## SUMMARY

The Electrotechnology Industry Reference Committee (IRC) Skills Forecast identifies the priority skill needs of the Electrotechnology industry following research and stakeholder consultation.

The IRC, made up of industry leaders and experts, acts as a conduit between the Electrotechnology industry and the Australian Industry and Skills Committee (AISC). It proposes Training Package development work to ensure that skills standards and qualifications are contemporary, as well as future focused, to meet the skill needs of industry.

INDUSTRY TRENDS AND OVERVIEW

The Electrotechnology industry is an $89.47 billion revenue industry employing over 352,000 people. The industry includes the design, maintenance, installation and repair for all electrical and electronic equipment. The technology stretches across many sectors including mining, manufacturing, communications, construction, renewables, domestic and commercial refrigeration and air-conditioning. The Electrical Services industry (a subsector within Electrotechnology) involves electrical wiring or fittings in buildings and other construction projects, and repair and maintenance of existing electrical equipment and fixtures.
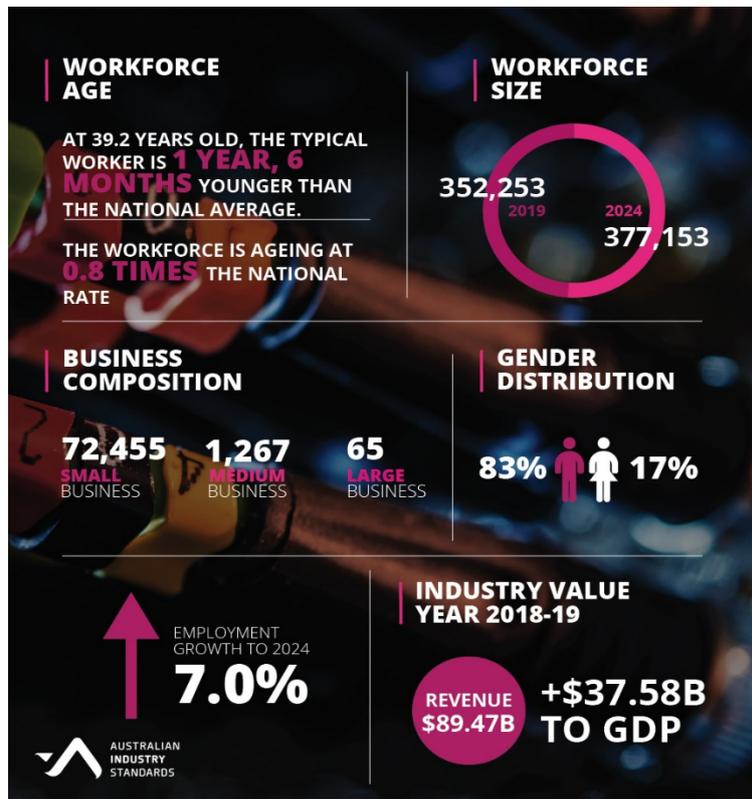
INDUSTRY CHALLENGES AND OPPORTUNITIES

Industries across the world are experiencing rapid changes in their daily operations, accelerated by technological innovation. Technological advances will provide challenges and opportunities to the Electrotechnology industry, with the merging of traditional industry sectors and new industry subsectors.

TECHNOLOGICAL CHANGES

Technological innovations will transform the way industries manage, supply, and regulate their operations. More and more Australians are using automated and smart systems such as security systems, smart lighting, heating and air conditioning, and camera systems in their homes. Technology has enabled these systems to communicate with one another across an Integrated Communications Network (ICN) that can be monitored and controlled remotely via a cell phone. These new technologies allow consumers to conserve energy and automate the use of certain home appliances. From tailored Programmable Logic Controller (PLC) programming to Supervisory Control and Data Acquisition (SCADA) systems, industrial process automation services and devices are now commonplace.

NEW ELECTRONICS AND COMPUTER SYSTEMS

Electronics and computer technology form the backbone of automated systems and smart devices. Many appliances and equipment at home are embedded with electronics which allow them to be controlled automatically and remotely with the help of radio frequency (RF) communication systems and wireless technology. The Internet of Things (IoT) is also opening up new frontiers. The IoT relies on computer technology and RF communication systems such as RoLa Wan, Wi-Fi, Z-Wave, Near Field Communications (NFC), Bluetooth, etc. Such communication systems are also employed in Autonomous Vehicles (AV), embedded with sensors that enable them to communicate with other vehicles (vehicle-to-vehicle, V2V) and with infrastructure (Vehicle-to-Infrastructure, V2I). All these technologies are enabled by electronics, computer, and communication systems which are continually evolving.

SILICOSIS AND WHS CONCERNS

Installation, maintenance, and repair of electrical wiring, equipment, and fixtures can involve tasks that generate dusts which may have a harmful effect when inhaled. Activities that might put electricians at risk of such hazardous exposures include drilling, riveting, and examining electrical fixtures and appliances such as fuse boxes, generators and electrical control systems. When drilling and riveting into materials such as concrete, a fine dust is produced which contains a chemical compound called silica. When inhaled, silica can cause a dangerous dust lung disease called silicosis or even lung cancer. Safe Work Australia is currently evaluating the 'Workplace Exposure Standards for Airborne Contaminants' to ensure they are based on the highest quality

evidence and supported by a rigorous scientific approach. The industry has made commendable efforts through training workshops to raise awareness regarding silica hazards.

SUSTAINABILITY AND HFC PHASE-DOWN

Globally, there is an increasing trend to reduce emissions and pollution as agreed to in the Paris Climate Agreement. Technologies such as solar photovoltaics (PV) panels are well suited to minimise electricity use in commercial and domestic buildings. PV-driven solar cooling and heating systems can achieve greater energy efficiency than current air-conditioning systems. The Government also started to phase down the implementation of hydrofluorocarbons (HFCs) on 1 January 2018 to reduce HFC emission by 85 per cent by 2036. HFCs are synthetic greenhouse gases that are primarily used in refrigeration and air-conditioning equipment. The phasedown has urged the industry to look for alternative refrigerants with a low Global Warming Potential (GWP) such as ammonia or carbon dioxide, known as natural refrigerants. While these gases are more 'ecofriendly', they may also be more flammable or more toxic to humans and operate at higher pressures.

INDUSTRY-SPECIFIC CYBER SECURITY

Cyberattacks are a common risk to many industries including the Electrotechnology sector. The unique nature of Electrotechnology technologies and innovations such as Big Data, IoT, and automation generates large amounts of data which can expose the industry to growing cyber security risks. It is therefore imperative to have a tailored cyber security training program to give the workforce the skills and competencies to be able to identify, block or remediate against any malicious cyberattacks.

DIGITAL LITERACY

Advancements in Artificial Intelligence, computer technology, automation, the Internet of Things, cloud computing, big data, and customer-service platforms are generating a massive volume of data and information, offering a range of benefits such as improved customer service and operational efficiency. Demand for analytical skills, digital literacy, and information management will continue to rise, making digital literacy one of the most significant areas for the new and existing workforce.

AGEING WORKFORCE

While the average age of workers in the Electrotechnology industry is 39, about 24 per cent of the workforce is aged over 50. The ageing workforce presents a considerable challenge to the industry. The loss of key skills and industry knowledge created by retiring workers will put strain on the workforce and further increase competition with other industries for employees. The loss of experience and corporate knowledge will

further strain the workforce. Mentoring and other knowledge-sharing initiatives could be utilised in training to maintain corporate and industry knowledge.

SKILLS RELATED INSIGHTS AND OUTLOOK

Nearly 76.9 per cent of respondents reported experiencing a skills shortage in the last 12 months. The occupations reported as being in shortage were: educators/trainers/assessors, electricians, refrigeration/air conditioning technicians, engineers, and appliance repair. The Electrotechnology industry employers identified the following reasons for the shortage:

1. Ageing workforce / current staff retiring
2. Cost/time to achieve the required qualification
3. Competition from other organisations
4. Wages/salaries considered too low
5. Geographic location of the vacancy

UEE 11 ELECTROTECHNOLOGY TRAINING PACKAGE

The UEE/UEE11 Electrotechnology Training Package provides the only nationally recognised Vocational Education and Training (VET) qualifications for occupations involved in electronics, electrical, communications, control systems, instrumentation, lifts, refrigeration and air conditioning, renewable/sustainable energy, fire and security, appliances, gaming and rail signalling. The UEE/UEE11 Electrotechnology Training Package comprises 87 qualifications, 75 Skill Sets, and 614 Units of Competency and associated assessment requirements and covers electrotechnology, electrical, electronics, hazardous areas, instrumentation, rail signalling, refrigeration and air-conditioning, renewable and sustainable energy.

TRAINING PACKAGE REVIEW AND DEVELOPMENT – PRIORITY WORK

*The following projects were proposed and submitted to Australian Industry and Skills Commission for consideration on 30 April 2019.

2019-20 REFRIGERATION AND AIR-CONDITIONING – DEVELOPMENT

This project will develop one new Unit of Competency and one new Skill Set for technicians that addresses the air handling requirements for fire and smoke control, including maintenance of essential services, relevant standards and regulations, Fire dampers, testing and commissioning, and certification.

The full Electrotechnology IRC Skills Forecast can be accessed at:
https://www.australianindustrystandards.org.au/industry-reference-committee-irc-skills-forecasts-2019/

AUSTRALIAN INDUSTRY STANDARDS

Australian Industry Standards (AIS) is a Government appointed Skills Service Organisation (SSO) that partners with industry to shape the workforce of the future through the development of skills standards.

We work under the direction of Industry Reference Committees that represent the following sectors: aviation, transport and logistics, maritime, energy, water and utilities, public safety, police, fire, defence and corrections. Together, these industries keep Australia productive, powered and secure.

AIS supports IRCs through industry engagement, research and analysis to prioritise the skill needs of their industry. We help to develop contemporary, future focused and world class qualifications for the workforce, create career pathways, and support industry growth and productivity.

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AUSTRALIAN INDUSTRY STANDARDS

Australian Government

Department of Employment, Skills, Small and Family Business