

Short term Within 1 year	Medium term Within 5 years	Long term More than 5 years	Persistent Could arise at any time
<p>S1: COVID-19 coronavirus harms industry's:</p> <ul style="list-style-type: none"> a) personnel capability/travel. b) availability and increased prices of imported goods/services. c) general level of preparedness and responsiveness for managing incidents, with the transition from elimination to "living with COVID" and the potential impact on critical industry plant such as generating stations and control rooms; and the ability to get enough critical expertise into the country with the aggregate impacts of COVID, a growing economy and big investments. 	<p>M1: <u>Inefficient</u> Market response to significant industrial demand reductions (<u>eg Tiwai exit</u>).</p>	<p>L1: the risk of a growing disconnect between energy and capacity issues <u>due to more intermittent renewables (without adequate firming)</u> causing <u>ing more</u> regular <u>industry</u> disruption and <u>could result in unplanned outages (eg 9 August 2021)</u> becoming critical.</p>	<p>P1: Cyber-attack damages power system assets and/or cuts supply, for example Waikato DHB and Colonial Pipeline (both 2021).</p>
<p>S2: Risk of lack of preparedness for the second <u>the next wave</u> of COVID-19 causing further economic hardship (with consequent impact on potential reduction in maintenance).</p>	<p>M2: <u>Continued delay to the</u> Review of 'Tree Regs' fails to capture <u>increases risk of damage and blackouts due to tree interference with</u></p>		<p>P2: Gas supply running down (in part due to exploration uncertainty) reduces generation adequacy and availability</p>

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	lines potential to boost reliability.		P2P3 : Physical attack (war, terrorism, sabotage, <u>and political unrest/protest</u>) damages power system assets and/or cuts supply.
S3: Generator investor incentives weakened due to uncertainty, for example, arising from Tiwai closure and central government investigation into solutions to dry-year risk such as pumped hydro storage.	M3: <u>Aspirational</u> Government setting of carbon goals <u>leading to early thermal exit potentially causing reduced reliability and security of supply.</u>	L3: Ageing and/or under-invested generation, <u>distribution</u> . and transmission assets lead to increased failures.	P 43 : Natural disaster damages power system assets and/or cuts supply.
S4: Black out risk rises if <u>the transition from the current two-block to a four-block</u> extended reserve scheme <u>is</u> delayed/poorly implemented.	M4: <u>Lack of</u> T thermal generation (Huntly, Taranaki - both) <u>existence and availability</u> <u>for its firming role</u> adversely affecting back-up supply <u>reliability and security.</u>	L4: The increasing dependence on <u>artificial intelligence (AI)</u> and automation reduces the industry's ability to deal with unusual and unexpected critical issues (in real time or to quickly recover)	P 54 : National or international pandemic harms access to: a) the availability of imported goods/services b) international specialists and reduces ability for work crews to travel domestically.
S5: Reduced output from hydro due to <u>changes in generation output arising from the</u> National Policy Statement on freshwater management.	M5: Poor standards governance <u>and enforcement</u> permits inadequate standards and/or significant non-compliance of	L5: Undersized generation fleet due to demand growth from greater electrification <u>(without adequate demand response)</u>	P 65 : <u>Insufficient</u> information sharing and planning amongst industry participants in relation to reliability of supply risks <u>increases</u>

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	equipment against standards.	<u>exceeds generation capacity causing unplanned outages.</u>	<u>costs and reduces reliability.</u>
S6: <u>Reduction in investment confidence due to</u> <u>Uncertainty about how Electricity Price Review conclusions and other Government policy interventions (eg Onslow pumped hydro)</u> will be implemented.	M6: <u>Increased peak demand on some LV networks from electric vehicles causes localised supply outages and potential network damage and unnecessary network investment.</u>		P76: Changes in industry live line and supply restoration operating guidelines, for example continued reluctance to use live line techniques for suitable work, lead to reduced supply reliability performance through increased planned outages.
S7: <u>Unsignalled or quickly changing</u> <u>Changing</u> strategic priorities of the regulator increases investment uncertainty for industry participants.	M7: Commerce Commission's regulatory control period #3 (<u>April 2020-March 2025</u>) impacts on reliability and asset health <u>by inhibiting investment.</u>	L6: Loss of industry knowledge and capability through an aging workforce <u>and younger people moving overseas.</u>	P87: AUFLS is not set per the current Code requirements <u>potentially causing blackouts if AUFLS does not arrest frequency drop.</u>
S8: Unreliable social media commentary impacting on assets or personnel in the industry (e.g. critical comments inciting physical attacks on repair personnel, equipment or thermal fuel deliveries).	M8: <u>Generation market structure not aligning with or reacting to physical structural change, reducing investment incentives, e.g. pumped hydro, thermal decommissioning, and the transition</u>	L7: Reliability treated less like a public good as new technology makes it more customisable <u>and left to individual response, which causes an unstable system if individuals don't take up DER.</u>	P98: LV network congestion, due to rapid increase in small scale distributed generation, <u>increasing likelihood of network damage and unplanned outages.</u>

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S9: <u>The prospect of Dry winter / official conservation campaign increasing prices and carbon emissions through increased thermal generation and as the risk becomes realised there is likely to be supply reductions both voluntary and mandatory.</u>		L8: Generation market structure not reacting to physical structural change, reducing investment incentives, e.g. pumped hydro, thermal decommissioning, and the transition to 100% renewables	P109: <u>Unplanned gas supply interruption</u> Availability of obtaining sufficient gas supply may limit gas fired thermals' ability to generate.
S10: m Market confidence could be affected-reduced by the pain from high prices and security of supply (dry year) <u>causing regulatory intervention</u> impacting on investor's willingness to invest long in -term <u>in</u> assets for de-carbonisation.	M9: Impact of increased climate and weather-related <u>events causes an increase in severity and frequency of network and transmission</u> outages.	L9: the risk of stranded assets increasing the cost for those left using them (the "death spiral") becoming increasingly apparent <u>making networks commercially unviable.</u>	