Addendum to the 2024-2034 Asset Management Plan Update

Pursuant to clause 17.2.2 of the Electricity Distribution Information Disclosure (Targeted Review 2024) Amendment Determination 2024

31 August 2024

Contents

1. 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 February 2024, the Commission introduced new reporting requirements to the asset management plans by introducing clause 17.2.2 of Attachment A of *the Electricity Distribution Information Disclosure (Targeted Review 2024) Amendment Determination 2024 [2024] NZCC2*, 29 February 2024 (the ID Determination).

We are pleased to disclose the information as prescribed by the Commission publicly as an addendum to our 2024-2034 Asset Management Plan Update (2024 AMP).

1.1 Where can you get a copy of this addendum

Copies of this addendum are available at our Levin head office, 25 Bristol Street, Levin, during business hours. Alternatively, contact us through our Contact Form on our website https://electra.co.nz/, or call us at 0800 353 2872, and we will email or mail you a copy.

2. Background

2.1 What information are we being asked to provide

The new clause (17.2.2) of the ID Determination requires us to provide a narrative on monitoring load and injection constraints, including:

(a) any challenges and progress towards collecting or procuring data required to inform the electrical distribution business (EDB) of current and forecast constraints on its low voltage network, including historical consumption data

(b) any analysis and modelling (including any assumptions and limitations) the EDB undertakes or intends to undertake, with the data described in clause 17.2.2(a).

3. Our journey with customer consumption data

3.1 Why is consumption data useful to us

Networks must be built and managed for peak demand, not energy consumption. To understand and manage increasingly constrained and more complex network demands, an efficient operator must be able to understand what is happening at the 'edges of the network'. Traditionally, most distribution networks only have 'visibility' at HV feeder level by way of substation and field telemetry through SCADA systems.

Historically electrical energy has flowed in one direction through distribution networks to the end customer, who are almost all connected to the low voltage network. Network operators managed power quality and thermal constraints through tried and tested network planning standards and engineering assumptions.

Visibility at the low voltage level is becoming increasingly important for managing future networks as the energy landscape changes, and it is expected that greater use will be made of customer-owned energy assets such as distributed energy resources (e.g., solar, micro-generation, and batteries). This new consumer behaviour requires complex multi-direction power flow especially on the low voltage networks.

Network operators increasingly need to actively manage power flows on their low voltage networks, maintaining power quality and managing thermal constraints (loading), in real-time and for long-term asset management and planning purposes. This requires significant changes to the quality and granularity of the data we have at our disposal, and to the systems needed to analyse that data.

3.2 Potential future uses for metering data

We envisage that metering data could be used in the following ways:

3.2.1 Real-time operations

We currently have very limited real-time information on our low voltage networks and in most cases are solely reliant on the customer informing us when they have lost power.

In the future, real-time data from meters has the potential for us to provide a more proactive and efficient customer service as we will know when customers have lost power, the extent of the outage, be able to target a proportionate response, and keep the customer fully informed.

3.2.2 Asset management and planning

We currently have a mix of data sources available to us.

At one end of the scale, we have some low voltage power quality monitors installed in our fleet of distribution transformers. These devices provide us with highly granular, accurate real-time data on each phase of each low voltage feeder. At the other end of the scale, we have after diversity maximum demand (ADMD) assumptions based on the number of customers connected to a particular distribution transformer.

With the rapid changes in consumption behaviour of electrical energy we envisage that connection point/ICP level consumption data will allow us to identify emerging trends and localised issues with power quality, constraints or emerging faults and defects on the low voltage network. Ultimately, we anticipate that this will allow us to make a targeted response as increased electrification challenges our network and allow us to maintain or increase customer service levels.

3.3 Our progress with obtaining consumption data

In January this year, we embarked on a project to obtain and process half-hourly customer consumption data. The project aims to leverage data collected from meters within our network to deliver improved outcomes across planning, asset management, and operations.

We have procured a single supply of three years of historic half-hourly consumption data to improve our load forecasting and pricing models. We have been able to obtain a high level of coverage on our network. 89% of ICPs in our region have a suitable smart meter installed; our agreements with retailers and MEPs have enabled us to obtain data from approximately 70% of those meters, representing 63% of total ICPs on our network.

3.4 What we have done with the consumption data to date

We have so far used the consumption data in the following ways:

3.4.1 Analysis at a distribution transformer level

We have aggregated the consumption data to each of our distribution transformers for each half-hour time period.

We have had to make assumptions to cover the gaps arising from ICPs which don't have consumption data available (i.e. those with legacy metering), and then been able to compare the consumption profile at each distribution transformer against their ratings. This has identified distribution transformers that have or may soon exceed their ratings.

3.4.2 Analysis with our modelling applications

We have been able to enter the half-hourly consumption data into our existing network modelling application and use it for planning and asset management purposes. The application allows us to analyse our entire low voltage network and identify constraints.

This analysis has highlighted that the lack of customer phasing in our network model limits the analysis we can currently undertake. We will be working on improvements to our network model with field verification as required.

3.4.3 Comparing the analysis

These two methods of analysing consumption data use differing assumptions and computation techniques. We have been able to compare the results from both and are working towards gaining a better understanding of the benefits and uses of each.

3.5 Alternatives to consumption data from meters

We commenced a programme in 2019/20 to identify distribution transformers and sections of the low voltage network where we believed we would benefit from high-quality real-time data that we could analyse in our network modelling systems.

This programme has now installed over 200 power quality monitors at low voltage level on ground and pole-mounted distribution transformers, which gives us granular real-time visibility of ~10% of our low voltage network down to each phase of the feeders.

We see this data as supplementary to consumption data and that there are benefits in both data sources.

4. Challenges with consumption data

4.1 Challenges with obtaining consumption data

Working with our industry partners we have addressed the commercial and privacy issues relating to half-hourly consumption data. It has been a time-consuming journey getting to the position overcoming some real and some perceived risks relating to the data.

This data has come at a cost and we are still in the process of evaluating the value it provides.

We have not sought to obtain the more granular real-time data known as NODS (network operational data services) as the costs are significantly higher than half-hourly consumption data currently.

4.2 Limitations with consumption data

Historic half-hourly consumption data is lagging data and does not provide any real time operational benefits. Any benefits are limited to planning and asset management functions. It is purely consumption data and gives no insight into power quality issues experienced by that customer.

4.3 Challenges with analysing consumption data

The volume of data, even just half-hourly consumption data, is considerable, as are the costs associated with storage and initial processing of this data.

4.4 Limitations to the modelling and analysis

We have looked to service providers for both ingesting and storing the data together with proprietary analysis applications that are available and emerging on the market. Whilst many of these applications offer interesting potential we have not yet been able to justify the costs based on our network conditions today.

Our analysis at distribution transformer level is limited by the unavailability of data for some ICPs.

Analysis using our existing network modelling application has been affected by network and connection information requiring us to make assumptions about connectivity that will require verification. It may be possible to provide this verification through data analysis or may require on-site investigation. Both options will come with associated costs and will need to make the economic trade-off between value and accuracy.

5. Our next steps

5.1 Network model and connectivity

We plan to focus on improving our network connectivity model. This will enable us to use and analyse half-hourly consumption data with greater confidence.

5.2 Forecasting and analysis

We have been on an improvement journey with our high-level long-term forecasting for the past few years. We intend to use the half-hourly consumption data and scale this using our forecasting to identify emerging power quality and thermal constraints on our low voltage network.

5.3 Value proposition

We intend to continue to test the value proposition from obtaining further half-hourly consumption data, obtaining real-time data and also the proprietary offerings in the market to analyse this data.

Appendix A — Director Certification

Schedule 18 Certification for Disclosures

Clauses 2.9.2 and 2.9.5

We, Stephen Robert Armstrong and James Albert Carmichael, being directors of Electra Limited, certify that, having made all reasonable enquiry, to the best of our knowledge—

a. the information prepared for the purposes of clause 2.6.1B of the Electricity Distribution Information Determination 2012 in all material respects complies with that determination.

30 August 2024

30 August 2024