

Regulatory Challenges to European Electricity Liberalisation

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*Regulatory Reform - Remaining
Challenges for Policy Makers*

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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 \Rightarrow privatisation
 - US: unbundling \Rightarrow lower prices
 - \Rightarrow 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 bounced into 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

EU 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

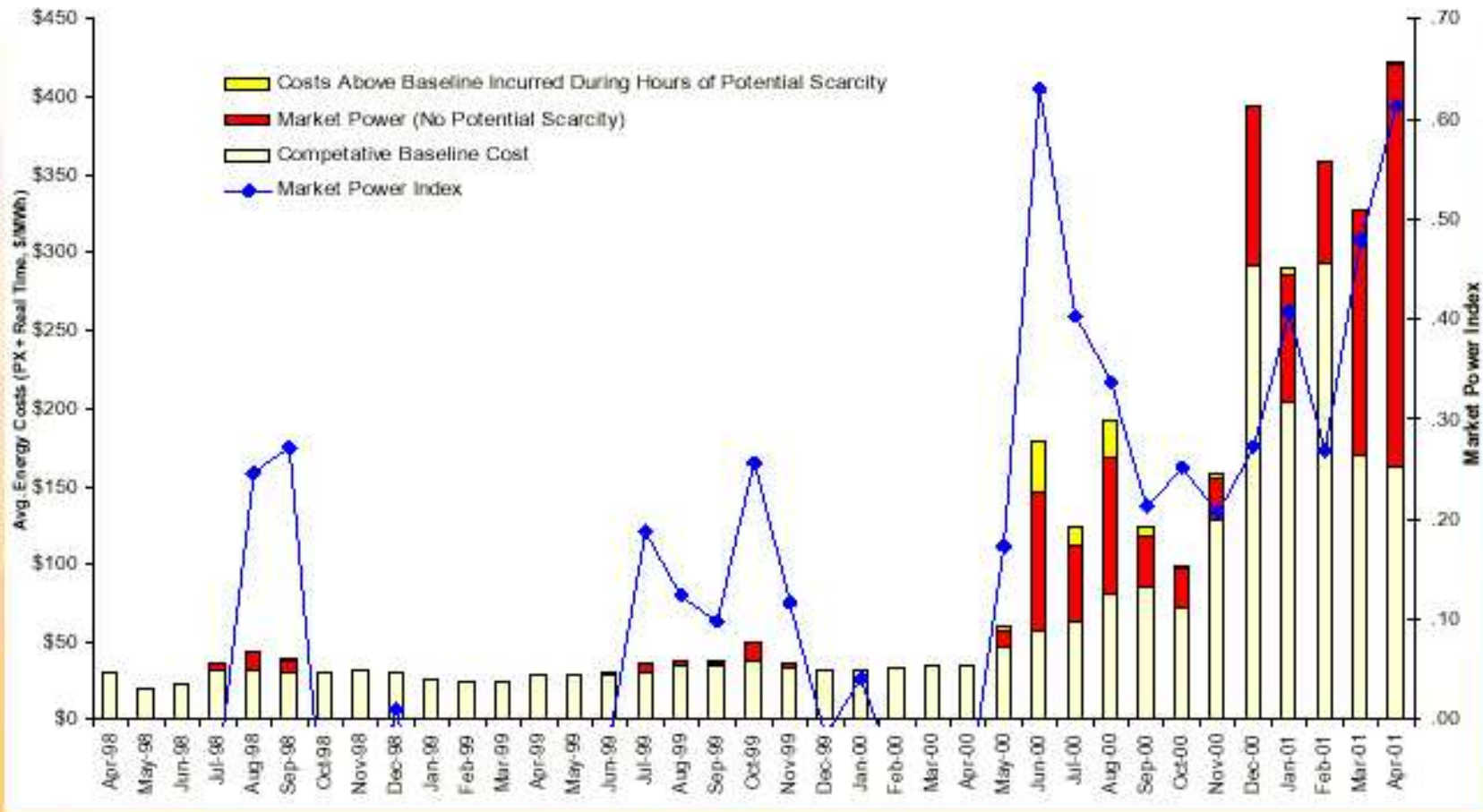
– buy out stranded generation assets

- 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



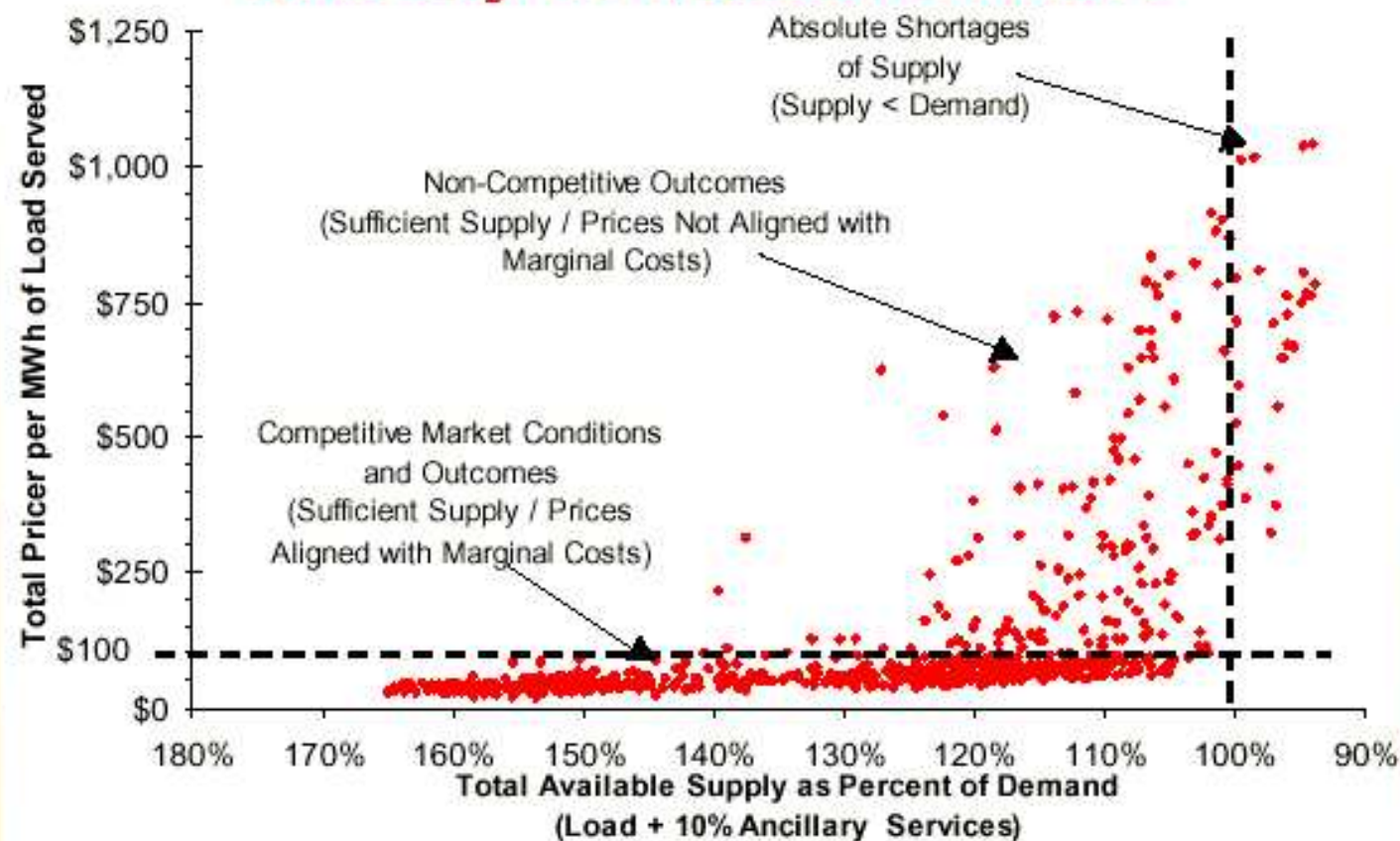
What Explains the High Prices?

Prices above competitive levels were due to both higher production cost and higher mark-up from market power





Scarcity or Market Power?



* Source: *Report on California Energy Market Issues and Performance: May-June, 2000*, Prepared by the Department of Market Analysis, August 10, 2000

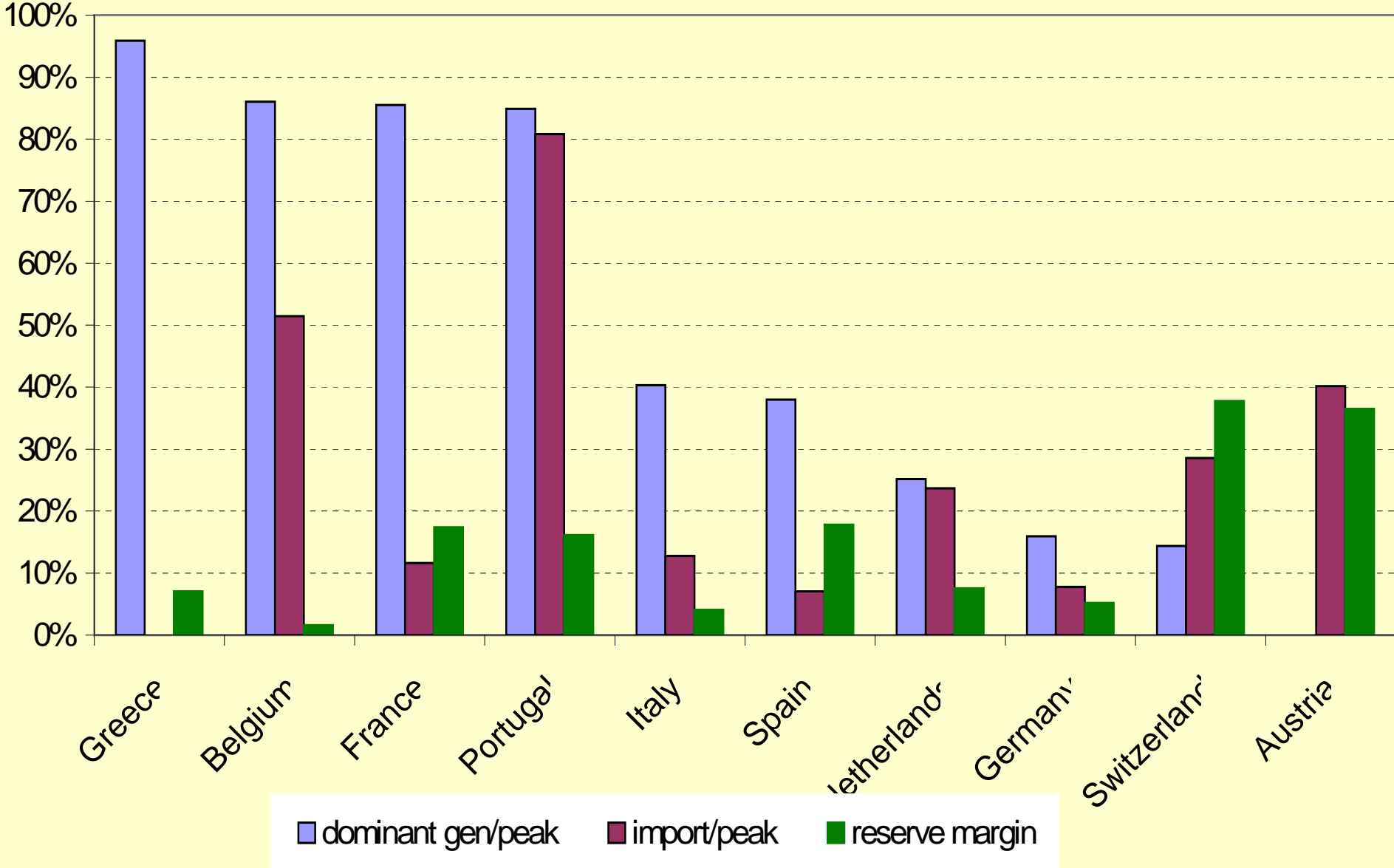
Responses to California

- 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, harmonised 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

Share of dominant generator in peak demand



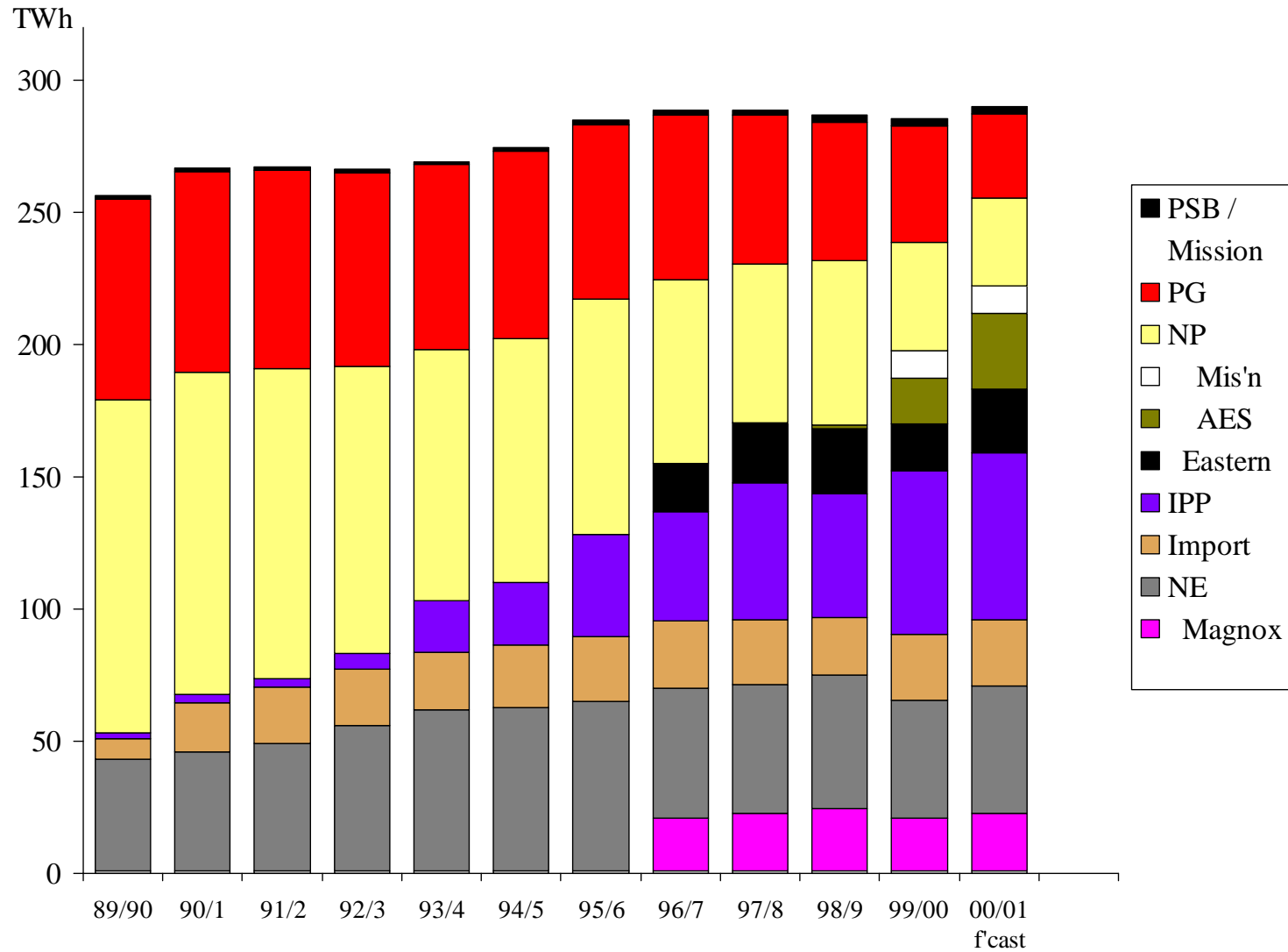
Ratio of largest generator to margin+imports



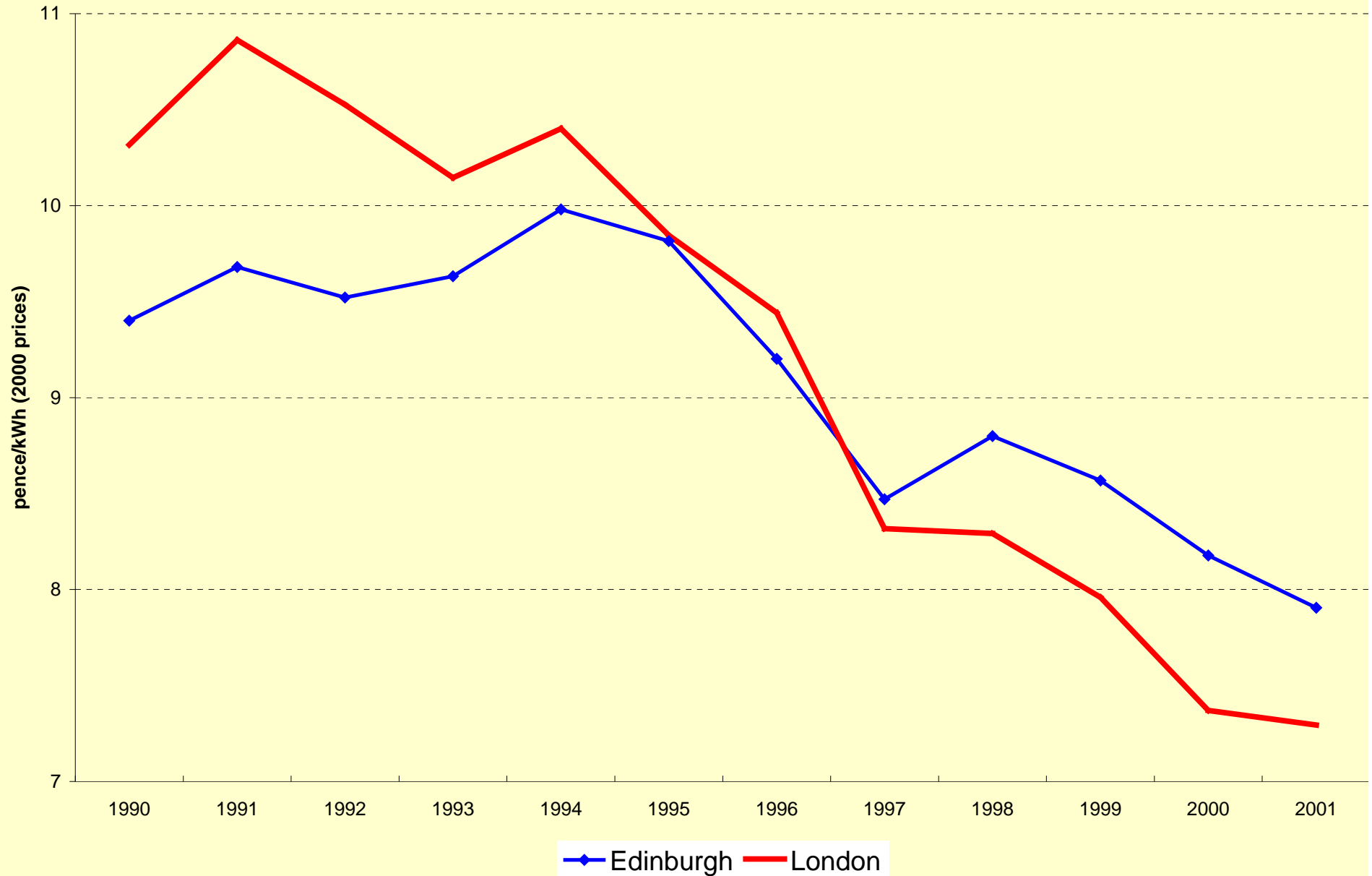
Why so much concentration?

- 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
- $p = \text{SRMC}$ 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

Response to risk

- market dynamics: pursuit of risk reduction and margin protection
- wholesale price risk reduced by vertical integration
- investment risk reduced by horizontal integration
- entry deterrence protects investment, margins

Without entry threats Gencos may

- Merge (c.f. Germany)
- Reduce spare capacity (Germany)

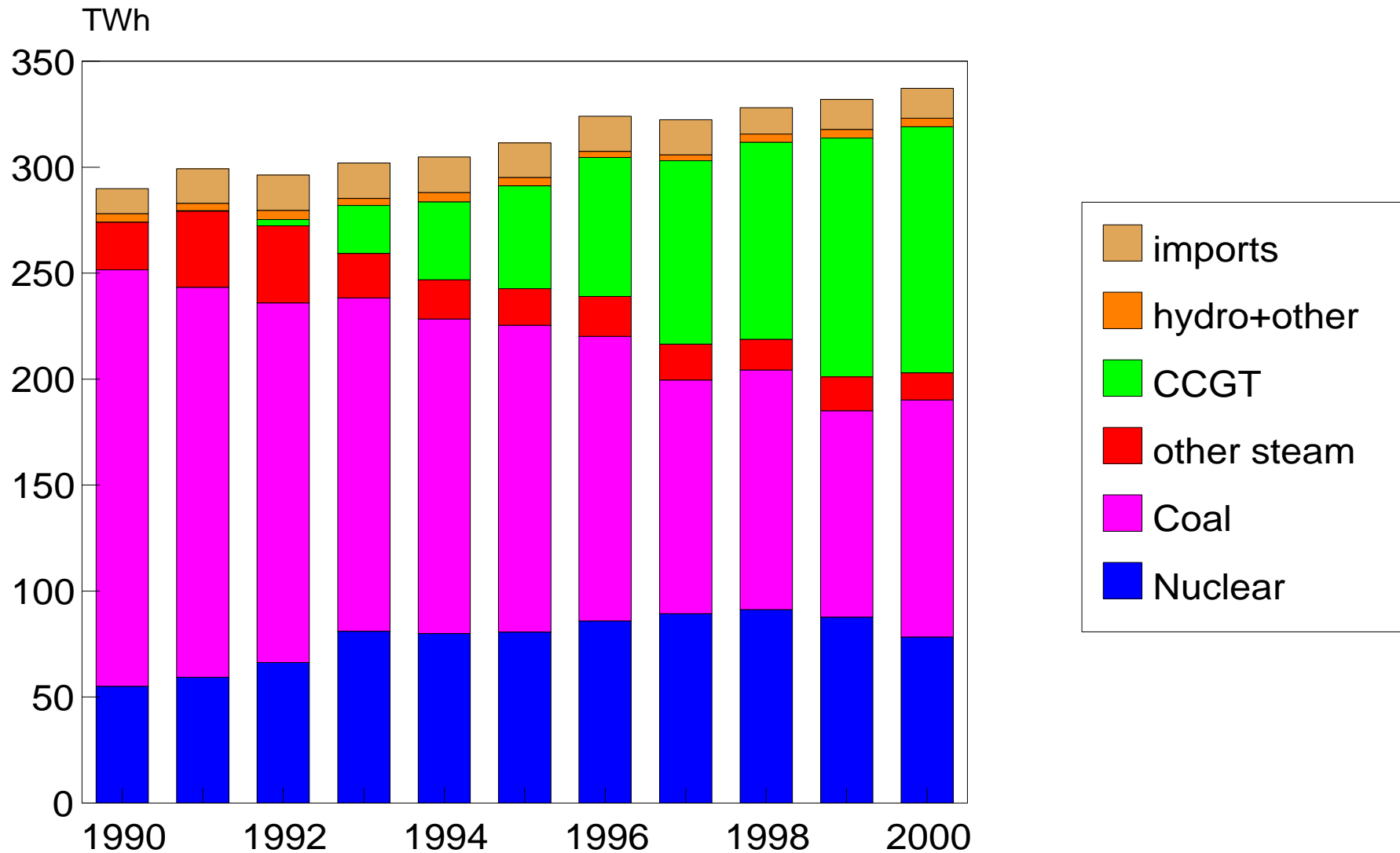
Contract cover demand driven \Rightarrow expensive
 \Rightarrow reduces cover \Rightarrow market power

\Rightarrow Critical to minimise barriers to entry
– ownership unbundling of G & T

CCGT as the answer to liberalisation?

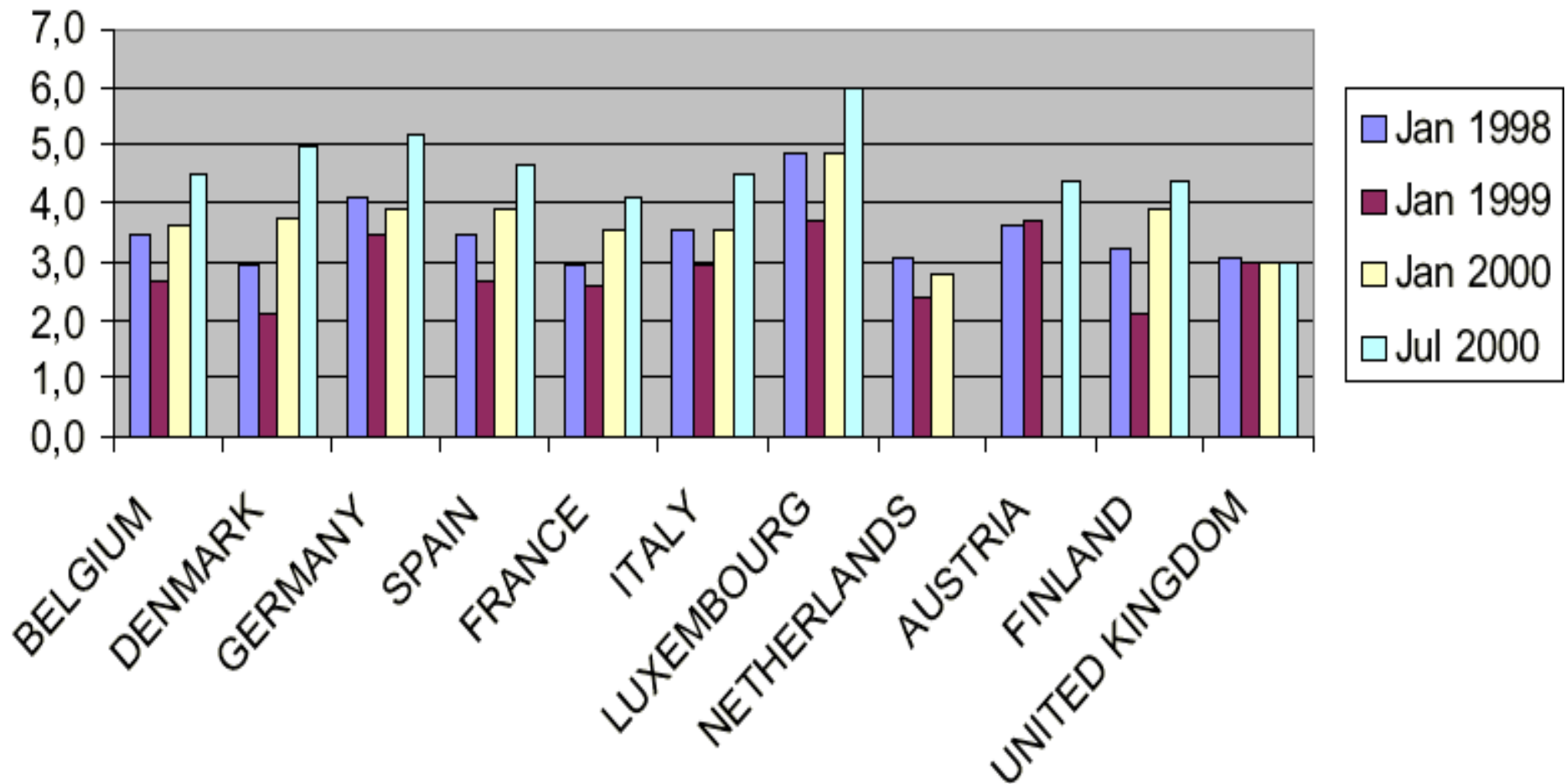
- High efficiency, low capital cost, fast build
- modest scale economies \Rightarrow IPP entry
- but economics depend on gas and electricity market design
- these are likely to be influenced by incumbents
- NETA as an example

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?

Managed unbundling

- Making markets competitive requires:
 - ownership unbundling
 - careful market design
 - attention to entry conditions
 - attention to security, reliability
 - ⇒ ‘excess’ capacity desirable
- hard to ensure capacity adequacy
- need to address resulting price risk

Dealing with market power

- desirable to reduce concentration
 - trend is in other direction
- desirable to increase spare generation
 - hard to sustain in liberalised market
- desirable to maximise extent of market
 - regulate for “excess” transmission - but how?
- Should TO's take account of market power?

Theory and evidence

- constraints increase after liberalisation
 - PJM, California - Borenstein
 - England and Wales
- Theory: Borenstein, Joskow-Tirole
 - Gencos bid to exploit constraints
 - increasing capacity reduces market power
 - withholding transport abusive

Competition concerns

- vertical integration \Rightarrow recover fixed costs via access charges to grid?
 - \Rightarrow low spot prices, entry deterrence, merger
 - Germany (Brunekreeft)
- Electrabel: 95% of Be, 30% of NL
 - vertically integrated in Be, no spot market
 - low cost but interconnector zero price

Single country solutions?

- Surplus T to maximise extent of market
 - requires careful regulation of investment
- Surplus G capacity for competitive prices
 - under-rewards capacity, deters entry, risks long-period price cycles a la California
- TO to secure reserve by capacity contracts?
- Firm capacity options (1-sided CfDs) or interruptible contracts \Rightarrow franchise or SB?

Federal solutions

- Spare capacity is a public good
 - importing countries can free ride
 - requires firm long-term import contracts?
- Hard for single SO to address market power
 - limit exporting G's to non-firm contracts?
 - Or place region under single SO?

Regulatory challenges

- Short-term stress on efficiency, competition may undermine capacity adequacy
- Adequate network can enhance competition
- Adequate G capacity needs 2-part charge?
- Easy with SB, hard with mobile customers
- Contracts require liquid transparent markets

Long-run equilibrium?

- Voting consumers with long-term contracts
 - secured by franchised Discos
- eligible buyers for supply competition
- Competitive generation requires:
 - Liquid pool+SMP as contract marker price
 - surplus transmission capacity
 - restrictions on G integration (& with D)

Business as usual

- Consolidation, market power through under-investment \Rightarrow capacity shortage
- Sustained high prices call for price controls \Rightarrow deters entry, requires capacity planning
- could threaten inter-regional trade \Rightarrow return to old equilibrium?

Optimistic scenario

- Evolve contracts to decentralise security
- strong anti-trust to protect competition
- Regulator ensures T and G reserve adequacy
 - security standards, long-term reserve contracts
- End franchise only on cost-benefit test
 - shown socially unprofitable in Britain

Environmental impacts

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