

Liberalizing Electricity Markets

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<http://www.econ.cam.ac.uk/dae/electricity>

Politically acceptable liberalisation requires:

- confidence in supply security
- sustainable competitive outcomes
- absence of market abuse
- ability to mitigate market power
- credible regulation for efficient free entry and investment

These challenges remain in EU

EU Energy Directives

- Electricity 96/92/EC due Feb 1999
- Gas 98/30/EC due Aug 2000
- ⇒ extend single market to energy
- ⇒ increased role of Commission
- ⇒ de-politicise energy policy
- ⇒ energy policy to be market friendly

Energy vs economic policy

- Tensions between energy policy and market solutions
- Liberalisation helped by benign circumstance?
 - Energy liberalisation worked in UK
 - collapse of communism ⇒ privatisation
 - US: unbundling ⇒ lower prices
 - ⇒ escape backward-looking RoR tariffs?

Energy policy for electricity

- Security of supply critical
- cannot store electricity - unlike oil, gas, coal
- local failures can have wide-area impacts
- security ensured previously by:
 - obligation to supply + reserve margins
 - franchise and vertical integration
 - imports on long-term contracts

Security of supply

- spare capacity aids liberalisation
- encourages competition \Rightarrow low prices
- liberalisation shortens contracts
 - threatens investment adequacy
- early liberalisers had spare capacity
- Britain developed regulation, licences
- Continent unprepared for Energy Directives?



A Single European Electricity Market?

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Lessons for Reform

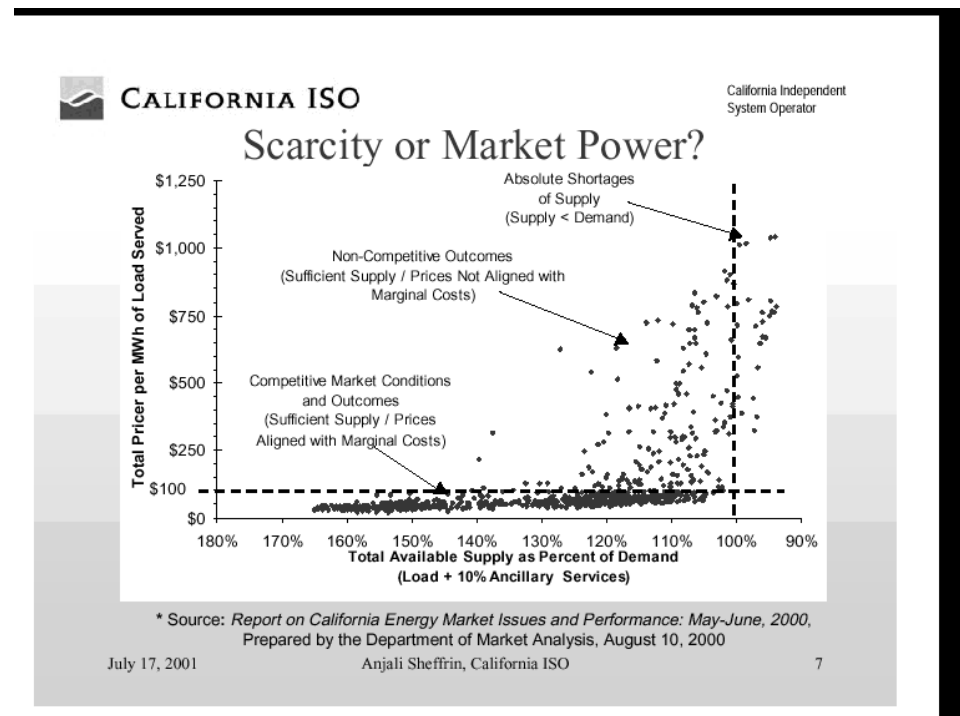
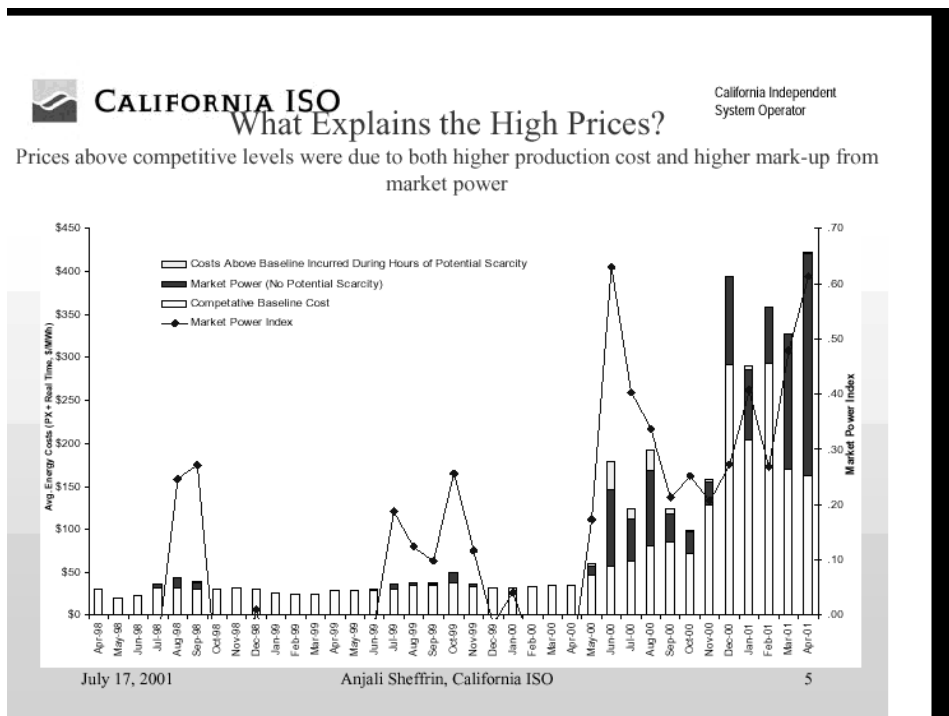
- authorisation preferable to tendering/SBM
- **access** is key to creating single market
 - press for rTPA
 - require transparency
- require ownership separation of G & T/D
- separate distribution and supply
- strong sector specific regulation needed

European Council response

- Lisbon 2000 European Council asks CEC to work to complete single ESI market
- CEC reaches same conclusion as CEPR
- Stockholm 2001 CEC presents
 - analysis: working papers
 - Press Release: ‘California not a problem’
 - proposed amendments to Gas+Elec Directives
- France and Germany oppose

What happened in California?

- 1996: cost of new power < regulated price
 - buy out stranded generation assets
- Price cap until then, expect price fall, *but*
- *average* 2000 wholesale price 3 x 1999
- Jan-Apr 2001 prices 10 x 1999
- distribution companies bankrupted
- State steps in at huge cost



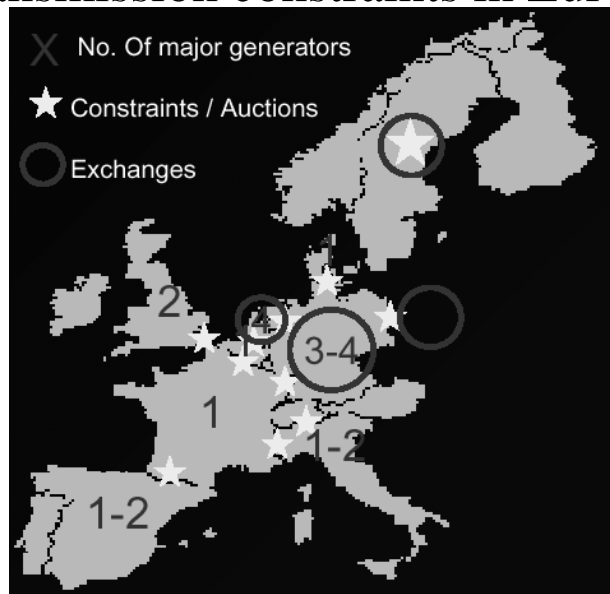
Responses to California

- ESC concerned at supply risks
- NRAs to monitor supply/demand balance
⇒ tenders if S/D inadequate
- security cost to be met by whole system
- improve interconnection, harmonise tariffs
- subsidiarity ⇒ CEC only if impossible

Competition problems in EU ESI

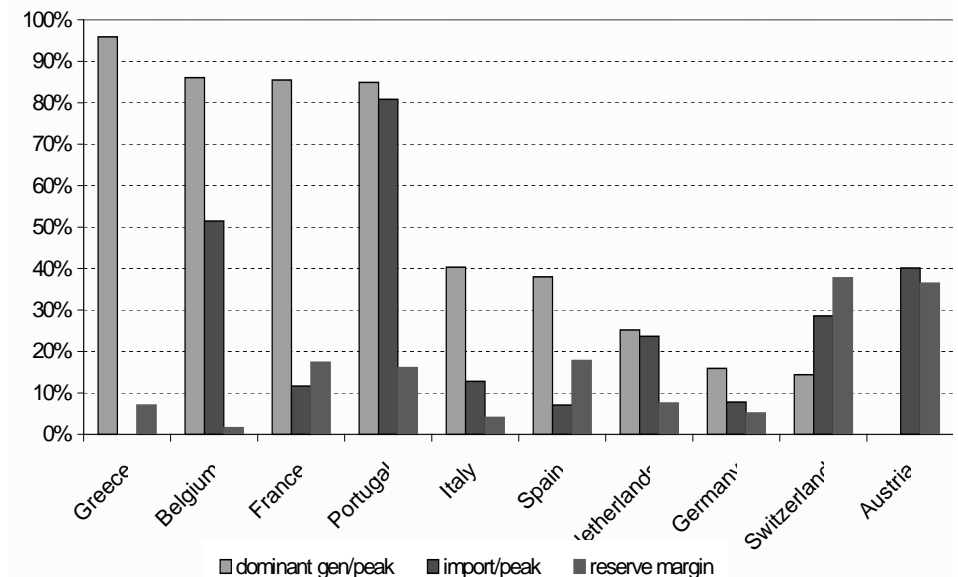
- dominant incumbents (Fr, Be, It)
- merger wave (EdF, E-on, RWE)
- inadequate interconnect transmission
- illiquid or absent wholesale markets
- under-staffed or no regulator
- access to information patchy
- lack of regulatory enforcement power

Transmission constraints in Europe

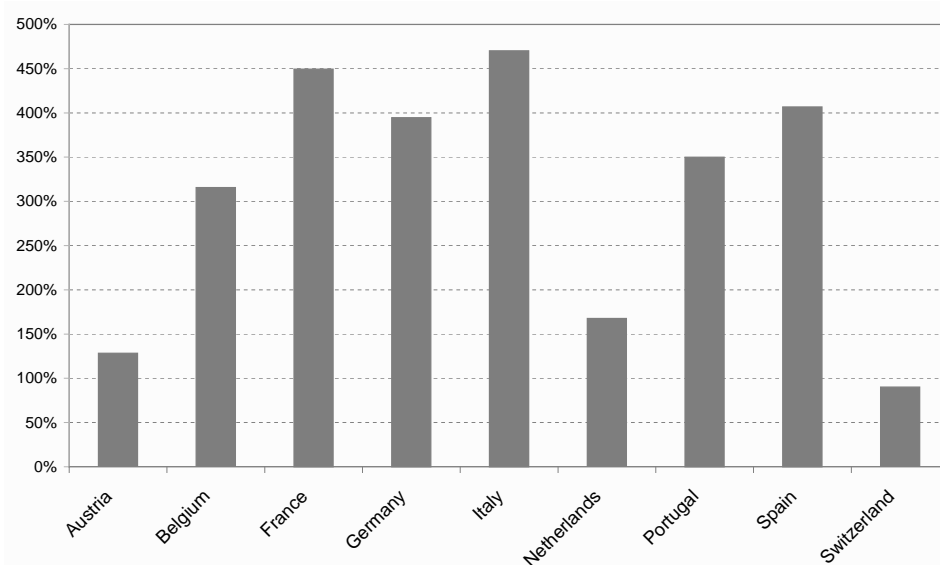


Source: Towards a Reliable European Energy Market, Presentation by B. den Ouden, APX, January 2001

Share of dominant generator in peak demand



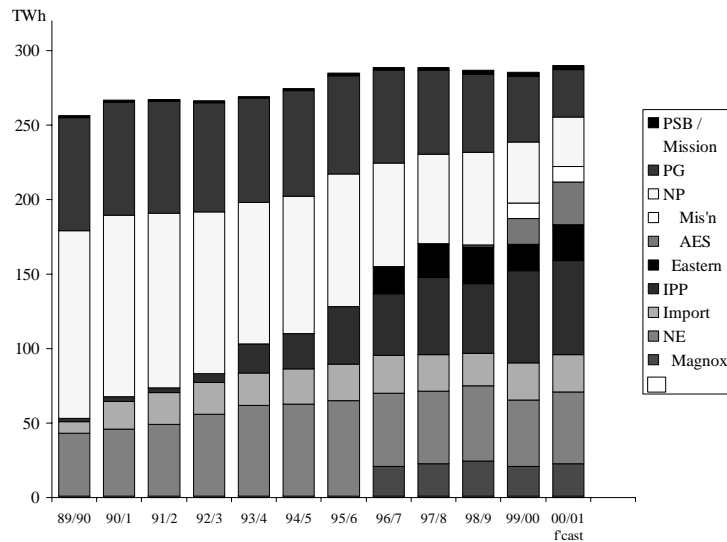
Ratio of largest generator to margin+imports



Why so much concentration?

- Energy policy vs market forces
- National champion to defend national interest?
- More policy control over dominant firms?
- Weak EU concept of 'market' and 'dominance'
- Britain shows importance of deconcentration
- Netherlands nearly merged 4 gencos into one!

Generation in England and Wales



Electricity prices by town: 3,300 kWh at 2000 prices excl VAT



Tensions in liberalisation

- variable cost ~ 50% average cost
 - $p = SRMC$ low unless margin tight
 - tight margins \Rightarrow low supply security
 - competitive market unacceptably volatile without long-term contracts
 - Supply competition reduces contract length
 - futures markets illiquid
- \Rightarrow investment risky in competitive markets

Response to risk

- market dynamics: \Rightarrow reduce risk, protect margins
- wholesale price risk: reduce by vertical integration
- investment risk: reduce by horizontal integration
- entry deterrence protects investment, margins

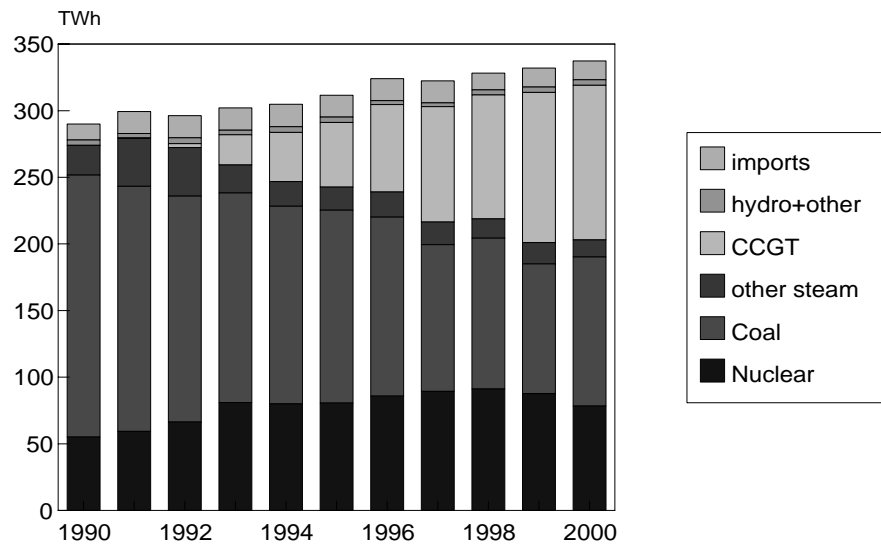
Without entry threats Gencos may

- Merge (c.f. Germany)
 - Reduce spare capacity (Germany)
- Contract cover demand driven \Rightarrow expensive
 \Rightarrow reduces cover \Rightarrow market power
- \Rightarrow Critical to minimise barriers to entry
– ownership unbundling of G & T

CCGT as the answer to liberalisation?

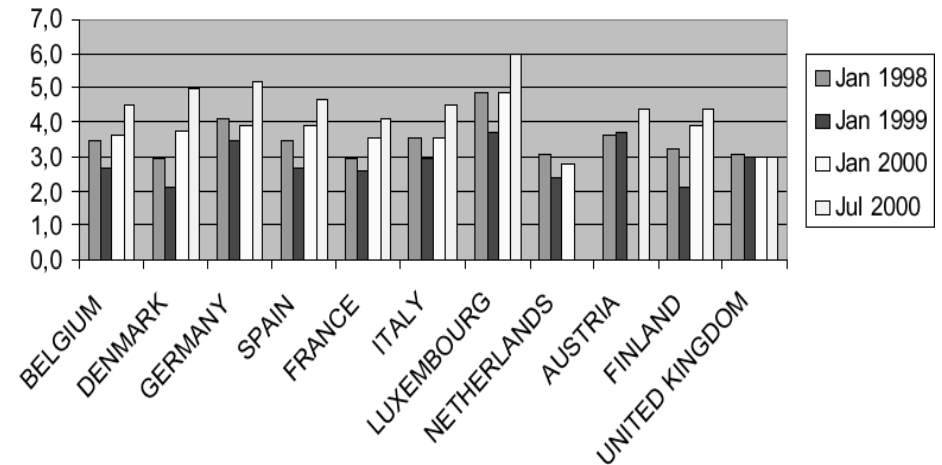
- High efficiency, low capital cost, fast build
- modest scale economies \Rightarrow IPP entry
- but economics depend on gas and electricity market design
- these are likely to be influenced by incumbents
- NETA as an example

Generation in England and Wales by fuel type



But gas prices are still linked to oil

Gas prices (excluding VAT and energy taxes) in € per GJ for industry



Contestable entry and gas liberalisation

- incumbent gas companies can
 - deny/delay access under nTPA
 - obstruct new imports
 - then price discriminate to extract rent
- gas balancing charges can distort electricity market

Benefits of gas liberalisation

- cheaper to move gas than electricity
 - ⇒ locate new CCGT near demand
 - ⇒ each country increases supply/demand
- reduces transmission constraints
- widens market, reduces concentration
- but is gas liberalisation even harder?

Increasing interconnection

- increases short-run security
- mitigates market power
- provokes cross-border mergers
- spare capacity becomes a public good
- California relied on other states for reserves

Decentralising security

- Suppliers to secure adequate reserves?
- Problem is length of contract
- Answer: retain the franchise?
⇒ yardstick contract regulation
⇒ requires more active NRAs

Environmental impacts

- liberalisation ⇒ lower prices, higher CO₂?
- Obvious solution = carbon tax
- practicality = 'green' energy
- country obligations ⇒ trade 'green' certificates
- CHP, wind disadvantaged by balancing markets
- wind requires more interconnection
⇒ competition benefits

Conclusions

- tension between competition and investment
- but oligopoly without entry threat reduces capacity
- gas liberalisation key to single electricity market
- otherwise maximise interconnection, ensure reserve adequacy
⇒ delay ending franchise?

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