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# The Mexican Electricity Market Reforms: An assessment

Peter R Hartley

George & Cynthia Mitchell Professor of Economics and  
Rice Scholar in Energy Studies, James A. Baker III Institute for Public Policy, Rice University

BHP Billiton Chair in Energy and Resource Economics  
University of Western Australia



# Electricity markets: benefits versus costs

- ❖ Establishing a wholesale electricity market is not an end in itself but a *means* to the end of promoting more efficient resource use
- ❖ The process is complicated and disruptive, so the net gains have to be sufficient to offset those transition costs
- ❖ The outcome can be worse than under the old vertically integrated government owned monopoly
  - ❖ The transmission system, and coordination and operation of the network, are natural monopoly functions
  - ❖ A network operator is a monopsony buyer and monopoly seller of energy, so if it were an unregulated commercial entity it could impose substantial efficiency costs
  - ❖ There is evidence that the old vertically integrated monopolies over-engineered the system, but that at least had the advantage of making it more reliable
- ❖ The need to coordinate supply and demand, and maintain network stability and power supply quality, mean that wholesale electricity markets were not possible prior to the IT revolution



# What are the potential gains?

- ❖ Strong evidence, not just from electricity markets, shows that government owned firms usually do not minimize costs or provide good customer service
  - ❖ Shareholder owned firms have much stronger incentives to minimize cost and also to innovate to find better technologies and better ways of serving customers
  - ❖ More rapid technological change raises the benefits of decentralized decision making
- ❖ Unlike owning and operating the transmission network, electricity generation is not a natural monopoly
  - ❖ In fact, the short-run system-wide operating costs are *increasing*
  - ❖ Economies of scale in the addition of new capacity imply the competitive equilibrium investment path will not be efficient, but the departures from efficiency are likely no greater than many other industries run on a competitive basis
- ❖ The many other uses for scarce public funds – such as education, health, public infrastructure – make it costly for government to do things firms would do
  - ❖ In addition, it does not make much sense to impose commercial risks on taxpayers



# Prices as signals

- ❖ Market prices convey information to consumers about the costs of production, and to producers about the benefits of satisfying consumer demand
- ❖ Individuals and firms have an incentive to use their own information to respond to the price signals in an efficient way
  - ❖ In doing so, they make the prices more informative
  - ❖ But decision makers need flexibility to respond to the price signals for them to work
- ❖ Decentralized decision making can utilize more, and more disparate, information than monopoly command and control structures
- ❖ Also, if prices are distorted signals about marginal costs and benefits, markets and incentivized agents can respond powerfully *in the wrong ways*



# Portfolios of generators

- ❖ Many electricity reforms leave significant market power in the wholesale market
- ❖ Sometimes this is supported on the grounds that there are economies of scale in electricity generation that mean costs would be higher if firms were smaller
  - ❖ Econometric studies supporting this notion estimate production functions including capital among the inputs
  - ❖ While there are economies of scale associated with the *investment* process, these do not justify aggregating existing firms since that does not lower *operating* costs
  - ❖ While there are likely economies from keeping a single owner/operator of each power station, these do not extend to multiple stations
- ❖ Another argument is that it is “more risky” for firms to hold generators that serve only part of the load (base, intermediate or peak)
  - ❖ But as with conglomerates, owners can diversify risk more efficiently themselves rather than have firms invest in portfolios of activities when there are no economies of scope across those activities

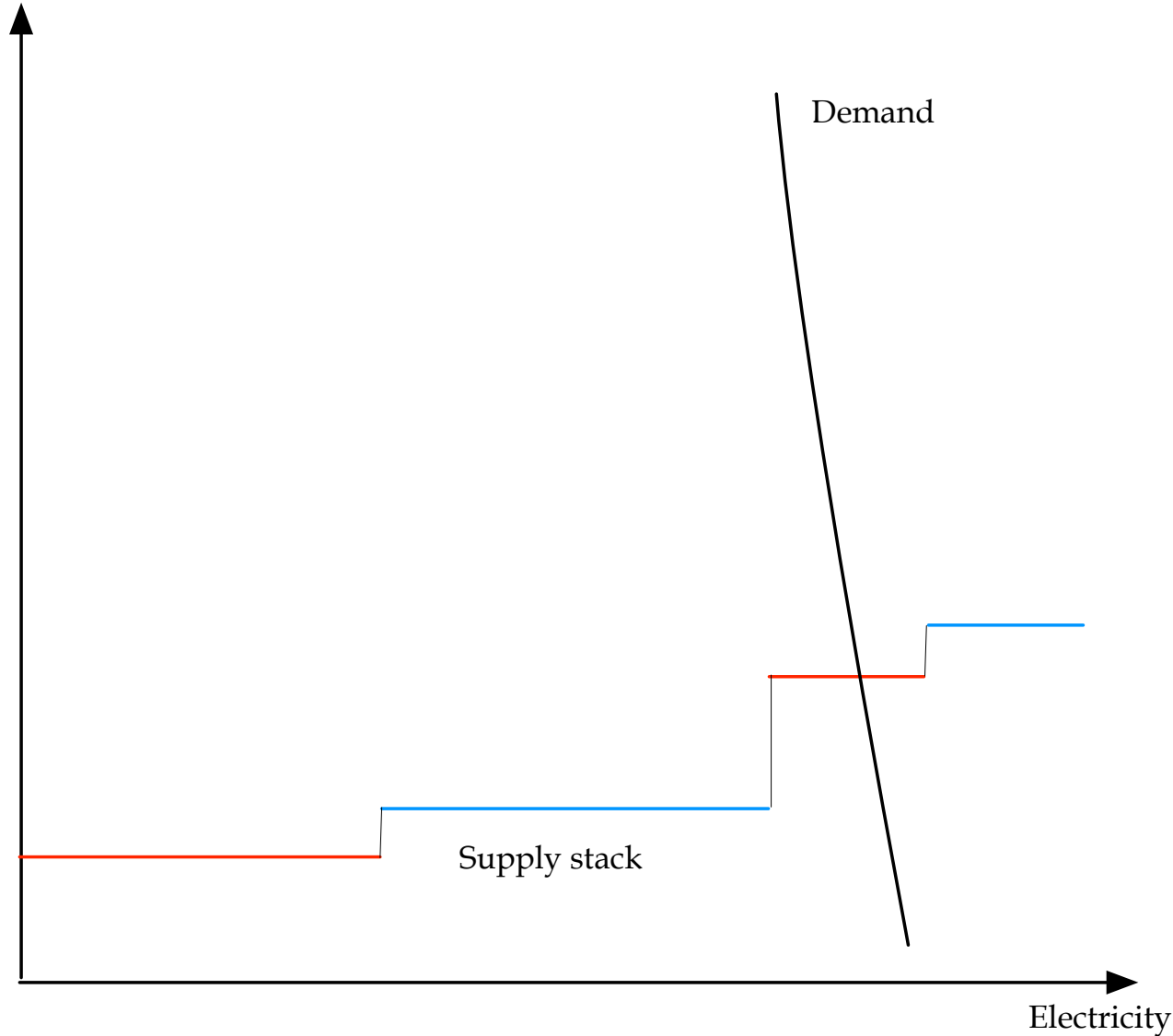


# Problems with portfolios of generators

- ❖ A firm with generators using just one technology has an incentive to bid its full capacity into the market at marginal cost whenever the market price  $p \geq MC$ 
  - ❖ Suppose a firm has generators with different marginal costs  $MC_1 < MC_2$
  - ❖ If  $p = MC_2$ , reducing 2 output cuts revenue and operating costs by the same amount
  - ❖ But if  $p$  rises as a result, rents to type 1 plant increases (see next slide)
- ❖ Firms may also manipulate the market by misrepresenting their marginal costs
- ❖ More generally, gaming the wholesale electricity market has repeatedly been a problem when firms hold multiple generators
- ❖ When firms can game the wholesale market, the prices can be a distorted signal of the true marginal costs of supply
  - ❖ Sending a “sharp signal” that is distorted could give a worse outcome than retaining the “blunt signals” of the old system of vertically integrated monopoly supply



Marginal cost, price





# Mechanisms to constrain abuse

- ❖ The dominant position of Pemex in the markets for natural gas and oil products may also lead to distorted fuel prices and thus marginal costs of generation
- ❖ The Mexican electricity reforms include establishment of a Market Monitor Authority to foster competition and efficiency in the electricity market
  - ❖ It will report monopoly practices, attempts to unduly manipulate the market, and lack of effective competition to CRE and Federal Commission of Economic Competition
- ❖ There is also a Market Monitor Unit charged with, among other functions
  - ❖ Establishing reference prices for fuel and other inputs
  - ❖ Verifying costs and capacity parameters by market participants
  - ❖ Watching for cases of firms withholding capacity, manipulating prices, creating artificial or apparent congestion between nodes to drive up prices
- ❖ A less competitive market structure places a much greater burden on these institutions – their job is much easier when the market is more competitive





# Attraction of investment

- ❖ A stated goal of the reform is to attract private capital into the market
  - ❖ Sener states that Mexico will require 66 GW of new capacity in the next 15 years
  - ❖ The Mexican government has many other uses for scarce public revenue and it does not make sense for the government to make such investments if private firms will do it
- ❖ A perception the market is not competitive may discourage needed investment
- ❖ In this context, Deloitte inauspiciously comments:
  - ❖ “Significant market power will likely remain with the national utility, CFE”
  - ❖ “CFE’s incumbent market power is a long-term issue of concern ... which will make new entrants cautious”
  - ❖ “While significant investment opportunities exist, many uncertainties and questions may affect investment attractiveness including long-term market power of CFE”
  - ❖ “The market for the next three to five years will most likely be a new-capacity, open-bid market ... the break-up of CFE’s market power ... must be addressed soon”
  - ❖ They suggest “mandatory divestment of CFE’s generation to mitigate market power”



# Government ownership

- ❖ When electricity supply was organized as a vertically integrated monopoly, most countries made the generating firms government-owned
  - ❖ Such firms have less incentive to exploit monopoly market power by restricting supply
  - ❖ But they also have less incentive to minimize costs, develop new technologies or innovate to make customers better off
  - ❖ Managers also know that, to remain government-owned, the firm cannot go bankrupt
- ❖ In a more competitive market, the threat of lost market share may impose some pressure to cut costs, but costs are unlikely to be minimized
  - ❖ Employees and other input suppliers will take some “monopoly rents” as higher costs
- ❖ One of the original objectives of the reform was to “transform CFE into a productive enterprise with a clear mandate to create economic value,” but will this happen if it remains government-owned?
- ❖ If CFE does not transform, will the private sector be as willing to invest in helping CFE install new generating capacity, upgrade grid infrastructure, and improve everything from customer services to back-office operations?



# Capacity markets

- ❖ Capacity markets have become a major policy issue in recent years
- ❖ One motivation is the co-called “missing money” problem whereby price caps limit rents on scarce capacity in peak periods and reduce incentives to invest
  - ❖ It could be argued that under some circumstances the combination of a price cap and capacity market acts like a form of “insurance” for consumers
  - ❖ A capacity market makes electricity prices higher on average but less variable
- ❖ However, I suspect the problem of “inadequate capacity” has been exacerbated by the widespread subsidies for intermittent wind
  - ❖ The higher variability of demand net of non-dispatchable generation increases the need for reserve capacity
- ❖ A market for ancillary services, and for generators and LSE’s to make contractual arrangements for capacity is preferable for ensuring adequate capacity
  - ❖ The proposed capacity market may be a prudent adjunct to ensure adequate capacity
  - ❖ But the West Australia example shows capacity payments can also be wasteful



# Regulatory oversight

- ❖ Why is there a need for both SENER and CRE as oversight bodies?
- ❖ According to Deloitte, the split between their duties is as follows

SENER	CRE
• Establish conduct & coordinate energy policy	• Grant transmission & distribution permits
• Verify compliance with the law	• Determine & apply rates for transmission, distribution, basic service, CENACE operations & provider of last resort maximum rates
• Direct planning process & development program	• Issue market rules & supervise their execution
• Ensure coordination of regulatory entities with CENACE	• Authorize contract models for generation, transmission, and distribution companies to be implemented by CENACE
• Define requirements for clean energy certificates (CECs)	• Grant CEC's and validate compliance with them
• Prepare & coordinate strategic infrastructure projects	• Authorize import of energy
• Define obligations for service to poor communities	• Manage registration for qualified users and retailers
• Authorize transmission & distribution infrastructure programs	
• Define conditions for national content in contracts	

- ❖ This seems unnecessarily complicated and the resulting uncertainty, lack of coordination or duplication of actions will discourage private investment



# Distributed generation

- ❖ The rules specify that regulated suppliers will pay a “regulated price” for surplus energy from distributed generators
  - ❖ I could not find information on how these regulated prices would be determined
- ❖ Unregulated suppliers can buy from distributed generators at “market prices”
  - ❖ It was not clear (to me) whether these are retail or wholesale prices
- ❖ It would appear that charges for power that owners of distributed generation take *from* the grid will be on the same basis as other consumers
- ❖ Retail prices contain an energy component *and* a network component
  - ❖ When all consumers are taking power 24/7 this does not matter
  - ❖ When some consumers do not draw power for some of most days, however, they end up underpaying for network services
  - ❖ If retail costs rise for remaining consumers, the incentive to self-generate increases
  - ❖ In a sunny country such as Mexico (or Australia) this implicit subsidy can lead to a dramatic increase in distributed generation and an escalation in retail prices



## Concluding remarks

- ❖ In general, the market mechanisms reflect many of the lessons learned from previous electricity market reforms conducted in other countries
- ❖ Given Mexico's current situation, it is important to attract private investment to expand the system
- ❖ I see three major issues:
  - ❖ The potential market power of the CFE subsidiaries
  - ❖ Continued government ownership compromising the ability to ensure costs are genuinely minimized
  - ❖ The regulatory structure appears to be unnecessarily complicated and may discourage private investors
- ❖ I also have some questions about the proposed mechanism for handling distributed generation