

SolarZero Submission to Default price-quality paths for electricity distribution businesses from 1 April 2025 – Draft decision paper

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12th July 2024

Summary

This DPP reset process is the most significant to date:

- Demand growth is set to increase significantly, due to for example, EV charging, resulting in a potential increase in peak demand. That could result in a significant increase in investment in electricity infrastructure if new management techniques are not rapidly introduced, such as “flex” and efficiency (e.g. hot water heat pumps), i.e. reducing both peak and overall demand to create space in the network for new uses, such as EV charging and conversion of gas appliances to electricity.
- Technology now enables (i) some sources of demand to be managed (ii) household load profiles to be changed significantly due to distributed generation such as batteries and (iii) some sources of demand to be significantly reduced, such as lighting and hot water heating.
- Pricing now matters because it can influence the uptake of technology to manage peak, reduce demand and therefore reduce the need for investment in infrastructure, but the industry has very little experience in developing and applying modern future-focused pricing regimes, particularly relating to virtual power plant (VPP)/flex technologies. The learning curve for this is steep and there is little time.
- Asset management plans are projecting a substantial increase in investment, reflecting (i) a projected increase in demand and (ii) a lack of knowledge by EDB and the EA on how that demand can be shaped via pricing.
- The productivity of the EDB sector is declining whereas it should actually be increasing.
- According to Callaghan Innovation the electricity sector is the second least innovative sector in New Zealand at a time when a massive amount of innovation is possible (due to new technology) and needed to avoid substantial infrastructure investment and therefore price rises for consumers.

In short, the Commerce Commission together with the Electricity Authority, i.e. both regulators, need to urgently drive the electricity sector from being efficient at running a capital **inefficient** system to being efficient at running a capital **efficient** system.

The proposed INTSA regime is a good step to supporting the innovation needed. But it is too small and need to be increased substantially, e.g. the 5% option.

But to increase productivity and turn the electricity sector into one that efficiently deploys capital a suite of additional measures are needed of which the DPP4 process is just one part. It will not be to the benefit of consumers if the Commerce Commission and EA do not substantially evolve their work programmes and begin to focus on ways to substantially increase the productivity of the power system and improve capital efficiency.

Overseas experience shows that only when the regulator(s) step up will the electricity sector begin to change and adopt more modern and efficient practices. Changing the habits and culture of an industry that developed over 130 years is a substantial challenge. That is the challenge that this DPP4 must face head on, and rapidly, before the increase in CAPEX proposed in AMPs is committed to. Addressing this challenge requires a joint work programme between the two regulators: Commerce Commission and the Electricity Authority.

New Zealand can learn from other jurisdictions that are on the same journey, such as the UK and specific projects such as the Brooklyn-Queens substation deferral in New York. The fundamental learning is that the regulators need to drive change.

Key points

1. At 0.6% the INTSA is too small to be effective, given the scale and urgency of change needed. It must be increased to 5%.
2. To ensure that the Commerce Commission is giving effect to s54Q it must develop a monitoring regime and be prepared to respond quickly if, for example, the INTSA is found to not be working effectively as was the case with the previous version of INTSA.
3. The Commerce Commission and the Electricity Authority as the two main regulators, need to rapidly develop an overall plan for encouraging a capital efficient power system that benefits consumers. This DPP4 needs to fit into the plan.
4. The Commerce Commission should ensure that the mechanisms are in place deliver on s54Q and apply course corrections if needed, using both statutory and non-statutory mechanisms. As part of this process the Commerce Commission should clearly articulate what meeting s54Q looks like in practice so that the entire industry is clear.
5. Given that INTSA is the only mechanism to encourage innovation and efficiency, it must be given a wide scope. Limiting it to 0.6% is not enough and it should be increased to 5%, as per the first point above.

6. AMPs are not yet reflecting the opportunities provided by flex and efficiency. The Commerce Commission needs to work across the industry to improve AMPs so they reflect the possibilities that 21st century technology enable in terms of flex, improved efficiency and resilience. This approach to improving AMPs needs to be part of the overall plan jointly developed by the EA and Commerce Commission.
7. New technologies such as solar and batteries provide a new approach to resilience, as SolarZero proved during Cyclone Gabrielle. INTSA should be used to provide funding for EDB to identify new ways to increase resilience via the deployment of distributed energy resources. SAIDI and SAIFI need to be changed to recognise the benefits of distributed energy resources in “keeping the lights on”. The QIS needs to be updated to encourage the adoption of new technologies such as solar and battery systems.
8. SolarZero supports draft decision O3.3 on data. Given this is a very new area for some lines companies, the Commerce Commission and EA should work with the industry to help it evolve good data practices.
9. The Commerce Commission should look internationally at power systems that have high levels of innovation and productivity. They need to understand what is driving these two factors and then look at what needs to be changed in New Zealand to deliver greater productivity and innovation.

INTSA seems to be the main mechanism for moving from a capital inefficient, low productivity power system to a capital efficient, high productivity power system

Previous documents by the Commerce Commission and the EA identify that new technology could result in a much more capital efficient and reliable power system, i.e. substantial benefits for consumers. Further, this technology needs to be applied quickly as the economy is electrified, otherwise the current inefficient use of capital in the power system will be perpetuated for decades because the power system will be over built.

The timing is critical. Unless the industry rapidly adopts new technologies and practices, networks will be over built resulting in long term dis-benefits to consumers. This DPP4 is the most critical so far in the DPP process. It must provide the incentives for a change in direction of lines companies. That new direction is to develop a modern, capital efficient, resilient power system.

We acknowledge that the DPP4 process is on its own timeline driven by statute. But in the time remaining and once the DPP4 is completed it is imperative that an overall plan between the Commerce Commission and the EA is developed for enabling a much

more productive, efficient and effective power system through the use of new technologies.

The INTSA is a very important initiative and is essentially the only lever the Commerce Commission is proposing to use to shift the industry from being an inefficient user of capital to a more efficient user. INTSA needs to be flexible enough that it can support the other parts of the overall Commerce Commission/Electricity Authority plan (proposed in this submission) as the plan is developed and evolves. The INTSA must be of a meaningful size in relation to the huge change in the power system; 0.6% is not huge and INTSA must be increased substantially, e.g. 5%.

Other than the INTSA it is hard to see how the draft decisions will help encourage the industry to adopt more innovative and efficient approaches. We are therefore not convinced that the draft DPP4 decisions adequately promote incentives for efficiency and demand side management (which we refer to as “flex”) as required under s54Q of the Commerce Act.

Given the amount of weight placed on the performance of the INTSA, should the INTSA fail to work effectively the Commerce Commission needs to be prepared to respond rapidly to get it working well, or come up with new mechanisms. The previous version of INTSA did not work and New Zealand cannot wait for the next DPP process if the INTSA does not work well – too much capital will be inefficiently deployed in the intervening period.

Key points:

1: At 0.6% the INTSA is too small to be effective, given the scale and urgency of change needed. It must be increased to 5%.

2: To ensure that the Commerce Commission is giving effect to s54Q it must develop a monitoring regime and be prepared to respond quickly if, for example, the INTSA is found to not be working effectively (as was the case with the previous version of INTSA).

The need for a coordinated plan between the two main regulators

In preparation of this submission SolarZero identified the following key questions:

1. Why is it that EDBs are planning substantial investment in infrastructure for meeting peak when new technology, i.e. flexibility and energy efficiency, can substantially reduce the need for new infrastructure?
2. Why is there an under-provision of flexibility (with the exception of hot water control) and energy efficiency in the NZ power system, given the technology is now available and proven?

3. Is existing and planned time of use pricing likely to be sufficient/insufficient to drive the uptake of flex and efficiency?
4. Why are EDBs not actively supporting solar and battery solutions as a resilience solution in areas of the country where it is hard to keep the power on? During Cyclone Gabrielle all houses with the SolarZero system kept the lights on, in some cases for ten days with no grid power.
5. Are the draft decisions in DPP4 going to address the questions posed above?
6. What role do the regulators play in encouraging a productive, efficient and innovative power system?

The answers to these questions are:

- Q1 (above) Flexibility and efficiency technologies, such as hot water heat pumps, are relatively new, especially flexibility services/technologies. EDB do not have the experience of working with flex providers or realising the benefits of energy efficiency technology. Similarly, flex providers only have limited experience of deployment. The whole industry is on a learning curve. The INTSA fund should help accelerate progress in trialling the deployment of flexibility and efficiency. But that in itself will be insufficient. Other policy/incentive measures will be needed that are outside of this DPP4 process. It is not clear to SolarZero that those additional measures are in place. The Commerce Commission and EA need to work to put the necessary measures in place, of which DPP4 is just one part, i.e. the EA and Commerce Commission need to develop a joint plan for transforming the electricity sector.
- Q2 (above) The under provision of flexibility and efficiency will occur for:
 - The reason above – lack of experience.
 - Pricing regimes that are unlikely to sufficiently encourage the uptake of flexibility and efficiency to the required level due to societal equity considerations, further elaborated in the point immediately below.
- Q3 (above) In areas where flexibility and efficiency are critical to defer or avoid electricity infrastructure upgrades, the pricing differential between peak and off peak is likely to be too great to be socially acceptable. Therefore, flexibility and efficiency is under provided for and everyone ends up paying more than they should for electricity, but in an equitable manner, i.e. everyone pays more than they should but somewhat equally so. New pricing regimes and investment approaches are needed. The INTSA can help with designing and trialling these.
- Q4 (above) The answer is a total mystery, re why EDB are not supporting new approaches to managing resilience. The reason probably relates to the answer to Q1 – a lack of experience with the technology.
- Q5. Clearly, the INTSA is a key initiative for helping lift the level of innovation in the second-least innovative industry sector in New Zealand. But a wider range of

activities are needed to go alongside the INTSA to move the industry to be more innovative. In other words, the DPP4 draft decisions, by themselves, are unlikely to move the sector from a declining productivity, low innovation path. The question thus becomes for the Commerce Commission and EA, what do the full suite of initiatives look like that will move the electricity sector from being capital inefficient with declining productivity to higher capital efficiency and increasing productivity?

- Q6. Evidence from the UK and the US (e.g. Brooklyn-Queens substation deferral) is that the regulator(s) need to actively encourage and push the industry to innovate. That may particularly be the case for NZ, where the Commerce Commission has identified that productivity in the electricity industry is declining, and Callaghan Innovation has identified that the electricity sector is the second least innovative sector in New Zealand. Putting these two points together suggests a substantial step up by the regulators is needed. The INTSA is a good step. But much more is needed.

The questions that follow from question 6 include:

- What is the overall plan across the regulatory agencies to lift the level of innovation, productivity and capital efficiency of the power system?
- Where does the DPP4 process and outcomes fit into this overall plan?

These two points need to be clearly explained to the industry because it is not clear what the overall plan is to shift the industry onto an increasing productivity and higher innovation path.

Paragraph 1.16 states that the Commerce Commission is working closely with the Electricity Authority to ensure the work programmes are aligned. What SolarZero can't see from (i) this DPP4 document and (ii) the various pieces of work from the both the EA and the Commerce Commission, is:

- What the overall plan is
- How the proposed DPP4 fits with an overall plan the EA and Commerce Commission have and
- Who/what/when the other key parts of the overall plan will be finalised?

For example, the Electricity Authority is currently preparing draft guidelines for distributor involvement in flexibility markets. Where and how does that work fit into an overall EA and Commerce Commission plan in a coordinated and coherent way?

Key point 3: The Commerce Commission and the Electricity Authority as the two main regulators, need to rapidly develop an overall plan for encouraging an efficient power system that benefits consumers. This DPP4 needs to fit into the plan.

Giving long term effect to section 54Q – enabling the first ever major change in the electricity sector

54Q Energy efficiency

The Commission must promote incentives, and must avoid imposing disincentives, for suppliers of electricity lines services to invest in energy efficiency and demand side management, and to reduce energy losses, when applying this Part in relation to electricity lines services.

Section 54Q: inserted, on 1 April 2009, by [section 4](#) of the Commerce Amendment Act 2008 (2008 No 70).

D2 This attachment covers the following:

- D2.1 **draft decision I1** to set the Capex retention factor at 33.18%;
- D2.2 **draft decision U1** to introduce an Innovation and non-traditional solutions allowance (INTSA) scheme, capped at 0.6% of maximum allowable revenue (MAR);
- D2.3 **draft decision U2** to incentivise energy efficiency and demand side management incentives through the draft INTSA; and
- D2.4 **draft decision U3** to incentivise the reduction of energy losses through the draft INTSA.

The DPP4 draft document acknowledges the electricity industry is going through a major change. We would argue the first ever change it has gone through. The change is driven by technology, specifically controllable devices, such as solar/battery systems, EV chargers, heat pumps and the like. Part of the technology is much more efficient appliances, particularly hot water heat pumps, heat pumps for heating and efficient lighting.

Electricity demand is set to increase substantially due to EV charging and conversion from gas/coal to electricity. Two responses are required:

- Shifting demand to times when there is currently low demand. Technology can now do this with no disruption to quality of life of households.
- Encouraging the uptake of energy efficient appliances, such as hot water heat pumps, in areas of the country where overall demand is a challenge (discussed later).

The whole industry needs to be on a steep learning curve to efficiently and effectively deploy this new technology. Again, INTSA is a good initiative, to encourage innovation but:

- The quantum is too small and should be increased.

- It may not be the right mechanism to encourage a **long term** commitment to innovation and deployment of energy efficient technologies to help reduce peak demand.
- Other than IRIS there does not appear to be a long term incentive to address issues set out in 54Q and innovation. Is IRIS working well? Has the Commerce Commission checked that the draft decisions enable it to comply with the legislation, particularly s54Q?
- To enable assessment against s54Q the Commerce Commission needs to be clear on its expectations – what does meeting 54Q actually look like in practice? We are not aware that has been clearly articulated in any document.

Key point 4: The Commerce Commission should ensure that the mechanisms in place deliver on s54Q and apply a mid-course correction if needed using both statutory and non-statutory mechanisms. As part of this process the Commerce Commission should clearly articulate what meeting s54Q looks like in practice.

Reducing peak, managing demand, the intersection of pricing and technology, where INTSA fits and what else is needed

The need to reduce demand and change household load profiles is very important in certain parts of the country. For example, in Queenstown, Wanaka and Nelson existing hot water control means that on certain days of the year demand has been flattened out for much of the day. In these areas efficiency will be important to manage demand, such as hot water heat pumps instead of resistive heaters.

We suggest that, in partnership with flexibility suppliers, EDB co-invest in a portion of energy efficiency and load shifting technologies and enable the investment to be incorporated into the RAB. From the perspective of a flex provider the investment would be in relation to a slice of the flex value stack relevant to the local situation.

INTSA can help with figuring out exactly how this can work, i.e. covering the costs of working through the detail of how to make this actually work. The detail will include a mix of economics, finance, software, deployment of distributed hardware and associated communication systems, and most importantly, understanding communities. The reason that understanding communities is important is that flex (including efficient appliances) is all about uptake by households/businesses.

Exploring pricing regimes also needs to be part of INTSA. A challenge is that lines companies will struggle to pass through the full marginal price in some areas of the country where there are constraints. For example, Aurora Energy estimates that in the Upper Clutha there should be a peak/off peak differential of around 24c/kWh. That kind of differential is likely to be challenging from a social/societal/equity perspective.

As a consequence lines companies will tend to not set tariffs that reflect the true cost of supply and there will be an under-provision of both flexibility and demand reduction services where they are most needed. Therefore, different ways of achieving the optimal level of flexibility and energy efficiency are needed.

These much-needed arrangements and pricing regimes are well outside current industry practice, e.g. EDB investing in a slice of the value stack for flex. Therefore, there will be a significant amount of learning required in order to develop, design and operationalise them. The INTSA fund can play a key role and must be allowed to do so, i.e. INTSA should not be limited to technical aspects.

Key Point 5: Given that INTSA is the only mechanism to encourage innovation and efficiency, it must be given a wide scope. As outlined elsewhere, 0.6% is not enough and it should be increased to 5%.

A heavy reliance on asset management plans, which results in a circular approach

The electricity industry is going through a once-ever change. Asset management plans are not yet reflecting the uptake of the new technology and approaches, such as flex and efficiency. Yet the Commerce Commission bases its DPP4 decisions on the published AMPs. The approach is therefore circular and could result in poor outcomes: AMPs do not reflect the new way the power system could work, the Commerce Commission bases its decisions on the AMPs, the power system does not evolve, the AMPs do not reflect flex and efficiency, the Commerce Commission bases its decisions on AMPs, the power system does not evolve and so it goes.

B41 However, we note that the flexibility market is still developing and may not have sufficient certainty or size to meaningfully defer EDB capex programmes. EDB investment programmes also take time to deliver and cannot be ramped up or delivered immediately. Accordingly, investment planning has to be undertaken based on an assessed likelihood of viability of alternative approaches, and the risk which arises if non-network solutions are either not available or cannot fully deliver to address network constraints.

The argument in B41 is circular: If the EDBs do not enable a flexibility market it will not develop. As the UK and Brooklyn-Queens programme (New York) have shown that if the regulator is serious about flex then flex will happen. The Commerce Commission together with the Electricity Authority need to drive flex. Otherwise it will not happen. That is a clear learning from overseas jurisdictions.

Further, AMPs tend to focus on specific issues in the power system, such as a feeder, zone substation or GXP that needs upgrading. The AMPs need to take an integrated

approach that reflect the hierarchical nature of the power system. If you change the demand profile and/or efficiency then benefits accrue at every level of the power system. AMPs do not reflect this integrated approach because they tend to focus on individual issues, e.g. a zone substation nearing capacity limits.

The Commerce Commission needs to work with the whole industry to rapidly improve AMPs so that they incorporate flex and efficiency. If AMPs take a much more integrated approach the Commerce Commission can start to rely on the AMPs in terms of future plans and pricing for the power system.

Key point 6: AMPs are not yet reflecting the opportunities provided by flex and efficiency. The Commerce Commission needs to work across the industry to improve AMPs so they reflect the possibilities that 21st century technology enable in terms of flex, improved efficiency and resilience. This approach to improve AMPs needs to be part of the overall plan jointly developed by the EA and Commerce Commission.

Resilience

Following Cyclone Gabrielle there is a much stronger focus on resilience – for good reasons. Distributed energy resources can provide household resilience effectively as SolarZero proved during Cyclone Gabrielle. All 3,000 SolarZero customers who lost grid power during Cyclone Gabrielle kept the lights on and the fridge/freezer cold, in some cases for up to ten days. Some SolarZero houses became hubs for the community because they were the only houses in the neighbourhood with electricity.

The thinking around resilience needs to include distributed solar and batteries. The ideal outcome is that lines companies identify areas where it is hard to maintain a reliable power supply and then works with the community and solar/battery providers to install distributed solar and battery systems. These systems ought to be able to be partially funded via the RAB. Potentially this is an area that the INTSA can help support to get the concept moving.

SAIDI and SAIFI need to be changed to reflect the benefits of distributed generation. For example, if a lines company works with a community and a provider such as SolarZero to install solar and batteries for resilience when the network fails and the lights stay on in that community the SAIDI and SAIFI figures should be adjusted to reflect the benefits to households and businesses of the installed distributed generation.

The QIS mechanism could also play a role here. But we are not clear as to whether the QIS would encourage more innovative approaches using new technologies. The QIS mechanism needs to be reviewed to ensure it does effectively encourage new approaches.

AMPs should identify areas where resilience is an issue and where distributed energy resources could play an important role.

Key point 7: New technologies such as solar and batteries provide a new approach to resilience, as SolarZero proved during Cyclone Gabrielle. INTSA should be used to provide funding for lines companies to identify new ways to increase resilience via the deployment of distributed energy resources. SAIDI and SAIFI need to be changed to recognise the benefits of distributed energy resources in “keeping the lights on”. QIS needs to be reviewed to ensure it encourages new technologies such as solar and batteries.

Data

Data is critical to the efficient operation of the power system. SolarZero has around 15,000 “sensors” (solar and battery systems) in the power system that report every 5 minutes, i.e. near real time and tens of millions of data points per day. Similarly, some EV chargers can provide data on the power system.

Having data available at the low voltage level is a significant change for the electricity industry. Data leads to visibility which should lead to more efficient investment decisions. SolarZero welcomes the draft decisions around data.

The Commerce Commission should encourage the most efficient approach to collecting that data. Approaches should include encouraging EDB to form partnerships with businesses that, in effect, run a sensor network as SolarZero does. This draft decision should not result in the duplication of metering/data collection and the Commerce Commission needs to be careful this does not occur.

Key point 8: SolarZero supports draft decision O3.3 on data. Given this is a very new area for some lines companies, the Commerce Commission and EA should work with the industry to help it evolve good data practices.

Productivity and innovation

It has long been recognised that New Zealand has a productivity problem. The electricity industry may be at the epi-centre of that problem. As the Commerce Commission identifies (C301-C342) productivity in the lines industry is declining. This fact, coupled with Callaghan Innovation’s view that the electricity industry is the second least industry in New Zealand should create some alarm across the Commerce Commission, Electricity Authority and MBIE, given the projected increase in expenditure by EDB and that the economy is going to be electrified.

Efficient electrification of the economy requires an electricity sector that is highly productive and innovative. Clearly, a major rethink of the settings and incentives on the distribution and transmission sector is needed. Apart from INTSA there is little new in the EDB settings. The same result can be expected – a low productivity, low innovation sector.

Key point 9: The Commerce Commission should look internationally at power systems that have high levels of innovation and productivity. They need to understand what is driving these two factors and then look at what needs to be changed in New Zealand to deliver greater productivity and innovation.

Response to specific draft decisions

C1-C6

As outlined above, relying on existing AMPs is problematic. AMPs need to be reconfigured to take a much more integrated approach to electricity sector management.

If the Commerce Commission is to rely on AMPs it needs to work with the whole industry to evolve the AMPs to reflect new technologies, including the use of data. The Commerce Commission and EA work with the industry to evolve AMPs into more integrated electricity system planning documents.

O3.2 Consumer engagement

SolarZero supports increased funding for consumer engagement. Part of that funding should be used to support consumer engagement in non-network solutions, flex and efficiency.

O3.3 LV Data

As per this submission's key point 6, SolarZero supports increased funding for data, with caveats around lines companies with data providers, such as SolarZero, as compared to investing in duplicative metering.

U1 and U2 INTSA

SolarZero supports the INTSA initiative. It needs to be much higher than 0.6%, e.g. 5%.

Quality incentives – resilience, SAID and SAIFI

As per key point 6, SolarZero supports INTSA being used to develop new approaches to increasing resilience. Keeping the lights on during Cyclone Gabrielle proved out distributed energy resources. SAIDI and SAIFI need to be adjusted to reflect the benefits of increasing distributed energy resources in certain areas, that can keep the lights on in households and businesses. The QIS system needs to be adjusted to incentivise distributed solutions for resilience.