

## **Comment on David Newbery: Regulatory challenges to European electricity liberalisation**

Lennart Hjalmarsson\*

Newbery has done an excellent job of discussing a large range of issues pertaining to the electricity liberalisation in Europe. The paper provides a systematic review, based on a worldwide perspective, of serious, and some rather alarming, problems in recently liberalised markets such as security of supply and monopoly power. The author seems more pessimistic (and more regulation-prone) than I am about the working of a liberalised electricity market.

To some extent, we are all slaves under our own systems, and the electricity market is no exception. There are, indeed, some important differences between the Nordic electricity market and most European markets:

- A history of vertical disintegration and mixed ownership;
- A high share of hydro power;
- Low concentration in both generation and supply;
- Relatively strong high-voltage transmission system and cross-border interconnections; and
- Weak regulation.

These differences might lead to a somewhat different, and less alarming, perspective of the problems the Scandinavian market will face in the future. I have four comments from a Swedish perspective.

First, the author seems very concerned about security of supply and investment incentives. While I see serious problems with investment incentives in Swedish electricity generation, because of an extremely slow plant commissioning process and the risk of political interventions, especially changes in energy taxation, I do not see the close link between capacity and security of supply. In my view, security of supply, at least in the Nordic context, is more linked to the different electricity contracts and markets and the trade-off between system operator responsibility and the functioning of the different mar-

\* *Lennart Hjalmarsson is professor at the School of Economics and Commercial Law, Göteborg University.*

kets. In the Nordic system, there exist long-term contracts (at least up to ten years), there are forward and futures markets (days, weeks, blocks, seasons, years; 3 years ahead), the spot market and country-specific regulation markets. With this combination of contracts and markets, I see no strong reason to be very concerned about the security of supply. Less or tighter capacity would immediately be reflected in long-term contracts and forward and futures prices, while smaller reserve margins would be a signal to the system operators to contract more reserve capacity.

There is also substantial flexibility on the demand side, particularly in Norway and Sweden, partly due to a large amount of electricity heating in dual systems with electricity and fuels, partly due to a large share of electricity-intensive industry which will reduce its capacity utilization, or close down, when electricity prices are high. Moreover, the spot market is optional, trading less than 30 per cent of the total generation, thereby also contributing to less price volatility. Increasing prices are met with increasing supply. This winter, with record-low hydro reservoirs, will provide an important test of the functioning of the Nordic market when supply is tight. So far, it has stood the test.

Second, the author makes a strong case for specific sector regulation or the “apparent need for more sophisticated, informed and possibly interventionist regulatory power”, to prevent market abuse (and ensure supply adequacy). As regards Scandinavia, I am still not convinced about this. What is obvious is that both theory and simulations predict a large potential for market power in electricity spot markets. Rudkevich et al. (1998) show that the power industry is extra susceptible to lack of competition. Research in experimental economics suggests that 5 firms of equal size are enough to force prices close to the marginal cost in a “normal” industry. Rudkevich’s result suggests that more than 30 firms of equal size are needed to ensure competitive pricing in the electricity spotmarkets, however.

Moreover, almost all liberalised electricity markets seem to have more or less serious market power problems. Although debated, Nord Pool may be an exception. The scientific evidence so far is very weak (when there are no transmission bottlenecks); see Hjalmarsson (1999) and SOU (2002). However, there are indications that local market power caused by transmission constraints is a problem; see Johnsen et al. (1999). When Sweden is an isolated price area in Nord Pool, the concentration in generation is extreme with a CR-3 ratio of 83 per cent. Thus, the potential for market power during such periods

is very high, calling either for a break-up of the largest (state-owned) generator, Vattenfall, or increases in cross-border transmission capacity.

Third, concerning renewable energy and climate policy, wind power is certainly not the least-cost technology in Scandinavia. The green electricity certificates, introduced in Sweden in May 2003 to enhance renewables in cogeneration, will in fact not benefit wind power enough to make it competitive with biofuels and combustible trash in CHP plants. On the contrary, the green certificates in combination with a phase out of the direct subsidies have been regarded as a blow to wind power. Since the price of trash is negative (plants get paid for taking care of the trash), and since there is a ban on deposits of combustible trash, we see a rapid expansion of large trash-fuelled plants in Sweden.

Because of the low electricity price level, CHP production based on natural gas is not yet competitive in the Scandinavian market compared to natural gas in heat-only plants. With the exception of Norway, cogeneration for district heating and electricity is a rather old technology in Scandinavia. District heating is extensively used in most urban areas, but the choice between heat-only plants and CHP plants is very sensitive to the expected path of the electricity price. Moreover, economies of scale are important in CHP production, making small plants considerably more costly than large ones. In recent years, large electric heat pumps, and during low-price periods, electric boilers, have been competitive, at least in the Swedish market for district heating.

Sweden and Norway are countries with steeply increasing marginal costs in GHG abatement. While power production is one of the major sources of carbon dioxide emissions in most European countries, in Sweden it is responsible for only about 2.5 per cent of the total emissions and almost zero in Norway. Thus, fuel switching is not an important option in climate policy. Except for closing down heavy industry, there are few low-cost options to reduce carbon dioxide emissions in other sectors of the economy. In Sweden, a life extension of nuclear power plants becomes extremely attractive.

Looking at the future, all zero-emission power production technologies are subject either to environmental constraints (hydro, nuclear and wind) or too costly compared with import (wind and biofuels for electricity generation in electricity-only plants). If permitted,

new nuclear power is still cheaper than the exploitation of additional major rivers (see SOU, 1991).

Finally, the liberalisation of the Nordic electricity markets has been a success so far. The joint Scandinavian power exchange, Nord Pool, functions satisfactorily. It has attracted a large number of agents (about 300) from all Scandinavian countries. There is no strong evidence of strategic behaviour in the spot market. In general, adjusted for “normal” precipitation, electricity prices have fallen by more than 30 per cent in the competitive market segment, and there has been a strong convergence of electricity prices in this segment. The switching costs are low (a single telephone call) and small retail consumers have gradually become more active in switching to new suppliers or renegotiating contracts with their old ones. In 2002, 37 per cent of all retail consumers had switched or renegotiated their contracts.

In my view, the most serious problems with the liberalised Swedish electricity market are the following:

- The low efficiency in local network services. Formal regulation is weak in Sweden and yardstick competition does not provide enough incentives for productive efficiency; see Kumbhakar and Hjalmarsson (1998). One might expect that Sweden will follow Norway in its gradual regulatory transition towards a kind of combined rate-of-return and price-cap regulation.
- The weak investment incentives in generation. Sweden has a sad history of frequent energy tax changes. In addition to market risks, investments in power generation, and especially in cogeneration, seem to be exposed to substantial political risks also in the future.

## References

- Hjalmarsson, E. (1999), Nord Pool: A power market without market power, Scandinavian Working Papers on Economics 28 ([www.swopec.hhs.se](http://www.swopec.hhs.se)), Department of Economics, Gothenburg University.
- Johnsen, T.A., Verma, S.K. and Wolfram C. D. (1999), Zonal pricing and demand-side bidding in the Norwegian electricity market, POWER Working Paper PWP-063, University of California Energy Institute.
- Kumbhakar, S. and Hjalmarsson L. (1998), Relative performance of public and private ownership under yardstick competition: Swedish electricity retail distribution, 1970-1990, *European Economic Review* 42, 97-122.
- Rudkevich, A., Duckworth, M., and Rosen, R. (1998), Modelling electricity pricing in a deregulated generation industry: The potential for oligopoly pricing in a poolco, *The Energy Journal* 19, 19-48.

SOU (1991), Beskatning av kraftföretag, SOU 1991:8.

SOU (2002), Konkurrens på elmarknaden, SOU 2002:7.