

MINUTES

Meeting number: 47

Venue: Rūnanga, Electricity Authority, Level 7, AON Centre, 1 Willis Street, Wellington

Time and date: 8.30am until 4.05 pm, Thursday 23 May 2024

Members Present

- Hon Heather Roy (Chair)
- Allan Miller
- André Botha
- Ben Gerritsen
- Chris Ewers
- Mike Underhill (as observer)
- Nanette Moreau (via Teams)
- Paula Checketts (via Teams)
- Phil Gibson (via Teams)
- Rebecca Larking

Apologies

- Karen Frew

In attendance

Name	Title	Agenda item # attended
<u>Electricity Authority (Authority):</u>		
Sarah Gillies	CE, Electricity Authority	All items
Andrew Millar	GM Policy, Electricity Authority	All items
Chris Otton	Manager, Policy Operations, Electricity Authority	All items
Andrew Marriott	Senior Analyst, Policy, Operations, Electricity Authority	#10b
Viktoria Nordstrom	Quantitative Analyst, Authority	Between items #11 and #12
<u>Other:</u>		
John Clarke	Executive GM, Transpower	#7a
Matt Copland	Grid & System Operations Manager, Transpower	#7a
Lucie Drummond	Executive GM, Sustainability, Mercury	#7b
Hon. Simeon Brown	Minister for Energy	#8a
Tom Rainbow	Private Secretary, Minister for Auckland	#8a
Liam McNamara	Ministerial Advisor	#8a
Laurie Boyce	MBIE	#8a
Justine Cannon	General Manager, Energy and Resource Markets, MBIE	#8b

Name	Title	Agenda item # attended
Tamara Linnhoff	Manager, Electricity Generation, Infrastructure and Markets Policy, MBIE	#8b
Daniel Brown	Manager, Electrify NZ, MBIE	#8b
Stephen Tat	Principal Advisor, MBIE	#8b
John Kidd	Director, Head of Research, Enerlytica	#10a
Alan Young	Associate Director, Enerlytica	#10a
Andy Knight	CE, Gas Industry Co (GIC)	#10c
John Pagani	External Relationship Manager, GIC	#10c
Dee Warring	Senior Communications Advisor, GIC	#10c
Iwan Bridge	Chief Operating Officer, Deputy CE, Clarus	#10d
David Darby	Engagement and Regulatory Affairs, OMV	#10e
Paul Eckford	Head of Commercial, OMV	#10e

The meeting opened at 8.30am, Sarah Gillies, Grant Benvenuti and James Blake-Palmer joined the meeting at 8.30am.

1. Attendance and apologies (agenda item 1)

- 1.1. The Chair welcomed members to the 47th meeting of the Security and Reliability Council (SRC). A quorum was established.
- 1.2. The Chair noted an apology from Karen Frew and Mike Underhill's attendance to present his paper, and as an observer.

Phil Gibson joined the meeting at 8.34am

Paula Checketts joined the meeting at 8.35am

2. Changes to disclosure of interests (agenda item 2)

- 2.1. The Chair reviewed the interests register.
- 2.2. Allan Miller confirmed he had noted one change for the secretariat to action.
- 2.3. The Chair approved members to act despite declared interests.
- 2.4. There were no other changes disclosed.

Action 1: Secretariat to update the interests register, with member changes

3. Minutes of previous meeting (agenda item 4)

- 3.1. The minutes of the 26 October 2023 SRC meeting were discussed.
- 3.2. The minutes were accepted as a true and accurate record.

Ben Gerritsen moved. All members approved.

4. Correspondence (agenda item 5)

- 4.1. The Chair gave an overview of the correspondence including the letter sent to the Authority and the Authority's reply.

- 4.2. The Chair noted the Authority's reference to a security of supply roadmap and the potential for the SRC to input on that at the risk and strategy sessions at its next meeting.

5. Action list and updates (agenda item 6)

- 5.1. The Chair introduced this item and noted the actions.
- 5.2. The secretariat confirmed completion of items and the proposed additions to the SRC's risk radar for further member discussion.
- 5.3. The secretariat received positive feedback about the comprehensive nature of the Actions and Updates paper.

6. SRC focus – a long-standing member's perspective (agenda item 6a)

- 6.1. The Chair introduced Mike Underhill's paper, noting it as an opportunity to identify areas of focus for the SRC from a long-standing members' perspective.
- 6.2. Mike Underhill talked through the points in his paper, highlighting:
 - a) The importance of security and reliability and the difficulty in getting action, despite the capability of the SRC, the secretariat, and Chair
 - b) The perceived 'politeness' of correspondence between the SRC and the Authority.
 - c) The positive steps taken for the sector, so far, by the new government and the need to work with MBIE to progress next steps.
 - d) The need to address vegetation issues, given the impact on the distribution network and consumers, in terms of frequency and duration of outages.
 - e) The need to quickly progress a review of, and changes to, standards to ensure they are fit for purpose.
- 6.3. Further points of discussion included:
 - a) The Authority Chair's request to the SRC Chair for the SRC to be candid in its feedback and advice
 - b) The SRC Chair's request for members to be candid in their feedback on draft advice when the secretariat circulates material for member input
 - c) The need for further education for journalists around notices from Transpower, as system operator, what they mean and the impact of reporting on consumer confidence
 - d) A call for a stronger proactive voice from the Authority, in its role as kaitiaki for the sector.
 - e) The need to promote and avoid compromising the single point of operational truth by providing a whole of system strategic view
 - f) A brief summary of Authority work on getting price signals to market, and a focus on deliverability of ancillary services
- 6.4. Various members acknowledged Mike's contribution to SRC.

- 6.5. SRC members and Authority staff are comfortable for Mike Underhill's paper to be shared internally at the Authority to assist relevant workstreams.

André Botha joined the meeting at 9.00am.

Sarah Gillies, Andrew Millar, Grant Benvenuti, Chris Otton and James Blake-Palmer left the meeting at 9.05am.

7. Members-only session (agenda item 3)

- 7.1. The members discussed their priorities for the meeting.

Sarah Gillies, Andrew Millar, Grant Benvenuti, Chris Otton and James Blake-Palmer joined the meeting at 9:16am.

8. Risk radar (note the latest version at the end of these minutes) (agenda item 7)

- 8.1. This item was replaced for this meeting, to allow for an update from Transpower on the recent solar storms and their impact on network resilience.

John Clarke and Matt Copland joined the meeting at 9.17

9. Solar storm update from Transpower (agenda item 7a)

- 9.1. The Chair introduced Transpower presenters to the meeting.
- 9.2. The presentation and discussion noted:
- a) The recent solar storm event reflects a busy period for the sun and therefore its potential impact on the power system, particularly transformers and high voltage conductors. With the timing of the sun's rotation there may potentially be another event around 5-6 June, if sunspots are earth oriented
 - b) For the vast majority of consumers, these events will not impact their systems
 - c) Transpower has been working with Otago University for about 10 years on these issues, including studies involving the HVDC link and modelling scenarios around 10x the scale of the recent events.
 - d) Non-action in response to these events risks cascade failure
 - e) With expert guidance, to date, based on goodwill, there is a risk such expertise will not be available when needed, so a more formalised retainer arrangement should be considered
 - f) The recently established industry working group will continue work on the issues these storms present, informed by data from industry. A draft industry response will be released shortly for feedback, with a workshop planned for October to support alignment with generators' plans
 - g) The SRC discussed geomagnetic storms can get so severe there is a point where it is better to deenergise grid assets (e.g. transformers) to avoid them getting damaged. The extent of this will be dependent on the severity and magnitude of the geomagnetic activity. The Authority and the system operator should look to develop

guidelines/procedures on when this might happen, to ensure a cohesive plan in advance, rather than making this decision in the middle of an urgent event

- h) The industry group is able to brief the Authority further on the issues and its proposed work programme

John Clarke and Matt Copland left the meeting at 9.45am

Lucie Drummond joined the meeting at 9.46am

10. Energy sector framework – pan industry approach to decarbonisation (agenda item 8b)

- 10.1. The Chair introduced Lucie Drummond and noted the context of the presentation was in response to SRC member concerns there was a lack of coordination and collaboration across the sector to address the challenges presented by the transition to a low emissions economy.
- 10.2. The sector framework is a pan-industry collaboration, following on from the BCG report, to provide a plan for the future.
- 10.3. The presentation and resulting member discussion noted:
 - a) The challenge involved in achieving a whole of system view when there is much action happening but a need for collective action.
 - b) The resulting *BCG report* shows the possibility of collaborative action through an agreed framework, enabling a group to come together to discuss priorities, removal of barriers and things various entities can contribute to
 - c) What the framework is: - a process to discuss priorities; a replacement for the CEO Forum
 - d) What the framework isn't: - an attempt to duplicate effort; an additional governance layer; a decision-making body impinging on independence of those involved
 - e) The framework is in its final approval process, with a document going to Cabinet for approval in the next 4-5 weeks, including provision for an independent chair and permanent secretariat.

Lucie left the meeting at 10.04am

11. Wrap on items 6a, 7a and 7b

- 11.1. Members discussed items 6a, 7a and 7b and what advice to provide to the Authority.

Energy Minister Hon. Simeon Brown, Laurie Boyce, Tom Rainbow and Liam McNamara joined the meeting at 10.26am

12. New government's approach and Minister for Energy's priorities (agenda item 8a)

- 12.1. The Chair introduced the Minister, noted the role of the SRC and proposed a round of brief introductions.
- 12.2. The Minister's presentation noted:

- a) His appreciation of the opportunity and the need to engage strongly with the sector
- b) The importance of security and reliability, underpinned by a competitive and reliable market, to keep the lights on and deal with the challenges ahead
- c) The need for a strong regulator to ensure competitive market operation that supports generation investment and applies downward pressure on prices.
- d) The Authority has the tools and the responsibility to use them to support a functioning market
- e) The need for sound principles, decision-making and evidence-based changes, underpinned by a competitive market
- f) The government is not looking to subsidise participants, new generation or multinational companies. It will be focusing on long term sustainable policies to enable what the market can bring, including, upstream investment and restoring confidence in gas and investment in fast start gas peaking plant
- g) Formation of a Gas Security Response Group, tasked with understanding and addressing near term gas supply shortages
- h) There is a focus on reducing consenting issues, with a new framework for wind and solar being developed that will enable decisions within a year, and a focus on long-term hydro consents and investment-return time-frames
- i) Other areas of focus include biogas and carbon capture, with the size of their role to be determined
- j) The emissions trading scheme (ETS) has a role to play, despite concerns from the forestry industry
- k) The government is looking at the Energy Efficiency and Conservation Act, to ensure it is fit for purpose

12.3. Discussion and comments from members noted:

- a) Strong support for action on the tree regulations and a need to get a sense of how to address damage caused by trees outside the growth limit zone and notice zone
- b) The need for MBIE or Worksafe to consider whether it is possible to pull standards out of legislation to make the process more flexible
- c) There are challenges to increase confidence in the upstream gas market and a need to understand and act on the concerns raised by GIC and others about resilience.

The Minister and officials left the meeting at 11.01am

Justine Cannon, Tamara Linnhoff, Daniel Brown and Stephen Tat joined the meeting at 11.07am

13. Energy policy development - MBIE (agenda item 8b)

- 13.1. The Chair introduced the presenters from MBIE, whose presentation was taken as read. The presentation and points of discussion included:
- a) MBIE administers 12 Ministerial portfolios, working closely with other crown agents, including the Authority, EECA, GIC and the Commerce Commission.
 - b) MBIE treats the gas and energy markets as an integrated system, as it focuses on repealing the offshore oil and gas ban, increasing the visibility of contracted gas and prioritises consenting
 - c) Electrify NZ is a programme banner covering RMA reform, where MBIE is working with Te Waihanga and others (for example the Authority on settings for distributors) to improve information on network capacity. Decisions are expected within the next two months
 - d) MBIE, with the Ministry of the Environment (MfE), are leading work on fast-track consenting, with a process that expects applicants to have undertaken broad discussions beforehand and aims to avoid long tails and appeals
 - e) The programme is focusing on enabling renewable electricity generation projects, not just fast-tracking, with aims to reduce connection costs and first-mover disadvantage.
 - f) The Commerce Commission work is looking at disclosure on costs
 - g) MBIE is developing a framework for offshore wind, to determine space allocation and give certainty to investors, with policy decisions going to Cabinet ahead of the Parliamentary Counsel Office for legislative drafting. The duration of allocation rights is yet to be resolved, but likely to involve a use-it-or-lost-it approach
 - h) MBIE's security of supply work has a focus on upstream funding, with the Gas Supply Response Group established to address declining forecasts
 - i) Tree regulations reform is being phased, with phase one including recently announced changes to the growth limit zone and notice zones and a new 'clear to the sky' requirement. Phase two will consider broader impacts, for example 'first cut' cost allocation, forestry and how trees further away impact electricity infrastructure. MBIE has taken on board feedback, they need to address concerns about cost to consumers and access rights for distribution companies, and go further than the existing proposals
 - j) Restoring gas market confidence is within MBIE's remit (with GIC) with a role to provide the government with advice on options, costs and alternatives
 - k) The Minister is keen for MBIE's energy markets team to develop, with the resources team, an overall energy strategy, which will focus on reducing barriers and increasing longer duration energy storage, utilising data, for example, from the Authority's pipeline survey.

- l) For demand response, MBIE's focus is to support the market to bring on more generation and put arrangements in place with industrial electricity users to address peak capacity issues. Electric vehicles are included in the mix, along with other devices.
- m) The Minister is concerned about pricing increases and MBIE is aware of the size of the capital investment required (and the need to feed into the EDB and grid owner cycles on funding). MBIE advice for government includes the need to leverage community energy initiatives and provide energy education for consumers
- n) Other areas of focus across MBIE include potential development of a fuel security plan, minimum stock holdings, a roadmap for hydrogen and consultation in the coming months on the next emissions reduction plan

Justine Cannon, Tamara Linnhoff, Daniel Brown and Stephen Tat left the meeting at 11.49am

14. Wrap up discussion on items #8a-#8b

- 14.1. Members considered the Minister's and MBIE presentations and discussed what advice to provide to the Authority

John Kidd and Alan Young joined the meeting at 12.08pm

15. Enerlytica presentation – gas resilience (agenda item 10a)

- 15.1. The Chair introduced this item and welcomed the presenters.
- 15.2. The presentation and points of discussion included:
 - a) Despite opposing hydro trajectories compared to last year, we're in the same place with tight margins giving concern for this year and next year
 - b) Concern that over the last five years we've lost access to 200 Terajoules (TJ) of gas production per day, (the equivalent of 110 cargoes of coal) following a substantial wave of investment in upstream gas that has not produced expected results
 - c) 95% of New Zealand's gas comes from 6 mature fields, which are all off-plateau (Kupe and Pohokura since 2019) and have experienced average weighted depletion of 82%
 - d) Warm winters have suppressed demand. New Zealand, like the rest of the world, is favouring domestic gas consumption, due to supply chain issues, making Methanex a 'fulcrum', as it operates a single plant at 2/3 capacity out of its potential 3 plant operation
 - e) The impact 'wet' years have of dulling sensitivity in the market
 - f) Some gas plant is being operated differently to its purpose, reflecting tight capacity and inadequate investment
 - g) More gas storage needs to be added to the system and be available for electricity generation, cycling (making available) more than Ahuroa's 65 TJ per day.

- h) Methanex's gas usage is down from 250TJ per day to 70 TJ per day, reducing its ability to trade gas, regardless of commercial or other incentives
- i) Natural disasters are of major concern. While Cyclone Gabrielle had a comparatively light impact on the power system, a rupture in the Hikurangi fault could impact supply-side assets, causing far greater impact
- j) Some recent positives include a 'material discovery' by OMV at Maui East, albeit with a high concentration of CO₂, and potential optionality of running peaking plant on Methanol or LPG
- k) Liquefied Natural Gas (LNG) remains an alternative fuel. Power barges supplying LNG could feasibly provide 500 TJ per day (more than current NZ demand). LNG is currently trading below the spot price for gas internationally. However, there are inadequate import facilities currently available in New Zealand

Sarah Gillies and Alan Young left the meeting at 1.00pm

The meeting broke for lunch at 1.00pm

John Kidd left the meeting at 1.30pm

Andrew Marriott joined the meeting at 1.34pm

Sarah Gillies joined the meeting at 1.35pm

16. Authority presentation on security of supply, including thermal fuels (agenda item 10b)

- 16.1. The Chair introduced the presenter from the Authority's Market Policy Operations team. The presentation and discussion noted:
 - a) The initiatives the Authority put in place for winter have all been made permanent, including publication of residuals and wind forecasting information. These will be published on Transpower's EMS website
 - b) Some disclosure gaps include the expected volumes of gas and coal, which makes it difficult for the Authority and system operator. Gas regulation around disclosures is not as it is for electricity
 - c) Areas where more information disclosure could support security and reliability include current contracted volumes, forward contract volumes, and gas and coal storage volumes.
 - d) The reporting frequency and appropriate arrangements for event-based reporting need to be worked through, as does the mechanism to achieve this, such as an industry developed arrangement, 'Part 2 notice' or through Code amendment
 - e) 2023 showed good compliance with the new requirements, although it hasn't to date materially increased the amount of disclosure and timeliness and quality of disclosures are two issues. Further work is needed to determine whether or not a re-evaluation review is needed

- f) An outstanding recommendation from the Authority's wholesale market review in 2022/23 is for development of an access portal. This work will likely be progressed separately
- g) The Authority is developing a security of supply roadmap, which will set out more actions. The intent is to seek SRC input on a draft, when available
- h) A question for the SRC is what other matters relating to thermal fuels would the SRC like to see the Authority investigate

Andrew Marriott left the meeting at 2.05

Andy Knight, John Pagani and Dee Warring joined the meeting at 2.05pm

17. Gas Industry CO (GIC) presentation on gas resilience (agenda item 10c)

17.1. The Chair introduced the presenters from GIC.

17.2. The presentation and discussion noted:

- a) A market survey about 5 years ago showed a lack of investment and lack of long-term arrangements between the electricity and gas sectors we are now experiencing
- b) Gas can be available for electricity peaking, but electricity suppliers who benefit from standby availability do not always pay for the cost of holding gas in storage or demand response
- c) Development is driven by petrochemical demand. We are now in a period of de-industrialisation where companies are reducing their output due to a lack of raw fuel materials and some large consumers are unable to get new gas contracts
- d) Electricity prices are high as a result of generation availability, not necessarily gas supplies. Electricity peaking is the worst customer for gas in terms of being the highest cost to serve per gigajoule (GJ) consumer due to variability of demand
- e) Investment in LNG may reduce investment in existing gas fields
- f) GIC's view that residential gas should be the last thing out of the system, as it is a small part of the gas market but significantly impacts to reduce electricity peaks. LNG may be suitable for residential use, serving transport fleets
- g) Biogas needs cross-government support to work, as is the case in Germany where rules and subsidies for new builds support biogas uptake. The creation of bio-methane from biogas incurs an ETS charge reducing its viability
- h) Decommissioning reform is needed

Andy Knight, John Pagani and Dee Warring left the meeting at 2.40pm

Mike Underhill left the meeting at 2.41pm

Iwan Bridge joined the meeting at 2.42pm

18. Clarus presentation (agenda item 10d)

- 18.1. The Chair introduced the presenter from Clarus.
- 18.2. The presentation and discussion noted:
 - a) The gas transmission system experienced no outages or supply disruptions due to weather-related events; plans are in place to address known threats and build asset resiliency, for example through control system (SCADA) upgrades
 - b) Clarus' project to use biomethane in North Island's gas supply will be the largest project of its kind in Australasia and should see injection into the transmission system later this year
 - c) The significant costs of increasing storage combine with the challenges of shareholder appetite and regulatory policy

Iwan Bridge left the meeting at 2.50pm

19. OMV – presentation on upstream gas resilience (agenda item 10e)

- 19.1. The Chair introduced the presenters from OMV.
- 19.2. The presentation and discussion noted:
 - a) OMV is undertaking a strategic reset - reducing petroleum in its portfolio, and increasing its low carbon business (including geothermal) with the aim of net zero carbon emissions by 2050
 - b) OMV is in no rush to divest itself of its New Zealand assets. Its focus on sustaining deliverability, while preparing for decommissioning, has resulted in 80% of current output coming from wells drilled since 2020
 - c) Recent gas policy has created uncertainty, with the situation 'extremely challenging' without, for example, a Methanex driving investment
 - d) OMV continues to invest in existing fields at Pohokura and Maui
 - e) Decommissioning requirements have a material impact on the value of assets, with uncertainty about how it could affect the recent Maui East discovery

Iwan Bridge left the meeting at 3.22pm

Andrew Millar left the meeting at 3.22pm and returned at 3.27pm

20. Wrap up discussion on items #10a-#10e (agenda item 11)

- 20.1. Members considered the gas resilience presentations and discussed what advice to provide to the Authority.

21. Update from the Authority's monitoring team

- 21.1. In response to member discussion about recent warning notices from the system operator between 8-10 May, the secretariat invited the Authority monitoring team to join the meeting and provide an update.
- 21.2. A presentation from the Authority's monitoring team joined the meeting and discussed the notices and the interaction between sustained

instantaneous reserve (SIR) and prices, to support the SRC's understanding of the industry response that occurred

- 21.3. Initial analysis suggests SIR offers were low (or decreasing over time) in some predispach schedules which went on to have high spot prices, as generators were seeking to be dispatched as energy to cover their own exposure to the spot market. However, in real time there was at times insufficient reserve to cover the risk setter, so more expensive energy was dispatched which allowed the risk setter to ramp back, this lead to instances of high SIR and energy prices.
- 21.4. During peak, major industrial, residential and commercial load response provided an estimated 230MW of demand response, which was not compensated and led to much lower wholesale market prices
- 21.5. The Authority is investigating further and can provide further updates ahead of the SRC's next meeting.

Action 2: The secretariat to provide a copy of the Authority Monitoring team's presentation to members

22. The purpose and scope of next meeting's substantive papers (agenda item 12)

- 22.1. The Chair introduced this item, noting the major component of the August meeting is the SRC's annual risk and strategy session.
- 22.2. The Chair proposed having no external facilitator this year, instead having an Authority presentation on the security of supply roadmap, combined with a review of the SRC's risk radar to support prioritisation of the SRC's work programme and align the SRC's work with the Authority's strategic objectives
- 22.3. The SRC sees the benefits of this in providing insight for the Authority on its planning, its thinking and what it's leading to, as the roadmap framework is being developed
- 22.4. The Chair also sought member views on proposed papers for the SRC's Q3 2024 meeting.
- 22.5. To support this item and inform a forward-looking approach, the SRC sought a presentation or paper from the Authority on things the sector has experienced over the last five years, including 21 August 2021, solar storms, Cyclone Gabrielle, and peak capacity events.

Action 3: The secretariat to scope and arrange an Authority paper on key power system events over the past five years

23. The SRC's Forward Work Programme (agenda item 13)

- 23.1. The Chair noted this item and proposed for the secretariat and Chair to refine options for further discussion at the August meeting.

The meeting ended at 4.05pm

Please note the latest version of the SRC's risk radar over the page

Risk Radar – Cause and Effect (see key below for guidance)

Priority	Cause	Effect	Horizon	Comments
	Reduced gas supply	Reduced peaking and last resort generation	P	
	Insufficient collaboration	Increased costs, reduces reliability	P	
	Government policy misaligned with industry objectives	Reduced investment and confidence & reduced water for hydro output & reduced gas	P	
	Increased small scale DG	Network congestion	P	
	Weather events	Increased outages	P	
	Inadequate AUFLS	Blackouts	P	
	Cyber attack	Damages system assets	P	
	Physical attack	Damaged system assets	P	
	Pandemic	Reduced workforce, restricted travel	P	
	Less live work	Increased outages	P	
	Social media	Personnel/asset attacks	P	
	Natural disasters and fires	Damaged system assets	P	A resilience issue
	Delayed tree regulations	Increased outages	S	
	Regulator strategic priorities misaligned with industry objectives	Reduced investment and confidence	S	
	Commerce Commission regulations	Inhibits investment	S	
	Supply chain	Reduced goods/services	S	
	Dry Year	Increased prices and emissions & reduced market confidence and investment	S	
	Increased intermittency	Reduced capacity and flexibility at peaks	S	
	Poor extended reserve implementation	Increased blackouts	S	
	Fragmented government approach	Delays	S	
	Lack of thermal	Reduced capacity and flexibility	L	
	Demand increases outpace generation capacity increases	Causing outages	L	
	Inefficient market response	Insufficient generation	L	
	Early thermal exit	Reduced capacity and flexibility	L	
	Poor/unenforced standards	Reduced power quality	L	Through noncompliance
	Insufficient DER uptake	Network instability	L	
	Generation market misaligned with policy changes	Reduced capacity and flexibility	L	
	Ageing assets	Increased failures	L	
	Over-reliance on AI and automation	Reduced emergency human input	L	Inadequate response leading to outages
	Ageing/emigrating workforce	Reduced institutional knowledge and people available to plan, design and build	L	
	EV uptake	Undermined LV network stability	L	
	Stranded asset costs	Reduced network viability	L	
	Simultaneous asset replacement	Reduced asset availability	L	
	Low-risk approach by industry	High-cost and consumer disengagement		*
	Consumer disengagement	Inadequate demand response and peaking issues		*

Key	Symbol/colour	Meaning	Horizon	Meaning
	Red	High priority	P	Persistent risks – could happen any time
	Amber	Medium priority	S	Risks that can manifest anytime in approx. the next year
	Green	Lower priority	L	Risks that can manifest in approx. 1-5 years

*** Proposed new entries - Needs further discussion at May meeting**