UnReDeregulating Electricity:
Hard Times for a True Believer

Larry E. Ruff

Seminar on New Directions in Regulation
Kennedy School of Government
Harvard University
Cambridge, MA
May 1, 2003
Agenda

Personal Journey and Statement of Faith
A Report from the Front
Some History and Interpretations
Costs and Benefits of “Competition”
Current Issues and Likely Outcomes
Benediction
Personal Journey and Statement of Faith
My Personal Journey

I was an early convert, contributor and advocate in the Church of Competitive Electricity Markets

- Predisposed by training/belief in microeconomics & markets
- Joined Thatcher Crusade to tear down CEGB (1988-90)
- Introduced simple pool pricing and financial contract (CfD) ideas
- Found U.S. too hard so became a missionary of simple ideas abroad (Bill Hogan developed the Principles of the True Faith)

In the past 10 years I have:

- Been excommunicated (with Bill) from California for refusing to accept the false market model worshiped there
- Helped design or fix electricity markets in UK, Spain, New Zealand, Australia, Argentina, Peru, …
- Unsuccessfully proposed markets in India, Pakistan, Thailand, …

My faith has been sorely tested more than once
Statement of Faith

I BELIEVE that competitive electricity markets:

• Are sound in concept, workable in practice (using Bill’s “LMP”)
• Can and do produce real benefits if done well
• Are not as technologically or economically essential or inevitable as are markets in (e.g.) telecoms or airlines
• Are particularly valuable where politics/regulation is very inefficient or corrupt (e.g., Latin America)
• Have less value where regulators are competent and honest

I ALSO BELIEVE that electricity markets are particularly difficult to develop/sustain in the U.S., because of:

• Federalism and checks-and-balances
• Populist and anti-centralization sentiments

“We” shall overcome (I think); but how/when?
A Report from the Front
"We" Have Learned HOW – Mostly

Markets are technically very difficult, because electricity:

- Cannot be stored, needs an integrated grid, flows according to physical law not contract laws, etc.
- Has features inconsistent with assumptions of market theory, e.g., scale economies, all-or-nothing (integer) decisions, externalities

“X% of experts” now agree that a reliable, efficient electricity market needs:

- Some sort of Independent System Operator (ISO), aka Regional Transmission Organization (RTO), Transco, … (X ≈ 99%)
- ISO-operated spot energy & ancillary service markets (X ≈ 90%)
- Locational Marginal (Energy) Pricing (LMP) to manage/ price energy imbalances and transmission congestion (X ≈ 75%)

These elements are necessary but not sufficient
But Broader Enthusiasm is Weak/Fading

This was always a revolution of the elite, not the people
• Most people think electricity is/should be regulated monopoly
• Service, prices were mostly OK; if it ain’t broke, why fix it?

Most news has been disappointing – or worse; e.g.:
• Retail “choice” for small consumers fizzled – for good reasons
• California was/is a disaster for consumers, utilities, taxpayers
• Marketers/traders (Enron) and independent generators “ripped us off – and then went broke and destroyed our pensions”
• Ontario market has been gutted by political reaction

The main claims for “successful” competitive markets are:
• They have not (yet?) exploded-and-then-collapsed like California
• Prices/costs are ≈ what they would have been in the old system

For most people, the question is WHY, not HOW
Market Forces Are Doubted and Limited

Much of the point of competition is to let market forces:

• Decide how much/what generation capacity to add and when
• Discipline output/pricing and consumption decisions
• Make generation-vs.-transmission choices and at least help select and pay for transmission investments

But market forces are imperfect and/or not trusted, so trend is for ISOs or some other central entity to:

• Set and enforce “resource adequacy” requirements
• Cap prices and limit sellers’ offer prices and quantities in the name of controlling market power
• Subsidize demand response to “help the market clear”
• Centrally plan and socialize costs of transmission investments

Even pro-competition experts disagree on these
The Early Momentum Has Been Lost

ISO/RTO development has slowed
- Existing ISO/RTOs in northeast continue; Texas has its own
- Calif. ISO is trying to reform, while pols threaten elimination
- Emerging RTOs are moving slowly under political pressure

FERC’s Standard Market Design (SMD) is on defensive
- Was initially intended to be detailed and virtually required
- Is actively opposed in some states; VA law “just says no”
- In recent White Paper is more a suggestion or long-term goal
- Even so, Congress may order FERC not to issue SMD rule

Foes are stronger, advocates are increasingly:
- Accepting more limits on the market as political necessity
- Falling back on “it’s too late to turn back now” – “GOTCHA!”

Shock-and-Awe is giving way to guerilla warfare
Some History and Interpretations
The First 88 Years in Brief

1882-1945: Growth, consolidation, excesses, reforms

- 1882: Edison’s first central generating station (New York City)
- 1890s: Turbines, AC → scale, growth, competition, monopolies
- 1898: Insull wants state regulation for legitimacy, stability, profits
- 1935: Holding Co. excesses → PUHCA to aid state regulation
- 1945: PUHCA-mandated break-ups largely complete

1945-1970: Golden Age of regulated monopolies

- Steady growth in demand, efficiency, scale/scope economies
- MargCost < AveCost → Growth lowers AveCost/regulated rates; average real prices fell ≈ 50% from 1947-1967
- 1965: NE blackout/black-eye → reliability reforms

*Market excesses → regulated monopoly model, which worked well by most objective standards*
The 1970s and 1980s

1970s: Oil crisis, nuclear follies, reversal of economics
- 1968-70: Surge of nuke orders ➔ nuclear power is “commercial”
- 1973: Oil prices soar; coal/construction costs and inflation follow
- Electricity demand growth projected at historic 7%/year or more
- Utilities/policy makers rush new capacity to reduce oil imports
- Marg Cost > AveCost/Rates ➔ Growth increases costs/rates
- Nukes experience safety concerns, errors, delays, cost overruns
- 1978: PURPA requires utilities to buy from QFs at “avoided cost”

1980s: Market collapse, backlash against the old model
- Falling oil prices, gas comeback, higher rates ➔ low demand ➔ excess capacity ➔ higher rates ➔ rate resistance/insolvencies
- Reaction ➔ QFs/IPP, demand-side management (DSM) and integrated resource planning (IRP) ➔ more excess capacity, high costs ➔ MargCost << Rates
The 1990s

Early 1990s: Cost/rate imbalance, new ideas/players
- For many utilities (particularly those with nukes and "successful" QF/IPP/DSM/IRP policies), MC << AveCost ≈ Rates
- Large consumers, gas marketers, IPPs see arbitrage opportunities
- British electricity market is working, Norway market is planned
- Some policy wonks, ideologues, regulators (e.g., FERC, CA), power pools, consultants 😊 push idea of competitive markets

Late 1990s: Competition develops, with mixed results
- ISO/Pool model is accepted, replacing failed “open access”
- PJM shows that it can be done and HOW (LMP, etc.)
- California shows how disastrous it can be
- New York, New England pools evolve to markets “successfully,” i.e., without California-type problems
One Interpretation of This History

Regulated monopoly model failed badly

- Pre-1970 Golden Era was dumb luck and/or a myth/illusion
- 1970s showed model was inherently prone to big, costly mistakes, and hence should be radically overhauled or abandoned
- Whether 1980s QF/IPP/DSM/IRP policies were necessary—but clumsy fixes or just more costly mistakes, the model failed again

Competition was desirable/possible/inevitable alternative

- Reduced scale economies, new information technologies and market concepts destroyed the “natural monopoly” in electricity
- Innovative, entrepreneurial firms sought to operate more efficiently, invest more wisely, improve service, etc.
- Mistakes were “teething problems;” lessons have been learned

We are on the right/only track, must push on ASAP
Another Interpretation of This History

Regulated monopoly worked well, but for unique 1970s

- Oil crisis would have rocked any system, maybe worse
- Rush to nukes was a big but one-time mistake due largely to government misinformation and misguided energy policies
- 1980’s QF/IPP/DSM/IRP “reforms” were fighting the last war; phony competition and inefficiencies made things worse

Rush to competition went too far, too fast, at high cost

- Electricity still has so many natural monopoly attributes and political constraints that full competition is infeasible/unwise
- Rent-seekers arbitraged the MC-Rates gap and then went broke, with little sign of better efficiency, investment, service, …
- Marginal competition can provide benefits, but there should be a core monopoly subject to performance-based regulation

The competitive monster should be reigned in
My Personal Interpretation

There is a lot of truth in the second interpretation

- 1970s oil crisis and over-hyped nukes created a “perfect storm;” what would have happened to a competitive electricity sector?
- Technology was not forcing full competition; rate redesign and IPP purchases by “single buyer” utilities could have been enough
- There was too much ideology, wishful thinking, rent-seeking and “if it can be done, it should/must be done” thinking

On the other hand, how different could things have been?

- Some changes were clearly needed and inevitable
- It is not always possible to control the details or pace of change
- Benefits will exceed costs in long run (at least w/o time-discounting)

The trend towards markets will/should continue – with more attention to short-run costs and benefits
Costs and Benefits of “Competition”
Defining Costs & Benefits of “Competition”

Defining real net benefits of “competition” is not easy

• Short-run price changes are not themselves real costs or benefits, but create large and transient transfers

• What is attributable to competition, e.g., would gas-combined cycle technology have been developed and used anyway?

• For projections, what is the external environment, e.g., will gas stay cheap and plentiful so that IPPs’ big bet on gas pays off?

Critically, competition is not all-or-nothing, now-or-never

• Competition can be wholesale without retail for some/all consumers

• Even “monopoly” utilities can/would contract with competitive IPPs

• It can all be done more or less quickly

The critical step is defining the counterfactual; costs and benefits compared to WHAT/WHEN?
The Benefits of Competition in Electricity

The potential benefits are lower costs due to:

• Competitive pressure for efficiency and innovation
• The discipline of private capital markets
• Better price signals to consumers, investors, …
• Less political/regulatory cost, hassle and interference

How far could such benefits be obtained by:

• IPPs competing to sell to monopoly utilities, i.e., PURPA with QFs = IPPs, avoided cost = market price
• Real-time pricing by utilities (where politically acceptable)
• Performance based regulation

How far will such potential benefits be lost due to:

• Political resistance to and interference in the market
• Commercial exploitation of market design and policy errors
The Costs of Competition in Electricity

The potential costs and risks of competition include:

- The direct costs of the needed sophisticated markets
- Inefficiencies in short-term coordination, i.e., dispatch
- Inefficiencies in long-run planning and investment, e.g., transmission
- Possibility of California-type mistakes

The costs/risks should fall with time and experience, but:

- Market coordination is fundamentally hard and imperfect
- Rules are needed and must continually evolve in processes subject to political and commercial influence
- Possibility of political rejection is always an election or less away, e.g., Ontario months ago and U.S. Congress yesterday

The fact that “we” think we know how to do it right does not mean “they” will do it right
Benefits and Costs So Far

Real benefits so far have been small

- Nobody was going to build more nukes anyway
- Unit commitment and dispatch are not much(?) better/worse
- IPPs may build/operate somewhat more efficiently than utilities, but they made a lot of money-losing investments
- There is still little demand response (or exposure) to prices
- Ending QF/DSM/IRP excesses was a benefit (if it would not have happened anyway) – but these may come back

Real costs so far have been significant

- Transition/transaction costs have been high
- “California” would have been avoided or at least more easily weathered if competition had never been considered there

Net real benefits so far are probably negative
Future Benefits and Costs

Future net benefits are potentially large but uncertain

- Larger, more efficient markets will increase efficiency
- IPPs will build/operate plants somewhat more efficiently
- Better demand response requires real-time consumer pricing, which is still resisted (and does not require competition)
- IPP investment/fuel choices may or may not turn out better, given their short-term herd instinct (e.g., focus on gas)

And there will be continuing economic and political risks

- Transmission planning/investment is a fundamental problem
- Boom-bust cycles will have economic costs, political fall-out
- Market power concerns will continue/increase with mergers
- Disputes will continue over rules, institutions and structures

*Competition will have/create its own problems*
Current Issues and Likely Outcomes
The Long-Term Future and Current Issues

The electricity system of the distant future will have:

• A national market based on LMP and financial contracting
• “Fully” competitive generation (with controls on market power), including consumer access to small, dispersed generation
• Full retail competition based on consumer exposure to spot prices and access to competitive contracting/risk management
• Market-driven transmission investment disciplined by competition from dispersed generation and demand response

The real issues in the U.S. today concern the transition

• What less utopian future should/can we define and try to reach sustain for the next 10-20 years?
• Should all markets have some minimum set of common market rules and structures and what should these include?
What Is Possible/Impossible Now?

Some parts of the ultimate market are possible now

- Regional, LMP-based markets in most of the U.S.
- Workable competition for most of the generation sector, with regulated contracts for generators with local market power
- Retail competition for larger consumers
- Gradual diffusion of real-time metering to all consumers

But experience and logic suggest some limits for now

- Retail choice for small consumers is not worth the trouble
- The market will not be allowed/trusted to assure resource adequacy – e.g., real scarcity pricing will not be possible
- Market power will remain a serious perceived/real problem
- Transmission will remain largely a natural monopoly, i.e., some regulated monopoly will have to plan and finance most of it
So What Will/Should We Do Now?

These “realities” suggest a system in which:

- Load-serving entities (LSEs) subject to PBR use “medium-term” contracts & spot purchases to serve small consumers
- Local distribution companies (LDCs) contract with transmission owners (TOs) for “prudent” transmission expansions in exchange for FTRs, passing net costs through to consumers

In this “wholesale only” market:

- LSE contracts assure “medium-term” resource adequacy, control of market power and stability of consumer prices
- Competing IPPs have incentives to build/operate efficiently and to make intelligent long-term investment decisions
- TOs and LSE/LDCs plan and finance transmission

Competition plays a large role, but consumers bear risks of LSE/LDC/TO purchases and investments
Does Everybody Have To Do/Be the Same?

Some areas have good, if parochial, reasons to resist, e.g.

• The regulated monopoly has kept reliability high and prices low and could continue doing so

• Exporting to the national market would create environmental problems and increase electricity prices in the region

Counter-arguments are economic, legal, constitutional

• Expanding the market increases total national welfare, and there must be ways to create win-win outcomes

• Energy Policy Act has said the market must be open

• No U.S. state has the right to keep its resources for itself or to interfere with interstate commerce, even in electricity

The legal/constitutional issues will be settled politically, probably in favor of states’ rights
Economic Arguments for/against Uniformity

A larger market using uniform rules is more efficient
  • Increasing diversity allows more trade and reserve-sharing
  • Uniform rules reduce “seams” and uneconomic arbitrage
  • Overhead costs and duplication can be reduced
  • There is less dispute and uncertainty about rules and processes

But there are declining marginal returns to market scale

Coercing/bribing systems to adopt SMD now:
  • Increases political resistance, possibly for little gain
  • May require compromises in market design or RTO structure that increase short-term risks and reduce long-term benefits

Maybe a coalition of the willing should design/operate good markets now and lead by example
Benediction
Benediction

Faith in competitive electricity markets

• Has a sound logical and empirical basis as a matter of economics
• Is shaken by political realities, particularly in the U.S. context
• May have to go underground for a (long?) time

The immediate issues for the faithful are:

• How important is it, really, to have a national Standard Market Design in the near term – or even in the long term?
• If it is very important in the short term, how hard and how to fight to keep/rebuild momentum for something like FERC’s SMD?
• If (as seems likely) the momentum is lost for now, what fallback position will best hold the ground and prepare for the future?

AMEN