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Commerce Commission
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Attention: Ben Woodham, Electricity Distribution Manager

Tēnā koe Ben,

IM REVIEW 2023: EDB EXPENDITURE FORECASTING QUESTIONS

INTRODUCTION AND EXECUTIVE SUMMARY

1. Unison appreciates the opportunity to provide feedback about expenditure forecasting for the ongoing Input Methodologies Review 2023 (IM Review).
2. As the Commission acknowledges in its request for feedback:¹ *“the energy sector is in a period of change and uncertainty, and the pace of change may accelerate”*.
3. Unison’s answers to the Commission’s questions illustrate the following themes:²
 - a) forecasting must embrace growth uncertainty and prudently respond through scenario planning (growth is certain, the rate, timing and location is not);
 - b) success is optimum investment ahead of the demand curve to facilitate and participate in a flexible network; and
 - c) the 2050 target is engrained in Unison’s forecasting scenarios and should form part of the considerations of the IM Review and the Commission’s evidentiary basis for facilitating widescale industry investment.
4. The quantum shift in demand, driven by the 2050 target, requires proactive innovative response. That is evidenced by Unison’s necessary growth during DPP3 to resource existing decarbonisation related growth, including small scale generation as a result of advancing solar technology. There will be a pinch point where rapid increases in demand exceed existing hosting capacity for all EDBs. The existing IRIS mechanisms penalise proactive investment and may force an unsustainable amount of trade-offs between necessary network expenditure and unforecast growth in customer driven expenditure.³ If that response is reactive, solutions will be more expensive and risk more frequent breaches of quality standards.

¹ 15 November, 2022 letter, pg 2.

² Information provided in this submission does not form any commitment on behalf of Unison in respect of its planning processes and tools. It reflects the current stage of forecasting, as a result of iterative and cyclical asset management planning.

³ Seemingly contrary to s 54Q of the Commerce Act 1986.

5. To effectively accommodate uncertainty, Unison has strategically adopted an initiative to embed scenario planning into its planning processes and tools. The scenarios are integral to a three phased approach over the period 2022 – 2050:
 - a) Phase 1 2022 – 2025, **Catch-up**, referencing Covid related workforce difficulties and limited work during lockdowns.
 - b) Phase 2 2025 – 2030, **Preparation and early mitigation**, preparing the network to be flexible and proving sufficient capacity for early adopters.
 - c) Phase 3 2030 - 2050, **Flexibility**, facilitating flexibility in the network to provide sufficient network hosting capacity.
6. The scenarios project lower, mid and upper range scenarios that result in an envelope of expenditure. The objective is sufficiently increasing hosting capacity to facilitate and participate in a flexible network.

UNISON'S FORECASTING METHODOLOGY

Question 1: How are EDBs obtaining confidence in establishing the requirements they are forecasting to meet, including but not limited to demand, resilience, and reliability?

7. There are four components to Unison's forecasting processes:
 - a) renewal expenditure, informed by mature asset management processes (Unison is New Zealand's first company to be certified ISO55001);⁴
 - b) organic growth (comprised of industrial / commercial process heat conversions driving high voltage upgrades, and new large point loads);
 - c) low voltage (LV) visibility and circuit upgrades (decarbonisation related expenditure including distributed energy resource (DER) hosting and coordination); and
 - d) other decarbonisation related expenditure (including decentralisation and digitalisation).
8. In advance of LV visibility validating assumptions, independent expert advice will validate locationally specific forecasting assumptions and results (i.e. EV and solar uptake).
9. The expected variability of demand must drive outcomes. Customer driven expenditure is forecast on longer term horizons of economic growth, and short to medium term forecasts are adjusted for sector specific indicators. As with all economic forecasting, there is inherent uncertainty and the potential for cyclical volatility and variations. Investment ahead of the curve of demand will save consumers paying for deferred and inevitable capex solutions. Deliverability timeframes are an essential consideration with network hosting solutions taking a minimum of 12 to 24 months to implement. The tables below list inputs relating to demand, resilience and reliability.

⁴ Unison Networks Limited, Regulatory Asset Management Plan (RAMP) 2022-2032, 1.8, [Asset Management Plan \(unison.co.nz\)](https://www.unison.co.nz)

Demand

Forecasting tools	Demand
Historical inputs (from previous planning exercises)	<ul style="list-style-type: none"> • Connection growth is informed by the councils' long-term plans, customer growth, known subdivisions and consents, economic forecasts and Government policy. • Relationship management informs large capacity growth and relies on understanding the stage of the project. • Incremental demand growth was historically based on population growth.
New inputs 2022 or 2025 onward (factored into scenario planning)	<p><i>Forecasting and solutions toolset</i></p> <p>The forecasting toolset includes:</p> <ul style="list-style-type: none"> • Scenario based load forecasts relating to lower, mid and upper envelope scenarios,⁵ <ul style="list-style-type: none"> ○ EVs ○ DER ○ Industrial process heat conversions ○ Residential space heating conversion ○ New commercial/industrial load; • Obtaining visibility of the low voltage network. • Working with other EDBs to understand and consistently model the impact of EVs, DER on household demand. • External consultant advice and validation of forecast data, especially uptake rates of EVs and DER and household impact for the regions. • Scenario based constraints forecasts. • Continuation of the above approaches to forecasting customer expenditure with the introduction of scenarios that take into account economic volatility.

Resilience and reliability

Forecasting tools	Resilience and reliability
Key inputs, historical and new	<ul style="list-style-type: none"> • Resilience against natural disasters, such as earthquakes for critical infrastructure has been a focus this decade.⁶ • Development of a Climate Adaptation Strategy using external support and guidance to feed into Asset Management Systems planning processes. • Evolving climate change information will iteratively impact the Climate Adaptation Strategy.⁷
Planning process	<ul style="list-style-type: none"> • The asset renewal programme is established using a bottom-up approach (with re-prioritisation as cost constraints become clear). • Every asset is considered individually in respect of the likelihood and consequence of its failure. • Electrical network assets used are generally long-life assets.

⁵ Scenario planning has been undertaken for the first time in the 2022/2023 planning cycle.

⁶ The industry took learnings from the effects of the Christchurch earthquakes on electrical infrastructure including that all ZS buildings must be seismically reinforced to protect against the effects of significant earthquakes.

⁷ As such, the next few years hold a relatively high degree of certainty, but certainty declines into the future.

Forecasting tools	Resilience and reliability
	<ul style="list-style-type: none"> • It is accepted that the operating context that assets face towards the end of their usable life will likely be substantially different from that when they were installed. Subsequently future utilisation is uncertain. • Maximising potential asset life through appropriate asset (material) selection incorporates considering the reliability and resilience of the asset (given the high labour cost associated with asset installation and commissioning). • The likelihood of failure increases over time relative to the deterioration of the asset, and generally at an accelerated rate towards the end of its useful life. • The consequence of failure is generally static across the asset's life. • For each asset fleet there is a set level of tolerable risk and the forecast timing for intervention is set for when the risk exceeds the level of tolerable risk. • Intervention to lower the risk of each asset exceeding the tolerance is considered through multiple lenses including the resilience of the asset to anticipated weather and natural disaster effects and where there are lifecycle benefits to be realised by the solution includes these elements.

Question 2: Are there specific events or metrics that can be forecast and then observed that indicate that a step change in expenditure is required or an alternate scenario is playing out?

The envelope captures variability

10. Unison's forecasts result in a range of scenarios that relate to the likely uptake of DER including EVs. For example, the EV uptake variables include: the timing, the rate, the kW demand, and the concentration. Hosting capacity can then be compared to demand.
11. If a trend moves faster than the scenarios, it will create an urgent need to rectify a network constraint. Flexibility is a useful tool and may act as a buffer to enable reinforcement of the network. The rate of change may exceed the limits of the flexibility service before there is time to reinforce the network.

Targeted proactive reinforcement

12. Reinforcement of the LV network is expected to be required first in affluent suburbs. Suburban and regional differences are expected, and independent consultant advice will assist to validate forecasts. As network design has advanced over decades, each suburb has varying levels of constraints to consider. Currently, a substantial part of the decarbonisation spend over the period 2022 – 2050 is expected to be on upgrading LV circuits. Visibility (discussed below) will inform priority.

Proactive investment will achieve cost stability and minimise risks

13. The intention is that scenario planning will enable agile decision-making and minimise the need for step changes in expenditure. Exceptions to this will include:
- a) Government policy interventions accelerating the uptake curve (as evidenced by the uptake of solar in Australia);
 - b) unpredictable advancements in technology; and
 - c) increasingly onerous regulatory requirements that absorb considerable opex (i.e. divergence from GAAP⁸).
14. Overall, proactive network response will assist to provide stability in the total required amount and minimise the risks of exceeding hosting capacity. In a reactive scenario, opex increases to implement temporary solutions as assets decline. Given the stage forecasting is at (in advance of publishing the Regulatory Asset Management Plan (RAMP) 2023 - 2033), more certainty is being sought on the triggers points to prudently respond to hosting capacity constraints.

Opex is increasing

15. Unison's 11 July 2022 submission discussed that the IMs do not provide reasonable allowances to meet consumers' current and future needs.⁹ While the IRIS mechanisms served a purpose in a steady state environment, the expected step change in distribution investment requires a fit-for-purpose regulatory response that maintains the integrity of the Part 4 purpose.¹⁰
16. Unison's submission highlighted that the forecasting approach to opex allowances is particularly problematic because it is anchored in the past. As functions for EDBs broaden and there is more clarity of demand, additional resourcing is required to facilitate growth and respond to the evolving market (including progressing research and development, innovations, and analysis of opex vs capex solutions). Metrics should be developed that do not equate line length and customer numbers to opex growth, alongside in-period adjustment mechanisms.
17. Non-network growth is an inevitable consequence of Unison's mature asset management practices (alongside prudent business planning) which has ensured it does not carry unproductive resourcing. More people are now required to navigate the industry change and make efficient business decisions (including considering opex vs capex solutions). Decarbonisation, decentralisation and digitalisation each come with additional resourcing needs and opex requirements. The value of those opex requirements is being worked through, noting considerable potential variability based on external factors.

⁸ Generally Accepted Accounting Practice.

⁹ Unison's submissions on the Commission's Process and Issues Framework Paper, pg 20 [49].

¹⁰ Commerce Act 1986.

Question 3: How are EDBs obtaining confidence that their proposed expenditure plan is the most effective and efficient solution for the forecast level of demand, resilience requirements, and reliability levels?

18. Investment is planned in Phases 1 and 2 to obtain and maintain a sophisticated understanding of the low voltage network (LV visibility). Monitoring will validate or disprove assumptions bolstering confidence in scenarios and the developed solutions, including non-network solutions. For example, significant assumptions are:
- a) The effect of New Zealand's predominant second-hand car market on EV uptake and an expectation that increased choice of second-hand EVs will drive increased demand from the late 2020s.
 - b) Increases in household demand are anticipated in more affluent areas first (consistent with Unison's monitoring of actual uptake of EVs to date).
 - c) Flexibility markets will utilise hot water ripple control.
19. To facilitate and participate in a flexibility market, Unison considers that full upgrades of all LV circuits will be required in DPP4 and DPP5. A substantial amount of forecast decarbonisation expenditure is allocated to that activity in Phase 2 (preparation and early mitigation). EDBs are also working together to standardise a collective understanding of the impact of EVs and solar on household demand. Solutions must be targeted because constraints on the network vary, depending on the decade of suburban development.
20. Future industrial and commercial loads rely on relationship management. Unison is facing unprecedented levels of interest in large-scale new connections and upgrades across all network regions, attributable to decarbonisation and economic growth.¹¹ The envelope scenarios reflect the certainty attached to a project (for example, the upper envelope scenario includes projects that have financial approval from the customer's board). Large customer loads require network upgrades, including for industrial process heat conversions (upgrades in zone sub capacity and 33kV and 11kV networks) and additional maintenance (opex) requirements flow from that rapid growth.
21. Supporting Unison's scenario planning are the demand forecasts that exist in the public domain, such as Transpower's Whakamana i Te Mauri Hiko¹², Boston Consulting Group's The Future is Electric,¹³ and EECA's New Zealand Energy Scenarios Times-NZ 2.0.¹⁴ Unison has also researched factors that have led to increased uptake rates in other countries.
22. Scenario planning therefore supports a phased approach that prioritises investment by understanding performance, constraints and demand on the network; and continues best practice asset management. This will enable smartly targeted and responsive growth investment that upgrades hosting capacity in direct correlation to known or validated future need. Deferral of that investment will push that cost to the future adding temporary opex cost to the total required expenditure.

¹¹ Annual Report 2022, pg 20.

¹² [Transpower releases its latest Whakamana i Te Mauri Hiko monitoring report | Transpower](#)

¹³ [the-future-is-electric-full-report-2022.pdf \(bcg.com\)](#)

¹⁴ [New Zealand Energy Scenarios TIMES-NZ 2.0 | EECA.](#)

Deliverability

23. Unison Contracting Services Limited (UCSL) provides electrical, civil and vegetation management contracting services, including a 24/7 fault response. UCSL's strategic workforce plan has adopted a longer-term view of workforce planning and development, as well as focusing on operational excellence to minimise impacts to affordability. The challenges of resourcing during and post-Covid are significant. Unison's 2023 – 2032 RAMP¹⁵ sets out the external deliverability challenges adding to a constrained labour market. This has put pressure on UCSL's ability to deliver the annual works programme.
24. In response to Unison's future network investment strategy, UCSL has developed a plan to increase workforce capability to meet forecast programmes of work. This will reduce reliance on subcontractors (due to unreliability). UCSL is continuing to build its comprehensive training pathway programme provided by Unison's Centre of Excellence in Hawke's Bay.¹⁶ Solutions are being considered that mitigate recruitment challenges. Proactive renewal in phases 1 and 2 attempts to mitigate future trade-offs by creating headroom for increasing decarbonisation activities in later periods.¹⁷
25. Deliverability analysis supports significant increases in UCSL's internal capability over the next five years. Non-recruitment solutions to address workforce capability issues will also be progressed including process and system improvements, innovative plant and equipment, and advanced technology.

Forecasting and the s 52N permissive considerations

26. A final point is the relevance of s 52N of the Climate Change Response Act 2002 (CCRA) to the Commission's IM Review and DPP reset deliberations. When considering forecasting inputs, it is unreasonable to move away from the fundamental driver to the anticipated rate of growth in electricity demand - the 2050 target.¹⁸
27. The Commission explains its position in its 13 October, 2022 Framework Paper that "we may take into account the permissive considerations under s 52N of the CCRA, but only where doing so is consistent with promoting the section 52A purpose of the Part 4".¹⁹
28. Unison's answers to these forecasting questions reflect the path to the 2050 target. It incorporates real-world scenarios which reflect different rates of electrification uptake. It is not a question of whether electrification occurs; but at what rate, where and when. Success is a synergistic flexible network that can host significant increases in demand.
29. Fundamentally, forecasting attempts to minimise inefficient and unreliable energy outcomes in DPP4 and DPP5 (and further into the future), consistent with s 52A(a) and (b), and s 54Q

¹⁵ 9.2.5 Deliverability of the AWP.

¹⁶ Annual Report 2022, pg 32: *This programme, coupled with the Group's investment in targeted leadership development training for future leaders within the business, continues to ensure UCSL attracts and retrains a capable workforce.*

¹⁷ Acknowledging that is not achievable in a scenario that includes aggressive uptake, which would result in deferred renewal supplemented by sub-optimal opex intervention to extend asset life (until that capex solution is able to be implemented). Other lower risk opex work would also be deferred to address decarbonisation activities.

¹⁸ Section 52N refers to the permissive considerations of the emission budget and emissions reduction plan in addition to the 2050 target.

¹⁹ Commerce Commission, Part 4 Input Methodologies Review, Framework Paper, 13 October 2022, [2.42], pg 22.

of the Commerce Act. Without adequate expenditure allowances, and with the risk of penalties for doing so (clear disincentives), EDBs will not be adequately incentivised to:

- (a) innovate and invest in the replacement, upgrade and construction of new assets;²⁰
- (b) improve efficiency and provide services at a quality that reflects consumer demands;²¹
- (c) invest in demand side management;²² and
- (d) reduce energy losses²³ and manage reactive power flows.²⁴

30. The upshot is that, by failing to take into account the 2050 target,²⁵ the Commission may, perversely, inhibit New Zealand's ability to reduce emissions, and actively disincentivise demonstrably necessary investment, ultimately at a significant economic and societal cost to the consumer. There is no identifiable inconsistency between the Part 4 purpose and the s 5ZN permissive considerations. In fact, inconsistency with the Part 4 purpose is only demonstrated by the consequences of failing to take the 2050 target into account.

Ngā mihi

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²⁰ Section 52A(a).

²¹ Section 52A(b).

²² Section 54Q: Defined in the IM Determination as: *in relation to expenditure, expenditure on assets or operational expenditure where the primary driver is to improve the efficient provision of electricity line services by-*

(a) improving energy efficiency, including by increasing the amount of energy services consumed or able to be consumed per unit of energy input;

(b) encouraging demand side management, including by managing consumers' rate or timing of electricity consumption; or

(c) implementing initiatives that reduce electricity losses;

(d) implementing initiatives that reduce reactive power flows in the network.

²³ For example, investing in better quality materials to reduce energy loss caused by historically used materials.

²⁴ Section 54Q.

²⁵ Section 5ZN, CCRA includes the considerations individually, such that a person or body exercising a public function, power or duty does not need to consider each listed matter.