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Electrician Workforce Capacity Study:

Why more apprentices are essential
and who holds the keys to growth



Executive Summary

Australia needs more electricians.
The challenge is how to create them.

The challenge is larger than it appears

Australia is entering an energy supercycle. Earlier estimates suggested a clean energy economy would require around 42,500 additional licensed electricians by 2030. Since then, additional demand from housing construction, data centres, and other major infrastructure investments not captured in those earlier estimates is expected to have increased workforce requirements by around a further 30,000 energy trades workers, a large share of which are electricians. The outlook, and opportunity, is now considerably larger than clean energy ambitions alone.

Governments have already recognised the importance of workforce growth to national priorities through investments in apprenticeships, skills reform, training capacity, workforce initiatives and targeted incentive programs. Despite these efforts, existing workforce projections continue to suggest future workforce supply may struggle to keep pace with what is required. Shortages of skilled electrical and technical labour are already driving up costs of energy developments in Australia and globally.

Why workforce supply may not keep pace under current settings

Under current settings, workforce supply is unlikely to keep pace with future demand because the energy supercycle changes who benefits from apprenticeship training without fundamentally changing who pays for it.

"The energy supercycle changes who benefits from apprenticeship training without fundamentally changing who pays for it."

This matters because apprenticeships are the primary pathway into the licensed electrical trades, with limited scope to expand workforce supply through skilled migration or university pathways. Apprenticeships are also one of the few education pathways where employers create the training places. In the electrical trades, those opportunities can only be created by businesses that already employ licensed electricians able to supervise and train apprentices.

Only actors with genuine links to this ecosystem can expand apprenticeship opportunities – small and large employers, group training organisations (GTOs), and even government, through its ownership of some public power networks. This report focuses on where the greatest latent capacity sits: the thousands of mostly smaller electrical contracting businesses that form the backbone of the system (they currently train 71 per cent of all electricians), but for whom the conditions to expand that capacity even further are not yet in place. That said, the solutions available and the role for other actors in the ecosystem is bigger than this group alone.

Historically, these electrical contractors employed apprentices to meet their own future workforce needs. The businesses that invested in training were also the businesses that expected to benefit from having more qualified electricians.

The energy supercycle broadens demand well beyond those established employers. Emerging industries – namely renewable energy for domestic and export purposes, data centres and housing construction accelerated by government targets – all depend on the same pool of licensed workers. However, many of the industries driving future demand are not structured to train apprentices at scale and instead rely on the existing apprenticeship system to supply qualified workers. This is a consequence of how workforce demand has evolved rather than the actions of any one sector.

As a result, stronger demand for qualified workers does not automatically create more apprenticeship opportunities. The businesses that employ apprentices continue to bear most of the costs and risks of training, while the benefits of a larger skilled workforce are increasingly shared across the economy. At the same time, more industries are likely to compete for newly qualified workers, making it less certain that employers who invest in apprenticeship training will retain the workers they develop.

Without changes to these settings, workforce supply is unlikely to expand at the pace required to meet projected future demand.

Why focus on apprenticeship employers?

Because if apprenticeship opportunities are created by employers, the question becomes how employer participation can be expanded within the existing apprenticeship system. The available evidence suggests this represents one of the highest-leverage opportunities for increasing workforce supply. Interest from prospective apprentices remains relatively strong, energy apprenticeship completion rates are comparatively high, and employers report fewer recruitment difficulties recruiting apprentices than qualified workers.

In contrast, employers face significant costs, supervision requirements, productivity trade-offs and business risks when employing apprentices. Employer costs were the most commonly cited barrier to employing more apprentices in Powering Skills Organisation's (PSO's) employer survey, raised by around one in four respondents. Wages are the largest component of those costs, accounting for around 54 per cent of total apprenticeship costs, and are most heavily concentrated in the first two years of the apprenticeship. Together, these factors weaken the employer value proposition and limit both the scale and pace of workforce growth.

The employer value proposition is not a new challenge. Employers have long faced significant costs, supervision requirements and business risks when employing apprentices. What changes under the energy supercycle is not the existence of these constraints, but their significance. A constraint that once limited apprenticeship growth at the margins now has the potential to influence whether workforce supply expands at the scale required to support major national objectives.

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Recent apprenticeship trends reinforce the significance of this challenge. Employer job advertisements for apprentices continue to fall. They have declined every year since 2022 and in early 2026 were at their lowest level since 2019. Energy apprenticeship commencements have moderated from the levels reached under the Boosting Apprenticeship Commencements (BAC) program. While some moderation was expected following the end of the program, workforce supply is not currently expanding at the pace implied by projected future workforce requirements.

Who holds the keys to growth?

The keys to growth are shared across several groups. Electrical contracting businesses (predominantly small and medium enterprises – SMEs) already train 71 per cent of all electrician apprentices but only one in three currently employs an apprentice, representing the largest identifiable pool of latent capacity. Large employers, GTOs and government as direct employers hold a second significant pool that has declined significantly over time. Government as a market shaper holds levers that can change the conditions under which both pools operate. And the emerging industries driving supercycle demand can also play a role in supporting the supply response. No single group holds all the keys. That fragmentation is at the heart of the challenge this report identifies and addressing it will require a coordinated response across the ecosystem.

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The evidence points to a significant opportunity

Put simply, if the question is where Australia could create the additional tens of thousands of qualified electricians needed by the 2030s, this analysis suggests the answer lies within the existing apprenticeship system. More specifically, a significant share could come from increasing the number of apprenticeship opportunities created by the thousands of predominantly smaller electrical contracting businesses that employ licensed electricians and are able to supervise and train apprentices.

Electrical contracting businesses employ around 56 per cent of Australia’s licensed electricians and hold the largest share of the country’s electrical apprenticeship training capacity. Yet only around one-third of the approximately 48,000 such businesses currently employ apprentices. With limited scope to expand workforce supply through skilled migration or alternative pathways, growing the licensed workforce at the scale the supercycle requires would be very difficult without expanding participation within this group.

If the employer value proposition cannot be strengthened, major projects and investments may still proceed, but over longer timeframes, at higher cost, and with fewer economic, employment and energy system benefits than might otherwise be realised.

What mechanism, or mix of mechanisms, could deliver this is less certain

This report does not prescribe future policy settings. It provides the evidence base on why those settings are important. A range of mechanisms could help strengthen the employer value proposition, including procurement settings, industry partnerships, tax measures, training and innovation funds and many others. Some of these sit with state, territory and federal governments, while others may sit with industry, employers, peak bodies or other parts of the system.

The appropriate mix will depend on the decision-makers involved, who may act independently or in a more coordinated way across different levels of government and industry, balanced against other priorities and what is practically achievable.

Of these, incentives are the only mechanism this report has tested. Preliminary PSO analysis suggests substantial latent capacity already exists within this group of employers. When employer conditions improved materially during the BAC program, energy apprenticeship commencements rose by around 45 per cent above what would otherwise have occurred, equivalent to approximately 10,500 additional commencements, the vast majority of them electricians. Incentives are not risk-free, including questions around cost, targeting and value for money. Their real significance lies in what they reveal: substantial latent capacity exists within this group of employers, and it responds when the employer value proposition genuinely improves.

"Substantial latent capacity exists within electrical contracting businesses, and it responds when the employer value proposition for hiring apprentices genuinely improves."

Policy implications

This report identifies a high-impact policy opportunity: expanding workforce supply by strengthening employer participation in the apprenticeship system.

Much of Australia's practical capacity to grow the future licensed electrician workforce already sits with businesses capable of employing and training apprentices across two distinct pools. The evidence presented in this report focuses on one of these – electrical contractors – who already train most of the nation's electrical apprentices and have significant capacity to grow.

It suggests the principal constraint on expanding that capacity is not apprentice interest or training infrastructure, both of which are getting stronger thanks to government and industry investment, but a weak employer value proposition. Whether workforce supply expands at a material scale now depends largely on whether more employers choose to create apprenticeship opportunities, and whether the conditions exist to make that worthwhile.

This does not mean the employer-side constraint is the only one that matters. The energy supercycle is too large and complex to be addressed through any single intervention. Continued investment in apprentice attraction, training capacity, apprentice support and workforce capability will remain essential. Equally, expanding apprenticeship supply is not the role of any single group. Large employers, GTOs and government as direct employers of apprentices all have a part to play even as the conditions facing smaller electrical contracting businesses are put in clearer focus. The opportunity identified here is to build on that progress by addressing the constraint that currently limits how much of it converts into additional qualified workers.

Electrician workforce capacity may also warrant a different policy approach from many other parts of the apprenticeship system. The immediate constraint is on the employer side, not the individual supply side. And at the same time the workforce these apprenticeships produce is critical to national clean energy ambitions, and apprenticeships are the only pathway capable of delivering it at scale. The energy supercycle has also acted as a demand shock: workforce demand has shifted dramatically, while the system that produces supply has remained largely unchanged.

Much of this demand is not the product of an ordinary or stable market. It has been shaped substantially by government policy, major infrastructure investment decisions, and the hyperscale nature of emerging markets such as AI and data centres.

Government already plays an active market-shaping role in the broader clean energy sector, and even smoothing the workforce impacts of the transition. Extending that logic to workforce formation, treating it as a strategic investment in a clean energy supply chain rather than a standard training policy problem, may open options and justify a scale of response that conventional apprenticeship policy does not. There is also scope for the emerging industries driving much of this demand for licensed workers, along with the broader ecosystem of established large employers, GTOs and government, to play a more active role in supporting the supply response.

This report does not prescribe specific policy settings or mechanisms for strengthening the employer value proposition for electrical contractors. It provides the evidence base from which those settings can be developed and the urgency to do so, and is intended to form part of the foundational reasoning PSO draws on in developing its workforce policy position for the energy trades.

Figure 1 illustrates the central structure of this challenge, how prospective apprentices and future workforce requirements exist on either side of a system where employers hold the key to converting one into the other.



Figure 1: The central diagnosis of this report and potential pathways forward.

Expanding the future workforce

Prospective apprentices and future workforce requirements already exist.
Workforce only expands when employers create apprenticeship positions.



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Introduction

Key message: Australia needs more electricians than ever before. The question is how to create them at the scale and speed required.

The challenge we face

Demand for energy trades workers, particularly electricians, is growing from multiple directions at once. Renewable energy, transmission, housing, data centres, electrification and broader infrastructure investment all rely on the same group of licensed workers. Earlier estimates suggested a clean energy economy would require around 42,500 additional licensed electricians by 2030.¹ Additional demand not captured in those estimates is expected to add a further 30,000 energy trades workers, a large share of which are electricians.² Shortages are already driving up costs of energy developments in Australia and globally.³ This report uses the term energy supercycle to describe this prolonged period of growing demand across the economy.

The question is not whether more workers are needed. It is how to create them. A range of explanations have been proposed for future workforce shortages, including an ageing workforce, apprentice attraction and low completion rates.⁴

This report argues that closer attention is needed on a different mechanism: the role of apprenticeship employers, as these businesses may hold the key to closing workforce gaps over the supercycle. Unlike institution-based education, the apprenticeship system depends on employers creating training opportunities. Today's licensed workforce, and the businesses they work in, are the only channel able to train tomorrow's (**Highlight 1**).

This employer side of the system includes a range of actors: smaller electrical contracting businesses, large employers, GTOs and government, each with a different capacity and set of conditions shaping their participation. What unites them is access to licensed electricians. Any organisation that employs them holds some capacity to train the next generation. And any emerging industry that depends on them has a stake in ensuring enough of them exist — particularly where those industries cannot train at scale themselves. This report focuses primarily on the smaller electrical contracting businesses that hold heavy concentration of latent capacity, while recognising that other actors in the ecosystem also have a role to play.

Highlight 1: From workforce demand to workforce formation

The aim of this research is to move beyond quantifying future workforce demand and potential workforce shortages, and towards understanding how additional workforce supply is actually created.

Traditional workforce analysis often focuses on forecasting future workforce needs and quantifying the gap between demand and supply. While these questions are important, they do not explain where additional workers come from, what may be limiting workforce growth, or how workforce supply can be expanded at scale.

This report focuses on workforce formation: the mechanisms through which additional workers enter the workforce over time and the factors that influence that process.

Defining Australia’s energy trades and energy apprentices

PSO has identified six priority occupations critical to the growth of the energy sector, five of which are trades occupations (**Table 1**). Electricians account for 69 per cent of that workforce and more than four in five energy apprentices. They also account for the largest energy trade in demand across the supercycle. As a result, this research focuses primarily on electricians and the apprenticeship pathways that lead to this occupation. Further detail on scope and methodology is provided in **Appendices C** and **D**.

Table 1: Australia’s energy trades by employment, 2026.⁵

Energy trades	2026	Proportion of energy trades
Electricians	195,400	69%
Air Conditioning and Refrigeration Mechanics	36,700	13%
Electrical Distribution and Transmission Trades Workers	10,600	4%
Electronics Trades Workers	30,900	11%
Electrical Engineering Draftspersons and Technicians	10,800	4%
Total	284,400	100%

Why this research now

Alongside the energy supercycle, PSO has undertaken this research in response to a series of developments (**Figure 2**).

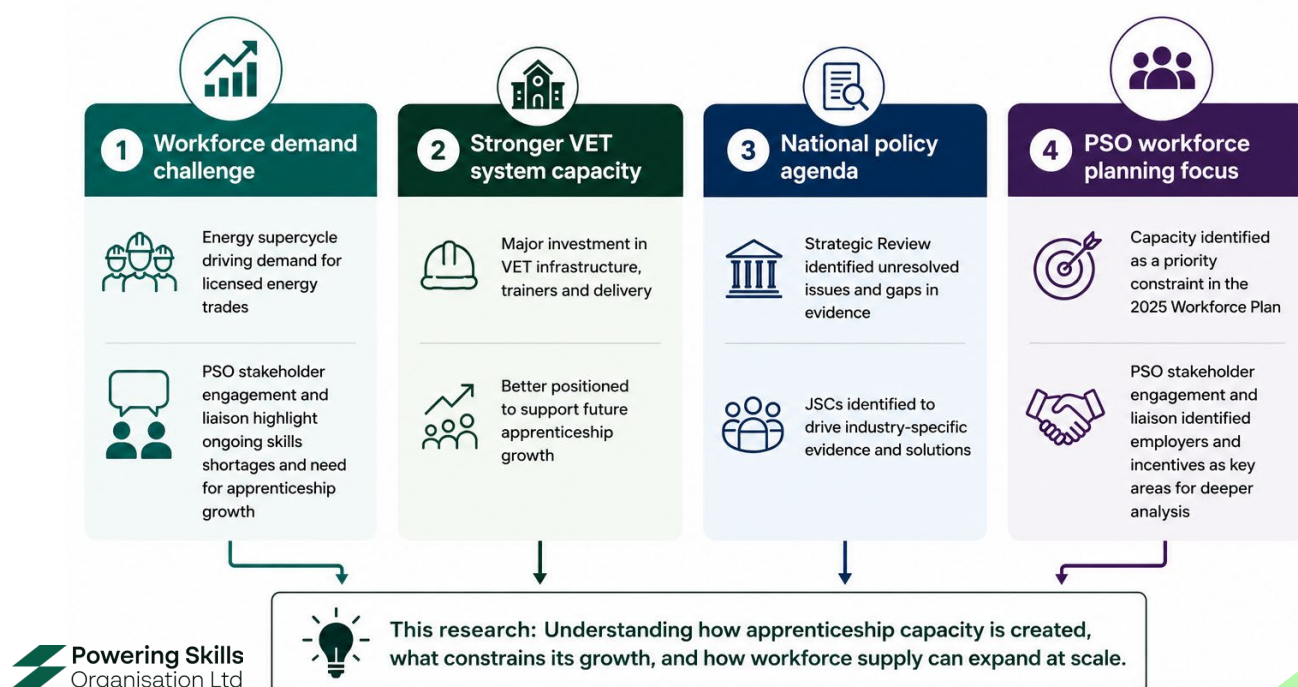
First, electrical apprenticeship commencements have normalised from the record levels observed during the COVID-era apprenticeship incentive period (known as the BAC).⁶ While this adjustment was broadly expected following the end of temporary support measures, this is generally heading in the opposite direction to supercycle needs. Second, significant investment has been directed towards strengthening Vocational Education and Training (VET) capacity, including training infrastructure, facilities, trainers and workforce delivery (**Highlight 2** and **Appendix A**).⁷ These investments increase the sector's capacity to support future apprenticeship growth and demonstrate a willingness to plan for a substantially larger apprenticeship influx in the future.

Thirdly, the Strategic Review of the Australian Apprenticeship Incentive System identified the need for further industry-specific analysis of apprenticeship capacity. Understanding how that capacity is created for electricians sits within PSO's remit as a Jobs and Skills Council (JSC).⁷ Fourth, the development of PSO's workforce planning framework identified the need for deeper investigation of workforce capacity, particularly the role of employers of electrical apprentices. For more information on this framework see **Appendix B**.

Figure 2: Why this research has been done now.

Why this research now?

Four key developments are increasing the importance of understanding apprenticeship capacity in the energy sector.



Highlight 2: Significant progress has been made in expanding VET capacity

A major recent focus of workforce policy has been expanding the capacity of the VET system, particularly the ability to provide off-the-job training for apprentices.

This reflects several factors. Record apprenticeship commencements during the COVID-era apprenticeship incentive period placed significant pressure on training infrastructure and workforce delivery. Long-standing constraints in parts of the VET system also highlighted the need for additional capacity. At the same time, governments have recognised that future workforce requirements associated with clean energy, electrification and the broader energy supercycle are likely to require a substantially larger training system over time.

Governments have responded through substantial investment in training infrastructure, facilities, trainers and workforce delivery.

These investments have strengthened the capacity of the VET system and placed the sector in a stronger position to support future apprenticeship growth than was the case during the previous period of rapid expansion. While continued investment will remain important, VET capacity has received substantial policy attention and is now better positioned to support future workforce growth.

This creates greater scope to examine other dimensions of workforce capacity. In particular, understanding how apprenticeship opportunities are created, and whether apprenticeship numbers can expand at the scale implied by future workforce demand, is becoming increasingly important.

This does not diminish the importance of continued investment in VET capacity. Rather, it highlights that workforce growth depends on multiple parts of the system. While the capacity to provide off-the-job training has expanded, apprenticeship opportunities must still be created by employers.

Further detail on recent VET investments is provided in **Appendix A**.

The next section examines the energy supercycle and why workforce supply may not keep pace with demand.

Australia's energy supercycle and the workforce capacity challenge

Key message: An energy supercycle is emerging in Australia. It is creating substantial needs for workers, but not the workers themselves.

Future requirements for licensed electricians are expected to increase substantially, but workforce supply may largely depend on training decisions being made years in advance by a different set of employers.

Under current settings, those employers have limited reason to expand their training activity at the scale required.

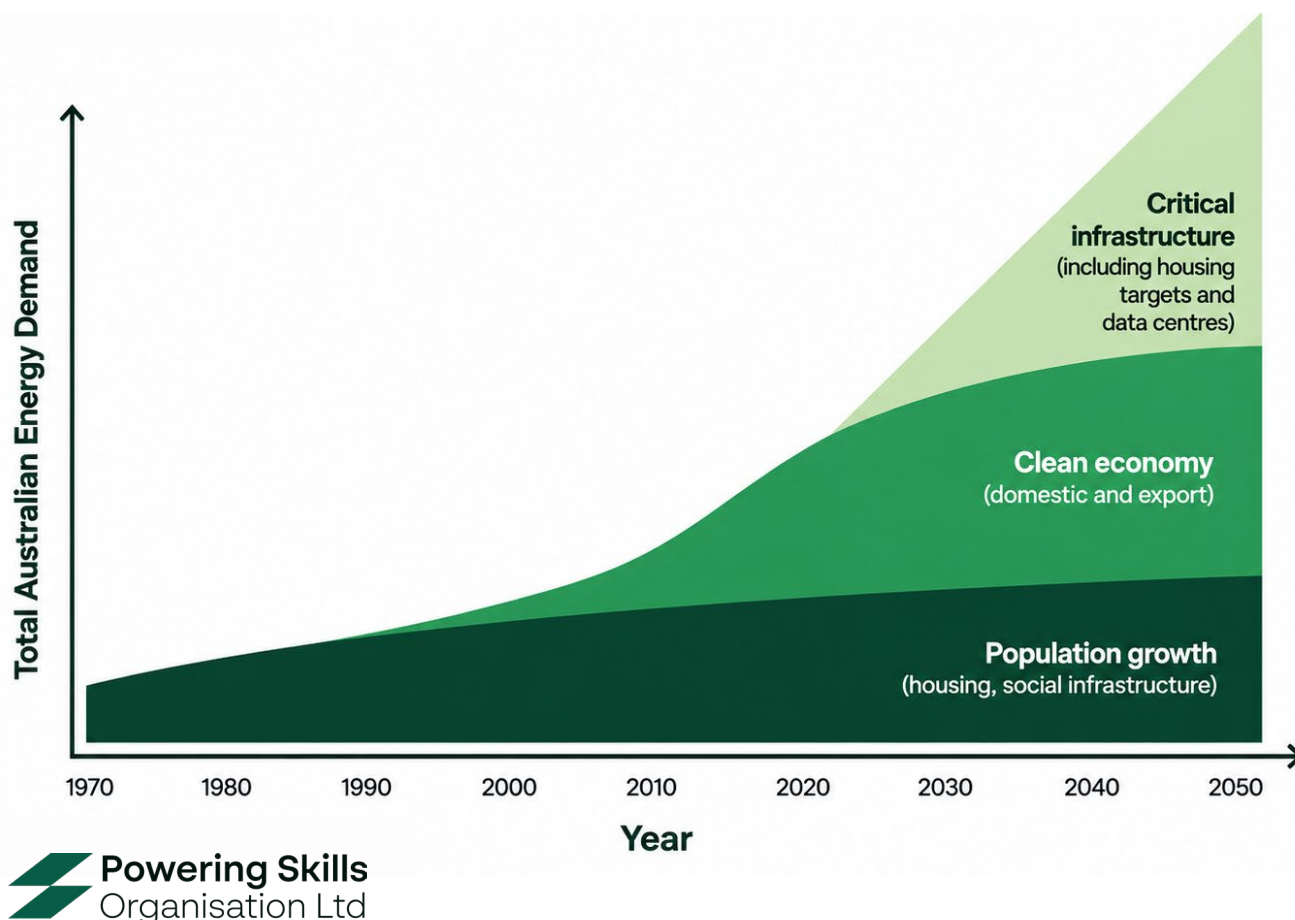
Australia's energy supercycle

Australia is entering a period of sustained growth in demand for licensed energy trades, particularly electricians. This is being driven by renewable energy generation and storage, transmission and network infrastructure, housing targets, data centres, cleaner manufacturing, and the broader electrification of homes, businesses, transport and industry (**Figure 3**).

Unlike previous periods, much of this demand is being generated by governments, developers and large capital-intensive actors who are consumers of workforce capacity rather than producers of it.

Figure 3: Australia's energy supercycle.

Australia's energy supercycle



While demand is very large it all draws on the same group of licensed trades. Electricians account for the largest share of employment across the clean energy industry and are also heavily relied upon in housing construction, transmission, data centres, electrification programs and other major infrastructure investments.⁸

Current estimates suggest the clean energy transition alone may require around 42,500 additional electricians by 2030. Closing that gap would require around 18,000 more electrician apprentices in training, equal to around a 40 per cent increase from recent levels. Given a four year apprenticeship, those apprentices would need to have commenced training by around 2026 to be licensed and available by 2030.⁹ This workforce gap is broadly consistent with estimates across the globe, which suggest energy graduate numbers would need to increase by around 40 per cent by 2030 to meet clean energy skills needs across the international economy.¹⁰ These Australian estimates may now be conservative. Additional demand from Housing Accord targets, data centres and AI infrastructure, and major state programs including the Brisbane 2032 Olympic and Paralympic Games is expected to add a further 30,000 or more workers, a large share of which are also electricians.¹¹

What makes this period distinctive is not just the scale of demand or its core need for electricians, but also its composition. Each new source of demand adds to the total without adding to the system that produces the workers it needs. The supercycle has created new consumers of workforce capacity. It has not created new producers of it.

Shortages in electricians and other licensed trades therefore have the potential to affect multiple sectors simultaneously. When workers are scarce, projects compete for the same pool, recruitment becomes harder, labour costs rise and experienced workers become increasingly mobile. Workforce availability begins to influence project sequencing, delivery timeframes and investment decisions. Evidence of these dynamics is already emerging. The Australian Energy Market Operator has identified skilled trades shortages as contributing to rising transmission project costs in Australia, and the International Energy Agency has identified electrician shortages as a growing constraint on energy transition delivery globally.¹⁰

The supply challenge

The challenge is not simply that more workers will be needed. PSO has previously described this as a challenge of high load, short supply: growing workforce demand meeting a supply system that requires time, investment and sustained participation to expand.

Most energy trades – including electricians – rely heavily on apprenticeship pathways, apprenticeships take several years to complete, and alternative sources of supply are limited by licensing requirements and migration constraints.¹² These supply characteristics matter because many energy occupations perform functions that cannot easily be substituted. Workforce shortages therefore affect more than labour availability, they affect the rate at which projects and investment can be delivered.

Apprenticeships are the primary pathway into many of the critical occupations facing the highest future demand. Unlike many occupations that can draw on multiple education and training pathways, future electrician workforce growth depends almost exclusively on apprenticeship commencements, progression and completion.¹³ **Figure 4** illustrates how these multiple demand sources converge on the same apprenticeship-produced workforce, and the resulting capacity gap if training activity does not expand.

Figure 4: Australia's energy supercycle and the electrician workforce capacity gap.

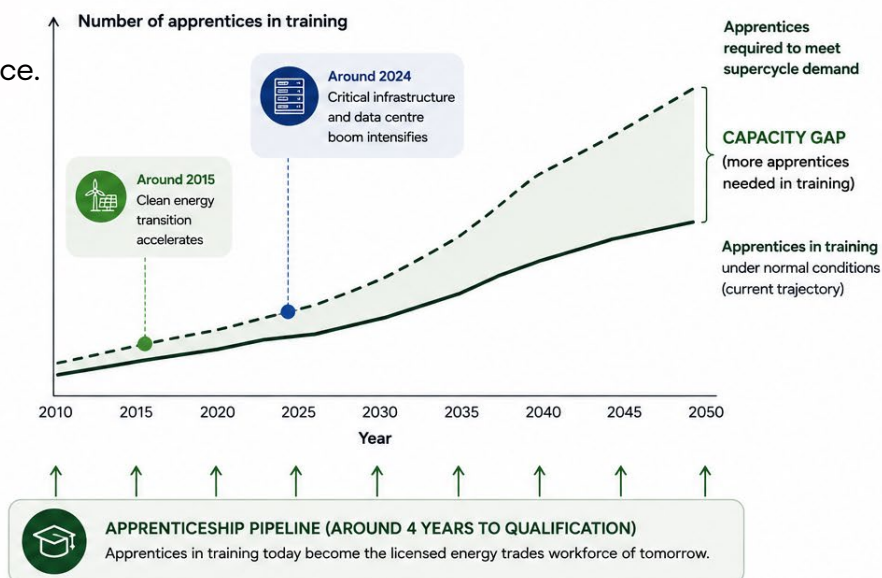
Australia's energy supercycle

Multiple demand sources are converging on the same apprenticeship-produced workforce.



The growing capacity gap in the apprenticeship pipeline

Without additional action, the number of apprentices in training is unlikely to keep pace with demand from the energy supercycle.



In licensed electrical trades, apprentices generally require supervision by licensed electricians employed by eligible businesses. This means the capacity to produce more qualified electricians depends on employers with licensed electricians creating and sustaining apprenticeship positions. There is no separate training workforce. Today's licensed workforce is the workforce that trains tomorrow's.

Why electrician workforce capacity is under pressure

More than half of the nation's licensed electricians are employed by electrical contracting businesses.¹⁴ This means much of the apprenticeship system's practical training capacity, and therefore much of its potential for future workforce growth, resides within this group. Small and medium-sized businesses make up 96 per cent of these businesses, and electrical contractors as a whole employ 71 per cent of all electrician apprentices, of which SME electrical contractors account for 62 per cent.¹⁵ They carry significant capacity, costs and risks of training, yet the return on that investment may not be captured solely by the employer that provided the opportunity.

This report argues that understanding the factors influencing their participation is essential to understanding how workforce supply can be expanded.

The emerging industries driving the supercycle's growth — renewable energy, data centres, housing construction accelerated by government targets — are not the businesses that can train at the pace and scale of workforce required. That role falls largely to a much narrower group of established electrical contracting businesses, predominantly SMEs, alongside a broader ecosystem of established large employers. Because the industries driving demand and the employers who train the workforce are largely different groups, a structural decoupling emerges between the forces driving demand and the system that produces supply. Demand is project driven, large-scale and increasingly shaped by long-term government and industry investment decisions. Supply is decentralised, employer-driven and shaped primarily by short-term business conditions and different contexts. Understanding why these systems do not automatically move together requires examining three interrelated challenges.

The first is time. Apprenticeship training responds slowly and apprentices take years to complete their training. A skilled workforce shortage in four years is a training shortage today. Future workforce demand can become visible long before the incentives to expand training become strong enough to generate the required supply.

The second is where training capacity sits. Much of the apprenticeship system's practical training capacity resides within small and medium-sized electrical contracting businesses. Many of the industries driving future demand, including renewable energy projects, data centres and major infrastructure, depend on qualified workers when projects commence but are poorly positioned to train apprentices themselves. Project delivery timeframes are often shorter than a four-year apprenticeship. Proper workforce readiness in this ecosystem has come to mean – in principle – that these emerging industries rely on a narrow group of separate employers to make training investments on their behalf years before that demand emerges.

The third is how these practical training decisions are actually made. Decisions about whether to take on apprentices are made by thousands of individual employers based on their own costs, workload, risks and business conditions, not the workforce needs of the broader economy. Employers are often expected to invest in training today to meet workforce needs that may emerge elsewhere in the industry several years into the future.

These three challenges act together. The problem is one of time, training capacity and employer behaviour, a system where future workforce demand does not automatically translate into present-day training activity.

If workforce supply does not expand in line with demand, workforce shortages may become an increasingly important constraint on the delivery of energy, housing, infrastructure and other major investments. The costs of inaction are not abstract. They are already emerging. The remainder of this report examines where the capacity to expand workforce supply resides, what is constraining it, and what would be required to activate it at the scale the supercycle demands.

Where supply capacity is headed

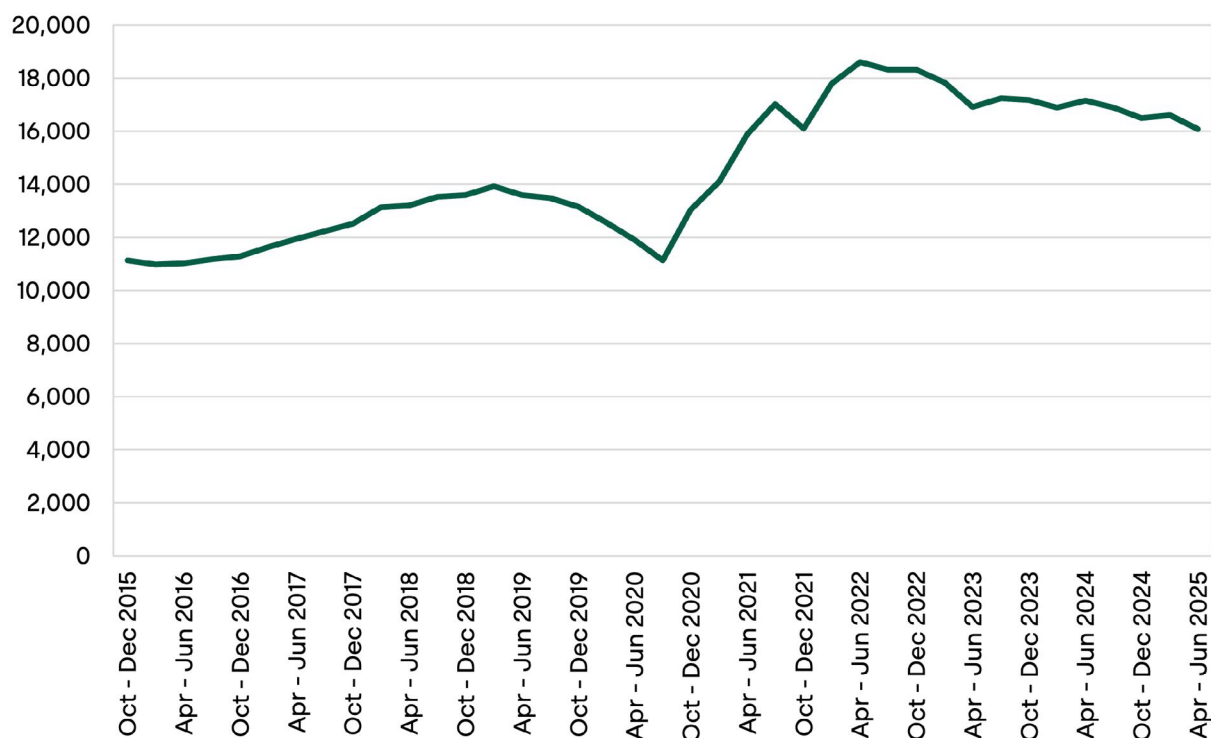
Key message: Workforce supply capacity is heading in the opposite direction to workforce demand. Future workforce shortages begin as apprenticeship shortages, and apprenticeship commencements remain one of the strongest leading indicators of future workforce supply.

Recent apprenticeship commencements suggest the workforce pipeline is not expanding at the pace required by future workforce demand. This gap could widen rather than narrow unless apprenticeship participation increases significantly from current levels.

Recent trends

Energy apprenticeship commencements have moderated from the record levels observed during the COVID-era apprenticeship incentive period.

While some moderation was anticipated following the withdrawal of temporary wage subsidies, the trend remains concerning given the scale of future workforce demand associated with the energy supercycle (**Highlight 3**). **Figure 5** shows energy apprenticeship commencements in Australia over the past decade using 12-month rolling totals. In the 12 months to June 2025, energy apprenticeship commencements were 6.4 per cent lower than the previous year and approximately 12 per cent below their 2022 peak.¹⁶

Figure 5: Energy apprentice commencements, Australia.¹⁷

Highlight 3: The COVID-era incentive period as a reference point

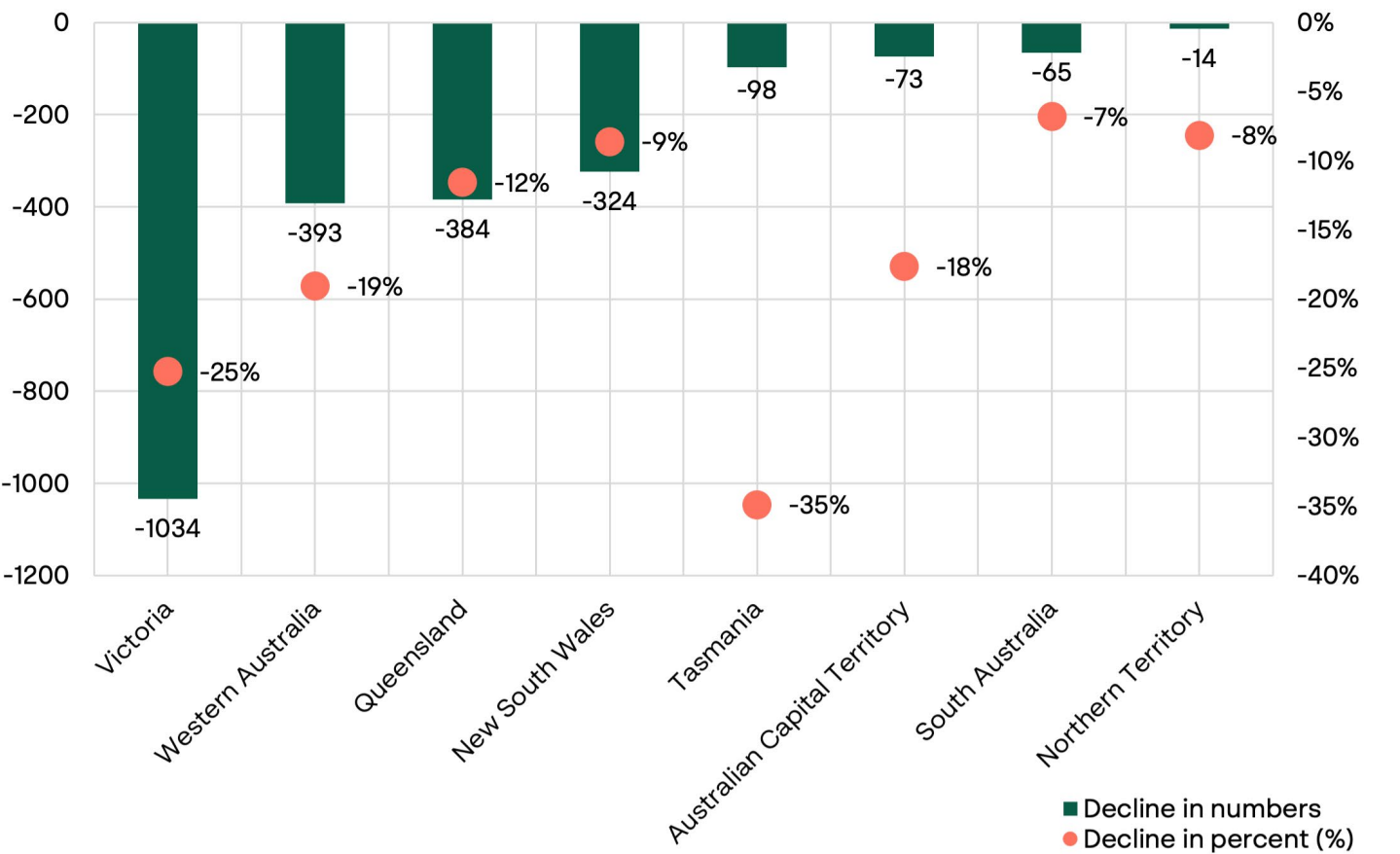
Commencement levels at present remain above those observed immediately prior to the pandemic.

More broadly, the apprenticeship system has transitioned from an exceptional period of broad-based apprenticeship support to a more targeted framework focused on priority occupations, workforce shortages and nationally significant economic priorities.

The Boosting Apprenticeship Commencements (BAC) and Completing Apprenticeship Commencements (CAC) programs provided substantially higher levels of employer support than either earlier or current arrangements. Together they created a rare opportunity to observe how apprenticeship commencements respond to changes in employer incentives. Apprenticeship trends during and after the BAC and CAC period are therefore used as an important reference point throughout this report. The role of employer incentives in shaping apprenticeship participation is examined further in a later section.

The moderation in energy apprenticeship commencements since 2022 has been concentrated in electrician apprenticeships. Electrician commencements reached record levels during the COVID-era apprenticeship incentive period and have since moderated by approximately 16 per cent, equivalent to around 2,500 fewer commencements than 2022. This pattern is evident across all states and territories, indicating a broadly national trend rather than one confined to a small number of jurisdictions (**Figure 6**).

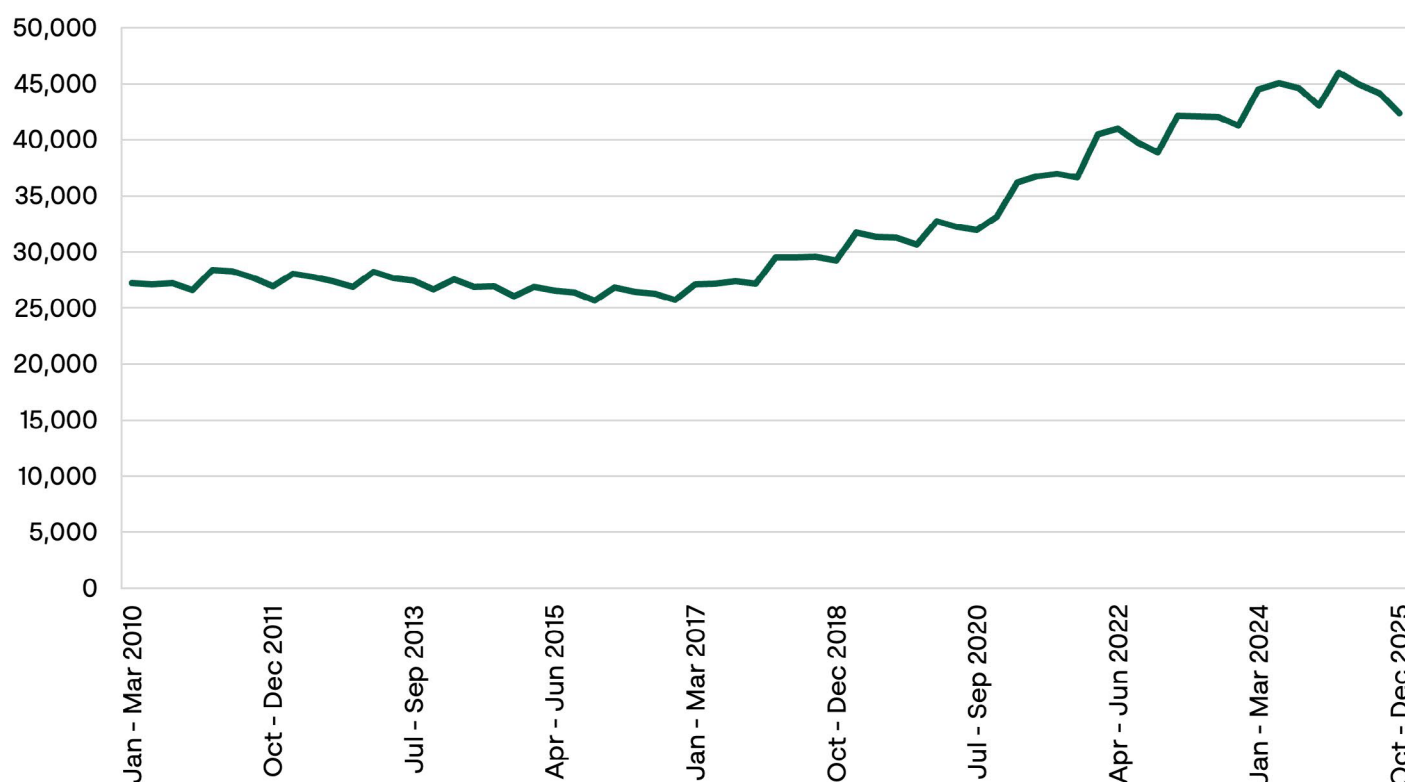
Figure 6: Electrician apprentice commencements, end of the COVID subsidy period (mid-2022) to mid-2025.¹⁸



This national decline in commencements is now flowing through to the number of electrician apprentices in training. After reaching a peak recently, electrician apprentices in training have also declined, falling sharply by around six per cent from recent highs (**Figure 7**). This lag is expected – with a four-year apprenticeship, the in-training pipeline takes time to reflect changes in commencements. That it is now declining confirms the contraction is real and sustained, not a short-term fluctuation.

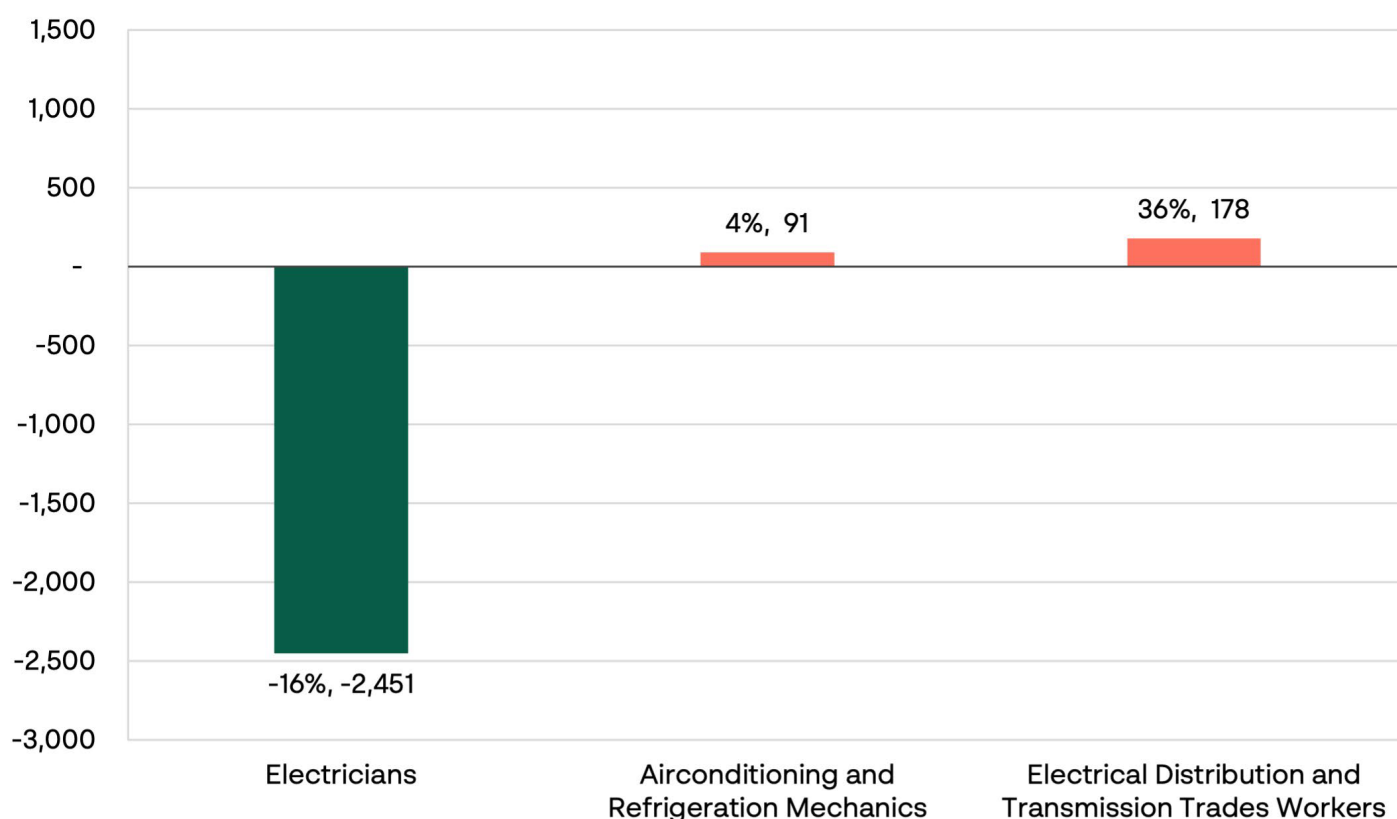
While the decline is not dramatic in isolation, it is moving in the wrong direction at a time of growing demand. Where falling commencements signal future pressure, falling apprentices in training confirms the pipeline is already shrinking, illustrating how the contraction in new entrants is now reducing the overall pipeline of future electricians.

Figure 7: Electrician apprentices in-training, Australia.¹⁹



In contrast, commencements across other energy apprenticeship pathways have continued to grow since 2022 (**Figure 8**). Collectively, commencements outside electrician apprenticeships increased by around six per cent. However, these occupations account for a relatively small share of total commencements and growth in these pathways has not been sufficient to offset the decline in electrician commencements.

Figure 8: Energy apprentice commencements trends, end of COVID subsidy period (mid-2022) to mid-2025), Australia.¹⁸



Future outlook and scenarios

To explore the future of commencements PSO developed three scenarios for electricians. This suggests future risks are concentrated on the downside.

The first scenario extends the pattern observed since the conclusion of the BAC period through to 2028.²⁰ Here electrician commencements would be around 12 per cent lower than current levels by 2028 (**Figure 9, blue broken line**).

The second scenario examines a more adverse pathway in which the moderation observed since the conclusion of the BAC period continues and broader economic conditions also weaken. This is based on empirical relationships between commencements and unemployment, and potential impacts of the Middle East conflict (**Appendix F**). Here electrician apprenticeship commencements decline by around 19.5 per cent from current levels by 2028 (**Figure 9, purple broken line**). This would represent a reduction of approximately 34 per cent relative to the 2022 peak and also return commencements to around pre-pandemic levels by 2028.

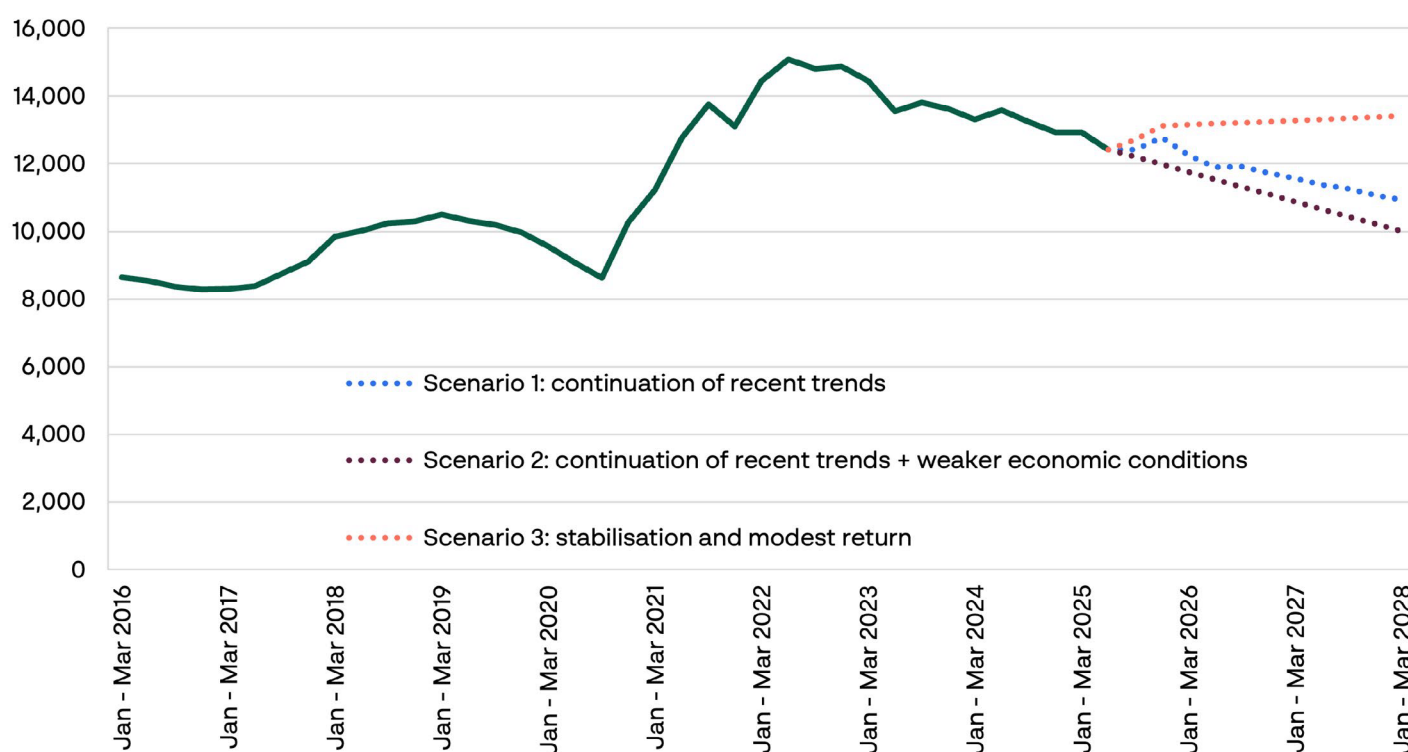
Some economic conditions are already softening in 2026 in line with this scenario. Unemployment reached 4.5 per cent in April, its highest since 2021.²¹ Just over one in four businesses made changes to their workforce in response to fuel prices.²² Business confidence is at historically low levels.²³ Apprenticeship job postings from employers have fallen steadily since 2023.²⁴ The effect of worsening conditions may also be large for electrical trades, where apprenticeship training decisions may be uniquely exposed to energy price shocks.²⁵

The third scenario reflects a stabilisation and modest increase in apprenticeship activity. Under this stabilisation scenario, electrician commencements would be around eight per cent higher in 2028 than current levels (**Figure 9, orange broken line**), equivalent to approximately 1,000 additional commencements.

Recent data show some tentative signs of such improvement. Two additional quarters of commencement data show modest growth in electrician commencements, coinciding with the introduction of the Key Apprenticeship Program in July 2025.

However, total electrician commencements across 2025 were still three per cent lower than 2023, the observation period is short (and does not include the Middle East conflict), and the balance of risks remains tilted to the downside.

Figure 9: Electrician apprenticeship commencements under alternative supply scenarios, Australia.²⁶



Regardless of which scenario is closer to the future, the important point is workforce supply capacity is currently moving in the opposite direction to workforce demand. The energy supercycle implies substantially higher future demand for licensed energy trades, yet apprenticeship commencements have moderated from recent peaks, driven primarily by changes in electrician commencements.

Even where apprenticeship activity stabilises and resumes modest growth, the resulting increase in workforce supply would remain well below the levels likely to be required under the energy supercycle. The risk is that even a recovery may not be enough. That said, much of the likelihood and risk remains on the downside scenarios given recent economic indicators.

This raises the next question: if substantially more apprenticeship participation is required regardless of scenario, where does that additional capacity reside and what would be required to unlock it?



Locating workforce capacity: Where it sits and why it matters

Key message: The capacity to grow Australia's electrician workforce is concentrated but underutilised. Small and medium electrical contracting businesses constitute one of the only major pools available, yet only one in three currently employs an apprentice.

Large employers, GTOs and government hold an additional pool of capacity that has declined significantly over time.

Both groups have a role to play, though this research focuses on electrical contractors.

Understanding where capacity to train electricians sits, and how much of it is currently activated, is essential to identifying where the greatest opportunities for growth lie. The following analysis examines three dimensions: total capacity, active capacity and latent capacity. (**Appendix E** provides supplementary data on much of this section, though it should be noted it firstly discusses who employs all energy apprentices, then electrician apprentices).

Who can train electricians

Total capacity refers to all businesses and organisations that hold the eligibility to employ and train apprentices.

Electrician apprentices can only be employed by businesses that already employ licensed electricians, or by GTOs that place apprentices with host businesses that do. This concentrates the pool of potential apprenticeship employers within a specific ecosystem.

According to the 2021 Census there were around 132,000 licensed electricians in Australia, and the businesses that employ them define the boundaries of total capacity.²⁷ This includes businesses of all sizes, government through publicly-owned enterprises such as power networks, and GTOs. Others in the ecosystem, including government through procurement and large industry players through supply chain requirements, can also influence how much

of this capacity is activated. These levers are more indirect and are not included here but are followed up in later sections where appropriate.

More than half of Australia's licensed electricians, around 56 per cent, are employed in electrical contracting businesses, the single largest concentration in the economy.²⁸ As mentioned prior, the electrical trade is also heavily anchored in the SME landscape, with an estimated 60 to 65 per cent of all electricians working in SMEs or as solo operators. Given the heavy overlap between these two groups, the greatest concentration of total capacity sits within small and medium electrical contracting businesses. The remaining 44 per cent of licensed electricians work across manufacturing, mining, utilities, construction and other industries, mostly in larger organisations.²⁹ These two parts of the economy, smaller electrical contracting businesses on one hand, and the broader ecosystem of larger employers and GTOs on the other, together define the two major pools of total capacity in the system.

It is worth noting that the large employers within this ecosystem, those with licensed electricians on their books such as utilities, mining companies and industrial manufacturing, are distinct from the emerging industries driving supercycle demand such as renewable energy developers and data centres. The former have significantly greater capacity to train. The latter, while not entirely without capacity, are primarily consumers of the workforce rather than producers of it.

Who is actively training electricians

Active capacity refers to the proportion of total capacity that is currently switched on — businesses that are actively employing and training apprentices.

Within electrical contracting businesses, only around one in three of the approximately 48,000 businesses currently employs an apprentice.³⁰ Yet because of their sheer size, activating only that one third accounts for a striking 71 per cent of all electrician apprentices in training nationally.³¹

Within the broader ecosystem, the activation rate is harder to calculate because business counts are not available in the same way. What is known is that large employers, GTOs and government collectively employ around 44 per cent of Australia's licensed electricians but account for only around a 21 per cent of all electrician apprenticeships,³² suggesting a lower activation rate than within electrical contracting businesses.

This gap has grown over time as participation outside electrical contracting has declined. Large employers now account for around 21 per cent of electrical apprentices, their lowest share in more than two decades (it was around 38 per cent in 2000). Government as a direct employer has declined from around seven per cent to around two per cent. GTOs have declined from around 25 per cent in 2000 to around one in ten today.³³ There may be structural

reasons for this decline, however, it suggests that a small subset of the economy (smaller electrical contracting businesses) is now doing most of the work of training Australia's future electricians, while larger employers appear to be doing less training than in previous periods.

Figures 10 and 11 at the end of this section illustrate the two pool framework in full. **Figure 10** shows total and active capacity across both pools, and where the largest concentrations of latent capacity sit within each. **Figure 11** focuses on the electrical contracting pool specifically, showing where latent capacity sits within it and why it is the primary focus of this research.

Where significant opportunity sits and why it matters

Latent capacity refers to parts of total capacity not currently being activated, businesses with licensed electricians but no apprentice. It exists across both pools in the system.

The first pool sits within small and medium electrical contracting businesses. Latent capacity within this pool exists across two areas. The first is the approximately 32,000 businesses that currently employ no apprentice despite having licensed electricians on their books. The second is the approximately 16,000 businesses already employing apprentices that have the capacity to take on more. A contractor currently employing one apprentice taking on a second represents latent capacity just as much as a contractor employing none taking on their first. Together these two groups represent the full scope of latent capacity within the electrical contracting pool. This means around two-thirds of electrical contracting businesses have latent capacity of the first kind, while those already active may hold additional latent capacity of the second kind. They represent the largest identifiable and most directly addressable pool of latent capacity in the system.

The existence of this latent capacity does not mean these businesses bear sole responsibility for activating it. Creating the conditions for them to do so is a shared responsibility across the ecosystem. Understanding those conditions and what is currently holding them back is the focus of this report.

Nor does it suggest that addressing workforce needs is only within the power of smaller electrical contractors. Importantly, significant latent capacity also sits within the broader ecosystem. There is a principled case that these groups, having stepped back from a role they once played more significantly, warrant some deeper focus and bear some responsibility for restoring their contribution. **Highlight 4** below examines this second channel in more detail.

Highlight 4: Activating the broader ecosystem — a second channel for workforce growth

The latent capacity held by large employers, GTOs and government represents a significant but distinct opportunity. These groups collectively employ around 44 per cent of Australia's licensed electricians — a substantial share of total capacity — yet account for only around 21 per cent of all electrician apprenticeships.³⁴ While this channel is beyond the direct scope of this research, the scale of the opportunity means it warrants some attention in the context of this report.

A different channel with different dynamics

This channel operates differently from the electrical contracting channel. Large employers, GTOs and government tend to make apprenticeship decisions based on operational context and business need rather than financial incentives, a pattern evident during the BAC period when large businesses recorded growth in absolute commencements but a decline in share. This channel also tends to produce stronger outcomes — large employers have higher completion rates than SMEs, and GTOs produce the strongest of all. The Strategic Review recognised these differences, recommending eligibility for incentive payments be redirected away from large employers toward SMEs, while identifying a specific opportunity for large employers to "scale up apprenticeships beyond their own business needs."

A channel that has declined

Despite its potential, this channel has declined significantly. For much of the 20th century government owned corporations, including electricity utilities, were major employers of electrical apprentices before withdrawing due to privatisation, outsourcing and efficiency pressures. Large employers and GTOs have similarly reduced their share, and all are now at or near historic lows.

Existing and emerging mechanisms

There are already policies in place designed to activate this channel through direct employer action and indirect levers such as procurement and supply chain requirements. The Australian Skills Guarantee creates obligations that reach large employers and their supply chains, and PSO has called for its extension to all federally funded renewable energy and transmission projects, including reserving labour hours for first and second year and mature-aged apprentices.³⁵ Large industry players also have scope to use supply chain requirements to drive apprenticeship activity among contractors and subcontractors. The Victorian Government's State

Electricity Commission announcement of 2,000 apprenticeship positions over four years demonstrates what direct government employer action can look like, and PSO has endorsed it.³⁶ GTOs feature prominently across the Strategic Review's recommendations, particularly for project-based and regional contexts, with specific models proposed for renewable energy zones. The Strategic Review also proposed an innovation fund to incentivise large businesses to create more apprenticeship opportunities within their supply chains.

Together these represent a growing set of levers that work in parallel with the focus on electrical contracting businesses. Activating this second channel will remain an active area of policy focus and advocacy for PSO.

The two pools are also distinct in nature. The first is concentrated in smaller businesses, the second in larger organisations, government and GTOs. They face different situations and are likely to require different mechanisms rather than a single universal approach. But the problem they collectively address is the same, Australia needs significantly more electrician apprentices, and both pools warrant serious attention.

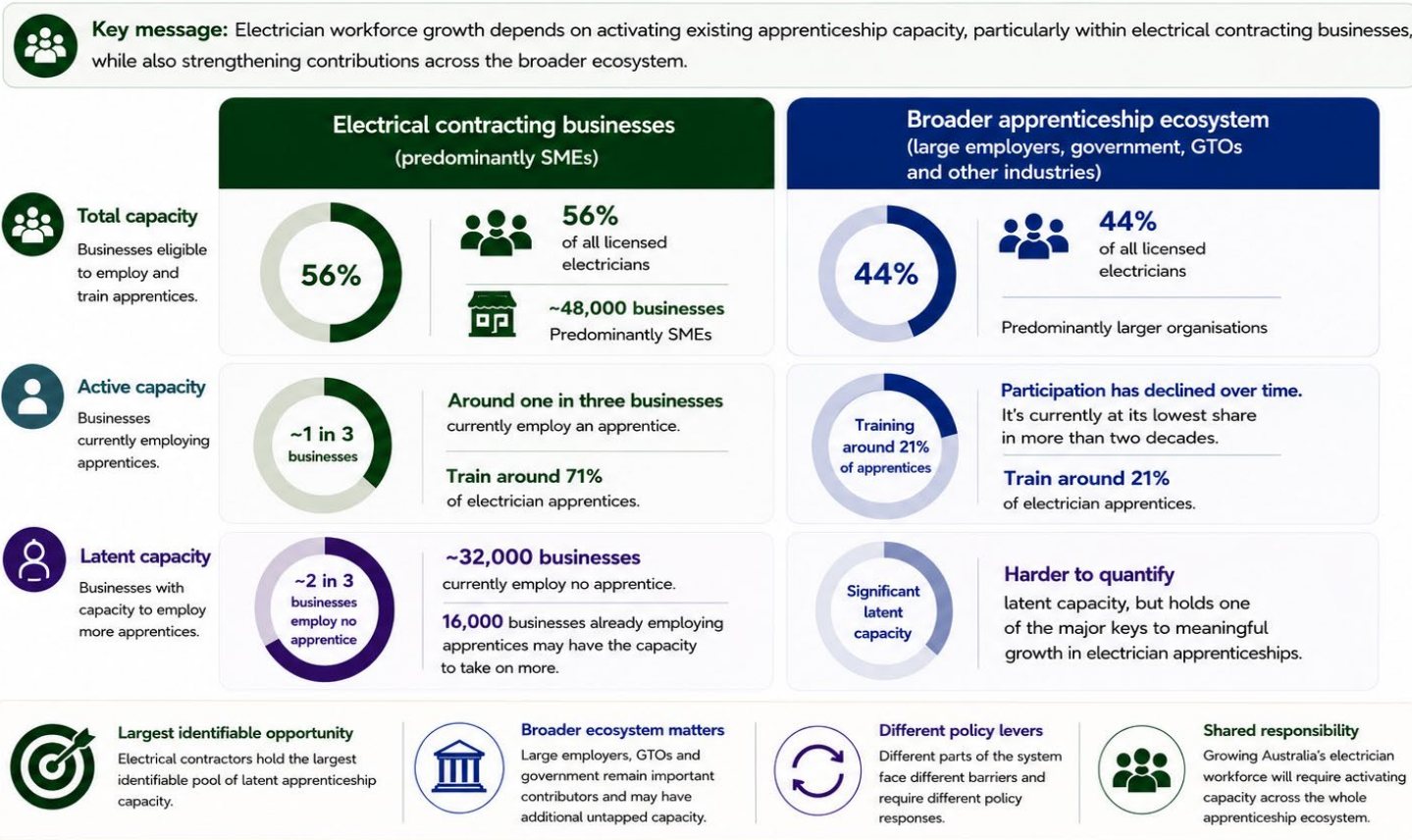
With electrical contracting businesses now firmly in scope as a major source of latent capacity, the next question then becomes what is preventing this channel from expanding in line with projected workforce requirements at present.



Figure 10: Two pools of apprenticeship capacity exist to grow Australia’s electrician workforce.

Where workforce capacity sits

Workforce capacity exists across the economy, but much of it is concentrated within electrical contracting businesses.



Note: Active capacity percentages may not sum to 100 per cent as around 8 per cent of electricians are not classified by employer type. See Appendix E.



Figure 11: Latent capacity within electrical contracting businesses — where significant opportunity sits.

Capacity in electrical contracting businesses

A large share of future growth could come from within electrical contracting businesses.
If conditions are right, this pool could activate latent capacity to train more electrician apprentices.



Why workforce capacity is constrained: The apprenticeship value proposition

Key message: The constraint on apprenticeship growth within electrical contracting businesses is on the employer side, not the apprentice side.

Costs, supervision requirements and uncertainty over returns make the employer value proposition weak, this applies both to businesses not yet employing an apprentice and to those already training who could take on more.

A direct opportunity lies in enabling more of these employers to participate — whether for the first time or at greater scale. Attracting more apprentices or improving completion rates may help too but only at the margins.

These employer constraints predate the energy supercycle. What the supercycle changes is how much is riding on overcoming them.

Apprenticeship activity depends on decisions made by two groups: individuals choosing whether to pursue (and complete) an apprenticeship, and employers choosing whether to create a position. While the apprenticeship system also depends on Registered Training Organisations (RTOs) to deliver the off-the-job component of training, significant investment has been made in expanding VET capacity and training delivery to better meet future needs. This report therefore focuses on the employer and apprentice sides of the system.

As has been mentioned also, on the employer side, this includes not only electrical contracting businesses that hold the greatest concentration of total capacity, but also large employers, GTOs and government, each of which faces a different set of conditions shaping their participation. The analysis that follows focuses primarily on electrical contracting businesses because this is where the value proposition argument is most directly applicable and most precisely evidenced, while recognising that the broader ecosystem also has a role to play.

In this report, the expected benefits and costs facing prospective apprentices and their employers are referred to as the apprenticeship value proposition. The following analysis examines the apprentice and employer value propositions for electricians, drawing on comparisons with other energy trades and the broader apprenticeship system where these add useful context.

Value proposition for apprentices

Key message: The value proposition for electrical apprentices appears strong, reflected in high career interest, strong competition for apprenticeship positions, and above-average completion rates.

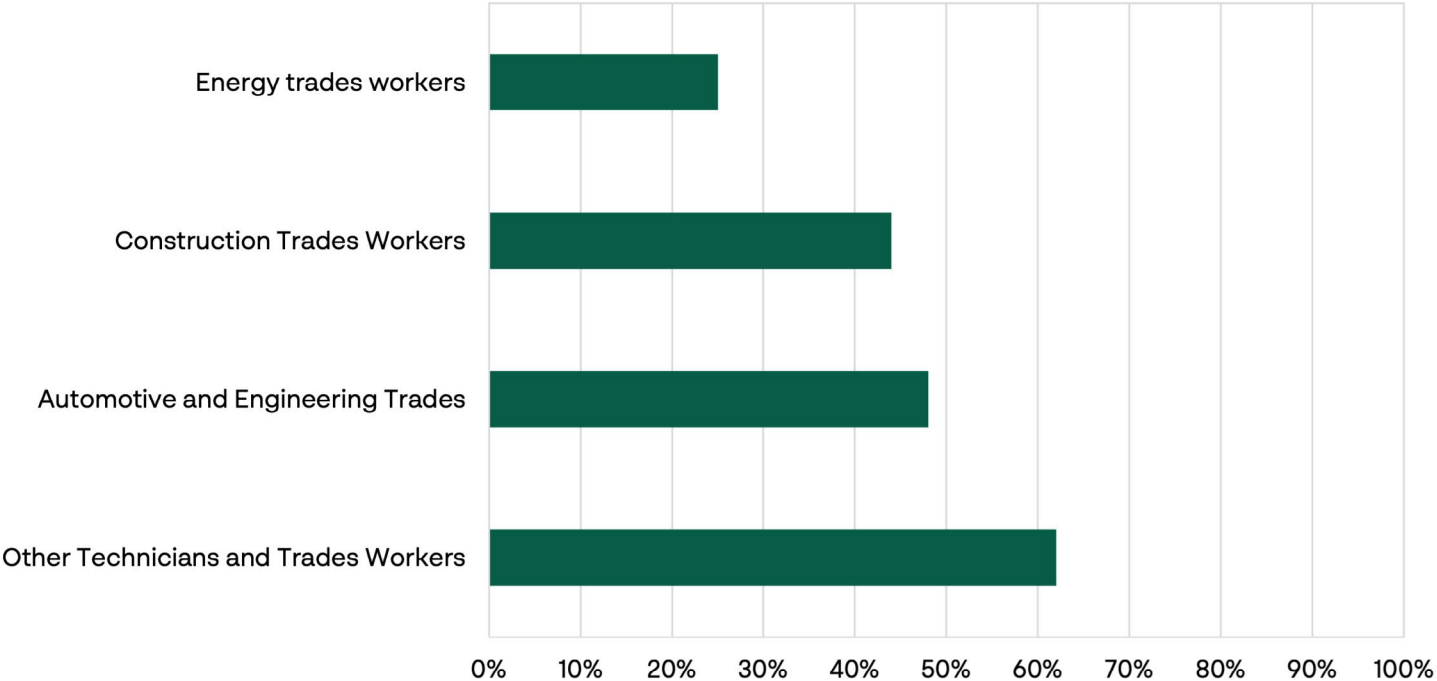
Multiple indicators point to strong interest in electrician careers and apprenticeships

While there is some variation, including lower levels in regional and remote areas, the overall pattern of strong interest is consistent across states and territories.

Electrician is the most preferred trade pathway among Australian high school students and the highest-ranked vocational career overall. It ranks in the top ten for all students across various states, including New South Wales, Queensland, Western Australia and South Australia. For males in high school across the country, it ranks as the third most common career choice.³⁷

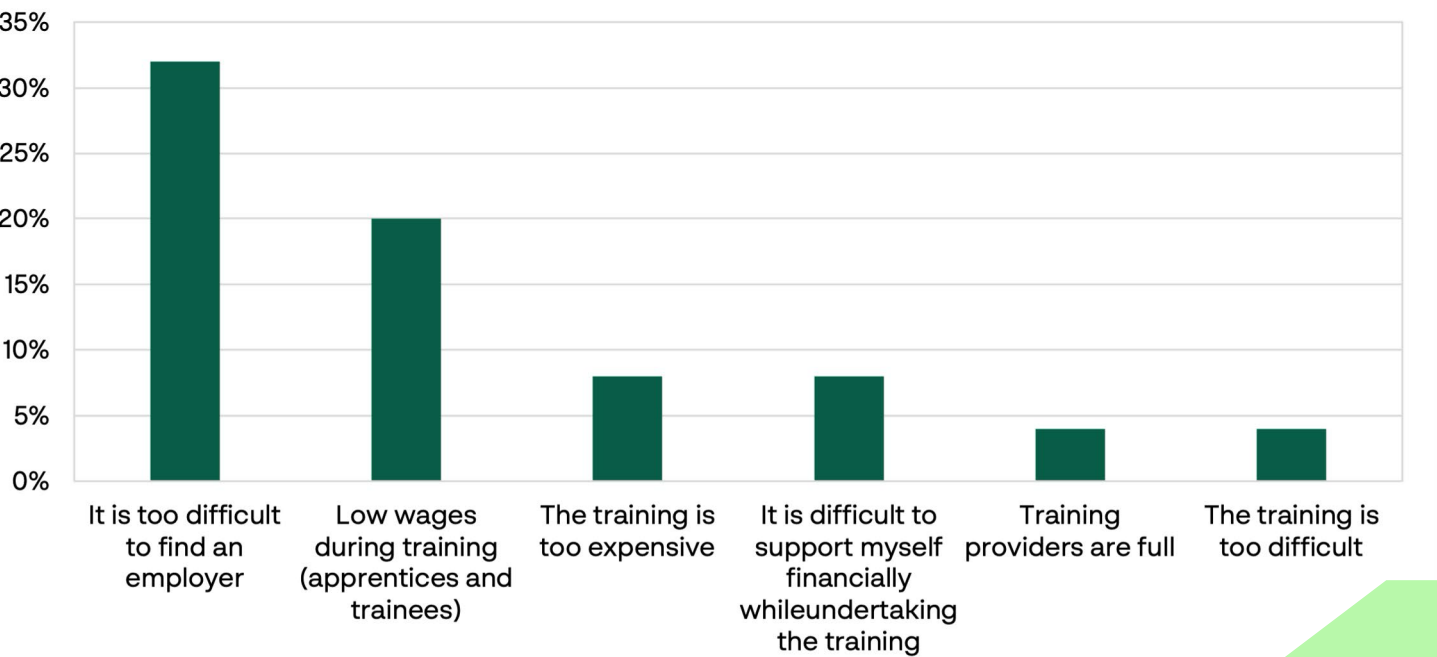
Demand for electrical apprenticeships consistently exceeds available places, with applicant-to-place ratios in some cases exceeding 50:1. For example, a Queensland electricity network business recently received around 7,500 applications for approximately 125 apprenticeship positions.³⁸ The electrician pathway is commonly the most popular pathway within the VET system. This is captured by the survey comment “...everyone wants to be an electrician”, along with other investigations showing a preference for apprenticeships in licenced roles, like electricians.^{39, 40} Stakeholder consultations frequently highlighted strong interest in electrician careers.^{41, 42} Employers generally report relatively low difficulty recruiting energy trade apprentices, primarily electricians (**Figure 12**).

Figure 12: Apprentice recruitment difficulty by employers.⁴³



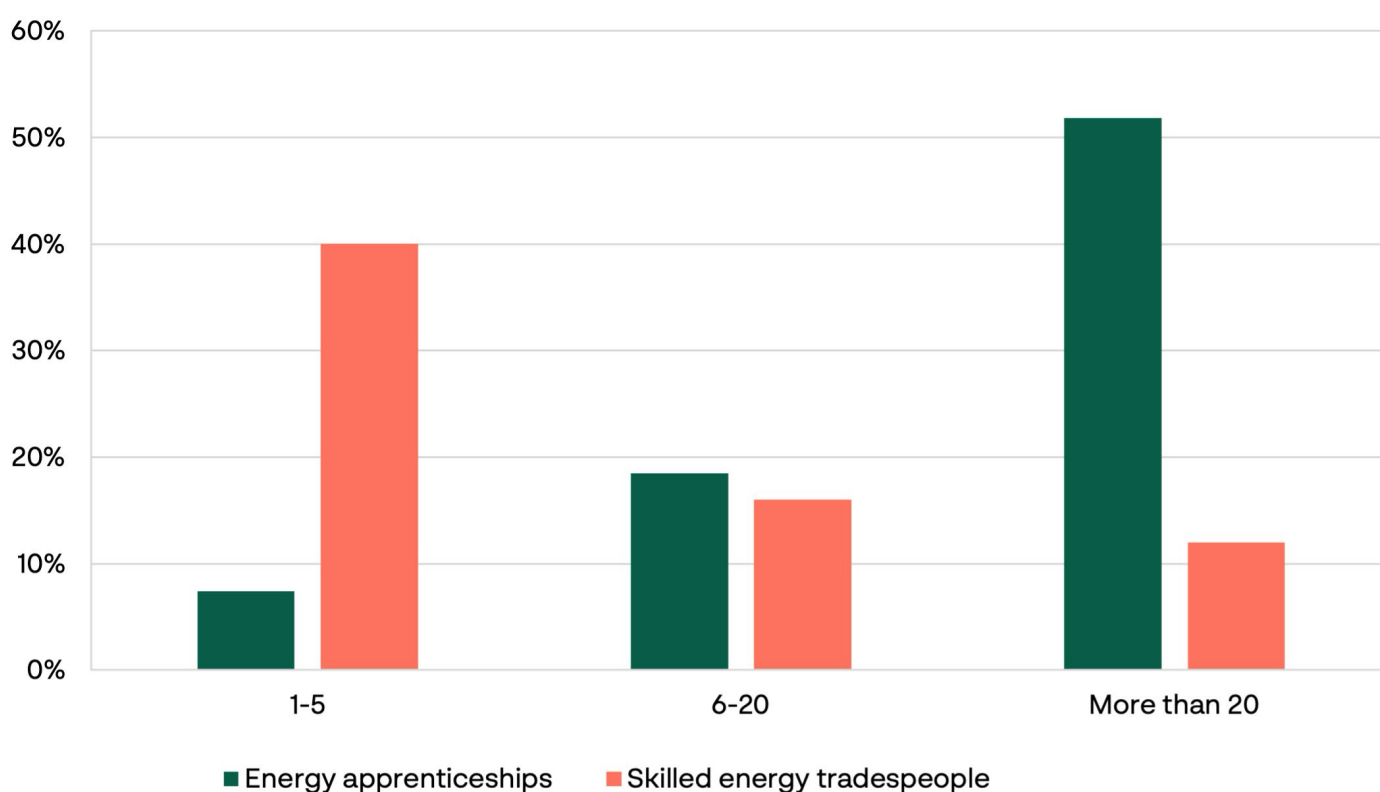
PSO 2026 industry survey data reinforces this pattern. When current apprentices were asked about the main barrier to entering the energy workforce, the most common response was difficulty securing an employer willing to take them on (Figure 13).

Figure 13: For electrician apprentices – ‘What is (or was) the biggest barrier to you entering the energy sector workforce?’⁴⁴



More than half of energy employers advertising apprenticeship positions also report receiving over 20 applicants per vacancy. For contrast, skilled energy trade vacancies attract significantly fewer applicants (**Figure 14**). This does not imply that all apprenticeship candidates are of high-quality or suitability, but aims to showcase that high interest is there, which is often the larger hurdle.

Figure 14: Applicants per advertised vacancy, by energy workforce position type.⁴⁵



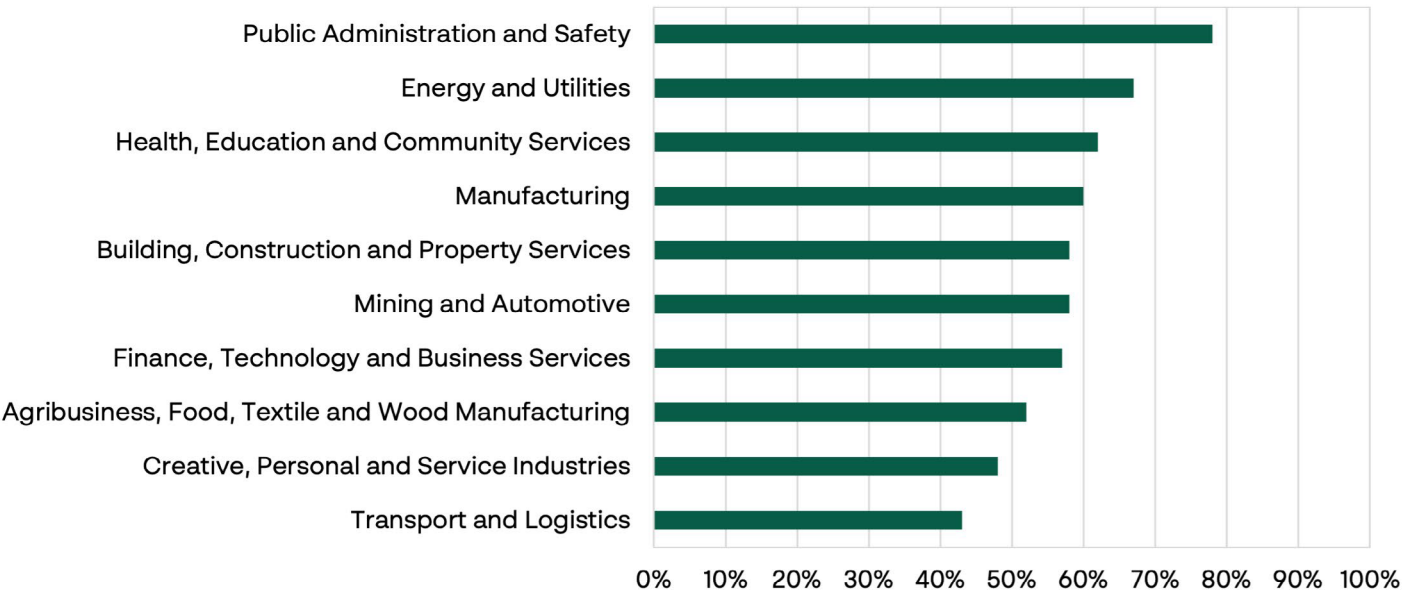
These findings are consistent with the 2025 PSO Workforce Plan, which identified concerns that electrician workforce capacity may be constrained more by the availability of apprenticeship opportunities than by a lack of interest in electrical trade careers.

Electrician apprenticeships deliver strong completion rates

Promisingly, once energy apprentices (including electricians) begin their training, they are more likely to complete than their peers in tertiary education. Completion rates for electrician apprenticeships are among the highest in the VET system.

Apprentices in the energy and utilities training packages, which cover electrical and electrotechnology qualifications including electricians, air conditioning and refrigeration, and distribution and transmission trades, consistently record higher completion rates than most other major training package areas, including manufacturing, construction, mining and automotive (**Figure 15**).

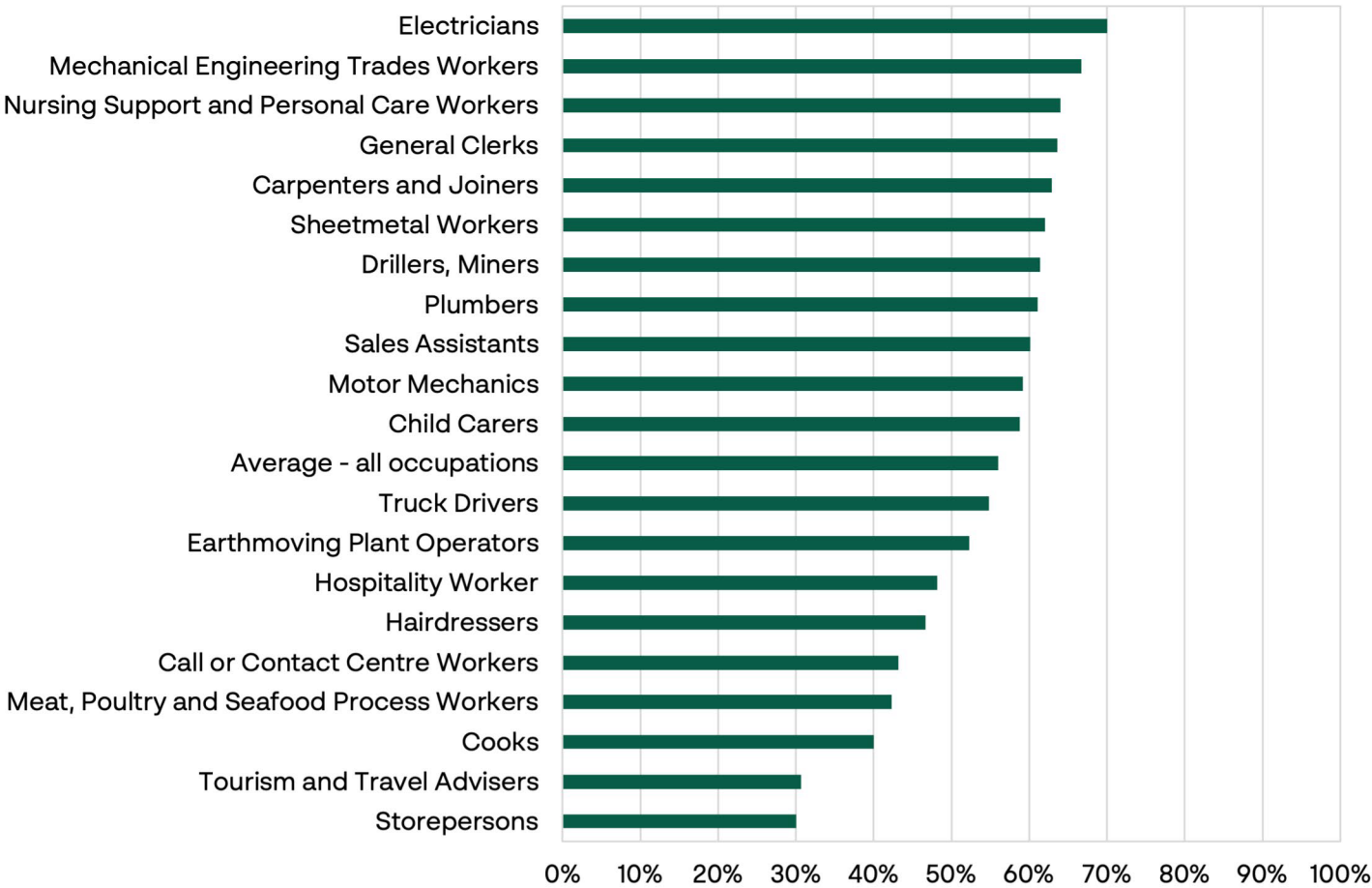
Figure 15: Completion rate of apprenticeships by industry training packages.⁴⁶



Within energy apprenticeships, electrician apprentices record a completion rate of 70 per cent, compared with a total VET average of 56 per cent (**Figure 16**). This is also higher than the most recent national university completion rate of 62 per cent (measured over six years).⁴⁷

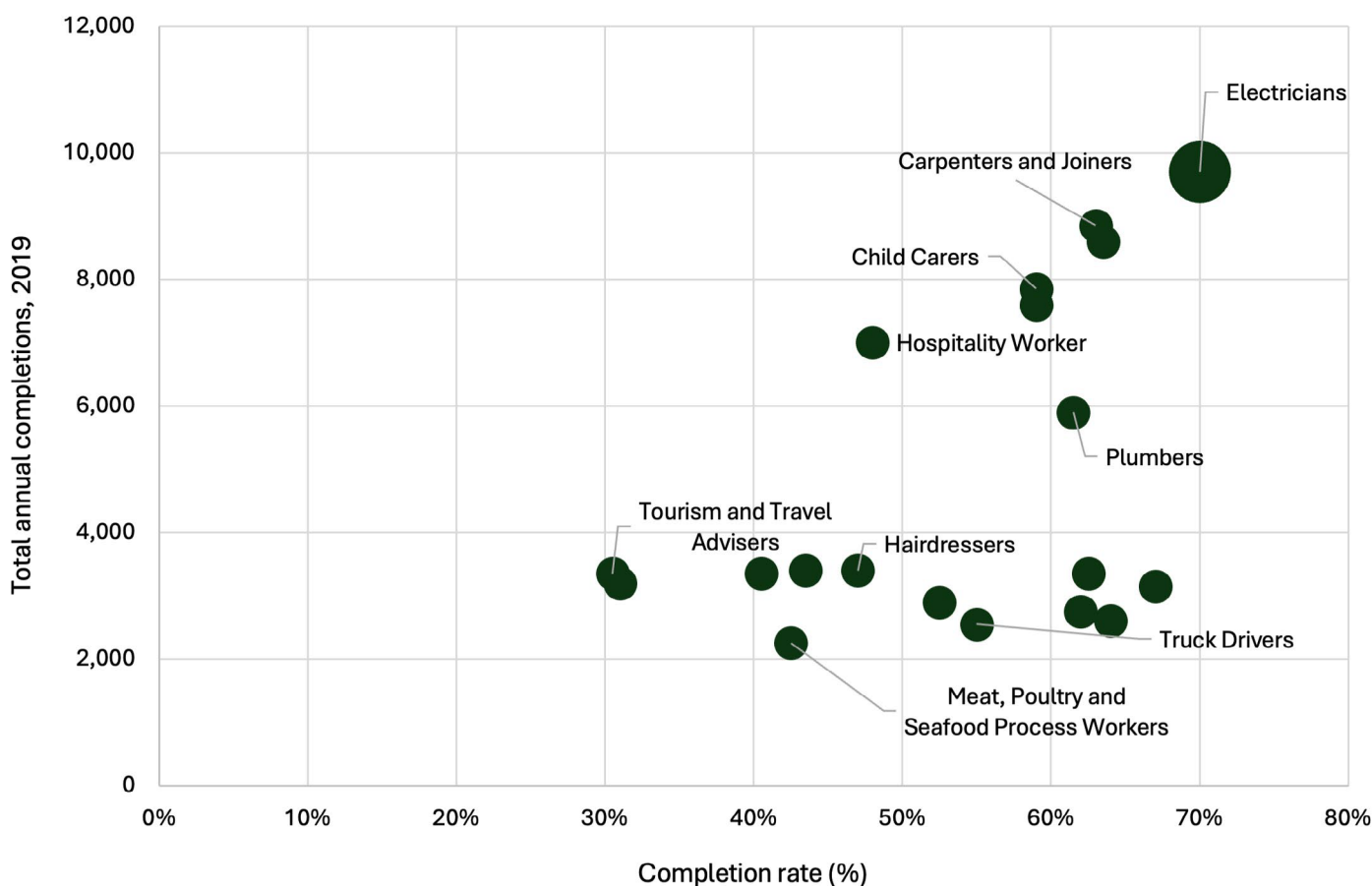


Figure 16: Completion rate by most common apprenticeships (these apprenticeships account for two-thirds of all completions in the VET system).⁴⁸



Among the 20 largest apprenticeships in Australia by underlying occupation pathway, electricians record both the highest completion rate and the highest number of completions (**Figure 17**), making it one of the VET system's strongest performing pathways in both scale and outcomes.

Figure 17: Electrician apprentices have the highest completion rate and the highest number of completions.⁴⁹



This strong performance is also evident over time. While electrician apprenticeship completion rates declined from around 75 per cent in 2012 to 70 per cent in 2019, completion rates across the broader VET system fell by a similar amount over the same period.⁵⁰

While these completion rates are among the strongest in the system, around three in ten energy apprentices do not complete their training, with 85 per cent of electrician apprenticeship cancellations occurring within the first two years. Improving completion rates represents a complementary opportunity to expand the qualified workforce alongside efforts to grow the number of apprenticeship places. PSO has recently completed research into foundation skills, including literacy and numeracy readiness, as a contributing factor in non-completion. The Foundation for Energy: Literacy and Numeracy for Energy Jobs project examines how improving numeracy pathways for secondary school students could strengthen completion rates and reduce early attrition.⁵¹ These initiatives also help to unlock capacity in the system.

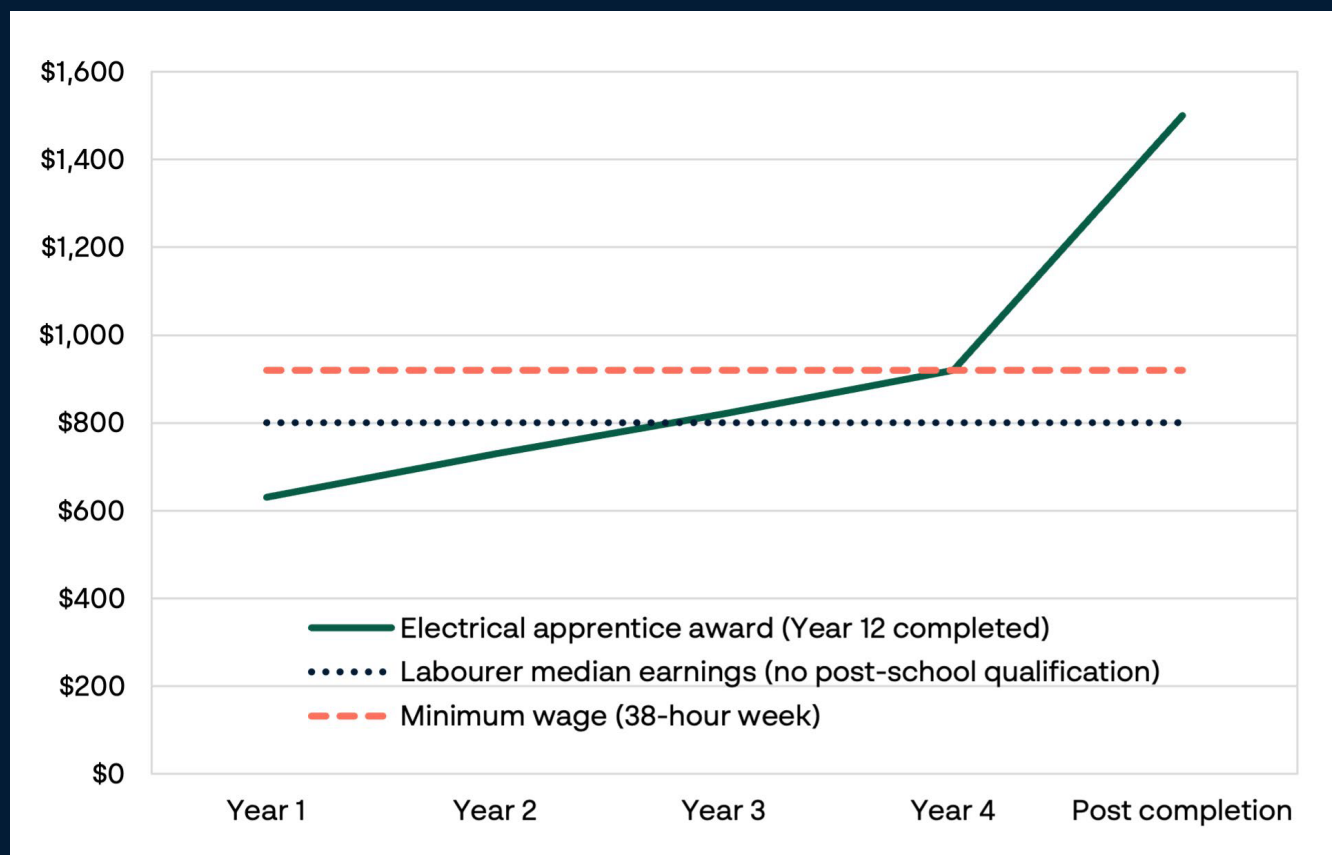
These higher completion rates are often attributed to licensing requirements. Apprenticeship completion is required to obtain a licence to work independently, creating a strong incentive for apprentices and the employers training them to complete training. For electrician apprentices, non-completion restricts future employment opportunities, increasing the value of completing the apprenticeship relative to many occupations where alternative non-licensed pathways such as trade assistants remain available. **Highlight 5** below outlines the drivers of this value proposition.

Highlight 5: Drivers of the strong value proposition – Several factors contribute but wage premiums appear to be the most significant

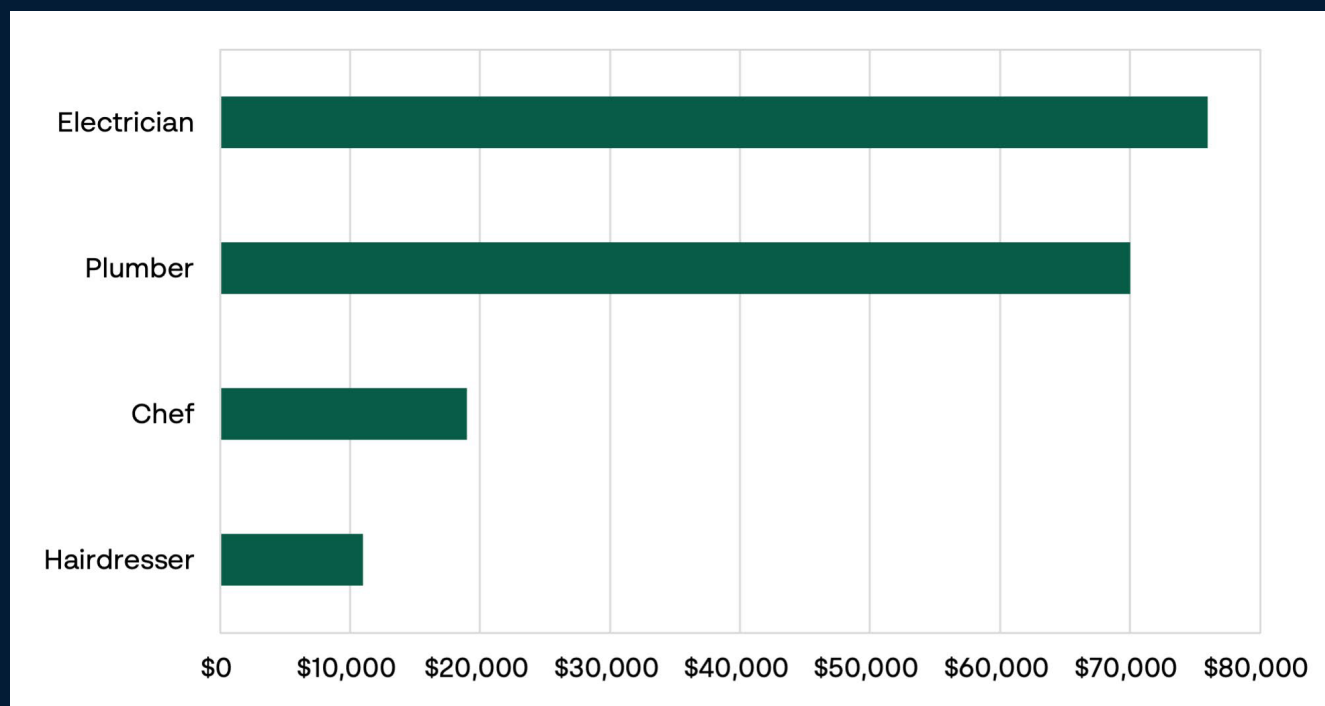
Other commonly cited factors include job security, licensing requirements, strong industry signalling, and the relatively lower risk of AI-related displacement in trade occupations.⁵² However, expected long-term earnings are central. Economic evidence suggests apprenticeship uptake is strongly influenced by the trade-off between short-term training wages and long-term income gains.⁵³

This helps explain why many individuals commence and complete electrician apprenticeships despite relatively low earnings during training. Early-career apprentice wages are below typical entry-level earnings across other occupations, but rise significantly post-qualification (**Figure 18**). These lower wages are partly in place to help make apprenticeship training more cost-effective for prospective employers to recruit and develop them over a four-year period.

That said, cost-of-living pressures, particularly recent inflation and fuel price increases add further sensitivity for apprentices to these wages, given their exposure to transport and travel costs. These wages, and their appropriateness, remain important issues but are beyond the scope of this research.

Figure 18: Earning trade-offs during and after electrical apprenticeship.⁵⁴

The wage premium earned after these apprenticeships is substantial. Electrician apprenticeships consistently offer some of the highest lifetime earnings returns in the labour market. On average, qualified electricians earn around 158 per cent more than apprentice wages, significantly higher than most other trade occupations (**Figure 19**). This reinforces apprenticeships as a strong long-term investment despite low initial earnings.

Figure 19: Wage premium of apprentices in selected occupations. ⁵⁵

These findings have important implications for where workforce policy attention is most needed right now.

The energy supercycle will require growth across all parts of the apprenticeship system, and significant investment in apprentice attraction, VET capacity, completion support and broader workforce development is already paying off. The challenge now is ensuring that progress is efficiently converted into qualified workers at the scale required, even as attraction efforts continue to grow the pipeline of people entering the system, VET capacity continues to expand to train them, and areas like literacy and numeracy are strengthened.

With interest in electrical careers comparatively high and completion rates among the strongest in the VET system, the evidence in this section suggests a large share of the immediate capacity constraint is not on the individual supply side. That points to the employer side of the system, which is examined in the following section.

Value proposition for employers

Key message: The employer value proposition to provide an electrical apprenticeship is relatively weak. Electrical contractors face high upfront costs, intensive supervision requirements, and uncertainty over the timing and capture of returns.

This suggests employers face significant barriers to participation. This may constrain growth of the apprenticeship system even when demand from prospective apprentices is strong, and other parts of the system are functioning well.

Given the value proposition for individuals is strong, the conditions shaping employer participation are critical to system growth. Apprenticeships are one of the few parts of the tertiary education system where employers determine the number of people in training.⁵⁶

Employer decisions to take on apprentices are shaped by a range of factors explored in this section. Together, these define the employer value proposition and determine whether workforce formation capacity expands or contracts. This is particularly important in electrician apprenticeships, where around 87 per cent of training occurs in the workplace, making the electrical apprenticeship fundamentally dependent on sustained employer commitment.

The cost of an apprentice electrician for employers

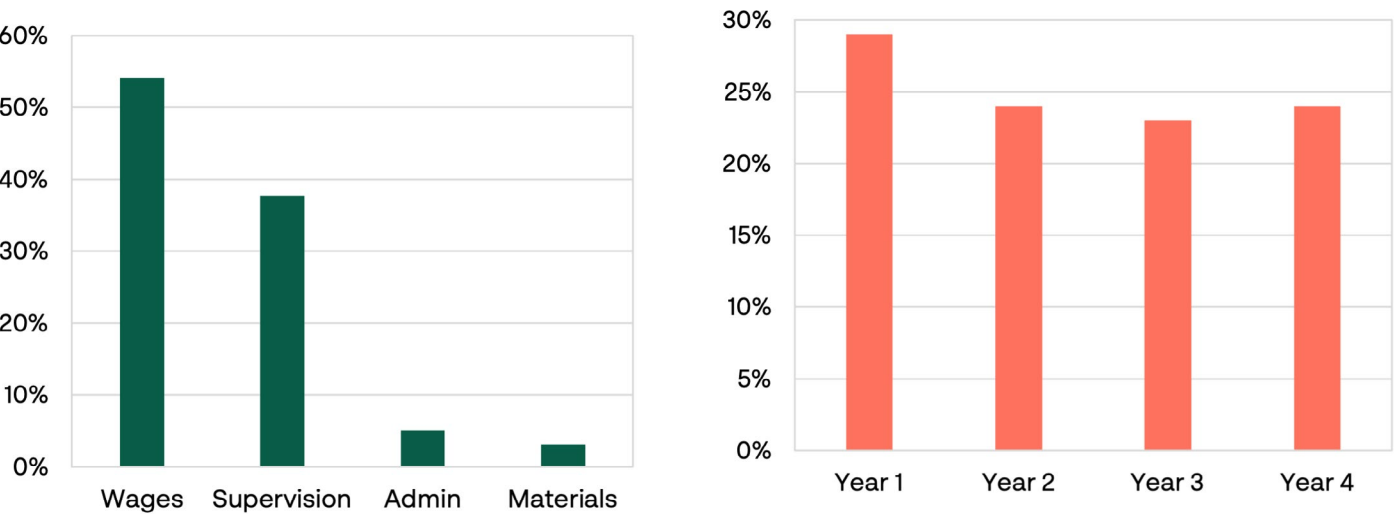
Employer costs are substantial and front-loaded, with most costs incurred before realising the full benefits of apprentice productivity.

Available evidence suggests employing an electrical apprentice costs between \$200,000 and \$250,000 over the life of the apprenticeship.^{57, 58} And while the precise cost varies depending on a range of factors the available evidence consistently points to a major long-term financial commitment.⁵⁹

Employer costs were the most commonly cited barrier to employing more apprentices in PSO's employer survey, raised by around one in four respondents. Wages are the largest single cost, accounting for around 54 per cent of total apprenticeship costs (**Figure 20**), with supervision the second largest. Together they account for more than 90 per cent of total employer costs.

Critically, these costs are front-loaded. The first year alone accounts for around 29 per cent of total costs, and the first two years combined account for more than half. Employers therefore bear the greatest financial burden at precisely the point when apprentice productivity is lowest. Government support can partially offset these costs, although the scale and availability of incentives varies across jurisdictions and over time. The role of incentives is explored later in this report.

Figure 20: Typical pattern of employer costs for a full electrical apprenticeship (per cent of total employer costs).⁶⁰



Supervision requirements

Supervision requirements are a major feature of electrical apprenticeships and a significant driver of employer costs.

Electrical apprentices must be supervised by appropriately licensed electricians, and in some circumstances supervision ratios can be as high as one-to-one. This requires businesses to allocate the time of qualified tradespeople who would otherwise be available for productive work. Examples of supervision arrangements are shown in **Table 2**.

Table 2: Levels of supervision of apprentices for selected examples of electrical installation work, Victoria.⁶¹

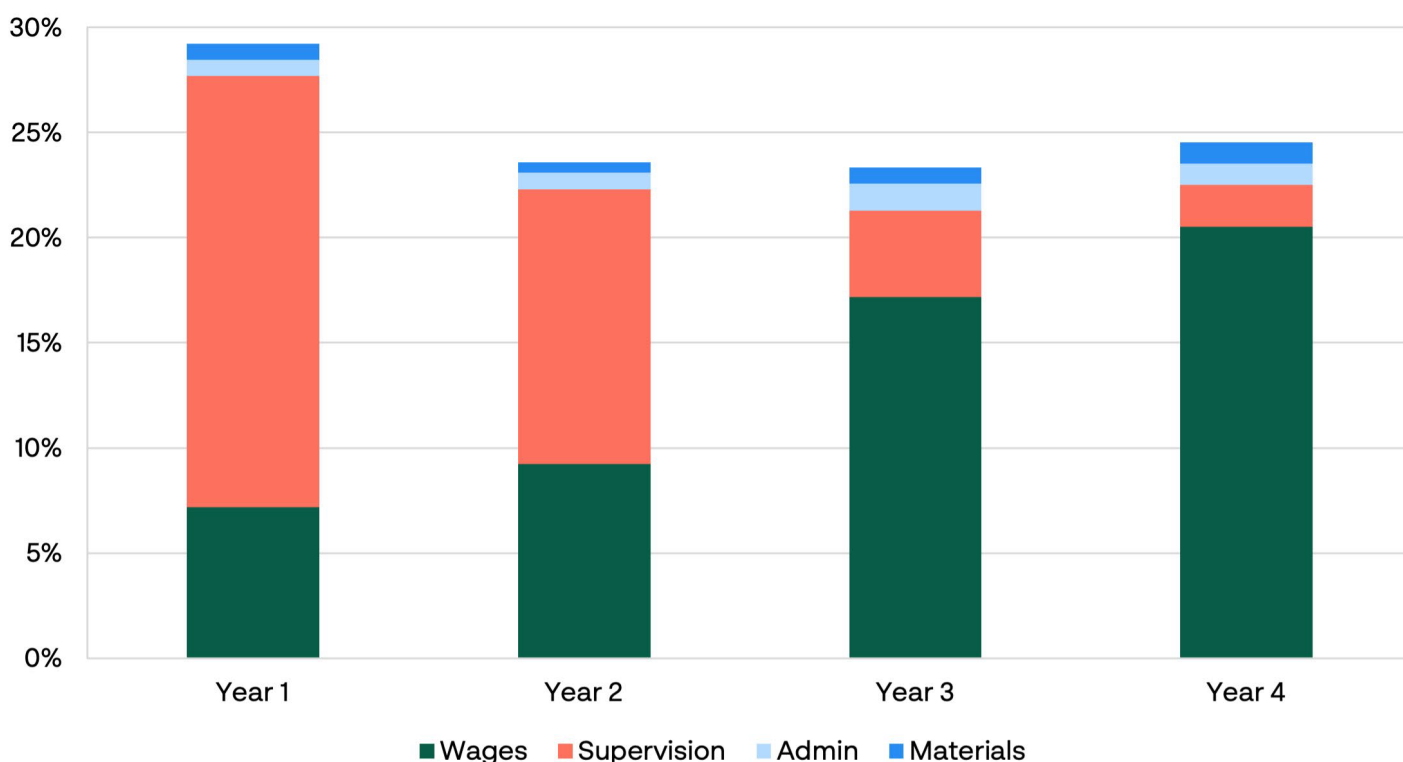
Type of electrical installation work	Year of apprenticeship			
	First	Second	Third	Fourth
New electrical installations (not connected to supply)	1:1	1:3	1:5	1:5
Maintenance & alterations to electrical installations	1:1	1:3	1:3	1:5
Distribution and main switchboard installation	1:1	1:1	1:3	1:5
Electrical isolation of installation and equipment	1:1*	1:1*	1:1*	1:1*
Advanced fault finding	NP	NP	NP	1:1*

*NP = Not permitted. * The supervisor must remain within both visual contact and audible range (within sight and earshot) of the apprentice electrician carrying out the work. 1:1 = direct supervision; 1:3 = general supervision; 1:5 = broad supervision. Disclaimer: This table does not in any way replace any Commonwealth, State or Territory legislative and/or regulatory requirements and does not override any duty of care responsibilities, codes of practice and other relevant codes or regulations pertaining to the supervision of apprentices.*

These requirements play a critical role in maintaining safety, quality and licensing standards. They should be understood as a structural feature of the apprenticeship system rather than a constraint that can simply be removed. The relevant workforce planning question is how apprenticeship growth can occur within a system where these requirements are both necessary and largely fixed.

Supervision is the second-largest cost associated with employing an electrical apprentice and supervision costs are heavily concentrated in the early years. More than half of total supervision costs are incurred in the first year, and more than 90 per cent within the first two years (**Figure 21**). This reflects the relationship between supervision requirements and apprentice productivity. Apprentices require the most oversight precisely when they are least able to work independently.

Figure 21: Detailed breakdown employer costs for a full electrical apprenticeship (per cent of total employer costs).⁶²



The apprenticeship investment lifecycle

The timing of costs and benefits is an important feature of the employer value proposition.

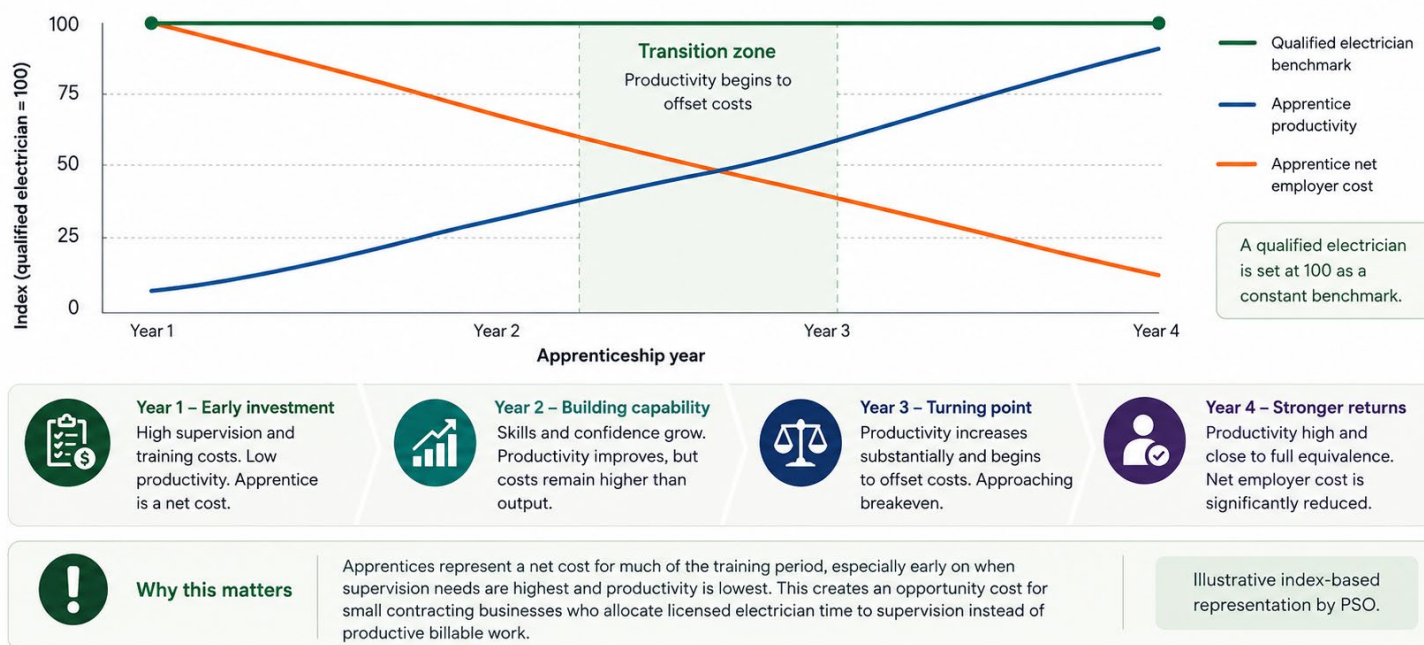
Apprenticeship employment is a long-term investment in which employers incur substantial upfront costs before receiving the full benefits of a qualified worker. Apprentice productivity increases over time as skills develop, while supervision requirements and other training costs gradually decline. However, apprentices remain below full productive equivalence for most of the training period, compared with a qualified electrician benchmark (**Figure 22**).⁶³

As a result, apprentices represent a net cost for a significant portion of the training period, particularly in the early years when supervision requirements are highest and productivity is lowest. The point at which productivity begins to offset costs generally occurs in the third and fourth year. This investment profile helps explain why apprenticeship recruitment decisions are not taken in isolation, and are highly sensitive to business conditions, workload, cashflow and confidence in future demand.

Figure 22: Apprenticeship lifecycle model.

Apprenticeship lifecycle model

Apprentice productivity, employer cost and qualified electrician benchmark over time.



Economic conditions and business constraints

Apprenticeship growth depends heavily on the decisions and operating conditions of electrical contracting businesses, which, as noted earlier, account for the large majority of current and latent electrical apprenticeship employment. Their collective characteristics and business conditions therefore play a decisive role in shaping apprenticeship trends.

Most of these businesses are small and privately owned, with limited capacity to absorb fixed costs or build the administrative infrastructure to support apprentice recruitment at scale. Apprenticeship hiring decisions are closely tied to short-term operational conditions including workload, cash flow and labour utilisation.

Apprenticeship employment is also a long-term commitment. Employers are not simply deciding whether they can absorb costs today, but whether they can sustain employment, supervision and training obligations over approximately four years. This means recruitment decisions are shaped by expectations about future demand and economic conditions, not just current performance.

Apprentice “poaching” and the employer value proposition

The reality or perception of apprentice poaching may further weaken the employer value proposition by creating uncertainty over whether employers who bear the costs of training will ultimately capture the benefits.

Poaching occurs when an apprentice leaves one employer and continues their apprenticeship with another. It is a commonly reported concern in the energy industry and emerged as a recurring theme during stakeholder engagement. Employers report that apprentice movement is most likely in the later stages of training or shortly after qualification, often from smaller to larger employers. Skills shortages are frequently identified as a contributing factor. Importantly, both the experience of poaching and the expectation that it may occur can influence apprenticeship hiring decisions (**Highlight 6**).

Highlight 6: What is a ‘poaching externality’ and why does it matter?

In economics, an externality occurs when one party bears the costs of an activity while some of the benefits are received by others. This can create situations where the level of investment made by individual participants is lower than what would be desirable from a broader economic or societal perspective.

A poaching externality can arise in apprenticeship systems because employers invest heavily in training apprentices through high upfront costs and intensive supervision, but may not fully capture the benefits if apprentices move to another employer before the original employer realises a return.

This means one employer can fund the training while another gains a skilled worker. Importantly, the perception that this type of movement is common can be just as influential as actual movement, as it shapes employer expectations and hiring decisions.

Over time, this may reduce the willingness of some employers to take on apprentices, particularly where the employer value proposition is already constrained. In this way, even general beliefs about apprentice movements can affect apprenticeship supply at a structural level if poaching risks are believed to be widespread.

Importantly, this does not imply that apprentice mobility is undesirable. Movement between employers can broaden experience, expose apprentices to different types of work and improve labour market matching across the industry. The policy challenge is therefore not to prevent apprentice mobility, but to ensure employers remain willing to invest in training despite the possibility that some apprentices will move to other businesses.

These dynamics are most pronounced in the later stages of training, when apprentices are simultaneously highly productive for their current employer and more attractive to alternative employers. At this point, apprentices offer relatively high productivity at a lower cost than fully qualified tradespeople. If an apprentice changes employer at this stage, the original employer may not fully capture the benefits of the earlier training investment.

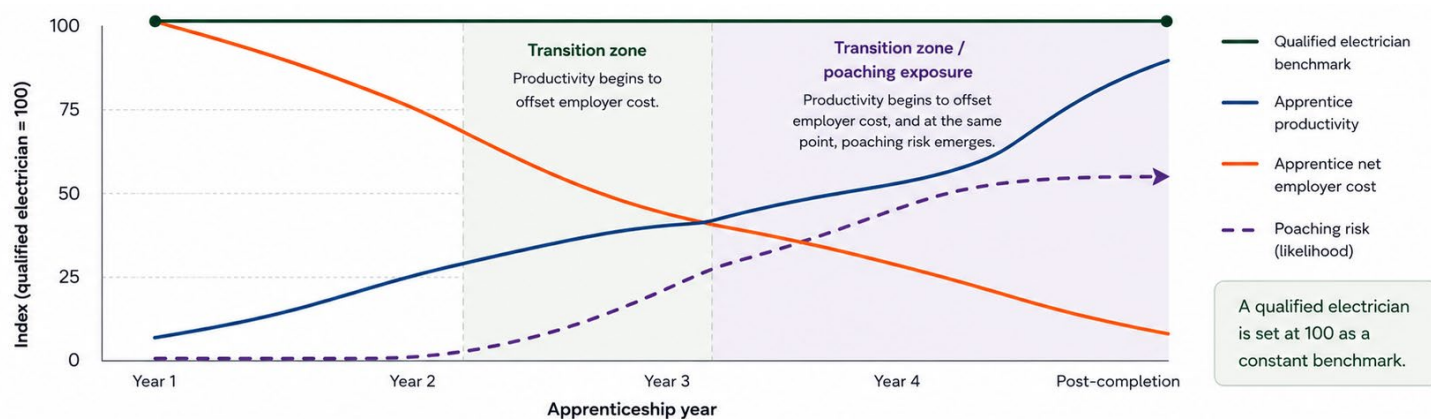
Smaller businesses account for a large share of apprentice commencements and may bear a disproportionate share of early training costs while also facing a higher perceived risk of losing apprentices later in the training cycle. Concerns about poaching therefore introduce uncertainty around the expected return on apprenticeship employment at precisely the point where employers would ordinarily begin to realise that return (**Figure 23**).⁶⁴

Employer costs are concentrated in the early years, while many of the benefits are realised later. Understanding where costs, risks and returns occur can help identify where interventions may be most effective in strengthening the employer value proposition.

Figure 23: Apprenticeship lifecycle model (with poaching risk included).

Apprenticeship lifecycle model

Apprentice productivity, employer cost, qualified electrician benchmark, and poaching risk over time.



Year 1 – Early investment
High supervision and training costs. Low productivity. Apprentice is a net cost.



Year 2 – Building capability
Skills and confidence grow. Productivity improves, but costs remain higher than output.



Year 3 – Turning point
Productivity increases substantially and begins to offset costs. Approaching breakeven.



Year 4 – Stronger returns
Productivity high and close to full equivalence. Net employer cost is significantly reduced.



Why this matters

Apprentices represent a net cost for much of the training period, especially early on when supervision needs are highest and productivity is lowest. This creates an opportunity cost for small contracting businesses who allocate licensed electrician time to supervision instead of productive billable work.

Illustrative index-based representation by PSO.

Implications for electrician workforce capacity

The analysis in this section points to several implications for understanding and expanding workforce supply for electricians.

First, the employer-side constraint for electrical contractors is structural rather than behavioural. The evidence suggests these employers are not simply unwilling to take on apprentices. The economics of apprenticeship employment, particularly in the early years, create a value proposition that is genuinely difficult for many small businesses to sustain. Addressing this requires more than encouraging employer participation. It requires changing the conditions under which participation occurs.

Second, the constraint is concentrated where a large share of the system's latent capacity sits. Smaller electrical contracting businesses bear a disproportionate share of apprenticeship costs and risks, yet they also represent one of the largest sources (and one of only two large sources) of potential apprenticeship growth. Interventions that reduce the burden on this group are therefore likely to have material impact on workforce supply.

Third, the constraint is self-reinforcing for this cohort. Front-loaded costs, intensive supervision requirements and poaching risk interact to make the expected return on apprenticeship investment uncertain. Each of these factors compounds the others, and together they create conditions where the employer value proposition weakens over time even as demand for qualified workers grows.

Fourth, the constraint has specific pressure points. The lifecycle model identifies precisely where the employer value proposition breaks down, in the early years of training when costs are highest, supervision requirements are most intensive and productivity is lowest. This points to where interventions are likely to be most effective. Strategic support that reduces costs or risk during this period has the potential to materially improve the employer value proposition and expand the number of apprenticeship opportunities created within this part of the system.

Fifth, the conditions shaping the other large capacity pool — participation among large employers, GTOs and government — are likely different in kind from those facing electrical contracting businesses, and are likely to require different levers to address. What is clear is that large businesses have scope to create more high-quality apprenticeship opportunities within their own operations and supply chains, and that restoring participation from this group is an important part of the overall response. The opportunity this pool represents warrants serious attention alongside the focus on electrical contracting businesses.

The employer value proposition has long constrained apprenticeship growth within electrical contracting businesses. What changes under the energy supercycle is its significance. Attracting more people into electrical careers will not be enough if the number of electrical contracting businesses willing and able to create apprenticeship opportunities does not grow alongside them.

Testing the constraint: What happens when the value proposition improves?

Key message: Employer participation in the apprenticeship system expands significantly when conditions improve.

The Boosting Apprenticeship Commencements (BAC) and Completing Apprenticeship Commencements (CAC) incentive programs demonstrate that substantial workforce growth can occur when employer costs and risks are materially reduced.

This growth occurred within the same occupations, employers and pathways already responsible for producing most future energy workers – electrical contractors training electricians. This suggests significant latent workforce capacity already exists within the current apprenticeship system and can be unlocked when employer conditions improve.

Recognising electricians as a priority occupation may be necessary but not sufficient. Future workforce growth may depend on whether policy settings materially improve conditions for the employers that hold the capacity to train future electricians as well.

Apprenticeship outcomes depend on both apprentices and employers, alongside a broader set of workforce development supports. However, earlier sections identified employer participation as the more significant constraint on electrical apprenticeship growth. This section focuses on employer incentives and what they reveal about workforce formation within the electrical apprenticeship system.

The analysis focuses on the main features of the national apprenticeship incentive framework and their relevance to electrical apprenticeships. It is not intended to provide a comprehensive review of all apprenticeship incentives or state and territory arrangements.

Evolution of incentives for apprenticeships

Apprenticeship incentive settings have changed significantly over time. Three broad phases are particularly relevant to understanding workforce growth within the electrical apprenticeship system (**Table 3**).

Before 2020, employer incentives accounted for around two per cent of the cost of employing a trade apprentice. While these arrangements provided broad-based coverage, they were generally too small to materially influence recruitment decisions. Within the electrical apprenticeship system, support remained small relative to apprenticeship costs and risks despite employer participation already being central to workforce growth.

During the pandemic period (2020 to 2022), the BAC and CAC programs represented a major departure from previous settings. Employer incentives increased to an estimated 19 per cent of the cost of employing a trade apprentice, materially changing the economics of apprenticeship employment. For the energy sector, this period provides a rare opportunity to observe how workforce growth responds when employer conditions improve materially.

Following the conclusion of BAC and CAC, the Australian Apprenticeships Incentive System commenced in July 2022. Subsequent reforms have increasingly focused support on priority occupations in shortage, smaller employers and nationally significant economic priorities. Many energy occupations continue to be recognised within these settings. The current Key Apprenticeship Program (KAP) provides targeted support to occupations on the Australian Apprenticeships Priority List, with employers able to receive up to \$5,000, equating to around three per cent of apprentice costs. Regarding the KAP, the current \$5,000 employer incentive is available until 31 December 2026. From 1 January 2027 until 30 June 2029 the employer incentive will be adjusted to \$4,000 per apprentice for eligible SMEs and GTOs.

The current system is more targeted and strategically aligned than earlier arrangements. However, while eligibility has evolved, the overall scale of employer support has largely returned to historical levels. For many electrical apprenticeship employers, incentive payments offset only a small share of total apprenticeship costs.

The BAC period provides the clearest evidence of what happens when employer support increases substantially.

Table 3: Evolution of apprenticeship incentive settings and key system trade-offs ('Employer support' is percentage of total apprenticeship costs offset by incentives).^{65, 66}

Phase	Employer support	Strength	Limitation
Pre-2020	~2%	Broad-based and stable support across the apprenticeship system at relatively low fiscal cost	Generally too small to materially influence employer behaviour
Pandemic (2020-2022)	~19%	Demonstrated that large reductions in employer costs can drive substantial growth in commencements	High fiscal cost and limited targeting
Current system	~3%	Better targeted towards workforce priorities, priority occupations and areas of need	May not fully address employer-side constraints in sectors where costs and risks remain a major barrier to apprenticeship growth

Boosting Apprenticeship Commencements: energy capacity impacts

Prior evaluation found that BAC increased apprenticeship commencements by around 70 per cent above the level expected in the absence of the program. Strong effects were also observed in trade occupations, including electrical trades, while growth was strongest among small and medium sized businesses.⁶⁷ **Highlight 7** provides the basics on the design and scale of this program.

Highlight 7: Boosting Apprenticeship Commencements: program design and scale

The Boosting Apprenticeship Commencements (BAC) program was introduced in October 2020 in response to weak employer demand during the COVID-19 pandemic. The program provided a 50 per cent wage subsidy for the first 12 months of an apprenticeship, followed by tapered support in subsequent years (10 per cent in year two and five per cent in year three). The subsidy was largely front-loaded to reflect the lower productivity of apprentices in the early stages of training. The program applied to new apprenticeships commenced between 5 October 2020 and 30 June 2022.⁶⁸

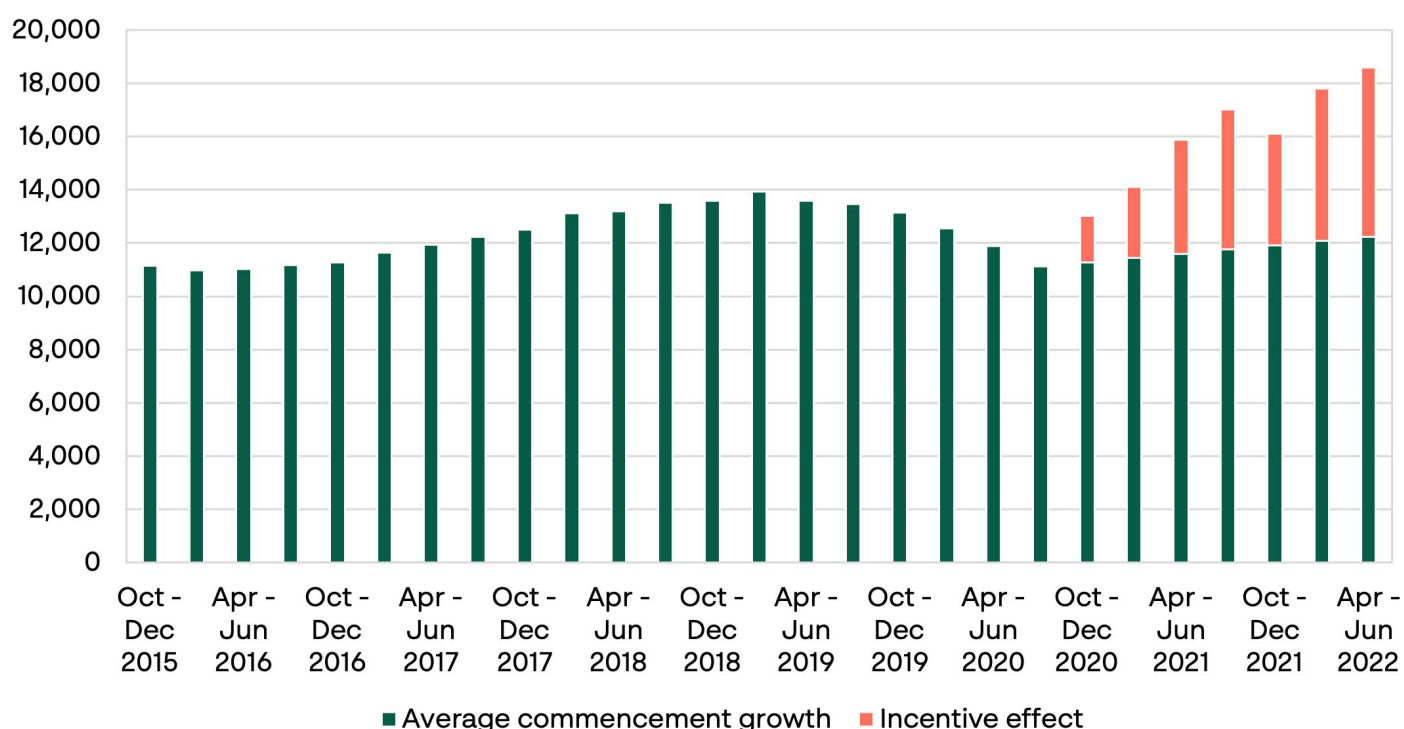
PSO estimates suggest average support per apprentice was approximately \$37,000 for employers. A complementary Completing Apprenticeship Commencements (CAC) program provided ongoing tapered support for apprentices progressing beyond the initial BAC period. CAC payments continued until 31 December 2025, meaning support for the BAC cohort remained in place several years after new BAC commencements closed.

Taken together, the BAC and CAC programs represent the full policy period associated with the apprenticeship cohort supported through the pandemic response.

PSO notes that the BAC and CAC operated alongside a broader suite of pandemic-era workforce measures, including JobKeeper, which helped ensure existing apprentices and workers retained their employment through a period of acute economic disruption. These complementary measures were largely oriented towards retention and maintaining existing workforce levels.

Treasury's evaluation was not conducted specifically for the energy sector. Preliminary PSO analysis suggests the BAC increased energy apprenticeship commencements by around 45 per cent above what would otherwise have occurred, equivalent to approximately 10,500 additional energy apprenticeship commencements during the program period (**Figure 24**). The vast majority of these were electrician apprenticeships.

Figure 24: Energy apprentice commencements, including during the BAC period compared with expected trend without BAC.⁶⁹



Growth occurred across the energy apprenticeship system but was concentrated in key occupations, employers and business types (**Figure 25**).

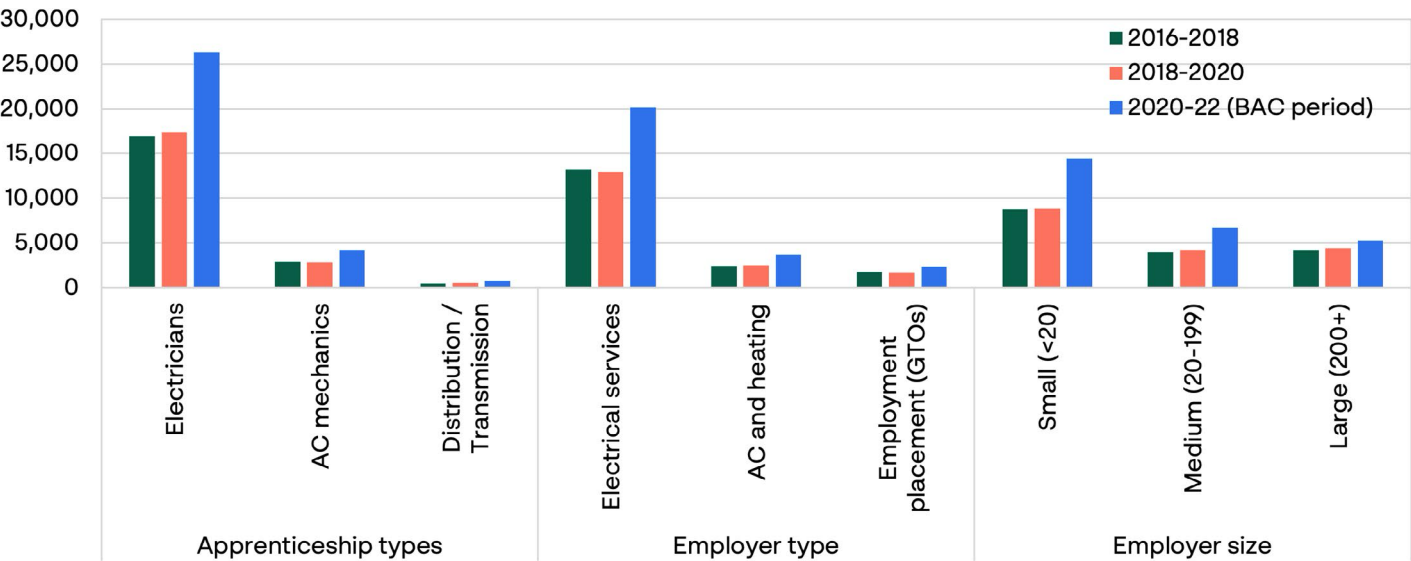
Electrician apprenticeships accounted for a large share of the increase. Around 26,000 people commenced an electrician apprenticeship during the BAC period, making it the largest energy trade both before and during the program and the primary driver of growth across the sector.

The strongest response was observed among electrical contracting businesses (known more formally as Electrical Services businesses). These employers commenced around 20,100 apprentices during the BAC period, including both underlying apprenticeship demand and any additional activity generated by the subsidy. Their share of energy apprenticeship commencements increased from around 57 per cent before the program to 62 per cent during the program.

This increase is important because it suggests electrical contracting businesses responded more strongly to improved employer conditions than other parts of the apprenticeship system. Given these businesses already represent the largest source of apprenticeship demand in the energy sector, the result provides evidence of substantial latent capacity within this employer group.

Small and medium-sized businesses were also particularly responsive. Small businesses increased their share of energy apprenticeship commencements from around 38 per cent before the BAC to 44 per cent during the program, while medium-sized businesses also increased their share. Large businesses recorded growth in absolute commencements but a decline in share, indicating comparatively lower responsiveness.

Figure 25: Energy apprentice commencements by key attributes, pre-BAC periods versus BAC period.⁷⁰



Importantly, the BAC did not create new occupations, qualifications or employer groups. The significance of the BAC is not simply that apprenticeship numbers increased. It demonstrates that substantial workforce capacity already exists within the current system and can be unlocked when employer conditions improve.

The central question for the energy supercycle may therefore be: what conditions are required to activate similar growth at the scale required?

Unlocking apprenticeship growth for the energy supercycle

Key message: The capacity to grow Australia's electrician workforce already exists within the system. The evidence shows it responds when conditions improve. The challenge — and the opportunity — is creating those conditions at the scale and duration the energy supercycle requires.

The preceding sections have answered the questions this report set out to examine.

What is driving demand? An energy supercycle that is creating unprecedented and concurrent demand for licensed electricians across renewables, housing, data centres and major infrastructure — demand that is growing faster than the system that produces the workers to meet it.

Where is supply headed? In the wrong direction. Electrician apprenticeship commencements are falling in every state and territory while the workforce is essentially fully employed. The pipeline is not expanding at the pace required.

Where does workforce capacity reside? For electrician apprenticeships, the structural levels of capacity are held mainly within established employers, namely smaller electrical contracting businesses, alongside a second pool of latent capacity held collectively by a range of larger employers across heavy industries, GTOs and government.

What is constraining growth in the electrical contractors pool? The economics of apprenticeship employment, particularly the front-loaded costs, supervision requirements and uncertainty over returns that make the employer value proposition difficult to sustain.

Can that constraint be overcome? The BAC program demonstrates it can, and at almost exactly the scale the supercycle requires.

What remains is the harder question: how do those conditions come about in a sustained and purposeful way?

Why workforce demand does not automatically create workforce supply

The workforce challenge created by the energy supercycle is fundamentally a coordination problem. The organisations creating most of the demand for skilled workers are not the organisations training them. The organisations doing the training are making decisions based on short-term business conditions.

Training capacity exists, interest from prospective apprentices is strong, completion rates are comparatively high, and VET capacity is growing. The constraint lies in the structural relationship between those who need workers and those who create them (**Highlight 8**).

Figure 26 then illustrates the central diagnosis of this research and the potential pathways forward.

Highlight 8: Why the market may not solve this on its own

Apprenticeship training for electricians has characteristics that economists associate with market failure. The costs and risks of training are borne largely by individual employers, predominantly smaller electrical contracting businesses alongside a broader ecosystem of larger employers and GTOs where participation has declined significantly over time, while many of the benefits of a larger skilled workforce accrue more broadly across industries, projects, governments and the wider economy.

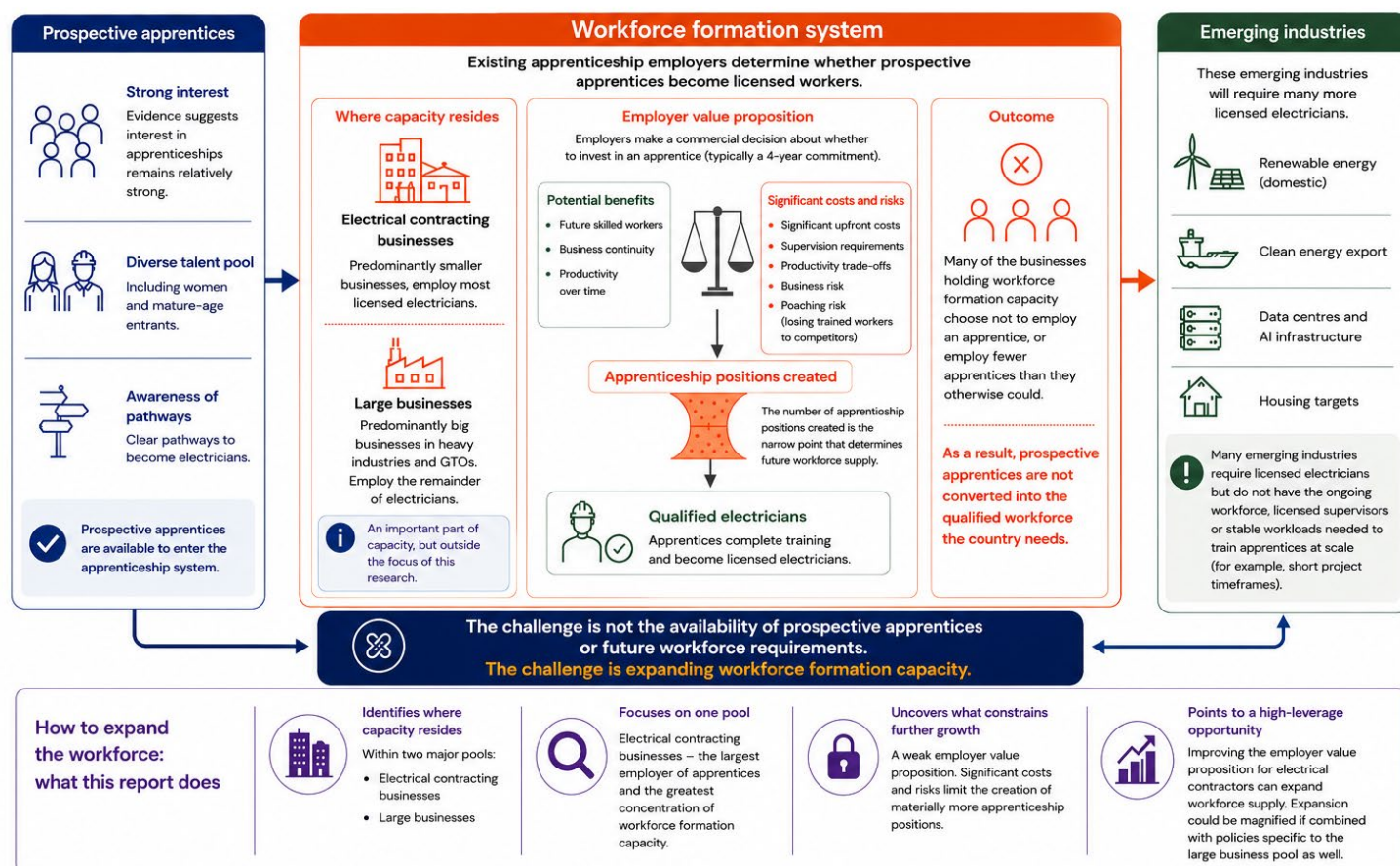
This creates a situation where the level of investment made by individual employers may be lower than what would be desirable from a broader economic perspective. Employers make rational decisions based on their own costs and expected returns, but those decisions do not automatically account for the wider benefits of a larger skilled workforce.

This dynamic is compounded by the poaching externality discussed earlier. Employers who invest in training may not capture the full return if apprentices move to other businesses after qualifying. Under these conditions, apprenticeship activity is unlikely to expand automatically to the level required by the energy supercycle.

Figure 26: The central diagnosis of this research and potential pathways forward.

Expanding the future workforce

Prospective apprentices and future workforce requirements already exist.
Workforce only expands when employers create apprenticeship positions.



This is not a new problem. Historically, parts of the energy sector addressed it through more coordinated approaches to workforce development. Publicly owned electricity utilities maintained significant apprenticeship programs and invested in workforce capacity beyond their immediate operational requirements, providing a steady flow of qualified workers into the broader industry.

The structure of the workforce system has since changed. Workforce demand is now generated by a diverse range of public and private actors, while the capacity to actually create the supply sits across two distinct pools of employers, electrical contracting businesses and the broader ecosystem of large employers, GTOs and government, who are the only groups in a position to do so. Neither pool is currently activated at the scale required, and neither is directly compensated for meeting the workforce needs of the broader economy. This decoupling between who benefits from a larger workforce and who can actually create it is at the heart of the coordination challenge.

The energy supercycle has made this coordination challenge more significant. The scale of future demand, the concentration of training capacity, and the long lead times of the apprenticeship system mean that workforce shortages could emerge before market signals are strong enough to generate the required supply response (**Highlight 9**).

The longer this goes unaddressed, the greater the risk that competition for the existing pool of qualified workers intensifies, a zero-sum dynamic that raises costs, accelerates workforce mobility and makes the underlying shortage harder to resolve. This is the rationale for proactive, large-scale and early action. Waiting for market signals to generate the required response risks arriving late to a competition for a workforce that is already too small to meet demand.

Highlight 9: A Renewable Energy Zone – illustrating the challenge

A Renewable Energy Zone illustrates how these dynamics play out in practice.

Governments and developers may know that a region will require substantially more electricians over the next decade. The region requires a larger stock of qualified, licensed electricians available when renewable generation, storage and transmission projects commence.

The businesses with the greatest capacity to begin creating that future workforce are often the local electrical contracting businesses already operating in the region. Those businesses already hold the scarce capability needed to produce future electricians. A contractor with one apprentice may be capable of employing a second. A contractor who currently employs no apprentices may be capable of taking on their first. Whether they do so depends primarily on the commercial circumstances of their own business rather than the future workforce needs of the region.

Individually, these decisions affect one business. Collectively, they determine whether Australia builds the larger stock of licensed electricians needed to deliver the ambitions of the energy supercycle. Similar dynamics play out across the broader ecosystem — for large employers, GTOs and government, the question is equally whether the conditions exist to restore and expand their participation alongside the electrical contracting channel.

The role of government and emerging industries

Governments and industry have already made significant investments in the foundations of clean energy ambitions and workforce growth. These investments are important and remain essential.

Part of the challenge is structural rather than a reflection of any policy failure. Workforce formation in the energy trades sits across two policy frameworks that have each developed with different objectives. Clean energy investment has focused on technology, infrastructure and market development, and initiatives like the Cheaper Home Batteries Program demonstrate what is possible when investment is designed around the specific characteristics of a market.⁷¹ Workforce and apprenticeship policy has focused on people: apprentice attraction, completion and support. Both frameworks have achieved real results.⁷²

The emerging challenge is that neither was designed around the specific characteristics of energy workforce formation or the strategic workforce needs of the supercycle – and in particular the employer-side constraint that sits at the intersection of both is one that the scale and nature of the supercycle is only now bringing into sharper focus.

There may be an opportunity to change that. Government already treats clean energy as a strategic market investment, using incentives, regulation and targeted programs to shape the conditions under which the transition occurs. Applying similar logic to workforce formation, treating it as a strategic investment in the infrastructure that makes the transition possible rather than a standard training policy problem, may open options and justify a scale of response that conventional apprenticeship policy does not (**Highlight 10**). The evidence base is now in place. The question is what happens next.

Highlight 10: Government as a market shaper in energy workforce formation

A similar logic to government's existing role in clean energy may apply to workforce formation. Rather than replacing employers as the primary providers of training, government can play a shaping role by helping share some of the costs and risks associated with developing the future workforce. This is consistent with a public-private approach to workforce development that has precedent in other parts of the economy.

Employer incentives are one practical mechanism. They reduce the upfront costs and risks borne by employers, bringing part of the future value of a larger skilled workforce into present-day training decisions. The BAC program demonstrates this approach can generate substantial workforce growth within existing pathways and employer

groups. The Australian Government is delivering targeted, evidence-based reforms to ensure apprenticeship incentives remain targeted and fiscally sustainable. The 2026-27 Federal Budget continues to build on this through further targeting of incentive settings to priority occupations, key sectors and cohorts, consistent with the Strategic Review's findings.

Incentives are unlikely to be the only mechanism available. These reforms also reflect evidence that governments and industry must collectively address broader cultural and systemic factors. The 2026-27 Budget responds to the Strategic Review findings by working with Jobs and Skills Councils to develop bespoke tripartite projects to improve quality, safety and completions for apprenticeships. Procurement settings, workforce obligations, industry partnerships and other approaches may also play a role. The appropriate mix will depend on the specific characteristics of the workforce challenge and the policy objectives being pursued.

The evidence presented in this report does not prescribe specific settings. It does suggest that the employer side of the apprenticeship system warrants sustained attention, and that the scale and design of support should reflect the strategic importance of the workforce challenge. The current direction of reform, targeting incentives toward priority occupations and smaller employers, is consistent with the evidence. Whether the scale of support under current settings will be sufficient to activate the latent capacity the supercycle requires remains an open question. Ensuring that support is both ambitious enough to activate that capacity and targeted enough to represent value for public investment will be a central design challenge for the policy settings that follow.

This challenge is not unique to Australia. Analysis by the Global Wind Energy Council and Global Wind Organisation — the peak international bodies for the wind industry — offers three findings that directly validate the diagnosis in this report.⁷³

First, on coordination: as the energy supply chain has become more specialised, no single entity holds full responsibility for workforce development and capability building across the value chain. The fragmentation is structural, not accidental.

Second, on industrial policy: skilled workforce availability is a fundamental part of the energy supply chain, yet it has not received the same recognition or systematic planning as physical infrastructure and technology.

Third, on government's role: as stewards of the broader system, government bodies are well placed to take on responsibility for workforce assessment, capacity building and monitoring across the energy transition. This follows directly from the coordination problem — because no single private entity holds responsibility across the fragmented energy supply chain, government has the reach and mandate to coordinate workforce development at the system level in a way that no other actor can. This role does not emerge automatically. It needs to be deliberately designed and resourced.

That all three findings mirror the Australian situation, identified independently by the industry's own global peak bodies, lends significant weight to the diagnosis this report offers and to the case for coordinated policy action.

Where to from here

The next step is for the evidence in this report to be interrogated on its merits and to inform the broader conversations that need to happen across the ecosystem — between government, industry, employers, peak bodies and PSO. This goes beyond individual policy design. It is about building a shared understanding of the issues at the roots of the ecosystem and calibrating a response that cuts across workforce policy, clean energy investment, industry strategy and procurement. This report aims to convey the urgency of that challenge, identify where the meaningful levers sit, and provide a foundation from which those broader conversations can be had.

There are approximately 48,000 electrical contracting businesses operating in Australia, and around one-third currently employ an apprentice. If Australia requires thousands more electrical apprentices, the evidence presented in this report suggests a significant share of that growth will need to come from this group. This is in parallel with a serious effort to drive capacity activation from the broader ecosystem of large employers, GTOs and government, and reinforced by mechanisms for emerging industries driving demand to also contribute to apprentice volumes — whether directly or through indirect means such as procurement and supply chain requirements. Across this agenda, the size of the ambition may be just as important as the right mix of policies.

Within the electrical contracting channel, the required scale of growth has already been demonstrated once, through the BAC program, within the existing apprenticeship system and without expanding skilled migration or creating new pathways. The opportunity this report identifies is to understand what made that possible and whether the conditions for it can be created again, at the scale and scope the energy supercycle requires.

If workforce supply does not expand in line with demand, the supercycle may still proceed, but over longer timeframes, at higher cost, and with fewer economic, employment and energy system benefits than might otherwise be realised. The central question is whether the conditions to activate that capacity can be put in place in time. It is a shared workforce challenge, but one where the actors who benefit from a larger skilled workforce and those responsible for creating it are currently fragmented and not aligned around a common response. A policy mix that is aware of this fragmentation and uses a range of approaches toward that collective end will be essential.

In terms of PSO's role, this report makes two contributions. It introduces the concept of the energy supercycle as a framework for understanding the scale and nature of future workforce demand, and it provides a substantive analysis of how the licensed energy workforce can be grown to meet it. Together these are intended to form the evidential foundation for PSO's workforce policy development in the energy trades and to inform the policy conversations that will need to occur between industry, employers and government.

PSO's position as the JSC for the energy sector means it is well placed to carry that work forward, bringing industry voice and employer evidence into policy discussions that reflect what the system is actually capable of and what the energy supercycle demands, while also developing policy recommendations to achieve these goals directly. This report highlights opportunities for both government and industry to help address skill shortages, including the role of government as a direct employer and market shaper, and the scope for industry to drive workforce growth through procurement, supply chain requirements and direct employer action. PSO intends to build on this research by developing more detailed policy options and recommendations as part of its ongoing workforce policy work.



Footnotes

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- ¹² Migration constraints: The energy trades have some of the lowest rates of skilled migration, and the licensing and safety requirements for occupations such as electricians mean migration is necessarily a carefully managed process. In the 2026–27 the Australian Government announced its investing \$85.2 million to accelerate skills assessments for migrant trades workers and occupational licensing. These reforms could reduce workforce entry times by up to six months and enable up to 4,000 additional skilled trades workers to enter the workforce each year. While these reforms are expected to strengthen migration pathways, much of the future workforce requirement is still expected to be met through the onshore apprenticeship system, highlighting the importance of strengthening other drivers of workforce growth.
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- ¹⁶ This peak is the final period of the COVID-era apprenticeship incentive period, Quarter 2 (April to June) 2022
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- Data for this research was extracted at a time when the most recently available data was Quarter 2 (April to June) 2025. Another two quarters of data become available since and are discussed in the 'Future outlook and scenarios' part of this section.
- For the purposes of this research the COVID-era apprenticeship incentive period, BAC and CAC the 'affected' period, is defined in rolling annual terms as Quarter 4 (October to December) 2020 to Quarter 2 (April to June) 2022, inclusive. The final period, Quarter 2 (April to June) 2022, was also the peak of the timeseries used to calculate movements since.
- ¹⁸ NCVER (2026). Apprentices and Trainees dataset. <https://vocstats.ncver.edu.au/webapi/jsf/login.xhtml>
- The end of the COVID subsidy period (mid-2022) was Quarter 2 (April to June) 2022, it was also the peak is the final period of the COVID-era apprenticeship trends in rolling annual terms. Mid-2025 is Quarter 2 (April to June) 2025.
- ¹⁹ NCVER (2026). Apprentices and Trainees dataset. <https://vocstats.ncver.edu.au/webapi/jsf/login.xhtml> This data was extracted up to Quarter 4 2025.
- ²⁰ For the purposes of this research the scenario base period used for this scenario is a continuation of trends in apprenticeship commencements from the conclusion of the BAC and CAC subsidy period defined as Quarter 2 (April to June) 2022 for this research to Quarter 2 (April to June) 2025.
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- ²⁶ Scenario 1: Assumes economic conditions remain broadly stable and that the moderation observed since 2022 continues. Scenario 2: Combines the moderation from Scenario 1 with historical relationships between unemployment and trade apprenticeship commencements. Assumes the unemployment rate increases by a further 0.5 percentage points to around 5.0 per cent over the coming years, broadly consistent with the severe Middle East conflict scenario presented in the 2026–27 Budget outlook. Scenario 3: Includes the recent upturn in apprentice commencements and assumes growth return to what it was in the years prior to the pandemic period (around 0.7 per cent growth per quarter)

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- ²⁹ These large employing industries (non-electrical contractors) account for around 4 to 7 per cent of employment of the remaining 44 per cent electricians each.
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Approximate PSO estimate based on from 30,000-32,000 energy apprentices employed by electrical contracting businesses (2025 in-training) and an assumption of two apprentices per host employer, consistent with PSO industry survey evidence suggesting most apprentice-hosting businesses employ between one and three apprentices. This implies approximately 16,000 apprentice-hosting businesses nationally, equivalent to around one-third (33 per cent) of the approximately 48,000 electrical contracting businesses operating in Australia.
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- ⁵⁹ The precise cost varies considerably depending on factors such as apprentice age, wage rates, supervision requirements, business structure and employment arrangements. Costs may also differ substantially between employers operating under different enterprise bargaining agreements and industrial arrangements, which can result in significantly different remuneration structures. Industry feedback further suggests mature-age apprentices may cost employers approximately \$40,000–\$50,000 more over the life of the apprenticeship than younger apprentices due to higher wage rates. While mature-age apprentices are not the primary focus of this report, their participation was identified as an important workforce issue in the 2025 PSO Workforce Plan and has been highlighted for further investigation.
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- Note: In Year 4 a small proportion of supervisor costs (2 per cent) have been added by PSO to the original data which implied supervisor costs were zero. This is to show supervision also occurs in the four year. This addition does not change any analysis or interpretation.
- ⁶³ Illustrative index-based representation by PSO. A qualified electrician is set at 100 as a constant benchmark. Apprentice productivity increases over time but remains below full productive equivalence across most of the training period, while employer costs decline as output increases. The comparison highlights the opportunity cost of allocating licensed electrician time to supervision in small contracting businesses. Based on research from NCVER (2009). The cost of training apprentices. https://ncver.edu.au/_data/assets/file/0019/16723/cp05070.pdf
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- ⁷⁰ This measures the total change and percentage change over the following periods October to December in the first year to April to June in the final year. These earlier periods were selected to match PSO's definition of COVID-19 incentive period established for this research, Quarter 4 (October to December) 2020 to Quarter 2 (April to June) 2022.
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Research Paper | August 2026

Electrician Workforce Capacity Study:

Why more apprentices are essential
and who holds the keys to growth

Appendix



A – Recent investment in VET capacity

In recent years, governments have made substantial investments in vocational education and training (VET) capacity. These investments span both workforce capacity and system infrastructure and are intended to strengthen the ability of the training system to support future workforce growth (**Table A**).¹

VET workforce capacity

Workforce capacity focuses on the people who deliver training. Within the National Skills Agreement, funding supports strengthening the VET workforce, including teachers, trainers and assessors. This is reinforced by the Turbocharging the VET Workforce initiative (\$15 million in 2026–27; \$30 million total) and the Advanced Entry Trades Training Program (\$39 million in 2026–27; \$78 million total), which expand trainer capacity and accelerate qualification pathways through recognition of prior learning and gap training.

VET system infrastructure

System infrastructure focuses on expanding the training system itself. The National Skills Agreement provides \$2.61 billion in 2026–27 (from a total commitment of \$11.95 billion) and supports state training systems, including TAFE Centres of Excellence and improvements to VET data and evidence systems.

The Fee-Free TAFE Skills Agreement provides \$207.3 million in 2026–27 (from a total commitment of \$910 million) to deliver at least 100,000 Free TAFE and VET places annually from 2027.

The TAFE Technology Fund and Mobile TAFE initiative provides \$23.8 million in 2026–27 (from a total of \$39.8 million) to upgrade facilities and expand delivery in regional and remote areas.

Additional investment supports clean energy training capacity through the Clean Energy Capital Investment Fund (\$10.5 million in 2027–28; \$35 million total) and the National Training Centre in New Energy Skills (\$5 million in 2026–27; \$20 million total), which is expected to train more than 2,000 tradespeople each year.

Table A: Australian Government investment in VET workforce and infrastructure, 2026–27 Budget.

Program	2026–27 funding	Total funding over 5 years	Purpose
National Skills Agreement	\$2.61 billion	\$11.95 billion	System-wide VET funding, TAFEs, data systems, Centres of Excellence
Fee-Free TAFE Skills Agreement	\$207.3 million	\$910 million	Free training places in high-demand areas
Turbocharging the VET Workforce	\$15 million	\$30 million	Expand VET teachers, trainers, assessors
Advanced Entry Trades Training Program	\$39 million	\$78 million	RPL and gap training for experienced workers
TAFE Technology Fund and Mobile TAFE	\$23.8 million	\$39.8 million	Facility upgrades and mobile training delivery
Clean Energy Capital Investment Fund	\$10.5 million (for 2027-28)	\$35 million	Expand clean energy training facilities
National Training Centre in New Energy Skills	\$5 million	\$20 million	New energy trades training capacity

B – PSO workforce planning framework: “The Four C’s”

This research is grounded in PSO’s workforce planning framework, which examines workforce challenges through four interrelated domains: capacity, capability, culture and confidence (**Figure B**). Together, these domains provide a structured way of understanding workforce performance and identifying where constraints may emerge across the workforce system. This framework is referred to by PSO as “the Four C’s”.

The framework is used as an organising lens rather than a predictive model. It helps identify where workforce pressures are occurring, how they interact, and where policy interventions may have the greatest system-wide impact.

Capacity

Capacity refers to the ability of the workforce system to produce sufficient numbers of workers to meet current and future demand. In the 2025 Workforce Plan, workforce capacity was understood as being shaped by four interconnected components: apprentices, employers, the VET system, and productivity.

The Plan emphasised that workforce growth depends on the interaction between these components rather than improvements in any single area. Constraints in any one component can limit overall workforce expansion.

Since publication of the 2025 Workforce Plan, substantial investment has been directed towards strengthening VET system capacity, particularly training infrastructure, facilities, trainers and workforce delivery. At the same time, PSO has continued to investigate other dimensions of workforce capacity, most formally, productivity.²

Previous PSO workforce planning work also identified apprenticeship employers and apprenticeship incentives as two areas warranting further investigation. Apprenticeships remain the primary pathway into many licensed energy occupations, while earlier analysis suggested apprenticeship activity may be responsive to changes in incentives and policy settings.

This report builds on those findings. It focuses on how apprenticeship capacity is created within the energy sector, the role employers play in creating apprenticeship opportunities, and the factors that influence workforce growth.

Capability, culture and confidence

While this report focuses on workforce capacity, the broader PSO workforce planning framework recognises that workforce outcomes are also shaped by capability, culture and confidence.

Capability refers to the skills, knowledge and competencies required within the workforce. Culture refers to workforce participation, inclusion, attraction and retention. Confidence refers to the ability of workers, employers and industry to make long-term workforce decisions with certainty.

These domains remain important to future workforce outcomes and continue to inform PSO's broader workforce planning agenda. The focus on capacity in this report should therefore be understood as one component of a wider workforce planning framework rather than a comprehensive assessment of all workforce challenges facing the energy sector.

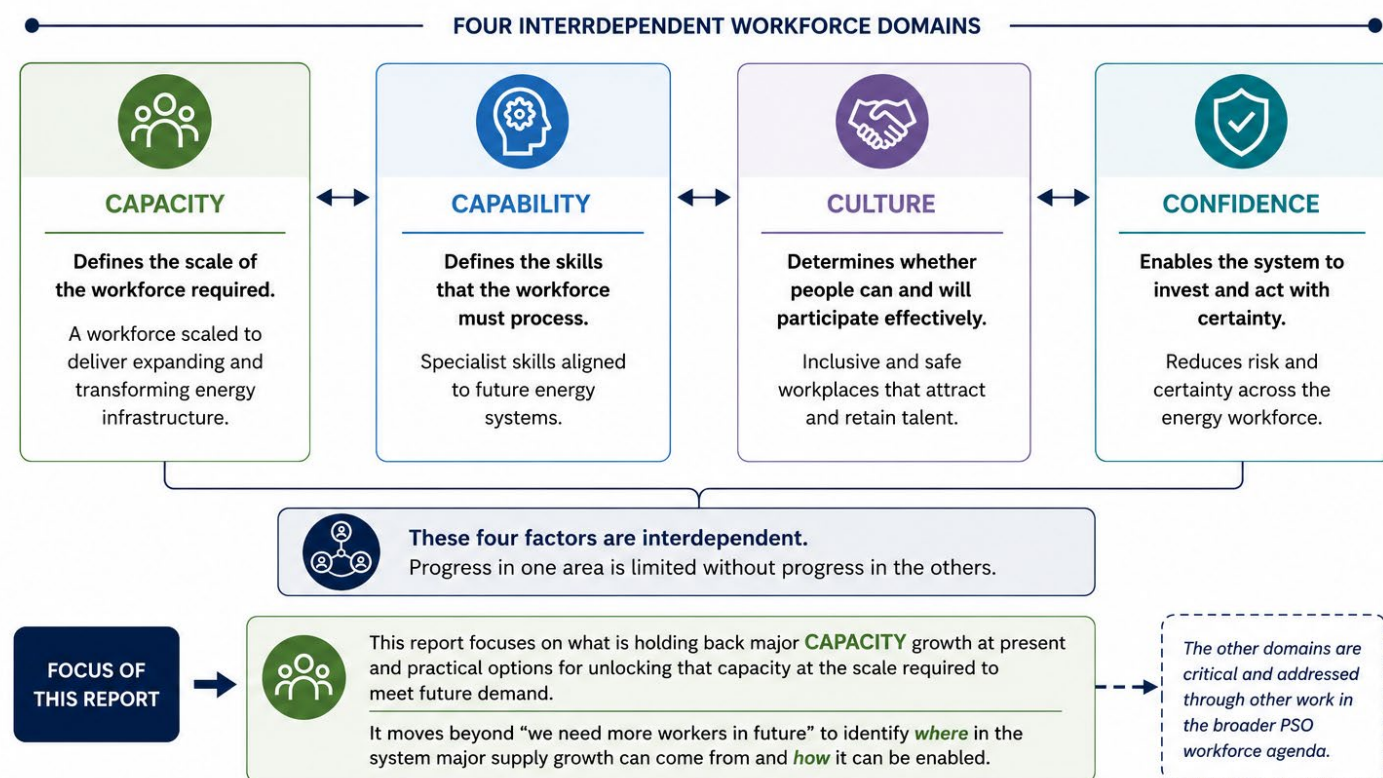
Figure B: Where this research sits in PSO's workforce planning framework.

PSO Workforce Planning Framework

Capacity · Capability · Culture · Confidence



The four factors that collectively explain the major workforce challenges facing the energy sector and represent the strategic priorities for long-term workforce success.



C – Analytical approach and methodology

The analysis draws on multiple sources of evidence, including primary survey data, stakeholder consultations, internal modelling, administrative data and secondary research. These sources are triangulated to develop an integrated understanding of how apprenticeship supply responds to changes in workforce demand, incentives and institutional settings.

The analysis adopts a workforce systems perspective. Rather than assuming labour demand automatically translates into workforce supply, it examines the mechanisms through which workforce capacity is created and the factors that may constrain expansion. Particular attention is given to apprenticeship employers because they occupy a critical position within the workforce formation process by creating apprenticeship opportunities and providing workplace training.

A central analytical distinction is made between structural constraints and policy-influenced factors.

Structural constraints include apprenticeship duration, licensing requirements, supervision requirements, and the limited availability of institutional training pathways outside traditional apprenticeships. These factors define the operating environment of the apprenticeship system and are treated as relatively fixed within the timeframe of analysis. Other factors, including migration pathways³ into licensed occupations, are also treated as comparatively stable in the short to medium term, while recognising that they may change over longer time horizons.

Within these conditions, the analysis focuses on factors that may influence workforce growth at a material scale. Particular attention is given to employer participation, apprenticeship incentives and the employer value proposition, reflecting evidence that apprenticeship supply may be responsive to changes in employer costs, risks and expected returns.

The objective is not to identify a single cause of future workforce shortages, but to better understand the relative importance of different constraints and the extent to which policy settings may influence future workforce capacity.

D – Research scope on electrician apprenticeship

This research focuses primarily on electricians within the energy trades and the apprenticeship pathways that lead to this occupation.

While all five energy trades are important to Australia's energy transition, electricians are examined as the primary focus of this report because they differ from the other trades in both scale and workforce dynamics. They account for the largest share of the energy trades workforce and are central to both current and projected workforce growth.

The energy trades comprise five key occupations that operate across the Australian economy (**Table C**). Together, these occupations employ approximately 284,400 people in 2026. Electricians account for around 195,400 workers, or approximately 69 per cent of this workforce – around seven in every ten energy trades workers. There are more electricians employed than the remaining four energy trades combined.

Table C: Energy trades workforce, Australian economy, 2026.⁴

Energy trade	2026 employment	Share
Electricians	195,400	69%
Air Conditioning and Refrigeration Mechanics	36,700	13%
Electronics Trades Workers	30,900	11%
Electrical Engineering Draftspersons and Technicians	10,800	4%
Electrical Distribution and Transmission Trades Workers	10,600	4%
Total	284,400	100%

Electricians are also expected to experience the largest future workforce shortages (**Table D**). Official modelling indicates that Australia will require approximately 42,500 additional electricians between 2023 and 2030, rising to up to 71,200 by 2040. Electricians are expected to remain the dominant energy trade over this period, accounting for around 65 to 70 per cent of the energy trades workforce.

Without intervention, projected apprentice supply is expected to fall around 15 to 20 per cent short of workforce requirements over the next 15 years, with electricians accounting for almost three-quarters of projected shortages across the energy trades.

Table D: Projected additional workforce required, energy trades, Australia.⁵

Projected additional workforce required	2030	2040
Electricians	31,600	49,400
Remaining four energy trades	13,800	20,800
Total	45,400	70,200

E – Employers, apprentices and employer eligibility in energy

Characteristics of employers

One way of understanding where apprenticeship capacity resides is to examine the types of businesses that employ energy apprentices. Australian businesses are classified into around 700 detailed industry groups. Looking across these groups helps identify which parts of the economy are responsible for employing and training energy apprentices.

The results show that apprenticeship employment is highly concentrated. Electrical Services businesses employ 59 per cent of all energy apprentices (**Table E**). Air Conditioning and Heating Services businesses employ a further 10 per cent.

Electrical Services businesses, commonly referred to as electrical contractors, undertake most electrical work across residential, commercial, industrial, and infrastructure settings, often through subcontracting arrangements. This reflects a long-standing industry structure characterised by fragmented, small-scale private provision.

The next largest category is Employment Placement and Recruitment Services, which includes Group Training Organisations (GTOs). These organisations employ around seven per cent of energy apprentices (**Highlight A**). The remaining apprenticeship employment is distributed across a large number of other industries, each accounting for a relatively small share of the total.

This concentration is important because it shows that much of the industry's apprenticeship capacity is located within a relatively small number of business types. As a result, future growth in the energy workforce depends heavily on the willingness and ability of these employers to create additional apprenticeship opportunities.

Table E: Energy apprentices by employer sector, Australia, 2025, top ten employers, apprentices in-training.⁶

Energy apprentices by employer	In-training	% In-training
Electrical Services	32,176	59%
Air Conditioning and Heating Services	5,474	10%
Employment Placement and Recruitment Services	3,786	7%
Electricity Distribution	1,570	3%
Defence	734	1%
Fossil Fuel Electricity Generation	730	1%
Labour Supply Services	705	1%
Fire and Security Alarm Installation Services	502	1%
Plumbing Services	366	1%
Iron Ore Mining	311	1%
<i>Top ten employees of energy apprentices</i>	<i>46,354</i>	<i>86%</i>
Total	54,179	100%



Highlight A: Group Training Organisations may play a targeted role in expanding energy apprenticeship capacity

Group Training Organisations (GTOs) play an important but comparatively small role in the employment of energy apprentices. They currently employ around seven to 10 per cent of energy apprentices, down from approximately 25 per cent in 2000. For electrician apprenticeships in particular, GTOs have declined from around 25 per cent in 2000 to around one in ten today.

Despite this decline, GTOs remain important in specific parts of the system. They can support apprenticeship employment where individual employers are unable to provide the full range of work, supervision or duration of employment required across a four-year apprenticeship. This may be particularly relevant for project-based sectors, including parts of the renewables industry, where work may be distributed across multiple sites and employers.

GTOs also appear to play an important role in widening participation. They employ around 20 per cent of women energy apprentices, higher than their overall share of energy apprentice employment.

On current settings, GTOs are unlikely to be the primary source of overall energy apprenticeship growth. Their share of employment has declined over time and remains much smaller than electrical services employers. However, they may provide an important complementary pathway in areas where direct employment by individual businesses is difficult, including project-based work, regional delivery and efforts to improve participation among underrepresented groups.

Apprenticeship employment is also concentrated among smaller employers. Analysis indicates that 74 per cent of energy apprentices are employed by small and medium-sized businesses, defined as businesses with fewer than 200 employees (**Table F**). Within this group, employment is concentrated in smaller businesses, with 49 per cent of all energy apprentices employed by businesses with fewer than 20 employees.

Electrician apprentices, who account for the majority of energy apprentices, largely drive this pattern. More than three quarters (77 per cent) of electrician apprentices are employed by small and medium-sized businesses, including 51 per cent employed by small businesses.

Table F: Energy apprentices by employer business size, Australia, 2025.⁷

Energy apprentices	In training	% In-training
Small	26,474	49%
Medium	13,745	25%
<i>Small and Medium</i>	<i>40,219</i>	<i>74%</i>
Large	13,880	26%
Total	54,179	100%

When combined, these findings show that energy apprenticeship employment is highly concentrated within electrical contracting businesses, particularly small and medium-sized electrical contractors (**Table G**). This group employs more than half of Australia's energy apprentices (56%). It has done so at a similar and stable volume for many years and is a structural feature of the energy apprentice system.

Table G: Energy apprentices by employer sector and size, Australia, 2025.⁷

	Electrical Services		ACH Services		Electrical and ACH		Total	
Small	21,086	39%	3,508	6%	24,594	45%	26,474	49%
Medium	9,061	17%	1,604	3%	10,665	20%	13,745	25%
<i>Small and Medium</i>	<i>30,147</i>	<i>56%</i>	<i>5,111</i>	<i>9%</i>	<i>35,259</i>	<i>65%</i>	<i>40,219</i>	<i>74%</i>
Large	1,968	4%	354	1%	2,322	4%	13,880	26%
Total	32,176	59%	5,474	10%	37,650	69%	54,179	100%

Overall, based on NCVER apprenticeship in-training data for the final quarter of 2025, half of all energy apprentices were electrician apprentices employed by small and medium-sized electrical contracting businesses. The remaining half of energy apprentices were distributed much more broadly across other energy trades and employer types. Because such a large share of workforce formation was concentrated within this part of the apprenticeship system, it became the primary focus of this research.

Characterising the two pools: employer type and apprenticeship concentration

The two-pool framework used in this report draws on data about where licensed electricians work and where electrician apprentices are trained. The following table summarises the share of electrician apprentices in training by employer group, illustrating the concentration of training within electrical contracting businesses and the smaller but significant share held by large businesses including GTOs and government.

The categories are not perfectly mutually exclusive — large electrical contracting businesses exist within both pools, and some SMEs operate outside electrical contracting. However, as the notes below the table explain, these overlaps are small enough that the two-pool framing holds up empirically.

Employer group	Share of electrician apprentices
Electrical contracting businesses	~71%
Large businesses (including GTOs and government)	~21%
Not classified	~8%
Total	100%

Note: These categories are not perfectly mutually exclusive. Three overlaps are worth noting:

- Large electrical contracting businesses are only around 4 per cent of electrical contractors — so electrical contracting is overwhelmingly an SME story.
- Non-electrical contracting SMEs account for only around 9 per cent of all SME electrician employers — so SMEs outside electrical contracting are a small tail.
- The not classified category is around 8 per cent — meaningful but not large enough to undermine the overall picture.

Together these overlaps are small enough that the two-pool framing holds up empirically. Electrical contracting businesses, predominantly SMEs, account for the large majority of electrician apprenticeship training. Large businesses, GTOs and government account for most of the remainder.

Characteristics of apprenticeships and apprentices

PSO workforce planning focuses on six critical energy occupations. Five are trade occupations and one is a professional occupation, Electrical Engineer. This report focuses primarily on the energy trades because workforce entry into these occupations depends heavily on the apprenticeship system. In contrast, Electrical Engineers are supplied primarily through higher education pathways and therefore fall outside the main scope of this apprenticeship-focused analysis.

These energy trades form the core skilled workforce underpinning many of Australia's future energy ambitions. Due to licensing requirements, apprenticeships represent the primary source of new workforce supply for most energy trades, supplemented only by a relatively small level of skilled migration.

Electricians are both the largest energy trade and the occupation requiring the greatest workforce growth. Analysis shows that 78 per cent of all energy apprentices are undertaking a single qualification: the UEE Certificate III in Electrotechnology Electrician.

This reveals a highly concentrated workforce supply chain (**Table H**). Australia's future energy workforce depends heavily on electricians, and almost all new electricians are supplied through a single apprenticeship qualification pathway. Overall, electrician apprentices account for 81 per cent of all energy apprentices in training, while Air Conditioning and Refrigeration Mechanics account for the next largest share at 12 per cent.

The significance of this concentration is that future workforce growth depends heavily on the performance of a relatively small number of apprenticeship pathways. Changes in electrician apprenticeship commencements, progression and completion therefore have a disproportionate impact on future workforce supply across the energy sector.

Table H: Energy apprenticeships by energy trade, Australia, 2025.⁸

Energy trade occupation pathway	In-training	% in training
Electricians	43,863	81%
Airconditioning and Refrigeration Mechanics	6,413	12%
<i>Electrical Distribution Trades Workers</i>	2,153	4%
Electronics Trades Workers	1,719	3%
Electrical Engineering Draftspersons and Technicians	30	0.06%
Total	54,179	100%

Energy apprentices are trained through four vocational training packages. Apprenticeship activity is highly concentrated within a single training package, with the Electrotechnology training package (UEE) accounting for 94 per cent of all energy apprentices in training.

This concentration becomes even more pronounced when occupations and qualifications are examined. Each level of analysis points to the same conclusion: workforce supply in the energy trades is highly concentrated. Most future workers are supplied through a single training package, a small number of occupations, and ultimately a very small number of apprenticeship qualifications.

This concentration is significant because future workforce growth depends heavily on the performance of a relatively small part of the apprenticeship system. Changes affecting a single qualification pathway therefore have the potential to influence workforce supply across much of the energy sector (**Tables I–K**)

Table I: Energy apprenticeships by training package, Australia, 2025.⁹

VET Training package	In-training	% in training
UEE - Electrotechnology	50,955	94%
UET - Transmission, Distribution and Rail	2,154	4%
MEM - Metal and Engineering	1,044	2%
CPP - Property Services	26	0.05%
Total	54,179	100%

Table J: Energy apprenticeships by energy trade, Australia, 2025.⁹

Energy trade occupation pathway and VET training package	UEE	UET	MEM	CPP	Total
Electricians	43,542	0	321	0	43,863
Airconditioning and Refrigeration Mechanics	5,690	0	723	0	6,413
Electrical Distribution Trades Workers	0	2,153	0	0	2,153
Electronics Trades Workers	1,693	0	0	0	1,693
Electrical Engineering Draftspersons and Technicians	29	1	0	26	57
Total	50,955	2,154	1,044	26	54,179

Table K: Electrician apprenticeships by qualification, Australia, 2025.⁹

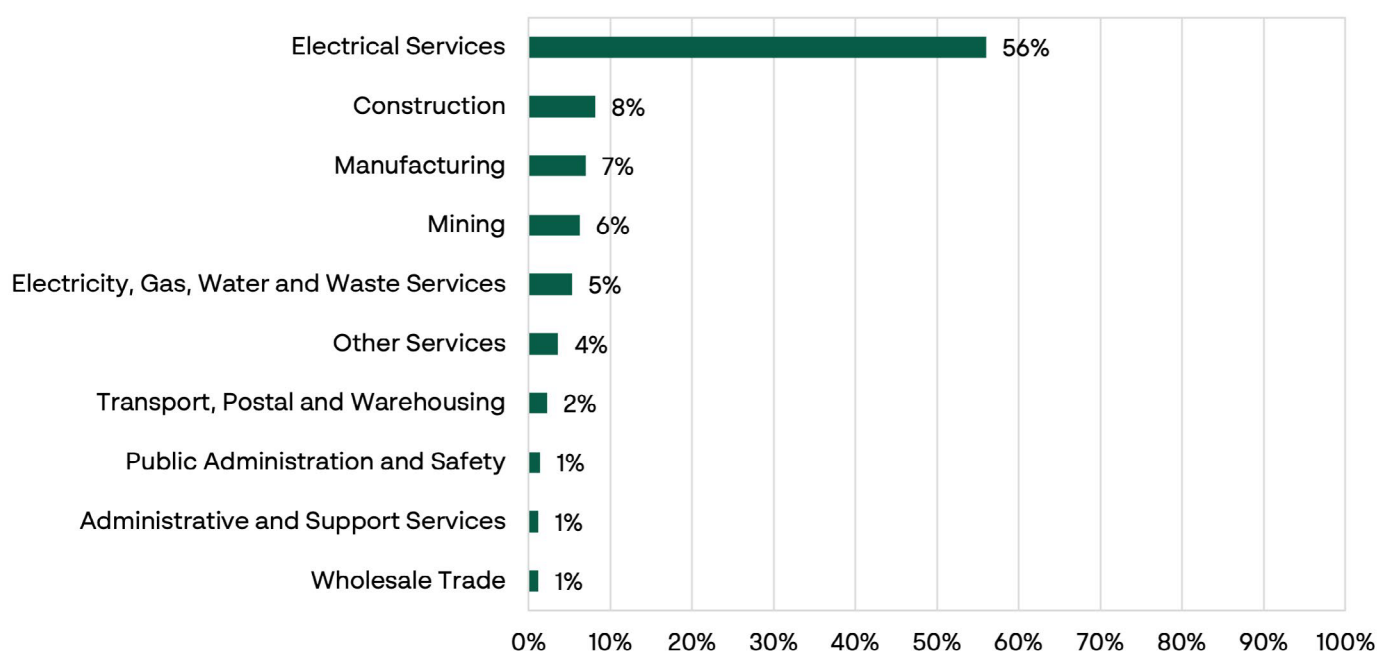
UEE – Electricians	UEE – Qualification	UEE – Qualification (%)
Certificate III in Electrotechnology Electrician	42,523	97.7%
Certificate III in Electrical Fitting	640	1.5%
Certificate III in Fire Protection Control	202	0.5%
Certificate III in Appliance Service	102	0.2%
Diploma of Electrical Engineering	36	0.1%
Certificate III in Electrical Machine Repair	32	0.1%
Certificate IV in Electrical - Instrumentation	7	0.0%
Total - UEE	43,542	100.0%
Total	26	54,179

Eligibility barriers for employers

Energy apprenticeships operate within a structurally defined employer base. Like many apprenticeships, energy apprenticeships require access to appropriately qualified workers who can supervise and train apprentices. However, licensed electrical trades are unusual in that apprenticeship completion is closely linked to occupational licensing and workforce entry. As a result, future workforce growth depends heavily on businesses that already employ licensed electricians.

Licensed electricians are concentrated in specific parts of the economy, particularly the electrical services sector (also known as electrical contractors). More than half (56 per cent) of Australia's approximately 132,000 licensed electricians as measured by the 2021 Census are employed in this sector (**Figure L**) despite it representing a relatively small share of total national employment. Outside the sector, electricians are dispersed across a wide range of industries.

The significance of this concentration is that the businesses with the greatest capacity to employ and train future electricians are also concentrated within a relatively small part of the economy. This means future workforce growth depends heavily on the decisions and operating conditions of businesses that already employ licensed electricians.

Figure L: Electricians by sector of employment.¹⁰

There are 48,279 electrical services businesses in Australia.¹¹ The sector is highly decentralised and predominantly composed of smaller businesses (**Tables M–N**):

- Around 98 per cent employ fewer than 20 staff
- Around 90 per cent are sole traders or micro-businesses
- The majority are privately owned

Table M: Electrical Services, business characteristics, Australia, 2025.¹²

Business size	Number of businesses	Percentage of businesses
Small (0-19 employees)	47,382	98.1%
Medium (20-199 employees)	869	1.8%
Large (200+ employees)	28	0.1%
Total	48,279	100.0%

Table N: Electrical Services, small business characteristics, Australia, 2025.¹³

Small business size	Number of businesses	Percentage of small businesses
Non-employing (sole trader)	21,621	45.6%
Micro-businesses (1-4 employees)	21,152	44.6%
Other (5-19 employees)	4,609	9.7%

Because licensed supervision capacity is concentrated in this sector, electrical services businesses account for around 59 per cent of all energy apprentices in training. At the same time, around three quarters of energy apprentices are employed by small and medium-sized businesses.¹⁴

Appendix F – Economic conditions and apprenticeship commencements

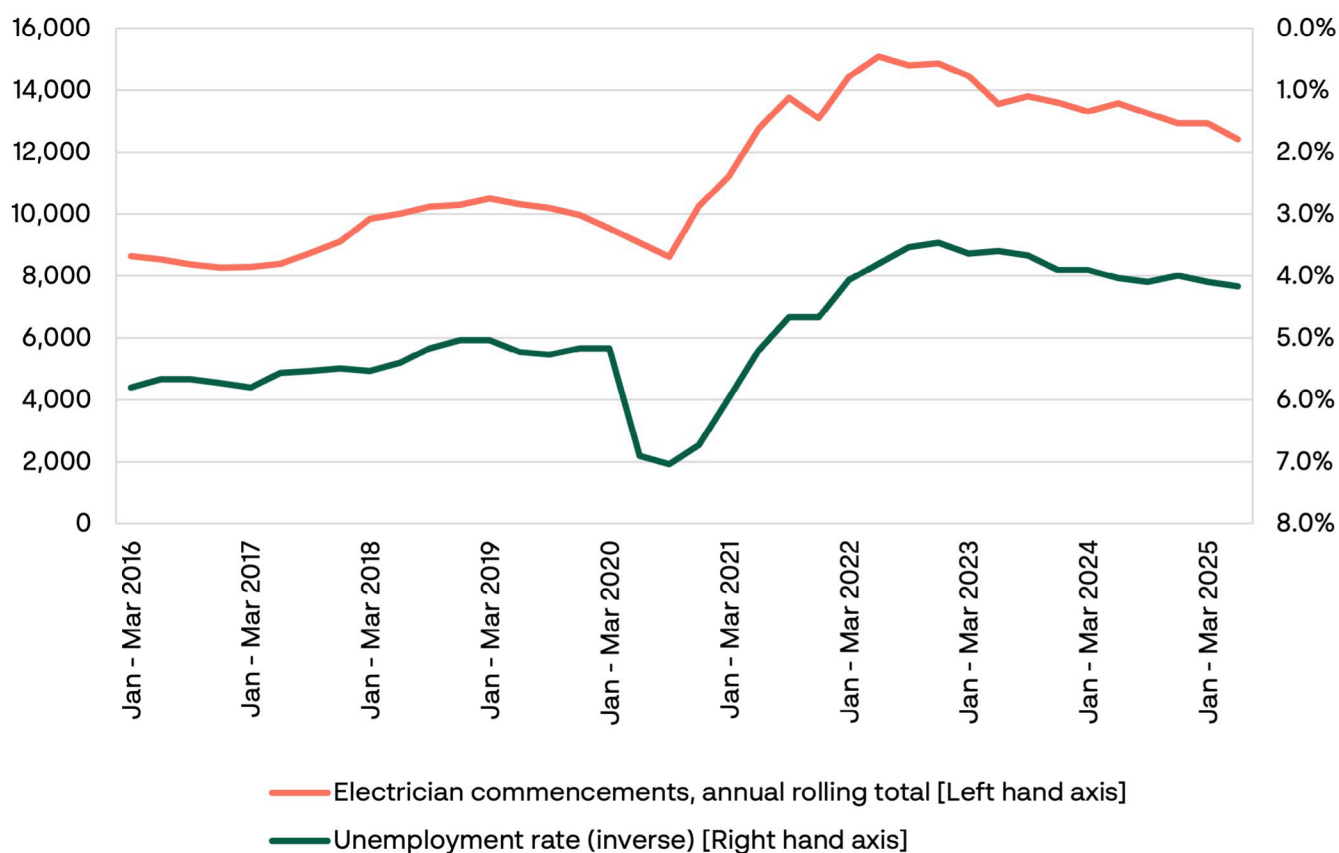
Apprenticeship commencements are sensitive to changes in economic conditions and business confidence, as most apprentices are employed in industries that expand and contract with the broader economy.

This relationship is particularly pronounced for trade apprenticeships, including electrician apprenticeships. Periods of strong economic activity and low unemployment are typically associated with higher apprentice hiring. Conversely, weaker economic conditions and rising unemployment are associated with lower commencements.

Historical analysis indicates a clear relationship between the unemployment rate and electrician apprenticeship commencements (**Figure O**). A one percentage point increase in unemployment is associated with a reduction in trade apprenticeship commencements of around 15 per cent. Larger economic downturns have been associated with declines of up to 30 per cent.^{15, 16}

This relationship is primarily driven by changes in employer demand. When economic conditions are strong, businesses are more willing to invest in training apprentices. When conditions weaken, hiring activity, including apprentice recruitment, tends to slow.

Apprenticeship commencements are also influenced by other factors, including policy settings and financial incentives, which can at times have a larger impact than underlying economic conditions.

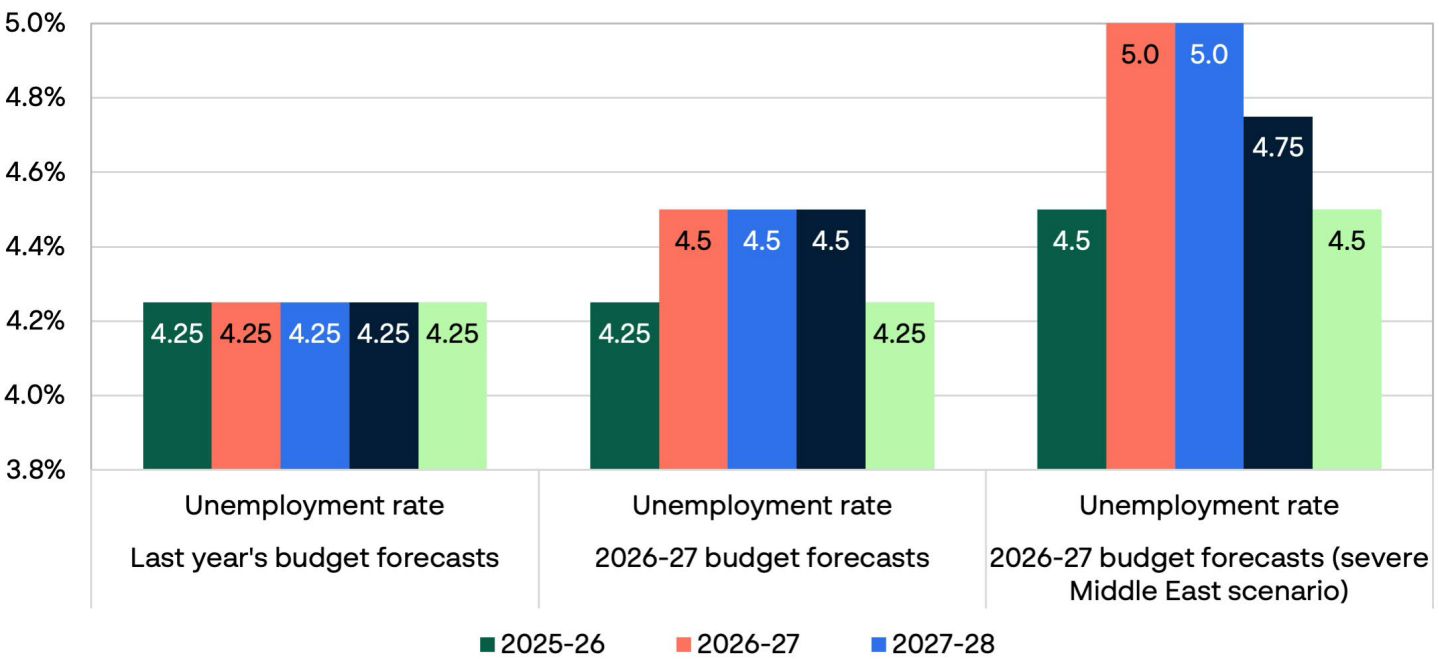
Figure O: Electrician apprentice commencements and the unemployment rate (inverse).¹⁷

External shocks and labour market risk: Potential impacts of Middle East conflict

PSO is monitoring labour market indicators and broader economic conditions as they evolve. While it is too early to fully assess the impact of the Middle East conflict, major external shocks can affect business confidence, investment, and employment, with flow-on effects for apprenticeship hiring.

The unemployment rate increased to 4.5 per cent in April 2026, its highest level since late 2021. Treasury 2026–27 Budget scenario analysis also considers a downside case involving weaker global conditions and higher unemployment (**Figure P**). Based on historical relationships, an increase in unemployment from 4.5 to 5.0 per cent is associated with a decline of around 7.5 per cent in trade apprenticeship commencements. These estimates are illustrative only and should be interpreted with caution, as actual outcomes depend on the nature, duration, and transmission of economic shocks.

Figure P: Unemployment rate forecasts, PSO analysis of Australia Treasury 2026-27 Budget.¹⁸



- ¹ Australian Government (2025), Budget 2026–27: Budget Paper No. 3
https://budget.gov.au/content/bp3/download/bp3_06_part_2_skills.pdf
- ² Powering Skills Organisation – PSO (2026). Productivity and Skills – Exploring their unique relationship in the energy sector.
https://poweringskills.com.au/wp-content/uploads/2026/05/PSO_ProductivityAndSkills_report.pdf
- ³ Migration constraints: The energy trades have some of the lowest rates of skilled migration, and the licensing and safety requirements for occupations such as electricians mean migration is necessarily a carefully managed process. The Australian Government is investing \$85.2 million to accelerate skills assessments for migrant trades workers and occupational licensing. These reforms could reduce workforce entry times by up to six months and enable up to 4,000 additional skilled trades workers to enter the workforce each year. While these reforms are expected to strengthen migration pathways, much of the future workforce requirement is still expected to be met through the onshore apprenticeship system, highlighting the importance of strengthening other drivers of workforce growth.
Powering Skills Organisation – PSO (2025). High Load, Short Supply – Bridging the gap to 2030. Workforce plan for the energy sector
https://poweringskills.com.au/wp-content/uploads/2025/08/PSO_2025_WorkforcePlan_v24_WEB.pdf
- Australian Government (2025), Budget 2026–27: Budget Paper No. 1
https://budget.gov.au/content/bp1/download/bp1_2026-27.pdf
- ⁴ Powering Skills Organisation – PSO (2026). Workforce and training data dashboard
<https://poweringskills.com.au/data-dashboard/>
- ⁵ PSO analysis of customised data produced by Deloitte Access Economics for Jobs and Skills Australia (2023) The Clean Energy Generation: Workforce needs for a Net Zero economy. High scenario.
Powering Skills Organisation – PSO (2025). High Load, Short Supply – Bridging the gap to 2030. Workforce plan for the energy sector
https://poweringskills.com.au/wp-content/uploads/2025/08/PSO_2025_WorkforcePlan_v24_WEB.pdf
- ⁶ NCVER (2026). Apprentices and Trainees – June 2025. <https://vocstats.ncver.edu.au/webapi/jsf/login.xhtml>
- ⁷ NCVER (2026). Apprentices and Trainees – June 2025. <https://vocstats.ncver.edu.au/webapi/jsf/login.xhtml>
- ⁸ NCVER (2026). Apprentices and Trainees – June 2025. <https://vocstats.ncver.edu.au/webapi/jsf/login.xhtml>
- ⁹ NCVER (2026). Apprentices and Trainees – June 2025. <https://vocstats.ncver.edu.au/webapi/jsf/login.xhtml>
- ¹⁰ Note: 'Electrical Services' 4-digit (class) ANZSIC level, remainder are 1-digit (division) ANSIC level. 'Electrical Services' technically sits within the 'Construction' division but has been split out. Electrical
- ¹¹ Australian Bureau of Statistics – ABS (2021). Census of Population and Housing. Table Builder. <https://tablebuilder.abs.gov.au/webapi/jsf/tableView/tableView.xhtml>
- ¹² Australian Bureau of Statistics – ABS (2026). Counts of Australian Businesses, including Entries and Exits. <https://www.abs.gov.au/statistics/economy/business-indicators/counts-australian-businesses-including-entries-and-exits/latest-release>
- ¹³ Australian Bureau of Statistics – ABS (2026). Counts of Australian Businesses, including Entries and Exits. <https://www.abs.gov.au/statistics/economy/business-indicators/counts-australian-businesses-including-entries-and-exits/latest-release>
- ¹⁴ NCVER (2026). Apprentices and Trainees – June 2025.
<https://vocstats.ncver.edu.au/webapi/jsf/login.xhtml>
- ¹⁵ Hurley, P. (2020). The impact of coronavirus on apprentices and trainees. Mitchell Institute for Education and Health Policy, Victoria University. https://content.vu.edu.au/sites/default/files/media/impact-of-coronavirus-on-apprentices-and-trainees.pdf?_gl=1*488c8m*_gcl_au*MTg2NjQ4MjM0OS4xNzgyMjA5MzI2*_ga*NDI4MDcxNDg5LjE3ODIyMDkzMjY.*_ga_Q1LS42WZC4*cZ3E3ODIyMDkzMjYkbzEkZzEkdE3ODIyMDkzNDYkajQwJGwwJGgw
- ¹⁶ Department of Employment and Workplace Relations – DEWR (2024). Skills for tomorrow: Shaping the future of Australian apprenticeship, Strategic Review of the Australian Apprenticeship Incentive System 2024 Final Report
<https://www.dewr.gov.au/download/16795/strategic-review-australian-apprenticeship-incentive-system-final-report/39422/strategic-review-australian-apprenticeship-incentive-system-final-report/pdf>
- ¹⁷ Electrician commencements. NCVER (2025). Apprentices and Trainees dataset.
<https://vocstats.ncver.edu.au/webapi/jsf/login.xhtml>
Unemployment rate. ABS (2026). Labour Force, Australia
<https://www.abs.gov.au/statistics/labour/employment-and-unemployment/labour-force-australia/latest-release>
Correlation = -0.86 “strong inverse relationship” between these factors.
Australian Government (2025), Budget 2026–27: Budget Paper No. 3 (page 70)
https://budget.gov.au/content/bp1/download/bp1_2026-27.pdf