The Electricity Authority's strategy - where to from here?

Address to Downstream Conference, 2 March 2016
Brent Layton

Many years ago I took an economic history course on entrepreneurship in nineteenth century Britain. Contemporary commentators and historians had noted a number of instances in the mid to late nineteenth century of British industrialists being slower to adopt new technology than German or American industrialists. The claim was that British entrepreneurs had failed in the technological race. A number of explanations were offered including that the British education system placed less emphasis on technical and engineering education than the German and American education systems so Britain's entrepreneurs were relatively technologically backward.

In the 1960s and 1970s economic historians looked at these claims in detail to see if British entrepreneurs had failed to adopt profitable innovations that were available to them. The general conclusion was that the differences in timing of adoption were accounted for by differences between the countries in the relative prices of inputs – labour, capital and raw materials – and in some instances due to differences in access to patented technology and products. In other words, British entrepreneurs had not given up materially profitable opportunities that were available to them and there was no economic evidence of entrepreneurial failure of a material nature.

There are a number of take-outs from this research:

1. The prices of inputs and outputs faced by decision makers matter when it comes to innovation.
2. Because prices differ between countries and over time the optimal technologies and the rates of adoption of new technologies can also vary without this meaning inefficient decisions have been made.
3. Firms responding to profit incentives do a pretty good job of sorting out what new technology to adopt and when to do so in order to maximise profits, given the prices they face.
4. Political commentators and other outsiders relying on casual observations, such as what is going on in other countries, without knowing the cost structures and prices facing firms, do a pretty poor job of identifying what new technology would be profitable to adopt and when it would be profitable.

There were a number of other suggestions from this and related research:

1. The adoption rates of new products and technology typically follow a sigmoid or s-shaped function but the speed of adoption is very strongly influenced by the economic benefits of adoption to those making the decisions. The bigger the benefits, the faster the adoption.
2. New entrants and smaller participants can play an important part in making new technologies economic and worth adopting.
3. Picking whether a technology will be economically successful is not easy when it is under development and very difficult for "outsiders" to pick.
4. Often a successful technology is partially or completely superseded by another more successful technology (e.g. telegraph v telephones, canals v railways).
5. Stranded assets due to technological change are a normal part of the operation of workably competitive markets.
6. Growth in GDP comes about through small incremental changes as a result of innovation and one change often triggers a dynamic response leading to others.

What relevance does this have to the future strategy of the Electricity Authority?

There are a number of evolving technologies currently impacting the electricity sector, or "threatening" to do so:

- photovoltaic and other small-scale distributed generators
- storage batteries
- smart meters
- smart appliances and electricity management IT and internet-based applications
- electric vehicles and plug-in hybrids
- LED lighting and heat pumps.

These evolving technologies have the potential to:

- enable consumers to more easily manage and control when they use electricity
- give consumers greater choice over whether they generate their own electricity and when to consume it
- give consumers greater choice over the extent to which and when they use the transmission and distribution systems
- significantly alter the level and timing of consumer demand for electricity in total and the share they seek though their distributor

- increase the degree to which distribution, transmission and energy charges can be service-based and cost-reflective and promote efficient use and investment.

The relevance the entrepreneurial failure studies have for the Authority in my opinion is:

It should avoid trying to pick which technologies will succeed and which will fail. As an "outsider" that inevitably will have only second hand knowledge about cost structures and demand, the Authority is not well placed to pick winners and losers. Market participants are much better placed.

Moreover, if market participants back the wrong technological horse and end up with stranded investments they, and not consumers, bear the financial consequences. This sharpens their decision-making and also means over time that those that tend to back the "right" horses get financially stronger. They have more influence on the investment process. Those that persistently back the "wrong" horses get financially weaker and have less influence. Both these consequences are of benefit to consumers in the long-term.

A few years ago the Authority was urged to mandate a national ripple control regime involving the construction of several communication towers at considerable expense to consumers. More recently the Authority has been urged to promote and mandate an advanced electronic hot water switching system that its advocate thinks would be an even better way to turn off other peoples' hot water cylinders to control peak demand and reduce investment.

Of course, if the Authority had decided to back the earlier proposal it would now have either locked consumers into this older, "redundant" technology or imposed on them the multi-million dollar costs of the assets invested in it that would now be stranded.

Instead of being tempted to pick and promote technological "winners" the lessons from history suggest the Authority should focus on providing opportunities for parties to innovate and compete, and on facilitating choice for consumers. This means:

- ensuring there are no inefficient barriers to the adoption of new technologies, whether by existing market participants or new entrants

- ensuring, as far as practicable, that decision makers about new technologies face efficient prices for inputs and outputs.

This is the strategy in relation to technological change being pursued by the Authority. In this context, business models can be considered to be a form of technology.

The Authority is currently undertaking a scoping project to identify aspects of the Code and its market processes to ensure that they do not contain implicit biases towards particular technologies.

A trend in many markets – clothing, household appliances, food and travel to name a few - is for consumers to use the internet to bypass retailers. Another trend is for consumers to use the internet to access new sources of supply. Well-known examples are Uber, Air BnB and Harmoney.

One of the specific issues the Authority is looking at is whether the Code unnecessarily restricts consumers bypassing retailers and buying directly from the wholesale market or distributed generators and whether and how it should be changed to avoid this.

The Authority is well aware that incumbents whose market returns are challenged by new technology are keen to protect their position and can be very creative in arguing that for one reason or another the regulator should continue with rules that block the adoption of new technology or adopt new rules that will ensure their returns are retained whole.

One example would be a distributor proposing that consumers that disconnect from their network should continue to pay them on the basis that the investment was made for their benefit.

Another example is that generators with large scale plant faced with competition from growing distributed generation capacity have in some jurisdictions convinced regulators to establish capacity markets so consumers pay them whether their generators provide consumers with energy or not and whether they want the increased security of supply or not.

This hasn't always turned out as well as the generators and regulators have hoped. For instance, in the United Kingdom prices in the tenders were much below where many thought they would be and a significant proportion of the capacity payments have gone to diesel back-up plants rather than to the large incumbent generators. Regulators have also been left wondering if the capacity they have "bought" will be delivered if called upon.

If capacity markets are a good solution to deal with short-term peaks in demand in industries that are capital intensive why is there no mandated levies on consumers to have standby capacity available for hotel accommodation? Capacity markets are not a feature of workably competitive markets and regulators should be very cautious about them having unintended consequences of reducing innovation and market responses.

The construction of the new Whirinaki power station, which opened in June 2004 at a cost of $150 million, can be characterised as the outcome of a call for back-up capacity to deal with dry-years. It was paid for by levies on consumers whether or not it produced energy. This New Zealand capacity market experiment was not a happy one financially for consumers and taxpayers. It also had the effect of crowding out more efficient provision of peaking capacity and arguably actually reduced the security of supply compared with what the market would have provided.

The Authority prefers market-oriented approaches and for this reason has facilitated the development of cap contracts on ASX. It is due to start trading later this year. Cap contracts effectively allow parties to buy and sell back-up capacity at a transparent price set in a market where buyers are able to convey the price they will pay for security and sellers are able to reflect the costs of providing it.

The growth in the number and capacity of distributed generators has often been to capture subsidies provided by regulators keen to promote new technologies. The subsidies are also often aimed at reducing emissions or increasing the political security of energy supplies. This highlights that regulatory actions can have unintended consequences that lead to calls for further regulatory action and a cycle of intervention, most of which is negative for the long-term interests of consumers.

The Authority has no mandate to protect the returns of distributors or generators from the impacts of new technology. But the Authority does have a mandate to promote the efficient operation of the electricity industry for the long-term benefit of consumers.

In general, this means the Authority should ensure that new technologies are able to be adopted and do not face inefficient barriers, such as, providing subsidies to existing plants or technologies. It also means that the Authority should pay particular attention to whether new entrants are enabled by the Code to participate on a level playing field with current market participants.

The Authority has recently put out a discussion paper on the potential impact of new technology and the implications for efficient pricing of distribution services.

The Authority's preliminary view is that distributors and the major generator/retailers have strong incentives to improve the efficiency of distribution pricing in the face of potential technological change. The Authority believes distributors have the legal capacity to do so reasonably effectively. This is despite the existence of regulations that require them to offer residential consumers a low-fixed, high variable charge option at their place of normal residence. The Authority, which is the enforcement agency for the regulations, has provided parties with the basis for it holding this view.

The Authority's preference is for each distributor to seek to tailor more efficient pricing that suits the circumstances in the various parts of its network. The Authority's suggestion is that distribution charges should be service-based and cost-reflective.

The Authority is in the final stages of deciding whether it should make proposals in relation to transmission pricing and charges for the connection of distributed generation to distributors. The key consideration for the Authority is whether any inefficiencies resulting from current pricing arrangements are such that alternative arrangements would be for the long-term benefit of consumers, and what, if any alternative arrangements should be proposed.

The Authority is well aware that those that are advantaged by current inefficiencies often object to changes in regulatory arrangements aimed at making them more efficient. The Authority is also aware that reviews of pricing methodologies offer opportunities for parties to tweak the rules so they provide them with advantages they do not currently have.

In this context, the role of the Authority is to promote the overall efficiency of the electricity industry for the long-term benefit of consumers. Inefficient investment by some to physically bypass or avoid liability for charges for existing distribution, transmission or generation assets because they face inefficient prices is not likely to promote the long-term benefit of consumers in general.

In my opinion, the Authority consistently pursuing its statutory objective to promote competition in, reliable supply by, and the efficient operation of the electricity industry for the long-term benefit of consumers is the best way for it

to promote regulatory certainty and the right climate for investment in the capital intensive electricity industry in the long-term.

This approach allows parties to make their own judgements about the likely response of the Authority in the face of new and unpredicted circumstances, including the innovation of new technologies and business models. It allows parties to innovate and invest with confidence if what they are doing is promoting competition, reliability and efficiency. This approach will also discourage parties from making investments that they know are not likely to promote competition, reliability and efficiency.

If the Authority were to retain payments that are obviously inefficient on the grounds removing them would create uncertainty for those that invested to exploit the inefficiency, this would encourage and reward rent seeking behaviour. It would also penalise those who had correctly realised the payments would not survive an efficiency review a regulator must inevitably conduct, given statutory objectives. It would also discourage others from acting efficiently in future. This outcome would not be in the long-term interests of consumers.

The Authority is also engaged in changing or reviewing the operation of the markets for reserves and frequency keeping to ensure they are sending efficient price signals and encourage efficient provision of services.

Another efficiency aspect of the Authority's work is its review of whether the wholesale spot market should move to being settled on real time prices. A desire to ensure that barriers to the effective implementation and use of demand and supply management tools are removed is an important motive for this work.

Currently, spot prices are not finalised until two or more days after the event and prices published prior to that are indicative and not the prices actually paid and received. Most of the time the discrepancies are not large but on occasions they are. It is often when the system is under stress due to outages or capacity limitations to deal with peaks in demand that this occurs. These are just the times when utilising price responsive demand and flexible generation and access to energy stored in batteries would be most helpful to security and efficiency.

New technology appears to be increasing the opportunities in this area and the Authority wants to make sure market operations do not inhibit inefficiently the

development and adoption of this technology. Hence it is reviewing if it would be better for the market to be settled on a basis much closer to real time.

The initial focus of the Authority's strategy when it was established in November 2010 was to deal with the matters set out in section 42 of the Electricity Industry Act 2010. These were a pot pouri of matters aimed at promoting competition and reliability, many of which had been on the policy agenda for several years.

If the Authority had not successfully dealt with these matters within its first 12 months there was the risk that the Minister (i.e. MBIE) would do so. The Authority's early initiatives around consumer compensation payments, scarcity pricing and stress testing appear to have successfully dealt with the concerns leading up to the Ministerial Review that the New Zealand electricity system was not reliable and was prone to dry year problems. Of course, reliability remains a matter that will always be on the Authority's radar.

Having dealt with the section 42 matters, the Authority's strategic focus then turned to promoting workable competition in the electricity industry. The Authority has never attempted to promote perfectly competitive markets, in the sense the term is used by economists.

Perfect competition is great for allocative and productive efficiency – producing the right things at the lowest cost. It is not at all conducive to dynamic efficiency – optimising investment and innovation. One of the lessons of history is that dynamic efficiency is far more significant for the long-term benefit of consumers than allocative or productive efficiency.

To promote workable competition the Authority has pursued a wide range of initiatives. The indicators around structure, conduct and performance that the Authority monitors point to the various aspects of the electricity market, apart from lines and system operator provision, being workably competitive.

Although promoting reliability and competition remain important to the Authority, more recently its strategic focus has turned towards the efficiency limb of its statutory objective.

The Authority's aim is to:

- ensure there are no inefficient barriers to the adoption of new technologies, whether by existing market participants or new entrants

- ensure, as far as practicable, that decision makers about new technologies face efficient prices for inputs and outputs.