

A Mixed Nordic Experience: Implementing Competitive Retail Electricity Markets for Household Customers

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Although the Nordic countries were among the first to develop competition in the electricity industry, it took a long time to make retail competition work. In Norway and Sweden a considerable number of households are actively using the market but very few households are active in Finland and Denmark. One problem has been institutional barriers involving metering, limited unbundling of distribution and supply, and limited access to reliable information on contracts and prices.

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I. Introduction

The Nordic countries¹ have all fully liberalized their electricity markets during the past 15 years, with Norway the first to commence in 1991 and Denmark the most recent in 2000. In each case, wholesale competition was the starting point, with switching

charges and metering problems preventing true retail competition during the early years. Gradually, there evolved a workable solution, which provided access to the liberalized electricity market for all consumers, even low-voltage consumers including households.

From an economic and regulatory perspective, the

primary objectives of electricity market liberalization are to facilitate:

- Efficient utilization of the available electricity resources in the short run, and
- Efficient expansion of the sector in the long run.

A crucial point related to short-term efficiency is that producers and consumers realize the actual scarcity of electricity, which is embedded in the electricity prices. The price signals will stimulate consumption when prices are low and vice versa. The supply business takes care of the link between wholesale and retail prices and offers various hedging opportunities for consumers. Competitive retail markets with a sufficient number of suppliers are expected to transfer electricity from the wholesale to the retail level at low margins. However, margins will only stay low if consumers are believed to penalize inefficient suppliers by switching to competitors with lower margins.

Experience has demonstrated that the benefits of competition will not come by just introducing third-party access. The institutions developed for the concrete implementation of competition is crucial for whether it is likely to work or not, which particularly is the case when looking at household customers. They would not need to do anything active to continue to be supplied and will probably find it most safe to stay with the local distribution company or its successor. The purpose of this article is to compare how

the institutional setting of relevance for household customers has been designed and implemented in the four Nordic countries. They are all part of the same, very successful wholesale market but have developed their retail markets differently.

The next section will include a short review of the Nordic electricity market and the introduction of retail competition in the four countries. Section III will

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present the regulations and efforts stimulating retail competition in the Nordic countries. Important regulations cover metering system, billing requirements, switching regulations, unbundling and neutrality principles, information efforts, and security of supply considerations. Section IV concludes.

II. The Nordic Electricity Market and the Introduction of Retail Competition

Electricity market liberalization has resulted in:

- Separation of transmission system operation from generation in legally distinct entities.
- Separation of distribution (grid) from sales (supply).
- Regulated third-party access for all consumers.
- Creation of a Nordic power exchange (Nord Pool).

As a consequence an integrated Nordic wholesale power market was established.²

While third-party access was theoretically possible for all Norwegian customers in 1991, it was only in 1997 when the problem of metering was solved (see Section III for details). Finland and Sweden liberalized their electricity markets in 1996 and introduced retail competition for low-voltage customers one to two years after Norway. Denmark was the last of the four countries to liberalize and low-voltage customers only got access to switch supplier in 2003. It means that Norway, Finland, and Sweden more or less have had the same time to develop the necessary market institutions for this group of customers, whereas it is still a new thing in Denmark.

Household customers account for about 25 to 30 percent of total electricity consumption in each of the four countries (Table 1).^{3,4} Average consumption differs considerably among those countries, which primarily reflects large variations in the use of electric heating.

In principle, access to the market is similar in the four countries but the actual use of the market is

Table 1: Consumption of Electricity in the Nordic Countries in 2002

| | Denmark | Finland | Norway | Sweden |
|---|---------|---------|-----------------|-----------------------------------|
| Total consumption (TWh) | 35.2 | 83.9 | 120.9 | 148.7 |
| Households (percent) | 27.3 | 25.0 | 30.1 | 28.1 |
| Consumption per household (kWh) | 4,000 | 7,000 | 19,000 | 10,000 |
| Share of households with electric heating (percent) | 5 | 22 | 98 ^a | 59 ^b 4 ^c |

Source: Nordel (2002), *Årsberetning* (Annual Report), 2002.

^a Most of these households have installed an alternative heating system, primarily a wood stove.³

^b Single family houses.⁴

^c Multiple family houses.

very different. While liberalization may have led to a reduction in the number of companies in the energy market, Nordic consumers are nevertheless presented with a significant choice of suppliers. The number of suppliers offering electricity to consumers beyond their incumbent areas varies over time and from country to country but consumers may typically choose among 20 to 40 suppliers.⁵ Besides choosing among different suppliers household customers can choose among different contracts. Under monopoly, consumers had only one *contract* with their local distribution company. After liberalization they have two, a distribution contract and a supply contract. The *distribution contract* essentially concerns all distribution and metering issues. The *supply contract* essentially concerns the electricity commodity itself. The supply contract, which regulates the relationship between the supplier and the consumer, represents the core of liberalization.

The main characteristic of a contract is its risk profile. However, the mode of payment and other details distinguish

contracts and suppliers. The most common supply contracts offered to Nordic household are:

- The *traditional contract* (sometimes referred to as the “standard variable” or “list” contract) where the supplier may adjust the contract price when he finds that appropriate, for instance, following changes in supply costs.
- The *market-based contract*, where the price directly reflects the Nord Pool day-ahead *spot price* plus a margin or some other kind of commission.
- The *fixed-price contract* where there is a fixed price for an agreed period of time, most often one to three years but sometimes longer.

In Norway and Sweden about 40 percent of households have been active by either switching supplier or by getting a different contract. In Finland this figure is less than 15 percent and very few have been active among Danish households. Norway and Sweden compare well with the two countries having the most active retail markets, the U.K. and Australia.⁶

The Nordic retail markets for residential consumers are still national. In principle, a supplier in

one country could offer contracts to households in another Nordic country, but in practice it barely happens yet. Some companies own and operate supply companies in more than one Nordic country, but the need for a supplier to arrange balancing power agreements for its supplies, along with national and unique registration procedures for supplier switching, serve to discourage direct trans-Nordic retail trade.

III. Regulations and Efforts Stimulating Retail Competition

Retail competition presupposes good and workable rules and regulations and some minimum public effort in order to become a success. Below, we will discuss several regulations and efforts that stimulate retail competition in the liberalized Nordic electricity market.

A. Metering requirements and the profile system

When Norwegian household consumers received third-party access after the reform in 1991 it was too expensive to change supplier since precise (hourly) metering was required. The potential savings were simply too small to justify the investment in new metering equipment. Therefore, a procedure relying on existing meters was required. These meters were usually checked once every year and this created at least two problems:

- It was not possible to track the consumption pattern for those customers who had switched to a new supplier. Since each supplier has to cover (provide) their customers' consumption hour by hour, the absence of individual metered values created problems linked to the allocation of consumption to the right supplier.

- In addition, frequent switches would require reading of a consumer's meter every time he chooses a new supplier.

Against this background, different procedures without these problems were considered. The alternative chosen was to create a consumption profile for all low-voltage consumers in the network area of each distribution system operator (DSO). The profile is applied to provide an estimate of the consumption of a consumer belonging to a particular supplier.

It was only in 1997–98 that a practicable profiling solution relying on existing meter readings was introduced for this group in Norway. In the following years a similar system was adopted in Finland and Sweden. In Denmark it was implemented in 2003 after full third-party access was introduced. Even though the same type of system is applied in all four countries there appears to be considerable differences with respect to how it works in practice. In addition the profile system has some inherent problems:

- Customers are charged according to their estimated and not their actual consumption, making it more difficult to understand and accept the bill.

- It is common for the meter to be read only once a year and sometimes even less frequently than that. The consumer is charged for his estimated consumption until the meter is read and will only have his account settled after that, which can result in large—and for the consumer unanticipated—after-payments.

- Customers whose annual consumption deviates from the

The alternative chosen was to create a consumption profile for all low-voltage consumers in the network area of each distribution system operator.

profile consumption will be either rewarded (if they consume more than the average when the price is high) or punished (if they consume more than the average when the price is low).

- Customers cannot influence their expenses by moving consumption to periods with low electricity prices.

It is not always obvious which profile should be applied. In Norway a supplier can choose his own profile or that of the DSO when the consumption figures for his customers are constructed. However, the supplier himself is billed according to the local profile.

Sometimes these inherent problems of the profile system are amplified by its concrete implementation. The radical solution will be to replace existing meters with new ones allowing hourly metering.⁷

B. Supplier switching regulations

The DSO has a central role in the necessary exchange of information when a low-voltage consumer is switching supplier. It still takes considerable time to handle the necessary exchange of information in some of the countries and thereby to effectuate the shift. In Norway it has to be done within two weeks. In Sweden and Denmark at least one month is necessary for a shift. A change of supplier is free of charge in these three countries. In Finland a shift of supplier can be done once every year without charge. However, it is not always true that the charge is levied if a consumer does it more frequently. In all four countries, there have been many complaints about poor service in terms of delays or misinformation offered by the DSO during the process of information exchange (see below).

We consider the procedure for switching supplier as very important for the functioning of the retail market. When customers find it burdensome or untrustworthy, which can be a significant barrier for switching supplier even under conditions that it would be desirable, thus hindering the proper functioning of the retail market.

C. Unbundling and neutrality: binding to the incumbent supplier

In all four countries a separation at the wholesale level of competition (generation and supply) and monopoly (transmission and system operations) took place from the very beginning, whereas a similar separation at the retail level was much more half-hearted. As a consequence the successor of the former distribution utility to a large extent preserved its privileged position.

Separation of supply activities from the DSO was and still is not obligatory in Norway and quite a few suppliers are still integrated with DSOs.⁸ To avoid misuse of their privileged position—which includes information of customers and the identity of their supplier—the DSOs must follow special regulations by the authorities. For instance, no supplier shall have access to the DSOs' customer register, and services offered by the DSO should be offered to all interested suppliers under non-discriminatory conditions. In Sweden, legal separation of suppliers and DSOs is obligatory, but many still belong to the same group.

In Finland, separation has not been obligatory. Suppliers that dominate a distribution area—in practice, suppliers affiliated with the local DSO—are obliged to serve customers without alternatives under regulated conditions. According to this provision in the Finnish electricity act, the authorities can intervene when

prices are considered unjust but cannot dictate a particular price. In Finland, Norway, and Sweden, the DSO is “the supplier of last resort.”

Conditions in Denmark are quite different. When the electricity market was liberalized in 2000, low-voltage customers continued as captive customers and were served by special supply obligation companies made obligatory for each distribution area

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by the electricity act. The Danish energy authority regulated the prices of these companies that were often but not always subsidiaries of the DSO in the area. After third-party access was extended in 2003 to all electricity customers, the supply obligation companies continued to exist under the provisions of the electricity act offering regulated prices to customers who were not interested in choosing suppliers by themselves. The companies, which today supply nearly all households, are also the “suppliers of last resort” in Denmark. Since 2005, the regulated prices have been calculated

in advance for each quarter as the average futures price on the wholesale market for this quarter plus an individual mark-up for each supply company. It has proved very hard for other retailers to compete on these terms.

D. Billing practice and regulations

In Norway, the billing procedures of DSOs that are monopolies are regulated. The DSOs must follow rules for maximum billing intervals, payment system, and design of the bill. The DSOs have to offer billing services to all suppliers represented in the area at cost-based rates. However, most often new entrants choose to do the billing themselves, since billing together with different DSOs create many practical and compatibility problems. Incumbent suppliers integrated or affiliated with the local DSO normally bill together with this company. This can be considered an advantage compared to their competitors and thus contributes to binding the consumer to the incumbent supplier.

A customer moving to an entrant supplier will most often receive two bills, one for supply and one for grid services. This is good for unbundling but may represent a considerable hindrance to competing suppliers seeking market access and consumers seeking a change of supplier. A system with two bills, one for distribution charges and one for supply charges, is considered more complicated than the past

system with only a single bill, and thus is a hindrance to the unfolding of retail competition.

In Sweden, it is more common that the supplier bills supply and grid services together. In Denmark and Finland, this is almost always the case.

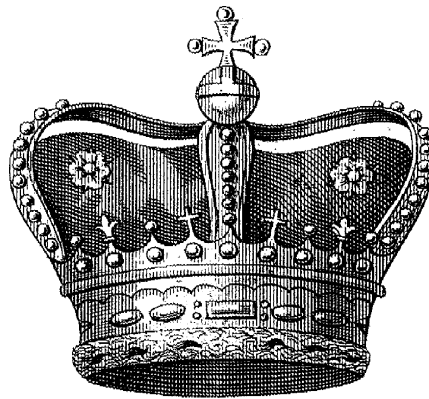
E. Information and market monitoring: consumer awareness

The information offered by competing electricity retailers can be difficult and time consuming for consumers to collect and compare. This may cause consumers to be inactive within the competitive market. Furthermore, the commoditized nature of the product means that price tends to be the main sales argument, even though the service surrounding the product may also prove to be a powerful differentiator. Suppliers wishing to access the market for household consumers therefore have the tough task of minimizing consumers' search cost through intensive price-focused but differentiated marketing communications. However, due to the necessarily low margins in electricity retail, any marketing communication must be conducted extremely cost-effectively.

In accordance with these marketing communication requirements, suppliers' Web sites tend to play a key role in the marketing process. Nearly all suppliers in the Nordic countries have Web sites telling consumers about the products and prices they offer. To assist this online channel of

communication and further reduce search costs, Norway, and more recently Sweden, have installed high-profile interactive Web pages with easily accessible, comparable, and trustworthy information on all suppliers offering contracts to household consumers in a particular area.

The Norwegian consumer, for instance, need only key in his



municipality and annual consumption into the Web service and in return will get information for the three cheapest suppliers offering contracts in his supply area. The information includes prices for different contracts (e.g., spot price plus or fixed price for a specified period) with or without taxes. In addition, it is possible for the consumer to check price developments during the last year for the particular company he is interested in. The Norwegian Web page is operated by the competition authority and it is obligatory for all suppliers selling to household consumers to provide information on their prices.⁹ By doing this they are obliged to follow certain standards with

respect to actuality of prices, payment rules, etc.

The authorities in Norway also spend some effort on persuading suppliers to harmonize contract terms and payment conditions. Standard contracts have consequently been agreed upon between the consumer authorities and associations of the electricity supply industry.

The Swedish Web page is operated by the consumer agency and has similar facilities to the Norwegian system. It is free for suppliers to participate but the Web page is considered to be fairly representative. In addition to accessing price information for alternative contracts, the consumer can also indicate preferences with respect to production technology (e.g., hydropower or other renewable sources) and check into the possibilities of discounts, for instance for members of trade unions and consumer cooperatives.¹⁰

In Denmark, the association of network companies has initiated a similar system.¹¹ However, the Danish Web page is much less representative with respect to coverage of both suppliers and contracts than those in Norway and Sweden and has also been criticized for poor validity of its price information.

The Finnish authorities and industry associations have so far not been as active as their Norwegian and Swedish counterparts when it comes to introducing measures to reduce information and transaction costs. In Finland there have since 2001 been

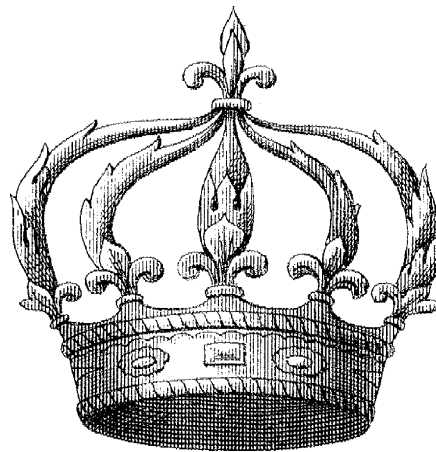
commercial Web sites which provide consumer price information, but they are more piecemeal, less official, and arguably less well promoted than those of the Norwegian and Swedish authorities. Recently, the Finnish Energy Market Authority has introduced a Web-based information system similar to those operating in Norway and Sweden.

Awareness stems not only from Web sites, however, official or otherwise. It stems from a whole host of channels of communication ranging from the media and electricity companies to official authorities and word of mouth. In the absence of comparable data concerning the extent and efficiency of operation of these channels, as well as the outcome in terms of measurable consumer awareness, we must focus on the evidence at hand.

In this respect recent evidence from the Finnish electricity market suggests that consumer awareness is and has been very poor and that this is a reason for the low switching activity in that country. In fact, recent research found that 30 percent of residential non-switchers in the Finnish electricity market said that they had not switched at least partly because they felt they had not received enough honest, independent, or clear information. Some 46 percent thought one reason was that price comparison was too difficult and 19 percent said it was a major reason.¹² For those consumers who had switched, 84 percent said that

switching ease had influenced their switching decision and 37 percent said switching ease had been a major influence. All in all, 92 percent of residential consumers were seen as "critically unaware" in one way or another.

The situation is very similar in Denmark. There, 88 percent of residential consumers who were



aware of the possibility of switching supplier (amounting to 70 percent of all households) said in a recent survey that they had not considered switching. The 12 percent that had considered switching were to a large extent unaware of the available information and found it time-consuming to switch.¹³

F. Consumer complaints

Liberalization has caused an increasing amount of consumer complaints. They are also different in kind. Prior to liberalization, they focused mainly on metering (when the consumer claimed the bill to be too high), interruption of

service after failing to pay, and compensation for damage caused by failing quality of service. Today, an increasing share of complaints comes from customers switching supplier:

- It takes too long for the DSOs to effectuate a switch. As a consequence the consumer is charged a different price than the contracted one or is charged by several suppliers.

- Relevant information on the applied profile is not provided.

- Metering and billing result in large afterpayments because the current (higher) price is charged instead of the prices valid during the consumption period.

- When a supplier goes bankrupt, the consumer is referred to another supplier by the DSO and often at a much higher price.

- Aggressive sales methods.

It has become more complicated for a household consumer to figure out where to address a complaint. When the complaint refers to something that is the responsibility of the DSO (network tariffs, switching procedure, metering, disconnection) the right address is the authority regulating the network monopoly. When it is about supplier contracts and marketing, the consumer authority is the relevant place. Some effort is now being made to ease the process for dissatisfied consumers. The consumer authority has become an important actor in this new system together with the associations that represent consumers and the electricity industry. Information on access to the complaint system

is made available by both the involved authorities and the private associations.

The development of a new complaint system is more pronounced in Norway and Sweden and so is the increase in the number of complaints stemming from the liberalized market. The process is behind in Denmark and Finland, where there have been very few complaints so far on switching procedures and the marketing behavior of suppliers.¹⁴

IV. Conclusion

The Nordic countries were among the first to develop competition in the electricity supply industry, including retail competition. However, it took a long time to make this part of the market work. In Norway and Sweden a considerable number of households are now actively using the market by either switching supplier or contract. A relatively large number of household customers in both countries have chosen another supplier than their local supplier (about 40 percent), but these customers are still a minority. In Finland and in particular in Denmark, very few household customers are participating actively.

One possible explanation is the large variation in average consumption that mainly reflects the different extent of electric heating in the four countries. In this article, the focus has been on institutional barriers to the access of household

customers to the electricity market. The profile system that was introduced as a practical solution to the lack of meters allowing two-way communication has several incentive problems. Another barrier can be the limited unbundling of distribution and supply on the retail level, which facilitates the continued dominance of the incumbent supplier that is integrated or otherwise affiliated with the DSO. Finally, easy access to reliable information that makes for straightforward comparisons of the contracts and prices offered by competing suppliers is important. This problem has so far been solved fairly well in Norway and Sweden but not yet in Finland and Denmark.

In contrast to the integrated wholesale market, the retail markets for household customers are still national and with large differences among the four countries. If it is in fact important to reach a Nordic retail market, then there is still considerable progress to be made. ■

Endnotes:

1. which liberalized its electricity market in 2003, is excluded from this study due to an absence of comparable data. The term "Nordic" used within this study consequently hereafter refers to Norway, Sweden, Finland, and Denmark.

2. For an account of the Nordic electricity market, see Eirik S. Amundsen *et al.*, *Robust by Design?* in Fereidoon P. Sioshansi and Wolfgang Pfaffenberger, Eds., *ELECTRICITY MARKET REFORM: AN INTERNATIONAL PERSPECTIVE* (Amsterdam: Elsevier, 2006).

3. Anne C. Bøeng and Runa Nesbakken, *Energibruk til stasjonære og*

mobile formål per husholdning 1993, 1994 og 1995, Rapport 99/22 (Oslo: Statistics Norway, 1999).

4. See *Energistatistik för småhus, flerbostadshus och lokaler 2002*, Statistiska Meddelanden EN 16 SM 0304 (Stockholm: Statistics Sweden, 2003).

5. Except for Denmark, where household customers only can choose among about 10.

6. See Ofgem, *Domestic Competitive Market Review 2004. A Review Document*, April 2004 (www.ofgem.gov.uk) and Australian Energy Regulator, *Inaugural Energy Retail Congress: The AER and the New Regulatory Environment*, (www.aer.gov.au/content/index.phtml/itemId/689256).

7. Sweden will make the monthly reading of meters obligatory starting in 2009. In all four countries, experiments with intelligent meters for low-voltage customers are now taking place and several companies have already decided to install such meters for all their customers.

8. See European Commission, *Annual Report on the Implementation of the Gas and Electricity Internal Market*, COM (2004) 863 final (Brussels, 5.1.2005).

9. The Norwegian Web site can be found on www.konkurransetilsynet.no/kraftpriser/velg_kommune.php.

10. The Swedish Web site can be found on www.elpriser.konsumentverket.se/.

11. The Danish Web site can be found on www.elpristavlen.dk.

12. Philip E. Lewis, Marja Pakkanen and Martti Muroma, *The Electricity Customer's Lot: The Status of the Deregulated Finnish Electricity Market—Consequences for the Customer* (Helsinki: Finnish Ministry of Trade and Industry, 2004).

13. Energistyrelsen (Danish Energy Agency) *et al.*, *Information om frit valg*, Copenhagen 2005 (www.forbrug.dk/fritvalg/rapport/rapport/).

14. See Ole J. Olsen, *Liberalisering af Energimarkedet*, TemaNord 2004:563 (Copenhagen: Nordic Council of Ministers).