Sustainable Energy
Association New Zealand

SEANZ Submission
Electricity Price Review

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Date: 23rd October, 2018
Re: Recommendations, New Technology Impacts
Solar PV, batteries and related consumer centric technologies

SUMMARY

To state that the New Zealand electricity system is operating well and is reliable, as the panel has stated is one thing. To confirm that we are not doing well when it comes to affordability of electricity in New Zealand surely says it all.

And to state that "consumers are at the heart of the sector and the reason why it exists" portrays the absolute necessity to move the focus away from the sectors incumbent position and the model on which it is based, to the outer perspective of the best interests of the consumer, which can be reflected in a wide range of models and options for them. That covers the set and forget group, the low socio-economic grouping in energy hardship, those seeking energy independence and all those in between.

The affordability perspective is key to making this work in addressing consumer requirements, increasing security of supply by building resilience into our system (yes, a plan B) and the many impacts of new technologies that serve consumers interests – by providing choices, not just the option to move between retailers who all operate off the same model.

It is our contention that the panel address new technologies, most of which are represented by SEANZ (small scale renewables - solar, wind, micro/mini hydro et al, storage/batteries, mini and micro grid infrastructure, energy management tech to drive energy efficiencies, smart appliances et al) in the manner that serves consumers with far more choice today, by the panel understanding three key values defined below, as has been evaluated in many other jurisdictions;

1. Value to the grid

    1.1. Avoided investment cost by EDB's in infrastructure, with consumer uptake of batteries which eliminates all peak demand times (as batteries scale, elimination not reduction of peak is evident. Please refer to Appendix 2)
    NB. Behind the meter (BHTM) solar and battery users subsidised by lower socio-economic groups is an untruth driven by incumbency. The quietly spoken truth is evidenced by solar and batteries incremental reduction of peak demand, reducing an EDB's investment in infrastructure and therefore their RAB. That requires them to get ahead using the platform model offering other services with less dependence on the RAB and returns from such by increasing charges to consumers

    1.2. Avoided costs of centralised generation and transmission. As more residential and commercial property owners continue building power stations – at a micro level, the less need

there is to build costly centralised generation including all the associated issues, and transmission use. This can be enhanced with arbitrage in play

2. Value of building resilience in our electricity system using mini and micro grids based on solar and batteries – by neighbourhood, by suburb or by town
3. Value to the distribution network – technical values like frequency management etc

DISRUPTION TO HELP ALL

The future of New Zealand's energy position will lie far more in the hands of the consumer than ever before. It will be more disrupted, more technology-enabled, more resilient, more democratised and more sustainable - based on consumer choice, action and delivery. The challenges ahead for the incumbent industry including regulators and the players in the current market model, are about the transition to accommodate and work with such as opposed to "if and why". This is about when the tipping point hits and New Zealand's preparedness for such from a ministerial, legislative, to policy, to adoption and or adaption – either by incumbent players, new entrants, both or either, building a new and or alternative model.

It is our belief that the risks to the New Zealand position based on the current position, are well under estimated. The scale of the change, given investment and take-up levels globally in new technologies that engage the consumer (and the flow on from empowered consumers developing and building new mechanisms to engage more consumers) is under-valued given current policy and regulatory settings.

The industry's belief that the old and current market structure and model is appropriate and will serve the needs of the new generations, their thinking, their increasing engagement levels in the acquisition of many other required services and products is a substantial risk moving forward.

The biggest risk is the uncertainty for all consumers, who are left to the interests of current incumbent stakeholders versed and vested in the current model and market given the propensity to preserve the same model, cost and charging structures with some fiddling around the edges and lots of PR stuff.

Strong change to prepare New Zealand for the inevitable upcoming shift is needed.

If we, as a nation, do not invest in wider ranging legislative and policy settings, like fair mandated, arbitrage arrangements for stored excess generation from small scale generation to policies enabling and mandating EDB's to engage in platform and shared models of product and service delivery, to changes in Part 6 of the code (Participation Code) of the Electricity Act, that provide consumers with fair engagement rules, New Zealand will be left far behind. The other risk is take-up of said technologies by consumers without any regard for legal implications.

The shift from central planning, generation, transmission to delivery of electricity is well documented around the globe. Acknowledgement that a de-centralised model based on the key elements of ***consumers incrementally and progressively gaining control through choice***, new technologies with cost curves heading in one direction only and the impact of sustainability, must be central to the panels thinking on direction around new technologies.

An implication of this, is that consumer centricity obviously becomes the norm in more ways than one. It is consumers who are driving and defining;

1. the speed at which technology uptake occurs
2. therefore, the pace of the disruption
3. and the direction it takes
4. and the new models that empower and engage other consumers

We point at the many other disrupted industries (IT, media, communications, personal transport, accommodation, entertainment, consumer electronics, photography et al) where the impact has started at a modest level, gaining impetus through other technology disrupted industries, continuing momentum and resulting in the incumbent industry players being caught out of sync, forcing them to protect what they know – defending their model and space in a combative and aggressive manner normally. By then it is always too late. As you all know – this is a common theme and we ask the panel for the sake of all consumers, to get way ahead of the curve in their narrative and recommendations.

The required new thinking and new technology impacts allow the retuning of electricity pricing for all.

Strong moves were made decades ago to move the sector to a model based on retail competition, with electricity purchased from a dynamic wholesale market, with managed outputs from generators who were vertically integrated as retailers. For those that recall the history, that was a significant step-change move at the time – and this is the next step change needed to address the retuning to a new model.

Questions being asked in other jurisdictions now, around the position of the old market structure include the value of vertical integration, the value of participating in both the wholesale and retail markets, the true value of the reported profits versus the risk profile, cost allocations against which component and who pays for what are the telling sign. Fit for purpose with impending significant disruption, and when can it change, are the commonly themed questions.

Compared to the incremental development of the consumer centric model with new technologies, besides the obvious decentralised perspective and the associated values of such, horizontal integration has emerged as the key point to take-up – as has been experienced by the IT, media, personal transport, and accommodation sectors. This is a key instrument in the new business models that have been built and continue to be developed in these sectors and we believe the same will apply in the electricity and energy sector. It is not insulated or immune from such.

This is furthered by the sectors legacy industry thinking that they apply to new technologies and resulting business models. Applying a LRMC equation to a consumer centric technology like solar on a rooftop or a group of solar and battery powered buildings sharing electricity, means nothing to the investor or property owner. Applying old school thinking to a new challenge doesn't work. Applying different and new thinking does. So, change it.

New thinkers in the space understand virtual power plants, electricity rate arbitrage, peak minimisation technology, energy diverters, deep data analytics, circuit management, BHTM, to name a few. They also understand the ***unique and key differences between a customer and a client.***

All of this contributes to a new model, how it develops and evolves and the right decisions being made in the transition to radically reduce consumer consumption and/or costs, saving all consumers more on their electricity prices as opposed to the current position.

Again, we recommend the panel, for the sake of all consumers, get ahead of this curve by encouraging policy settings that are helpful to the uptake of decentralised generation at a local level, by consumer and consumer groups – not to work against them because of perceived and incumbent industry driven mis-conceptions based on inaccurate and convenient statements like social inequities - solar and battery users subsidised by lower socio-economic groups, as noted previously.

REVIEW MUST ENABLE DISRUPTION

The opportunity exists right here right now, to ensure policy be enacted that enables the full scale and potential of disruption to be recognised and put in play for the benefit of all kiwis and not to simply say it's not broken and doesn't need fixing – because it does – driven by the key component, affordability. The status quo and fiddling around the edges are not a fix but a sticky plaster.

Our recommendations seek solutions to address and enable changes in the interests of all New Zealanders:

1. The assumption that the more retail brands there are, equates to a genuinely competitive market that is working in the best possible interests of consumers is not a competitive market. This is a ridiculous self-serving premise and implies it is the only game in town, when it is not.

   It can be addressed with the establishment and development of a formal (or informal) secondary market that is consumer driven and managed, where they secure the benefits of lower electricity costs through a circular sharing eco-system and economy. This model is developing with or without regulatory or associated inputs but we raise it to help your understanding with new thinking

2. Existing status quo generation cost structures are not clearly defined and understood

3. Restrictive wholesale energy market behaviour that continues without being questioned needs to be addressed

4. Lack of transparency and oversight of gentailers who dominate the New Zealand market at a cost to consumers and new entrants

Again, we recommend the panel, for the sake of all consumers, get ahead of the new technology and resulting business model curve by encouraging policy settings that are helpful to the uptake of decentralised generation at a local level, by consumer and consumer groups – not to work against them because of perceived and incumbent industry driven mis-conceptions based on inaccurate and convenient statements like social inequities - solar and battery users subsidised by lower socio-economic groups, as noted previously.

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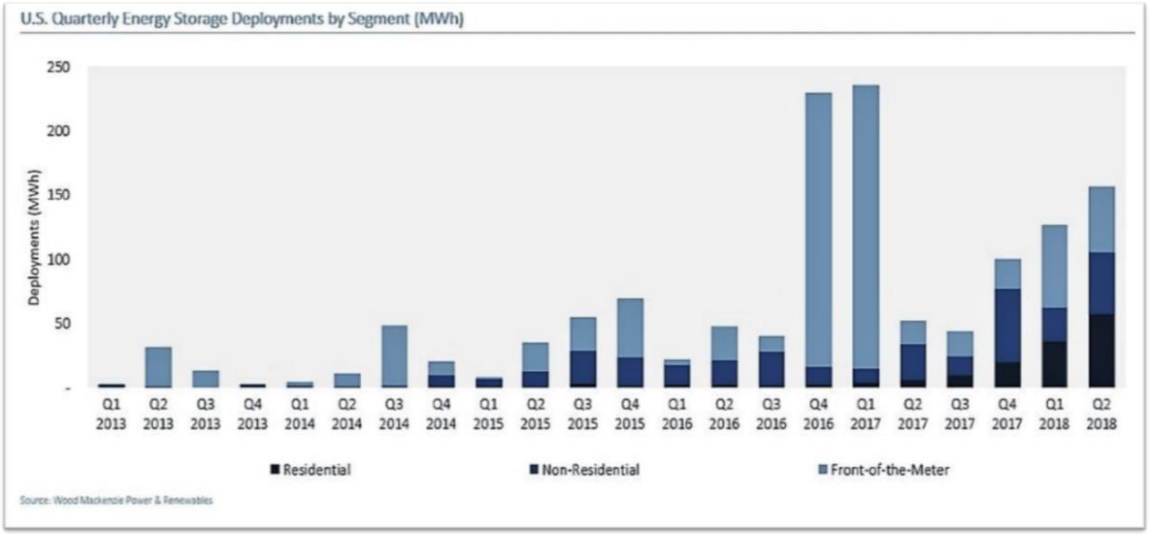
APPENDIX 1 - BACKGROUND

SOLAR AND BATTERIES GLOBALLY

- Solar is now the largest form of new generation being installed around the globe
- In 2018 nearly 100GW of solar was installed globally, more than 10 times the entire generation capacity of New Zealand. Global investment in solar was a tad under 60% of all renewable generation investment, more than 1.5 times the global investment in new coal generation. In 2017 the world added more solar capacity than gas, coal and nuclear combined[1]
- The growth of solar has been spectacular globally. In many parts of the world, solar is now the cheapest form of new generation as evidenced by prices via auctions
- Batteries are growing rapidly. The trend globally is "behind the meter" battery storage, i.e. battery storage in homes and businesses. The graph below shows the historical uptake and uptake forecast for storage in the US that is currently tracking slightly behind the uptake of solar



- This is the solar and battery age for the electricity sector as evidenced by the rapid uptake of solar and batteries globally

SOLAR AND BATTERIES IN NEW ZEALAND

- The development of solar and batteries in New Zealand has been slower than international growth. But that is now changing. Currently solar is the only form of new renewable generation being installed across New Zealand on a consistent and sustained basis – 1 residential or commercial property at a time
- Solar in New Zealand is led by ***households and businesses that recognise that solar is a very cost-effective form of new generation, that provides other benefits including helping the consumer/solar user understand energy and energy efficiency because they have to manage such on a micro scale, addressing the resilience issue, contribution to fixing operating household and business costs moving forward and lowering emissions***

[1] https://phys.org/news/2018-04-world-added-solar-fossil-fuel.html, based on a range of sources such as UNEP and Bloomberg New Energy Finance

- A new solar system is switched on every 25 minutes (working hours) in New Zealand
- Over 1MWh of batteries are installed monthly "behind the meter" every 6 weeks – that's the equivalent battery storage to the Mercury grid scale battery in Southdown, installed in kiwi homes
- That equates to over 30% of solar systems being installed with batteries. Many solar providers install only integrated solar and batteries. Consumers have already disconnected from the grid, and will continue to do so which we do not want long term for obvious reasons
- The average size of residential solar systems increased this year from 3.4 to 5.0 kW to enable battery charging for today and to retrofit batteries later
- The new grid -assisted solar and battery installation model is developing in New Zealand as in some other countries (does not require a connection agreement with the EDB or any consenting)
- Solar generation coupled with batteries is steadily increasing. The main generators are not investing in new renewable generation until they see the clear uptick in electricity demand from electric vehicles. And even then, the process will be difficult to enact more centralised generation including wind
- With the right policy settings, the uptake of solar and batteries can deliver a range of qualifiable and quantifiable benefits:

1. Achievement of the government's 100% renewable energy target earlier than 2035
2. Significantly lower investment in grid and distribution upgrades as behind the meter batteries reduce peak load

    2.1.1. An example of the impact of solar and batteries on household electricity demand in the NZ context is shown in Appendix 1 – a live example from a residential property on the Kapiti Coast showing peak evening demand from grid supply at near zero. Solar and batteries reduce electricity costs for everyone, not just those who install it – contrary to reports from lines companies/distributors. Taking this example/model, replicating it, and scaling it up across the country will significantly reduce peak demand periods with obvious substantial follow on benefits for other consumers and stakeholders

3. Greater electricity affordability for low income groupings - in social housing, communities and suburbs with the reduction of peak demand times which in turn reduces the gold plating on EDB's networks. This is extended using the "solar as a service" model with no capital costs upfront to install and a lower fixed monthly cost is paid for the service (includes solar, batteries, installation, maintenance et al)
4. Developing resilience in our system using localised mini and microgrids
5. The technologies to do so – solar and batteries are consumer funded requiring no assistance or help from other parties – a public/private partnership initiative

[2] https://thinkprogress.org/soaring-demand-for-global-solar-53f11bcaa89e/

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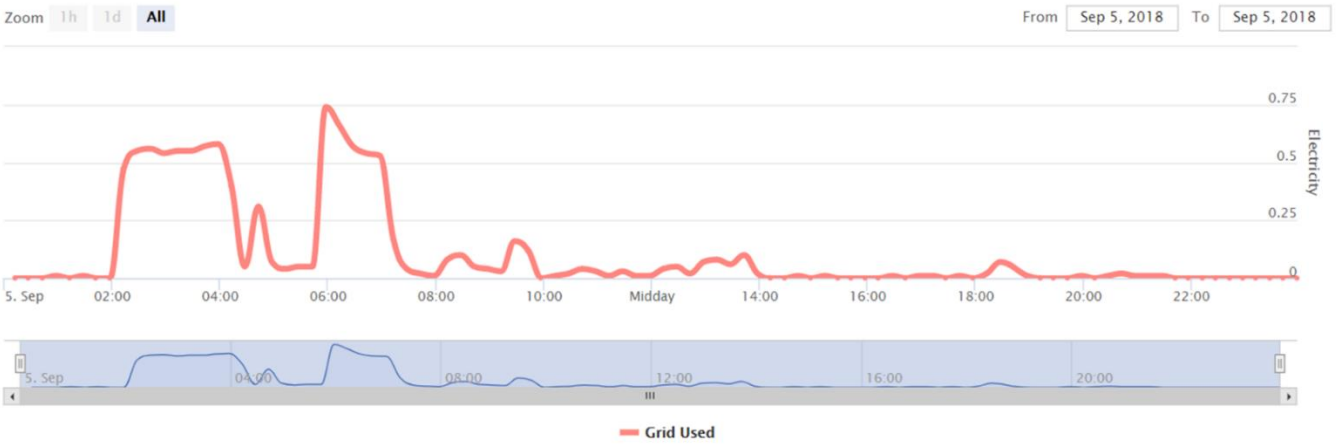
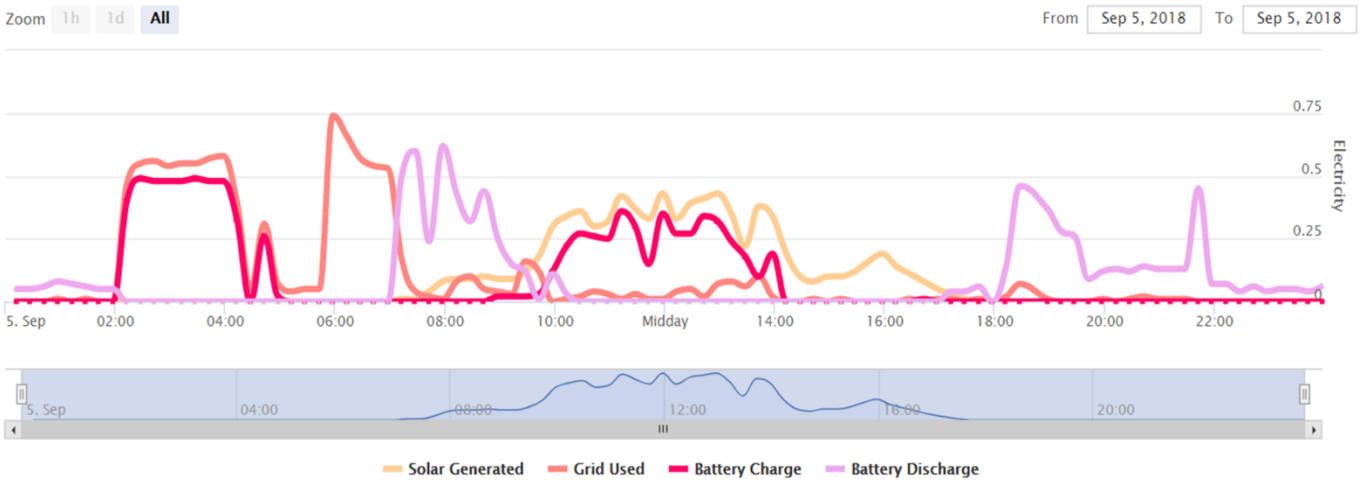
APPENDIX 2 – How Solar and Batteries Work with The Grid

They help the grid at peak times to reduce peak consumption
Graphs of typical Solar and Battery use in residential home – live example from Kapiti Coast



1. Other than early morning battery charging and the heating of a secondary hot water cylinder between 6am and 7.15am when lines and electricity prices are lowest) there is little electricity required from the grid
2. During the lines company peaks of 7am to 10am and 5pm to 9pm the house runs mainly off the battery



1. The battery charges from the grid at 2am to 4.30am when electricity and lines costs are cheapest
2. The battery discharges to support electricity use in the home from 7am (start of local lines company peak pricing period) to 10am
3. During the day solar generation works with the battery to support electricity use with all excess solar generation stored in the battery
4. The battery supplies electricity to support use at peak demand time from 5pm for the rest of the evening
5. An integrated EV charger can be added to charge from the battery, solar or the grid or a combination thereof based on user preferences