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Retail Markets in the Electricity Industry: An Overview
First Part: Retail Competition Results

(Working Paper from the Florence School of Regulation)
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Introduction

In the “second” guideline of 2003, Member States of the European Union agreed that all of their electricity retail markets would be open by July of 2007. As a result, these markets now represent the final frontier in electricity reforms.

Compared to wholesale markets, which have become part of the landscape, electricity retail markets have a lower profile and are the subject of fewer studies. On the one hand, the experience is much more recent, with only five to seven years of retail competition compared to ten to fifteen years for wholesale competition. Thus, Great Britain, whose retail market remains a benchmark, only fully opened this market in 1999, close to ten years after opening its wholesale market. On the other hand, the retail market experience affects fewer countries. In Europe, outside of Great Britain only the Nordic countries show an interesting experience in terms of their approach to retail competition. The German market, though open since 1998, has not yet been definitively implemented.

Also, these new retail markets are not particularly respected by all economists specialized in electricity markets, even among the American and the English. P. Joskow of MIT is known for having maintained, since 2000, that retail markets cannot play a key role in electricity reforms, and that wholesale markets are capable of ensuring most of the major functions of these reforms. D. Newbery (Great Britain) and F. Wolak (United States) have also expressed disappointment in the results.

The first result expected from the opening of retail markets can certainly be characterized as structural. First of all, the dominant position of incumbent systems operators is expected to weaken, as part of their customer base flees to other suppliers (*cf.* I). This structural result is generally measured with a new indicator that has become quite renown, the “*switching rate.*” This rate expresses the idea of a departure rate: the proportion of customers having abandoned their historical supplier. But the switching rate does not shed any light on the evolution of the

market shares between incumbent systems operators. That remains the province of traditional concentration indicators.

However, the greatest anticipations from these new retail markets are not structural, but rather behavioural: lower prices to consumers (*cf.* II). Within these retail prices, as they are perceived by consumers, we need to draw some distinctions in terms of the specific evolution of each of the many price components, in particular energy wholesale prices, grid (transmission and distribution) access fees, taxes, and, finally, the retail margin.

-I-

Shrinking or Growing Market Power? Switching and New Entrants

A reduction in the market power of incumbent supply monopolies is presumably the first structural objective of retail competition. The measurement of this phenomenon is better performed with a new indicator, namely, the *switching rate*, than with traditional concentration indices, owing to difficulties in successfully identifying relevant new retail markets. The main benefit of the switching rate is that it defines a reference market for each of the incumbent suppliers, and assesses its evolution over time in terms of the corresponding historical customer base. Nevertheless, the switching measurement brings its own set of difficulties, notably distinguishing between the gross and the net switching rate, since one consumer can switch suppliers several times (and may even return to his or her previous supplier).

However, this new indicator effectively enables certain discrepancies to be resolved in terms of traditional indicators of structure. Traditional indicators measure market share nationwide, while retail markets more often have a significant, overriding local dimension. In contrast, the switching rate fails to provide any indication of the domestic concentration of supply. Since high switching rates may be accompanied by a strong re-concentration of retail markets, as seen in England, they do not necessarily involve the arrival of new entrants, and may simply reflect a significant reconfiguration of customer bases exclusively between the incumbent suppliers. Finally, these switching rates, as concentration indices, merely indicate the structure, and do not measure the economic performance of the new markets.

In practice, in most European countries having opened retail markets, the market shares retained by the former monopolies in their historical zones remain very sizeable throughout the domestic customer segment (between 85% and 95%). It is only on very rare occasions that the former local monopolies slip below 80% in their incumbent market (in the case of Norway), or around 60% (in the case of Great Britain). Conversely, in the commercial consumer market, the former local monopolies frequently lose from 35% to 55% of their historical commercial customers.

Also, there is no compelling example of new suppliers entering the domestic electricity market on a sustainable basis. The only significant case of external supplier entering the electricity industry is that of Centrica – BG, which is also the former national gas monopoly in Great Britain. As a result, the customer movements described by the switching rates essentially occur between incumbent electricity suppliers, sometimes through the creation or acquisition of subsidiaries. In particular, this is the case for the foreign market penetration by incumbent supplier, a very frequent occurrence in Central Europe (*Germany* with Vattenfall, EDF; *United Kingdom* with E.ON, RWE, EDF) and in Northern Europe (*Norway* with Fortum; *Sweden* with E.ON, Fortum; *Finland* with Vattenfall, E.ON).

The result is most often an increased concentration of domestic markets nationwide after these markets are opened to competition. The textbook case is Great Britain, where two-thirds of incumbent regional electricity suppliers vanished in under ten years. The level of concentration on the British retail market, as measured by the HHI indicator, now reaches the traditionally critical level of 1800, while it was at 700 in the early 1990s. Nevertheless, the local concentration in each of the 14 incumbent zones still remains very high (HHI between 4000 and 5000).

I-1 Structural results of retail competition: Switching vs. concentration

Traditionally, for competition authorities and economists, dominant positions have been measured by market share, particularly by way of a concentration index, such as the HHI.¹

¹ The HHI calculates the sum of the squares of the market shares expressed as a %. The 1800 threshold separates the markets with an acceptable competitive structure from other, less competitive markets. An indicator of 2000 therefore corresponds to a market with a lead position at 35% of market shares (square = 1225), plus three following at 15% (total squares = 675), then four small at 5% (total squares = 100). See the presentation by R. Green for the

Nevertheless, in the area of retail markets, these traditional concentration indices have remained ambiguous, for they assume that the retail market corresponds to the domestic market. In reality, in a large number of countries, retail markets are primarily, sometimes exclusively, local. Therefore, the incumbent distribution monopolies are also local. Thus, in Great Britain, the retail market opened with 14 regional monopolies; in Norway and Sweden, with 200 local monopolies,² in Germany, with approximately 1000. Assessed with traditional means,³ these retail markets therefore cannot appear very concentrated at the national level (*cf.* Table N°1).

Table N°1 – European Union Retailers and Their National Market Shares in 2004

| | Active suppliers | Suppliers independent of DSOs | Suppliers with market share >5% | Top 3 suppliers' share (all consumers) | Market share of foreign owned suppliers |
|----------------|------------------|-------------------------------|---------------------------------|--|---|
| Austria | 144 | 19 | 4 | 67% | 2% |
| Belgium | 41 | 17 ⁴³ | 2 | c. 90% | <10% |
| Denmark | 69 | 23 | 5 | 67% | n.k. |
| Finland | 70 | 8 | 6 | 30% | 25% |
| France | 20-25 | 15 | 1 | 88% | 9% |
| Germany | 1050 | 100 | 3 | 50% | c. 20% |
| Greece | 10 | 9 | 1 | 100% | 0% |
| Ireland | 9 | 7 | 4 | 88% | 12% |
| Italy | 305 | 270 | 6 | 35% | n.k. |
| Luxembourg | 12 | 1 | 2 | 100% | 0% |
| Netherlands | 37 | 16 | 3 | 88% | 18% |
| Portugal | 4 | 3 | 3 | 99% | 33% |
| Spain | 70 | 62 | 5 | 85% | 8% |
| Sweden | 127 | 127 | 4 | 70% | 39% |
| UK | 80 | 66 | 6 | 60% | 50% |
| Norway | 130 | 70 | 4 | 44% | 2% |

Source: 4th Benchmarking Report – European Commission, 2005

Switching rate indicators start from the opposite premise. That is, they take a direct measurement of the number of consumers who leave their incumbent systems operators, whoever they may be, and express it as a percentage rate on the national scale. (*cf.* Table N°2). This switching rate can also be expressed on a local scale.

SESSA proeject (http://www.sessa.eu.com/documents/bruxelles/Richard_Green_Brussels.pdf) and the corresponding report in the SESSA project (http://www.sessa.eu.com/documents/bruxelles/SESSA_report_wp2.pdf).

² At the opening of retail markets, ten or more years ago.

³ See the excellent presentation by J. Mayer (Director at E. Control, Austrian regulator) at the SESSA conference in Brussels, on September 9, 2005 (http://www.sessa.eu.com/documents/bruxelles/Johannes_Mayer_09092005.pdf).

Table N°2 – Switching Rates in the EU in 2004

| | <i>Large eligible industrial users</i> | | <i>Small commercial/ Domestic</i> | |
|-----------------------|---|--------------------|--|--------------------|
| | <i>since market opening</i> | <i>during 2003</i> | <i>since market opening</i> | <i>during 2003</i> |
| Austria | 22% | 7% | 3% | 1% |
| Belgium | 35% | 8% | (Flanders)19% | 19% |
| Denmark | > 50% | 22% | 5% | 5% |
| <i>Finland</i> | <i>≥ 50%</i> | <i>16%</i> | <i>n.k.</i> | <i>4%</i> |
| France | 22% | n.k. | -- | -- |
| <i>Germany</i> | <i>35%</i> | <i>n.k.</i> | <i>6%</i> | <i>n.k.</i> |
| Greece | 0% | 0% | -- | -- |
| Ireland | >50% | 6% | 1% | 1% |
| Italy | c. 15% | n.k. | -- | -- |
| Luxembourg | 10% | n.k. | -- | -- |
| Netherlands | 30% | n.k. | 35% | n.k. |
| Portugal | 9% | 7% | 1% | 1% |
| Spain | 18% | 5% | 0% | 0% |
| <i>Sweden</i> | <i>>50%</i> | <i>5%</i> | <i>n.k.</i> | <i>10%</i> |
| <i>UK</i> | <i>>50%</i> | <i>n.k.</i> | <i>>50%</i> | <i>22%</i> |
| <i>Norway</i> | <i>>50%</i> | <i>15%</i> | <i>>50%</i> | <i>19%</i> |

Source: 4th Benchmarking Report – European Commission, 2005

We observe that, with a mean national switching rate of 6%, incumbent systems operators in Germany still enjoy a retail market share equal to 94% of their former monopoly position.⁴ For Finland or Sweden, the 4th Benchmarking Report, published January 2005 by the European Commission, does not have data on the switching rate for domestic customers (*cf.* Table N°2). The 3rd Benchmarking Report of March 2004, while also devoid of data, did indicate an overall switching rate of 10% for small commercial and domestic customers. In Sweden, according to the regulator in early 2005, this domestic switching rate approximated 23%, corresponding to a 77% market share for former local monopolies. In Norway and the United Kingdom, with a switching rate exceeding 50%, local monopolies may have lost more than half of their original customer base.

Switching among commercial customers and domestic customers

Unfortunately, harmonized switching data collected on a pan-European scale⁵ aggregates all consumers, both domestic and commercial, up to 1 GWh. Now, a single 1GWh consumer (approximately 4000 hours annually at 250 kW) is equivalent to 300 average domestic consumers. A clearer distinction between commercial consumers and domestic consumers would

⁴ An evaluation by a German system operator yields a switching rate of 5% for domestic consumers. *Cf.* C. Müller, ENBW, presentation at the “*Electricity Markets*” conference of IDEI, Toulouse, June 2005.

⁵ By the *Benchmarking* questionnaire administered by the European Commission.

be much more useful.⁶ Table N°3 shows that, in the United States, switching rates for consumers in the commercial sector are two to five times higher than for domestic consumers.

Table N°3 – Switching Rates in the U.S. in 2003 (as a % of consumption)

| State | Residential | Commercial | Industrial | Total |
|-------|-------------|--------------------------|------------|-------|
| AZ | 0.0 | 0.0 | 0.0 | 0.0 |
| CA | 0.6 | 1.2* / 14.0 [#] | 35.4 | 13.1 |
| CT | 1.6 | 0.4 | | 1.5 |
| DC | 14.2 | 48.7 | | 41.8 |
| DE | n/a | n/a | | n/a |
| IL | 0.0 | 26.3 | 57.6 | 29.7 |
| MA | 2.3 | 9.5* / 12.8 [#] | 27.5 | 14.9 |
| MD | 4.6 | 26.9 | | 16.2 |
| ME | 1.7 | 25.7 | 68.1 | 31.0 |
| MI | n/a | n/a | n/a | 9.7 |
| NJ | 0.0 | 0.0 | | 1.6 |
| NY | 5.6 | 33.6 | | 22.5 |
| OH | 13.5 | 24.1 | 13.6 | 16.0 |
| PA | 4.9 | 13.3 | 12.1 | 9.5 |
| RI | n/a | n/a | n/a | 10.4 |
| TX | 11.6 | | 47.6 | 31.6 |

*Small Commercial #Large Commercial n/a= Not Available n/o= Not Open

Source: RetailEnergy Foresight, June 2003.

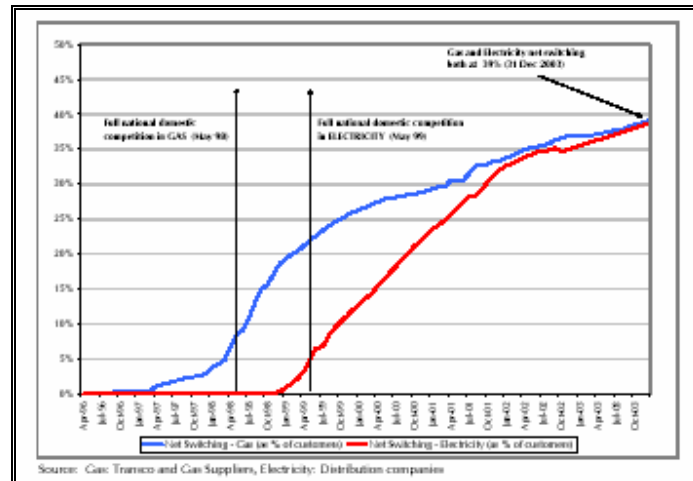
In 2003, only three states (Washington DC, Ohio and Texas) reached or surpassed a domestic switching rate of 10%, while seven states reached or surpassed a rate of 25% for commercial customers.

Gross switching and net switching

Furthermore, switching data is inherently imprecise, since a consumer can switch suppliers several times (including returning to the incumbent supplier). In April 2004, OFGEM published detailed switching data, enabling the difference between gross and net data to be measured (*cf.* Figure N°1).

⁶ In France, for example, there are approximately 4.5 million commercial consumers from among the 30 million customers in the electricity industry.

Figure N°1 – Gross & Net Switching Rates in the British Domestic Market up to 2003
(as a percentage of domestic customers)



Source: OFGEM, Domestic Competitive Market Review, April 2004.

While the British gross switching rate reached 51% for electricity (and 47% for gas), net data indicates that the percentage of domestic consumers having actually left their incumbent supplier is, in fact, below 40% for each of the two energy types. The difference between gross switching and net switching is therefore approximately 10 points. This difference is very high, because repeated switching (or multiple cases of switching) corresponds to roughly one-quarter of net switching.

A similar observation holds for Norway, where the last publication by the NVE, based on data from the second of quarter 2005, quantifies the market share of incumbent systems operators at 77.5% for the domestic consumer market. This corresponds to a net switching rate of 22.5%, while the gross switching rate of Table N°2 indicates a rate greater than 50%. To our knowledge, there exists no available data that is as specific for Finland or Sweden,⁷ but British and Norwegian examples suggest that the official Swedish figure of 23% of switchers in 2003 may only reflect approximately 15% actual switching among domestic consumers and, consequently, an incumbent system operator market share of about 85% for the domestic sector.

⁷ See, however, “The Energy Market 2004” on the Swedish regulator Web site. ([http://www.stem.se/web/bibshop_eng.nsf/FilAtkomst/ET29_04.pdf/\\$FILE/ET29_04.pdf?OpenElement](http://www.stem.se/web/bibshop_eng.nsf/FilAtkomst/ET29_04.pdf/$FILE/ET29_04.pdf?OpenElement))

In conclusion, the market shares of incumbent suppliers, the former local distribution monopolies, remain very high, even many years after the retail market opening. In Norway and Sweden, where retail markets started to open in 1991 and 1996, respectively, the former monopolies maintained from 77% to 85% net market share in the domestic consumer sector (with 23% and 15% domestic net switching rates). In Germany, the domestic switching rate of approximately 5% positions the former local monopolies at 95% market share. In the United States, only three states fell below 90% of the domestic market shares for incumbent monopolies (with a domestic switching rate of more than 10%⁸).

**Table N°4 – Domestic and Commercial Switching Rates
(in 2003 or 2004)**

| | <i>Germany</i> | <i>Norway</i> | <i>3 U.S. states (DC, OH, TX)</i> |
|------------------------------------|----------------|---------------|---------------------------------------|
| Domestic switching | 5% | 22.5% | 13% |
| Market shares of former monopolies | 95% | 77.5% | 87% |
| Commercial switching | 36% | 47% | 37% |
| Market shares of former monopolies | 64% | 53% | 63% |

Source: Müller 2005, NVE 2005, Retail Energy Foresight, June 2003.

Finally, Great Britain stands as an exception with a domestic switching rate of approximately 40%, causing the former regional monopolies (the Regional Electricity Companies, or RECs) to shrink to a 60% market share a mere five years after the opening.

By comparison, commercial markets generally present a higher switching rate (from 35% to 50%), corresponding to greater losses in market share to the former local monopolies (cf. Table N°4). It is therefore not unusual for a former local monopoly to have lost half or more of its former commercial customer base.

⁸ At the end of 2004, in Texas, approximately 18% of domestic consumers and 50% of commercial consumers had left their incumbent suppliers. These appear to be the highest rates in the United States. Texas' large size (22 million inhabitants) renders these rates particularly significant.

I-2 New entrants: New suppliers or incumbent suppliers?

Although the switching rate addresses the structural phenomenon of expanding retail competition better than traditional concentration indices, it remains totally mute regarding the corresponding development of concentration between suppliers on these retail markets. The fact that consumers abandon their historical ties for new suppliers does not necessarily imply that the latter are new entrants, nor a decline in concentration on these domestic markets.

Consumers can switch from one incumbent supplier category to another, so that concentration may rise sharply on the retail market nationwide while continually decreasing in the former local monopoly zones. This phenomenon of national concentration within the competitive opening process is even accelerated when mergers and acquisitions occur between incumbent suppliers.

In Great Britain: A strong re-concentration and the creation of a domestic market

In Great Britain, before the wave of mergers and acquisitions among regional distribution monopolies in the mid-1990s, the 14 original monopoly zones would have corresponded to an HHI national concentration indicator of 800.⁹ At the end of 2003, this national HHI indicator reached 1762—the alarm point for market concentration. This was the upshot of numerous mergers between the 14 former regional monopolies now grouped into five national groups and of the very dramatic penetration by British Gas, the former national gas supply monopoly and new national leader in electricity sales to domestic customers. In this new market, the place occupied by the *true* new entrants, never having been incumbent monopolies in the supply of gas or electricity, remains marginal with only a 1% market share¹⁰. The erosion of the incumbent electricity monopolies' shares of the regional market (regional HHI falling in the 4000–5000 range; except in Northern Scotland, where it stands at 7000) therefore took place between electricity concerns, under constant pressure from the national gas monopoly that broke into these markets. However, a detailed analysis of electricity price behaviour¹¹ reveals that the British electricity retail market is still profoundly regional (with 14 different markets), while the retail gas market is truly national.

⁹ With only two zones above 10% in the total British domestic customer base and three zones below 5%.

¹⁰ In 2005, S. Littlechild examined the obstacles upon entry and facing the survival of these new British retail market entrants, and presented OFGEM with an entire series of remedies. Consult his report (June 2005):

<http://www.electricitypolicy.org.uk/pubs/misc/littlechildsuppliers.pdf>

¹¹ OFGEM, *Domestic Market Review*, 2004, Chap. 6 and Appendices 12 and 13.

Table N°5 – Market Shares of British Domestic Customers by Corporate Group (as a percentage – (from September 2000 to September 2003))

| Group | Sept-00 | Sept-01 | Sept-02 | Sept-03 |
|--------------------------|---------|---------|---------|---------|
| Powergen | 8 | 8 | 8 | 22 |
| TXU Energy | 17 | 15 | 15 | - |
| BG (Centrica) | 14 | 17 | 22 | 23 |
| Npower | 8 | 19 | 17 | 16 |
| Northern Electric | 4 | - | - | - |
| Yorkshire | 7 | - | - | - |
| EDF Energy | 10 | 10 | 15 | 14 |
| Seeboard | 6 | 6 | - | - |
| SSE Energy | 14 | 14 | 13 | 14 |
| Scottish Power | 10 | 10 | 10 | 10 |
| <i>Other</i> | 0 | 1 | 0 | 1 |
| Total | 100 | 100 | 100 | 100 |

Source: OFGEM GRJM data; grey cells represent foreign-based groups (German for Powergen and Npower; French for EDF Energy)

On the whole, Great Britain’s extraordinary switching rate, which reached 40%, does not spell the end of former monopolies—now diminished to 60% of their historical customer base. What is truly new here is the creation of a new *national* supply market, in which several national groups coalesce in the former fiefdoms of the 14 incumbent suppliers. In April 1990, only two of the original 14 RECs remained, both in Scotland, while all of the 12 Anglo-Welsh RECs lost their independence. The net entry rate of 40% in the regional suppliers’ historic regions certainly attests to a major surge in the establishment of a national retail market. However, there was not a single significant new entrant¹² in Great Britain.

When we look at the ownership structure of the six groups currently operating in this market, we observe substantial entry into the British retail supply sector. Half of these six groups are owned by foreign incumbent operators: German (PowerGen and Npower, belonging to E.ON and RWE, respectively) or French (EDF Energy). Their share of the British domestic market is a little more than half (52% at the end of 2003), whereas the share of the two surviving British RECs (SSE and Scottish Power) is 24%. The rest of the market (1/4) switched to the former Gas monopoly (Centrica – BG).

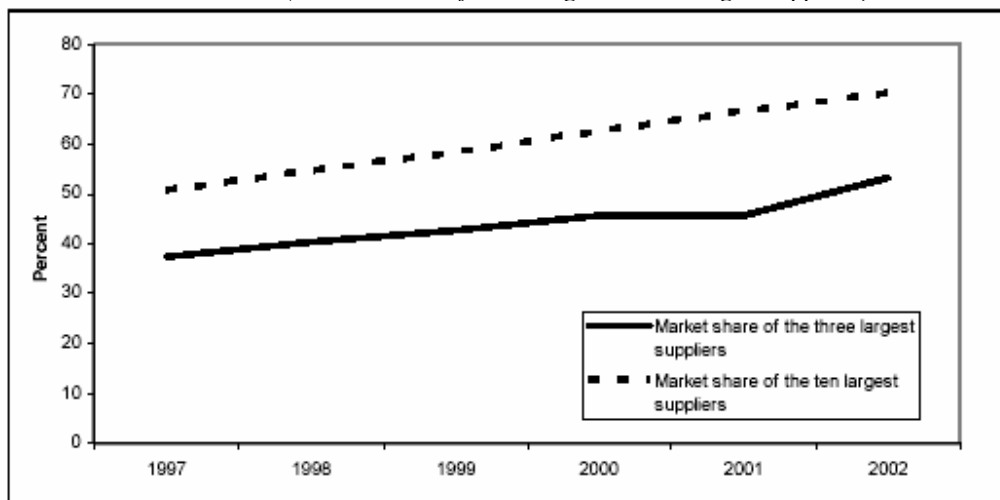
¹² Five per cent of market shares can be considered the criterion of a “significant” entry. In Great Britain, this corresponds to 5 TWH or 1.25 million domestic consumers.

In Norway and Sweden: The failure of the non-electrical entrants

In Norway and Sweden, attempts to penetrate the domestic electricity market by non-electrical companies were also unsuccessful. In particular, the two Nordic petroleum fuel distributors (OK in Sweden; Statoil in Norway and Sweden) failed in their attempt. Although both have large clienteles and strong brand images, and very carefully planned their entry,¹³ they were unable to reproduce Centrica's success in Great Britain under the brand name BG (British Gas). On the other hand, like in England, foreign incumbent suppliers have made significant inroads in the Nordic countries by way of mergers and acquisitions (the German E.ON and the Finnish Fortum are the second and third largest domestic suppliers in Sweden; Fortum is also the reference shareholder of the top domestic supplier in Norway, Hafslund; and Vattenfall is number two in Finland, where E.ON is also a significant new entrant—on the threshold of 5%).

Vendor concentration also increased in the Nordic countries. In Sweden, more than half of the 250 local suppliers present in 1996, at the time of the electricity reform vote, no longer exist today. The top three suppliers now control over 60% of the national market. In Norway, concentration also intensified, though it still remains moderate.

Figure N°2 – Supply Concentration in Norway (1997-2002)
(Market shares of the 3 largest and 10 largest suppliers)



(Source: Philip E. Lewis, Tor A. Johnsen & v.a.¹⁴, May 2004)

¹³ From meetings I had with the electricity customer *managers* of Statoil and OK in Norway and Sweden, in July 1998.

¹⁴ Philip E. Lewis, Tor A. Johnsen, Teemu Närvä, and Salman Wasti, “*Analysing the relationship between wholesale and end-user prices in the Nordic electricity market*”, Report to the Finnish Ministry of Trade and Industry, May 2004.

Germany and the United States: The new entrants are the incumbent suppliers

In Germany, a single new domestic supplier, Yello Strom, persists on the national scale, with approximately one million consumers acquired since the summer of 1999. However, this supplier remains small on the larger German market, remaining at less than half the 5% of market share required to be a “significant player.” On the other hand, this new player is also a direct subsidiary of the incumbent supplier Baden-Württemberg ENBW (5 million clients and 100 TWh). The only massive entries into the domestic market are therefore the mergers and acquisitions of foreign origin that shaped the third and fourth largest German groups (EDF in ENBW; Vattenfall in VEAG, Berlin and Hamburg).

Finally, in the United States, it seems that no supplier from outside the electricity sector has successfully managed a significant penetration of the domestic customer market, and that the only new and trans-state supplier to survive (like New Energy and Strategic Energy), conduct most of their business with commercial consumers, and even that only after having been bought out by large incumbent suppliers¹⁵.

In conclusion, there is no compelling example of non-electrical companies penetrating the domestic electricity supply market. The only notable case of entry by companies from outside the electricity industry is that of Centrica – BG, the incumbent gas monopoly in Great Britain. All other customer movements therefore occur between the incumbents, sometimes involving the creation or acquisition of subsidiaries. This is notably the case for expansions abroad, which are very frequent in Central Europe (Germany, United Kingdom) and in Northern Europe (Norway, Sweden, Finland).

-II-

Retail Market Performances: Prices

Price evolution remains the main economic indicator of performance for a new electricity market, though consumer expectations and supplier strategies may focus on many other aspects.

¹⁵ From meetings I had with systems operators in Texas and Pennsylvania, in April 2005.

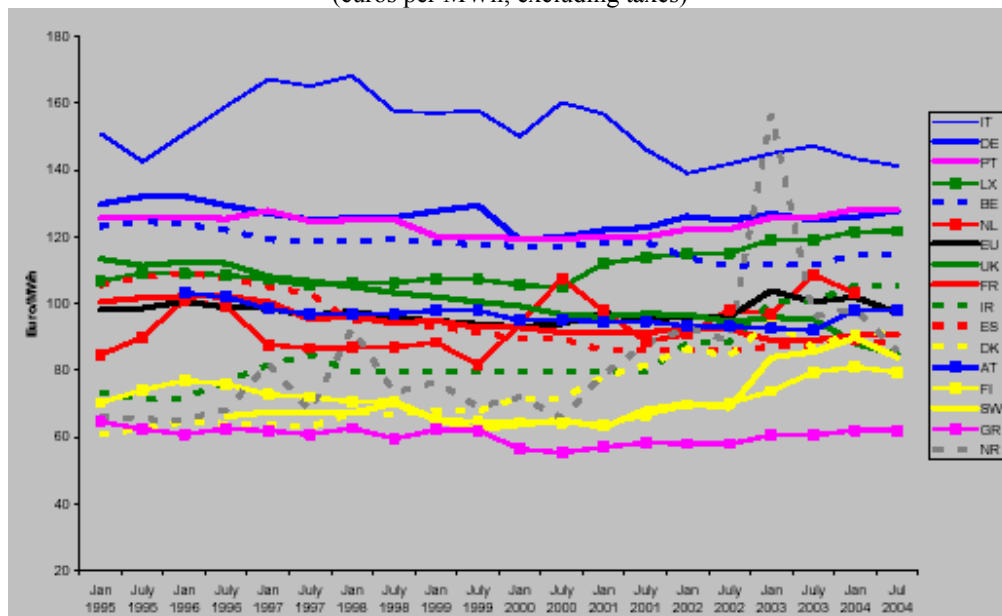
Since the most significant wave of opening of retail markets in the European Union occurred in 1998–1999, enough time has now passed for us to properly examine their performances in terms of price.

Certainly, the primary result expected of retail prices is that they decline, and the second likely relates to the evolution of domestic retail prices relative to the price facing other categories of consumers, i.e., commercial consumers. Ultimately, the price performance of retail competition can only be truly understood by breaking the retail price down into its components: grid access fees, wholesale prices, and supplier margins.

II-1 Expectation of lower prices and actual retail price trends

A drop in retail prices is, without a doubt, the principal result expected from these new electricity markets. Although the official retail market opening dates differ by country, 1998–1999 can be reasonably be construed as pivotal in the five European countries of interest to us (United Kingdom, Germany, Norway, Sweden, and Finland). However, with the exception of the United Kingdom, the decline in prices is not very noticeable for domestic consumers (cf. Figure N°3).

Figure N°3 - EU 15 Domestic Electricity Prices 1997 to 2004 (3,5 MWh /year)
(euros per MWh; excluding taxes)



(Source: European Commission, 4th Benchmarking Report, 2005)

Only the United Kingdom experienced a sharp decrease for the average domestic consumer (3.5 MWh annually), with a drop in prevailing HT prices of approximately 17% between January 1999 and July 2004 (cf. Table N°6). In Germany, prevailing prices ultimately remained unchanged over this period, remaining 25% higher than the average in the 15-member European Union. In the three Nordic countries, these prices rose substantially (from +15% to nearly +30%). This is much higher than the average trend of the European Union over the same period (+7%).

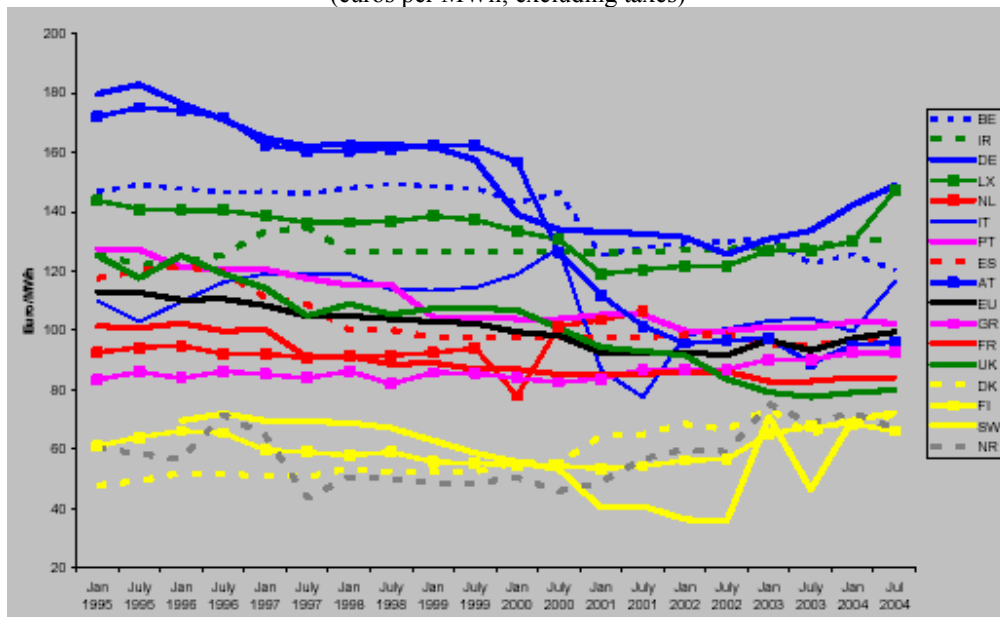
Table N°6 – EU 15 Domestic Electricity Prices January 1999–July 2004
(3.5 MWh; excluding taxes)

| | Price in euros per MWh | | | | | | | As a % | Base EU15 = 100 | |
|------------|------------------------|--------------|--------------|--------------|--------------|--------------|-----------|---------------|------------------|------------------|
| | January 1999 | January 2000 | January 2001 | January 2002 | January 2003 | January 2004 | July 2004 | Trend 1999-04 | 1999 as a % EU15 | 2004 as a % EU15 |
| Austria | 98 | 95 | 95 | 93 | 93 | 98 | 98 | +0.2 | 103% | 97% |
| Belgium | 118 | 117 | 118 | 114 | 112 | 115 | 119 | +0.3 | 125% | 117% |
| Denmark | 68 | 59 | 78 | 87 | 95 | 92 | 91 | +33.7 | 72% | 90% |
| Spain | 93 | 90 | 86 | 86 | 87 | 89 | 89 | -4.7 | 98% | 88% |
| France | 95 | 93 | 91 | 92 | 89 | 91 | 91 | -4.3 | 100% | 89% |
| Greece | 62 | 56 | 56 | 58 | 61 | 62 | 62 | -0.3 | 66% | 61% |
| Ireland | 80 | 80 | 80 | 88 | 101 | 106 | 106 | +32.7 | 84% | 104% |
| Italy | 158 | 151 | 158 | 139 | 149 | 144 | 141 | -10.6 | 167% | 140% |
| Luxembourg | 83 | 106 | 112 | 115 | 119 | 122 | 122 | +47.0 | 87% | 120% |
| Holland | 91 | 94 | 98 | 91 | 97 | 103 | nd | +12.9 | 96% | 102% |
| Portugal | 121 | 120 | 120 | 122 | 126 | 128 | 128 | +6.3 | 127% | 127% |
| Germany | 128 | 119 | 122 | 126 | 127 | 126 | 128 | -0.2 | 135% | 126% |
| UK | 102 | 99 | 96 | 97 | 96 | 88 | 85 | -16.7 | 107% | 84% |
| Finland | 66 | 64 | 64 | 70 | 78 | 81 | 79 | +21.2 | 69% | 79% |
| Sweden | 65 | 64 | 63 | 70 | 84 | 90 | 84 | +28.5 | 69% | 83% |
| Norway | 75 | 72 | 79 | 93 | 157 | 99 | 86 | +14.7 | 79% | 85% |
| EU 15 | 95.1 | 93.7 | 95.7 | 96.5 | 100.8 | 102.2 | 101.5 | +6.7 | 100% | 100% |

(Source: Eurostat and European Commission)

This trend in prices to domestic consumers is comparable to that facing small commercial consumers whose typical annual consumption is 50 MWh. Compared to domestic consumers, small commercial consumers seem to have enjoyed greater benefits from market opening (cf. Figure N°4).

Figure N°4 - EU 15 Commercial Electricity Prices 1997 to 2004 (50 MWh /year)
(euros per MWh; excluding taxes)



(Source: European Commission, 4th Benchmarking Report, 2005)

This is true not only in the United Kingdom, where the decrease in prices to small commercial consumers appears to be more dramatic than to domestic consumers, but also in Germany and Sweden where, at least from 1998 to 2002, substantial declines in prices (from -20% to -40%) have been observed. However, over the entire 1999–2004 period, prevailing prices to small commercial clients increased in each of the three Nordic countries: from +15% to nearly +40% (cf. Table N°7). Furthermore, in Germany, prices have clearly resumed their ascent since early 2003 (+15% in 18 months).

Table N°7 – Commercial Prices From January 1999 to July 2004
(50 MWh; excluding taxes)

| | Price in euros per MWh | | | | | | | As a % 1999-04 evolution |
|---------|------------------------|-------|-------|-------|-------|-------|--------|--------------------------------|
| | Jan99 | Jan00 | Jan01 | Jan02 | Jan03 | Jan04 | July04 | |
| Germany | 162 | 139 | 133 | 131 | 131 | 142 | 149 | -8,0 |
| UK | 107 | 107 | 94 | 92 | 79 | 79 | 80 | -25,2 |
| Finland | 56 | 55 | 53 | 56 | 65 | 69 | 66 | +17,9 |
| Sweden | 63 | 56 | 40 | 36 | 71 | 70 | 72 | +14,3 |
| Norway | 49 | 50 | 49 | 60 | 75 | 72 | 67 | +36,7 |

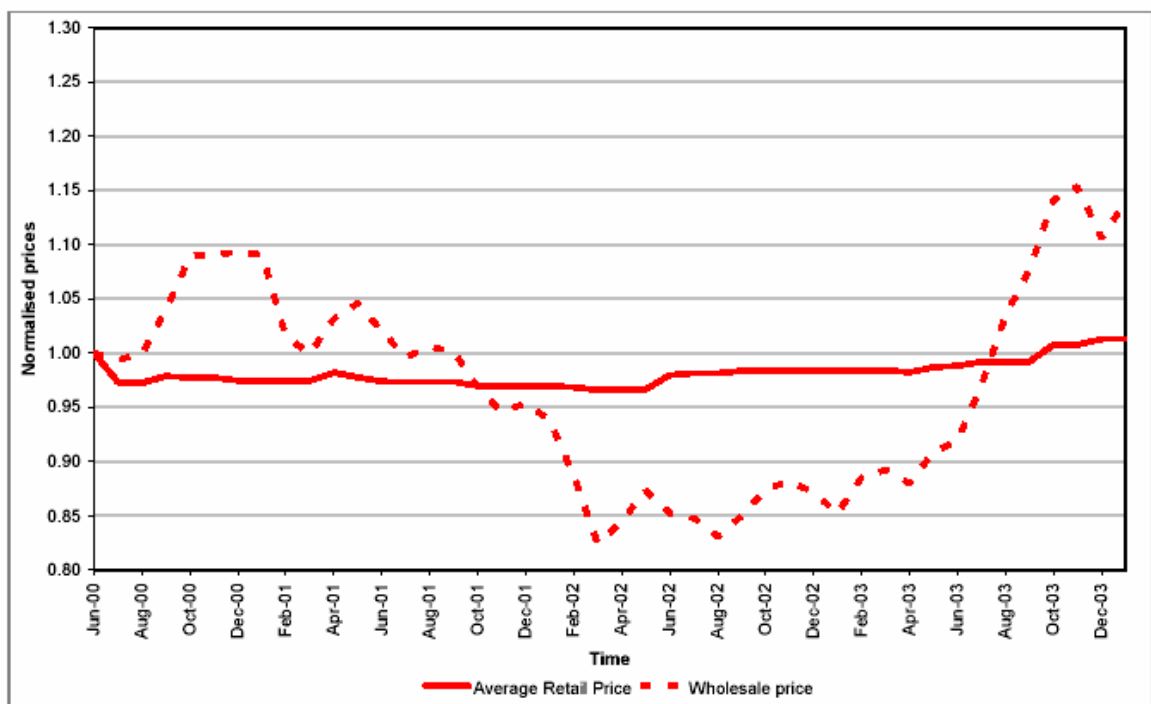
(Source : Eurostat and European Commission)

II-2 Can retail prices fall?

Although a drop in prices can generally be expected when a new retail market opens, the question must really be asked as to whether there exists a real potential for decreases, and from where this potential might stem.

For that, we need to distinguish between the different components contributing to retail price performance, notably: grid access fees, energy wholesale purchase prices, and gross retailer margins. This is a delicate task, requiring a great deal of precise and detailed data.

Figure N°5 – Evolution of British Monthly Wholesale Prices Compared to Domestic Prices



OFGEM, Domestic Market Review, April 2004 (Nominal energy prices; excluding taxes and grid fees)

In Great Britain, the fall in prices is deemed inadequate

Although Great Britain is the only one of our five countries in which prices for domestic customers have been observed to decline over a sustained period between 1999 and 2004, these decreases have been deemed inadequate in light of the potential. This potential has been approximated from the gap between the trend in the sales prices to consumers and the trend in the wholesale market price. Figure N°5 (above) shows that in 2002–2003 British retail electricity prices did not reflect the significant decline in wholesale prices, of 10 to 15%. Admittedly, retail

prices will not respond daily, or even monthly, to every movement in the wholesale price, but we are perplexed as to why they failed to react in 18 months.

International comparison of potential for price cuts: DG TREN Benchmarking Report

The Commission's 3rd Benchmarking Report provides interesting indications of potential reserves for retail price reductions by breaking down the components of the price to small commercial customers (consumption of 50 MWh/year) at the beginning of 2004.

Table N°8 – Commercial Price Components in 2004
(Euros /MWh excluding taxes; 50 MWh)

| | <i>Network access</i> | <i>Wholesale energy prices</i> | <i>Supply margin</i> | <i>Total</i> |
|---------|-----------------------|--------------------------------|----------------------|--------------|
| UK | 34 | 33 | 10 | 77 |
| Germany | 65 | 40 | 20 | 125 |
| Finland | 34 | 30 | 10 | 74 |
| Sweden | 34 | 30 | 10 | 74 |
| Norway | 27 | 30 | 10 | 67 |

(in % of the price; 50 MWh)

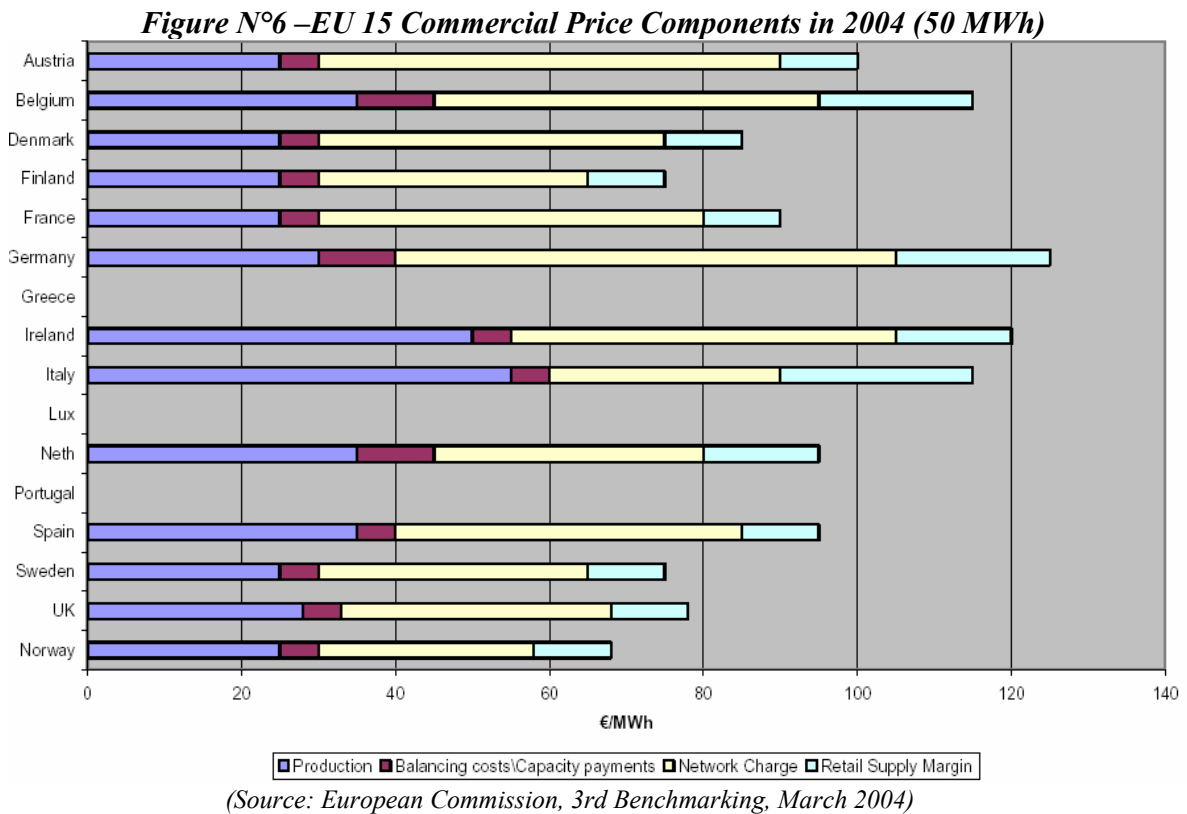
| | <i>Network access</i> | <i>Wholesale energy prices</i> | <i>Supply margin</i> | <i>Total</i> |
|---------|-----------------------|--------------------------------|----------------------|--------------|
| UK | 44% | 43% | 13% | 100% |
| Germany | 52% | 32% | 16% | 100% |
| Finland | 46% | 41% | 13% | 100% |
| Sweden | 46% | 41% | 13% | 100% |
| Norway | 40% | 45% | 15% | 100% |

(Source: European Commission, 3rd Benchmarking, March 2004)

DG TREN's estimates first allow the impact of grid access fees (transmission and distribution) on retail prices to be isolated. We observe that grid access costs vary by more than a factor of two between Norway and Germany (*cf.* Table N°8). This Benchmarking Report also enables us to identify the impact of wholesale energy prices, and shows approximately a 30% difference between Germany and Great Britain or the Nordic countries. Finally, the supplier's gross margin appears twice as large in Germany (20 euros per MWh, equivalent to half of the purchase price of energy) than in the other countries (10 euros per MWh, approximately one-third of the purchase price of energy).

If these five European countries can serve as a yardstick to each other, Germany would have been able to cut its wholesale energy price by 10 euros/MWh at the beginning of 2004, and the supply margin by another 10 euros/MWh. Finally, a further reserve for price reductions, amounting to between 10 and 25 euros, could be found in network access fees. If all this

potential for price reductions could have been realized, their combined effects might have lowered German retail prices from 20% to 30%, aligning them with English, Danish, Dutch and Austrian levels (*cf.* Figure N°6).



Two Finnish reports that appeared in 2004¹⁶ provide an interesting complement to this Benchmarking Report; addressing the same issue using detailed actual data (grid access fees, wholesale prices, and supply margins) instead of relying on approximations such as the estimates provided in DG TREN’s 3rd Benchmarking Report.

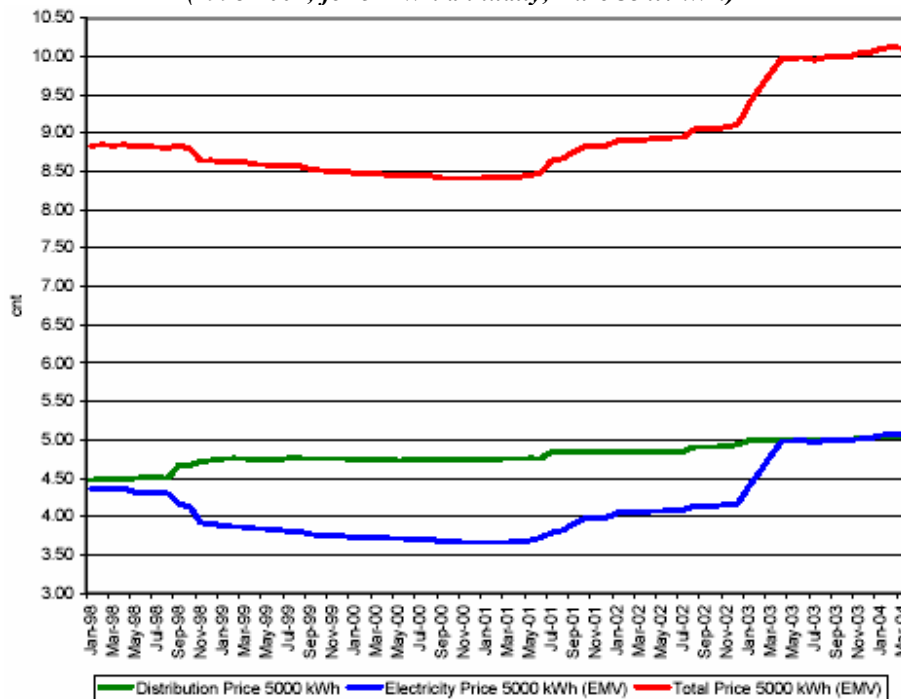
Grid access fees and supplier margins

In principle, there is no logical reason to link the evolution of energy prices in a new retail market with the corresponding evolution of network access fees. These two components should

¹⁶ Philip E. Lewis, Tor A. Johnsen, Teemu Närvä, and Salman Wasti, “Analysing the relationship between wholesale and end-user prices in the Nordic electricity market”, Report to the Finnish Ministry of Trade and Industry, May 2004; Philip E. Lewis, Merja Pakkanen, and Martti Muroma, “The Electricity Customer’s Lot”, Report to the Finnish Ministry of Trade and Industry, May 2004.

be divorced by way of a professional legal separation (known as unbundling). In addition, the evolution of network fees should be subject to a regulation that is independent of the risks associated with the new market. However, these basic principles are not necessarily always adhered to, in particular when unbundling between distribution grids and competitive energy supply is ineffectual, when there are very many local distribution networks and local incumbent suppliers (a hundred or more), and when the regulator is weak (*ex post* or light-handed regulation: Sweden or Finland) or absent (Germany).

Figure N°7 – Finland: Distribution Network Tariff, Energy and Total Price Evolution (1998-2004; for 5 MWh annually; EuroCent /kWh)



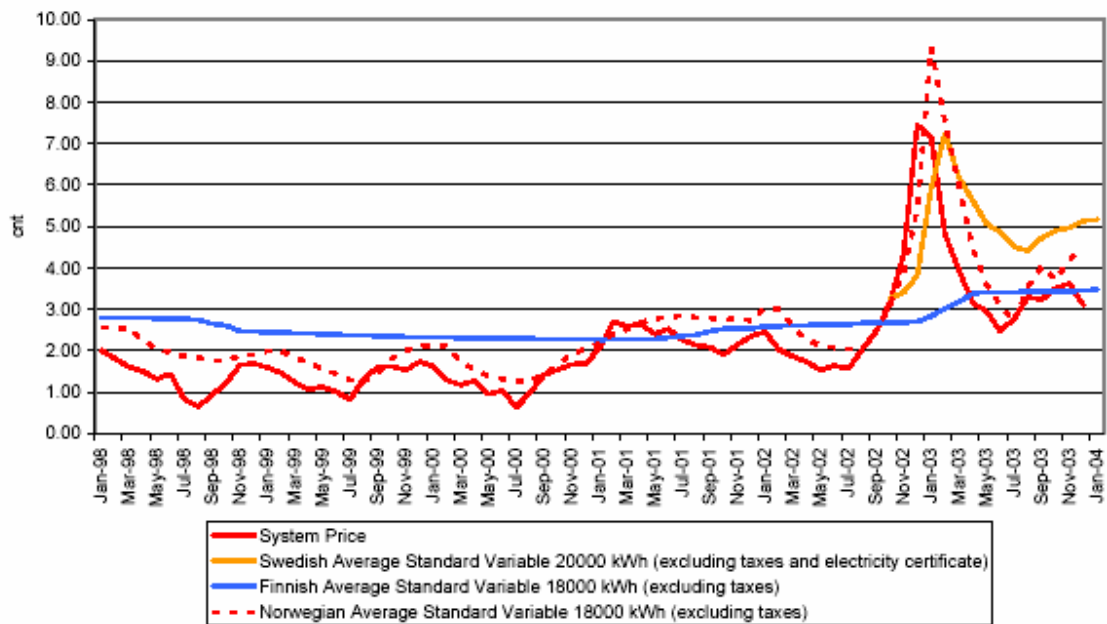
(Source: Finnish regulator, reproduced by Lewis & v.a., May 2004)

For this reason it is disturbing to observe, on Figure N°7 above, that the opening of retail competition in Finland, in September 1998, simultaneously triggered a decrease in energy prices and an increase in distribution network access fees. Overall, in four years (Fall 1998–Fall 2002), nominal access tariffs increased +11%. This yielded additional revenues equivalent to the 11% of initial decrease in the price of energy to the integrated local suppliers & network operators, which combine distribution and generation operations.

Wholesale energy price and supplier margins

When retail suppliers purchase on the wholesale market, or when the wholesale market is sufficiently competitive, suppliers' gross margins can be calculated by comparing their resale price with the wholesale price. On the Nord Pool spot market, this benchmark price is called the "system price".

Figure N°8 – Nordic Household Standard Energy Prices and Margin (1998-2004; 18 to 20 MWh /Year; en EuroCent /kWh; free from grid fees and taxes)



(Source: Philip E. Lewis, Tor A. Johnsen & v.a., May 2004)

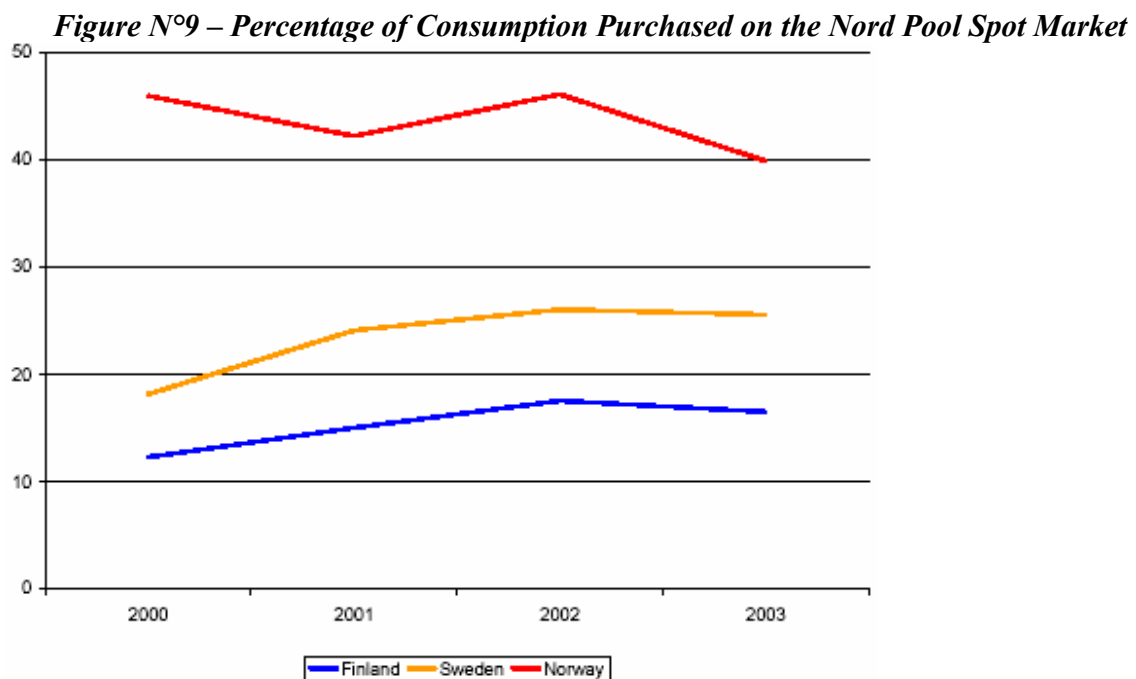
This calculation shows the substantial gaps between supplier margins in the three Nordic countries (cf. Figure N°8). In Norway, for a domestic consumer with individual electric heating (18 to 20 MWh per year), the average margin on supplies to historic customers (called standard variable, or *EMV* in the contract) ranges between 5 and 10 euros per MWh (5 to 10 eurocents per kWh), except during the spike in prices during the winter of 2000–2001 and the crisis in the winter of 2002–2003. In Finland, the same margin fluctuated between 10 and 20 euros per MWh before 2001. In Sweden, this margin has only been documented as of the winter of 2002. However, for nearly one year, in 2003–2004, it stood at 10 to 20 euros per MWh.

A price reduction of 10 to 15 euros per MWh is therefore identified. The exact value of this reserve depends on what the "normal" margin of a supplier serving incumbent customers

(maintaining their standard contract) should be. Regardless of its exact value, this potential for lowering margins nevertheless represents 15 to 20% of the total price (including access fees).

However, this comparative Nordic data also draws attention to the fact that variations in wholesale prices on the Nord Pool market can amount to 10 to 20 euros/MWh. They even fluctuated as much as 50 euros/MWh during the crisis in the winter 2002–2003, and never returned to former wholesale prices levels (those of 1998–2000).

As a result, with respect to suppliers vertically integrated in generation, the behaviour of producers on the wholesale market cannot easily be dissociated from that of suppliers on the retail market. Thus, in Finland and Sweden, where the visible supply margins can be twice or three times those in Norway, the Nord Pool also plays a very secondary role as a source of wholesale energy supplies (*cf.* Figure N°9).

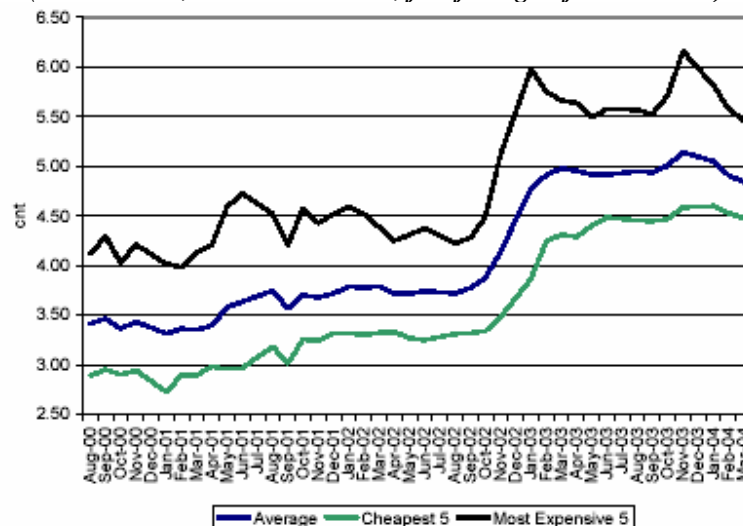


In the case of Finland, the prices of the different suppliers on the so-called “competitive” retail market are comparable (it is the segment of customers switching to “offer price” contracts, or EMG). For this client segment being in direct competition, the gap between energy prices from the different suppliers was almost always approximately 10 euros per MWh (1 eurocent per kWh), during close to four years (*cf.* Figure N°10). This margin of potential energy price

reductions forms a band equivalent to about 12% of the total supply price (including the network access fee).

The visible and ongoing parallelism in the behaviour of prices from different suppliers in the competitive segment of the Finnish retail market (*cf.* Figure N°10) suggests that they all regularly practice a cost + policy (reference price + margin), which may come as a surprise¹⁷ in an ostensibly competitive segment in a country in which close to 85% of the energy is not traded on the Nord Pool wholesale market (*cf.* Figure N°9).

Figure N°10 –Finnish Suppliers’ Competitive Price Range - August 2000 to March 2004
(5 MWh /Year; in EuroCent /kWh; free from grid fees and taxes)



(Source: Philip E. Lewis, Tor A. Johnsen & v.a.¹⁸, May 2004)

We have therefore identified several potential areas for price reductions that could be activated by retail market openings. The most significant seem to come from sound regulation of grid access fees or an unhampered propagation of the movements on an already reasonably competitive wholesale market. But these two price reduction reserves originate outside of the retail market. This is not the case with the third, which assumes that supplier margins will fall to

¹⁷ See OFGEM, *Domestic Market Review*, April 2004, chap. 6. In Great Britain, there is parallelism in prices on the gas retail market, but not on the electricity retail market, and OFGEM considers that electricity competition is more regional than national.

¹⁸ Philip E. Lewis, Tor A. Johnsen, Teemu Närvä, and Salman Wasti, “*Analysing the relationship between wholesale and end-user prices in the Nordic electricity market*,” Report to the Finnish Ministry of Trade and Industry, May 2004.

a “normal” level. It is therefore of some interest to further examine this last possibility. A “normalization” of margins may drive down retail prices, but their level is crucial for attracting new suppliers into the competitive retail business!

II-3- The “normal” margin of the competitive supplier: New entrants vs. incumbent suppliers

To determine whether the opening of a retail market clears enough headroom to trigger the penetration of new suppliers alongside local incumbent monopolies, supply must be analysed independently from the network and generation segments. It must also be possible to distinguish between the situation of the new entrant and that of an incumbent supplier already servicing an established customer base.

In this area, the case of Great Britain stands out as the most interesting *a priori*, because the British retail market is considered the most open of all European retail markets, particularly owing to its high switching rate and the price cuts that have already been observed.

Table N°9 – Headroom for New Entrants in Great Britain in 2004
(in £ per customer /year)

| Customer* 3,300 kWh | In £ | In % |
|------------------------------|--------------|-------------|
| Energy Taxes | 8,1 | 3% |
| Network & Meter Fees | 69,2 | 27% |
| Electricity Costs | 78,1 | 31% |
| Supply Business Costs | 50,2 | 20% |
| Acquisition Costs** | 19,6 | 8% |
| TOTAL COSTS = | 225,2 | 89% |
| ANNUAL REVENUE***= | 252,3 | 100% |
| HEADROOM° (£) = | 27,1 | |
| Headroom (per cent) = | 11% | |
| Customer* 6,600 kWh | In £ | In % |
| Energy Taxes | 12,7 | 3% |
| Network & Meter Fees | 94,1 | 25% |
| Electricity Costs | 156,2 | 42% |
| Supply Business Costs | 51,6 | 14% |
| Acquisition Costs** | 19,6 | 5% |
| TOTAL COSTS = | 334,3 | 89% |
| ANNUAL REVENUE***= | 376,2 | 100% |
| HEADROOM° (£) = | 42,0 | |
| Headroom (per cent) = | 11% | |

(*) Customer portfolio made of 45% Standard + 40% Direct + 15% Prepayment

(**) Acquisition Costs for a new supplier = 53 £ each customer; discounted over 3 years

(***) Annual Revenue for incumbent suppliers operating in their former monopoly zone

(°) Headroom for a new supplier operating in all 14 former monopoly zones

(Source: OFGEM, Domestic Market Review, 2004)

The study published by OFGEM in 2004, “*Domestic Market Review*,” is therefore particularly welcome. We have summarized the main data on British electricity suppliers’ profitability¹⁹ in Table N°9.

Table N°9 compares normal costs of a new entrant supplier²⁰ with the revenue per customer that the incumbent systems operators collect in their historic zones of Great Britain from the portion of their customer base that did not change suppliers. The new supplier is supposed to incur expenses of the same nature as the incumbent systems operators, except for acquisition costs of its customer base, which are valued by OFGEM at 53.33£/head (amortized over three years) for an acquisition exclusively based on commercial solicitation (therefore separate from any customer acquisition costs through a corporate merger).

Although new entrants have to incur annual customer acquisition costs of close to 20£ (approximately 30 euros) per customer over three years, they will nevertheless benefit from an 11% edge compared to the prices effectively applied in 2004 by the incumbent systems operators in their original zone.

As a result, the substantial margin for price cuts that is necessary to attract customers to the new supplier exists, leaving a “normal” margin for covering customer acquisition costs and all the other normal operating costs of a new supplier (including a normal profit covering a capital cost “*based on market conditions*”). These two margins sum up to 19% of the price of incumbent systems operators for customers of 3.3 MWh (11% potential price reduction + 8% acquisition costs), and 16% of the price of incumbent systems operators for customers of 6.6 MWh (11% potential price reduction + 5% acquisition costs). These margins appear very high, since they are also equal to the total amount of the incumbent supplier’s operating costs (Supply Business Costs: 20% of the selling price for customers of 3.3 MWh, and 14% of the selling price for

¹⁹ Cf. particularly Chapter 5 and Appendix 11 of the OFGEM report. To summarize OFGEM’s data, we have had to simplify the level of network access costs and determine which ones are different in the 14 regions of Great Britain and which ones could vary between 30 and 50£ between these regions. As a result, the data for this item in our Table N°9 are only approximations. However, our normal portfolio of customers has been composed according to the specific calculation rules of OFGEM, with 45% of customers paying with standard credit, 40% paying by direct debit, and 15% paying by prepayment.

²⁰ A new supplier operating under average conditions in 2004 in Great Britain, and with a capital cost clearly higher than 10%. OFGEM does not provide an exact figure, but indicates a range in which the capital cost varies from 11% to 16%.

customers of 6.6 MWh). It suggests incumbents have an extra margin equal to their “normal” costs.

Understanding the importance of these potential economic margins, it is surprising to see that new entrants occupy so little space in Great Britain in retail market activity, with less than 1% market share after five years of opening. At the beginning of 2004, the six new British entrants active in the electricity retail business were serving 190,000 out of 26 million customers, while incumbent systems operators (former gas or electricity distribution monopolies) maintained over 99% market share (in gas as in electricity).

Table N°10 – Market Shares in Domestic Electricity Market in Great Britain
(as a % of 26 million customers)

| Group | Sep-00 | Sep-01 | Sep-02 | Sep-03 | Dec-03 |
|----------------------|--------|--------|--------|--------|--------|
| Powergen | 8 | 8 | 8 | 22 | 21 |
| TXU Energi | 17 | 15 | 15 | | |
| BGT | 14 | 17 | 22 | 23 | 24 |
| Npower | 8 | 19 | 17 | 16 | 15 |
| Northern Electric | 4 | | | | |
| Yorkshire | 7 | | | | |
| SSE Energy | 14 | 14 | 13 | 14 | 14 |
| EDF Energy | 10 | 10 | 15 | 14 | 14 |
| Seaboard | 6 | 6 | | | |
| ScottishPower | 10 | 10 | 10 | 10 | 11 |
| Others | 0 | 1 | 0 | 1 | 1 |

(Source: OFGEM, Domestic Market Review, 2004)

Table N°11 – Market Shares in Domestic Gas and Electricity Market in Great Britain
(in % of 47 million customers; beginning of year 2004)

| Group | Gas + Electricity |
|----------------|-------------------|
| BGT | 40 |
| Powergen | 17 |
| Npower | 13 |
| EDF | 10 |
| SSE | 11 |
| Scottish Power | 8 |
| Others | 1 |
| Total | 100 |

(Source: OFGEM, Domestic Market Review, 2004)

Conclusion

This brief analysis of the structural transformations and behavioural performance in the retail markets of five European countries raises as many questions as it answers.

If there are so many margins for potential price reductions here and there, why have there not been sharper cuts where retail markets have opened? If these potential margins are so substantial, why are there not more cases of entry of new suppliers interested in these business opportunities? Why are there not more suppliers, new or already established, offering lower prices to attract consumers?

Or even, if “low price” or “low cost” suppliers exist, why are they not expanding faster, or simply more? Why aren’t they easily stealing incumbent systems operators’ customer bases? Why aren’t consumers gravitating to less expensive suppliers more frequently? Or, when there is much consumer movement (i.e., *switching*), as in England (40% net), why are not more new suppliers entering? And why is an incumbent national monopoly (British Gas – Centrica) the principal agent of electricity retail competition?

We will answer these questions in the second part of our *Working Paper*.

There we will begin by examining consumer behaviour. We will look at the hypothesis that consumers on the electricity retail market permit all the functional anomalies of these markets by not behaving like “best price” purchasing automatons. This is what economists call the assumption of “*switching costs*,” (the cost of changing suppliers appears higher to consumers than the benefits expected from this change).

Next we will look into whether switching costs are fixed or variable, imposed or “natural”, and whether they can evolve in the midst of a climate of retail market development.

We will then examine the strategic behaviour of suppliers, new and incumbent, on retail markets in terms of two different clienteles (an incumbent clientele directly inherited from the monopoly era; and a new clientele that has already switched suppliers) and two distinct segments (a single-product electricity-only segment, and a bi-energy, dual-fuel segment, i.e., electricity and gas).

Finally, we will address the “third side” of the retail market, which is no longer a matter of demand and supply, but rather of the formal rules imposed by either regulators or the government, because it is these public authorities who establish or legitimize the basic

institutions that operate the retail markets. In particular, we will examine: the separation between competitive activities and non-competitive activities; metering and settlements between wholesalers and retailers; standardization procedures of retail sales contracts; and finally, mechanisms of transition from monopoly to competition (notably incentives to switch supplier: price control, service guarantees, information and protection).

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