

Electricity Restructuring: Is Ontario Getting it Right?

*By John Grant**

As many know, electricity restructuring is proceeding rapidly in much of the United States and indeed many parts of the world. As far as Canada is concerned, the two provinces of Alberta and Ontario have led the way but there isn't exactly a rush to get on board. Most of the Canadian provinces already benefit from relatively low-cost and ample electricity supply, based on endowments of hydro power or coal and, in Ontario's case, large-scale nuclear installations. Given this endowment, most Canadian provinces see themselves as exporters of electricity (as well as other energy products) to the United States and will do whatever is necessary, including providing open access to their electricity grids at the wholesale level, to obtain FERC permission to make those exports; but generally there has been little enthusiasm for opening up retail markets. Keep in mind that in Canada, most of the integrated utilities are owned by the provincial government, so that the natural inclination of the incumbent to preserve its monopoly franchise is reinforced by the government's position as the owner of the monopoly asset. Of all the provinces, only Ontario and Alberta, both of them under fairly right-wing regimes, have pursued electricity restructuring through to the retail frontier.

In Canada, too, electricity has been and continues to be primarily regulated at the provincial level. While a federal licence is required to export electricity to the United States, there is no body in Canada that exerts an authority comparable to FERC, the U.S. Federal Energy Regulatory Commission. Again, given that the vast majority of generation and transmission assets are owned by the provincial governments and given, too, that interprovincial transmission has been very small compared to the within-province load and the export flows to the United States, the feds have stayed out of trouble by keeping a low profile. In the negotiations that led to the North American Free Trade Agreement, electricity was conspicuous by its absence.

Why then, did Ontario become such an anomaly? Go back for a moment to 1990. At that time, the provincially-owned utility, Ontario Hydro, operated roughly 90% of generation and almost all the transmission facilities within the province. Distribution was primarily in the hands of some 300 municipally-based utilities, although Ontario Hydro also had a significant chunk of distribution in the rural areas of the province. Although there was a small private-sector presence in Ontario's electricity industry, it is fair to say that Ontarians considered it "their" patrimony and were exceedingly proud of the high professional reputation and on the whole the low, stable prices, provided by Ontario Hydro's mix of large and small hydro, fossil, and nuclear generation and its strong well-optimised transmission network.

But Ontario Hydro over-reached itself. It suffered major cost overruns on a major new nuclear station, and then suddenly and unexpectedly had to deal with falling demand in

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the early 1990s, requiring it to raise prices just when natural gas prices were falling, angering its major industrial customers and leading to dire threats of switching away. Hydro's management came up with a plan to restore its balance sheet by merging with the debt-free municipal utilities, but this was a political non-starter. By 1997, to cap an already dire situation, evidence of severe mismanagement of the nuclear stations came to light. The provincial government, already in fiscal straits itself as a result of federal downloading and a weak economy, was in no position to bail the company out, and so it made use of the advice of a 1996 Advisory Committee, on which I sat, that proposed breaking up Ontario Hydro and opening a fully competitive electricity market at the wholesale level. The generation and transmission companies would be re-capitalized with appropriate balance sheets, and Hydro's excess debt would be allocated to a government agency to be paid down one way or another out of electricity rates over a period of years. A key part of the reasoning here was that Ontario would need access to U.S. electricity markets, and in the context of FERC's Open Access pronouncements, it would have to open its own wholesale market to U.S. suppliers in a reciprocal manner.

In retrospect, the truly ambitious part of the government's plan was the proposal to open retail markets to full competition simultaneously with the wholesale market. This caught the local municipal utilities by surprise and, I have to say, they have generally been unhappy partners in the subsequent developments, although our markets did open this year on May 1 and all customers, large and small, now have an effective choice among suppliers.

Enough about the history. As many are aware, Ontario has thus taken its place in a worldwide march toward open electricity markets. It caught the tide, so to speak, and for partly fortuitous reasons it has become a market leader in some respects. It has entirely avoided the market design weaknesses that plagued California and it has experienced relatively few issues and problems in the first few months of operating its new markets, partly because of a very intensive period of testing and coordination that has taken place since the Independent Market Operator was established in the spring of 1999. But these processes are far from mature. I would like to spend my time primarily discussing the issues that remain on the table. Of course, we are far from alone. In that context, our working relationships with the Independent System Operators in New York, New England, and Pennsylvania-New Jersey-Maryland or PJM, and with the Midwest ISO and control authorities in Michigan and Minnesota, not to mention our extremely important interties with the provinces of Quebec and Manitoba, all need further work. Although many Ontarians still cling to the notion of Ontario as in some sense a self-sufficient electricity fortress, the reality is that we will gain a great deal from the market access that the new arrangements make possible. This was dramatically demonstrated recently, in fact, when due to the exceptionally hot weather, Ontario as a whole was importing some 2700 MW of its total record peak load of roughly 25500 MW – i.e. over 10% of its requirements. We would never have been able to meet that demand from internal resources. Mind you, this reflects a situation that we hope is only temporary, that is, the delayed return to service of our ailing nuclear reactors. If six of these do return to duty over the next few years, as planned, they will add some 3500 MW to baseload

capacity and put Ontario in a position to be a net exporter most of the time. Although prices did rise sharply during that episode, the markets did meet the challenge, which has given us somewhat greater confidence in our new tools.

From an economist's point of view, the critical reform in restructuring is a shift in the basis of pricing from long-run average cost as calculated by a monopolist, to short-run marginal cost as experienced by a myriad of competing entrepreneurs. The result should be a transfer from producer to consumer surplus and a much greater effort on the part of producers to innovate. Not only that, but it will give consumers a reason to respond to the new price signals, because the supply curve looks like a hockey stick most of the time – that is, a very large part of the supply is available at relatively low cost, but the curve rises very sharply over the last ten percent of its range; in peak hours, or when weather or equipment outages supervene, the resulting price spikes can be very dramatic. As a result, if there is any meaningful price elasticity out there, we should, over time, observe a reduction in peak loads in favour of off-peak usage that is far cheaper to supply, thus saving very substantial amounts in both generation and transmission investment over time.

The good news is that this will provide an opportunity to reduce costs. The bad news is that consumers don't seem to like it. In Ontario, consumers have seen very stable prices for decades, punctuated by the one very severe increase in the early 1990s that I referred to earlier. Now that the new market is open, fully 20% of residential consumers have chosen to accept a fixed-price contract with a retailer rather than accepting the pass-through of the wholesale spot price that they would otherwise receive. Of course, there is another reason why consumers may be wary of a spot-price passthrough, and that is that the technology of interval meters has not yet caught up with the new market design.

If you think about it, this is one of those “killer apps” where a combination of a remotely-readable interval meter with home management software, controllable appliances, and access to prices over the internet stands to save the average householder a fair amount of money. As far as Ontario is concerned, unfortunately, we have now produced a viable egg, but it has yet to hatch this particular chicken, and I am not the only one who is quite impatient for someone, ideally a Canadian technology company, to come along with the solution.

One of the things we have learned as we have struggled with setting up this marketplace is the vast importance of a consistent and appropriate regulatory environment. In the old days, Ontario Hydro in effect was its own regulator, and its Chairman appears to have communed from time to time with the Premier of the Province to take whatever strategic decisions needed making. In an open market, on the other hand, it is critically important that all the players be seen to have equal opportunity, and this includes those entities that remain under provincial ownership. Unfortunately, the province decided at the outset of restructuring to retain all the generation stations of Ontario Hydro in a single successor company; this company thereby retained close to 90% of all the capacity in the province, quite an unacceptable starting point. A key accomplishment of our Market Design Committee, in that context, was to work out a Market Power Mitigation Agreement whereby the generation company is obligated to reduce its control to no more than 35% of the

capacity available to the province within 10 years of market opening. In the interim, it is subject to a revenue cap which, roughly stated, obligates it to make a rebate to customers if the annual average price of energy it receives for most of its supply in Ontario goes above the price it had charged before the market opened. The provincially-owned transmission company is obliged for its part to expand Ontario's intertie capacity with Michigan and Quebec, so that imports could play a larger role and hopefully exercise some restraint on prices. But studies suggest that market power will remain a concern until and unless the largest generator controls no more than 20 to 25% of the capacity serving Ontario.

Now that FERC has proven itself aggressive in forcing the pace of regional consolidation of the U.S. electricity grids, and is more or less bent on requiring each region to operate under a standard market design, the question naturally arises whether Ontario's market will interface seamlessly with those around it. It has to be said that there is no way that our key could fit all the locks in any case: New York and New England, now pursuing a marriage with each other, have market designs very similar to ours but not exactly the same; Quebec doesn't operate a market; Michigan is different again. One of the interesting proposals now on the table is to construct a 975-MW High Voltage Direct Current link under Lake Erie, a link that would connect Ontario for the first time directly to Pennsylvania and Ohio; each of these is under a different regime again. Once Ontario's ailing nuclear reactors are back in service, the Lake Erie link may prove very beneficial in getting our electricity out to the vast midwest U.S. market, but, again, since this business is infinitely complex, Ontario regulators and the IMO are having to think very carefully about how it is to be integrated to the grids at both ends.

The Lake Erie Link is in fact an example of what is now called “merchant transmission” – that is, it proposes to sell its capacity in advance to those who finance it, and it will not apply for rate base regulated pricing. In effect its capacity will be auctioned off in the form of so-called “transmission rights”. But these rights do not necessarily imply that their owner can access the grid at either end. To win access to the Ontario grid you have to be a successful bidder or offeror in the IMO's market – that is, you have to offer your energy no more expensively, or offer to take it at no lower a price, than whatever the clearing price turns out to be. On the other hand, access to the grid in Pennsylvania or Ohio depends on your ability to meet somewhat different tests. So there is a great deal of effort now being expended on facilitating “one-stop shopping”, i.e., smoothing the way for would-be traders.

Finally, I want to note a couple of other items that are in the category of “good things to have” and that we are currently investigating. One is a forward market. The other is locational pricing for energy.

As far as a forward market is concerned, there is no question that if we could establish a forward price curve based on deep, liquid trading activity, it would provide a major benefit to market participants both in managing and hedging their energy needs and could add to investor confidence in undertaking long-lived investments in generation. Actually, there are two types of forward market that are being considered, one is a day-ahead market, the other involves the longer-forward delivery dates.

The day-ahead market is actually a fairly high priority and may be developed relatively soon. The IMO has just signed an agreement with the New York and New England Independent System Operators to explore whether a single Day-Ahead market, or compatible Day-Ahead markets, would best enable their market participants to engage in seamless transactions within and across their markets.

One of the problems we face in promoting seamless trading between the neighbouring control areas is that, due to technical limitations, intertie transactions must last for at least one hour; whereas within the individual markets, prices and volumes are set every five minutes. Up to four hours before the hour in question, bids and offers over the interties are placed in the same hierarchy as domestic bids and offers, and cleared on the same basis in order to decide whether they should be accepted; but, once accepted, they are in effect placed at the bottom of the stack during the hour, and the subsequent five-minute markets examine only domestic bids and offers. Depending on how things develop over the hour, significant anomalies can arise, and it may happen that Ontario commits itself, for example, to using expensive imported energy during a given hour when, as it turns out during the hour, less expensive domestic energy has come available.

The IMO, with New York and New England, is exploring whether day-ahead markets in which participants would make binding commitments and be settled on those commitments, would add to pricing efficiency. In this sort of regime, the spot markets would in effect become balancing markets, where prices would reflect emergent circumstances such as hot weather or unplanned equipment outages, but the amount of power settled at those spot prices would be very substantially less than it is today.

Locational energy prices arise because, in the presence of transmission constraints between one place and another, the cost of serving load at one location can differ from the cost at another location. Even if a cheaper generator were available to meet demand at a given point, it may not be physically possible to deliver its power to that point, so that a more expensive generator may have to run to serve it. In the Ontario market, we set one Ontario price, using an algorithm that places the generation in merit order, assuming that no such constraints exist; but in the actual operation of the market, the IMO often has to call upon certain other generators to run and may have to tell certain accepted generators not to run. These generators are compensated individually at the expense of the market as a whole. Better investment signals would be sent, however, if prices at each location actually reflected the cost of serving it, because generators and transmitters would both then be incented to take steps to reduce the congestion. Generators would locate close to load, and transmission would be reinforced where the price differentials made it worthwhile. The problem with locational pricing, however, is that Ontarians will need to be convinced that market efficiency trumps their notion of equity, fostered over 100 years of public power, namely that everyone in Ontario should pay the same price for their electricity no matter how expensive they are to serve.

Let me sum up by simply noting that, as as can be seen, we are making substantial strides, and I don't think we have made significant mistakes along the way, but the evolution of this marketplace is by no means complete. In my opinion, the

vision to be accomplished is one in which North America has in effect a set of harmonized markets for energy, where traders can move product from place to place, whether in the form of coal, gas, or electricity, subject only to environmental policy, to strict reliability and security considerations, and, of course, the prudential requirements that must be enforced to ensure that contracts, once entered into, will be honoured. Spot markets will be reinforced by deep, liquid forward and futures markets so that traders can hedge and speculate confidently and invest in new innovation and upgrade their assets in response to reliable market signals. Is it a lot to ask? Absolutely it is. Are we moving in that direction? I think we have taken some giant strides in the last five years. From here in Ontario, the news is good.

The North Sea in a Global Context: A BP View *(continued from page 10)*

activity, the level of production, the level of employment and the level of revenue. It had made the UK to coin a phrase "a great place to do business and a great place from which to do business"

Over time, breaking that equilibrium will have damaging consequences for the offshore industry and the areas of Scotland and the North East which particularly depend on it, and for the onshore activity that is tied to offshore success.

I hope it isn't too late for reconsideration and dialogue.

If there is an overwhelming desire to change the established tax regime, I do think its possible to design a set of measures which restore confidence for those investing in the UK and which ensure the regime is sensitive to the real competitive challenges which the North Sea faces.

Royalty should be abolished immediately and the system should incorporate the possibility that prices will fall back towards the long-run average.

I believe we have a common interest in getting this right.

Summary

In summary, we are at a very important moment in the history of the North Sea after 30 years of un-interrupted growth. We face the onset of decline.

Our challenge is to create a future where decline is managed in such a way to ensure that every possible barrel is recovered and that the North Sea never enters harvest mode.

The keys to this are firstly Technology – how innovative can the industry be in its application of technology – the signs to-date are very encouraging.

Secondly, Commercial Innovation: with support from the DTI, can we create ever more innovative commercial structures to ensure a steady flow of capital from all sources—from super-majors, the independents, venture capitalists and private equity - into the North Sea - again the early indications are very encouraging.

And finally, can the government create the right long term fiscal regime to ensure that the North Sea remains globally competitive so that the available capital flows to the North Sea and to Scottish and UK jobs and not to other countries for construction or other provinces for investment.