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The Electricity Authority

Distributed Generation Pricing Principles

It seems to me that the Electricity Authority is initiating something that could have implications all through the electricity market without considering the big picture.

The fundamental objective of the electricity market is, I assume, to provide a reliable and economic supply of electricity. That, after all, is what the consumer needs and wants.

Electricity supply in New Zealand involves three commodities which, to some extent, are independent of each other.

> The first commodity is a supply of energy at the lowest possible price in the long and short term. The present market concentrates on the short term and hopes that various mechanisms associated with the market will ensure a low cost supply in the long term.
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> The second commodity is a supply of MW sufficient to meet peak demands with a reasonable reserve supply available at all times. The present market has an expectation that this will happen without any specific inducement. It also has a short term mechanism for rewarding generators for being available as reserves. There was also a market in demand response at, it seems, considerable expense. (It should be noted that the demand response system that existed before the electricity market was formed – ripple control – has run down as a result of regulations that were part of the electricity reforms. The cost to consumers has been enormous.)
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> The third commodity is a supply of energy that is held in reserve for 1:20 dry years when hydro generation can drop by as much as 3600 GWh. Although this was previously the major concern of the electricity planners, it seems that it is now left to the market to provide in spite of the fact that there does not seem to be any market-based inducement that would provide a consistent reward for generators who ensure that dry year energy will always be available when needed.

Providing sufficient capacity (MW) is costly. In the long-term every new MW of demand requires additional generating capacity, additional transmission capacity and additional capacity in the distribution system. The long run marginal cost of this would not be less than $3 million/MW.

The engineers and management of the old State Hydroelectric Department recognised the high cost of meeting incremental generation and transmission and, because hydro energy was virtually free but hydropower stations were expensive, the bulk tariff was set at £5/kW of maximum demand with no energy charge. This was later changed to a demand charge plus an energy charge, with the demand charge being high enough to have a significant effect. By putting a high price on maximum demand, these tariffs promoted the installation of storage water heaters and ripple control systems to the extent that the New Zealand load could be held constant from about 7 AM until 8 PM on peak demand days. It was, almost certainly, the best demand side management system in the world.

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If the electricity market recognised the high cost of meeting additional demand it would have market mechanisms that passed on the cost of meeting additional demand to the consumers and also rewarded those who provided demand management. This would immediately make demand-side management worthwhile without any additional inducements and it would provide additional income for those generators who, unlike wind and solar power, were able to make a significant contribution to meeting maximum demand.

To a degree, the Transpower charge of approximately $100/kW was a reasonable surrogate for a peak demand charge that included all the system costs. Unfortunately, regulations prevented the lines companies – who were the ones who could control peak demand – from recovering the cost of operating, maintaining and extending their ripple systems. So the Transpower charge was much less effective than it should have been. As a result, system peak demand is probably 500 MW higher than it needs to be and the additional cost to consumers has probably exceeded $1 billion.

Now, instead of looking at the costs of providing additional system capacity, and taking steps that would, over the short and long-term, reduce costs to the consumers the Electricity Authority is proposing to make a massive reduction in the Transpower demand charge.

Not only is this proposal against common sense and sound economics, its lack of forward vision condemns consumers to an endless cycle of fluctuating demand charges.

At the moment the transmission system has more than adequate capacity. So the Electricity Authority wants to reduce the peak demand charge. Sooner or later, the transmission capacity margin will reduce and so, presumably, the Electricity Authority will make a massive increase in demand charges to deter peak demand growth. Eventually, the transmission system will be reinforced and, once again, more than adequate capacity will be available. So there will be a massive drop in peak demand charges. And so on.

The only solution is to base pricing principles on a much longer term view of investment requirements.

The lack of an adequate incentive to minimize peak demand and the rapid increase in retail prices that have resulted from the resulting inflation of the regulatory asset base is behind the large increases in transmission and distribution assets over the last couple of decades. A result is that residential prices have doubled since 1987. Much of the increase during the 1990's can be attributed to rebalancing of tariffs between sectors, but this process was complete by 2000. Nevertheless residential prices have increased by over 50% in real terms since then. The prime driver for this has been lines charges, both transmission and distribution. The major underlying cause is the collapse of demand management.

That lines charges have become so prominent in inflating electricity prices has become a source of political concern. That the EA should look for means to mitigate the concern is not surprising. What is concerning is that this has become a search for a fall guy. Large sums now need to be collected and given to lines companies. Consumers are complaining so an alternative has been found: distributed generators.

The impact of sudden regulatory shifts such as the EA's current proposal cannot easily or quickly be reversed in an industry dependent on long term investments. The discovery that an industry is highly exposed to regulatory risk has a chilling effect of long duration. A decade ago the forestry industry suffered such a shock, when it was included in the ETS (emissions trading system for greenhouse gases). This was even expected, by the policy's promotors, to have a positive effect on the industry. The industry has never recovered. Indeed one of the industry's significant participants (P F Olsen) has recently stated "The forestry and wood processing sectors really matter to New Zealand ... They are too important to lose but the risk of that occurring looks to be increasing." In particular that: "In some regions, particularly Northland, there is real concern that a combination of lack of planting over the past decade and early harvest for log export is creating a serious hole in the wood supply from about 2030." The objective situation of the forest industry has not greatly changed over this time, but confidence in the industry certainly has. Distributed generation is now faced

with a similar impact and future. The EA may think that it does not need the distributed generators at present, but when they are wanted some time in the future they may not be there.

The Electricity Authority's plan is fundamentally unstable.

The electricity supply business is characterised by long life assets that take a long time to build and have very long lives. Trying to manage this business efficiently with short term inducements is doomed to failure.

There is another aspect to this that should not be overlooked. There appears to be a general acceptance that demand side management is good and there are inducements available to those who provide demand-side management. Distributed generators provide exactly the same service yet, it seems, will be deprived of a very large portion of the benefit that they confer. This defies common sense and sound economics.

Network charges

The Electricity Authority seems to have also decided that lines companies should charge distributed generators for feeding into the distribution network. This too does not stand up to common sense.

The basic principle has always been that generators get free use of the existing network. Network costs are paid for by consumers and the generators only pay for any capital upgrades necessary for their connection. This seems to be sensible because the generators have no say in where the loads appear and the network that might be needed to supply them.

If the principle of recovering revenue from generators is to be implemented, then all generators feeding electricity into a distribution network should be included. The proposal to impose these charges on DG but not those injecting via a GXP is arbitrarily discriminatory. The distributor must invest capital and undertake maintenance of its network to transport electricity from a GXP to consumers just as is does in the case of a DG supplier. Indeed the DG injection point is often along the route from a GXP to consumers. Hence no additional investment in lines capacity is required, over and above that needed to service the generators injecting into the distribution network at a GXP. Hence the same exposure to common costs should apply to all generators supplying electricity to a distribution network.

If distributed generators are also charged for use of the network then the lines companies will make a double recovery – once from consumers and once from the generators. In the case of networks like the West Coast where, as I understand, the transmission system could not provide the peak demand without the local generation that supplies something like half the demand, it really is a nonsense.

Conclusion

The Electricity Authority should abandon its efforts to "optimise" power transmission and distribution charges in the short term. Instead, it should look at the big picture, consider the commodities that need to be provided to ensure an economic and reliable supply and then redesign the market so that it provides these commodities at the lowest possible cost to the consumer in the short and the long term while minimising potential damage to the economy from electricity shortages, especially during dry years.

Sincerely yours,

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