Annex I

Liberalizing UK Energy Markets

Introduction

The UK experience of privatization, liberalization and creation of competitive markets both in electricity and gas is of particular importance for all European countries. The UK was a pioneer in this process, and is the country that has gone further in building a competitive structure.¹ Before the privatization and liberalization wave that started in the 1990s, both electricity and gas were concentrated in a national public monopoly. In England and Wales (population of 50 million and a peak demand of 49 GW) the industry was under public ownership from 1948 to 1990. The Central Electricity Generating Board (CEGB) operated all generation and transmission as a vertically integrated statutory monopoly, whereas 12 area boards acted as regional distribution monopolies.

The UK has spent more than 10 years to address the structural market problems in both the gas and electricity markets. Its experience shows that privatizing incumbents that have a strong dominant position in a network creates serious competition problems. It further shows that only continuous regulatory pressure that obliged the incumbents to divest assets while creating third party open access, through a Network Code, has allowed efficiency gains to pass through to consumers. Moreover, the creation of an open system of suppliers was extremely important in fostering competition among energy generators.

The first part looks at problems of privatization and liberalization in a highly concentrated market structure. The second part shows the contribution of building a

¹ They have the highest score in competitive markets among EU and G7 countries, according to Oxera (2006).
competitive supply and open access to the network in improving consumer welfare. The third part shows how the monopoly and competitive segments of the system have been separated, how regulation of natural monopolies has been carried out, and how the coordination problems have been solved through market signalling. The fourth part describes the recent energy crisis and how the market has responded. The two next sections show the importance of switching as a competitive pressure, and provide evidence of consumer benefits. Finally we conclude with some lessons.

(1) Privatization and Liberalization: problems of privatizing a highly concentrated incumbent

The Gas Enterprise Act of 1982 terminated the state British Gas Corporation (BGC) monopoly over the pipeline system. But no entry occurred, since BGC was able to foreclose entry. The Gas Act of 1984 transferred the business of BGC to British Gas (BG) and established a regulatory body (Ofgas). Gas privatization took place in 1986, with all the problems of a public monopoly turning into a private monopoly. BG had a large portfolio of long-term take-or-pay contracts, and the prospectus claimed that it had a 25 year control of about two-thirds of the market until 2009. In fact, BG owned transmission, distribution, supply, and bought gas on long-term contracts from North Sea producers and Norway, in addition to owning several gas fields. BG was able to abuse the dominant position. A report by the MMC found in 1988, and again in 1993, that there was extensive discrimination in the pricing and supply of gas to contract customers, prices being inversely related to switching costs of customers related to alternative uses; and that BG used information to identify customers of its competitors and maintained
its position as the sole purchaser of gas in Britain. The 1988 report also raised the
problem of storage that was in the hands of BG. The solution was to auction BG storage
rights, with no bidder or group of bidders allowed to buy more than 20% of the capacity.
We are now 10 years away from the start of liberalization and the effects on consumers
were not yet felt. The 1992 Act gave Ofgas new powers to regulate transportation and
storage, so the regulator started to exercise pressure on tariffs reduction. It was then that
BG undertook to set up a separate gas transportation and storage unit (BG
Transportation and Storage, later Transco) but still within BG. The MMC reports
prompted the minister to announce new legislation to introduce competition in the
franchise market, starting in the southwest in 1996 and extended to the whole country by
1998. By this time all customers were able to choose their suppliers.
The process of unbundling different services was explicitly introduced in the Gas Act of
1995, which does not permit a public gas transporter (PGT) to hold a gas supplier or
shipper license. In 1996, when the Act came into force, the assets and liabilities of BG
supply business were transferred to British Gas Trading, while BG was granted a PGT
license, with its duties set out in the Network Code. Further problems of vertical
foreclosure were also evident in the reluctance of BG to sell gas for electricity generation
in CCGTs, which was seen as a competitor in the consumer market. However, the
development of increasingly liquid spot and future markets created a serious alternative
to long-term contracts for producers and suppliers, and dramatically changed the
structure of the industry, as was the case in the USA.
Continuous regulatory pressure finally led BG to complete the unbundling. In February
1997 shareholders accepted the demerger. Centrica separated from the rest of the

---

2 Newberry, D. Deregulation and Restructuring in Gas, in Privatization, pp 364 and following.
company and owns British Gas Trading, British Gas Services, Energy Centres for retail trade. BG plc owned Transco and Exploration and Production.

The first phase of competition started in April 1996 in the SW of England with ten competing licensed gas suppliers. Over the following years only 25% of customers changed from BG, but lower prices resulted from spot and contract prices for new entrants, putting pressure on Centrica to reduce its costs.

(2) Unbundling and divestments: towards a less concentrated industry

The Electricity Act 1989 tried to correct the unsatisfactory experience of gas, and divided the CEGB of England and Wales into four companies: (i) National Power with 40 power stations with 29.5 GW; (ii) PowerGen with 23 power stations of 19.8 GW; (iii) Nuclear Electric with 12 nuclear plants of about 10 GW; (iv) National Grid Company with the high-tension grid, together with 2 GW of pumped-storage generation. There were also 12 distribution companies, known as the Regional Electricity Companies (REC). Almost all of the RECs became joint investors with smaller independent producers in building CCGT plants. The two companies of the Scottish system were privatized in 1991 as vertically integrated regulated utilities, and free to sell and buy in the English market.

The inflow of gas into the British market associated with the entry of independent power producers, and the high price of coal compared with gas, coupled with environmental concerns led to the collapse of the coal market and the closure of more than half the remaining deep pits when the coal contracts came up for renewal in 1993.

In the first three years of the pool operation the two major generators set the pool price 90 percent of the time, and as vesting contracts expired, pool prices kept increasing even

---

3 It also owned the Morecombe gas field, which accounted for 10% of gas supply, in order to offset the liabilities of the long-term contracts still in the books.
though fuel costs were falling. Faced with the reference to the Monopolies and Mergers Commission (MMC) to investigate their abuse of market power, the two major generators agreed to a price-cap on pool prices for 1994-96 and to divest about 13% of capacity, that they leased to the Eastern Group, the largest REC. This measure did not have much impact, because the duopolists included an “earn out” clause in the leasing contract that was intended to keep their previous merit order. Following the OFFER 1997-98 winter prices report, and another threat of a referral to the MMC, National Power and PowerGen were each required to further divest 4 GW capacity of coal-fired plants. A careful econometric study by Evans, Joanne and Richard Green\textsuperscript{4} proves that the divestitures undertaken during that period had a major impact in reducing market prices, as the following graph shows. Without divestiture prices would have been about 30 percent higher by 2003/04, whereas the increased capacity built in the meantime has lead to a further reduction of about 10 percent. This is a very powerful result in favour of structural competition.

\begin{center}
\textbf{Simulated prices and counter-factuals}
\end{center}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{graph.png}
\caption{Simulated prices and counter-factuals.}
\end{figure}

Source: Evans and Green.

Building a competitive market goes in waves, and sometimes there are clear waves of backlash. This was resisted by the government. In September 1995, PowerGen announced a bid for Midlands, and National Power responded with a proposed merger with Southern. Although MMC did not oppose, the government rejected the mergers, and announced that it would block any merger of the two largest power generators until “there is adequate competition in the generation and supply markets”.

It is also interesting that the first bid by a US company (Pacificorp) for a REC, Eastern, was referred to the MMC in 1997, after it had been cleared by both OFFER and OFT. The secretary of state, of a Labour government, rejected it, based on the fact that it raised regulatory issues.

Today the UK is one of the countries in Europe with the largest share of foreign owned electricity companies, showing that it is possible to operate an efficient system with open capital markets.

Wholesale market concentration levels were decreasing, due to entry and divesture (between 1990 and 1999 the number of generators selling through the pool increased from 8 to 38), but prices were not coming down enough. A new decision for pool prices increase was taken in 1999 in a document by Ofgem (1999). In this document, it was shown that new signs of abusive prices were detected in July 1999, leading to a Ofgem decision to propose a Market Abuse License Condition (MALC). This was a pre-condition to participate in the wholesale market, for those generators likely to have substantial market power. It established penalties for those generators which engaged in abusive behaviour. Eight power generators were required to include such licence amendments, of which two (AES and British Energy) refused to do so through a successful recourse to the MMC.
Ownership unbundling, that became effective in 2000, led to a significant increase in the gas network, as illustrated by the experience of the British Gas Group:

<table>
<thead>
<tr>
<th>Transco owned by BG</th>
<th>Units: Million £</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998-1999</td>
<td>191</td>
</tr>
<tr>
<td>1999-2000</td>
<td>140</td>
</tr>
<tr>
<td>Fully unbundled</td>
<td></td>
</tr>
<tr>
<td>2000-2001</td>
<td>228</td>
</tr>
<tr>
<td>2001-2002</td>
<td>239</td>
</tr>
<tr>
<td>2002-2003</td>
<td>182</td>
</tr>
<tr>
<td>2003-2004</td>
<td>159</td>
</tr>
<tr>
<td>2004-2005</td>
<td>128</td>
</tr>
<tr>
<td>2005-2006</td>
<td>360</td>
</tr>
</tbody>
</table>

Source: Lattice and National Grid Annual Accounts, cit in Lowe et al.

The annual average investment increased from £159 to £216 million, following full unbundling. This comparison should be subject to all kinds of caveats and is merely illustrative.

(3) The power of building a competitive supply and open access to the network

The pressure put through market competition due to opening up the whole consumers from the franchise sector, eventually led to the duopolists share of generation to fall from 54 percent in 1996 to 39 percent in 1999, almost the same share they have today. Other important changes were the takeover of London Electricity by EDF and RWE purchase of nPower, the retail branch of National Power.
As soon as the electricity and gas markets opened, electricity companies started to supply also gas and gas companies started to supply electricity. By the year 2000 this process was already well established, and in 2007 40% of potential customers have dual fuel contracts, with a significant upward trend as more consumers take advantage of joint offer discounts.


Table 1

<table>
<thead>
<tr>
<th>Group</th>
<th>Dec-02</th>
<th>Jun-03</th>
<th>Dec-03</th>
<th>Jun-04</th>
<th>Dec-04</th>
<th>Jun-05</th>
<th>Mar-06</th>
<th>Mar-07</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCT</td>
<td>22%</td>
<td>23%</td>
<td>24%</td>
<td>24%</td>
<td>23%</td>
<td>22%</td>
<td>22%</td>
<td>22%</td>
</tr>
<tr>
<td>Powergen</td>
<td>22%</td>
<td>22%</td>
<td>21%</td>
<td>21%</td>
<td>21%</td>
<td>21%</td>
<td>20%</td>
<td>19%</td>
</tr>
<tr>
<td>SSE</td>
<td>13%</td>
<td>14%</td>
<td>14%</td>
<td>15%</td>
<td>15%</td>
<td>16%</td>
<td>16%</td>
<td>18%</td>
</tr>
<tr>
<td>npower</td>
<td>16%</td>
<td>16%</td>
<td>15%</td>
<td>15%</td>
<td>15%</td>
<td>15%</td>
<td>15%</td>
<td>16%</td>
</tr>
<tr>
<td>EDF Energy</td>
<td>15%</td>
<td>15%</td>
<td>14%</td>
<td>14%</td>
<td>13%</td>
<td>13%</td>
<td>13%</td>
<td>14%</td>
</tr>
<tr>
<td>ScottishPwr</td>
<td>10%</td>
<td>10%</td>
<td>11%</td>
<td>12%</td>
<td>13%</td>
<td>13%</td>
<td>13%</td>
<td>12%</td>
</tr>
<tr>
<td>Others</td>
<td>0%</td>
<td>1%</td>
<td>1%</td>
<td>0%</td>
<td>0%</td>
<td>1%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Source: Electricity distribution companies


Figure 1

Source: Domestic gas suppliers and electricity distribution companies

The gas markets experienced also a significant restructuring, but British Gas has been able to retain a clear lead in the market, as the following table shows.

Table 2

<table>
<thead>
<tr>
<th>Group</th>
<th>Dec-02</th>
<th>Jun-03</th>
<th>Dec-03</th>
<th>Jun-04</th>
<th>Dec-04</th>
<th>Jun-05</th>
<th>Mar-06</th>
<th>Mar-07</th>
</tr>
</thead>
<tbody>
<tr>
<td>BGT</td>
<td>63%</td>
<td>62%</td>
<td>61%</td>
<td>59%</td>
<td>57%</td>
<td>53%</td>
<td>52%</td>
<td>47%</td>
</tr>
<tr>
<td>Powergen</td>
<td>12%</td>
<td>12%</td>
<td>12%</td>
<td>12%</td>
<td>13%</td>
<td>14%</td>
<td>13%</td>
<td>13%</td>
</tr>
<tr>
<td>SSE</td>
<td>6%</td>
<td>6%</td>
<td>7%</td>
<td>8%</td>
<td>8%</td>
<td>9%</td>
<td>10%</td>
<td>13%</td>
</tr>
<tr>
<td>npower</td>
<td>9%</td>
<td>9%</td>
<td>9%</td>
<td>9%</td>
<td>9%</td>
<td>9%</td>
<td>10%</td>
<td>12%</td>
</tr>
<tr>
<td>ScottishPower</td>
<td>5%</td>
<td>5%</td>
<td>6%</td>
<td>7%</td>
<td>8%</td>
<td>9%</td>
<td>9%</td>
<td>9%</td>
</tr>
<tr>
<td>EDF Energy</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
<td>6%</td>
<td>7%</td>
</tr>
<tr>
<td>Others</td>
<td>0%</td>
<td>0%</td>
<td>1%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Source: Ofgem, DRMR, March 2007

(4) Regulating the monopolies component and solving the coordination problem

An essential element of the liberalization of any electricity market is the way prices are set and resources allocated accordingly. Market design had to answer three major issues: (i) it should deliver the “merit order”, i.e., the least-cost system for dispatch; (ii) ensure stability and security in a decentralized system, i.e., “whether the lights would stay on”; and (iii) solve the long-term problem of choosing the type and location of power stations and transmission reinforcements on an efficient way. The original system was a single UK Electricity Pool that preserved the CEGB rules for dispatching power stations, including the GOAL (generation ordering and loading program) scheduling program, based on engineering concepts. The most important difference was that the system was operated based on market information submitted by the companies acting commercially rather than using the technical details of station performance. The Pool operated for almost ten years and up to 2001 as a daily, day-ahead, sealed bid auction. Every morning before 10 am, generators must declare which of their generating sets will be available the next day
and announce five prices for start-up, no-load and three ranges of output. The market was run as last-price auction in which the system marginal price (SMP) is set equal to the bid price of the most expensive generating set called on in the last half hour. This system would work in a competitive setting. However, with the market power of the duopolists, they managed strategically capacity in order to raise prices of the marginal plant and thus increase the revenue earned by all of its infra-marginal plants. In addition there were capacity payments for each unit of capacity declared available to generate. Green and Newberry (1992) showed that switching from 2 to 5 equal-sized operators changes dramatically the supply function, making it converge towards marginal cost when there was a low level of demand.

The New Electricity Trading Arrangements (NETA) introduced in March 2001 solved most of the problems and wholesale prices over the first year fell by 20 percent. NETA created a market where electricity is traded like any other commodity through bilateral contracts, agreed either on power exchanges or between two contracting parties. The National Grid Company (NGC) operates the balancing mechanism to ensure system security. Generators or suppliers that are out of balance are charged fees based on the additional costs that NGC has to incur to keep the system under continuous balance. In April 2005, the British Electricity Transmission and Trading Arrangements (BETTA) were introduced to enable a single GB wholesale market. National Grid became the sole system operator. The present arrangements are based on bilateral trading between generators, suppliers, traders and customers across a series of markets operating on a rolling half-hourly basis. Generators self despatch their plant rather than being centrally despatched by NGC. Forward and Futures contracts markets for delivery of electricity operate from a year ahead or more, ahead of real time, and short-term bilateral markets (Power Exchanges) tends to concentrate in the last 24 hours. The Balancing Mechanism operates
from Gate Closure (1 hour before delivery) through real time, and ensures that supply and demand can be continuously matched in real time. It is operated by NGC, acting as the sole counterparty to all operations, and operates on a “pay-as-bid” basis. All participants are required to inform National Grid of their net physical flows in both the Forwards and Futures Contract Markets and Power Exchange. Initial Physical Notifications (IPNs) are submitted at 11.00 am at the day ahead stage. Finally we have the Imbalances and Settlement phase. Power flows are metered in real time and imbalanced volumes are settled at a System Buy Price or System Sell Price.

The current price system, at wholesale level is based on zone pricing that is an aggregation of nodal pricing. Brunekreeft, Neuhoff and Newberry (2004) conclude that signalling the efficient location of generation investment requires a system of a competitive Locational Marginal Pricing (LMP) coupled with deep connection charges. However, the problem of determining nodal pricing is cumbersome, so in practise the system has evolved to zone pricing. For 2004-5 the annual zonal G tariffs range from £10.7/kW to -£6.8. NGC uses two types of tariffs: (i) connection charges; and (ii) use of system charges, that aggregate a use of transmission system charge and a balancing charge. The system charges are computed for marginal investments required for generation and load at each node, based on an optimized system, and a set of 15 generator nodes. These charges are constrained by a price-cap regulation by Ofgem. So far, this system has generated enough investment in both production and transmission.

NGC also makes 7-year plans for investments, that submits to the regulator, subject to three criteria: availability (supply and demand), reliability, and quality of service. The balancing and losses targets are established by Ofgem. If NGC beats the target it keeps 60

---

5 The subsidy is paid to hydroelectric plants in Scotland.
percent of the savings, otherwise it has to compensate customers with 50 percent, with a cap and a collar.

In the last price review by Ofgem, for the period 2007-12, the RPI-X rule produced an increase of 8 percent, levelling off to 2 percent. The level of investment for Britain’s gas and electricity transmission systems over the next five years will be £5 billion, the double of the previous period, in order (i) to enable network operators to “maintain the current high levels of performance” and replace aging assets, (ii) help meet climate change objectives by connecting and delivering more low-carbon generation, and (iii) increase security of gas supplies by building and improving connections to new import and storage facilities. A safety net for consumers will trigger a revision mechanism, should investment fall more than 20 percent below plan. The rate of return on capital, in real terms, and after tax, is 4.4 percent. As Figure 2 shows, investment in the energy industries is picking up strongly in 2006, after the fall in 2001-2004.

Figure 2

(5) The Present Energy Crisis and the Market Response
To provide the right signals to the market it is crucial to allow the price mechanism to operate in order for the supply and demand agents to take the right decisions and allocate their resources efficiently. The price mechanism will also enable the security of supply to be maintained in both the short-term – a price spike may help bring the system into balance, otherwise we need to introduce rationing or the system will collapse - and the long-term giving the right incentives for investment and energy conservation. When the system is short of energy, the System Operator (SO) enters the market to purchase additional energy, normally at an increasing price. This price rise conveys information about the shortage to all participants in the market. Price sensitive customers respond by reducing consumption.

Longer-term price signals allow investors to estimate the expected returns of infrastructure projects busting additional energy to the market. Lead time may take 2 to 3 years in CCGT and 4 to 8 years in nuclear power. In the UK case some higher cost plants that were mothballed responded by being reactivated just in a couple of months.

Provided barriers to entry are low, higher prices will lead to investment in additional facilities, leading also to improved security of supply. Where arrangements are centrally planned, important information regarding consumer preferences – willingness to pay for energy supply – is not revealed, and allocation is clearly inefficient.

Since 2004, and especially over the winters of 2005-06 and 2006-07, there were serious shocks to the system. Gas prices to domestic consumers increased 32 percent from September 2004 to March 2006, and following the winter season their rise did not abate and continued to increase a further 35 percent up to the peak in February 2007. All the other fuels also had a substantial increase.
One of the main reasons for the tighter market has been the strong decrease in gas reserves, with production peaking in the late 1990s and starting to decrease in this decade. There were also additional short-term supply problems, with a fire in the Rough offshore platform (Feb 2006), causing a decrease of 10 percent on the peak demand day. Following
this incident there was a cold snap leading to high levels of demand. The market responded to these price increases with a combination of higher flows from other storage facilities and flows from LNG storage.

Figure 5

Net imports from the Continent increased, more than doubling 2003. Ofgem has raised the issue, on several occasions, with the Commission, that not enough gas was being made available in the market for imports to GB, and is calling for an increase in the interconnection with the Netherlands and Norway, and for further liberalisation of the gas markets.⁶

Figure 6

⁶ In fact, in 1995 the UK ranked third within the EU-15 with the lowest domestic gas prices, with 20.5 percent less than the EU average, before taxes. In 2006 it ranked 7th with prices equal to the average. Including taxes, UK prices ranked still the third lowest.
Over the winter 2005/06, gas-fired power stations provided over 40 mcm/day of additional gas supplies by switching to coal or distillate in response to the high and volatile prices experienced. This supply was equivalent to the Rough facility. Demand has responded with substantial savings: domestic users have cut consumption by about 10 percent in the last 2 years, and industry by 23 percent since 2000.

The long-term response to the problem has been an increase in investment in gas supply infrastructure, including £6.4 billion in additional offshore infrastructure to bring new supplies, new 43 bcm/year LNG import capacity, and doubling of storage capacity. Two new pipelines have also started operation: Langeled and the Balgzand-Bacton (BBL), with and additional capacity of 40 bcm. By 2010 gas import capacity would be equivalent to 49 percent of peak demand.
Nodal pricing in gas is also redirecting the network to E-W orientation from a N-S system, as gas reserves are being depleted, and the UK will have to rely more on Russian and Norwegian gas supplies, as well as LNG:

(6) The competitive market at work: importance of switching

The UK is the outstanding case in Europe of creating conditions for new entrants to gain access to the market, both in electricity and gas, with a major step occurring in 1998-99 in gas and in 1999-2002 in electricity. The Electricity Act of 1989 set out a timetable for introducing competition into supply. At privatization the customers with more than 1 MW demand were defranchised. In the first year of this measure the RECs lost two-fifths of their sales in volume. In 1994 the franchise limit was lowered to 100 kW and from 1998 all customers were freed. Offer (1998) estimated that by 1996-97 the RECs were supplying less than 30 percent of demand in their local market.

Figure 7

Figure 7.1: Market share of entrant suppliers (March 2007)

Source: Domestic gas suppliers and electricity distribution companies

---

According to the latest numbers published by Ofgem there are about 20 percent of customers that switch, on average, of supplier, per year. The net loss of incumbents in both electricity and gas is about 10 percent per year, and the rate of switching between non-incumbent suppliers is about 12 percent, which demonstrates a high rate of customers that shop around for the best price. Consumers can switch every month and a large number do it by a simple click in the internet.

(7) Prices and margins: evidence of a competitive market

Figures 3 and 4 show the evolution of prices and costs in the energy markets. Figure 3 shows the real prices to consumers (Ofgem standard annual bill for a consumer) of electricity and gas and the prices of fuels deflated by the CPI. Both retail prices show a downward trend since privatization. At the end of 2000 and beginning of 2001 consumers were paying about 27 percent less than in 1990 for gas and electricity. Afterwards both prices started to increase due to fuel price raises, with a larger increase in gas. However, the impact on final consumers was much lower than should have been expected.

---

8 DRMR, March 2007.
One way to investigate the impact of fuel prices on consumers is to estimate the margin between a weighted average of fuel costs\(^9\) and the retail price. This index reflects quite a number of factors, like the improvement in efficiency of producers, changes in the fuels mix, and impact of competition on wholesale and retail margins. But a significant part of the effect has certainly to do with the competitive pressure that was amply documented before. Figure 4 reports to the electricity sector. It shows that just after the privatization the situation worsened, because the unsatisfactory competitive structure; a private monopoly is worse than a public monopoly. After the peak in 1994, margins started to decrease until around 2000, due to implementation of regulatory measures and to the

---

\(^9\) Due to the problems with the coal sector in the UK, we took the border price equivalent of coal, computed as the international price.

Source: Gas and electricity-Ofgem, DRMR, 2007; UK Coal-DTI and WTI for Oil.
regulatory pressure on incumbents. Except for the 2000-2002 episode, that may have been the result of a collusive outcome, it is clear that it was the steady entry into the supply of both electricity and gas that led to the large decrease in margins in the following period. The recent reversal is a result of major rebalancing that is need in the eve of British gas reserves depletion and the need for major investments required for

Figure 9

![Index of the gross margin in the electricity sector](image)

Source: Calculations by author.

restructuring supply in the context of the present energy crisis. The present crisis is a unique test of the reliance of the system. Market outcomes clearly show that the system has responded well with all agents sharing the costs and in the end the outcome was beneficial to consumers.

(7) What conclusions can we take from the British experience?

The creation of an independent TSO with incentive regulation had an immediate important impact, with real transmission charges decreasing 30 percent between 1993 and 2005. Newbery and Politt (1997) studied also the welfare impact of the privatization of
CEGB with data covering only a restricted section of our analysis. Even so they conclude
that the net social welfare gains amounted to £4.8 billion, coming mainly from the
increased efficiency of generating plants. A similar exercise repeated today would have
computed a much higher figure, given that the competitive environment has improved
dramatically relatively to the 1990s. This exercise covered only the privatization
component.

It is not enough to carry out the unbundling of the electricity and gas incumbents. It is
essential to build an open access network. It is very difficult to solve problems of abuses
of dominant position using antitrust law. Those are structural problems that can be
solved only by having enough firms to compete.

Divestment through leasing may be used for collusion between the original firm and its
“subcontractor”: contracts can be written in such a way that they preserve the market
power of the firm that has the dominant position and is required to divest.

Electricity markets are very tricky: in markets dominated by a small number of firms they
can use explicit or tacit collusion to segment markets (by hours) and then control prices
in order to keep high margins. There are high incentives for a small number of firms to
collude, especially when all preconditions are present: market transparency, repeated
communication in a continuous market, and capacity to discipline a deviant firm.

It is not enough to have a large number of firms. In electricity markets, market power has
to be controlled at different times of the day, because congestion markets become
fragmented and dominant players can exploit their market power. Congestion also poses
a problem in gas markets. This means that there should be a system of pricing the flows
in tandem with a system to price transmission/congestion.
There is no compelling need of a one-price rule throughout a given country. Wholesale and as a consequence consumer prices should reflect effective costs at each location and time.

In a pool system, price according to bid is preferable to a single price determined by the highest bid, due to strategic bids that can be placed by participants with market power. Finally, unbundling is efficient and was the most important step in the whole process. Coordination problems have been solved through the market mechanism and market information led by the regulators, and they are of a second order of magnitude compared with generation costs and getting the competitive structure to work.