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Tony Baldwin
Chair MDAG
Electricity Authority
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Dear Tony,

Price Discovery Under 100% Renewable Electricity Supply | Issues Discussion Paper. 2 February 2022 paper.

We welcome the opportunity to comment.

Our submission focuses on the need to better communicate with the demand side on the significant future value of flexible load.

We know that electricity consumption will grow significantly as we decarbonise the economy. We can expect a significant amount of load growth from process heat as industrial and commercial boilers are converted away from fossil fuels to electricity. By 2035 it is assumed that process heat will add around 4 TWh of load to the grid.

The South Island Linecos are completing a study using the specialist Engineering Consultancy DETA to better understand the fossil fuelled South Island boilers. This work has been strongly supported by EECA and Transpower.

The aims of the work are to:

- Better understand the likely decarbonisation technology solutions (with specific focus on fuel switching opportunities) at the sites of interest.
- Better understand the current time frame for decarbonisation.
- Undertake a high-level assessment of how these sites might impact electricity distribution and transmission systems.
- Assess what incentives or assistance might be needed to increase the pace of decarbonisation.

We have identified 1460 MW of fossil fuelled boilers in the South Island at around 300 sites.

What has surprises us the most, is that many are planning to significantly decarbonise in the next 10 years, but few are thinking about how the future shape of electricity prices. In particular, the fact that as we increase the proportion of uncontrollable renewables, prices will be much more volatile. This means heating systems that can be interrupted will be cheaper to supply. Not only will the customer have cheaper electricity, but wider system costs will be lower as well.

Many of these customers are looking at installing systems such as heat pumps to make hot water but without any real storage or the with the ability to manage load in response to prices but unfortunately few are intending investing in demand-flexibility systems (DFS).

From the initial work we have done it would appear that the cost of the hot water storage tank for a typical large food processor is around $100/MWh or about 1/5 of the cost of a grid scale battery.

Unfortunately, when we talk to these customers about such investments, they really show us the business case or information that prices will be more volatile going forward. In addition, their advisors, in the form of consulting engineers have no concept of the increasing volatility of future wholesale prices and therefore the value of the new electric systems being flexible.

Demand-flexibility systems will also reduce the costs the transmission and distribution systems needed to supply the new loads.

Our key message is that if we as an industry need to start a programme so that large customers understand more about this future volatility of prices under a 100% renewable electricity supply.

In scanning publications published by the Electricity Authority we couldn't find any information that would help someone doing the business case for demand-flexibility systems.

Your discussion paper states (para 3.46) that the gross benefits of harnessing demand-flexibility systems as $120 to $170m per year. But this type of analysis doesn't help an engineer writing the business case for a new electric heat pump system having flexibility or storage.

We want customers to decarbonise. For this to happen they need as much certainty as possible.

What is needed is some detailed price forecasts with a range of scenarios that can be used by the demand side as an input for the business case for demand-flexibility systems.

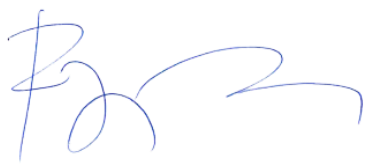
We fully appreciate that regulators and governments prefer not to publish forecasts, because they will be wrong. However, without any forecasts then the demand side won't invest in new electric energy systems with the desired flexibility.

What is also clear to us is that as the government ramps up support for converting these fossil fuelled systems to electricity it needs to make supporting systems with demand-flexibility systems a priority. There is even an argument that as the government moves to decarbonise its own boilers found in schools or hospitals that it should ensure that all new electric systems have some demand-flexibility systems.

Thank you for the opportunity to submit.

We'd be happy to answer any questions you might have.

Cheers,



Roger Sutton
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