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Cost Shifting: the single buyer model with price discrimination

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The proposal for a single buyer model for electricity with household electricity price discounts would be a major retreat from encouraging the wise use of water, the wise application of taxation and it would be a retreat from using the ETS to mitigate environmental effects of carbon emissions.

The proposal will almost surely have to extend management to control of supply similar to the old ECNZ model if it is to force the price electricity to the levels it proposes. The proposal as a whole would seem to rest on recent commentators' propositions, that water is free, that dams have been paid for and the prices of electricity have gone up egregiously.

Water and hydroelectricity are not free

Water is freely subject to gravity and freely flows into reservoirs but it is scarce and has its own value in the same way as any other scarce resource in the economy.

The electricity market values water and allocates water-usage among time periods. It does this by managing reservoir storage to eke out economically the water that flows down rivers and it does this in conjunction with other urban and rural uses of water. The value of water is the value derived from its use. The price of stored water for electricity today is the value of its use in generation today or in future generation. Today's opportunity cost of water is its use in generation in the future, or in some other endeavour such as irrigation. Water has no value only if its supply is so great that there are no limitations of its use now, in the future or in other activity.

The electricity spot market gives a value to water that reflects alternative uses, the state of storage and scarcity or plenty of river flow. It is an electricity water market that signals and spreads to those parties – industrial and commercial consumers – willing and able to manage the variation in water scarcity that is a fact of life from time to time in New Zealand. This is in direct contrast to the pre-electricity market era when it was households that were forced to absorb fluctuations in electricity availability. The proposal is silent about the way it proposes to manage dry years. This a key issue. The high proportion of hydro, the fluctuating inflows and relatively low water storage capacity in combination are unique features for the electricity market to manage.

One does not have to rely on this warm summer to know that water is in fact scarce and that there are other socially valued uses that would otherwise go to generation. In The Environment Court deliberation of Variation 6 of the Waikato District Plan it was demonstrated by cost benefit analysis that removing water

from generation in all dams of the Waikao River to convert dryland to irrigated pasture would, in situations, be in society's best interest: this despite ignoring any generation cost relating to all the dams on the Waikato river, on the basis that the dams were already established. In this setting, do the proposal advocates plan to mandate that water in rivers cannot be use for anthing else? In recent times a great deal of public effort has gone to establish institutional frameworks for the trading of water among uses in order that it may flow (sic) to its most socially valued uses: the proposal seems to cut right across these.

Recognition of the value of water is to the benefit of society

The electricity-water market – and in some locales associated markets for other uses of water such as irrigation – only do their job because of the role of prices in an economy: a role recognised by economists for more than 200 years. Prices for the same good should be the same, otherwise some uses of the good will have a higher value use in others' hands. The value of water in electricity should be the same in in-stream use, recreation or irrigation otherwise one use is subsidising the another and causing over and under of supply of one or an other. There may be different prices where costs differ: for example as between different localities. But the idea of differential pricing of electricity depending upon who you are or what you use it for violates this law of one price and means that electricity and the inputs to electricity – water and gas – do not flow to where society most values them.

Electricity prices for households convey information about the value of electricity in non-household uses. At this level they encourage adopting appropriate ways of economising on energy consumption. In contrast, proposed low electricity prices reduce household benefits from energy saving insulation, from adapting alternative energy sources, and from managing heating requirements more actively. My neighbour has installed solar electricity generation that covers his household needs; he calculates that it has something like a 10-12 year payback period. It is most unlikely that such investments would take place under the proposal.

The emissions trading scheme relies on the law of one price: to transmit the cost of carbon emissions through the economy in a way that allows the most economic management of emissions throughout the economy. Electricity prices are higher under the ETS reflecting the price of carbon-emitting activity in generation so that substitute, even innovative, activities by households and firms in all sections of the economy are encouraged for carbon-emitting activity where they are economic. The second role of the ETS in the electricity sector is to

induce investment in renewable forms of generation rather than carbon-emitting forms. Additional electricity consumption induced by the provision of mandated low-cost power for households, and any electricity economies that otherwise would have occurred will produce additional resource costs, since they imply more generation, higher prices or both.

In electricity the value of stored water and current inflows determine the when and how of generation by hydro and gas plants since these are close substitutes in many situations. Because they are close substitutes the value of gas and electricity are determined together: to misprice gas or water is to over-use one or the other.

Increasing prices values and history

New Zealand, in common with Australia, has an energy-only market which means that the wholesale price of energy has to support the generator's running costs and investment in new plant. A rising price does not of itself imply a lack of competition. A standard test in any industry of whether the market is performing as it should is whether the market price – for electricity now measured in the hedge market - is approximately equal to the unit cost of the next potential generation plant. The market has historically passed this test.

In recent years there has been a goal of promoting renewables; and since the cost of renewables plant is generally higher and quite volatile – depending as it does on resource consents and the volatile cost of equipment – one would expect the wholesale price to rise. The wholesale electricity price has risen reflecting determinants of cost that include an increasing proportion of renewable plant. The ETS scheme has additionally increased the wholesale price because thermal generation that has an ETS charge affects the price directly in peak and water scarcity periods.

Energy at reasonable cost has never been abundant in New Zealand. Perhaps it came close with the discovery of the Maui gas field, but hydro has always been limited in extent and costly to harness. Studies have shown that past hydro plants funded by the tax payer would not have passed a cost-benefit test of social viability. The present profitability of existing hydro plants results from, legitimately, ignoring establishment cost in computing profit. Additional significant hydro plants will be unlikely to be socially worthwhile, especially where the value of water and the environment is properly recognised.

It is this supply-equal-demand price that sets the price paid for all generation: a position one expects to see in textbook markets. As it increases overtime

reflecting demand and supply factors the profitability of the established plant will increase: again as is common in other markets. The accounting profits of the existing hydro plant will increase with the price of electricity even where the new plant on the block is barely breaking even. Again this effect is common in markets with increasing supply costs. For a really pronounced case see the Auckland housing market. In private markets, whether the owners of the firm enjoy this profitability will depend upon when they bought into the firm: a recent buyer would have to pay the previous owner for at least some of this profit.

Yes, well established efficient firms will enjoy increased profitability with increased prices but this is no reason to interfere with the socially important role that the prices have for ensuring that water and other resources are used to the benefit of society.

From market to taxation

The increased profitability of the electricity market to long established players has largely gone to the Crown as the owner of SOEs; and would stay with the Crown under the privatisation proposal. There are at least two reasons why the proposal presages tax increases.

The first reason is that the Crown presently gets the total profit of the electricity state owned enterprises. The proposal would transfer this surplus by regulation to households. The lost tax revenue is substantial and it will have to be managed by some combination of higher taxes and reduced government expenditure.

Secondly, it is most unlikely that firms would enter this market without government financial inducements. This follows from the purpose of the proposal being to lower the cost of electricity to households. And doing so by ignoring the principle of one price and transferring established firms' profit directly to consumers. Even if – somehow – non-hydro generators were free under the proposal to trade in an electricity market the risk of entry would be very high. Particularly for relatively higher cost generators, and these include renewables, it is likely that any expansion of electricity supply would require some sort of government funding.

The bottom line

The proposal is incomplete: it should be accompanied by a list of government programmes planned to be cut and consequent taxation increases.

At first blush the proposal is redistributive in that it lowers electricity charges to households, but it is not. People live in households and while they may gain from lower electricity charges they would lose by the extra tax they pay or the fewer government programmes they enjoy.

It does not lower the real cost of electricity to the economy. This would be lowered if demand fell – as would be the case if aluminium smelting ceased – but otherwise is set by the cost of the next megawatt of generation to be installed.

It weakens incentives for the economy as a whole to take carbon emissions into account in decisionmaking. It weakens the prospect of general processes for managing the scarcity of water in the electricity market and beyond. It is likely to “lock up” water for electricity production.

There are no prospective employment effects because the proposal does not affect the real cost of energy to the economy and it has significant taxation requirements that leaves household income as a group essentially unchanged.

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