



16 December 2022

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Dear Ben

Feedback – Expenditure forecasting by electricity distribution businesses and areas of focus for the 2025 default price-quality path

Introduction

1. Orion appreciates the opportunity given to industry stakeholders by the Commerce Commission (the Commission) seeking feedback on EDBs expenditure forecasting for the 2025 default price-quality path reset.
 - The Commission published the request for feedback on 15 November 2022¹. The purpose of the request is to enable the Commission to *“have sufficient confidence in the robustness of EDB forecasts to be able to use them for the DPP reset, recognising that EDBs might have an incentive to inflate costs and variations in quality and content of AMPs and in planning assumptions may mean it is not relatively low-cost to undertake detailed scrutiny of AMPs”*.

¹ https://comcom.govt.nz/_data/assets/pdf_file/0031/298057/Request-for-feedback-Expenditure-forecasting-by-electricity-distribution-businesses-and-areas-of-focus-for-the-2025-default-price-quality-path-reset-15-November-2022.pdf

- Orion also notes that the Commission is *“seeking feedback in advance of the 2023 AMPs as we are looking to be better informed on some key challenges facing EDBs and better understand the extent to which the AMPs will reflect the scale of expenditure uplift indicated in some submissions”*.

Summary

2. We have reviewed the request which was published on the Commerce Commission’s website.
3. This submission provides insights into our forecast expenditure when preparing our 2023 AMP.

Other Feedback

4. In principle, Orion supports the Electricity Network’s Association’s submission.

Purpose of Part 4 of the Act

5. *“The purpose of this Part is to promote the long-term benefit of consumers in markets where there is little or no competition by promoting outcomes that are consistent with outcomes produced in competitive markets such that suppliers of regulated goods or services”*.²
6. The industry is facing a number of challenges around increased expenditure relating to decarbonisation and security in the coming years. The Commission needs to ensure that regulated businesses requirements are met while aligning with the long-term benefit of consumers.

Feedback on expenditure forecasting

7. The Commission requested feedback on specific areas in Attachment A of the letter.
8. The following is Orion’s response to these questions.

Confidence in forecast requirements

Primary question	How are EDBs obtaining confidence in establishing the requirements they are forecasting to meet, including but not limited to demand, resilience, and reliability?
Answer	Orion has forecast demand, resilience and reliability based on industry research. Our network development approach and asset lifecycle management approaches are detailed on pages 91 and 92 of our Asset Management Plan ⁶ .

² Section 52A <https://www.legislation.govt.nz/act/public/1986/0005/latest/whole.html#DLM1685404>

When **planning our network**, we:

- apply our High Voltage (HV) Security of Supply Standard, which is the ability of our network to meet the demand for energy when electrical equipment fails or is damaged
- monitor our network utilisation thresholds to prepare an annual network reinforcement programme
- compare our current network capacity with load forecast scenarios and develop projects to address capacity limitations as they arise
- carry out robust inspection programmes. In particular, our approach for overhead poles has been reviewed and enhanced, and we have adopted drone technology.

The table below shows areas which Orion has identified as constraints where we may consider non-network alternatives:

Table 7.4.21 Distributed Energy Resources Management capacity for non-network alternatives

No.	Project description	Season	Year	Base constraint (kW)	Growth per year (kW)
1070	Norwood 66/11kV zone substation	Summer	FY25	4,500	–
639	Burnham 66/11kV zone substation	All	FY25	4,500	300
919	Halswell ZS 3rd transformer and 11kV switchgear	Winter	FY26	–	1,500
1524	Halswell area 11kV reinforcement	Summer	FY26	–	750
842	Greenpark 33/11kV zone substation				
1080	Springston to Lincoln ZS 66kV line reconductor				
1084	Edward St to Greenpark 33kV cable				

We use the following flow diagram to assess needs and workstreams in preparing for a net-zero network.



We signal projects in our AMP where we look to support the development of non-network alternatives, including flexibility markets through Distributed Energy Resource Management³. This discovery process identifies new capability to forecast flexible solutions to ensure lowest cost to consumer, including through collaborative innovation and looking at options for flexibility services (our first tender in an area of high demand growth is currently in the market which will be implemented if successful). We have also looked at “self-healing networks” through automation to make our networks more resilient to events.

Examples of external research we have used is:

- The Boston Consulting Group Report⁴ which aligns with our forecast demand
- DETAs on MW – process heat (Demand)
- The impacts of Distributed Generation⁶ and EV hosting capacity⁷ on Orion’s low voltage network

³ Page 156, https://www.oriongroup.co.nz/assets/Orion_AMP2022-web.pdf

⁴ <https://web-assets.bcg.com/b3/79/19665b7f40c8ba52d5b372cf7e6c/the-future-is-electric-full-report-october-2022.pdf>

⁵ <https://carbon.deta.global/nz-process-heat-pt1>

⁶ <https://www.canterbury.ac.nz/epecentre/research-and-innovation/publications/green-grid/posters/content-blocks-for-posters/DGHost-Poster-June-2019.pdf>

⁷ https://www.canterbury.ac.nz/media/documents/epecentre/UC-EPEC-21-C-SJM-01-Orion_EV_Hosting_Capacity_EEA_Paper_2021-112-179-McNab-Sharee.pdf

- Exposure of poles to ground water from climate change on exposed coastline areas (climate and resilience). See the research on environmental justice on sea level rise and storm tides in New Zealand from the University of Canterbury⁸
- NIWA climate modelling aligned with Representative Concentration Pathway (RCP) scenarios on weather most related to network outages, in both coastal and inland areas.

Collaborative innovation is part of our DNA, as this will be critical to ensure a whole of system cost effective approach to meeting our customers' needs as the energy system evolves rapidly over the coming years.

We actively collaborate with others to understand and enable the energy transition in forming our views for future expenditure, including:

- leading work in our region on the South Island Boiler Study (to understand boiler users decarbonisation plans and how we might support these – with DETA)
- collaborating with EDBs to seek cost effective solutions (including through the ENA's Smart Technology Working Group);
- driving cross-sector collaborative innovation as a founding member of the FlexForum, and
- maintaining a strong focus on equity and hardship including as a member of the cross-sector Energy Wellbeing Evaluation Consortium.

We have also established the Orion Energy Accelerator (now in its 2nd year) and partnered on the 'EDB Challenge' programme with peers and Are Ake.⁹

We also seek ways to mitigate uncertainty through the following activities:

- Demand and distributed generation – we are adopting a managed release approach to augmenting and optimising capacity for electrification. This avoids unnecessary investment, but also creates some risk given the uncertainties we face on future demand and tipping points for matters such as DER, utility scale solar and urban intensification of infill housing

⁸ <https://ir.canterbury.ac.nz/handle/10092/2649>

⁹ <https://www.orionaccelerator.nz/>

- The installation of low voltage monitoring and eventual acquisition of customer smart meter data to enable a greater understanding of customer behaviour and network performance.

This includes the development of:

- more mature future energy scenarios (in collaboration with local consumers and stakeholders)
- improved demand modelling capability (incl LV)
- improved understanding of LV network capacity and hence current / potential constraints under different scenarios.

We have partnered with subject matter experts to **explore the impact of future climatic changes** on our network, which in turn enables us to identify where additional expenditure to improve resilience may be required. By way of example,

- NIWA used 10 years of outage data to produce a model of how changes in weather conditions in different RCP scenarios will affect our network. This allows us to forecast expenditure to improve resilience on our overhead network in lee zone areas, which will be affected by wind
- The University of Canterbury, in conjunction with the Christchurch City Council, have mapped the impact of sea level rise in different RCP scenarios on coastal communities around Christchurch and the Banks Peninsula. We will use this information to review maintenance and renewal strategies for assets that may be affected in the coming years.

We have also developed an **Innovation Pipeline process** to enable a prioritised approach to understanding and addressing key uncertainties facing our network (particularly in respect of investment decision making and drivers including evolving consumer needs and expectations, and emerging challenges and opportunities through technology, market, and other drivers of change). In 2023, we will publish our first Innovation Strategy, providing our stakeholders with visibility of our approach, and supporting further engagement and collaboration.

<p>Additional questions to help frame responses</p> <p>Answer:</p>	<ul style="list-style-type: none"> • Are EDBs intending to change the inputs used in forecasting expenditure given key drivers of forecasts may have changed –particularly in the following areas: <p>Orion has revised the inputs we use to recognise the change in our environment and the impact on this toward good forecasting. Our network transformation teams look at future network and systems requirements including:</p> <ul style="list-style-type: none"> • Connection growth (e.g., new connections from development of green fields and brown fields sites). We recognise that these have traditionally been under-forecast and that reliance on council’s expectations in respect of the influx of infill housing and the cost of brownfields compared to green fields development has not been sufficient • Utility scale solar generation • Large capacity growth, (e.g., decarbonisation, industrial growth) to support the energy transition and expand capacity around their energy strategy. We are also proactively looking to work with consumers to verify this growth. DETA has done work on decarbonisation by process heat, and we have accounted for this • Incremental demand growth (e.g., EVs, residential, technology and loss of control of hot water through ripple to accommodate other participants in flexibility services) • we front foot legislative changes and manifest how it will impact costs as they occur (infill housing and the GIDI fund which could result in increased activity). <ul style="list-style-type: none"> • With a potentially increased need for resilience-related investment, what are the key inputs for EDB resilience forecasting? <p>Some key inputs Orion has identified are:</p> <ul style="list-style-type: none"> • Community climate adaptation (for example managed retreat or changing resilience needs for the community). Network adaptation to physical and transitional impacts, including sea level rise, flooding and changes to wind and temperature. Refer to the response above on resilience investigations for more
<p>Answer:</p>	

<p>Answer:</p>	<p>detail</p> <ul style="list-style-type: none"> • Design standards-revisiting standards for overhead design • Better input data on weather and high fire risk in fire season for automatic switching on circuit breakers may in time provide clues for different asset management solutions in some areas of the network. <ul style="list-style-type: none"> • What forms of assurance will EDBs use (e.g., external verification) to provide confidence in forecasts, particularly where new forecasting inputs are used? <ul style="list-style-type: none"> • Refer to our response to the primary question regarding DETA, Boston Consulting Group report, innovative collaboration and consultants. <p>Our AMP, Page 113 outlines our Energy Transformation and Climate Change approach:</p> <p><i>“In the future, it is anticipated electricity networks will undergo major changes in consumer energy usage habits due to increased customer choice and the impact of climate change. At a national level, Transpower has produced their Te Mauri Hiko – Energy Futures long-term vision of future electricity use. The focus of this vision is the 20–50-year range as opposed to our 5–10-year planning horizon. Being at a national level it is difficult to translate this into the projected impact on our network. We will however use their underlying information where it provides a forecast that better matches observed changes compared with other projections”.</i></p>
<p>Why we are asking this question (Relation to regime)</p>	<p><i>DPP reset</i></p> <ul style="list-style-type: none"> • We better understand what forms of assurance may be available to support EDB forecasts • We have improved visibility on categories of expenditure where we may be able to obtain confidence in EDBs’ approaches in a relatively low-cost manner • We are better informed on potential forecasting inputs we could use <p><i>Performance Analysis</i></p> <ul style="list-style-type: none"> • We are better informed of where our summary & analysis work may assist EDB practice

Step changes and scenarios

Primary question	<p>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?</p> <p>Orion is working towards developing a set of future energy scenarios for use in planning for long term changes due to decarbonisation.</p> <p>There are events which can be forecast with some level of certainty such as:</p> <ul style="list-style-type: none">• impacts of legislative changes and government incentives like the GIDI fund• EV subsidies and the uptake of new technologies• emerging work under the Climate Change Response Act that may inform impacts on our infrastructure and the need for investment. <p>The impacts and response will be developed with the involvement of local stakeholders and communities as part of developing local area planning for regional decarbonisation.</p> <p>We are also establishing a new demand modelling approach that will allow for more granular levels of assumptions about the different forecast areas, allowing us to test multiple inputs in scenarios. This will integrate with the network development planning for future AMPs.</p> <p>Orion is undertaking gap analysis of our data and digitisation platforms and controls to support capability of these changes and look at asset lifecycle management to develop our digitisation roadmap. This will result in a step change in expenditure in this space.</p>
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<p>Additional questions to help frame responses</p>	<p>i. What forms of information do EDBs use to build scenarios on the different forecast areas?</p> <p>Refer to the first set of questions on “Confidence in forecast requirements”. We have also reviewed our internal organisational structure and capability to support the strategic work required to build scenarios in our Energy Futures and Future network teams.</p> <ul style="list-style-type: none"> • We also consider new legislation requirements, such as traffic management, safety, etc. when forecasting scenarios • Orion uses external research which has already been undertaken by industry participants • Our internal future networks team develops scenarios and identifies opportunities for future proofing Orion’s network. <p>ii. What are the underlying drivers where EDBs are forecasting a potential significant step change in expenditure requirements compared to previous levels?</p> <ul style="list-style-type: none"> • Assessing existing asset conditions and future replacement requirements including drivers such as current inflation rates and supply chain constraints which has resulted in increases in expenditure • A drive for efficiency and better customer service through data and digitisation solutions such as a customer relationship management platform • Reviewing business risk drivers such as cybersecurity in respect of software and hardware replacements which may both substitute capex for opex solutions and drive capex and opex more generally until the efficiency is realised • Assessed the potential loss of control over demand management via ripple control to other industry participants and the investment impact it may have to accommodate larger capacity needs on the network • The locational impact of the Medium Density Residential Standard (MDRS)¹⁰ on the low and medium voltage networks. <p>iii. Are there trigger points where increased certainty on level of spend required may be obtained?</p>
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¹⁰ <https://environment.govt.nz/assets/publications/Files/Medium-Density-Residential-Standards-A-guide-for-territorial-authorities-July-2022.pdf>

	<ul style="list-style-type: none"> • We have developed scenarios for our AMP which considers where step changes may happen, and the additional investment required based on capacity which will need to be built. Trigger points that create certainty can include significant committed industrial load, utility scale DER or subdivision development, trended changes in consumption profiles, monitoring of new loads like EVs and process heat. <p>iv. What are the key dependencies or risks EDBs have identified which may impact forecast scenarios?</p> <ul style="list-style-type: none"> • Historically, Orion has spent their allowances set by the Commission and been granted a high level of confidence in our forecasting when setting DPP3. <p>We consider that key dependencies to include:</p> <ul style="list-style-type: none"> • Decarbonisation (government legislation) • Consumer uptake of new technologies • Alternative solutions which are rapidly evolving in the electricity sector • Maintaining and increasing resilience to mitigate against climate change • Growth projections of residential and industrial connections. <ul style="list-style-type: none"> • Orion also looks at resourcing requirements (internal and external) as part of assessing the projects which we intend to complete over the DPP period in order to support deliverability. <p>v. Do EDBs consider that the expenditure required to address different scenarios may usefully follow proxies or will these be disjointed and network characteristic and network design specific increases?</p> <ul style="list-style-type: none"> • No, various EDBs have different challenges. Each network will experience different drivers of expenditure and timing dependent on their geographic, demographic and customer type mixes along with consideration of historical design standards and resultant latent capacity headroom. <p>vi. What is the sensitivity of the expenditure plan to out-turn differences in requirements like incremental demand growth, resilience, decarbonisation, and connection growth?</p>
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	<ul style="list-style-type: none"> • We assess the sensitivity based on various alternatives available to consumers when they decide on electrification. An example of this is demand growth and decarbonisation when assessing process heat conversions from traditional fuel sources. DETA has undertaken research which looks at Biomass conversions to electricity as a fuel of choice • We use Council data to support our forecasts to mitigate uncertainty. When setting DPP3, we forecast a drop off of new connections over the five-year period. Orion's AMP 2019¹¹ AMP forecast (Schedule 12c (i)), 4,000 new consumer connections for RY22. We have seen consistent strong growth in Canterbury post Covid and reported 6,012 in our IDs¹² for RY22, 50% above forecast growth. Economic conditions such as low interest rates, population movement south and an unforeseen escalation of infill housing have all contributed • We envisage large local decarbonisation/expansion developments with infrastructure such as the airport¹³ and port which will drive a need for expenditure with the uptake of load and large scale DER within these locations • Our contractors are in the process of reviewing our overhead design standard to ensure the network is robust and can withstand recurring severe weather storms to ensure they are resilient. The review will also look at scenarios to assess the design to ensure the network can handle future peak demands.
Why we are asking this question (Relation to regime)	<p><i>DPP reset</i></p> <ul style="list-style-type: none"> • We are better informed on potential forecasting inputs we could use • We have improved visibility on categories of expenditure where EDBs have higher and lower levels of confidence in the robustness of their forecasting <p><i>Performance Analysis</i></p> <ul style="list-style-type: none"> • We are better informed of where our summary & analysis work may provide insights on potential step changes or alternate scenarios.

¹¹ <https://www.oriongroup.co.nz/assets/Company/Corporate-publications/Orion-AMP-FINAL-2019.pdf>

¹² <https://www.oriongroup.co.nz/assets/Company/Regulatory-Disclosures/FY22-ID-partial-final-version-for-website.pdf>

¹³ <https://www.christchurchairport.co.nz/about-us/sustainability/kowhai-park/>

Confidence in expenditure plan

Primary question	<p>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?</p> <p>Orion takes the following steps in preparation of forecasting expenditure:</p> <ul style="list-style-type: none"> • External research reports undertaken by reputable consultants such as DETA and the Boston Consulting Group • Collaboration with peers, customers, and the community • Internal teams apply scrutiny, test assumptions and challenge for alternative solutions. Orion also undertakes trials to test possible alternatives. Our business case template takes into consideration flexibility services to ensure we test alternatives to drive efficiency and explore future solutions. We envisage that this will help stimulate the marketplace for flexibility services • Deliverability and unit cost reviews • Financial and regulatory analysis and review of economic indicators such as inflation and other indicators outside of Orion's control • Senior leadership and board scrutiny.
Additional questions to help frame responses	<p>i. In which categories of expenditure do EDBs have greater levels of confidence than others?</p> <ul style="list-style-type: none"> • Expenditure such as asset renewals and replacement, and network planning for incremental system growth and resilience can be given a higher level of confidence • Future timing of climate adaptation impact and customer driven expenditure is less certain. <p>ii. Where new sources of uncertainty exist related to potential increases in expenditure requirements, is there a particular driver of the uncertainty?</p> <p>There are several drivers of uncertainty:</p> <ul style="list-style-type: none"> • Customer uptake in new technologies such as EV and smart appliances • Decarbonisation plans with respect to fuel choice, • Immigration (increase in demand for housing) • Flexibility markets and the impact on hot water control which

	<p>has the potential to drive significant capex investment if not managed well or markets don't eventuate</p> <ul style="list-style-type: none"> • Capex versus Opex substitution and funding flexibility. Opex will likely increase due to alternative solutions, outsourcing and interim solutions before deciding on a longer-term capex option • Community specific adaptation and resilience needs due to climate change • The locational impact of the Medium Density Residential Standard (MDRS)¹⁴ on the low and medium voltage networks. <p>iii. How are EDBs accounting for the uncertainty of timing of when non-network solutions may become available or viable (due to technological developments or scale) and able to defer network investment requirements?</p> <ul style="list-style-type: none"> • The further out we forecast the more uncertain the outcomes may be. AMPs become more robust as we get more information, the certainties become more reliable Note that the FY25 AMP will provide the most up to date information for setting allowances • We also look at work in respect of our innovation strategy and pipeline. This pipeline work can support our AMP planning assumptions and de-risk future solutions. <p>iv. What forms of assurance do EDBs use, including external verification / challenge to provide confidence in the appropriateness of expenditure plans?</p> <ul style="list-style-type: none"> • See above
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¹⁴ <https://environment.govt.nz/assets/publications/Files/Medium-Density-Residential-Standards-A-guide-for-territorial-authorities-July-2022.pdf>

Why we are asking this question (Relation to regime)	<p><i>DPP reset</i></p> <ul style="list-style-type: none">• We want to improve our understanding of what forms of assurance EDBs use to support EDB forecasts, including understanding the various approaches EDBs use to gain confidence in their expenditure plans• We have improved visibility of which categories of expenditure EDBs have greater confidence in within their expenditure plans. <p><i>Performance Analysis</i></p> <ul style="list-style-type: none">• We are better informed and understand the rigour that goes into finalising AMP expenditure forecast• We can target and trend expenditure in areas of lower confidence
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Deliverability

<p>Primary question</p>	<p>How are EDBs getting confidence that their expenditure plans are deliverable, particularly if they involve a significant increase from historic levels?</p> <p>We have a long history and proven experience in delivering and forecasting 10-year AMPs to the Commerce Commission. In the DPP3 decision we received 97% opex forecast and 100% capex forecast while stepping off a CPP period. We also have long standing relationships with key service providers and suppliers of materials and hence, can usually forecast medium term increases and resourcing of material supply and skilled labour.</p> <p>However, we acknowledge that capability and quantity of that will be challenging moving forward as our sector competes nationally and internationally for resources to deliver decarbonisation. To support the future outlook, we look at how we can improve efficiency through modern operating and procurement practices for network service and supply such as non-network solutions/demand management/flexibility and construction. We are deliberate in supporting training and competency pipelines. We are also assessing and reassessing our processes and systems to prevent any roadblocks or bottlenecks in our work programme.</p>
<p>Additional questions to help frame responses</p>	<p>i. How are EDB forecasts accounting for availability of materials and skilled staff to deliver programmes of work if there are significant increases in expenditure forecasted?</p> <ul style="list-style-type: none"> • Over the past three years we have experienced unprecedented economic turmoil which would have been difficult to predict • While current market conditions indicate that we will continue to see constraints in material cost and delivery we have factored these into our short-term forecasts • We are seeing some slight relief in availability of local materials as we move into a new normal with COVID restrictions being lifted and these will be accounted for in our cost and time driver considerations when reviewing the deliverability of our AMP • New Zealand is currently experiencing a shortage of skilled workers due to immigration restrictions and a fluid labour market. We expect this to be a short-term constraint and are

	<p>actively completing operational workforce planning for positions. In addition, a strategic workforce plan for skills and capabilities is underway</p> <ul style="list-style-type: none"> • Further to the above, we are introducing significant improvements in people related technology systems, which should provide us a reduction in cost, time, and materials longer term. <p>ii. What are the trade-offs between asset renewal / replacement and significant new connection work that EDBs make in forecasting, particularly where a step change in expenditure is forecasted?</p> <ul style="list-style-type: none"> • We are not deferring necessary renewal or replacement work at the expense of new connection work i.e., we continue to deliver both workstreams • Orion maintains close relations with service providers to ensure flexibility and to accommodate our dynamic environment. In recent times we have engaged with some of our smaller (tier2) providers who have been awarded work to deliver some of our new connection work. <p>iii. How do EDBs assess achievability of delivery under different scenarios and forecasts?</p> <ul style="list-style-type: none"> • Orion reviews our various resource pools and considers whether we are able to deliver our projects within this capability. We also seek feedback from our service providers and look at our internal capability to deliver on projects.
Why we are asking this question (Relation to regime)	<p><i>DPP reset</i></p> <ul style="list-style-type: none"> • We better understand how EDBs will develop confidence in their delivery plans • We are better informed on how we could address key risks that forecasts are inflated, and plans are not deliverable <p><i>Performance Analysis</i></p> <ul style="list-style-type: none"> • We are better informed and understand the rigor that goes into ensuring the plans are deliverable to achieve the project outcomes stated within the Asset Management Plans

Concluding Remarks

Thank you for the opportunity to provide feedback. I do not consider any part of this feedback as confidential.

If you have any questions or queries or aspects of the submission which you would like to discuss, please email [REDACTED].

Yours sincerely

Rob Tweedie
Regulatory Manager