SP-SP Report

Regulation and Competition in the Spanish Gas and Electricity Markets

Summary of findings

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Aims and nature of the SP-SP Report

• Provides a review of competition and regulation in the Spanish gas and electricity markets, based on established economic principles of Industrial Organisation, antitrust, and regulation

• Sets the Spanish market in the broader context of the European debate on energy security and liberalisation

• Reviews evolution of regulation and competition policy since liberalisation, focusing on most recent reforms (2006-2007)

• Overviews performance of the gas and electricity wholesale and retail markets over the 2004-2007 period

• Provides detailed economic analysis of recent reforms of forward contracting (VPP, CESUR) and capacity payments

• Puts forward a number of policy recommendations
The European context

Energy dependence and security

• EU27 energy import dependence up from 44% in 1990 to 54% in 2006

• Driven by oil and gas imports

• Shift to gas-fired electricity generation a contributing factor

• Russia is largest gas exporter (40%+), with LNG still limited

• Significant investment in new LNG and pipeline projects

• Growing trade-off between energy security, environmental issues and competitiveness

Competition and regulation

• Energy Sector Inquiry of 2007 raised horizontal and vertical competition concerns

• Draft third legislative package promotes further unbundling – but current compromise solution appears weaker

• Active antitrust enforcement by the European Commission (e.g. Article 82 cases against several incumbents)

• Relatively strict merger control (EDP/GDP, E.On/MOL, Dong, GDF/Suez)
## The Spanish context

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<th>Quasi-structural features</th>
<th>Policy</th>
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<tr>
<td>• High energy import dependence (100% in gas and oil, and 81% total in 2006)</td>
<td>• Ownership unbundling of transmission networks</td>
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<td>• Weak physical interconnection with other countries in both electricity and gas</td>
<td>• Distorted wholesale electricity competition: CTCs and other regulatory interventions</td>
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<td>• Very rapid electricity demand growth since liberalisation (leading to significant gas demand growth too)</td>
<td>• Distorted retail electricity competition: subsidised tariffs</td>
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<td>• High levels of market concentration at liberalisation</td>
<td>• Effective wholesale gas competition through LNG-based entry</td>
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<td>• Increasing gas-electricity convergence (at wholesale level)</td>
<td>• Inconsistent application of merger control</td>
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<td>• Subsidies for renewable energy lead to very rapid expansion</td>
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## Recent policies in the Spanish market (2006-2007)

<table>
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<th>Policy</th>
<th>Description</th>
<th>Evaluation</th>
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<tr>
<td>1. Reform of allocation of tariff deficit (2007)</td>
<td>Allocates deficit to regulated element of tariff</td>
<td>Favours level-playing field in electricity retail. Does not address fundamental inefficiencies caused by the tariff deficit</td>
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<td>2. Removal of ETS windfall gains (2006-2012)</td>
<td>Removes gains to generators from the introduction of the European Emission Trading Scheme</td>
<td>Motivated by design features of the ETS (i.e. free allocation of permits) but policy also applied to generators with no permits. Ex-post application may be distortionary</td>
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<td>3. “Forced bilateralisation” (2006)</td>
<td>Assigns temporary price to ‘internal’ trades in spot market</td>
<td>Lowers wholesale prices in the short-term. Represented a distortionary policy which was not sustainable</td>
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<td>4. VPPs (2007- )</td>
<td>Imposes Virtual Power Plants on Endesa and Iberdrola from mid-2007</td>
<td>In principle can render the market more competitive. Limited size and imperfect design however limit effectiveness</td>
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<td>5. Procurement auctions (CESUR) (2007 - )</td>
<td>Distributors need to procure large volumes in advance through organised auctions</td>
<td>Unlikely to improve competitive conditions. Could be reformed over time to make the market more contestable</td>
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<td>6. Reform of capacity payment (2007 - )</td>
<td>Introduces separate payments for investments and availability</td>
<td>Continues policy of not relying on ‘energy-only-markets’. Payments are however still administratively determined.</td>
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Evolution of the wholesale markets (2007)

**Gas**

- Market relies heavily on LNG (>70% of volumes) which diversifies import base

- Gas demand growth from power sector very rapid
  - > 2-fold increase in 4 years
  - Currently accounts for more than 1/3 of total gas demand

- Gas Natural continues to dominate overall import procurement volumes (60%+)

- Most of gas demand consumes on market-based tariffs
  - Close to 90% in volume terms…
  - ...but lower in customer terms (<40%)

**Electricity**

- CCGT and wind capacity increasingly rapidly (+17GW combined in 4 years)
  - By 2011 CCGT and special regime could account for 2/3 of the market
  - Most system ‘flexibility’ in 2007 provided by CCGT (45%) and hydro (19%)

- New-build is making the market less concentrated but assessment also depends on market definition
  - Narrow market (ordinary capacity in Spain): HHI > 2,000 and C2 > 60%
  - Wide market (including special regime and/or MIBEL): HHI < 2,000 and C2 < 60%
  - Endesa and Iberdrola practically no longer pivotal in 2007 (but unclear how well this measure explains market power)
  - Price-setting segment of the merit order (i.e. CCGT) less concentrated (HHI = 1,600)

- Market integration with France and Portugal remains weak
Wholesale gas: market structure (2007)

LNG (280)
- Nigeria (97)
- Gulf (53)
- Algeria (50)
- Egypt (47)
- T&T (24)
- Lybia (9)

Pipeline (130)
- Algeria Tarifa (102)*
- Norway Larrau (26)*

Domestic market (408)
- Barcelona (70)
- Sagunto (59)
- Huelva (58)
- Bilbao (45)
- Cartagena (38)
- Mugardos (9)

Liberalised market (362)

Industrial market (206)

Electricity demand (142)

Regulated market (46)

Residential market (60)

* Excludes transit gas to third countries, domestic production and domestic storage flows

Figures in TWh

Source: Enagas
Wholesale electricity: capacity mix

GW

Source: REE; own analysis

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Wholesale electricity: output profiles 2007

Note: the duration of spot prices shows the average spot price realised in each decile of load (from the top 10% to the lowest 10%).
Source: REE; own analysis
Wholesale electricity: output shares by firm 2007

Spain (Ordinary)  | Spain (All)  | Iberia (Ordinary) | Iberia (All)
--- | --- | --- | ---
Endesa | Iberdrola | Unión Fenosa | Gas Natural | HC/EDP
35% | 29% | 31% | 26%
26% | 24% | 23% | 21%
16% | 13% | 14% | 11%
7% | 6% | 6% | 5%
7% | 6% | 6% |
6% | 6% | 6% | 5%
15% | 14% | 16% |
Source: REE; company reports; own analysis
Wholesale electricity: concentration indicators

Source: REE; company reports: own analysis
Wholesale electricity: pivotality*

* A generator is defined as *pivotal* when some of its capacity is required to supply aggregate demand (assuming that demand is price-inelastic)

Source: REE; company reports; own analysis
Wholesale electricity: market integration

- Interconnectors with France and Portugal remain congested (especially in 2007)
- Import capacity relative to peak demand is low relative to other major European markets
  - Spain: 7%
  - Italy: 13%, France: 14%, Germany: 13-23%.

Source: REE
## Evolution of the retail markets (2007)

### Gas

- Growing competition in industrial gas and CCGT
  - Driven by entry of electricity firms (Unión Fenosa, Endesa, Iberdrola)
  - Compares favourably to several other European markets

- Concentration at regional residential level remains high
  - 10% of customers have switched supplier in each region on average
  - 60% are still on regulated tariffs

- Limited signs to date of effective dual-fuel competition (probably due to the electricity tariff deficit)

### Electricity

- Large tariff deficits of 2005 and 2006 halted liberalisation process
  - At regional level on average 5% of customers were not served by the incumbent in 2007

- Reforms of 2007 appear to be reviving retail competition, but unclear whether this trend will continue in 2008

- Large tariff deficits continue to be accumulated when wholesale prices are high (e.g. 2005, 2006 and again 2008), which is not sustainable

- In the future, the regional gas incumbent (typically Gas Natural) may become an effective competitive force, if dual fuel offers become profitable
Retail gas – market shares (liberalised volumes)

Source: CNE
Retail gas – residential switching patterns in 2007

Source: CNE; own analysis
Retail electricity – evolution of tariff deficit

Source: CNE; own analysis
Retail electricity – switching to liberalised market

Source: CNE
Economic analysis of market design reforms: 
**VPPs and CESUR**

- Economic literature suggests that forward contract obligations (e.g. VPPs) can make concentrated markets more competitive under some conditions

- **VPP design issues are important**
  - **Size**: Forward contracts/VPPs need to be sufficiently large
    - Libro Blanco had recommended 5-6GW per firm at peak, whilst only a maximum of 1.25GW have been implemented so far
  - **Dynamic linkages**: Short and frequently repeated contracts can create dynamic incentives that reduce impact of VPPs
    - Generators face incentives to keep spot prices high in order to affect future VPP auctions
  - **Fostering “physical” entry**: Larger lots and fewer restrictions on buyers can allow entrants to use contracts to learn about the market and build a retail position
  - **Current design of VPPs in Spain can be improved in some of these aspects**

- **Procurement auctions (CESUR) also introduced in mid-2007 to encourage bilateral trading**
  - Affect potentially large volumes of energy: 30-40% of regulated demand
  - Auctions are voluntary for generators so they are unlikely to significantly improve wholesale market competition
  - Auctions could be reformed to procure energy on a longer-term basis (e.g. like capacity auctions) to facilitate entry both in wholesale and retail (“competition for the market”). These auctions could be designed to also improve pricing incentives in the spot market (e.g. if they are combined with contracts for difference) and can allow spot prices to converge towards the average cost of entry
  - Longer contracts could also help in retail tariff setting: improve predictability and stability of wholesale prices

ACE Madrid – 23 October, 2008
Economic analysis of market design reforms: *Capacity Payments*

- Previous *garantía de potencia* abolished in 2007 and replaced with *pagos por capacidad* (capacity payments)
- New system introduces
  - Investment incentives
  - Payment for availability
- **Investment incentive determined by a downwards-sloping “capacity demand curve”**
- **Issues for analysis**
  1. Long-standing (and complex) debate on capacity payments vs. energy-only-markets
  2. Why is the spot market not trusted to provide sufficient incentives for availability?
  3. Demand curve becomes downwards sloping at reserve index of 110% -- if this is the desired level for the reserve margin, why not procure this level directly through suitably-designed capacity auctions?
  4. Opens door for future capacity auctions: these could be used to procure energy on a longer-term basis to make the market more contestable
Policy recommendations

A. Encourage a balanced energy generation mix and demand control using market-based tools.
   Market-based mechanisms should be used to assess the benefits and costs of renewable technologies, and also value the case for clean-coal and new nuclear. This could reduce future dependence on imported gas.
   More efforts to encourage energy savings and demand-side responsiveness are also required.

B. Adjust electricity retail tariffs to eliminate the deficit and provide correct price signals
   Retail tariffs must be adjusted rapidly over time to bring them in line with market prices and prevent further accumulation of the deficit. This would send the correct price signals to consumers, especially if accompanied by time-of-use pricing.
   A secondary benefit would be to allow for more effective competition for residential customers.

C. Render market power mitigation measures in the generation sector more effective
   Even though market power in generation may be less critical now than it was when the market was first liberalised, there is still a need to improve market power mitigation measures. VPP contracts of greater size and duration are required.
Policy recommendations (continued)

D. Induce an efficient firm and market structure
   Remove artificial impediments to efficient corporate restructuring that are not based on sound competition policy.
   Introduce structural measures to improve competition where possible, e.g. greater interconnection with France and Portugal in electricity.
   Merger control and/or antitrust proceedings can also be used to improve the structure of the market.
   Need to open European-wide debate on role of state-owned energy firms in the energy sector.

E. Improve regulatory stability
   Multiple regulatory initiatives in recent past have contributed to regulatory instability. There is now a need to promote regulatory stability in the sector, with selected and targeted policy measures adopted to improve current framework.
   Competition policy needs to be based on effects-based economic principles, in line with European trend.
   Regulatory stability towards new generation investment and retail price controls should also be improved. Policy should be used to achieve and maintain an efficient energy market and not to pursue other objectives (e.g. inflation control).