

Management of the energy (power and natural gas) sectors - from centrally planned systems to competitive markets

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Is energy „a special“ commodity?

- Crucial input to the economy (strategic in economic and military terms, control over the domestic resources, import dependency).
- Highly capital intensive (entry barriers, difficult operation)
- Economy of scale and benefits of co-ordination of production, transmission and distribution leading to vertical and horizontal monopolization.

Is energy „a special“ commodity?

- Importance of (imported) energy resources emphasized during the WWII.
 - Germany – coal (domestic resources + sources of France, Belgium, Poland and Czechoslovakia), oil (synthetic fuel technologies, campaigns to conquer sources of Romania, Russia).
 - Japan – limited domestic sources, occupation of Netherlands East Indies.
 - UK – imports from Middle East.
 - USA – sufficient domestic sources.
- Governmental control over the industry (coal, electricity, natural gas), especially in Europe.

Some specific features of electricity and natural gas

- Network (grid) = natural monopoly
- Electricity:
 - Lack of storage potential
 - High cost of outages
 - High variability of consumption
 - Lack of import dependence
- Natural gas:
 - Geopolitics
 - Gas chain
 - Storage and timing of actions

Traditional paradigm

- Model of government - energy industry relation that emphasizes stability, reliability of supply, and public service, where the role of a consumer is limited.

Essential characteristics:

- Exclusive rights to build and operate networks.
- Closure to competition.
- Detailed regulation.
- Remuneration based on historical costs.
- Centralized control over planning.
- Limited participation of consumers.

Ownership model of utilities

State-owned or privately owned but regulated monopolies.

- Poor accountability to consumers or shareholders, low sensitivity to customers needs, limited incentives to improve services. No customer choice.
- Limited incentives to engage in (technology) innovations.
- Price subsidies.
- Politicization of utilities – social, environmental aims, linkage to the governments.
- Risks borne by consumers (Overinvestment to ensure the security of supply).
- Lack of investments. (In growing economies governments with no sufficient resources).

(Economic) liberalization

- Fewer government regulations and restrictions in the economy in exchange for greater participation of private entities.
- Greater efficiency and effectiveness that would provide greater profit for everybody.
- Removal of controls, to encourage economic development.

Expected effects of liberalized (= competitive) market:

- Allocative efficiency – the resources invested in direction preferred by consumers. To reduce the risk of low or non-existing demand.
- Innovation - adjustment to changes of consumer preferences.
- Cost reduction – to keep the costs and prices down.
- Progress – country committed to competition enjoys advances in efficiency and utilisation of resources.

Drivers of change in regulatory paradigm

Started in around 1980, following the development in airlines and telecoms.

- Ideology and politics.
- Sympathetic regulators.
- Technology (gas turbines, now RES).
- Public debt.
- Inadequate investment in infrastructure.
- Poor accountability.
- Decentralized decision-making
- Curbing trade union power

Liberal paradigm

- Stresses a greater reliance on markets, introducing competition whenever possible, encouraging openness, decentralized production with network access, and profit based on the market prices, not costs (regulation for competition).
- Some basic characteristic:
 - Separation of activities to facilitate the competition (unbundling).
 - Freedom of entry and investment into competitive activities, instead of a centrally-planned approach.
 - Freedom of contract and competitive formation of prices.
 - Access to the network and infrastructure.
 - Supervision of the model by an independent regulator.

Liberalization and privatization

- Related but not interchangeable: in US, Germany and Japan private ownership before liberalisation. Similarly, Norway, Sweden, New Zealand or Australia substantial public ownership even within liberalised energy sectors.
- Sales of oil and gas assets in 1980s and 1990s – to get money for the governments. (but Middle East...).
- Chilean electricity industry in 1982
- UK domestic gas supply in 1986
- Changes in the EU
- China 2002 introduction electricity reform and reform of the coal industry, selling some assets.

Liberalization – pros and cons

- Prices are set by the market and competition drives prices lower vs. market pricing (manipulations with prices).
- Prices are 'real', reflecting the costs, demand, and supply vs. inability of some customers to buy them (public service obligation).
- Stress on profit (effective allocation of sources) may weaken the incentives to some investments vs. long-term stability, reliability and security of supply.
- Sources are not wasted on non-profitable projects vs. private utilities don't reflect the interests (social, environmental) of state.

California crisis of 2000-2001

- 1996 – grids opened to competition, unbundling of generation and transmission. 40% of installed capacity sold to independent power producers, obliged to buy electricity on DA market only.
- 2000 – wholesale prices deregulated, retail prices regulated. Producers gaming the market, retail utilities (Southern California Edison, Pacific Gas and Electric) had to buy their electricity, not being able to pass the costs to the customers. No incentives for saving.
- April to December 2000 – 80% increase in wholesale prices, rolling blackouts, costs of crisis about USD 40 billion.

Impact of liberalization

- Utilities are losing both their market share and political leverage.
- New entrants to the market – in production, supporting services, trading services.
- Governments limited in affecting the market.
- Trading organized via power exchanges/natural gas hubs, long-term contracts restricted.
- Significant role of the regulators.
- New role of customers.
- Increasing cross-border trade.
- Impact on prices (?) and effectivity (?) of the companies.

Liberalization not universal model

- In some regions (Middle East) national companies
- 25 out of 39 leading energy countries state ownership within their electricity sector
- In the downstream gas sector 16 out of 39 leading countries have public ownership of 50% or more in the largest gas distribution company
- State ownership at China's coal market

Impact on specific investments

- Smaller companies being more innovative and flexible?
- Nuclear not suitable for the liberalized market?

Impact on performance of the companies

- Positive impact of privatization/liberalization – profits, output, capital expenditure, labour productivity.
- Wolf and Pollit 2008 – 60 privatisation events of 28 national oil companies, Wolf and Pollitt 2009 partial privatisation of Norway's Statoil in 2001. Price and Weyman-Jones described improved productivity in 12 regions of British gas.
- Copenhagen Economics 2005 found industrial prices fell in the EU by 1% in the short run and 4-5% in the long run (natural gas), but Brau et.al. 2010 find no household price reduction impact in EU15.

Impact on retail prices

- Rather limited, with variety of intervening factors.
- Negative impact on electricity prices in some (developing) countries, esp. in terms of deliveries for subsidized poor customers. In Latin America tariff rebalancing post privatization leading to price increases for poorest.
- Copenhagen Economics 2005 found industrial prices of gas fell in the EU by 1% in the short run and 4-5% in the long run, but Brau et.al. 2010 find no household price reduction impact in EU15.

Impact on security of the energy sectors

- Who is responsible for security in energy?
 - LNG terminals in Poland, Lithuania
 - Capacity markets
 - Oil and oil product reserves