Electra | ALWAYS THERE, FOR YOU

ASSET MANAGEMENT PLAN

ADDENDUM

CONTENTS

PURPOSE STATEMENT

Electra Limited is a supplier of electricity distribution services and is regulated under Part 4 of the Commerce Act 1986. We are subject to information disclosure regulations administered by the Commerce Commission. In November 2022, the Commission introduced new reporting requirements to the asset management plans by introducing clauses 17.1-17.6 of Attachment A of the *Electricity Distribution Information Disclosure Determination 2012, consolidating the principal determination and all amendments as of 18 May 2023* (the ID Determination).

We are pleased to disclose the information as prescribed by the Commission publicly. For this disclosure year, we have chosen to publicly disclose the information as a separate document to our 2023-2033 Asset Management Plan (AMP), i.e., as an addendum.[1]

Who is Electra

Electra Limited (Electra) is the electricity network owner and operator in the Kāpiti and Horowhenua regions on the west coast of the lower North Island, New Zealand. Our network stretches from Foxton and Tokomaru in the north to Paekākāriki in the south. We are one of 29 network companies in New Zealand and the 9th largest network by connections.

We are owned by the community that we serve

The Electra Trust owns us, meaning we are wholly owned by the community we serve and in 2023, we served over 46,300 beneficiaries (consumers).

What information is available in this addendum

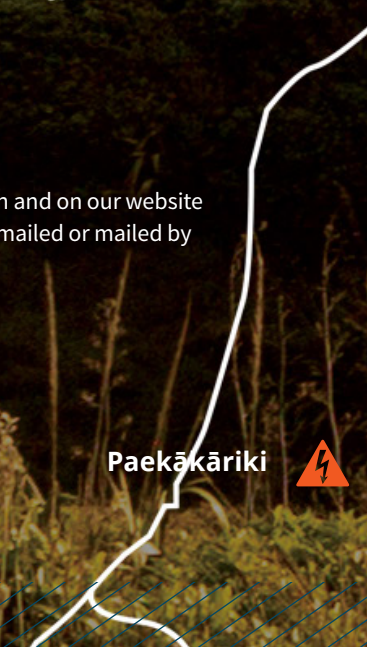
This addendum to our AMP is broken into six sections:

1. Notice of planned and unplanned interruptions—clause 17.1 describes our customer notice and communication protocols for planned and unplanned interruptions.
2. Voltage quality—clause 17.2 describes our practices for monitoring voltage quality on our low voltage networks, including how we respond, report voltage quality issues, and communicate with affected customers.
3. Customer service practices—clause 17.3 describes our customer engagement protocols, customer services measures, and our approach to planning and managing customer complaints.
4. Practices for connecting new consumers and altering existing connections—clause 17.4 describes how we connect new customers to our network and manage connection changes, including extensions and requests for increases in connected capacity.
5. New connections likely to significantly impact network operations or asset management priorities—clause 17.5 describes our capability and risk management practices for demand, generation, and storage that we c onsider likely to impact our network operations or asset management priorities significantly.
6. Innovation practices—clause 17.6 describes what innovation practices we have undertaken and plan to undertake since the publication of our 2022/2032 AMP Update in March 2022.

A compliance matrix demonstrating our compliance with clauses 17.1-17.6 of the ID Determination is included in Appendix A.

Where can you get a copy of this addendum

Copies of this addendum are available at our Levin head office, on the corner of Bristol and Exeter Streets, Levin and on our website at www.electra.co.nz. Interested persons can drop into our office during business hours or request a copy be emailed or mailed by contacting us through our Contact Form on our website or calling us at 0800 353 2872.



[1] As per clause 2.6(4)(b


Substations
Hydro Stations
Planned Substations
Grid Exits
Electra Office/Depot
Foxton Beach
Foxton
Tokomaru
Shannon
Waitārere Beach
Hōkio Beach
Mangahao
Kuku Beach
Levin
Ohau Beach
Waikawa Beach
Manakau
Ōtaki Beach
Ōtaki
Te Horo Beach
Te Horo
Peka Peka
Waikanae Beach
Waikanae
Paraparaumu Beach
Otaihanga
Reikorangi
Paraparaumu
Raumati

1. NOTICE OF PLANNED AND UNPLANNED INTERRUPTIONS

We cannot guarantee electricity supply as to do so is cost prohibitive. There will be times when our electricity distribution services are interrupted. Interruptions are classified into two types:

- Planned — is an interruption on our network that we initiated, and at least 24 hours' notice was given of the impending interruption to the public or all customers affected by the interruption; and
- Unplanned — is an interruption on our network for which no notice was given to the public or the customers affected by the interruption.

Keeping our customers informed of interruptions to their services is important to us. We have systems to inform customers when we intend to have a planned interruption to do scheduled work on our network and when services are interrupted without warning, and an unplanned interruption occurs. The communications for planned and unplanned interruptions are different, and we outline our approach below.

1.1 Planned service interruptions

We have, on average, 170 planned interruptions on our network each year. We have planned interruptions to maintain and grow our network and keep the public and service teams safe.

Planned interruptions form part of our life cycle assessment management practices. To the extent practicable, the duration and frequency of planned interruptions are kept to a minimum through good work planning. When a planned interruption is necessary, we post information about the planned interruption, including; date and time, location, cause, and intended restoration date and time on our website and Electra Outage App. We give consumers at least four days before the intended interruption as required by our default distributor agreement (the DDA), and we notify the retailers of the details of the planned interruption on our network as prescribed by the EIEP5A[2] protocols.

Our assets can be situated on private property. When we need access to private property to carry out planned work, we contact the property owner directly and seek permission to enter their property. Often the property owner and customer are the same, and we then notify the customer of the details of the planned interruption at the same time. Where this is not the case, or the planned outage impacts multiple customers, we post information about the planned interruption on our website and Electra Outage App and notify retailers as prescribed in the EIEP5A[2] protocols.

There are times when we need to cancel a planned interruption. Cancellations occur due to adverse weather on the intended day or an operational change that prevents us from doing the work as intended. We appreciate that customers prepare for interruptions to their supply, and as such, cancelling a planned interruption can be as, if not more, frustrating than the interruption occurring. Where possible, when we become aware of the need to cancel a planned interruption, we notify customers and retailers of the cancellation with at least 24 hours' notice.

1.2 Unplanned service interruptions

Sometimes, outside of our reasonable control, we have interruptions on our network that occur without warning. We have, on average, 250 unplanned interruptions on our network each year.

Unplanned interruptions cause inconvenience to our customers and are highly disruptive as soon as reasonably practicable. After first becoming aware of an unplanned service interruption, we post information about the unplanned interruption, including location, cause, and expected restoration date and time, on our website and Electra Outage App. As prescribed by the EIEP5B[3] protocols, we notify the retailers of the unplanned interruption on our network.

We update the details of the unplanned interruption as and when updated information becomes available. Once the supply is restored, we post a notice that the supply has been restored on our website and Electra Outage App and inform retailers. There may be circumstances where supply is not restored to all customers, and we do not have the viability of those individual customers. When posting a notice of restoration, we also invite customers to contact us if their power electricity supply has not been restored so that we can respond to those customers and restore the supply as soon as is reasonably practicable.

[2] Electricity Authority, Electricity Information Exchange Protocols (EIEP), EIEP5A: Planned service interruptions.
[3] Electricity Authority, Electricity Information Exchange Protocols (EIEP), EIEP5B: Unplanned service interruptions.

2. VOLTAGE QUALITY

Voltage quality refers to the features of electricity supply in terms of voltage level and stability. Voltage quality ensures electrical equipment and systems' reliable and safe operation and is typically measured and assessed based on the following parameters.

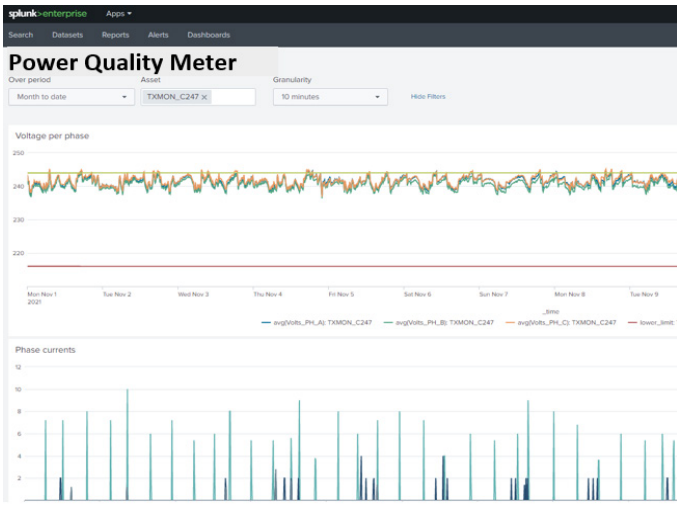
- Voltage level — the nominal voltage level provided by us is 240V to residential and standard commercial customers on our low voltage network and 11kV or 33kV to large commercial or industrial customers on our high voltage network.
- Voltage fluctuations — can occur where there is a variation in the supply voltage from a nominal level. Fluctuations can be categorised as short-term variations (e.g., voltage sags, swells, or interruptions) or long-term variations (e.g., voltage imbalances or flickers). Fluctuations affect the performance and lifespan of sensitive electrical equipment.
- Voltage stability — is the ability of the power system to maintain a steady voltage level under varying load conditions. Voltage instability can result in voltage fluctuations or even power outages.
- Harmonics — are unwanted electrical waveforms that are multiples of the fundamental frequency. Harmonics can be introduced onto our network by non-linear loads, such as electronic devices, and can cause voltage distortion. Harmonics can adversely affect equipment performance, leading to increased heat, decreased efficiency, and malfunctions.
- Voltage imbalance — occurs when the three phases of a three-phase power system are not equal. Unbalanced voltages can cause unequal power distribution among the phases, overheating, increased losses, and reduced equipment lifespan.
- Voltage flicker — refers to rapid, repetitive changes in voltage magnitude that can occur due to sudden changes in load demand. Flicker can affect the quality of lighting and the performance of sensitive equipment like computers or measurement instruments.

In New Zealand, voltage quality standards are set and regulated by the Electricity Industry Participation Code 2010 (the Code) and the New Zealand Electrical Code of Practice (NZECP). We use various measures such as voltage regulation, power factor correction, and harmonic filtering to improve quality and ensure the reliable operation of electrical systems to meet the requirements of the Code and NZECP.

2.1 We are developing and improving monitoring voltage quality on our low voltage network

In the last 12 months, we have installed 89 low-voltage power quality monitors (LVPQMs) on poles and ground-mounted distribution transformers. Over the coming disclosure year, we will install a further 90 devices. We selected the sites to install LVPQMs based on the load factor, criticality, location and the number of customers connected.

The LVPQMs provide detailed data regarding voltage, current, power, power factor and voltage harmonics, which are communicated via cellular communications to a cloud-based server and application software. The application includes a dashboard providing a holistic view of the voltage quality of the monitored sites. It also allows users to undertake detailed analyses on each monitored site.



We have also installed 11 kilovolts (kV) power quality monitors (HVPQMs) onto the 11kV bus at each of our ten zone substations. The HVPQMs provide detailed data on voltage, current, power, power factor and voltage harmonics, which are communicated via cellular communications to a cloud-based server and application software. These devices allow us to monitor our 11kV voltage plane accurately and in granular detail. Modelling software ensures that the optimum settings for the 11kV voltage plane and the off-line tap positions of the downstream distribution transformers are set.

A plethora of providers offer an extensive range of modelling and analysis tools. We have been heavily engaged with several of these and recognise the benefits these platforms may provide us, especially in terms of low voltage management and monitoring (given the inputs from our LVPQMs, our network impedance and connectivity model and smart meter power quality data).

We are preparing detailed specification requirements for analysis software/SaaS and will go to market with an RFI during the 2024 disclosure year. We will evaluate the various products/services, select the most appropriate and implement installation (if deemed cost-effective and appropriate etc.). Following implementation, we will develop processes for the ongoing monitoring of voltage quality using the platform and required remedial actions. Enter into contractual agreements to obtain smart meter consumption and power quality data for basic analysis using our data lab and resources. In addition, this data will be entered into the selected analysis platform. Over the short term, our plans are to:

- increase our LVPQMs until we see an optimum saturation of these devices, and
- install additional Rogowski coils to the LVPQMs allowing us to monitor each feeder phase and way rather than at a whole distribution transformer level.

2.2 Addressing known non-compliance with the applicable voltage requirements of the Electricity (Safety) Regulations 2010

We do not currently have any known non-compliance issues. We become aware of issues through our customer complaints process when issues arise. The LVPQMs (discussed above) give us visibility of what is happening at the distribution transformer but not at the customer's connection point. We do not have readily available information about what is happening at the customer's connection point as the meter equipment provider (MEP) holds this information, and we need permission from the customer retailers to attain this information.

We need power quality data from the MEP's smart meters to identify non-compliance. Using this data would then periodically analyse the power quality smart meter data, identify any non-compliant issues, and then commence remedial action. We have not, to date, had a voltage complaint that has led us to follow this process.

2.3 Responding to and reporting on voltage quality issues

Customers can report voltage issues to us by calling us at 0800 567 876, using our online form on our Contact Us link via our main webpage or our online form outage reporting webpage with a drop-down field for voltage complaints.

When we receive a voltage complaint, our administration team creates a job and issues that job to our fault team to investigate. The investigation requires a site visit and instantaneous voltage readings to be taken. The investigation may also involve installing a data logger to capture and better understand the magnitude and timings of the voltage quality issue. Our field staff will engage with our engineering team. Solutions range from replacement of faulty equipment, augmentation of required conductors or transformers, and adjustment of the off-line tap changer of the affected distribution transformer (followed by a period of continued data logging to ensure that the tap change has had the desired effect). We may install an LVPQM to the affected transformer to gain more data, or if a wider issue is identified, we may look to study and alter the 11kV voltage plane.

2.4 Working to improve voltage quality on our LV network to affected consumers?

We will notify customers affected by the work if a planned interruption is needed. The planned interruption notice will state that we are conducting planned maintenance and that the interruption is to facilitate work to improve voltage quality.

Often the work will be part of a new customer connection (say a small subdivision) where the planning assessment has identified that upstream augmentation is required to avoid a voltage quality issue.

3. CUSTOMER SERVICE PRACTICES

3.1 Our customers are at the centre of everything we do

We are a 100% trust-owned company; this means we are owned by the community we serve. For us, customer service practices are our strategies, policies, and procedures that support meeting customers' expectations. Our practices encompass the actions that we take to support and assist customer solutions to connect to our network and, once connected, to supply electricity distribution services at a price they expect to pay at the level of service they expect to receive. Our key customer service practices include the following:

1. **Prompt and respectful communications:** SECURELY™ provide us with call centre services, which ensures customers can reach us 24 hours a day, seven days a week, and 365 days a year. Customer service representatives manage our customer inquiries, concerns, and complaints, ensuring the customer is referred to the right person within Electra. Each month SECURELY™ provides us with reporting against key performance indicators for the responsiveness to a customer enquiry and statistics around the nature of the enquiries received. The Senior Leadership review and analyse these reports for continuous improvements that can be made to our systems to improve the customer experience.
2. **Active listening:** effective customer service requires us to listen to customers actively, understand their needs, and empathise with their concerns. This human approach helps us personalise the assistance and size of the solutions we provide to our customers.
3. **Patience and empathy:** our customers may be frustrated or upset when they contact us, especially if services have not met their expectations. Demonstrating patience and empathy is critical to maintaining a positive interaction. We strive to understand the customer's perspective and work towards finding a satisfactory resolution.
4. **Feedback and Improvement:** we encourage customers to provide us with their feedback. We actively seek ways to improve our customer service experience through our annual customer survey. Each year, we ask 300 residential and commercial customers, half of whom have had recent dealings with us, about their customer experience. Customers can provide feedback anytime by dropping into our Levin office between 8am – 5pm on weekdays, calling us on 0800 353 2872, or through the Contact Us page on our website.

3.2 Our customers are satisfied with our price-quality trade-offs

We have been running our customer survey since 2000. Our customer survey represents a broad cross-section of our customer base. We use the customer survey results to measure our strategy's effectiveness and inform our plans, such as forecast expenditure in our AMP, pricing plans, and communication approaches.

Our most recent customer survey was in November 2022. The survey results overall were very positive, with customer satisfaction with service and network reliability remaining high with the rating of our 'friendliness, helpfulness, and customer concern' remaining high.

97%

of customers who contacted us rated the service received as 'excellent' or 'very good', up on the 95% achieved in the 2021 survey.

99%

of customers who experienced a fault rated the service person responding to the fault as 'excellent' or 'very good'.

93%

of customers considered that the fault they experienced was 'fully resolved', a similar result to the 2021 survey. The 6% of respondents who stated their fault had not been resolved indicated that the job had been logged and further action had been required to resolve the issue.

96%

of customers said they were 'very' or 'quite satisfied' with the reliability of the electricity supply, up on the 91% achieved in the 2021 survey.

8% of faults customers indicated that they would be prepared to have 'slightly more power cuts if it meant their electricity bill was a bit lower', which leads us to conclude that customers are satisfied that the price-quality trade-offs are appropriate.

84% of faults customers were satisfied, and 1% were dissatisfied with the call wait times, a similar result to the 2021 survey.

36% of fault customers indicated that they knew that we have an Outage App that can be downloaded to their Smartphones. This result is up from 20% in the 2021 and 15% in the 2020 survey. Customers that used the Electra Outage App described the app as 'very useful' and 'very' or 'quite easy to use'.

16% of fault customers used the Electra webpage for information about their recent power outage, which is unchanged from the 2021 survey. Virtually all of these customers indicated they could find the required information. 60% of them found the information on the webpage 'very useful' and 40% 'quite useful'.

The survey results confirm a consistent level of service delivery between the sub-regions of our network. The customers interviewed north, and south of Otaki gave similar ratings in terms of excellence. Based on the survey results, we determined there to be six focus areas:

1. Refresh advertising and communications programme with customers and stakeholders.
2. Promote Powerswitch encouraging customers to check that they are on the best power plan.
3. Maintain greater use of social media and websites to promote significant projects.
4. Provide customers with information on solar, electric vehicles and other emerging changes.
5. Implement multi-channel communication tools for planned and unplanned events.
6. Improve timeliness of outage information.

3.3 When we get it wrong, what do we do

We don't always get it right, and when we receive a customer complaint, we recognise that our customers have the right to expect quality service and support from us.

When a customer has a complaint or experiences a problem with our service, we want to know so that we can fix it. All our staff are committed to treating complaints seriously and reaching resolutions as quickly and fairly as possible. We have tried to make our complaint process easy and have two simple steps.

Step 1 — Talk to us. A quick chat with us to resolve a customer concern or problem. Customers can call us on 0800 353 2872 between 8am – 5pm on weekdays and ask to speak with our Chief Operating Officer, Lines Business. Our COO ensures customer complaints are thoroughly investigated and resolved efficiently and appropriately. We endeavour to resolve all formal complaints within 20 days.

Step 2 — Mediation through the Utilities Disputes Scheme. Electra is a member of the Utilities Disputes Scheme, including land complaints. We sincerely hope to resolve a customer complaint directly with the customer. However, if we haven't resolved the complaint to the customer's satisfaction, the customer can contact Utilities Disputes on 0800 22 33 40 or go to www.utilititesdisputes.co.nz. Utilities Disputes are a free and independent service for resolving customer complaints.

4. PRACTICES FOR CONNECTING NEW CONSUMERS AND ALTERING EXISTING CONNECTIONS

Facilitating new customer connections and changes to the existing connection to meet customers' needs is fundamental to our assessment management process. We believe the process should not be made any harder than necessary. Our approach to new connections and alterations is different from our peers.

We do not manage new connections or alterations. Customers can use any approved contractor to manage their connection to our network or their existing connection. The approved contractor will then liaise with us per our New Connections Standard and Network Extension Policy.

We consider there to be two types of connections on our network; standard and non-standard connections.

Standard connections are small connections that follow our business-as-usual processes. These are typically residential and small commercial premises. The connection will usually be to our low voltage (LV) network and does not require us to upgrade the network (e.g., replace the existing transformer) to accommodate the new connection or alteration. There are four types of standard connections on our network:

(i) small—all single-phase connections
(ii) medium—three-phase connections with 40/60 Amp fuses
(iii) large—three-phase connections with 80/120 Amp fuses
(iv) small subdivisions of less than ten lots.

Non-standard connections are connections that fall outside of our business-as-usual processes. New connections and alterations for these customers are more complex and can be unique to the customer's individual needs. Non-standard connections typically support large commercial or manufacturing functions, subdivisions, or large embedded generation (i.e., >1MW). These connections will usually be connected to our high voltage (HV) network.

4.1 Connecting or altering a standard connection

We connect approximately 300 standard new connections each year. The process is outlined at a high level in Figure 1.

Figure 1: High-level process to connect a new standard customer

Step	Approved Contractor	Engagement with Electra
Step 1: the customer chooses an approved contractor	The customer engages with an approved contractor for a new connection or alteration to their existing connection.	None. Customers can select their approved contractor from the list available on our website.
Step 2: the customer and approved contractor agree on the work to be done and the cost	The customer and approved contractor agree on what work is to be done and the cost of that work.	None. Completing the work is a commercial arrangement between the customer and the approved contractor. Approved contractors operate in a competitive market; we do not influence or control the customer's choice of contractors.
Step 3: the approved contractor submits a design for the new connection or alteration	The approved contractor sends us the design for the new connection via email and, in some cases, drops by our Levin or Paraparaumu office to discuss the design.	Our Network Planning Engineer will assess the new design and, in most cases, approve the design and send a Design Approval Letter to the approved contractor within five working days.
Step 4: the approved contractor does the new connection or alteration as per the contractual terms with the customer, and the design	The approved contractor completes the work per the agreed terms with the customer and the approved design.	None. The approved contractor entirely manages this step. We are here to help and can be contacted by the approved contractor or customer at any time should they want to discuss the new connection or alteration with us.
Step 5: the approved contractor sends Electra the As-builts	Once the work is completed, the approved contractor sends Electra the As-builds. The new connection can be livened at this stage, provided a certified inspector has inspected it and signed off.	Our Network Planning Engineer will verify the As-Builts and pass these along to the Administration Support to create a vested asset record and the GIS Team to enter the asset into our GIS. The Network Planning Engineer will also inform the Asset Assurance Manager of the new connection and alteration, and they will audit the new connection or alteration to ensure compliance with the approved design and our New Connections Standard and Network Extension Policy.

The approved contractors on our network operate in a competitive market. Customers can choose their approved contractor, and prices can be a factor. Our streamlined approach avoids adding costs to establishing or altering a new connection. Thereby we reduce the costs of connection to customers.

Our process promotes one point of contact for the customer's connection, which is the approved contractor. That is not to say we won't speak with customers about their new connection or alteration; we are available to speak with customers at any time during the process. Rather, the customer is not obligated to liaise with us about their connection.

Because the approved contractors in the entirety manage new connections and alterations for standard connections, we do not delay connections to our network. Customers may experience delays from the approved contractor due to resourcing, consenting, or materials, but we are not privy to these.

We do not measure the average timeframes for standard new connections. We do not manage the process and, as such, do not influence the timeframes the approved contractor works to or measure their performance. Further, because the approved contractors operate in a competitive market, it would be inappropriate for us to measure their individual performances or customer satisfaction.

4.2 **Connecting or altering a non-standard connection**

We connect between three to seven non-standard new connections each year. The process is outlined at a high level in Figure 2.

Figure 2: High-level process to connect a new standard customer

Step	Customer/Approved Contractor	Engagement with Electra
Step 1: the customer or approved contractor approaches us about a new connection or alteration	Non-standard connection customers tend to be well-informed and often approach us directly. A customer might also engage a representative, e.g., an engineering or project management specialist or an approved contractor. We use the term 'customer' to generalise all scenarios for simplicity.	We will meet with the customer. Discussions can start as casual enquiries, or they might be more advanced, and the customer might provide us with a detailed design. We allow the customer to determine the level of engagement with us that suits their needs and do not discourage informal enquiries.
Step 2: a detailed design is submitted	The customer will submit a detailed design per our New Connections Standard and Network Extension Policy.	Our Network Planning Engineer will assess the new design and liaise with the customer to confirm the specifications of the new connection or alteration.
Step 3: impact assessment	The customer will need to answer any follow-up questions, including alternative points of connection and the feasibility of non-network solutions.	We will conduct a network impact assessment based on the customer's design. This step often involves the customer as we firm up the assumptions the customer has made around their needs. Depending on the complexity of the connections, this step can take several months to complete.
Step 4: Design approval	The customer will receive the design approval. They then decide if they want to proceed or not. An approved design does not obligate the customer to progress with the new connection or alteration.	Once we are satisfied that the customer has settled on the connection and understands the impact on the network, we will approve the design. Once approved, we will send a Design Approval Letter to the customer. There is no standard time frame in which we issue the letter. Timeframes are highly dependent on eh nature of the connection, the level of detail provided by the customer, and the design.
Step 5: Build the new connection or action the alteration	The customer will then build the new connection or action the alteration, including connection to our network, energisation, and living.	None. This step is managed entirely by the customer. We are here to help and can contact the customer at any time should they want to discuss the new connection or alteration with us.
Step 6: the customer sends us the As-builts	Once the work is completed, the customer sends us the As-builds. The new connection is then inspected and livened.	Our Network Planning Engineer will verify the As-Builts and pass these along to the Administration Support to create a vested asset record and the GIS Team to enter the asset into our GIS. The Network Planning Engineer will also inform the Asset Assurance Manager of the new connection and alteration, and they will audit the new connection or alteration to ensure compliance with the approved design and our New Connections Standard and Network Extension Policy.

5. NEW CONNECTIONS LIKELY TO HAVE A SIGNIFICANT IMPACT ON NETWORK OPERATIONS OR ASSET MANAGEMENT PRIORITIES

Most of the new connections onto our network are standard connections, which can be connected with no augmentation of our network. We do, however, from time to time, have large non-standard connections that can have a significant impact on our operations and asset management priorities.

5.1 Connecting large-scale renewable energy sources

Enquiries for connecting large-scale renewable energy sources have grown in recent years. Integrating renewable energy sources, such as solar and wind, onto our network has a transformative effect. Distributed energy resources often have intermittent and variable output, requiring us to manage power flows and balance supply and demand. Our asset management priorities focus on maintaining grid stability, upgrading infrastructure to accommodate renewable generation and optimising power flow management.

5.2 Enabling electric vehicle charging infrastructure

The electrification of transport under New Zealand's carbon-zero targets is driving the installation of electric vehicle (EV) charging infrastructure across New Zealand; our network is no exception. As electric vehicle adoption continues to grow, the demand for EV charging infrastructure is increasing new challenges are introduced to our operations and asset management practices. Over the coming years, we want to appropriately support the deployment of charging stations strategically and enable the charging needs of EVs while avoiding excessive strain on our network. Our asset management priorities focus on optimising charging infrastructure, load management, and integrated smart charging stations to minimise the impact on our network.

5.3 Supporting microgrids and energy communities

The building of Transmission Gully connects the Kapiti coast to Wellington with a relatively short drive of under an hour. Transmission Gully has stimulated residential housing growth, including subdivisions with microgrids and energy communities. Microgrids are localised electricity networks operating independently or in conjunction with our network. Predominately microgrids incorporate renewable energy sources, energy storage systems, and demand response capabilities. The emergence of microgrids and energy communities allows for decentralised generation and consumption, requiring us to adapt our operations and asset management strategies. Our asset management priorities focus on integrating and coordinating microgrids with our network, managing bidirectional power flows, and ensuring grid resilience.

5.4 **Facilitating energy storage systems**

The deployment of energy storage systems, such as batteries, at various points on our network can enhance network stability, improve reliability, and support the integration of renewable energy sources. We intend to incorporate energy storage systems into our asset management priorities, including optimising the placement and sizing of storage units, managing charge and discharge cycles, and implementing intelligent control systems to maximise benefits.

5.5 **Digitalisation and automation of our operations**

The digitalisation and automation of our operations through technologies such as Supervisory Control and Data Acquisition (SCADA), Internet of Things (IoT), and artificial intelligence (AI) have a significant impact on our network operations and asset management practices. These technologies enable real-time monitoring, predictive maintenance, fault detection, and network performance optimisation. The focus of our asset management priorities requires us to deploy and manage these digital technologies, train personnel, and leverage data analytics to improve asset performance and reliability.

We are acutely aware of the importance for us as good asset managers to adapt our strategies and network to accommodate large non-standard new connections onto our network. By embracing technology advancements in SCADA, IoT, and AI, we can optimise our asset management and ensure our network reliability meets our customers‘ evolving expectations.

6. INNOVATION PRACTICES

Innovation practices in electricity distribution have become increasingly important as the energy sector pivots to meet the government's NetZero carbon goals, enabling New Zealand's decarbonisation journey. Several key practices and technologies have emerged as leaders enhance their electricity distribution networks with efficiency, reliability, and sustainability measures in front of mind.

6.1 Industry collaboration

Industry collaboration plays a significant role in supporting innovation. We belong to several collaborative forums, including the Electricity Networks Aotearoa and its various working groups, the North Island CEOs and CIOs forums, National Risk Managers Forum, and the FlexForum. The pooling of resources and expertise and the cross-pollination of ideas supports innovation through the lowest lifetime cost approach that is in the long-term best interests of consumers.

When we wanted to improve the visibility of our low voltage network, we partnered with Chorus to trial their PowerSense as a pilot project. The driver of this innovation was primarily to improve customer experience by learning of unplanned events without the customer needing to call us. Such information has the added benefit of informing our asset management lifecycle management practices by helping us better understand the effects of unplanned events.

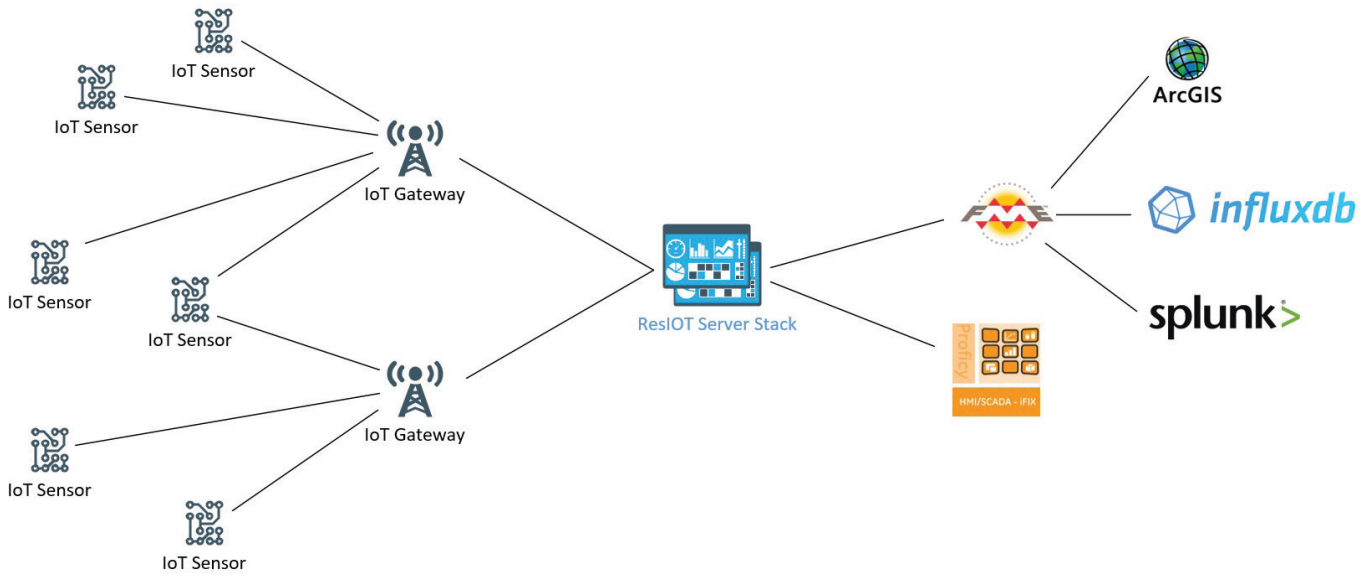
The innovation is in adopting the Feature Manipulation Engine (FME) Server platform, which enables us to consume information from a fleet of Phase Loss Sensors, which informs us when the voltage traverses 150vac.

Currently, through the Chorus PowerSense pilot project, we can use the last and first-gasp information from fibre modems. We look forward to adopting the production solution when it launches later this year.

6.2 Deployment of smart grid technologies

Deploying smart grid technologies (SGTs) is a major innovation practice in electricity distribution. SGT involves the integration of advanced sensors, communication systems, and data analytics to improve our network's efficiency, reliability, and resilience. SGTs enable real-time monitoring, control, and optimisation of our network, leading to better outage management, load balancing, and integration of renewable energy sources.

Like several of our peers, we do not own the customer electricity meters connected to its distribution network; therefore, we don't have access to the data available from these meters. We recognise the need to understand better our network conditions to improve operational efficiency, network planning and customer experience. To solve this issue, we decided to innovate and implement a private low power, wide area network (LoRaWAN) solution comprising seventeen LoRaWAN Gateways made up of MultiTech MTCDT 8-channel and, more recently, 16-channel Tektelik Kona Macro Gateways.



We have deployed sensors across our network (including smart Maximum Demand Indicators, LV Phase Loss Sensors and Fault Path Indicators) have been deployed across the network. Telemetry from these sensors is delivered securely via the gateways to a small cluster of ResIoT servers. These servers then pass the telemetry to our SCADA environment or our Integration Stack (FME) for processing and forwarding to the GIS, SPLUNK and InfluxDB.

6.3 **Utilising smart meter data**

Most of the connections on our network have advanced metering infrastructure (AMI), commonly known as smart meters. Smart meters allow for real-time monitoring and two-way communications between connections and networks. Smart meters enable accurate electricity consumption measurement, enable demand response programmes, and provide vital data for our network operations and asset management practices. Our asset management priorities focus on utilising smart meter data to inform our asset management plan, ensuring data security and privacy, and leveraging the data for network optimisation and good asset management decisions.

6.4 **Supporting distributed energy resources**

Distributed energy resources (DER) include small renewable energy sources, energy storage systems and demand response programs. Our innovation practices include integrating DER into our network and effectively managing the impact on our network and operations. DER will require us to develop advanced control systems and implement policies and incentives encouraging adoption. We do not want to become a barrier or inhibit innovation.

This year we have been working with Transpower and Far North Solar Farms Ltd to connect a 30MW solar farm to Electra's Foxton substation, which may serve 30% of the needs of the Horowhenua electricity network annually. Combined with Mangahao hydroelectric generator station, the Horowhenua electricity network will generate 95% of the energy it consumes annually. We have not connected a distributed generation resource of this scale before. Ensuring our systems are effective and appropriate to support decarbonisation projects such as a large-scale solar farm requires us to be flexible but not lose sight of good asset management practices. Innovation is our cornerstone, enabling a successful Far North Solar Farms project.

6.5 **Modernising and automating our network**

Network modernisation and automation of our network entail us deploying advanced sensors, communication networks, and automation systems. These innovations enable real-time monitoring, fault detection, and self-healing capabilities. Automation reduces the need for manual intervention and speeds up fault restoration, improving our network's overall reliability and efficiency.

6.6 **Enhancing our information layer**

We are increasing our use of data analytics and AI techniques to analyse the large volumes of data our systems generate. Enabling an 'information layer' can uncover valuable insights, such as predicting equipment failures, optimising maintenance schedules, and identifying opportunities for efficiency improvements. These technologies help us make data-driven, i.e., informed decisions and optimise our operations.

6.7 **Customer engagement and energy management**

Our customers must be brought along with us on the journey. Our innovation practices include initiatives to improve customer engagement and energy management. Our vision is to empower customers to manage their energy usage actively and, thereby, their impact on our network. We can optimise our grid operations and reduce peak demand and the costs to serve by enabling customers to give effect to their supply decisions.

In 2019, the Commission requested more information on storm conditions, including wind speed impacts on our network following several adverse weather events on our network and across New Zealand. To support this request, we launched our private weather network to give stakeholders enhanced visibility of real-world conditions.

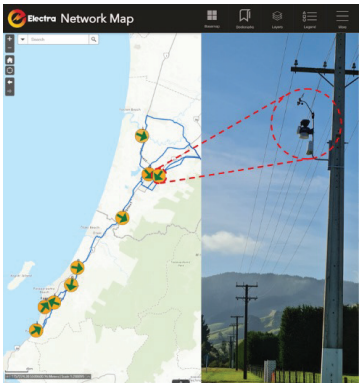
Operationally, this data informs us of real-world conditions across the region. Helping to determine the likely cause of a fault (high winds, for example) and whether the conditions are safe enough to repair. The data also enables us to provide detailed and accurate weather condition information for unplanned events caused by adverse weather.

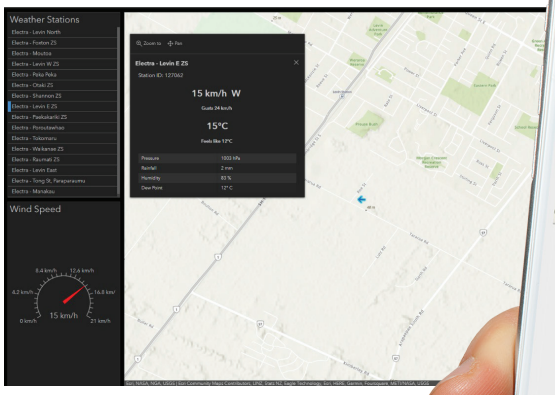
The Electra Weather Network (EWN) currently includes 15 solar-powered Davis Vantage Pro 2 weather stations, with plans to deploy a further 15 over the next 12 months.

6.8 **Innovation is a journey, not a destination**

industry collaboration supports innovation by combining resources, fostering diverse thinking, accelerating R&D, providing access to complementary technologies, mitigating risks, validating solutions, and driving advancements at an industry level. It creates an ecosystem where innovation thrives, enabling companies to push boundaries, solve complex problems, and create new value for their customers and industries.

We intend to be a 'fast follower' as we scope and right-size smart technologies to meet our current and future needs appropriately. The focus of innovation practices on our network is to leverage advanced technologies, data analytics, and customer-centric approaches to create a more efficient, reliable, and sustainable network. These practices enable us to adapt to the ever-changing energy landscape and meet the evolving needs of our customers and New Zealand as a whole.





ArcGIS DAVIS WEATHER UNDERGROUND influxdata®

APPENDIX

APPENDIX A – COMPLIANCE MATRIX

Regulatory obligation		Reference
17.1	a description of how the EDB provides notice to an communicates with consumers regarding planned interruptions and unplanned interruptions, including any changes to EDB's processes and communications in respect of planned interruptions and unplanned interruptions.	Section 1
17.2	a description of the EDB's practices for monitoring voltage, including: **17.2.1** the EDB's practices for monitoring voltage quality on its low voltage network; **17.2.2** work the EDB is doing on its low voltage network to address any known non-compliance with the applicable voltage requirements of the Electricity (Safety) Regulations 2010; **17.2.3** how the EDB responds to and reports on voltage quality issues when the EDB identifies them, or when they are raised by a stakeholder; **17.2.4** how the EDB communicates with affected consumers regarding the voltage quality work it is carrying out on its low voltage network; and **17.2.5** any plans for improvements to any of the practices outlined at clauses 17.2.1 – 17.2.4 above;	Section 2
17.3	a description of the EDB's customer services practices, including: **17.3.1** the EDB's customer engagement protocols and customer service measures — including customer satisfaction with the EDB's supply of electricity distribution services; **17.3.2** the EDB's approach to planning and managing customer compliant resolution;	Section 3
17.4	a description of the EDB's practices for connecting consumers, including: **17.4.1** the EDB's approach to planning and management of— (a) connecting new consumers (offtake and injection connections), and overcoming commonly encountered issues; and (b) alterations to existing connections (offtake and injection connections); **17.4.2** how the EDB is seeking to minimise the cost to consumers of new or altered connections; **17.4.3** the EDB's approach to planning and managing communication with consumers about new or altered connections; and **17.4.4** commonly encountered delays and potential timeframes for different connections.	Section 4

Regulatory obligation		Reference
17.5	a description of the following: **17.5.1** how the EDB assesses the impact that new demand, generation, or storage capacity will have on the EDB's network, including: (a) how the EDB measures the scale and impact of new demand, generation, or storage capacity; (b) how the EDB takes the timing and uncertainty of new demand, generation, or storage capacity into account; (c) how the EDB takes other factors into account, eg, the network location of new demand, generation, or storage capacity; and **17.5.2** how the EDB assesses and manages the risk to the network posed by uncertainty regarding new demand, generation, or storage capacity;	Section 5
17.6	a description of the following: **17.6.1** any innovation practices the EDB has planned or undertaken since the last AMP or AMP update was publicly disclosed, including case studies and trials; **17.6.2** the EDB's desired outcomes of any innovation practices, and how they may improve outcomes for consumers; **17.6.3** how the EDB measures success and makes decisions regarding any innovation practices, including how the EDB decides whether to commence, commercially adopt, or discontinue these practices; **17.6.4** how the EDB's decision-making and innovation practices depend on the work of other companies, including other EDBs and providers of non-network solutions; and **17.6.5** the types of information the EDB uses to inform or enable any innovation practices, and the EDB's approach to seeking that information.	Section 6

As per clause 2.6.1A(3)(b), this addendum is exempt from the director certification requirements in clause 2.9 of the ID Determination. Director certification has, therefore, not been sought for this year-beginning disclosure requirement.

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