



AUSTRALIAN  
INDUSTRY  
STANDARDS

# ESI GENERATION DISCUSSION STARTER







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This discussion paper has been developed as part of consultations to guide the ESI Generation Industry Reference Committee (ESI Generation IRC) in planning upcoming activities.

The ESI Generation IRC is the voice of industry in the development and maintenance of nationally recognised vocational qualifications and skills standards. IRCs ensure that priority skills needs are identified and provide a forum for industry engagement. This work includes an analysis of trends, challenges and opportunities across the industry, and subsequent identification of skills solutions that meet the needs of employers and the workforce are contemporary and future focused.

With representatives from small, medium, and large enterprises, unions, industry regulators and peak bodies, IRC members have experience, skills and knowledge of their particular industry sector. They are supported by independent Skills Service Organisations – like Australian Industry Standards (AIS), that support their important work.



## DOUBLE DISRUPTORS: COVID-19 AND DIGITAL TRANSFORMATION

The sector is currently experiencing a double disruption, with the COVID-19 pandemic causing unprecedented changes in every element of work and dramatically accelerating the pace of digital transformation that was already well underway. As a primary driver of productivity and as a prerequisite to meeting constant changes to consumer behaviour, Digital Transformation will be central to the recovery of the Australian economy.

Now more than ever it is important the IRC works closely with stakeholders to ensure qualifications remain contemporary and meet the requirements of employers whilst providing flexibility for workforce participants.







## DISCUSSION QUESTIONS

AIS has worked with the ESI Generation IRC to identify priority skills needs and develop solutions for how these may be addressed through the national training system; these are **outlined in Table 1**. The following discussion questions have been designed to improve understanding of the skills needs facing the ESI Generation sector and feedback was sought from stakeholders via a survey. Please **contact our skills team** if you would like to discuss or find out further information.

1. Do the skills needs identified in Table 1 broadly reflect your understanding of the needs facing **the sector**? If not, what are the skills needs facing the sector?
2. Are there other skills that will assist with recovery of **the sector**?
3. Will the proposed solutions in Table 1 address skills needs in **your organisation**? If not, how can the VET system better meet the skills needs of your organisation?
4. Are there emerging job roles or skills needs that are not currently or sufficiently met through the VET system?



## TABLE 1 - INDUSTRY ISSUES & FUTURE WORKFORCE NEEDS

<b>INDUSTRY ISSUE</b> <i>Summary of current and emerging industry trends</i>	<b>FORECAST WORKFORCE NEED</b> <i>How the industry issue will likely impact on workforce need</i>	<b>PROPOSED IRC FOCUS</b> <i>How the IRC will work with industry to address the workforce need</i>
<p><b>COVID-19, Renewables, and New Control Systems</b></p> <p>The pandemic has severely impacted the Australian economy, but investments in renewables can assist in jumpstarting the economic recovery. The Renewable sector has the potential to <b>employ</b> over 44,000 by 2025 and with the right policy settings, regional areas are poised to benefit the most with potentially about 70 per cent of these jobs being located in regional areas. The energy sector's <b>transition</b> to renewables is among the top five key shifts in the Australian economy. One source of renewable energy is <b>hydropower</b> including technologies such as pumped hydro – which pumps water from a storage reservoir at a lower elevation to a storage reservoir at a higher elevation, before releasing it through turbines to generate electricity. Hydro <b>accounted for</b> 31 per cent of renewable energy generation (6 per cent of total electricity generation) in 2018-19. Other approaches such as, offshore Wind farms, solar panels and <b>virtual power plants</b> (cloud-based power plants) are transforming the electricity grid and its operations. The diversification of electricity generation is making Australia less reliant on coal to produce electricity. Ten of Australia's coal plants have already <b>shut down</b> and by 2030 about 55 per cent of the existing coal plants will be over 40 years old.</p>	<p>The transition to renewable energy has led to changes in the skills requirements of workers and a growing need for workforce mobility across the generation industry. The workforce needs to be upskilled and retrained in the operation and maintenance of existing and emerging renewable technologies, and be able to adapt to new systems and processes. There is an opportunity for some sectors to transition workers from fossil fuels to renewables.</p> <p>A new generation of energy operators working with new energy generation approaches will require a range of new skills that vary depending on the method of generation.</p>	<ul style="list-style-type: none"> <li>• <b>Control Centre Operations:</b> The IRC is proposing to develop four new Units of Competency and three Skill Sets to address skills requirements for control room operations relating to power generation in both fossil fuels and renewable energies, encompassing automated control systems. Units will include: Operate and monitor hydro plant/systems; Co-ordinate grid operations control centre; Operate and monitor multi-control room site; Operate Renewable Wind, Solar and Hydro systems. New Skill Sets include: Managing site outages; Co-ordinate real-time offshore operations; and Managing network communications.</li> <li>• <b>Fossil Fuel to Renewable:</b> The Generation IRC is investigating the need for developing new Units of Competency and Skill Sets to provide specific knowledge for those operators in fossil fuel generation transitioning to the renewable energy generation. These skills would enable operators to transition across fossil and renewable sectors.</li> </ul>



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		<ul style="list-style-type: none"> <li>• <b>Wind Power Generation:</b> The IRC is revising the Certificate IV in Large Scale Wind Generation – Electrical and associated Units of Competency to align with new technologies and current work practices.</li> </ul>
<p><b>Automation and Digital Technologies</b></p> <p>The ESI Generation industry is increasing its use of <b>automation</b> and digitalisation. Sensors and digital devices are being deployed to <b>diagnose</b> issues and optimise operations. Installation of such equipment highlights the role of data analytics and digital literacy. Digital innovations <b>provide</b> real-time information about electricity consumption, potential power outages and fault identification. Insights provided by data analytics and AI can also <b>improve</b> decision making processes in the energy generation sector.</p> <p>Australia's energy supply involves increasing integration of renewable sources such as wind and solar where intelligence systems can play a key <b>role</b> in orchestrating and managing the integration of energy from renewable sources into the grid.</p>	<p>The widespread implementation of digital and automatic systems has had a significant impact on the ESI Generation industry and its workforce. Upskilling the current and future workforce will be essential to meet new skill demands.</p>	<ul style="list-style-type: none"> <li>• <b>Operation Personnel:</b> The IRC is currently revising seven qualifications to address changes in the generation industry, including the move to renewable energy power generation, increasing automation of power generation control systems, and data analytics.</li> </ul>



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<p><b>Remote Area Service and Microgrids</b></p> <p>Renewables sources such as wind and solar energy as well as battery storage technology can help in addressing this challenge. One solution being implemented in Australia is via <b>microgrids</b>, defined as autonomous/isolated grids (remote power systems), or hybrid generation systems which are small scale and can either operate independently or be connected to the main grid. Microgrids can be installed in remote communities to enhance electricity grid resilience and reliability.</p>	<p>As microgrids are becoming more reliant on renewable energies and new technologies, the workforce will require new skills to support ongoing power generation maintenance and repair, emergency technical response (generation plant breakdowns), and ongoing monitoring and reporting of remote power generation installations.</p>	<ul style="list-style-type: none"> <li>• <b>Remote Area Essential Service:</b> The IRC is currently updating the Certificate II in remote area essential service to include new power generation technology skills and provide clear vocational pathways to enhance employment opportunities for remote areas communities.</li> </ul>





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<p><b>Industry-Specific Cybersecurity</b></p> <p>The Generation industry is transforming its operational technology environments, relying increasingly on automation and digital technologies. Cloud-based systems, and Industrial Control Systems (ICS) such as supervisory control and data acquisition (SCADA) are becoming more vulnerable to cyber threats. New digital systems also engage in data sharing and organisations need to handle information securely.</p>	<p>The industry needs to have a robust cyber security strategy and build industry-specific cyber security awareness and training to bridge the gap in developing appropriate cyber security skills for managing industrial control systems.</p> <p>The workforce requires skills to:</p> <ol style="list-style-type: none"> <li>minimise the risk of cyber attacks; and</li> <li>reinstate digital businesses systems as quickly as possible in the event of a cybersecurity incident – including compliance with regulatory requirements.</li> </ol>	<ul style="list-style-type: none"> <li>The IRC will monitor the Skill Sets developed by other IRCs, as well as the work of the new Digital Skills Organisation (SO) pilot. Any suitable identified Skill Sets will be contextualised for use in the Generation Training Package.</li> </ul>



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<p><b>Environmental Impact</b></p> <p>Australia has committed to <b>reducing</b> its CO2 emissions to 26-28% below 2005 levels by 2030. The Electricity sector accounts for 33% of Australia's total emission. Further integration of solar panels, battery storage, and wind generation technologies can play a significant role in reducing the industry's carbon footprint. Energy Networks Australia and the CSIRO <b>predict</b> more than 40% of industrial customers will use renewable technologies by 2027, lifting to 60% in the next 30 years. With the <b>expected</b> retirement of several coal generation plants, green energy sources and methods will improve the efficiency of electricity generation. Methods and technologies such as Carbon Capture and Storage, battery storage, and demand management will be key in reducing electricity generation emissions.</p>	<p>The workforce needs to be skilled in the implementation, operation, and maintenance of renewables technologies to facilitate the transition between fossil fuels to renewables. Workers are also required to be aware of the latest regulatory and compliance issues regarding these technologies.</p>	<ul style="list-style-type: none"> <li>The IRC will continue to engage with stakeholders and regulators to review the currency of existing qualifications, Units of Competency and Skill Sets.</li> </ul>