boiled down to a single point, Domenici said.

"Certain senators needed assurance that SMD was going nowhere," Domenici said.

In the most recent draft of the electricity title circulated prior to the markup, Domenici called for a 120 delay on SMD.

Some Republicans and Democrats had called for a delay on SMD until 2007.

Delay SMD- but for how long?

Especially now- following the blackout?

The language included in the bill that passed out of the committee would do three things:

- Prohibit FERC from issuing a final rule on its proposed SMD rulemaking until after July 1, 2005;
- Prohibit FERC from issuing any additional rules or orders "of general applicability" that would fall within the scope of the SMD proposal until 2005;
- Include a sense of Congress statement that all transmitting utilities, such as regional transmission organizations (RTOs), be based on voluntary rather than mandatory membership.

What may happen in September…

After the Congress finishes grilling electric grid operators and regulators about the blackout…

The SMD portion of the comprehensive energy policy bill will be debated in the House/Senate conference meetings. A crisis mentality will be prevailing to demonstrate that the government must "do something" to increase reliability.

It promises to be a highly visible political sparring between those who want an "all or nothing" energy bill (e.g. drilling in the Arctic and nuclear power subsidies) and those who want to concentrate on only certain issues- like electric reliability.

Senate version of Electricity Section of the bill:

Amends the Federal Power Act to give the FERC authority over regional transmission organizations and the ability to approve reliability standards for RTOs.

Repeals the Public Utility Holding Company Act.

Repeals the Public Utility Regulatory Policies Act with modifications, eliminating the mandatory purchase requirement with exceptions for cogeneration.

Directs utilities to provide real-time pricing and net-metering services.

Establishes a task force among FERC, the Federal Trade Commission and Department of Justice to assess wholesale competition.

According to Standard & Poor's, investors made several errors when trying to assess the outlook of the power sector in the late 1990s. First, they assumed that competition and deregulation would spread quickly and widely—a theory turned up-side-down as a result of the California energy crisis of 2000-2001 as well as the bankruptcy of Enron in 2001. And, secondly, they believed that older coal-fired and nuclear power plants would be retired—something that appears less and less likely in the near term.

Conclusion

- Restructuring of the electric retail market has been a very rough ride.
- Restructuring of the generation market is more plausible.
- Restructuring of the transmission market has been a political minefield- and it will get even more interesting post-blackout.
- Restructuring of the distribution market- it is broken (due to lack of investment), but don't try to fix it through markets. Time to try old-fashioned regulation?

Thank you