Submission on "Accelerating renewable energy and energy efficiency"

Prepared by Energy Link

for

Ministry of Business, Innovation & Employment

Energy Link
decision power

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1 Introduction

We welcome the opportunity to make this submission and to contribute positively to the debate over renewable energy and energy efficiency. Questions on this submission can be directed to Greg Sise, Managing Director, Energy Link Ltd, at 03 477 3572 or greg.sise@energylink.co.nz.

2 Questions Q4.1 and Q8.1 – Q8.5

We don't have a view either way on whether a ban should be introduced or not, but it is stated in section 4 that "a ban is simple to administer, incurs minimal cost on the Government, and could be introduced quickly". If a line is to be drawn in the sand, then we agree that this would be one way to do it with little risk to the government and a high chance of success.

The objective stated in section 8 is to "accelerate investment in renewable electricity generation by matching additional supply to new sources of demand from process heat electrification" and so it is directly related to section 4 which addresses the phasing out of fossil fuels in process heat.

While a ban would be effective, the efficacy of introducing some form of PPA platform would be very limited in achieving the objective of reducing fossil fuel-firing of process heat in commerce and industry.

We have directly relevant experience in this area. Starting in 2013, we developed a fully-automated internet-based procurement platform for large electricity users which literally allowed an uninformed commercial, NGO or government entity, with an electricity bill of $100k per annum or more, to complete an RFP or reverse auction process to renew their electricity contract, with all of Energy Link's expertise "built-in"[1].

We successfully ran some of New Zealand's largest electricity procurements through our Energy Exchange, but we are not using it today because we found that clients preferred us to run procurements for them. This occurred for several reasons, but key amongst them was the desire to have their procurement process directly supported by us.

It was also expensive to market the Energy Exchange to the target group of non-residential electricity users because electricity procurement is a pressing need for them only for a narrow window of time around contract-expiry, and they have many more higher priority tasks to deal with at any particular point in time.

If there were to be a ban on coal-firing by 2030, then this would bring the issue to front of mind as a higher priority, and coal consumers would be looking for solutions. But even with a platform of some form, or government assistance, contracting with independent renewable power producers (IRPPs) would require a major step up in consumers' understanding of how PPAs would work, the complexities of the electricity market and contracting arrangements, and so on. We believe that most consumers don't, and won't want to take on this task, which they will see as onerous and a low priority.

A better solution is to allow suppliers of the relevant electric process heat equipment, along with electricity retailers, to act as the middle-men between IRPPs and consumers. Rather than trying to 'be the solution,' if there is a role for government, then it would be preferable for government to

[1] And a small amount of direct support from Energy Link if required.

ensure that the retail market works in a way that facilitates innovation in this sector: we believe this sub-sector faces excessive barriers.

The electricity market at the retail level is dominated by five large gentailers, with small independent retailers making up only 9.8% of the market by ICP number[2], despite this sector existing since 2007. This sector was the first to introduce spot-based pricing (Flick), solar-sharing (P2Power), carbon-zero electricity (Ecotricity), fixed retail margins (energyclubnz), the 'free hour of power' (Electric Kiwi), and the list goes on; which demonstrates how important this sector is when it comes to spurring innovation in the electricity market.

We strongly believe that efforts to support and facilitate growth in the independent retailer sector to ultimately reach 20% of the market, quickly, would be a superior approach to this and other problems, when compared to the government attempting to effectively become a market participant at a number of levels through the measures discussed in section 8.

The electricity market has evolved in a way which primarily supports the large, integrated gentailers, but puts barriers up for smaller generators and retailers: these include the settlement cycle, prudential requirements, the lack of suitable hedge market instruments, and the cost of complying with the myriad of electricity Code requirements.

In our experience, there are more than enough potential and existing independent retailers that would relish the challenge of working with consumers to electrify their process heat, but they are held back by these barriers.

Notwithstanding the above, where government could play a more direct and positive role (other than implementing a ban) is in assisting consumers by:

1. the development and promotion of a selection of demonstration projects, for example in the central and local government sectors, where relevant examples are not already in the market[3]; or
2. working with banks and green investment funds to ensure that finance is available to consumers for conversions away from fossil fuels.

As EECA has already pointed out, many process heat conversions are already cost-effective, but until consumers are made aware of this, and shown how "easy it can be", then they won't convert, simply because they have many other priorities.

3 Question Q8.24 – Q8.29

Every quarter, Energy Link publishes a long-term electricity Price Path[4], and has done since 1997. We also undertook the electricity market modelling for the Interim Climate Change Committee, investigating levels of renewables up to 100% by 2035. Two relevant points arise consistently from this modelling and forecasting:

1. given the current state of knowledge, it is technically feasible, but not economically feasible to achieve greater than around 97% renewables, which means that we need to plan to retain a

[2] This includes only Type 1 retailers that buy direct from the Clearing Manager, as of 31-Jan-20. A number of Type 2 retailers buy from other retailers but data on their ICPs is not available to the public.

[3] For example, replacing coal and gas-fired low and medium temperature boilers with high-temperature heat pump systems.

[4] Not publicly: it is costly to produce and available only by subscription.

thermal fleet that can make up the difference between demand and renewables during dry years and during winter peaks; and

2. when large thermal plant such as TCC, Huntly or e3p retire from the market, a multi-year "hump" in spot prices results.

It is important to emphasise "current state of knowledge" in 1 above because in future it is likely there will be innovations, developments, cost-reductions and so on that might reduce or eliminate the need for a thermal fleet in order to achieve 100% renewables by 2035 or soon after. The point is that we need to retain flexibility in this area for many years yet, while alternatives are researched and developed, and hence we need to avoid interventions that could put the existence of a thermal fleet at risk, at least until such time as we can be confident that there is an economically viable alternative.

That said, from a technical perspective, there is a lot of older thermal generation that could be replaced by renewables without major issues, which raises the question of retirement or phasing out of existing thermal generation in favour of renewables or more efficient and flexible thermal plant: this is where 2 above is relevant.

Why does the hump occur? It is assumed that retirements occur with insufficient warning to allow new plant to be built prior to the plant closing, thus creating a squeeze on the gap between supply and demand, leading to higher prices.

Is a price hump a problem? "No", not if it is taken as a signal that new generation is needed, and that generation needs to be built. But, "yes", if this generation is not built in a timely fashion, resulting in consumers facing substantial price increases in the meantime[5].

The hump is largest when Huntly retires, due to its size (500 MW) and its flexibility (low minimum output and dual-fuel capability).

The discussion document notes in the case study on page 86 that Genesis Energy has made several announcements concerning coal firing at Huntly. The announcements have changed a number of times already, so there is significant uncertainty over Huntly's future, and no one outside of Genesis really knows when it will or might close.

It should be noted that generators have no incentive[6] to make firm announcements about plant closure until they have determined their strategy post-retirement, for example they might wait until they have decided to build plant to replace or partially replace the retiring plant.

This is potentially where government could have a useful role to play.

We can't rule out the need for new market structures in future, but capacity markets do have issues, for example that they require the regulator to make decisions on how much capacity is required: there is little or no evidence to suggest the regulator is any better at forecasting demand than anyone else; and they might be worse than "the market". They are certainly likely to be conservative, with an incentive to overestimate, given the potential fallout if they underestimate future demand. So, in the New Zealand context, it is not yet clear that we need a capacity market in its conventional form.

[5] Arguably, this is happening now, noting that 560 MW of thermal plant in Auckland was retired at the end of 2015.
[6] They possibly have an incentive to keep the market guessing.

A strategic reserve has some appeal, but Genesis has recently stated that it is expensive to maintain sufficient human and other resource for all three operational units at Huntly, when only two are ever in service at any time. Genesis could close a unit and have only two units available, so there is always a spare unit available, but there remains the substantial cost to maintaining the human, technical and fuel resources to allow the plant to reenter the market at short notice.

Some sort of negotiated phase-out would, in our view, be the best approach, but limited to Huntly. As majority shareholder, the government could lead a process that establishes a timetable for retirement, which could then be made public, allowing the market to respond in timely fashion with new generation.

This is not without its risks, a point made abundantly clear by the failure at the Pohokura gas field in September 2018, which reduced gas supply through to December 2018: the ability of Huntly to burn coal came in very handy during that period.

Nevertheless, Huntly has to close at some point, and the era of coal-fired electricity brought to a close. It is in everyone's interest to make this transition as smooth as possible, without stressing the wider electricity market.

4 Questions Q10.5 to Q10.10

The EDGS has historically had a role to play in "informing policy debate"[7] and currently in approving Transpower's major projects.

But two factors are making forecasting more challenging[8]:

1. the electricity sector is changing at an increasing pace, driven by climate change policy and the falling cost of renewables; and
2. historically low interest rates.

It was announced just this week, for example, that Genesis Energy is in advanced discussions with a solar developer over a 300 MW solar farm located near its Huntly plant. Outside of Genesis, this project was on no one's radar, and no one appears to know who the developer might be. For this project to appear now, and given the price that Genesis is likely to be getting for the solar output[9], it strongly suggests that the LRMC of this project is well below current expectations, e.g. as expressed in the latest EDGS.

When developers evaluate a project they need vastly more information, along with related analysis, than is provided in the EDGS at present, or that could be provided if it were to be extended incrementally. Often, project-specific factors make a big difference to the viability of a project. For example, the developer may own or have access to land at low cost; they may be able to build generation close to a point of connection to the grid; they may be deploying used equipment; they may have access to a cancelled order of tens of thousands of solar panels; they may have access to debt finance at very low interest rates; and so on.

They need to secure a resource consent for their project. They need to understand in quite some detail how connecting new generation to the grid will alter prices, both in relative and absolute terms, and whether there might be existing or new 'pinch-points' on the grid that could limit their ability to

[7] Quoting from older EDGS'.
[8] But more interesting.
[9] from its PPA with the recently announced Waipipi windfarm

generate, or to generate at a reasonable price. They need to understand the risks they face in terms of expected prices, and how low prices could go in future and why. They may also need to understand how the output of their new project is likely to impact on existing plant.

The cost of capital and the details of the financing arrangements will be key to every project, so typically we find that financing arrangements play a critical role in the decision to build or not.

Last, but not least, there is the issue of securing a sufficiently reliable revenue stream for a generator's output, which can make or break a project despite it having a sufficiently low LRMC.

It is noted on page 110 that "consideration would be needed over which scenario(s) should be forecast, if this option was implemented." But how many are considered sufficient? Every quarter, we run over 1,100 scenarios that are each at least 15 years long, and model a total of over 17,000 individual years. The objective is to provide an indication of the probability of any particular price being achieved in any particular future day, week, month or year. We have increased the number of scenarios many times over since we first ran a long-term forecast, and are constantly looking to increase the scenarios and reduce the granularity of the forecasts, for example from day-night down to three-hourly, as computing power and other resources allow.

It is noted on page 109 that currently sources of information have a "limited shelf life". Like it or not, that is the reality of today's market and no amount of additional information made available in the current EDGS is going to change that – it's why we update our Price Path every quarter without fail. Even then, we often run custom scenarios for developers to answer specific questions about their projects, many of which are not in any publicly available lists of potential projects.

If the EDGS were to be extended incrementally then it would still be a long way from having the scope and detail required by would-be generators.

It is also suggested in section 10 that expanding the EDGS, or related information, could somehow reduce uncertainty for Transpower in terms of planning grid investment. Transpower is a regulated monopoly and so we understand that it places a high value on certainty, but unless generation developers were actually required to commit to building new generation (which is clearly not going to happen), Transpower has to live with the risk that projects that appear to be probable or even committed, may not turn out to be, and that hitherto unheard of projects can arise at any time.

If the underlying problem is that Transpower has difficulty planning for grid investment, then we suggest that Transpower has access to the advisers and resources required to step up its work in this area, along with the relevant communication channels with its demand and generation customers, including 27 ELBs and the large grid-connected generators, to better understand where demand and new generation is likely to be located and to what extent. In other words, there doesn't seem to be any reason why Transpower, in its own right, should not be as well-informed as anyone else in respect of potential new generation projects.

