Meeting Date: 20 June 2019

RISK AND STRATEGY

SECURITY AND RELIABILITY COUNCIL

This paper is to aid the Security and Reliability Council's (SRC) discussion of its strategic environment. It provides a framework for considering the SRC's strategic issues, sets out some discussion material, and includes an environment scan of current strategic issues.

Note: This paper has been prepared for the SRC. Content should not be interpreted as representing the views or policy of the Electricity Authority.

Background

The SRC's statutory function is to provide independent advice on the performance of the electricity system and the system operator, and reliability of supply issues.

The SRC Chair's 2019 survey of SRC members found that "establishing an agreed SRC strategy would help drive a work programme and agenda relevant to the SRC brief, ensure the SRC is fulfilling its role, and provide the Authority with more meaningful, actionable advice." It concluded that:

- once a year there should be an opportunity to discuss the current SRC work programme, explore emerging strategic issues, consider these in the context of the SRC role and develop an agreed SRC strategy
- such a SRC strategy session should be held in the near future.

Accordingly, this session has been scheduled. Two hours has been allocated for this session, and David Hunt of Concept Consulting will act as a facilitator for the discussion.

A strategic environment session was held in June 2018.[1] The scope overlapped somewhat with that of this session, but the focus in 2018 was more on the strategic environment and the SRC's own capabilities.

The SRC Chair's 2019 survey also highlighted:

- that the SRC may be too backward-looking, particularly given significant technology shifts and the transition to a low-carbon future
- that the SRC needs to be aware of emerging security and reliability issues systemic to other jurisdictions and/or unique to New Zealand.

The attached slides are to aid SRC discussion

To facilitate the SRC's discussion, the secretariat has developed the attached supporting material. It draws heavily on the strategic framework established in the June 2018 material, as many of the issues identified are still relevant.

The material has been refreshed to reflect significant developments:

- the Interim Climate Change Committee has reported to the Government (but the report is still unreleased)
- the Electricity Price Review has reported to the Government (report still unreleased, but the options paper proposed that the Electricity Authority ask the SRC to complete a thorough review of security, reliability and resilience within 12 months)
- the gas supply interruptions at Pohokura, highlighting dependencies on the gas sector and the importance of resilience
- the impact of new technology on the sector, which brings opportunities but may increase coordination challenges.

The material also reproduces the list of threats to security and reliability identified in the SRC member survey.

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[1] Available from https://www.ea.govt.nz/dmsdocument/23692-strategic-alignment-of-the-security-and-reliability-council

Although set out as a series of Powerpoint slides, the secretariat does not intend to verbally present that material in the meeting. Rather, the material provides a framework for considering the SRC's strategic issues and some material to spur discussion.

In advance of the meeting, the Chair asks that you review the slides and **consider the questions in slide 13**. This preparation will help ensure the SRC can get the most value from the session on the day.

The Chair anticipates the session will have three components:

- The SRC's role/function/purpose
- An environment scan for relevant risks and strategic considerations
- What should be done as a result of the session.

20 June 2019

STRATEGIC ENVIRONMENT

Discussion document

SECURITY AND RELIABILITY COUNCIL

SRC Secretariat

Origin of the SRC

There were ongoing security/reliability concerns in 2000-2008 due to sporadic shortages

Improving security/reliability was a key focus of 2010 electricity reform package – and one element of package was creation of the SRC

Australian Reliability Panel

The SRC was broadly modelled on the 'Reliability Panel', which advises the Australian Energy Market Commission

Functions and powers of the Reliability Panel are:

- to monitor, review and report on the safety, security and reliability of the national electricity system
- at the request of the Australian Energy Market Commission, to provide advice in relation to the safety, security and reliability of the national electricity system
- any other functions and powers conferred on it under law (such as giving advice in the 4 yearly reviews of reliability standards)

Panel comprises an Australian Energy Market Commission commissioner, and representatives of consumer interests, suppliers, networks and independent market operator (currently ten members)

The function of the SRC

Function

The function of the SRC is to "provide independent advice on the performance of the electricity system and the system operator, and reliability of supply issues". [Electricity Industry Act, s.20]

Scope of SRC role

The Authority may seek the SRC's advice on:

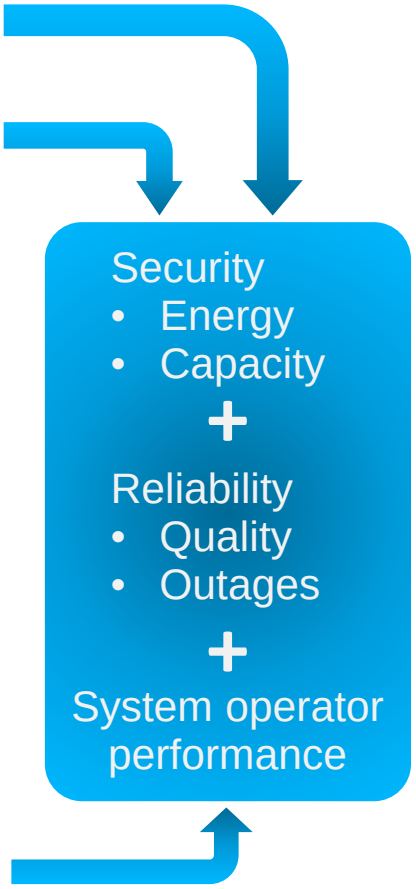
(a) the system operator's performance including against its PPOs, security of supply function and any other function important to the performance of the electricity system and/or to reliability of supply

(b) system operation issues, including industry development needs and priorities relating to system operations

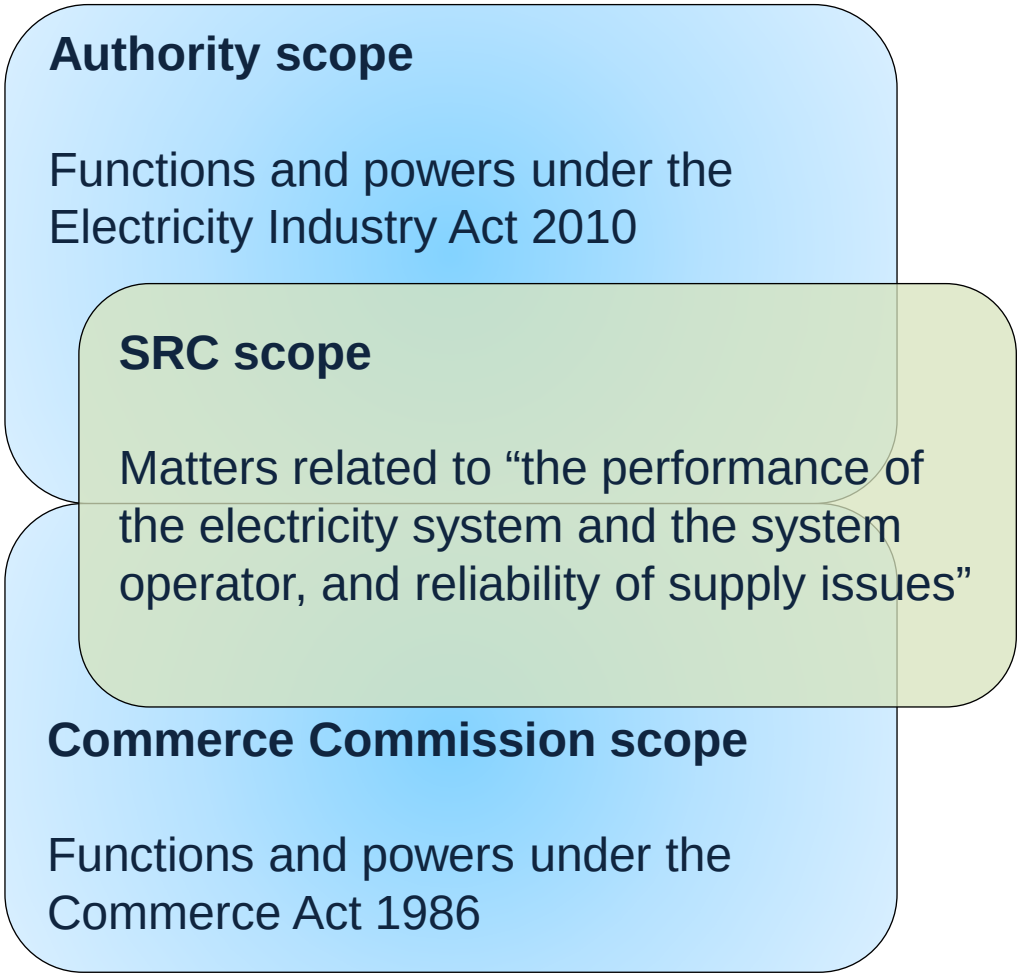
(c) security of supply issues, including system security assessments and security of supply forecasts

(d) reliability of supply issues, including planned and unplanned loss of supply and quality of supply issues

(e) any other matters that the Authority considers to be within the function of the SRC.



Scope of SRC advice



The SRC can (and should) provide advice on any security/reliability aspect of the electricity industry.

The Authority is the direct recipient of all SRC advice. Where advice is relevant to another party, the Authority passes that advice to the relevant party.

Key SRC strategic issues – environment scan *(prepared June 2018, but remains relevant)*

Security

Energy

- fuel supply risks (exposure to renewable shortages in dry years, gas, other fuels)
- access to emergency/contingent hydro storage
- changing mix of generation types (move towards even more renewable sources)
- government policy on gas exploration
- direct impact of climate change on inflows and demand

Capacity

- supply/demand forecasting uncertainty (eg load growth, thermal decommissioning)
- implications of electrification of the economy (eg EV and battery charging)
- transmission constraints (eg NI grid backbone with low UNI generation)

Reliability

Quality

- implications of emerging/disruptive technologies (batteries, PV, EV) on quality (voltage, harmonics, flicker etc)
- implications of electrification of the economy on power quality
- ancillary service performance
- changing consumer behaviour and expectations

Outages

- implications of emerging technologies on transmission/distribution co-ordination
- ancillary service performance
- performance of extended reserve regime (AUFLS)
- reliability of aging assets (generation, transmission, distribution)
- implications of growing interconnectedness on cyber security

System operator performance

Key SRC strategic issues – the landscape is changing

Two strategic themes identified in 2018 remain relevant:

Electrification of the economy, leading to:

- increasing dependence on electricity and therefore more significant consequences if there is a shortage or interruption
- likelihood of faster demand growth and associated investment needs
- potential challenges to capacity security from charging of EVs/batteries

Climate change developments, including:

- targeting increased renewable generation – much of which is non-controllable
- incentives/pressures on owners of thermal generation (social licence to operate, gas exploration law changes, use of coal etc)
- direct impacts of climate change on inflows and demand

Key SRC strategic issues – the landscape is changing (contd)

Key workstreams underway create potential for further change:

- Interim Climate Change Committee has recently reported to Government (report yet to be released):
  - tasked with advising on how New Zealand should transition to net zero emissions by 2050, including planning for the transition to 100% renewable electricity generation (in a normal hydro year) by 2035
- Electricity Price Review has reported to Government (report yet to be released)
  - options paper proposed Electricity Authority ask SRC to complete a thorough review of security, reliability and resilience within 12 months

Other key matters to consider:

- **Resilience** - flow-on effects to electricity sector from recent gas supply interruptions at Pohokura field highlight exposure to certain physical risks
- **Disaggregation** – new technology changing the sector – creates new opportunities but may increase coordination challenges - such as avoiding a new demand peak if many electric vehicles are recharged at same time

List of threats to security and reliability identified in the SRC member survey (1)

Significant threats to security and reliability of supply in the short term from a major system impact, and from multiple localised system impacts:

- traditional dry year
- other weather-related events (eg storm)
- N-security interruptions
- terrorism
- seismic interruption (eg earthquake on Alpine Fault or Hikurangi trench causing widespread disruption to transmission, distribution and generation)
- cyber security breaches
- thermal fuel shortages (eg gas)
- transition to a low emissions economy without considering the infrastructure/societal and market dynamics may result in major impact that causes intervention
- no debate on the economics v security trade off
- public panic or lack of information

List of threats to security and reliability identified in the SRC member survey (2)

Significant threats in the future, particularly those driven by new technology:

- change in general
- new technology can be both a threat and an opportunity (and/or part of the solution)
- poorly designed policies to achieve higher renewables (also a threat to affordability)
- inherent fluctuations in a system with high levels of renewables, especially if the country moves to 100% renewable
- cyber security
- extreme weather events
- a very decentralised system with very complicated interactions that aren't fully understood
- system complexity (the system is becoming increasingly difficult to understand)
- widespread use of non-compliant distributed energy technology
- focusing on the impacts of technology that will take decades to impact fully v the transitions around thermal fuels in the next ten years
- regional system outage where the people affected are unable to get power to address a life-threatening situation, or avoid long term economic damage

Risk management framework

- The SRC’s risk management framework has identified many topics for SRC attention
- Details are included in paper #12

Authority work relevant to the SRC

The Authority's work programme contains a number of key projects relevant to the strategic environment scan:

- Projects relevant to theme of increasing disaggregation
  - 'Additional consumer choice of electricity services', 'Participation of new generating technologies in the wholesale market', 'Enabling mass participation', etc
- Projects aimed at delivering better price signals, including for reliability
  - Transmission and distribution pricing reviews, real-time spot market pricing, extended reserves project
- Business-as-usual workstreams related to security and reliability

Other work relevant to the SRC

In preparing this presentation, we considered material from the following strategically significant documents:

- ENA's Network Transformation Roadmap www.ena.org.nz/dmsdocument/483
- Transpower's Te Mauri Hiko (https://www.transpower.co.nz/resources/te-mauri-hiko-energy-futures)
- The Authority's Strategic Directions (https://www.ea.govt.nz/about-us/corporate-projects/2013-2016-planning-and-reporting/development/strategic-directions-for-market-development)
- The Productivity Commission's Low Emissions Economy (https://www.productivity.govt.nz/sites/default/files/Productivity%20Commission_Low-emissions%20economy_Final%20Report_FINAL.pdf)
- BusinessNZ Council's BEC20250 scenarios (https://www.bec.org.nz/our-work/scenarios/bec2050)
- Electricity Price Review options paper www.mbie.govt.nz/dmsdocument/4578-electricity-price-review-options-paper

Preparation before the meeting

To get the most out of the session, ***we ask that you come prepared to answer the following questions***:

1. What do you think is the role and function of the SRC?
2. If the SRC is performing its role successfully, how will we know?
3. How can the SRC be most useful to industry stakeholders?

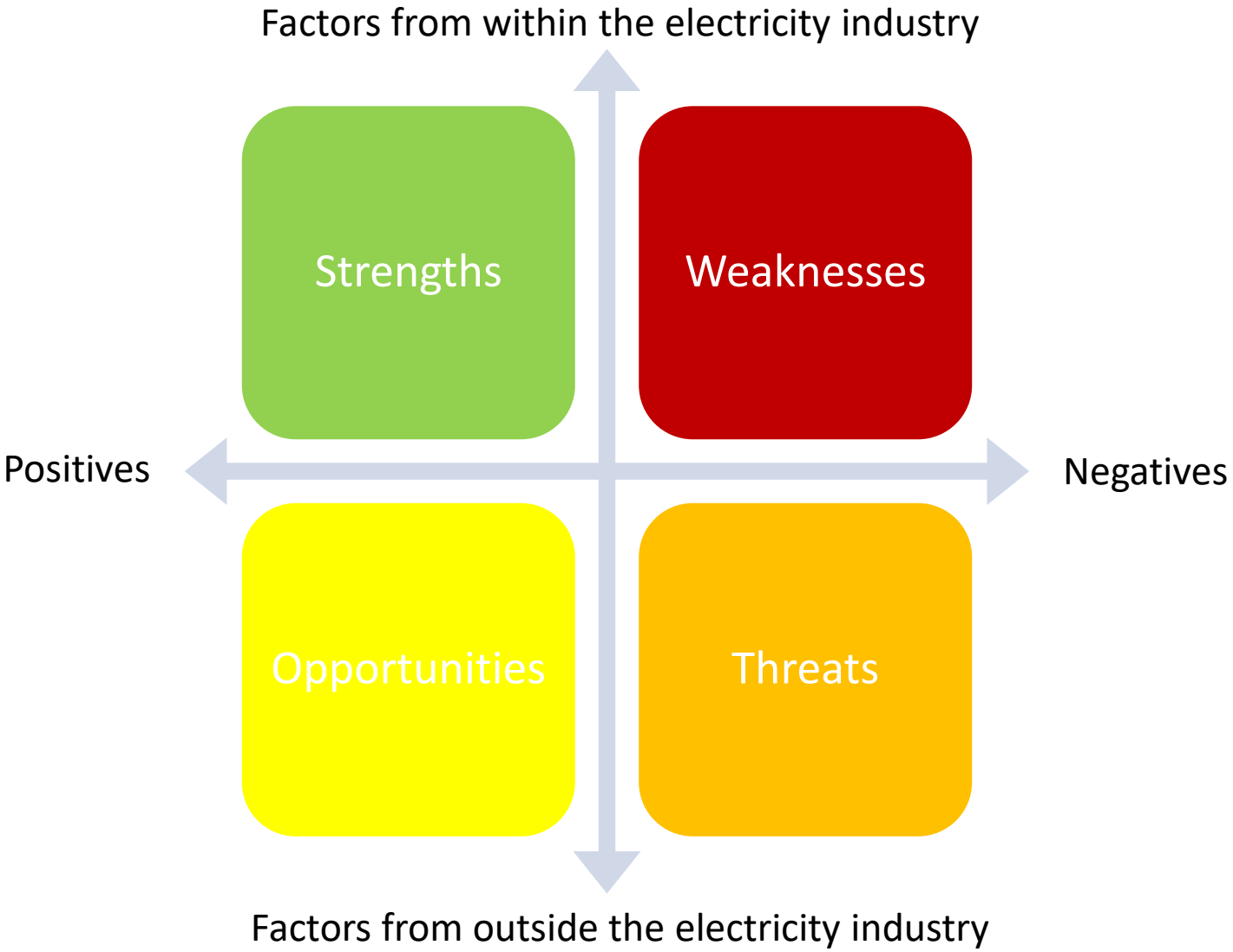
We will also divide into two sub-groups for a short break-out session – with one group compiling a SWOT analysis and the other a PEST analysis for the electricity system

We ask that you come prepared with the key issues you believe should feed into a SWOT/PEST analysis (suggested templates on following slides)

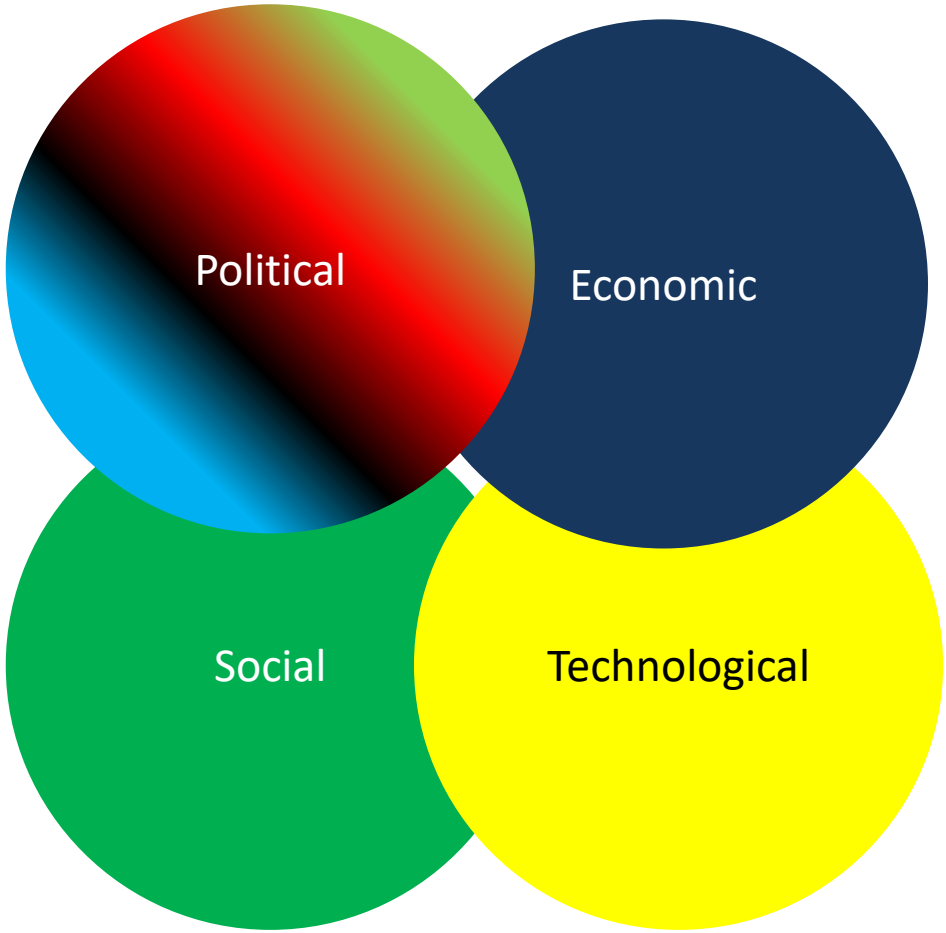
Strengths, Weaknesses, Opportunities, Threats – Barbara Elliston, Vince Hawksworth, Tracey Hickman, Heather Roy, Nathan Strong

Political, Economic, Social, Technology – Anne Herrington, Greg Skelton, Bruce Turner, Guy Waipara

Sample SWOT template



Sample PEST template



Actions arising from the discussion

Following a thorough exploration of the SRC's role and the strategic environment, the SRC needs to ask 'so what?'

- What should the SRC be doing differently as a result?
- What should industry stakeholders be doing differently as a result?

The SRC should consider how to capture the insights of its discussion. For example:

- The SRC could develop an internally-focussed strategic plan with principles that guide its secretariat to provide relevant papers
- The SRC could develop a multi-year work programme setting out the papers it expects from its secretariat
- The SRC could develop stakeholder-focussed strategic directions to provoke industry discussion and guide stakeholder priorities (such as the Electricity Authority's strategy)