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FlexForum advice on default price-quality paths for electricity distributors from April 2025

FlexForum exists to support coordinated and collaborative action across the electricity ecosystem to speed the development of distributed flexibility to maximise benefits for households, businesses and communities and the wider economy.

We incorporated in July 2023 and currently have 25 Members from across the electricity ecosystem including gentailers, retailers, metering services suppliers, EV charger manufacturers, energy management software firms, Transpower, distributors, advisory services firms, universities, and individuals.¹

Our conversations regularly have observers from the Ministry of Business, Innovation and Employment, Electricity Authority, Energy Efficiency and Conservation Agency and the Commerce Commission, and more recently, Utilities Disputes and the Consumer Advocacy Council.

We are focused on getting things done. We met for the first time in February 2022 and have so far delivered Flexibility Plan 1.0 plus a range of insights which draw on the combined expertise and perspectives of FlexForum Members about distributed flexibility.

[Flexibility Plan 1.0](#) provides the Aotearoa New Zealand electricity ecosystem a list of the practical steps and actions needed over the coming years for households, businesses and communities to maximise the value of their distributed flexibility.

The plan is a way to monitor and coordinate action and hold the electricity ecosystem, including regulatory bodies, accountable for taking the actions needed to integrate distributed flexibility into the electricity system and benefit from the flexibility of electric devices and equipment owned by households, business and communities as they electrify transport, heating and cooling and similar fossil-fuel reliant activities.

This response focuses on the DPP settings needed to enable the uptake and use of distributed flexibility

This response is the initial FlexForum perspective on the effectiveness of the tools proposed for the default price-quality path (DPP) starting 1 April 2025 to enable the uptake and use of distributed flexibility. Our specific focus is the role of the next DPP in making it easier for households, businesses and communities to maximise the value of their distributed energy resources and flexibility to:

¹ FlexForum Members are listed at the end of this document.

- support the affordable and reliable operation of the electricity market and power system
- enable accelerated electrification by households and businesses as part of the transition to a zero emissions economy.

The advice is presented in 2 parts.

1. **looking back from 2030** - drawing on the Flexibility Plan we identify at a high level the capability, processes and practises a distributor should have or be developing by 2030 to enable a household, business or community to invest in and maximise the value of distributed flexibility. Basically, what does good (plausibly) look like in 2030.
Appendix A sets out the expectations underlying what good looks like in 2030 for households, businesses and communities and the main assumptions.
2. **A view on whether the next DPP can deliver what good looks like** - considering the expected impact of key elements of the next DPP on the uptake and use of distributed flexibility.

We see this advice as starting a conversation and consider the process to finalise the next DPP should involve open workshops involving people from across the electricity ecosystem probing and reality testing the proposed settings and their individual perspectives. We look forward to discussing making what good looks like happen!

Our key points

Electrification first and foremost involves households, businesses and communities deciding to invest in and use distributed and flexible resources like solar, battery systems, electric vehicles and EV chargers etc. The next DPP will deliver long-term benefits to households, businesses and communities using electricity networks (ie, 'consumers') by ensuring distributors have the ability and the incentives to make the multi-year investments in learning-by-doing and to develop new capability to enable people to electrify and easily connect to and use electricity networks.

Encouraging learning-by-doing and necessary preemptive investment will help to avoid the credible and material risk that household and business experiences in the coming years will be typified by 'my power bills are already going up, my reliability has gotten worse, and now you want me to pay even more to reduce emissions, at the same time as telling me I cannot connect my solar and electric vehicle...'

All distributors will need to make step change investments where the full benefits will not be realised until after 2030. We need distributors to make more than incremental improvements in operating practices to meet the challenges of electrification. We need distributors to be developing and obtaining new capabilities, systems and practices which allow them to make the step change required by a power system driven by electrification and distributed flexibility.

The challenge for the Commission is that much of the pay-off of this investment will be seen after 2030 and the DPP settings are more suited to enabling incremental efficiency rather than multi-year preemptive investments required to adapt to the fundamental shift in circumstances arising from electrification.

Doing nothing, or waiting until uncertainty about near-term decisions is reduced through time, is reasonable in a steady state environment because the costs of doing nothing are low. In a state of transition, the costs of doing nothing are significant. Preparing for the future will be cheaper in the long run by creating an environment that allows for experimentation, so that learnings from mistakes and successes can be captured and shared, while also ensuring that the impact on reliability and affordability of any mistakes can be managed. We think that moving faster now will be cheaper in the long term even if the learning process is a bit messy.

Given this, we think the next DPP can be made flexible so that distributors are not a roadblock to electrification and uptake of distributed flexibility.

1. Supplement the baseline incentives provided by the foundational DPP settings to ensure distributors are positively encouraged to undertake learning-by-doing and make the preemptive investments required to adapt to the fundamental shift in

circumstances arising from electrification, and particularly to enable uptake and use of distributed flexibility. The additional incentives could be provided through the proposed innovation and non-traditional solutions allowance or a package of schemes.

2. Design the supplementary incentives to encourage learning-by-doing and pre-emptive investment but avoid unconstrained spending by requiring collaboration and requiring distributors to anchor their spending to the actions in the Network Transformation Roadmap or Flexibility Plan 1.0 (or similar collaborative exercises).
3. Reality test the workability of the supplementary incentives in collaboration with distributors and the wider electricity ecosystem to build confidence they will do what it says on the box. We suggest identifying the practical impacts by working through scenarios of the lived experience of outcomes looking back from a plausible 2030.

FlexForum is ready to assist the Commission with coordinating workshops with representation from across the electricity ecosystem to provide a whole-of-system view of the workability of tools targeted at incentivising innovation and investment in learning by doing and developing new capability.

Context: a multi-year commitment is needed to enable electrification and flexibility

A multi-year commitment is needed across the electricity ecosystem² to enable electrification and the routine use of distributed flexibility so that households, businesses and communities can enjoy a sustainable, affordable and reliable electricity supply.

Electrification first and foremost involves households, businesses and communities deciding to invest in and use solar and other distributed generation, electric vehicles (and their chargers), battery storage, electric heating and cooling (by both household and commercial), electric motors and similar equipment. All these devices can be flexible and thereby could provide a range of benefits to households, businesses, communities and to the electricity supply chain.

Flexibility Plan 1.0 sets out the steps required (based on what we know now; it will be updated as we learn more) to enable the routine use of distributed flexibility and the associated benefits.

Delivering the plan requires the electricity ecosystem to undertake learning-by-doing to identify and implement new capabilities, processes and practices. This learning-by-doing must be a multi-year, ongoing commitment if we are to maintain and accelerate progress towards enabling electrification and flexibility.

Using Australia and the United Kingdom as reference points we should expect the effort to take at least 10 years starting now. The UK started its flexibility journey in 2010-ish. Australia got serious in about 2017. While we can learn from their experience, we should not expect a simple cut-and-paste exercise to provide answers which work here.

The long-term benefit for households, businesses and communities using electricity networks (ie, ‘consumers’) relies on the 2025 DPP decision. The DPP must ensure distributors and the ecosystem have the ability and the incentives to start making the necessary multi-year investments in learning-by-doing and implementing the experience of that learning as soon as possible. We consider investing early in learning-by-doing is the surest way to mitigate the risks and costs of the fundamental changes to the electricity sector and economy wrought by electrification.

Looking back from 2030 and what good looks like

We think an effective way to assess the effectiveness of the tools the Commerce Commission proposes to apply within the next DPP is to look back from a plausible 2030. We encourage the Commission to take this approach as it develops and finalises the next DPP to help ensure the tools and incentives are practicably workable.

² FlexForum deliberately refers to the electricity ecosystem because enabling distributed flexibility requires effort from the ‘traditional’ industry, ‘new’ industry participants such as EV and charging infrastructure manufacturers, the Commerce Commission and other sectoral regulators, and from other industry sectors such as transport and agriculture.

Our starting point is that households, businesses and communities rely on being able to connect to and use electricity networks to achieve one or more of the five main outcomes below. These outcomes anchor the actions outlined in the Flexibility Plan 1.0.

- Reducing energy-related capital costs ‘I want the most affordable upfront investment to meet my specific energy needs’
- Reducing energy-related ongoing costs ‘I want the most affordable ongoing costs to meet my energy needs (sell my surplus power for the best price or ensure my consumption occurs when prices are cheap)’
- Improving reliability and resilience ‘I want a specific level of reliability and resilience’
- Reducing emissions ‘I want to reduce my effect on emissions’
- Supplying electricity services using flexibility ‘I want to modify my generation or consumption to earn revenue by supplying services across the electricity supply chain’

Enabling each of these outcomes requires a distributor to have various capabilities, processes and practices which are obtained within the boundaries set by the DPP (or customer ownership). These capabilities will not emerge fully formed and perfect once some threshold (eg, 20% of urban dwellers have an EV) is crossed. Most will require years of investment in learning-by-doing to identify specific requirements and further investment to implement the capability by distributors and by people using electricity networks.

We have identified a set of key enablers of distributed flexibility and electrification generally which distributors will need to have or be developing by 2030 to realise the plausible expectations of a household or business and realise the long-term benefit of consumers. The expectations are outlined in Appendix A.

Looking back from 2030, FlexForum considers the key enablers, or capabilities, electricity distributors had in place to meet the expectations of households, businesses and communities were:

- the distributor was able to invest time and resources in gaining **LV monitoring information and analytics** to enable:
 - improved network awareness to provide feeder-level information on historical statistics (voltage levels and outages), available hosting capacity, and forecasts of planned capacity
 - improved forecasting of available network capacity allowed more dynamic connection options for consumers when the distributor had access to a platform that communicated network capacity constraints
- the distributor invested in an Advanced Distribution Management System which provided **initial LV and distribution system orchestration capability**, including more advanced coordination with the System Operator and individual network users to keep the network within operating limits and manage emergencies at both a national and local scale
- the distributor **used LV monitoring and system orchestration capabilities to offer a suite of pricing options and payments** to selected network users to offer flexibility in defined circumstances
- the distributor was able to invest in **learning how to adapt network operation and planning practices** to manage changing network use and the integration of demand flexibility
- the distributor was able to invest in a **streamlined DER application and connection process** which, depending on the type of connection request, provided confidence in speedy connection decisions and provided an initial menu of connection size options (and associated service levels) for new and upsized connections.

Basically, this is what ‘good’ will plausibly and broadly look like in 2030 and provides a reference point for the outcomes which the DPP should be designed to deliver. These outcomes are not being achieved through the current DPP settings.

FlexForum’s view on whether the next DPP can deliver what good looks like

The DPP is expected to operate for the long-term benefit of consumers by promoting outcomes consistent with those in workably competitive markets, such as incentives to innovate, invest, improve efficiency, provide services that meet consumers demands, and to limit distributors ability to extract excessive profits. Put more plainly, the DPP is expected to ensure distributors enable connecting

to and using the electricity network while delivering a reasonable level of service (reliability) for a reasonable price (affordability) over the long term.

In a transition state - which we are now in - acting in the interests of consumers in the long term means distributors must have clear and obvious encouragement to learn-by-doing, involving both failures and successes, and then to make efficient investments as a result of that learning.

We need distributors to make more than incremental improvements in operating practices to meet the challenges of electrification. We need distributors to be developing and obtaining new capabilities, systems and practices which allow them to make the step change required by a power system driven by electrification and distributed flexibility.

We see the biggest challenge for the next DPP is neither distributors nor the Commission know with confidence how much more needs to be spent and on what in the period 2025 to 2030 (and beyond). We understand³ the DPP settings are not designed to deal with this type of uncertainty.

Our greatest concern is the resulting inertia that distributors face because they are not sufficiently encouraged to make step change investments. Incentives to innovate are important, but encouraging practical learning and investment to develop new capabilities needed to meet the challenge of electrification is even more critical.

Doing nothing, or waiting until uncertainty about near-term decisions is reduced through time, is reasonable in a steady state environment because the costs of doing nothing are low. In a state of transition, the costs of doing nothing are significant. Preparing for the future will be cheaper in the long run by creating an environment that allows for experimentation, so that learnings from mistakes and successes can be captured and shared, while also ensuring that the impact on reliability and affordability of any mistakes can be managed.

Given this, the next DPP must be to encourage learning-by-doing by distributors, in collaboration with others, so that distributors are not a roadblock to electrification and uptake of distributed flexibility. We think that moving faster now will be cheaper in the long term even if the learning process is a bit messy.

FlexForum considers there are five key elements of the proposed next DPP which impact flexibility and electrification.

1. Foundational DPP settings provide baseline incentives but do not effectively encourage the step change investments needed to enable uptake and use of distributed flexibility
2. The innovation and non-traditional solutions allowance may be sufficient to supplement the foundational incentives, but this depends on the final design
3. Specific incentives for demand-side management (and other forms of flexibility) will be needed if the innovation and non-traditional solutions allowance does not fill the gap
4. Distributors will need more operating expenditure to invest in new functionality
5. Quality standards framework needs further changes.

Foundational DPP settings provide sufficient baseline incentives but do not encourage the step change investments needed to enable uptake and use of distributed flexibility

FlexForum agrees the foundational DPP settings provide incentives for distributors to seek incremental efficiencies within the regulatory period. Broadly the Commission believes the foundational DPP settings provide sufficient baseline incentives for distributors to strive to be efficient:

- 'the regime incentivises innovation where it results in a lower cost to serve, as distributors retain a proportion of any efficiency gain
- the Incremental Rolling Incentive Scheme (IRIS) mechanism equalises the strength of the financial incentive to be efficient across

³ FlexForum prepared this response relying on the expertise and experience of its Members. Throughout this document the phrase 'We understand...' reflects Member input and the ensuing discussion testing the statements and explanations.

the regulatory period and across opex and capex, meaning there is no incentive to defer innovative solutions which may deliver efficiency gains

- a price-quality path does not specifically allocate expenditure to particular categories. This allows a supplier to change allocations between opex or capex solutions with IRIS equalising the financial incentive between spending on capex or opex.’

Electrification involves fundamental changes to the operating environment and practices which require investment now and over the next 10-15 years in learning-by-doing and material investment in new capabilities. This investment will over time deliver a more reliable and affordable and lower emissions power system - including the integration of distributed flexibility - but the full pay-off will not be seen until after 2030.

The Input Methodology (IM) review highlighted the foundational DPP settings (ie, IRIS and issues with opex and capex substitution across regulatory periods as described in the IM draft decision⁴) do not provide sufficient incentives for learning-by-doing and preemptive investments which may not realise benefits until later regulatory periods but are needed to prepare for electrification and distributed flexibility. We understand the result is distributors are incentivised to prefer investment decisions that continue to rely on the certainty provided by capital expenditures in poles and wires. If this continues we expect households and businesses will pay for more network than necessary and experience poorer reliability because distributors cannot build fast enough and do not have flexible alternatives.

Given the ‘costs now and benefits later’ paradigm, distributors need stronger incentives than those currently provided through the foundational DPP settings that promote investment in learning-by-doing to start developing new capabilities.

All distributors will need to make step change investments where the full benefits will not be realised until after 2030. These are necessary to enable the 6 capabilities identified by FlexForum that deliver the flexibility-related outcomes households and businesses are likely to expect. Recognising there are efforts underway - Resi-flex⁵ etc - we are not seeing the scope of investment we would expect to see if the foundational DPP settings encouraged innovation and development of new capabilities.

The next DPP needs to encourage actual innovation and preemptive investment to avoid the credible and material risk that household and business experiences in the coming years will be typified by ‘my power bills are already going up, my reliability has gotten worse, and now you want me to pay even more to reduce emissions, at the same time as telling me I cannot do my bit by purchasing PV and EV...’.

The baseline DPP settings are not sufficient to encourage the investment needed and need to be bolstered by targeted incentive schemes, such as the innovation and non-traditional solutions allowance. The big questions are whether that allowance (or similar) will sufficiently strengthen incentives and how quickly and easily the Commission and distributors and the wider electricity ecosystem can respond if it does not, because waiting to make additional changes in 2030 is not a plausible option if the objective is the long-term benefit for consumers.

The innovation and non-traditional solutions allowance may be sufficient to supplement the foundational incentives, but this depends on the final design

The IM decision included a new ‘innovation and non-traditional solutions allowance’ to replace the existing innovation project allowance with the details to be developed as part of the next DPP.

The focus of the new allowance is to provide the Commission with more scope and flexibility at DPP resets to set schemes that (amongst other things) improve incentives to encourage distributors to:

- seek opportunities to defer or remove the need for traditional capital expenditure investments
- test and/or employ new technologies and business practices, potentially changing the ways networks could operate

⁴ Commerce Commission, Part 4 Input Methodologies Review 2023 – Draft decision, Financing and incentivising efficient expenditure during the energy transition topic paper – Attachment C

⁵ [Resi-Flex](#) is an Orion and Wellington Electricity project.

The innovation and non-traditional solutions allowance looks like the primary tool within the next DPP to encourage distributors to develop and procure flexibility because we understand that

- the IM decision notes no sensible solution can be found that would allow opex and capex to be substituted across regulatory periods and that the best approach to funding flexibility payments and similar forward-looking investments is to provide additional allowances.
- a high level of certainty will be expected for forecasts of new operating expenditure.

Specifics of the allowance will be decided as part of setting the DPP for 2025-2030. The Commission has suggested several design principles:

- **Additionality principle.** The investment would not happen otherwise, ie, because it has a high risk profile and no other learning-by-doing funding is available
- **Risk allocation (and compensation).** Risk and reward from the project are allocated to suppliers or consumers based on who is best placed to manage them, and distributors face some (or all) of the costs of failed innovations
- **Incentives for efficient expenditure (where appropriate).** Any funding within a potential scheme should ideally face incentives to be used efficiently, to increase potential benefits to consumers
- **Fits within the relatively low-cost DPP settings.** The allowance is low cost to administer.

The suggested parameters and characteristics of the proposed allowance appear reasonable, but the key will be to reality test the application before a final decision and implementation. At a minimum, the proposed allowance needs to be easier to use and applicable to a broader range of investments than the existing innovation project allowance.

The allowance must workably supplement the incentives of the foundational DPP settings. Each of the 6 capabilities needed to deliver flexibility-related outcomes require most distributors to incur extra operating costs through to 2030. For example, building and resourcing a 'streamlined DER application and connection process' able to manage a material increase in throughput and achieve customer service (quality) expectations will require a step change in operating expenditure - the allowance appears to be the primary tool for encouraging and enabling this type of investment which will be critical to electrification and uptake of distributed flexibility.

FlexForum is ready to assist the Commission with coordinating a workshop with representation from across the electricity ecosystem to provide a whole-of-system view of tools targeted at incentivising innovation and investment in learning by doing and developing new capability. In helping the Commission to reality test the allowance design across a range of scenarios to ensure workability from April 2025, we would like to explore things like:

- the scope of the allowance - will it be narrowly focused on trials or broadly focused to support investments in developing new capabilities?
- the definition of non-traditional solutions to ensure all forms of flexibility and other tools are in scope
- the incentives for distributors to collaborate and share learning, ie, the allowance design should avoid several distributors attempting identical learning-by-doing individually and instead encourage collaborative efforts. Similarly, the allowance should explicitly support expenditure to collate, assess and share results
- how the allowance will treat operating expenditure to pay for flexibility (or is a separate allowance/mechanism required).

Specific incentives for demand-side management (and other forms of flexibility) will be needed if the innovation and non-traditional solutions allowance does not fill the gap

The Commission has suggested that no specific incentive for energy efficiency and demand-side management (ie, flexibility) are needed because the revenue cap form of control does not block the implementation of energy efficiency and demand-side management initiatives.

Demand-side management is a form of flexibility. Investment in demand-side management involves investment to develop 5 of the 6 capabilities needed to deliver flexibility-related outcomes by 2030 (ie, excluding investment in a DER application and connection process).

The Commission thinks the revenue cap form of regulation gives distributors flexibility to set prices that may incentivise loadshifting and are incentivised to do so where this may lower costs, and will result in outcomes such as:

- ...flexibility (ie, demand side management initiatives) is expected to become more used because distributors face incentives to defer investments to increase network capacity planned for future regulatory periods.
- ‘...providing incentives for opex/capex trade-offs during and across regulatory periods may encourage suppliers to increase their use of demand-side management (including by using non-traditional solutions).’

These outcomes are difficult to reconcile with the outcomes experienced from the existing DPP settings or expected from the tools proposed for the next DPP. In particular, we are not convinced the next DPP provide sufficient incentives for distributors to engage in activity which meets the Commission’s expectation that flexibility will be ‘used’ by distributors through the progressive procurement of services from flexibility providers (opex) to efficiently defer investments to increase network capacity planned for future regulatory periods (capex).

The foundational DPP settings do not provide incentives to encourage investment to enable the full potential of flexibility, and the opex forecasting requirements are not expected to allow funding to invest in new capability or to pay for flexibility. Although the Commission is looking to strengthen incentives in this area through the new innovation and non-traditional solutions allowance, it is not possible to say that no specific incentives are needed without knowing the final design of the allowance - the allowance must be workable from April 2025 to realise the outcomes expected by households and businesses.

Distributors need more operating expenditure to invest in new functionality

The Commission wants to ensure the next DPP enables distributors to increase capital and operating expenditure to meet the demands of electrification etc while maintaining checks to avoid ‘over’ expenditure.

Increased investment and new expenditure will be needed in the period 2025-2030 for distributors to obtain the capabilities necessary to meet the expectations households, businesses and communities will have of electricity networks (explicitly or implicitly), particularly to obtain or begin developing capabilities relating to:

- LV monitoring capability and analytics - the expenditure is a necessary condition for distributors to integrate and enable uptake of distributed flexibility and a key building block of an affordable, reliable electrification transition. Without this capability distributors are likely to build for a worst case electrification scenario resulting in a power system that is significantly more expensive in the long-term, and less reliable in the short to medium term where distributors cannot build infrastructure fast enough (LV monitoring capability is necessary to transact and use flexibility)
- LV and distribution system orchestration capability - Advanced distribution management systems capability is needed to manage and coordinate the increase in distributed resources. The capability is not expected by 2030, but significant investment will be needed in the 2025-2030 period to ensure distributors have the appropriate capability when it is needed. We expect the initial investments will focus on defining the specific orchestration functionality and capability and undertaking trials to test what works and doesn’t
- Paying for flexibility either through pricing structures or directly, particularly to learn-by-doing. In particular, the requirement to use verifiable cost estimates to lock in future OPEX allowances does not suit budgeting for flexibility payments, eg, distribution constraints are not necessarily known 5 years ahead of time.

Investment to enable uptake and use of distributed flexibility will be most affected by the base-step-trend operating expenditure forecasting approach which is proposed to ‘set an appropriately high threshold for evidence, due to the presence of information asymmetry around positive and negative step changes’. The proposal is that a step change must:

- be significant

- be robustly verifiable
- not be captured in any other components of the DPP allowance (base year, trend factors, capex, pass-through and recoverable costs, or reopeners)
- be largely outside the control of the distributor and demonstrate that expenditure needs to occur in DPP4
- in principle, be applicable to most, if not all, distributors.

We understand a key problem with the step change criteria are requirements that the change be ‘verifiable’ and be applicable to most distributors. These requirements penalise first-movers because there are few reference points for new types of expenditure and distributors will be incurring new expenditures at different times. Ideally the step change process should recognise the transition involves uncertainty. An option is to ensure the innovation and non-traditional solutions allowance enables expenditure necessary to develop robust estimates of the cost of new types of expenditure.

Setting the bar too high and making the step change process too difficult to achieve will reinforce the existing capex bias and discourage distributors from using flexibility. This in turn will slow down electrification and uptake of distributed flexibility by households, businesses and communities.

Again, we consider the DPP settings for setting and adjusting the operating expenditure envelope should be reality tested to ensure they are practically workable and complement other DPP tools to achieve the desired outcomes.

Quality standards framework needs further changes

The Commission is not proposing material changes to the quality standard framework, but has flagged a potential change to exclude outages due to ‘flexibility-related’ learning-by-doing from the definition of interruption based on distributor concerns that the current approach discourages learning.

Excluding outages relating to ‘flexibility-related’ learning-by-doing from the definition of interruption is a useful response to distributor concerns that the current approach discourages learning and will help to address a barrier to practical learning-by-doing. Distributors and the wider electricity eco-system need the confidence they can make the mistakes that come with learning (for example, in a trial setting, when using the innovation allowance or using a regulatory sandbox) without penalties, which could stifle experimentation and trying new things.

However, more fundamental changes are needed for the quality standards framework to provide real incentives for distributors to efficiently manage reliability of supply. The existing average or whole of network approach to setting quality standards is not necessarily in the long-term benefit of consumers.

The Commission view is that applying quality at an aggregate network level enables distributors to consider the needs and expectations of different customers and customer groups when making trade-offs about quality on different parts of their networks and to reflect these in their asset planning.

This approach is no longer fit-for-purpose. To be clear, we consider households, businesses and communities are worse off due to this DPP setting because it materially reduces the level of scrutiny on distributors in managing reliability and materially reduces incentives for distributors to manage LV reliability. This is most evident with voltage. Distributors have no incentive and are not funded to monitor and manage LV voltage despite a legislative obligation to keep within set limits. Data available from the growing fleet of distributed resources highlights these limits are routinely not met which in turn reduces the value of distributed flexibility.⁶

We struggle to see how continuing with the current settings will result in distributors doing things differently to more effectively manage quality trade offs across a network, despite the growing focus on the LV layer due to electrification.

⁶ Solar and battery systems are unable to export when network voltages are outside the permitted range which means they are unable to earn revenue, for example by selling surplus electricity or by participating in the ancillary services markets.

The averaging approach also reduces the focus on performance of critical sub-transmission assets, which deserve greater scrutiny through specific quality standards. This is even more important now that the recent TPM changes mean distributors can no longer rely on upstream pricing incentives to manage peak demand on these assets.

Not exposing distributors to more granular scrutiny materially weakens incentives on distributors to measure and manage reliability and quality performance DPP. Households, businesses and communities are worse off in two ways:

- a more expensive and less reliable electricity network by reducing incentives on distributors to invest to manage network performance, including by using distributed flexibility
- weaker incentives for people to invest in distributed flexibility because a source of value is not incentivised.

What is not subject to scrutiny will not be measured or managed or, at least, not well. The Commission should commit now to introducing more granular quality standards from 2030 to expose distributors to more scrutiny. The LV visibility investments flagged by most distributors will then provide the information needed to calibrate more granular quality thresholds. Additionally, by making this commitment, the Commission will provide a clear signal it expects and supports the investments necessary to have LV visibility.

Concluding points

Electrification first and foremost involves households, businesses and communities deciding to invest in and use distributed and flexible resources like solar, battery systems, EVs and EV chargers etc.

The next DPP will deliver long-term benefits to households, businesses and communities using electricity networks (ie, 'consumers') by ensuring distributors have the ability and the incentives to make the multi-year investments in learning-by-doing and to develop new capability to enable people to electrify and easily connect to and use electricity networks.

Providing distributors the ability and incentive to invest to prepare for electrification does require an uplift in costs and network charges. The five representative outcomes that a household, business or community will be seeking from flexibility will be difficult to achieve by 2030 without distributors and the wider electricity ecosystem investing considerable extra time, effort and money to develop and obtain the capability needed to harness the opportunities of electrification and distributed flexibility.

The pay-off of this investment is an affordable, reliable and low carbon energy system based on a renewable and flexible electricity system. The affordability dimension comes from people having more options to manage the cost of electricity and from electrifying things that are currently fossil-fuelled, particularly transport.⁷

The challenge for the Commission is that much of the pay-off of this investment will be seen after 2030 and the DPP settings are more suited to enabling incremental efficiency rather than multi-year preemptive investments required to adapt to the fundamental shift in circumstances arising from electrification.

In responding to this challenge, the Commission should ensure the DPP settings enable a flexible approach that encourages learning-by-doing and pre-emptive investment but avoids unconstrained spending by requiring collaboration and distributors can anchor their spending to the actions in the Network Transformation Roadmap or Flexibility Plan 1.0 (or similar).

- We should be confident from the work of the Climate Change Commission, Boston Consulting Group and others that electrification will benefit households, businesses and communities. We know that the benefits of electrification rely on distributors developing and obtaining new capabilities, particularly those described in Flexibility Plan 1.0
- Estimating the cost of the effort involved cannot be done with any certainty because although we generally know what needs to

⁷ See this report for Electricity Networks Aotearoa, [Total Household Energy Costs NZ](#), November 2022 which concludes... 'from 2026 all electric households can expect the total annual electricity cost, including the capital costs required to switch, to be lower than the combined petrol, gas and electricity bills (including the relevant capital costs) they would pay otherwise.'...with 'One of the biggest gains in total household energy costs is the switch from internal combustion engines (ICEs) to mains charged electric vehicles (EVs).'

be done, we don't really know how it can be done

- We know these capabilities will not emerge fully formed and perfect 'just in time' but require time, effort and money over the coming 5 to 10 years:
 - learning-by-doing to identify specific requirements of new capabilities and gain experience in how to best use those capabilities
 - pre-emptive investment to build capability to be ready when it is needed.
- We know that starting now is better than starting later because accelerating electrification brings forward the benefits.

Enabling learning-by-doing and pre-emptive investment will promote affordability by making it easier for households, businesses and communities to electrify and reduce their total energy costs by replacing more expensive fossil fuels, particularly for transport, with less expensive electricity. Enabling development of distributed flexibility will also support affordability by providing people - whether individual households or Kainga Ora or businesses - with more choice and options to manage electricity use and costs.

The response is the FlexForum perspective given its objective and purpose to support coordinated collaboration to make it easier for households, businesses and communities to maximise the value of their distributed flexibility. Individual FlexForum Members will have their own perspectives and positions.

You can contact FlexForum at info@flexforum.nz with any questions and to arrange further discussion about this response. We are very keen to work with you to provide a whole-of-system reality test of the tools proposed for the next DPP to ensure they are workable and will deliver long-term benefits to the households, businesses and communities using electricity networks.

FlexForum Members

		 An initiative of the Australian National University		
				
				
				
				 2 individuals

Appendix A: Flexibility outcomes in 2030 and the key enablers

Flexibility Plan 1.0 uses five representative outcomes that a household, business or community could obtain using flexibility (separately or, more likely as part of a package) as the anchor for the actions and specific capability, processes and practices required by the electricity ecosystem to deliver those outcomes. The approach attempts to reflect the perspective of a household, business or community – who may have flexible resources either now or in the future – making choices about flexibility and wanting to maximise the value of their DER for themselves, their community and for the wider economy.

The table describes some of the key enablers for the five outcomes which require a distributor to develop a new capability, process or practice (or combination of the three).

Outcome desired by the household, business or community	Key enablers of the outcome
<p>Reduce energy-related capital costs ‘I want the most affordable upfront investment to meet my specific energy needs’</p>	<p>...I was able to optimise my energy sources to suit my commercial requirements using a portfolio of solar, battery, efficiency investments and the network electricity supply after reviewing a menu of connection size options provided by the distributor for that location and a suite of energy and network pricing options. Using the flexibility of the DER meant I could operate with a smaller, cheaper connection and no upstream upgrades were needed. The application and decision process took [3 months]. I also make a bit of money from selling our surplus generation and by occasionally responding to requests/signals to charge/discharge our batteries.</p> <p>This outcome was possible because, amongst other things:</p> <ul style="list-style-type: none"> the distributor invested to obtain LV monitoring and analytics capability which enabled it to provide feeder-level information on historical voltage and outage statistics, available and planned capacity the distributor invested to build an Advanced Distribution Management System to provide initial LV and distribution system orchestration capability, including coordination with the System Operator the distributor invested to gain understanding and practise in using its monitoring capability and ADMS to maximise the use of available network capacity by offering people variable connection capacity based on available network capacity the distributor invested to gain understanding of the implications for network operating engineering and planning practices of changing network use taking account of flexibility the distributor invested to develop and resource a streamlined connection process which provided people requesting new and upsizing connection requests with an initial menu of connection size options (and associated service levels) for their location taking account of hosting capacity analysis and connection profile scenarios as a BAU.
<p>Reduce energy-related ongoing costs ‘I want the most affordable ongoing costs to meet my energy needs (sell my surplus power for the best price or ensure my consumption occurs when prices are cheap)’</p>	<p>...I was able to optimise my ongoing energy costs by electrifying my transport and commercial activities and using a portfolio of solar, battery, efficiency investments and the network electricity supply to offset consumption and making a bit of money from selling surplus generated electricity and by occasionally responding to requests/signals to charge or discharge the battery or lower my consumption or generation. My existing connection was sufficient despite the increased capacity requirement because I use the DER to manage operations within the capacity</p>

Outcome desired by the household, business or community	Key enablers of the outcome
	<p>envelope.</p> <p>This outcome was possible because, amongst other things:</p> <ul style="list-style-type: none"> the distributor invested to obtain LV monitoring and analytics capability which enabled it to provide feeder-level information on historical voltage and outage statistics, available and planned capacity the distributor invested to build an Advanced Distribution Management System to provide initial LV and distribution system orchestration capability, including coordination with the System Operator and network users to keep the network within operating limits the distributor invested to gain understanding and practise in using its monitoring capability and ADMS to maximise the use of available network capacity by signalling forecast network capacity constraints the distributor offered a basic suite of pricing options and payments to selected network users to offer flexibility in defined circumstances the distributor invested to gain understanding of the implications for network operating engineering and planning practices of changing network use taking account of flexibility.
<p>Improve reliability and resilience ‘I want a specific level of reliability and resilience’</p>	<p>...I invested in a solar and battery set-up sufficient to keep the lights on at home despite these increasingly frequent severe storms and cyclones. The most recent outage saw the network down for nearly 2 days. This time I didn’t need to visit my neighbour (they got solar years ago) to charge the phones and laptops. Nearly everyone in the street has solar now and we all make a bit of money from selling our surplus generation and by occasionally responding to requests/signals to charge/discharge our batteries or pause charging our EV.</p> <p>This outcome was possible because, amongst other things:</p> <ul style="list-style-type: none"> the distributor invested to obtain LV monitoring and analytics capability which provided it with feeder-level information on hosting capacity the distributor invested to build an Advanced Distribution Management System to provide initial LV and distribution system orchestration capability, including coordination with the System Operator the distributor invested to gain understanding and practise in using its monitoring capability and ADMS to maximise the use of available network capacity by offering people variable connection capacity based on available network capacity the distributor offered a basic suite of pricing options and payments to selected network users to offer flexibility in defined circumstances the distributor invested to gain understanding of the implications for network operating engineering and planning practices of changing network use taking account of flexibility the distributor invested to develop and resource a streamlined DER application process taking account of hosting capacity analysis for the local feeder.

Outcome desired by the household, business or community	Key enablers of the outcome
<p>Reduce emissions 'I want to reduce my effect on emissions'</p>	<p>...I was able to reduce my household emissions and significantly reduce my total energy costs by electrifying everything in my house. I got a new EV, new heat pump, solar hot water system and new conduction stove (better than cooking with gas!). I also make a bit of money from selling our surplus generation and by occasionally responding to requests/signals to charge/discharge our batteries or pause charging our EV.</p> <p>This outcome was possible because, amongst other things:</p> <ul style="list-style-type: none"> the distributor invested to obtain LV monitoring and analytics capability which provided it with feeder-level information on hosting capacity the distributor invested to build an Advanced Distribution Management System to provide initial LV and distribution system orchestration capability, including coordination with the System Operator the distributor invested to gain understanding and practise in using its monitoring capability and ADMS to maximise the use of available network capacity by offering people variable connection capacity based on available network capacity the distributor offered a basic suite of pricing options and payments to selected network users to offer flexibility in defined circumstances the distributor invested to gain understanding of the implications for network operating engineering and planning practices of changing network use taking account of flexibility
<p>Supply electricity services 'I want to modify my generation or consumption to earn revenue from supplying services across the electricity supply chain'</p>	<p>... I am able to make a bit of money from selling our surplus generation and by occasionally responding to requests/signals to charge/discharge our batteries or pause charging our EV. It's easy money. It just happens.</p> <p>This outcome was possible because, amongst other things:</p> <ul style="list-style-type: none"> the distributor invested to obtain LV monitoring and analytics capability which provided it with feeder-level information on hosting capacity the distributor invested to build an Advanced Distribution Management System to provide initial LV and distribution system orchestration capability, including coordination with the System Operator the distributor invested to gain understanding and practise in using its monitoring capability and ADMS to maximise the use of available network capacity by offering people variable connection capacity based on available network capacity the distributor offered a basic suite of pricing options and payments to selected network users to offer flexibility in defined circumstances the distributor invested to gain understanding of the implications for network operating engineering and planning practices of changing network use taking account of flexibility.

This view of the future state rests on some broad assumptions:

- Households, businesses and communities will be electrifying because it reduces emissions and keeps costs down - electrification and decarbonisation will be materially impacting network operations, though the nature and extent will vary

according to network circumstances

- households and businesses will be trying to decarbonise in the face of rising living costs and many will include the teenagers who are today advocating for climate action - there will be considerable appetite for solutions which reduce emissions and keep costs down
- there will be upwards of 180,000 solar systems across the country. Transpower forecast in March 2020 there would be nearly 180,000 solar systems by 2030.⁸ Systems will not be evenly distributed and clustering will result in some distributors needing to do something sooner than others.⁹ In particular, households and businesses will invest in solar and battery systems in response to the actual or perceived increase in frequency of power outages from extreme weather and cyclones. Cyclone Gabrielle prompted increased interest and investment in solar in Hawkes Bay - this mirrors responses to power outages due to natural disasters elsewhere in the world.
- personal and light commercial transport will continue to electrify. We could be well on our way to 1 million electric light passenger and commercial vehicles by 2030 given falling purchase prices across an increasing number of makes and models. Transpower forecast about 875,000 EV chargers by 2030.¹⁰ Wellington Electricity found via a trial from 2017 an EV would add at least 30% additional household load and has since estimated that 50% penetration of EV chargers larger than 2.5 kW would exceed what its network has been designed to accommodate.¹¹
- the shift away from reticulated natural gas for household and commercial uses will be underway with implications for network design and operating assumptions because the prevalence of residential gas heating resulted in a very low after diversity maximum demand (ADMD)
- the legacy distributor managed ripple control systems will continue to be replaced by direct to device management systems (for hot water cylinders and other devices). This fragmentation of management will make system operation and management of winter peak demand challenging while capability and processes are developed to enable coordination.
- **the power system will be getting bigger** - BCG reckoned roughly \$42B would be spent by 2030 on generation, storage, demand response and network infrastructure - this big number represents an estimate of the investment needed to provide infrastructure to meet demand from population growth, to address the housing shortage, and meet the demands of electrification.
- **some distributors will not be able to build fast enough** eg, because there are not the human and material resources available to physically build what is needed. Not building will affect households, businesses and communities through more frequent outages (reliability impact) or reduced service levels, eg, connections taking longer or restrictions on network access and use. Investing in flexibility is a least-regrets way to avoid or mitigate the negative impacts of not being able to build fast enough.
- **network charges will be higher than today** - Transpower is proposing a 40% increase in revenues/charges and distributors are anticipating the regulatory model to result in revenues/charges increasing 10% a year 2025-2030
- **electricity prices will be more volatile and potentially higher than today.** Wholesale electricity prices will be more volatile as supply and demand responds to periods of very low marginal costs of supply interspersed with periods of very high marginal costs of supply, eg, cold winter nights or low hydro lake levels. Existing forward price curve information may not be a good guide to future costs.

⁸ Transpower in [Whakamana i Te Mauri Hiko](#) forecast in March 2020 there would be 178,065 solar systems by 2030 (see figure 20) up from 41,360 solar systems (1.8% of connections) on 31 July 2022 and 51,592 solar systems (2.3% of connections) on 31 October 2023 (see <https://www.emi.ea.govt.nz/r/j2mfd>). The same March 2020 forecast said there would be 68,349 solar systems connected by 2025.

⁹ Nationally 2.3% of connections had solar at 31 October 2023. However, over 4% of connections on the Aurora (central Otago), Top Energy, Network Tasman and Mainpower networks had solar. See <https://www.emi.ea.govt.nz/r/5vecr>

¹⁰ Transpower, [Whakamana i Te Mauri Hiko](#), see figure 20.

¹¹ See [Wellington Electricity 10 year Asset Management Plan 1 April 2023-31 March 2033](#)