



RESIDENTIAL ELECTRIFICATION

OCTOBER, 2023

Submission to the Senate Standing Committee on
Economics' Inquiry

Recommendations

1. Develop a training programme in consultation with key industry stakeholders for upskilling workers to be able to deliver electrification upgrades safely and effectively.
2. Implement a robust accreditation framework for businesses and workers delivering residential electrification upgrades, including requirements for:
 - a. Compliance with strict safety standards,
 - b. All workers to have completed minimum task familiarisation and relevant upskilling training,
 - c. Minimum apprenticeship and training ratios, and
 - d. Minimum labour standards
3. Develop and apply a comprehensive, industry led monitoring, compliance, and enforcement framework to regulate the implementation of an accreditation scheme for the safe and efficient delivery of residential electrification upgrades.
4. Ensure sufficient funding to relevant regulators for monitoring, compliance, and enforcement.
5. Apply strong minimum efficiency standards to household appliances sold in Australia
6. Apply minimum technical standards to consumer energy resources requiring interoperability between devices.
7. Ensure program design addresses accessibility for all Australians, including low socio-economic demographics, First Nations communities, social and affordable housing residents, renters, and multi-dwelling properties.

Contents

Recommendations	1
About the ETU.....	2
Acknowledgement	2
The Electrification Opportunity	2
What is residential electrification?	2
Employment opportunities.....	3
Consumer Savings and Access	3
Barriers.....	4
Safety & Quality Assurance.....	4
Workforce	4
Case Study 1 – US Inflation Reduction Act.....	6
Case Study 2 – Victorian An Adept Workforce for the Zero Emission Vehicle Boom Project	6
Case Study 3: Clean Energy Council (CEC) Solar Installer Accreditation	7
Market Access.....	8
Path Forward.....	9
Installer Accreditation.....	9
Product Standards.....	9

About the ETU

The Electrical Trades Union of Australia ('the ETU')¹ is the principal union for electrical and electrotechnology tradespeople and apprentices in Australia, representing well over sixty-thousand workers around the country.

The electricians and electrical workers we represent will be the predominant skilled workforce responsible for delivering the household electrification upgrades needed to keep Australian power costs low and carbon emissions on a downward trajectory.

Acknowledgement

In the spirit of reconciliation, the ETU acknowledges the Traditional Custodians of country throughout Australia and their connections to land, sea and community. We pay our respect to their Elders past and present and extend that respect to all First Nations peoples today.

The Electrification Opportunity

What is residential electrification?

Australian homes lag behind global standards in terms of energy efficiency. Residential demand for electricity and gas is inflated by inefficient homes and barriers to accessing highly efficient appliances such as cost and availability. Government intervention to encourage Australian households to improve their energy efficiency by making the switch to highly efficient electrical appliances has the potential to:

- Reduce consumer energy bills,
- Drive growth in domestic supply chains, and
- Create thousands of jobs for skilled tradespeople.

In combination with ongoing efforts to transition Australian electricity generation to renewable sources, electrifying households also has the capacity to eliminate up to 11% of Australia's national emissions in a relatively short timeframe.

A comprehensive program for residential electrification in Australia needs to consider:

- Replacing inefficient gas and electric storage water heaters with more efficient systems such as heat pumps
- Replacing gas and electric resistive space heating with reverse cycle air conditioning
- Replacing gas cooking appliances with induction electric alternatives
- Continuing the expansion of rooftop solar generation and home battery storage
- Rolling out residential EV charging infrastructure

¹ Being a division of the CEPU, a trade union registered under the *Fair Work (Registered Organisations) Act 2009* (Cth).

Employment opportunities

A 2019 analysis by Green Energy Markets² of the potential employment benefits of energy efficiency improvements in Australia estimated that residential efficiency upgrades had the potential to generate over 34,000 job-years for Australian workers.

Upgrades Requiring Electrical Tradespeople – Electricians, Air Conditioning Technicians	Employment Opportunity (Job Years)
Water Heating Replacing inefficient electric storage water heaters and gas water heaters with electric heat pumps	9,347
Space Heating Replacing electric resistive and gas heating systems with efficient heat pump heater/coolers	16,973
Lighting Replacing inefficient lighting with LEDs	2,265

Efficiency upgrades in commercial buildings were anticipated to provide opportunities for a further 47,545 job-years. The Green Energy Markets analysis did not consider the employment opportunities of electrification initiatives such as rooftop solar and battery installations, EV charging installations, and the rollout of smart meters, which should provide thousands of further opportunities for skilled Australian tradespeople in the coming decade.

Consumer Savings and Access

In 2022, over a quarter (28%) of energy consumers indicated they had difficulties being able to afford to pay their energy bills³. Participation in payment plans over the last 12 months has risen by 7.7%⁴. Energy consumers looking to reduce their energy bills have reported investigating drastic measures like “sitting in dark cold rooms” “moving into a tent” and “shower every second day”³. Nobody living in a developed nation such as Australia should be forced to suffer such indignity to afford their power bills.

Energy poverty is particularly acute for First Nations Australians who are not protected by the consumer protections afforded to mainstream Australia⁵ and suffer higher rates of disconnection and significantly higher barriers to accessing efficiency improvements such as insulation, or heating or cooling, and which can make the biggest difference to costs and comfort.

68% of First Nations adults are renters (34% living in social housing and 34% living in private rental arrangements or renting from some other type of landlord in urban and regional areas), while in remote and very remote areas, 89% of First Nations adults rent, with 71% in social housing.⁶

² Green Energy Markets, “Energy Efficiency Employment in Australia,” Energy Efficiency Council, 2019

³ AER Consumer Reference Group, “CRG Consumer Survey 3 Update on Insights into Energy Consumers’ Price - Service Priorities and Price Impacts,” August 2022.

⁴ AER, “State of the Energy Market 2023,” Australian Energy Regulator, October 2023

⁵ See <https://www.anu.edu.au/news/all-news/power%20disconnections%20put-first-nations%20people-at-risk>

⁶ see <https://www.aihw.gov.au/reports/australias-welfare/indigenous-housing>.

Over the last decade, wholesale gas market prices have risen 50% faster than wholesale electricity spot prices on the National Electricity Market⁷⁸. Switching household gas appliances over to new, more efficient, electric alternatives will generate long-term savings on energy costs and eliminate gas bills entirely. Combining these interventions with rooftop solar and storage installations can take this one step further and eliminate energy usage charges altogether – effectively locking in power prices at the fixed cost of repaying their enabling finance.

Other tools to enhance the efficient use of electrified homes such as smart meters and smart plugs also allow consumers to access further cost savings by monitoring and tailoring their power use around time-of-use pricing structures, doing energy-intensive tasks when power is most affordable.

Barriers

Safety & Quality Assurance

Ensuring safe, high-quality installations is essential for protecting workers, consumers, and the long-term social license of any residential electrification initiative. Household energy upgrades have an added risk when compared to small scale solar, in that most of the installation work associated with small scale solar is external and usually out of reach to the ordinary household occupants during both installation and operation. Residential upgrades to be carried out include installation work, appliances and associated equipment that consumers, including vulnerable consumers such as children, the elderly and disabled, will have direct access to and will often be in close proximity to, will be able to physically touch and will usually be required to physically operate once installed.

Concerns about the quality of installations under a residential electrification program go hand in hand with skilled workforce considerations. A failure to provide an adequate skilled workforce to meet demand for residential upgrades will cause frustration and delay for consumers, raise labour costs, and incentivise the proliferation of unqualified cowboys looking to make a quick buck. Even workers with considerable experience in the domestic sector will require upskilling and retraining to familiarise themselves with new types of work, appliances, and standards. This goes extra for those who may have a generalist electrician qualification but only limited experience in the domestic space.

Workforce

Electrifying millions of Australian households is going to require the dedication of thousands of skilled electrical tradespeople over the coming years. From July 2020 to April 2021, only

⁷ AER, “Annual Volume Weighted Average 30-Minute Prices,” Australian Energy Regulator, 2023, <https://www.aer.gov.au/wholesale-markets/wholesale-statistics/annual-volume-weighted-average-30-minute-prices-regions>.

⁸ AER, “Gas Market Prices,” Australian Energy Regulator, 2023, <https://www.aer.gov.au/wholesale-markets/wholesale-statistics/gas-market-prices>.

64% of advertised roles for electricians were eventually filled nationwide⁹, the estimated number of vacancies has risen by over 30% since that period¹⁰. The Clean Energy Capacity Study¹¹ recently released by Jobs and Skills Australia forecast that Australia is going to need 32,000 additional electricians and around 6,000 more air conditioning and refrigeration mechanics by 2030 to meet skills demand, requiring both occupations to grow faster than 2.5% annually.

Meeting this target and ensuring a sufficient workforce to achieve key government objectives in sectors like renewable energy, housing, and manufacturing is going to be a major challenge. For starters, given the mandatory (and absolutely necessary) 4-year apprenticeship requirement for these trades, we only have until 2027 to recruit around 55,000 new apprentice electricians if we are to meet the 2030 target at current completion rates.

This workforce challenge has the potential to be even more acute in the domestic sector responsible for carrying out residential upgrades as smaller domestic businesses will be forced to compete for workers with large, well-funded, and often unionised projects in the construction and energy sectors offering higher pay.

To meet the skills needs of a comprehensive residential electrification program, it is essential that governments, industry, unions, and the VET sector collaborate to:

- **Hire more apprentices** – Facilitate the creation of thousands of additional apprenticeship places in the domestic electrical sector to ensure that it is making a positive contribution to the skilled workforce, not drawing down from it.
- **Lift apprenticeship completions** – Electrical apprenticeship completion rates have sat between 50-60% over the last decade. Without addressing completions, we will waste limited training resources and have to work twice as hard at recruiting.
- **Fix the VET system** – We need to ensure that there are enough places, teachers, and resources across the VET sector to train the workers we need.
- **Attract more women** – Women currently only make up around 2% of electrical tradespeople. We are not going to find the additional workers we need without including the other half of Australia’s population.
- **Improve labour standards** – The domestic sector will not be able to compete for workers with large contractors on major projects without a concerted effort to lift the pay and working conditions of its workers and stamp out unfair practices. Setting a fair, reasonable, and enforceable floor on wages and conditions will remove the incentive for some bad-faith employers to exploit, mistreat, and underpay employees to get ahead.

⁹ National Skills Commission. “Skills Priority List Findings: Electrotechnology and Telecommunications Trades Workers ANZSCO Sub-Major Group 34 Occupations in Shortage.” Canberra: Australian Government, August 2022.

¹⁰ Jobs and Skills Australia. “Jobs and Skills Atlas Dashboard.” Jobs and Skills Australia, August 29, 2023. <https://www.jobsandskills.gov.au/jobs-and-skills-atlas-dashboard?nav=state&tab=state-occupations®ion=aus>.

¹¹ Jobs and Skills Australia, “The Clean Energy Generation: Workforce Needs for a Net Zero Economy,” Canberra: Australian Government, October 2023.

Other jurisdictions have navigated these challenges of assuring consumer and worker protections while also delivering broader social and economic benefits through implementation of industry endorsed accreditation regimes and commitments to skills and training development.

Case Study 1 – US Inflation Reduction Act

Key Features:

- Prevailing wage and minimum apprenticeship requirements (rising to 15% of workforce or at least 1 apprentice where workforce is greater than 4 by 2024) are applicable to tax credits for the construction of new energy efficient homes, and for efficiency upgrades to commercial buildings.
- Home Energy Efficiency Contractor Training Grants allocated to States to develop and implement training and education programs for contractors installing home energy efficiency and electrification improvements.
- Guidelines for States responsible for administering the Home Energy Rebates package recommend setting wage standards for qualified contractors and requiring them to have completed the certifications developed using the Contractor Training Grants.

Case Study 2 – Victorian An Adept Workforce for the Zero Emission Vehicle Boom Project

Key Features:

- The Victorian State Government has funded the development of a 1-day upskilling course to train licensed electricians in how to design, test, and commission electric vehicle charging installations.
- The training course was developed and designed in consultation with key industry stakeholders.
- The course is currently being delivered for free to 500 electricians as part of a pilot program and is expected to be integrated into Victoria's accreditation frameworks.
- The project has been led by the Electrical Trades Union and delivered by training provider the Centre for U, and Holmesglen TAFE.

The infamous Home Insulation Program is a prime example of what can go wrong where Government programs are implemented without first establishing robust training and accreditation requirements.

While accreditation schemes are necessary, not all are created equal. Some valuable lessons need also be learned from sub-optimal programs.

Case Study 3: Clean Energy Council (CEC) Solar Installer Accreditation

In considering the argument for a robust accreditation and licensing regime, the small-scale renewable energy sector provides a compelling argument due to its high and persistent rates of underperformance.

The ETU's engagement with this sector has repeatedly shown that a subpar accreditation program coupled with a largely ineffective monitoring, compliance and enforcement regime is resulting in suboptimal outcomes with providers regularly advertising for 'unlicensed' electrical workers and trades assistants to complete installations.

The CEC is not a registered training organisation and does not develop or offer the formal training units required for accreditation, outsourcing this element to the wider VET sector. Accreditation was not designed in consultation with, nor supported by key industry stakeholders.

The CEC does not conduct any audits on compliance from accredited installers, this function is carried out by the Clean Energy Regulator (CER). Only 0.94% of rooftop solar installations in 2020 were inspected by the CER, of this sample 23.5% of installations were non-compliant.

Table 1: Number of inspections completed, unsafe and substandard systems for states and territories up to 30 June 2022 (over the life of the program)

	Systems inspected	Unsafe systems	Substandard systems
ACT	423	14	52
NSW	8,754	260	1,612
NT	222	7	39
QLD	10,398	311	2,177
SA	4,199	61	762
TAS	453	20	72
VIC	7,249	220	1,063
WA	5,258	151	1,070
Total	36,956	1,044	6,847

On average, 2.8% of installations were unsafe and 18.5% were substandard, which is a continuation of a long-term trend in performance at both the state level and nationwide for this part of the sector.

Case Study 3 (cont'd): Clean Energy Council (CEC) Solar Installer Accreditation

Despite the high rates of underperformance, no accredited installer has ever been fined, referred to an electrical licensing authority, or otherwise meaningfully sanctioned. No business has had their accreditation status or ability to offer small-scale renewable technology certificates, which allow installers to offer consumers government rebates, threatened because of non-compliant or unsafe installations.

On the positive side, the consumer-facing element of the CEC accreditation scheme – allowing prospective customers to find accredited installers near them or verify an installer's accreditation status online – may be a useful design element for enabling potential consumers to access important information about a program.

Verifying that scheme participants are appropriately skilled and aware of safety and technical requirements is a critical element of any successful accreditation scheme. Collaboration with industry stakeholders and the VET sector to get the balance between depth and accessibility right is pivotal to building an upskilling product that lifts industry standards.

Licensing and WHS regulators need to play a frontline role in monitoring and enforcing compliance with relevant standards on installations under any future household electrification program and will need significant additional resourcing to do so. An effective accreditation scheme must incorporate monitoring and enforcement as well as respond to information from the broader regulatory environment to maintain the program's integrity. Enforcement of non-compliance should happen on a graduated basis, from fines to having access to program certificates suspended or revoked depending on the severity of any breach.

Market Access

If households are to reap the benefits of “electrifying everything” then consumers must be able to access appliances that meet minimum efficiency standards and allow for demand management functionality. Currently in Australia, these appliances are limited in their availability and, where available, are prohibitively expensive.

Implementing a residential electrification initiative can play an important role in improving access in a manner complementary to any future efforts to improve Australian appliance standards. Structuring appliance standards into the eligibility criteria for any government incentives or assistance would send a strong signal to suppliers and manufacturers that Australia's demand profile for their goods is changing, whilst making high-quality products more affordable for Australian consumers.

Path Forward

Installer Accreditation

Ensuring that suppliers of energy efficiency and electrification upgrades are suitably qualified and appropriately trained is critical for keeping both workers and consumers safe, as well as preserving the reputation of the Government and maintaining broad social license for residential electrification. Providing for the appropriate growth of the skilled workforce to meet demand stimulated by residential upgrades will be an important factor in ensuring a smooth rollout and solidifying social license. A suitably robust accreditation model must go beyond being a simple checklist to determine if an individual holds a licence and must be tailored to a systems-based approach to risk management.

The breadth of work that may be performed necessitates a robust framework that is capable of being adapted to the diversity of hazards that will be encountered throughout the program. Such a model needs to deliver:

- Business and worker accreditation
- Business and worker upskilling and/or task familiarisation prior to participation
- High safety standards, especially regarding asbestos and engineered stone.

An appropriate accreditation and licensing regime must also manage social licence and program deployment risks. Entities delivering electrification upgrades need to deliver fair and ethical employment practices while also contributing towards maintaining and expanding the workforce available to perform the work. Allowing entrants to the scheme to avoid their obligations to contribute to the expansion of the workforce risks both social licence and the capacity of the Government to deliver the program.

In addition, a comprehensive, industry led monitoring, compliance, and enforcement function needs to be embedded in the program using a graduated risk-based approach to regulating the implementation of the program. In order for compliance to work, the program must contain three key elements:

- Participants must clearly understand what they have to do,
- Participants must know that they will be caught if they underperform, and
- Participants must understand the consequences and be genuinely concerned about those consequences.

Product Standards

Minimum efficiency standards need to be applied and strengthened across the range of products households will use to electrify and reduce energy consumption. Applying such standards to appliances sold in Australia will send an important market signal for manufacturers to increase the supply of higher quality options, increasing accessibility and lowering prices. Product standards will also eliminate many of the soft costs associated with finding and choosing more efficient appliances.

Similarly, technical standards must be applied to consumer energy resources like rooftop solar and household battery storage to require interoperability between devices and supporting systems. This interoperability allows consumers more flexibility to choose how they manage their energy use, as well as affords energy providers and market operators the ability to safely manage 2-way demand and grid stability.