

Meeting Date: 20 June 2019

## ASSET MANAGEMENT OF ELECTRICITY DISTRIBUTION BUSINESSES

# SECURITY AND RELIABILITY COUNCIL

The Commerce Commission has been increasing its focus on the asset management of electricity distributors. Asset management has direct impacts on the reliability experienced by consumers, so is of interest to the Security and Reliability Council (SRC).

**Note:** This paper has been prepared for the purpose of the Security and Reliability Council. Content should not be interpreted as representing the views or policy of the Electricity Authority.

# Asset management of electricity distribution businesses

## Background

On 22 June 2018 the Commerce Commission (Commission) presented to the SRC on their role regulating electricity distribution businesses. They noted that asset management was a key focus area for the Commission going forward. Asset management is very closely aligned with the SRC's interest in security and reliability.

In an open letter to stakeholders dated 9 November 2017, the Commission noted:

“Sound asset management is an integral part of ensuring that distributors improve efficiency and provide services at a price and quality that reflects the demands of electricity consumers. However, assessing whether distributors' asset management decisions result in over- or under-investment is a challenge, given the typically long lifetimes of network assets. In addition, there can be a significant lag between assets deteriorating and quality reducing, and it can be difficult to set leading performance indicators that appropriately reflect the risk of poorer quality in the future.”

“As electricity distributors' asset management practices continue to mature, we would expect them to be increasingly focusing on, among other things:

- the health and criticality of their assets;
- investment 'sufficiency'—the extent to which they are re-investing in assets at a prudent level; and
- appropriate levels of network resilience—the ability to maintain and restore electricity supply to consumers, particularly following high-impact, low-probability (HILP) events, such as earthquakes.”

At the SRC meeting in June 2018 representatives from the Commission presented and outlined the process of price-quality regulation and information disclosure.<sup>1</sup> They discussed how they wanted the industry to lead asset management improvement facilitated by the Commission's range of tools.

Subsequent to that presentation, the SRC created an action:

“Secretariat to request the Commerce Commission to attend the SRC's second meeting of 2019 to provide a refresher and update on the asset management of distributors.”

Representatives from the Commission will attend the 20 June 2019 meeting, present a selection of the attached slides and be available to answer questions from the SRC.

The Commerce Commission has provided the attached presentation which contains information on an upcoming report “AMP report of EDB Risk Preparedness” to the SRC *in confidence*. The information in that presentation is confidential (with a right of action for breach of confidence in respect of any unauthorised disclosure) and embargoed until such time the Commerce Commission publishes the source material. SRC members also have individual duties to not disclose the information under [s57 of the Crown Entities Act 2004](#).

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<sup>1</sup> The Commission presentation from 22 June 2018 is located [here](#).

The secretariat will advise members when the Commerce Commission's embargo is lifted and the information ceases to be confidential.

## Questions for the SRC to consider

The SRC may wish to consider the following questions.

- Q1. What further information, if any, does the SRC wish to have provided to it by the secretariat?**
- Q2. Has the SRC received information sufficient for it to reach any preliminary conclusions about the adequacy of the levels of reliability provided by distributors?**
- Q3. What advice, if any, does the SRC wish to provide to the Authority?**

## Attachments

The following item is included as an attachment to this paper:

- *Commission focus: asset management* by the Commerce Commission (Appendix A)

## Appendix A: Commission focus: asset management

# Commission focus: asset management

## Security and Reliability Council meeting

20 June 2019

Nick Russ and Simon Wakefield



# Asset management focus

- Asset management is the core function of the businesses we regulate.
- Asset management and resilience are the key determinants of the quality (principally reliability) that consumers receive and also helps determine the efficiency and direction of the business.
- So, improving asset management is closely aligned with our purpose and strategy, promoting the long-term benefits of consumers.
- Increased focus on asset management is now possible having set the rules (input methodologies) and evaluated profitability levels.
- Open letter to stakeholders (November 2017) reinforced this:
  - <http://www.comcom.govt.nz/regulated-industries/electricity/our-priorities-in-electricity-distribution/>

# Focus areas for Asset Management



- Open letter reflected we expect EDBs to be increasingly focusing on:
  - the health and criticality of their assets;
  - investment ‘sufficiency’—the extent to which they are re-investing in assets at a prudent level; and
  - appropriate levels of network resilience—the ability to maintain and restore electricity supply to consumers, particularly following high-impact, low-probability (HILP) events, such as earthquakes.

# Tools for improving asset management



- **Price-quality regulation, information disclosure regime** (including our analysis and publications), and our **influencing role** work together to incentivise better asset management practices
- Asset management was important to past decisions, such as our emphasis on incentivising sufficient investment, but we are now refining our consideration of asset management to a more detailed and expanded level across our full range of tools
- **Price-quality regulation:** quality standards and an appropriate weighted average cost of capital (including uplift) provide a counter-balance to cost-minimisation incentives
- **Information disclosure:** disclosure and our analysis of the information reveals good and poor practices, particularly through asset management plans and core asset management data (eg, asset condition)
- **Influencing role in the sector:** working with lines businesses to promote the long-term benefits of consumers, beyond our typical regulatory tools

# Price-quality regulation

## Resetting Transpower's independent price-quality path

- Final decisions to be issued on 29 August 2019 with Final IPP determination issued on 14 November, taking effect from 1 April 2020
- Transpower voluntarily engaged a verifier (independent expert engineer) to review its price-quality path proposal.
- Verification process has been useful and effective:
  - Tested in advance of proposal the policies, planning standards and assumptions that underpin Transpower's forecast information on proposed capex, opex, and demand;
  - Identified other key areas of focus for the Commission's review
- Asset management processes improving, but still areas of improvement needed in asset health modelling such as overhead line conductor, secondary systems, switched devices and HVDC assets.
- Our RCP3 draft decision is encouraging Transpower to focus on asset health modelling in preparation for signalled renewals capex uplift in RCP4.

## Resetting Transpower's independent price-quality path

- Currently consulting on proposed changes to quality standards
  - Greater pooling of categories and using a 2 out of 3 year breach trigger to account for issue raised by the small amount of outages.
- Also introducing a number of reliability reporting measures with a view to making these quality standards in RCP4.
- We have proposed implementing a range of reporting measures and plan to carry out a mid-RCP3 period review of progress in a number of areas, including:
  - Annual reporting on progress of network risk, asset health and asset-life extension modelling. Reporting on progress to be completed by an independent expert.
  - Cost estimation reporting on project cost estimate variances and final costs.

# Price-quality regulation

## Resetting the default price-quality paths for distributors

- Applies to 17 distributors (others meet community-ownership criteria)
- To be set in November 2019, taking effect from 1 April 2020
- Our proposed approach to **forecasting capex** has focused on distributors' AMPs. At this stage, we have assessed major categories of capex against high-level metrics, rather than on detailed asset management practice.
- We have set **quality standards** and a **quality incentive scheme** that create incentives for EDBs to manage their networks in a way that takes into account the value consumers place on avoiding interruptions.
- For both capex and quality, our work has highlighted areas where ID requirements may need to be improved to provide us more ability to assess whether EDBs' investment forecasts are based on prudent and efficient asset management practices.

# Price-quality regulation

## Investigations of quality standard contraventions

- We investigate all breaches of the quality standard to make recommendations on enforcement action, which can range from issuing a no further action letter to warning letter, settlement, enforceable outcome, or penalty through high court action
- A wide range of factors are taken into account when making our enforcement decision, including the contribution of asset management, replacement and renewal to causing the contravention(s)
- Vector were penalised \$3.575m for breaching quality standards; their practices in managing vegetation, life-cycle maintenance of certain aging assets and decision making practices were sited in the Court Settlement.
- Alpine Energy were issued a warning letter on the balance of their action to improve condition of assets while the breach occurred.
- We have also announced our intention to file proceedings against Aurora, and are currently investigating quality standards by a small number of other EDBs.

# Information disclosure

## Our role in reviewing EDBs asset management practices reviews

- Responsibility and accountability for sound asset management practices and decisions rests with the EDBs. However, we are seeking to encourage improvement in their practices and understanding of them by stakeholders because poor asset management can impose significant costs on consumers through inefficient delivery of services and poor quality outcomes.
- Our programme of work to achieve this includes:
  - Disseminating good practice; both in terms of asset management practices and disclosure of these practices within the AMP; and
  - Identification of potential risks which may not currently have active mitigation.
- We accept that some EDBs' practices may not necessarily be currently aligned with best practice. Expectation is EDBs are reflecting the nature of their practices and network condition accurately in their disclosures and where appropriate have credible plans for improvement.

## Asset management practices reviews undertaken

- We published a review of distributors' 2016 and 2017 asset management plans in July 2018 against a series of questions. Intention was to identify noteworthy examples of business practices to help disseminate good practice.
- We will shortly be publishing a report prepared by Partna Consulting Group "AMP review of EDB Risk Preparedness" *see other slide deck*.
- We are currently reviewing the distributors' 2018 and 2019 asset management plans. The review focuses on a selection of areas which have previously contributed to non-compliance with quality standards and/or significant levels of required catch-up expenditure. Will request further information from EDBs where the asset management plan doesn't adequately address potential issues.

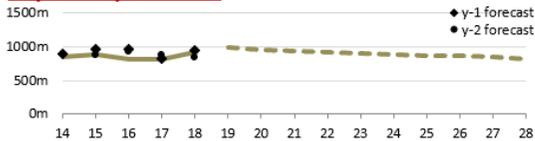
## Improving accessibility to disclosed information

- We have recently been focused on improving the public accessibility of the data disclosed by our regulated suppliers, including electricity lines businesses.
- Our publications include:
  - [One page summaries](#) (example in following slide)
  - [Performance accessibility tool](#)
- Very shortly we will be issuing an updated release to our performance accessibility tool which will have more asset information (examples in following slides)

## Summary statistics

	2018 value	5 year trend	3 year CAGR	Rank
Regulatory asset base	\$11,440m		+2.7%	
Regulatory profit	\$672.9m		+2.8%	
Return on investment	6.40%			
Line charge revenue	\$2,613.3m		+0.9%	
Other income	\$24.4m		-21.6%	
Customer connections	2,109,747		+1.0%	
Energy delivered	32,036 GWh		+0.8%	
Peak demand	6,638 MW		+1.6%	
Network capacity	21,371 MVA		+2.1%	
Capital expenditure	\$920.3m		+1.4%	
Operating expenditure	\$594.6m		+2.8%	
Capital contributions	\$156.0m		+9.8%	
Related party transactions	\$383.3m		+1.2%	
Line length	154,324km		+0.7%	
Outages - SAIDI	287 minutes		-5.4%	
Outages - SAIFI	2.38 faults		+2.2%	

## Capital expenditure



## 3 year ratios

Total capex / asset base	Total capex / connections	Total capex / depreciation
7.6% Rank:	\$409 Rank:	2.00 Rank:

Capex by expenditure category	Average (2016-2018)	5 year trend	% of capex
Asset replacement & renewal	\$341.1m		40.0%
Consumer connection	\$202.9m		23.8%
System growth	\$144.2m		16.9%
Non-network assets	\$62.7m		7.3%
Reliability, safety & environment	\$57.5m		6.7%
Asset relocations	\$45.3m		5.3%
Total capital expenditure	\$853.7m		100.0%
Related party transactions	\$237.5m		27.8%

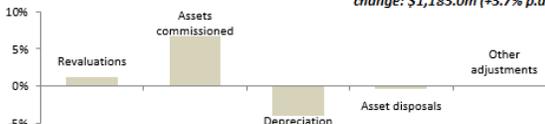
## Line charge revenues

	Proportion of revenue	Charges per unit	Rank
Average daily charge	20.5%	69.3c/CP	
Delivery (kWh)	58.6%	4.8c/kWh	
Peak based	20.8%	\$82/kW	

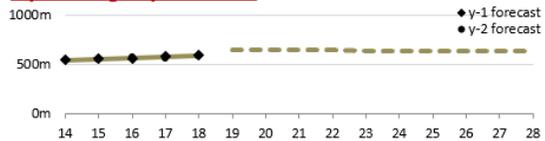


## Annualised RAB changes (2016-2018)

Opening RAB: \$10,257.1million Closing RAB: \$11,440.1million  
change: \$1,183.0m (+3.7% p.a.)



## Operating expenditure

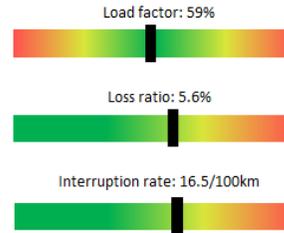


## 3 year ratios

Network opex / metre of line	Non-network opex / connections	Total opex / kW
\$1.57 Rank:	\$164 Rank:	\$89 Rank:

Opex by expenditure category	Average (2016-2018)	5 year trend	% of opex
Business support	\$203.4m		35.0%
System operations & network support	\$138.7m		23.8%
Routine & corrective maintenance	\$84.5m		14.5%
Service interruptions & emergencies	\$65.4m		11.2%
Asset replacement & renewal	\$46.2m		7.9%
Vegetation management	\$43.8m		7.5%
Total operating expenditure	\$582.0m		100.0%
Related party transactions	\$167.5m		28.8%

## Network ratios



## Company details

PQ Regulated?	-
Ownership:	-
Head Office:	New Zealand
Phone number:	-
Website:	-

## Lines and cables

Estimated state of the assets	Distribution & LV O/H lines	Distribution & LV U/G cables	Subtransmission lines and cables	Poles
Quantity	98,920km	43,043km	11,637km	1,358,255
RAB Value	\$2,351.9m	\$2,717.9m	\$1,291.1m	*
Average grade	3.21	3.52	3.31	3.43
Grade 1 / 2	4.5% / 5.0%	0.5% / 3.1%	2.3% / 3.4%	1.7% / 4.0%
Unknown grade	3.5%	2.9%	4.1%	5.3%
Average age	37 years	25 years	35 years	33 years
Over generic age	8,384km (8.5%)	502km (1.2%)	1,192km (10.2%)	159,462 (11.7%)
Unknown age	1.2%	0.9%	1.3%	3.1%
5yr replacement req (est)	7.1%	2.0%	4.0%	3.7%
5yr planned replacement	4.2%	1.2%	5.2%	5.8%
Forecast repex (ave)	\$165.5m +15%	\$37.0m +37%	\$37.8m +52%	*
Repex series				

\* RAB and expenditure on poles is included within Distribution and LV lines

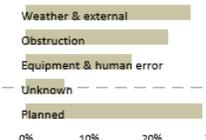
## Switchgear and transformers

Estimated state of the assets	Distribution transformers	Distribution switchgear	Zone-substation transformers	Zone-substation switchgear
Quantity	188,035	213,655	1,273	12,253
RAB Value	\$1,489.9m	\$825.4m	<---- \$1,379.5m ---->	
Average grade	3.41	3.31	3.20	3.19
Grade 1 / 2	2.0% / 3.1%	2.9% / 4.8%	2.6% / 5.0%	4.4% / 4.7%
Unknown grade	3.8%	2.3%	0.0%	1.2%
Average age	24 years	22 years	31 years	23 years
Over generic age	29,539 (15.7%)	51,754 (24.2%)	541 (42.5%)	3,644 (29.7%)
Unknown age	0.5%	5.3%	0.2%	0.9%
5yr replacement req (est)	3.5%	5.3%	5.0%	6.8%
5yr planned replacement	5.6%	7.2%	6.9%	11.7%
Forecast repex (ave)	\$37.7m -10%	\$53.3m +56%	\$67.5m +39%	
Repex series				

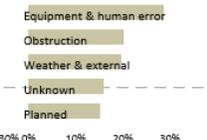
## Reliability

	Unplanned	Planned	Trend
Interruptions	13,773	11,624	
SAIDI	202.8	83.8	
SAIFI	2.00	0.39	
CAIDI	101.6	216.6	

## SAIDI causes



## SAIFI causes



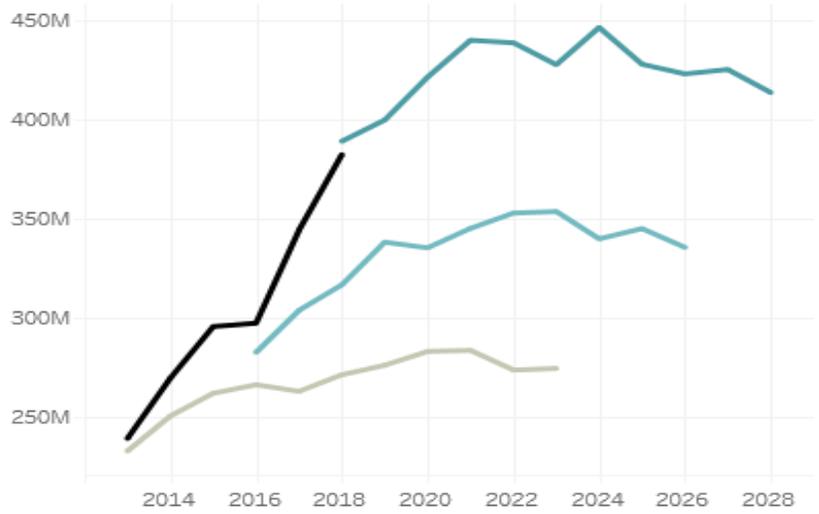
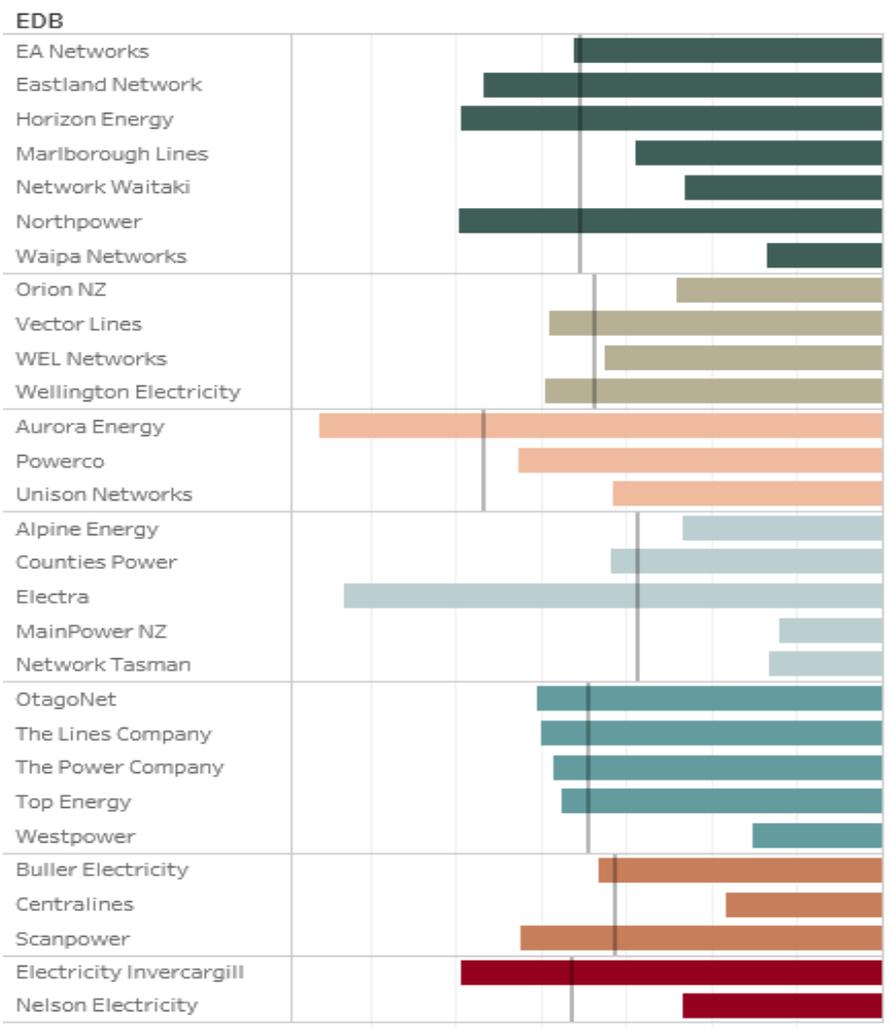
# Capital Expenditure (Capex)



(Ctrl) click capex item(s) to filter graphs  
 (Ctrl) click EDB(s) to filter table and time-series  
 Use filter to view by year(s) or apply different inflator

Choose year: (All) | Choose index: constant | Choose view: Bar chart | Choose EDB grouping: Commission example | Choose ratio: Depreciation

Category	Selection	Spend	% of spend	
Network assets	Asset relocations	\$247.39m	4.9%	
	Asset replacement and renewal	\$1,826.74m	36.0%	
	Consumer connection	\$1,058.72m	20.9%	
	Reliability, safety and environment	\$406.78m	8.0%	
	System growth	\$1,118.56m	22.1%	
	Non-network assets		\$410.03m	8.1%
	Total capital expenditure		\$5,068.22m	100.0%





# Asset condition

This dashboard shows the condition of network assets as graded by EDBs.

Click on any asset category to drill down to the relevant asset classes.

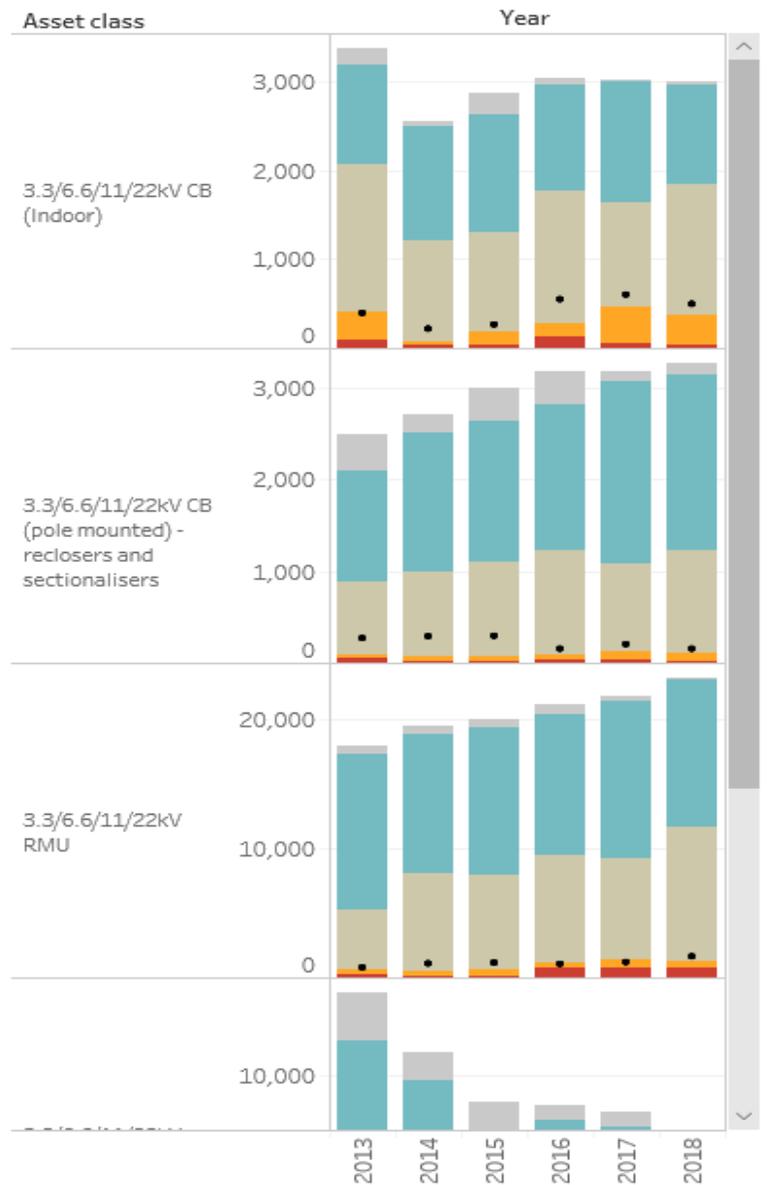
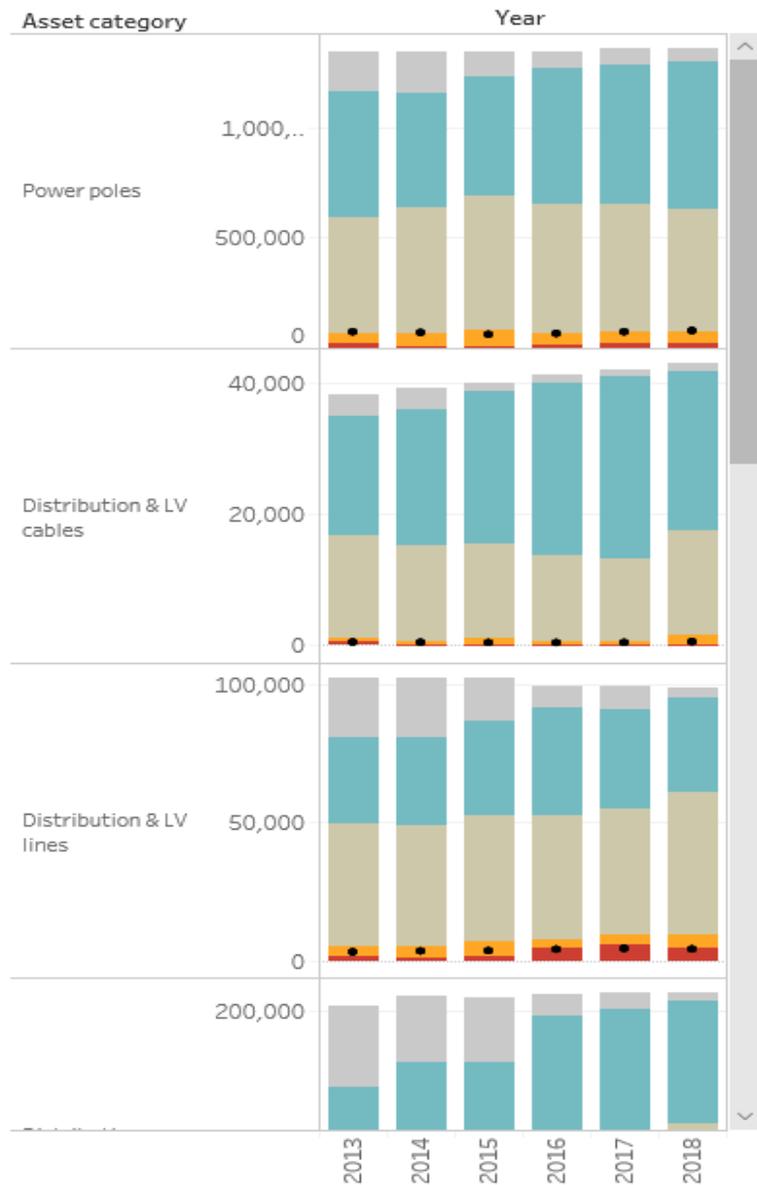
Use the filters to choose any EDB or to focus on certain grades.

**Five-year replacement**  
The black dot represents the amount of assets forecast to be replaced within five years

Choose EDB

- Selects grade(s)
- (All)
  - Grade 1
  - Grade 2
  - Grade 3
  - Grade 4
  - Grade unknown

- Grade
- Grade unknown
  - Grade 4
  - Grade 3
  - Grade 2
  - Grade 1



## Asset age

This dashboard shows the age of network assets by decade.

Use the filters to choose an asset category and class.

Click on any EDB to view more detail in the right graphs.

Choose a year

2018

Choose an asset category

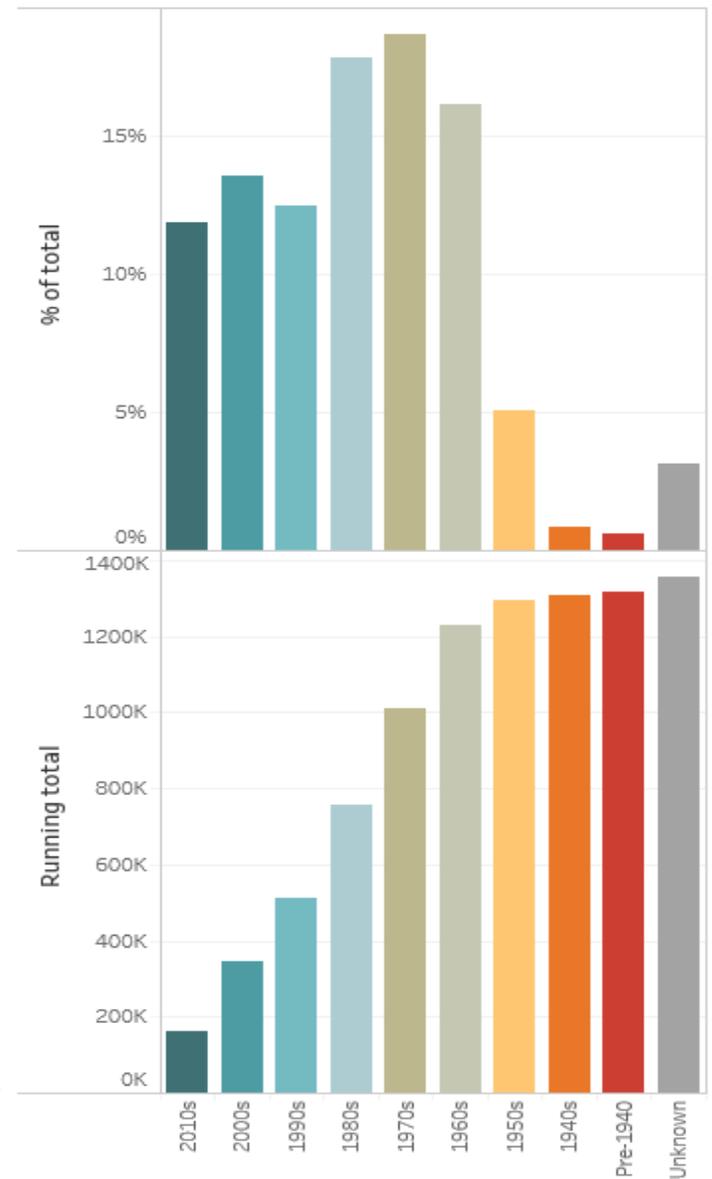
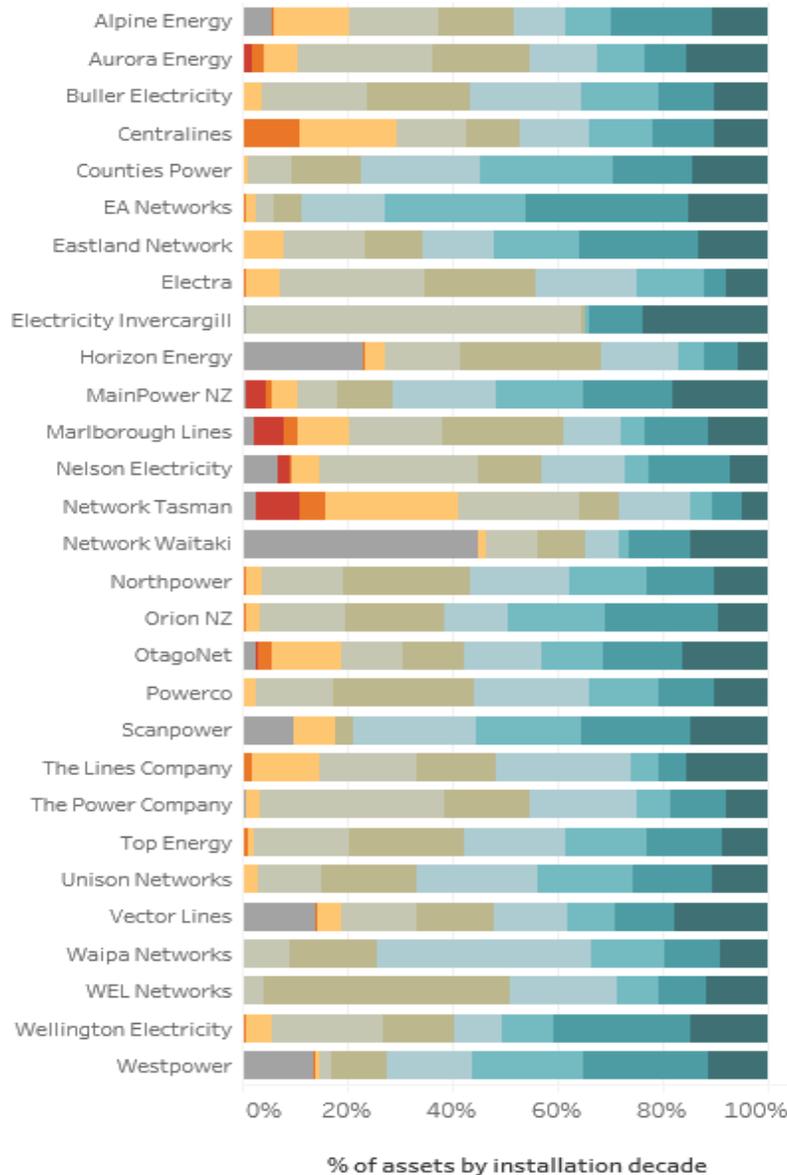
- Distribution & LV cables
- Distribution & LV lines
- Distribution switchgear
- Distribution transformers
- Other equipment
- Power poles
- Subtransmission cables & lines
- Zone substation switchgear
- Zone substation transformers

Choose an asset class

(All)

Installation decade

- 2010s
- 2000s
- 1990s
- 1980s
- 1970s
- 1960s
- 1950s
- 1940s
- Pre-1940
- Unknown



## Asset management fact-finding visits

- Staff have visited nearly all the electricity distributors, with the primary focus on asset management.
- Allows us to appreciate the specific circumstances of different distributors and their different asset management strategies responding to those circumstances.
- We are seeing differing capability amongst individual networks.
- While we haven't published a report on these visits, they inform the other work we do, such as our review of asset management plans.

## Other reviews of networks and events

- Where appropriate, we encourage, request, or are directly involved with reviews of networks and network events or request other information relevant to the asset management or resilience performance of lines businesses. We will look to be more active in this area.
- For example, in Aurora's 'State of the network' review we had active input into the terms of reference, scoping of the work, review of interim and draft reports and ensuring the independence of this work.
- Have found that issues can be difficult to uncover – ie Aurora having outdated protection systems that were not maintained.

## Overall summary of risks



# Asset management focus

## Key points

- The Commission is continuing its increased focus on asset management
- We want industry to lead asset management improvements but will help facilitate with our range of tools including:
  - Changes to aspects of our price-quality regulation;
  - Amendments to our ID requirements to capture better information to assess performance
  - Enforcement of quality standard non-compliance;
  - Review of asset management practices
  - Visualisation of asset information to make it more accessible
  - Engagement with EDBs, including through involvement in state of the network reviews

# Contact us: Simon Wakefield



Call: +64 4 924 3794

Email: [Simon.Wakefield@comcom.govt.nz](mailto:Simon.Wakefield@comcom.govt.nz)

Website: [comcom.govt.nz](http://comcom.govt.nz)

