Tomorrow's Trades to Power Australia's Future

Skills Shortfall Policy Document

August 2022

CLEAN ENERGY COUNCIL

national electrical and communicatic association

SMART ENERGY COUNCIL

ETU Electrical Trades Union

MASTER ELECTRICIANS AUSTRALIA

Rewiring Australia

Tomorrow's Trades to Power Australia's Future

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Executive Summary

Australia's future is bright, but only if we have the workforce to light it.

The Energy Transition is in full swing, from renewable energy constituting a third of electricity generation to EV and PHEV sales each increasing by well over 100% year on year. But already our workforce is in crisis – with skills shortages rife across critical trades and occupations and persistent gaps in the labour market only widening.

We need a plan to combat these chronic skills shortages, a plan to train the workforce that will deliver our energy future, a plan that maximises the benefits of the energy future for all Australians.

To this end, key industry stakeholders have united to develop this Powering Australia Skills Plan. This Plan focuses in particular on vocational education, but in no way derogates from the breadth of the challenge and the need for the development of similar strategies in the university sector. This Plan is critical not only for delivering our energy future, but promotes the good job agenda that is critical for maintaining Powering Australia's social licence.

The Australian Government has an ambitious program to "to create jobs, cut power bills and reduce emissions", which will:

- Reduce emissions by 43% by 2030
- Increase renewable energy generation to 82% of overall demand
- Expedite the "electrification of everything", with the rise and rise of electric vehicles, home batteries, electric home heating and cooking
- Create 63,000 Powering Australia jobs, and facilitate the creation of a further 604,000 jobs across the economy
- Directly support 10,000 energy apprenticeships
- Deliver $76 billion in overall investment, including $20 billion in Federal Government investment in grid infrastructure
- See the creation of solar banks and community batteries around the country

Powering Australia is as our Nation's greatest challenge. A challenge that presents great opportunity for broad cross sections of our country if lessons from the past are learnt. The challenge, however, is to overcome some significant barriers to success.

The challenges before us include:

- Unprecedented labour shortages, demands and competition both internally and externally to the sector
- A VET system in crisis, with chronic underfunding of high-cost training
- Declining apprentice completion rates, driven in no small part by the failure of the Australian Apprenticeship Support Network model
- A chronically underfunded transmission network that is already unable to fully integrate renewables
- A degrading distribution network that was never built to be a "two-way street" and is wholly unprepared for a dramatic uptake in EVs and home batteries
- Millions of homes and workplaces with decaying wiring that will need replacement
- Nationwide, simultaneous, capital-intensive projects that will deliver long term benefit to regional and rural communities if planning and procurement processes are based on best practice and not lowest price.
- Millions of rooftop solar systems that are partially or fully curtailed from exporting into the grid

Meeting the workforce challenges that arise from the program of work this presents is fundamental not only for delivering Australia's energy future, but for the creation of good jobs throughout the country: jobs that are key for creating the social licence to truly end the climate wars.

Delivering the workforce we need requires a dedicated Powering Australia VET plan. A plan that includes:

- A Powering Australia Skills Cluster that is laser-focused on responding to the sector's rapidly changing skills needs
- A Powering Australia Apprenticeship Support Network that, through mentoring and supporting apprentices, actively works to drive up completion rates
- Dedicated funding for Powering Australia RTOs, including dedicated industry-led Skills Centres, which are equipped to train apprentices with 21st Century technology
- Integrating improvements in attraction and retention of apprentices and trainees, especially non-traditional industry participants such as women, First Nations, and CALD workers.
- Ensuring workforce mobility with nationally consistent training and licensing whilst presenting opportunity for workers who need / want to reskill by making sure the alternative pathways to achieve a just transition in affected industries or regions are available and accessible.
- Becoming a "Nation of Excellence" whereby migrating overseas tradespeople are supported to achieve the same level of technical expertise and focus of the Powering Australia sector and that supplements Australia reputation as a safe and inclusive multicultural society.

Acronyms

EV
Electric Vehicle

PHEV
Plug-in Hybrid Electric Vehicle

PV Cells
Photovoltaic cells (i.e. solar cells)

SEC
Smart Energy Council

AASN
Australian Apprenticeship Support Network

RTO
Registered Training Organisation (e.g. TAFEs)

GTO
Group Training Organisation

REZ
Renewable Energy Zone

AEMO
Australian Energy Market Operator

Strategic Drivers

The Albanese Government's current target of reducing emission in Australia by 43% by 2030 is an ambitious plan that will require our Nation to pull together to achieve it. In addition to the planned emission reductions, the Government has committed to significantly upgrading transmission infrastructure, invest in solar banks and install 400 community batteries to achieve renewables comprising 82% of power generation in Australia's national electricity market by 2030, instead of 68% under the current projections.

These projects are occurring in the context of:

- A rapid rise in electric vehicle uptake;
- A shift to green hydrogen, requiring renewal of the gas network on an as yet undetermined scale;
- An increase in the electrification of home heating and cooking; and
- A distribution network which is unequipped for the role which electric vehicles, small-scale renewables, and battery technology is going to play in powering the Grid.

The above trends may not fall within the traditional DNSP/TNSP/generation framework, but let us be clear: from the power point to the pylon, from the solar farm to the electric sedan, it is the one Powering Australia workforce. A failure to plan on this basis is, in truth, planning to fail.

Whilst the above targets are simple to articulate there is an enormous flow on effect and a mammoth task that lays ahead for the Nation. We understand that no one party can achieve this, it will take a combination of government (at all levels), unions, employers (both private and public), investors, and employees to work together and to identify, evaluate, and evolve Powering Australia into a platform for national success.

Supply and Demand Analysis

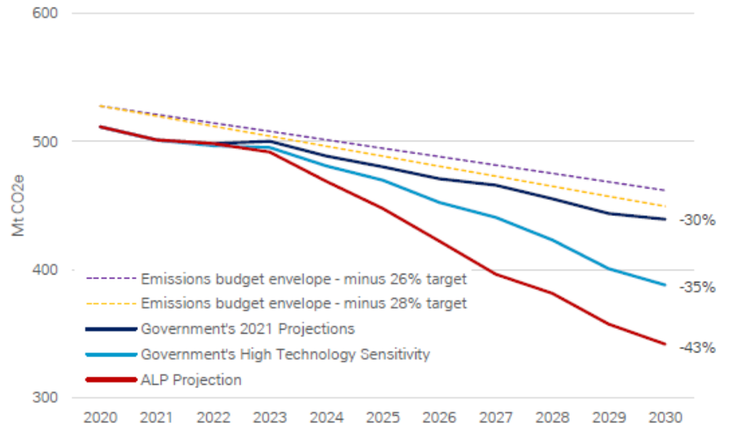
Labour Demands

The Federal Government plan outlines the following of what is required to reach 43% emission reduction by 2030.

Figure 1: Summ;ary of all policy benefits

Policy benefit	Summary
Emissions reductions	– 440 MT emissions reductions between 2023-30 – National emissions forecast to fall to 43% below 2005 levels by 2030. – Renewable energy penetration to grow to 82% by 2030 (versus 68% under BAU)
Investment	– $24 billion in public investment, driving $76 billion in total investment.
Jobs created	– 604,000 direct and indirect jobs created by 2030 relative to a business-as-usual scenario.
Electricity prices	– Annual average retail bills are projected to be $275 lower by 2025 (-18%) and $378 by 2030 (-26%).

Figure 2: Emissions by scenario (% on 2005 levels in Paris accounting terms)

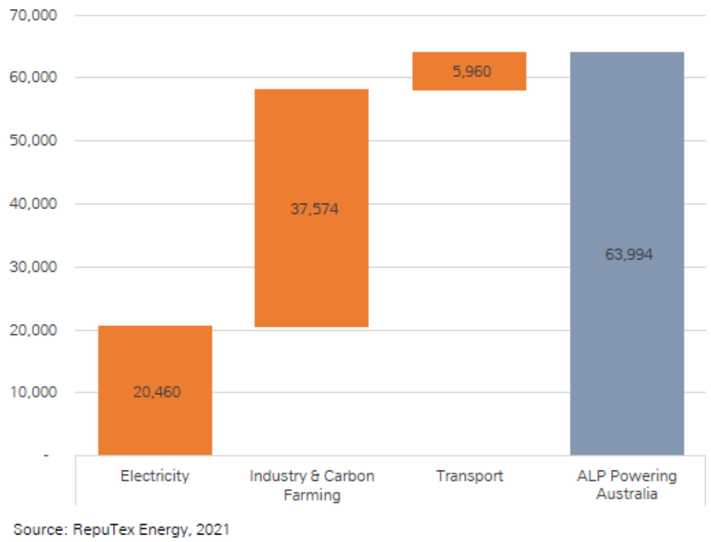


Source: RepuTex Energy, 2021

RepuTex Energy summary of modelling results demonstrates the projected pathway for emissions reduction has been brought forward by some 10 years based on the projections (see the below table).

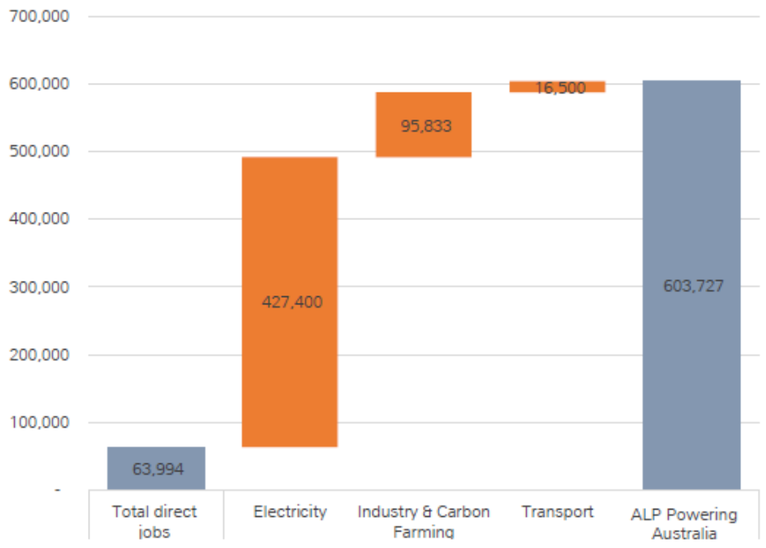
To achieve the above the RepuTex Energy report demonstrates a huge opportunity for job creation (see the table below. The plan and the flow on to employment skills and industry presents a number of challenges that industry needs to overcome in order to harness these opportunities and deliver on the Powering Australia plan.

Figure 5: Forecast job creation by sector – direct jobs by 2030



Source: RepuTex Energy, 2021

Figure 6: Forecast job creation by sector – indirect and total jobs by 2030



Source: RepuTex Energy, 2021

Powering Australia Opportunities

Project Planning

The Powering Australia plan also commits $20 Billion in projects to upgrade and modernise the transmission and distribution networks. These projects will bring renewable energy from the AEMO (Australian Energy Market Operator) Renewable Energy Zones (REZ) to the distribution network and the battery storage systems that are being planned. These projects if poorly implemented or poorly timed, will present severe challenges in attracting and retaining staff and could result in a failure to deliver the local long term economic benefits that are possible, particularly for regional, rural and remote communities.

The 2015 report Economic Benefits of Better Procurement Practices, commissioned by Consult Australia and written by Deloitte Access Economics, found that simply improving procurement processes would create direct savings of 5.4 per cent and flow-on savings estimated of up to $87 million per year.

The report itself highlights the following:

> "However, there are some elements of current government procurement policy and practice that are inefficient, adding unnecessarily to the cost of infrastructure. This includes cases where government clients have unclear project objectives, select inappropriate project delivery models, fail to guarantee the accuracy of information in project briefs and use contract clauses to transfer responsibility for risks that firms are not best placed to manage.
>
> In the bidding phase, businesses respond to these practices in a number of ways, by charging additional price premiums, recouping bid costs, accepting uninsurable risks and reducing competition. This has significant economic impacts over the longer term, constraining economic activity through a higher cost of infrastructure."

The opportunities here are not limited to the direct Powering Australia sector. Proper sequencing of projects is vital for the development of a domestic energy manufacturing industry.

The report clearly shows there key opportunities for Government procurement to address the following areas when developing the Powering Australia procurement strategy:

- Unclear project objectives
- Contracting out of proportionate liability
- Skills of procurement managers
- Disincentive for innovation
- Bid costs and unverified project information

Offshore Wind

Offshore wind will play a significant role in decarbonising the electricity system in Australia. There are now over 12 developers working on over 20 offshore windfarms around Australia. Some of these are:

1. Star of the South: Gippsland, Victoria. 2.2 GW. $8.7 billion. Funded by Copenhagen Infrastructure Partners, construction could begin in 2025 and last five years.
2. Energy Estate and BlueFloat Energy are developing three large projects: off the Hunter Coast, NSW (1.4 GW), off Wollongong, NSW (1.6 GW), and off Greater Gippsland, Vic (1.3 GW)
3. Oceanex NSW offshore wind: Starting with 1.8 GW off Newcastle, with a significant port construction hub, then expanding with further locations off Wollongong, Ulladulla and Eden, potentially up to 7.5 GW. $31 billion with construction starting about 2027. Oceanex is lead by Andy Evans from Star of the South and also backed by European/Japanese investors Green Tower and Daiwa.

4. Newcastle Offshore Wind. Project lead by Green Energy Partners and Richard Findlay-Jones. Applied for a licence from DISER in Jan 2020. This was is pending the new legislation.
5. Illawarra Offshore Wind. Led by Green Energy Partners, who applied for a licence from DISER in Jan 2020. This is pending the new legislation. This project would use Port Kembla as a construction hub.
6. Bass Offshore Wind Energy off Burnie, being developed by Brookvale Energy. Initially 360 MW, possibly up to 2GW in size.
7. Oceanex WA offshore wind. 2GW project off West Australia.

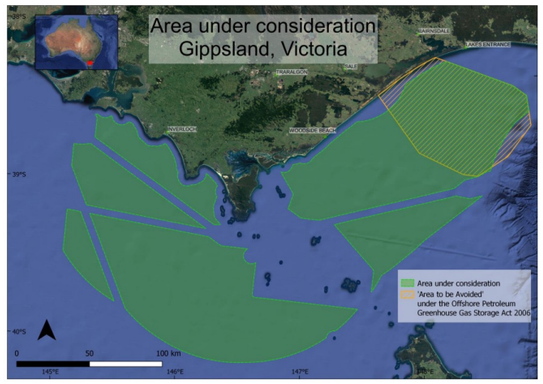
Up until recently Australia has had no legislative framework for offshore wind, but with the passage last year of the *Offshore Electricity Infrastructure Act 2021* the development of offshore wind opportunities is set to accelerate.

The Government has already taken strong steps to create the industry, with Minister Bowen on Friday 5 August 2022 announcing the start of consultation on the first offshore renewable energy zone, off Gippsland and along the coast to the entrance of Western Port.

Minister Bowen also indicated further areas to be declared in his announcement:

> "The next zone that I intend and expect to be consulting on is offshore wind in the Pacific region off the Hunter Valley in New South Wales, and then off the Illawarra, the Pacific Ocean region of Portland in Victoria, the Bass Strait region off northern Tasmania and the Indian Ocean region off Perth and Bunbury, of course in Western Australia. These are the next zones that we will be beginning consultation on… over the next 18 months.
>
> "Offshore wind will create a lot of jobs. Offshore wind turbines need a lot of maintenance, they need ships to maintain them, ports to keep them operating. This is good news for the jobs, for the environment, for emissions reduction and good news for Australia."

Below is a map of the proposed Gippsland area.



Offshore wind will provide a rich source of long term quality jobs with the Blue Ecnomoy Cooperative Research Centre (BECRC) identifying in a report in 2019[1] that offshore wind could provide alternative employment for workers in the offshore oil and gas industry and to a lesser extent from coal fired power stations. The Global Wind Energy Council (GWEC) estimates 17.3 direct jobs are created in Offshore Wind per MW of generation capacity over the lifetime of the project. Employment scales identified in the BECRC report (page 10) indicate up to between 3,000 – 4,000 jobs annually from 2030 and in a higher scenario up to 5,000 – 8,000 jobs each year. This was based on one large project being built mid-2020s and then further projects being developed from 2030. Licenced electricians will be a key component of this new workforce.

[1] *https://blueeconomycrc.com.au/offshore-wind-key-to-australias-clean-energy-future/*

Offshore wind is a critical component of our future grid, but again will require a highly trading workforce to deliver it.

Labour Market

Unemployment / Participation

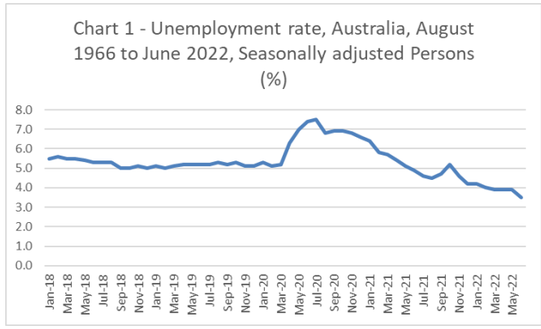
Australia's unemployment rate is 3.9%(graph1). This is the lowest unemployment rate since the 1970's and the number of unemployed persons in Australia decreased to 493,000 in June of 2022 from 548,000 in May of 2022. source: Australian Bureau of Statistics.

Compounding the ability to deliver on the Powering Australia plan, the participation rate in Australia is at a level of 66.80 % (graph 2) the highest in a generation (25 years). This presents an enormous challenge that must be overcome to ensure the plan is delivered.

At all levels of the current employment market talent of any description, let alone well trained and qualified employees are hard to engage and retain. This is not a new issue for the industry where we have seen shortages before, however the Powering Australia sector is again being caught short due to a combination of factors, including a lack of policy certainty leading to 'boom / bust' investment cycles, underinvestment in VET, inconsistency in state and federal procurement rules and the lack of support, mentoring and industry support able to be delivered through the AASN network which are all detrimental to the long lead times needed for new entrants to become trained and qualified.

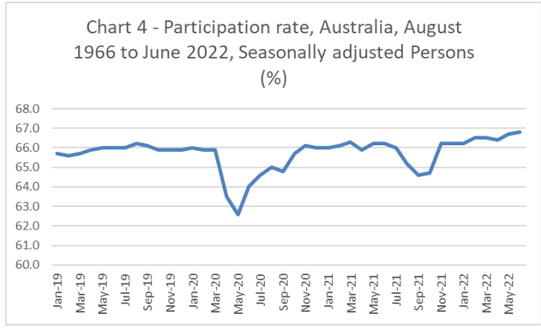
Graph 1

ABS historical-charts June 2022



Graph 2

ABS historical-charts June 2022



Migration

In the last 10 years, including Covid effects, the labour/skilled market migration numbers have been decreasing. In raw numbers, the decrease has been by some 40,000 places between 2011-12 to 2020-21. We believe that with continued trends in 2022 this number is likely to reduce to below 70,000. Concerningly the migration data shows there is an overall reduction which includes family migration has only dropped approximately 12%. Of particular concern is the more than 80% drop in skilled independent immigration experienced in the last 10 years as shown in table 1.1. Migration for electrical tradespeople is a protracted process, given the safety and technical requirements for licensing. However, what can be confusing is that there are multiple states with different requirements which then limits where applicants choose to go, which – for key trades – can affect the licence class they are ultimately issued with and can then possibly restrict their future mobility.

These challenges were compounded by the decision of the previous government in 2020 to abolish the Trades Recognition Services (TRS) scheme which provided a valuable role in assisting overseas electrical workers to have their skills assessed where the worker was already in country.

Industry supports the current process of Offshore Technical Skills Assessments in accordance with Trades Recognition Australia (TRA) requirements. This includes verifying completion of an equivalent apprenticeship in the country of origin, interviews, assessments and course work where needed in order to obtain an Offshore Technical Skills Record. This is the appropriate process for all migrants to follow who are seeking to obtain a Certificate III Electrotechnology qualification, and subsequent electrical and electrical contracting licenses.

However, the changes in 2020 create both a potential loophole and leave a cohort of workers with limited access to reliable access to trades recognition. The TRA Trades Recognition Service is the process for migrant electrical workers already in Australia. They may be living in Australia on a spousal or other form of sponsored partner visa and are therefore excluded from the TRA process – Offshore Skills Assessment Program (OSAP) and Temporary Skills Shortage (TSS) Skills Assessment.

The pathway for these workers to a licence is through the state or territory's system of licence recognition, which in turn, falls to Registered Training Organisations (RTO) who may not perform the critical checks required for a robust licensing system. Previous experience has shown that candidates will have non-trade qualifications 'reverse engineered' to achieve a Certificate III Electrotechnology, apply for a licence in a less regulated jurisdiction, and then claim mutual recognition in another jurisdiction. This weakens the whole licensing system.

Going forward it will be critical to both reinstate the TRS program and also to ensure both the TRS and TRA schemes are adequately resourced to deliver expedient, high quality skills verification and gap training of overseas trained electrical workers.

Lastly, over the past decade temporary migration programs have received preference from Government over permanent migration outcomes which brings with it a whole range of risks for both industry and individual migrant workers. Industry does not support temporary migration outcomes for our sector except in very limited circumstances where a specialist skill set or product knowledge is necessary for a particular project and then should only occur with a detailed skills transfer plan to ensure the local workforce acquires these skills. Given that the program of work associated with the energy sector extends well into the next two decades, permanent migration outcomes should be the focus of addressing any residual labour shortages that emerge after comprehensive domestic skills programs have been developed and implemented.

Table 1.1: Migration Program outcome by category, 2011–12 to 2020–21

Skill stream										
Year	Employer Sponsored[1]	State/Territory Nominated	Regional[2]	Business Innovation and Investment[3]	Global Talent (Independent)[4]	Skilled Independent	Distinguished Talent	Skilled Regional[5]	Skill stream total	Total migration
2011–12	46,554	22,247	n/a	7,202	n/a	37,772	180	11,800	125,755	184,998
2012–13	47,740	21,637	n/a	7,010	n/a	44,251	200	8,132	128,973	190,000
2013–14	47,450	24,656	n/a	6,160	n/a	44,984	200	5,100	128,550	190,000
2014–15	48,250	26,050	n/a	6,484	n/a	43,990	200	2,800	127,774	189,097
2015–16	48,250	24,650	n/a	7,260	n/a	43,994	200	4,196	128,550	189,770
2016–17	48,250	23,765	n/a	7,260	n/a	42,422	200	1,670	123,567	183,608
2017–18	35,528	27,400	n/a	7,260	n/a	39,137	200	1,574	111,099	162,417
2018–19	42,012	25,346	n/a	7,261	n/a	34,247	200	647	109,713	160,323
2019–20	29,261	21,495	23,372	4,420	4,109	12,986	200	n/a	95,843	140,366
2020–21	23,503	14,268	13,585	11,198	9,584	7,213	269	n/a	79,620	160,052

australian-migration-statistics

Industry Competition and Evolution

In a recent article in The Australian, Ewin Hannan reported that Australian Resources and Energy Employer Association (AREEA) will need 15,000 new workers to staff scores of projects over the next two years and that Master Builders currently required a further 40,000 workers and would need an extra 477,000 workers by 2026. theaustralian worst-skills-crisis-in-a-generation

NaTHERs 7 Star Energy Rating and Electrotechnology Skills

The Climate Council and the Property Council of Australia has called for all new dwellings to be built to a 7-star energy rating, which would save consumers $450/yr and could reduce annual residential emissions by up to 12% by 2030. The National Construction Code currently mandates 6 Stars, and building ministers are actively considering the plan[2].

The industry competition and changes to building codes will mean higher demand for electrotechnology and other skills than those as estimated by the Powering Australia plan. Industry must improve its ability to create a better workforce plan for industry that collects information and holds it centrally by use of participants.

[2] *abcb.gov.au/sites/default/files/resources/2021/FAQ_NCC2022_Residential_Energy_Efficiency%20%283%29.pdf*

Industry Training

According to the Australian Institute of Health and Welfare

> The number of people undertaking apprenticeships and traineeships was lower in 2019–20 than in 2007–08 (Figure 1).
>
> The number of commencements and completions began to increase in 2009–10, alongside the Apprentice Kickstart initiative to address skills shortages in Australia, with a peak around 2012 (NCVER 2020c). This was followed by a sharp decline from 2012–13. The decline was steeper for non-trades than trades, and reflected:

– changes to Australian Government incentive payments for qualifications not on the National Skills Needs List (Atkinson & Stanwick 2016), including the discontinuation of a $1,500 standard employer commencement payment (Gilfillan 2016)

– a decline in demand for labour in industries such as mining and utilities (Gilfillan 2016).

The decline disproportionately affected women and older apprentices and trainees. Between June 2012 and December 2015, the number of female apprentices and trainees declined by 59%, compared to a decline of 38% for males. Over the same period, the number of apprentices and trainees aged 45 years and over declined by 71%, compared to a decline of 26% and 39% for people aged 20–24 and 19 and under, respectively (Gilfillan 2016).

Trends of apprentice and trainee commencements and completions show that in the 12 months ending 30 June 2020:

– there were 133,500 commencements, a decline from the peak of 377,000 in 2011–12, and at their lowest since 1996–97

– completions (84,000) declined sharply since the peak of 214,600 in 2012–13 and were at their lowest since 1998–99

– the number of cancellations and withdrawals (77,800) were also at their lowest since 1998–99 (NCVER 2020c).

Currently if we examine the electrotechnology trades (a crucial bellwether for Powering Australia) we can see that there is initial 61 745 enrolment in the sector which is comprised of all qualification from Certificate II to Advanced Diploma.

The top 10 qualification by enrolments are

Program name	Counts
UEE30811 - CERTIFICATE III IN ELECTROTECHNOLOGY ELECTRICIAN	34,970
UEE22011 - CERTIFICATE II IN ELECTROTECHNOLOGY (CAREER START)	11,320
UEE32211 - CERTIFICATE III IN AIR-CONDITIONING AND REFRIGERATION	5,455
UEE20111 - CERTIFICATE II IN SPLIT AIR-CONDITIONING AND HEAT PUMP SYSTEMS	1,905
UEE40411 - CERTIFICATE IV IN ELECTRICAL - INSTRUMENTATION	1,365
UEE31211 - CERTIFICATE III IN INSTRUMENTATION AND CONTROL	820
UEE33011 - CERTIFICATE III IN ELECTRICAL FITTING	820
UEE30911 - CERTIFICATE III IN ELECTRONICS AND COMMUNICATIONS	585
UEE42611 - CERTIFICATE IV IN HAZARDOUS AREAS - ELECTRICAL	480

Table 2 ncver research-and-statistics atlas-of-total-vet

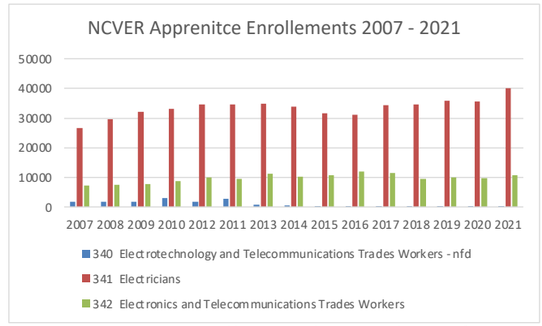
According to the Australian industry Skills Committee (ASIC)

> "As the rate of solar installation continues to grow in Australia and advancements are made in related technologies, the skills needed by Electrotechnology workers must also evolve. Renewable technologies are predicted to create more than 60,000 jobs over the next ten years, and workers will require the necessary skills for the installation and maintenance of solar systems. However, as noted in the Electrotechnology IRC's 2019 Skills Forecast, there is already a reported shortage of qualified electricians who have the necessary skills for the installation and maintenance of solar systems."
> ASIC renewable-and-sustainable-energy

The above situation is replicated for the the other trades and occupations which are crucial for delivering the energy transition.

The data from both NCVER and ASIC lead us to believe that whilst the Powering Australia reports shows a shortfall of some 10,000 position, we believe that the upskilling of current electricians to meet demand means that training of an additional 20,000 to 30,000 thousand will be required. This estimate is not factoring in the potential de-gasification of Victoria which, if current trends continue, will drive this shortfall even deeper.

Graph 3
NCVER Vocsstats https://vocstats.ncver.edu.au/webapi/jsf/tableView/tableView.xhtml

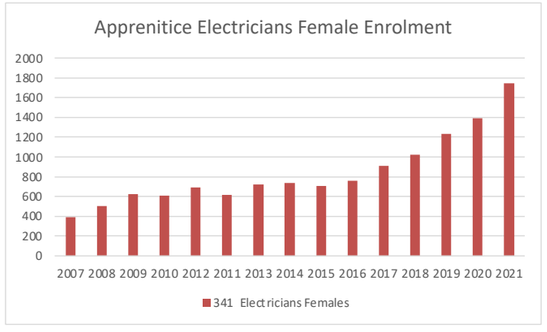


Graph 3 shows the Apprentice enrolment data since 2007. The peak in 2021 can be attributed to the extensive wage subsidies and increase in work that was available after the pandemic and that the dip experienced from 2013 was timed after withdrawal of government employer support and increased wages being awards by the Fair Work Commission. We believe that the various data presented here certainly demonstrates that apprentice opportunities are cost sensitive. Given 85% of all apprentices are completed in small businesses it is imperative of success that the reality of cost sensitivity is addressed to remove or reduce the disincentive to take on apprentices

Women Indigenous and CALD workers

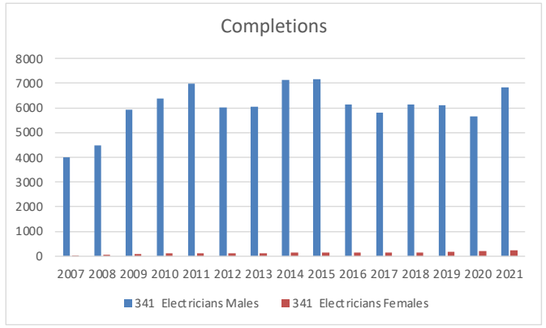
Graph 4, 5, and 6 below detail statistics concerning both women indigenous and culturally and linguistically diverse (CALD) workers. Graph 4 shows an increase in female participation in the industry of over 450% with 1744 female apprentices enrolled this equate to approximately 4% enrolment rate.

Graph 4



NCVER Vocsstats https://vocstats.ncver.edu.au/webapi/jsf/tableView/tableView.xhtml

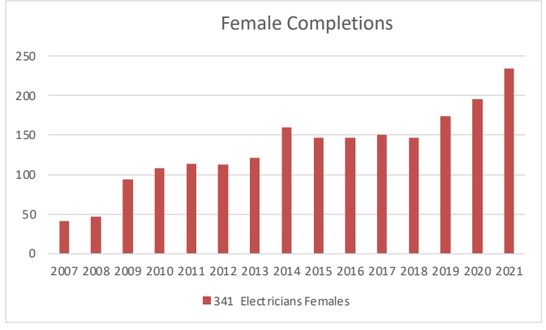
Graph 5



NCVER Vocsstats https://vocstats.ncver.edu.au/webapi/jsf/tableView/tableView.xhtml

Completions however are detailing that they do not exactly follow those of commencement and indicate that apprentices are subject to failures in mentoring services, numeracy tuition, economic impacts, effects of lower wages from cost of living pressures, career changes and a lack of suitability for the trade to begin with. Some factors, such as career change or lack of suitability, will always persist – but account for less than 10% of non-completions. The main drivers of non-completion, like cost of living, mentoring and support, are strongly susceptible to Government and industry intervention – and represent real opportunity for improvement.

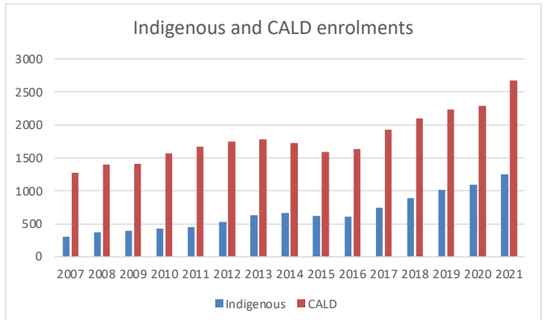
Graph 6



NCVER Vocsstats https://vocstats.ncver.edu.au/webapi/jsf/tableView/tableView.xhtml

Indigenous and Culturally and Linguistic Diverse (CALD)

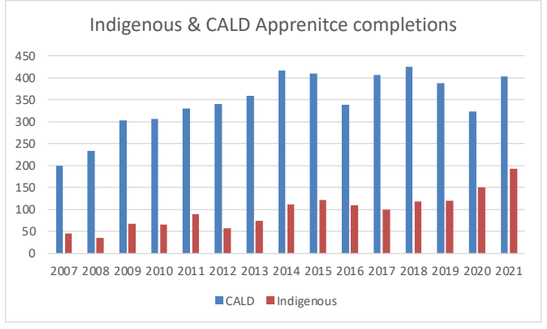
Graph 7



NCVER Vocsstats https://vocstats.ncver.edu.au/webapi/jsf/tableView/tableView.xhtml

Overall completion rates of women, CALD and Indigenous workers are improving on the basis of higher enrolments, but it is obvious from the low participation rates that these groups suffer from increased barriers to completion compared to the traditional apprentices cohort.

Graph 8



NCVER Vocsstats https://vocstats.ncver.edu.au/webapi/jsf/tableView/tableView.xhtml

As with female industry completions CALD and Indigenous apprentices only make up approximately 6% and 2% of the total of completions. These rates will not change the overall status of the industry in even a long-term view.

The industry again needs to encapsulate better data and workforce planning on these non-traditional groups in the Electrotechnology industry.

Non-completion is a problem across the training system, but is pronounced by the “binary” nature of electrical training. By way of example, a carpentry apprentice who does not complete their apprenticeship will still have significant transferability of skills (and still able to work in the industry) than they were prior to training – thus delivering some dividend for the Government’s investment. For electrical trades (again, a key driver of Powering Australia), due to the necessity to ensure safety, quality and consumer protections through a licensed outcome , a non-completing apprentice is unable to exercise many of their skills and the risk is higher that taxpayer dollars could effectively be wasted. For licensed outcomes, there is a clear and persuasive case for greater early investment in mentoring and support services for apprentices to maximise the impact of the public’s investment and drive up the completion outcomes.

UEE Qualification Updating

The current training packages has been under review since 2012. However, in the interceding 10 years the pace of change and incorporation of renewable energy and “the internet of things” and other technology advancements has not been included in the package. The current package suffers from delays in refreshing content and ensuring delivery is possible by RTO’s. MEA certainly has feedback from employers and their supervising tradesman that content being taught is out of date and using superseded technology.

Currently the VET system and qualifications are subject to almost 16 different interest groups including various state and federal government departments, RTO's, Employers, Unions, students, and their advocates however the training package feedback and industry intelligence is not being gathered in a way in which it understands what industry needs are. The needs of both the apprentice and the employer to deliver on the Powering Australia plan need to be forefront in the decision-making framework. The current vocational package system is slow to react to technology change and cumbersome to change, a stand-alone Electrotechnology skills cluster led by industry would best address this.

School Curriculum

Recently reported in the Australian

Australian Mathematical Sciences Institute reveals that year 12 enrolments in intermediate or advanced mathematics have crashed from 34.9 per cent in 2008 to 26.8 per cent in 2020. In other concerning sources of information, it has been details that 4 in 10 Maths teachers in Australia are not qualified to teach mathematics. theaustralian stem-decline

Professor Marchant called for better quality teaching, noting that up to 40 per cent of maths teachers were not qualified to teach the subject.

> "Particularly in junior high school, years seven to 10, many (maths) classes are being taught by teachers that aren't trained in mathematics," he said.
>
> "Students need their teachers to be trained in the discipline.
>
> "We need to be working with these teachers, increasing their training and professional development."
>
> Only 9.2 per cent of year 12 students enrolled in specialist maths in 2020, compared with 11.6 per cent in 2008, the AMSI report shows.
>
> Just 17.6 per cent studied intermediate mathematics in 2020 – down significantly from 23.3 per cent of students in 2008.
>
> Together, the proportion of year 12 students who studied intermediate or advanced mathematics has crashed from 34.9 per cent in 2008 to 26.8 per cent in 2020.

We share these concerns based on industry feedback and, by way of example, the trends observed in the Certificate II in Electrotechnology. We believe there needs to be a better pathway and better links between maths curriculum in schools and VET qualifications. There is strong industry and RTO feedback that "general" maths in years 11 and 12 is not a sufficient preparation for key Powering Australia curricula due to the emphasis these trades place on algebra, calculus, and transposition of equations in, for instance, the studying of AC (Alternating Current) and DC (Direct Current) theory. However, feedback has also been received that Math Methods level in years 11 and 12 are far in advance of what is needed and is a disincentive for students not wanting to achieve an Australian Tertiary Admission Ranking (ATAR). It's a case of either too little or too much and the curriculum needs to include a more targeted VET pathway.

VET in Schools

Students are also in many states suffering from poor administration of VET in schools, moving students away into alternative pathways such as certificate III in fitness or horticulture which later in the student's career precludes them from accessing user choice funding under the Cert3 Guarantee.

Most High Schools deliver VET as an alternative stream to students attaining an ATAR. Some schools use VET qualifications as a mechanism to facilitate an equivalent ATAR score. This result allows schools to achieve their departmental KPI and educational outcome KPI's, in a way that may result in funding for the school. Many students in these VET in schools programs, disengage from the vocational path studied at school upon finishing Year 12. This however results in disadvantage later in their career journey. Many employers report apprentices being told that their user choice funding from their Cert3 guarantee is no longer available, and that the employer will need to cover the full bill for funding, as they have completed a lower value "fill in" course in a year 11 and 12, in a VET in Schools program that did not lead to a productive job outcome.

School children and their parents make decision in isolation of not understanding fully State and Federal Government policy. Transparency of funding and a separation of school and VET funding should be examined to remove these occurrences which are expensive and have long term effects for industry entrants.

Solution Formulation

Curriculum

We understand that the current training landscape is complex and has been built over the last 100 years. However, in the last 10 years we have experienced an unprecedented acceleration of change in energy management technology and efficiency. The industry must now start to match this evolution of the industry and as such our training must evolve as well, without losing the focus on safety, quality and reliability that has been developed through industry collaboration between regulators employers and Unions. To this end, we suggest that the to achieve the Powering Australia plan a multifaceted approach, overseen in a genuinely tripartite manner, is necessary to achieve the Government's ambitious emissions target and energy transformation timeline for the benefit of Australia.

Stand-alone Industry Skills Cluster (ERET)

The reforms to the current Skills Service Organisations to create National Industry Skills Clusters means there is a current and significant gap in training infrastructure to address this skills crisis for the sector The current tender process and advice from the Department demonstrates that the Powering Australia sector will be split across multiple Skills Cluster, a situation we find unacceptable and is not congruent with the Powering Australia plan. The Skills Cluster process has been riddled with problems and conflicts, whilst the current regime has crawled to a standstill.

As a critical area for vocational education, there is a clear and urgent need to establish a Powering Australia Skills Cluster.

The Powering Australia Skills Cluster will have coverage of the four traditional energy training package areas - UEE, UET, UEP, UEG, with expanded scope to ensure skills requirements are met in emerging industries such as renewables, EV charging, the internet of things, advanced programming and hydrogen.

An industry owned and led cluster that focusses directly on the Powering Australia sector will have numerous benefits over being spread across different clusters, including:

- Coherence with industry in developing workforce planning strategies
- Unification of skills requirements analysis
- A connected plan across industry sectors to enable opportunities for cross skilling and up skilling, particularly in a transitioning energy sector with emerging technology opportunities
- Coordinated approach for testing and sharing of latest ideas
- Development of high-quality training products that avoid duplication and/or fragmentation
- Simplification and support for career pathways across sectors and into higher education
- Full ownership and oversight throughout the end-to-end process
- Shared industry intelligence

A strong, united sector that has a consistent approach to training and assessment implementation advice, a Powering Australia Skills Cluster is industry, knows industry and will always act on behalf of industry in producing the best outcome for industry. With the breadth of the Powering Australia sector, the focus can truly be on developing the careers of the workforce, instead of knee jerk reactions to isolated or short-term issues.

The Powering Australia Skills Cluster will also be able to ensure a focus and detailed plans actions and targets for disadvantage groups and nontraditional candidates. The Cluster will, through concerted effort with industry and unions, be able to accelerate participation by women indigenous and CALD groups. Given that a significant amount of direct and indirect industry jobs in the Powering Australia plan are located in rural and remote parts of Australia this will be a significant opportunity to engage with these groups. Our experience is that a combined program of apprenticeship career advice program and mentoring for apprentices ensures greater participation and completion in the industry.

Industry apprenticeship mentors are a proven way to ensure completion in small to medium businesses. During the Rudd and Gillard labour Government MEA own program of mentoring achieved above a 90% retention rate of apprentices in small business during the program, with great results also delivered by the Centre for U with its Women in Apprenticeships Electrical Program and the Queensland Government Advancing Apprenticeships in increasing participation and take up of apprenticeships by small employers. It is this direct intervention and assisting both employee and small business that ensures a long-term uplift in enrolments and completions to meet the need.

Powering Australia Apprenticeship Support Network

Introduced in July 2015, the Australian Apprenticeship Support Network providers have been tasked with providing administrative services, mentoring, and a range of support services. The contracts are awarded to the providers on a geographic basis with a remit across all apprenticeships.

To date, and perhaps despite the best efforts of the providers, the AASN model has failed to demonstrate a meaningful increase in apprentice completion.

A core design failure in the model is the lack of occupational specificity and industry leadership. Apprentices are more likely to seek, and be receptive to, mentoring and support where it is provided by someone from their industry or occupation. By designing the AASNs to fall across all apprenticeships, this key link between mentor and apprentice is broken before it can begin.

The importance of mentoring and support for apprentices in the Powering Australia sectors is particularly acute. As noted above, the need for a licensed outcome on many of these trades means that every dollar of taxpayer meant spent on a non-completing apprentice is a dollar wasted.

Another key function of AASNs is to provide advice to apprentices around electives. Again, due to the generalist nature of AASN contracts, providers are simply unable to meaningfully assist apprentice – or industry – in finding appropriate courses, resulting in apprentices missing out on opportunities to gain experience in emerging technologies, often not even being presented with the full range of elective modules available to them.

The lack of industry leadership in the AASN model which currently exists also means that where grievances or challenges arise in the employment relationship, the AASN is more motivated to simply cancel the apprenticeship rather than attempting to either resolve the issue or facilitate the transfer of the training contract to another employer where the employment relationship may be more suitable.

A dedicated, industry-led Power Australia Apprenticeship Support Network, financed from the existing funding allocation, would:

- Create the critical industry-led link between apprentices and their Support Network;
- Supercharge the GTO system, delivering apprentices with industry-wide experience;
- Facilitate the delivery of successful mentoring programs[3] with a proven track-record of driving up completion rates and which are trusted by both employers and apprentices;
- Provide credible advice on choosing electives which best match the apprentice's nascent career and deliver more suitable skills development for the employers industry sector;

– Allow better mapping and targeting of support – such as numeracy tuition or career pathways to at-risk apprentices; and
– Be dedicated to securing alternative paths for apprentices struggling in their specific role.

Alternative Skills Pathways

There have been many successful pilots that have been run that prove the concept of alternative pathways models[4], including defense force personnel transitioning to civilian life and gaining qualifications, utilising knowledge and training gained during their service careers[5].

We now need to use this knowledge to drive outcomes at scale. With the current and foreseeable fierce competition for labour and skills, tapping into the rich vein of semi-skilled labour to change the trajectory of their lives by giving them the opportunity to turn their jobs into careers, fits into the "just transition" model that we will need to embrace as the economy goes through this period of transformation.

There will be several groups over the next 10 years that will need alternative pathways to ensure a just transition including coal generation workers, mining workers and even automotive mechanical workers all who have Cert III or higher qualification. There have been several examples so far used through the closing of the Auto Manufacturing industry and Brown Coal generation plants in Victoria that many of the current parties have been involved in and can attest for coordinated and funded transitions. These can be retraining in skills, business, and career transitions but all based around the electrical industry and must be a strong group and focus for recruitment into the Powering Australia workforce .

Industry Migration Programs

As can be seen from the data regarding the current state of migration it is apparent to the parties that a significant effort by industry needs to quickly reestablish Australia as a highly desirable destination for migration. ETU and MEA are proposing that working with Trades Recognition Australia (TRA) and electrical regulators an industry led migration program can quickly re-establish Australia as a prime destination to attract international electrical workers.

MEA and ETU at this early stage envisage 2 possible programs that may be investigated with TRA. The first is to use the current 428 visa employer sponsored visa system combined with an industry led delegation and high-profile campaign in designated countries to provide a source of candidates over the short term. This program would pool resources from employer and the unions to ensure good candidates are attracted and provided with secure work and good conditions.

The second more experimental program would require an initial pilot program to evaluate its suitability be determining establishing it as a longer term program. A significant barrier to immigration is the fear of the unknown, however a program targeted at highly mobile young workers in other countries who have recently finished training may be able to attract them to have a "Gap Year" after their training. The program would target new trade qualified young tradespersons and target them to work in Australia experiencing 3 or 4 interstate locations based on the current working holiday visa. The aim is to provide experience for a brief period and then successfully transfer them into the main Employer sponsored program mentioned above.

[3]Such as the Electrical Industry Specialist Mentoring for Australian Apprentices Program by E-Oz Energy Space and the Women in Apprenticeships Victoria Electrical Program by Centre for U
[4]pc.gov.au/inquiries/completed/infrastructure/submissions/submissions-test/submission-counter/sub009-infrastructure.pdf
[5]nationalapprenticeships.com.au/index.php?page=eca-s-national-apprenticeships-programs

Crucial to the success and social acceptance of both these programs will be ensuring domestic training, apprenticeship and employment programs are developed, fit for purpose and being delivered on the ground with Australian workers receiving apprenticeship and employment opportunities as a priority demonstrating that migrant workers are filling a genuine labour shortage.

Wage Subsidies for 1st and 2nd Year Apprentices

Electrical apprenticeship intakes for the past year have been at strong levels not seen for some decades, but this is coming off a period of below trend apprenticeship recruitment, and the growth this year will only go towards balancing organic demand, and not address the exceptional circumstances foreshadowed by the AMEO Integrated System Plan.

The 50% wage subsidy during Covid was an effective policy, finally lifting numbers of apprentices after years of decline and we believe that a targeted extension of this program must be considered as part of a solution.

Just as in the university sector where the taxpayer heavily subsidises courses for taxpayers, the training of key VET skills should be a shared responsibility between government and industry. Small Employers who take on 85% of the apprentices in the electrical industry, and who lose them to wider industry once an apprenticeship is complete, are providing the vital "training space" for the completion of the experiential learning that underpins the apprenticeship system. Safety requirements for 1st and 2nd year apprentices are very stringent on the levels of supervision needed, this does however mean that the productivity of an apprentice in this period is quite low, and in the price sensitive end of the market that SMEs operate in, this is a large dis-incentive towards taking on apprentices.

A major skills risk for our sector then, is that approximately 85% of apprentices are employed by Small to Medium Enterprises (SME's) with SME's making up 98% of all electrical contracting businesses in Australia . Bearing this in mind, without taking these price factors around the productivity of 1st and 2nd year apprentices into account when planning a campaign to address this shortage, then major infrastructure work like the Government's planned grid investment will be at the direct cost of SMEs, and they already carry a disproportionate burden in comparison to big business in providing the training spaces that are needed to grow our skilled workforce.

MEA believe that a SME-led apprenticeship revolution is also urgently needed to cope with the nation's rapid and irreversible energy transformation. Small to medium contractors with their ability to deliver the scope and range of work necessary to train licensed electricians, are the incubators of the skills required to meet the skills shortage and disseminate them into the wider industry workforce, often continuing employment in larger businesses delivering projects operating under union Enterprise Bargaining Agreements (EBA's).

Expectations included within the AEMO report of 25,000 more skilled workers of that number, we estimate that potentially 10,000 of these people will be licensed electricians, and this figure is only for large-scale renewable projects across the country by 2027. This figure does not consider the shortages of electricians that already exist in other sectors of the economy such as construction, and the expected demand for electricians to install the EV chargers and home batteries in the domestic market.

Powering Australia Skills Centres

TAFE is and must remain the centre of vocational education in Australia. However, for various reasons, TAFE is struggling to meet the needs of the rapidly evolving Powering Australia sector. With thin markets plaguing the provision of hi-tech electives, and the enormous investment required for properly reconstituting TAFEs – it is unlikely that TAFEs will be in a position in the short to medium term to train the volume of apprentices that Powering Australia demands.

In these circumstances, the best option available to Government is the seed funding of Powering Australia Centres of Excellence, industry-led RTOs that are specifically tailored to the match the training needs of their region.

Such a model is already being rolled-out piecemeal in some jurisdictions, but the Federal Government is in a unique position to properly map the sector's needs and provide the requisite funding.

Workforce Mobility

In all the above sections we have largely been talking about one specific workforce within the electrotechnology sector, "A Grade" or "Electricians." Electricians have a national qualification, national standards through the Australian Standards and an ever-increasing responsibility for continuous professional development. Recently we have seen more consistency being developed with regard to electrical safety legislation with improvements in Victoria, and reviews into the Northern Territory, Queensland and New South Wales.

The Powering Australia plan is a national building plan, and it requires a national plan for labour and in this case that means a national license or a process by which workers can freely move around the country and work for employers. Automatic Mutual Recognition (AMR) is especially important in this unique situation to deliver a national industry, the east coast established a deemed mutual recognition process however to maximise the opportunity for a truly national response to the Powering Australia plan urgent priority should be placed on properly implementing a robust and effective Automatic Mutual Recognition program which could then be used as an example for other industries in the future. The health sector achieved a national registration board but began with one occupation, Nursing. Electricians could be the leader in this process and led by the ETU and MEA to have a truly national licensing regime that respects and enforces state-based rules on all electrical employers and ensures electricians and their employers can deliver on the national plan.

Project Planning

The Federal Government must ensure that the following high level procurement policy outcomes are achieved when agencies call for tenders for the $20 Billion of infrastructure work

1. Ensuring Federal State and Energy Generation and Transmission companies cooperate to schedule capital projects sequentially to ensure, as far as reasonably practicable, long-term benefit. The staging of projects rather than short term peak workforce will reduce FIFO / DIDO/ Short term contract labour and maximise long term local economic benefit.

2. Procurement practices should ensure

a. Integrity and accountability

b. Best practice approach

c. Be collaborative with industry

d. Utilise sound governance

e. Prioritise employers who demonstrate investment in skills and training

f. The avoidance of duplication with state procurement settings

3. Deliver value for money maximising economic environment and social benefits

a. Focus on the economic benefit to local communities – by applying a local benefits test for all significant procurement and supporting secure and fair employment outcomes.

b. Maximise suppliers' opportunity to participate by ensuring that for each procurement opportunity, at least one regional supplier, where possible, is invited to submit a quote or tender.

c. Support regional and remote economies – by encouraging agencies to procure in regional and remote locations.

d. Support disadvantaged by increasing procurement with genuine, quality social enterprises.

4. Support long term incentives for TAFE/RTO's/ GTOs to provide training in REZ project areas resulting in the retention of a highly skilled workforce future local community benefits

5. Ensure procurement actions and the information contained in them is accurate and ensures geotechnical information, environmental impacts, technical specifications, and financial data can be relied upon without the need for additional work by contractors or subcontractors.

Conclusion

We believe that the ambitious undertaking that Powering Australia presents can be achieved if Government, Employers and Employees work collaboratively and focus on the long-term gains for the nation. The above actions if implemented correctly will ensure that Australia will benefit from the vast investment and create an evolution for the industry that will lay the foundation for the next 50 years. Further, this plan will ensure the creation of the social licence which will supercharge the rollout of our energy transition and deliver the future that Australians deserve.

The Powering Australia Skills Plan

The Clean Energy Council is the peak body for the renewable energy and energy storage industry in Australia. We represent and work with hundreds of leading businesses operating in solar, wind, hydro, bioenergy, energy storage, hydrogen and emerging technologies along with more than 8500 solar and battery storage installers.

cleanenergycouncil.org.au

The Electrical Trade Union (ETU) is the union representing over 60,000 electricians, electrical tradespeople, and apprentices in every part of the Powering Australia sector. We campaign to raise wages, improve conditions, safety, and life for our members and our industry. For over 120 years we have used our collective strength to achieve industrial, political and social progress.

etunational.asn.au

Master Electricians Australia (MEA) is the trade association representing electrical contractors recognised by industry and government as the electrical industry's leading business partner, knowledge source and advocate.

masterelectricians.com.au

The National Electrical Contractors Association is the peak body for Australia's electrotechnology and communications sector, which employs nearly 200,000 skilled workers. With over 6,000 member businesses, we represent a wide range business in activities such as the design, installation and maintenance of electrical and telecommunications componentry. Our members span the building, construction, renewable energy, mining, air conditioning, refrigeration, manufacturing and communications sectors of the Australian economy. NECA through its advocacy and associated entities is also a leading trainer of apprentices and provider of post trade training for the energy sector.

neca.asn.au

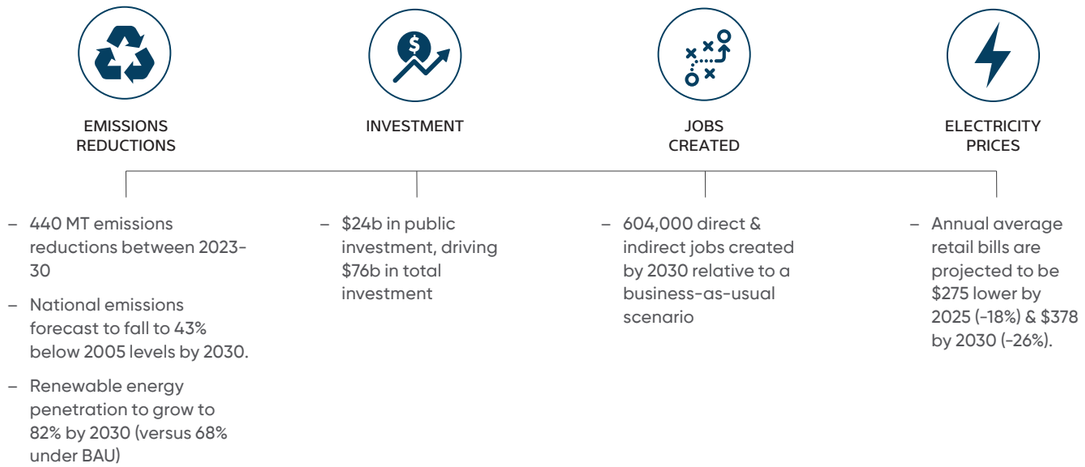
Rewiring Australia was launched in 2021, founded by Dr. Saul Griffith. It is supported by an optimistic group of non-partisan Australians to collectively illustrate the positive climate and economic outcomes possible for Australia, and the world, with the electrification of fossil fuel machines

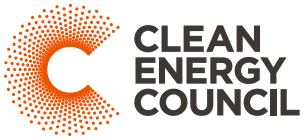
rewiringaustralia.org

The Smart Energy Council is an independent peak body for Australia's smart energy industry. The Smart Energy Council has around 1000 corporate members, covering household, commercial, large-scale and superpower renewable energy, smart energy management, smart transport and renewable hydrogen.

smartenergy.org.au

Policy benefit





etunational.asn.au