



SUBMISSION TO THE INQUIRY INTO RESIDENTIAL ELECTRIFICATION IN AUSTRALIA

The Australian Renewables Academy (ARA) welcomes the opportunity to provide this submission to the Senate Economics References Committee's Inquiry into Residential Electrification in Australia.

The ARA is a partnership between regional businesses established to develop a renewable energy workforce with the right skills for the pipeline of renewable energy projects delivered in regional Australia.

ARA works with local stakeholders to

- Identify and promote careers in the renewable energy industry and provide a direct skills and workforce development channel for people looking to enter the industry;
- Develop and deliver skills training for employees transitioning into the renewable energy industry;
- Provide advice to individual job seekers on translating their skills and qualifications to available jobs within the industry;
- Connect job seekers to relevant education and training providers and direct jobs within the renewable energy sector;
- Engage schools, higher and tertiary education providers, employment services and the community in the growth and development of the renewable energy industry in regional Australia; and
- Facilitate industry-led action research to foster innovation and strengthen local economies and communities.

In December 2021, ARA hosted the inaugural Activating Gippsland's Renewable Energy Workforce Forum in Sale. The purpose of the Forum was two-fold: firstly, to explore the opportunities emerging from the rapid scale-up of the renewable energy sector in Gippsland, and secondly, to agree on actions that industry, businesses and community stakeholders can take together, with the support of governments, to grow a local renewable energy workforce for the Gippsland region.

Forum participants identified themes, opportunities and challenges as critical for consideration in activating Gippsland's renewable energy workforce. They were reflected in ARA's Activating Gippsland's Renewable Energy Workforce Action Plan 2022 – 2025, attached with this submission.

On 22 November 2022, ARA held its second Forum in Sale, Victoria. The Forum's purpose was to provide an opportunity for key stakeholders to review the key agreed actions, share information on workforce initiatives, identify gaps and opportunities and harness commitment and resources so that together, the Gippsland community can take a coordinated approach to activating the renewable energy industry and supply chain workforce in Gippsland and the Latrobe Valley.

A copy of the Action Plan is attached with this submission.



ARA will host a national forum in late 2023 to bring together key Renewable Energy sector stakeholders and representatives of government, industry and communities transitioning to the Renewable Energy sector from around Australia.

In 2023, ARA is also undertaking a range of initiatives, from advocacy, locally and nationally, providing a suite of webinars to support leadership growth and innovation in the renewable energy sector, and delivering certificated New Energy Leadership and Management Training (commencing in late 2023).

Regarding issues identified in the Committee's Terms of Reference, ARA makes the following submissions:

- (a) **Economic Opportunities of Household Electrification:** Household electrification presents an unprecedented opportunity to deliver economic and societal benefits. These benefits include:
- **Long-term reduction of energy price inflation:** Electrification will provide a buffer against energy price inflation by enabling homeowners to generate and manage their own power supply. It will also provide more predictable pricing models.
 - **Long-term Employment Opportunities:** Transitioning to a clean energy economy will generate thousands of new jobs nationwide. This will be particularly prevalent in the installation, maintenance, and ancillary industries related to renewable energy infrastructure. Furthermore, the design, installation and maintenance of energy-efficient and smart homes can be a significant source of employment, especially in regional areas.
 - Providing comprehensive and ongoing training programmes and industry certifications ensures Australians can seize these opportunities. Such initiatives should be developed in collaboration with training organisations, TAFEs, universities, and industry bodies to ensure alignment with industry needs and global best practices.
 - **Scaling Up of Domestic Capacity:** The development of local industries such as battery storage, electric vehicle technology, and energy management systems offers an opportunity to expand Australia's industrial capacity significantly. We can reduce our dependence on imports and improve energy security by fostering these industries.
 - To enable the growth of these industries, there needs to be a supportive regulatory environment, targeted investment in research and development, and a focus on workforce training to build the required skills locally. Additionally, mechanisms to facilitate collaboration and technology transfer between industry and research institutions can help spur innovation and technological advancements.
- (b) **Macro-barriers to Home Electrification:** ARA has identified challenges, including a need for greater community awareness about the benefits of electrification, initial high upfront costs, regulatory barriers and grid stability issues. Strategic initiatives that could help overcome these barriers include the following:



- **Enhancing Public Awareness and Engagement:** A need for more awareness about the benefits of electrification is a significant barrier. Government can launch nationwide campaigns to educate the public about the economic and environmental benefits of home electrification. This could be complemented by providing practical information on financing options, rebates, tax incentives, and the process of installation. Local community workshops, school programs and online resources could be utilised to boost public engagement further.
- **Reducing Upfront Costs:** The initial high upfront costs can deter many homeowners. To mitigate this, government can provide financial incentives such as rebates, tax credits, and low-interest loans to reduce the burden of initial investments. The government could also consider exploring innovative models such as 'on-bill financing', where the retrofit cost is added to the consumer's electricity bill and paid back over time.
- **Addressing Regulatory Barriers:** Government can play a crucial role in removing regulatory barriers by providing clear and consistent policy signals. Streamlining permitting processes and providing more clarity on grid interconnection standards can significantly reduce the barriers for householders and businesses interested in installing renewable energy systems.
- **Improving Grid Stability:** As more homes transition to renewable energy, there are potential implications for the stability and reliability of the electricity grid. Governments can invest in grid infrastructure upgrades and support research into energy storage and smart grid technologies. Integrating battery storage systems, microgrids, and demand response mechanisms can help manage the intermittency of renewable energy and ensure grid stability.
- **Workforce Training:** A skilled workforce is crucial to support the transition to home electrification. Government must work with training organisations, educational institutions and industry bodies to develop training programs that provide the necessary skills for this growing industry.

These training programs may have the following elements:

- **Skill Needs Assessment:** a comprehensive analysis of the specific skill requirements for the home electrification sector. This assessment should be done in close collaboration with industry stakeholders and training organisations, such as ARA, to ensure training programs are tailored to the sector's needs.
- **Technical Training:** The core of training programs should be focused on providing technical skills, such as installation, operation, and maintenance of renewable energy systems, energy efficiency measures, and smart home technologies.
- **Safety Training:** Safety should be a paramount concern in all training programs. This should cover electrical safety, working at heights for solar panel installation, and handling of battery systems.



- **Certification Programs:** Training programs should include industry-recognised certifications to ensure quality and standardisation across the sector.
- **Soft Skills:** Apart from technical skills, training programs should also focus on soft skills such as customer service and communication, which are critical for interactions with homeowners.

Attracting International Workers: While training the local workforce must be the primary focus, there could be scenarios where the demand for skilled workers exceeds the local supply. To address this, the following policy issues should be considered:

- **Visa Policies:** Review and potentially revise visa policies to make it easier for skilled workers in the home electrification industry to migrate to Australia. This could involve introducing new visa categories or modifying existing ones to accommodate these workers.
 - **Recognition of Foreign Qualifications:** Establish a process to recognise qualifications obtained overseas to enable skilled foreign workers to contribute their expertise to the Australian home electrification industry.
 - **Incentive Programs:** Develop incentive programs to attract overseas workers to Australia. These could include competitive remuneration packages, relocation assistance, and opportunities for permanent residency.
 - **Partnerships with Overseas Training Institutions:** Establish partnerships with training institutions in other countries to facilitate the exchange of knowledge and skills and to provide a pathway for skilled workers to come to Australia.
- (c) **Total Upfront Cost and Longer-Term Benefits:** While the upfront cost for household electrification may be high, the long-term benefits outweigh the initial investment. These include reduced energy bills, energy security, and increased property value. Alternative models such as on-bill financing, low-interest loans, and energy service companies (ESCOs) can help to manage these upfront costs.
- (d) **Marginal Cost of Abatement:** The marginal cost of abatement for household electrification is one of the most cost-effective measures, particularly when considering the lifecycle cost of renewable energy infrastructure.
- (e) **Optimal Timeline for Household Electrification:** The optimal timeline should align with the broader decarbonisation targets, ensuring an equitable transition for all households by 2050, with strong progress towards this target being made by 2030. ARA recommends that Departments and Agencies responsible for meeting these targets be required to report on their progress annually to this Committee or another body as recommended by the Committee.
- (f) **Impacts and Opportunities:** Household electrification will increase domestic energy security, promote energy independence and potentially positively impact the balance of international trade by reducing dependence on imported fossil fuels.



ARA recognises that household electrification can significantly increase a country's energy security by replacing imported fossil fuels with locally generated electricity. Energy security is the uninterrupted availability of energy sources at an affordable price. Australia can protect itself against supply disruptions and price volatility associated with fossil fuel markets by increasing reliance on local, renewable energy sources. For example, in the case of a geopolitical crisis that disrupts oil supplies, a country with a high degree of household electrification could be less affected as they rely less on oil for heating and power.

Moreover, promoting energy independence is a natural consequence of improved energy security. As countries rely more on domestic energy sources, they become less dependent on foreign oil and gas. The U.S. Energy Information Administration (EIA) has reported that increased use of renewable energy and efficiency improvements have decreased net energy imports. For example, in the U.S., a study by the National Renewable Energy Laboratory (NREL) found that it would be possible to generate 80% of the country's electricity from renewable sources by 2050, reducing the need for imported energy.

It is an economic truism that countries that rely heavily on imported fossil fuels often have a trade deficit. Household electrification can improve Australia's trade balance by reducing the need for imported fossil fuels.

ARA also considers that household electrification can have significant environmental benefits. By reducing the use of fossil fuels, household electrification can help reduce greenhouse gas emissions and mitigate the effects of climate change.

Implementing household electrification, specifically focusing on renewable energy sources, could significantly reduce Australia's greenhouse gas emissions.

According to a study published in the journal "Applied Energy" in 2020, electrification of residential heating in Australia could reduce CO² emissions by up to 24 million tons per year, roughly equivalent to 4.5% of Australia's total CO² emissions in 2020¹. The effect would be even more significant if the electricity used for heating came from renewable sources.

Electric appliances are generally more energy efficient than their fossil fuel counterparts. An Energy Efficiency Council (EEC) report stated that shifting to high-efficiency electrical appliances could reduce Australian household energy use by up to 45%. As less energy is used, fewer emissions are produced².

Despite the above, ARA acknowledges that household electrification's impact on Australia's greenhouse gas emissions will also depend on how the electricity is produced. If the additional demand for electricity from household electrification is met with coal-fired power, the emissions

¹ Cheng, M., & Richter, J. (2020). *Impact of residential heat pump adoption on power demand and emissions: Australia's case*. *Applied Energy*, 275, 115301.

² Energy Efficiency Council, *Navigating a dynamic energy landscape*, Oct 2020.



could actually increase. Hence, ARA considers that household electrification should go hand in hand with a transition towards renewable energy sources for electricity generation.

- (g) **Reducing Household Energy Spending:** Electrification will enable households to reduce energy spending significantly and insulate them from energy price inflation. According to a report by American Progress, investments in clean electricity, electrification, and efficiency will save the average household \$500 annually in reduced energy costs³.
- (h) **Economic Barriers for Low-Income Households:** Targeted subsidies, low-interest loans, and inclusive financing schemes can help ensure that low-income households are included in the transition to electrification. ARA, therefore, supports initiatives such as the \$1.3 billion Household Upgrades Fund, which includes \$1 billion in cheap loans to help households install solar panels, get rid of gas hot-water systems and stove-tops, double-glaze their windows and undertake other energy efficiency measures.

We also note that a further \$300 million will be committed to support upgrades to social housing which will be co-funded and co-designed with the states and territories. Again, ARA considers this to be a progressive and much-needed initiative, one which will benefit individuals and the nation alike.

- (i) **Government Initiatives:** While various government initiatives (including some referred to this in this submission) have been useful in promoting household electrification, a more coordinated national strategy is needed to scale up the transition. Key elements of such a strategy may include the following:
 - **Clear and Consistent Policy Signals:** Establish clear, long-term targets for residential electrification, accompanied by consistent policies. This will provide certainty to consumers, industry, and investors and encourage innovation and investment in the sector.
 - **Incentive Schemes:** Implement robust incentive schemes that make the initial investment in home electrification more affordable. These could include tax incentives, rebates, and low-interest loans for households installing renewable energy systems or energy-efficient appliances.
 - **Regulatory Reform:** Streamline regulatory processes to reduce the time, cost, and complexity of installing home renewable energy systems. This includes easing restrictions on grid connections and fast-tracking permit approvals.
 - **Grid Infrastructure and Stability:** Invest in grid infrastructure upgrades to accommodate the increased demand and intermittency from renewable energy.

³ Clean Energy Will Lower Household Energy Costs. <https://www.americanprogress.org/article/clean-energy-will-lower-household-energy-costs/>



This includes encouraging the development of energy storage technologies, such as home battery systems, and promoting the use of smart grid technologies to enhance grid stability and resilience.

- **Education and Training:** Develop comprehensive training programs to ensure a skilled workforce is ready to support the transition to residential electrification. Work with educational institutions, industry bodies, and community organisations to deliver these programs, including through mechanisms that support remote learning via VR and AR platforms.
 - **Public Awareness Campaigns:** Launch nationwide educational campaigns to raise awareness about the benefits of home electrification, available incentives, and the process of installing renewable energy systems. Use a mix of digital and traditional media platforms to reach a broad audience.
 - **Research and Development:** Support research and development in home electrification technologies to reduce costs, improve efficiency, and foster innovation. Encourage collaboration between research institutions, industry, and government to accelerate technology transfer and commercialisation.
 - **Equity Measures:** Ensure the transition to home electrification is equitable by providing additional support to low-income households and rural and remote communities. This could include targeted subsidies, community energy projects, and tailored training programs.
- (j) **International Standards:** Australia has a significant potential to become a global leader in residential electrification, particularly in areas such as rooftop solar, batteries, and electric household appliances.
- (k) **Other Matters/the National Net Zero Authority:** Ensuring energy literacy, skills development and community engagement are critical to the success of household electrification. On this point, ARA welcomes the establishment of the National Net Zero Authority. We do so on the basis of our understanding that the Authority will assist workers, industries and communities that have been dependent on fossil fuels to adapt to the changing energy landscape and seize the opportunities of renewable energy⁴.

The Authority can best support the transition to electrification by playing a coordinating role across all levels of government, and particularly the REZs around Australia, to:

- Work with state and local governments, utilities, retailers and community groups to develop policies and programs that encourage electrification, address potential impacts on the electricity grid and ensure that the workforce required to deliver electrification is trained and available where it is needed most (i.e. a 'prioritisation' role).
- Provide funding and incentives for households to install energy-efficient appliances, solar panels, batteries and electric vehicles.

⁴ Australian Government Media Release, 5 May 2023, [National Net Zero Authority | Prime Minister of Australia \(pm.gov.au\)](https://www.pm.gov.au)



- Engage with consumers and stakeholders to raise awareness of the benefits of electrification and address any concerns or misconceptions.
- Support research and innovation to develop new technologies and solutions that can lower costs and improve the performance of electrification.

In conclusion

ARA welcomes the opportunity to discuss any of the above points with the Committee and stands ready to provide further information as required.