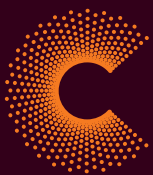


Rooftop solar and storage report

July—December 2024



**CLEAN
ENERGY
COUNCIL**



About this report

This is the third edition of the Clean Energy Council's (CEC) half-yearly report monitoring the progress of the deployment of rooftop solar and behind-the-meter energy storage systems in Australia. The rooftop solar and battery installation data featured in this report is sourced from our data partner for these Rooftop Solar and Storage reports, SunWiz, with supplementary data from Green Energy Markets – the Clean Energy Council's data partner for our annual Clean Energy Australia report – referenced in some instances. The report's section on installer, product and approved seller accreditation draws on CEC data.

Acknowledgement of Country

We respect and acknowledge the diversity of communities, identities, and clan groups for all First Nations peoples throughout Australia and recognise the continuing connection to lands, waters and communities. We pay our respect to Aboriginal and Torres Strait Islander cultures; and to Elders past and present.

As a collective of diverse businesses operating on a national scale, we understand that the success of our endeavours is intrinsically linked to the wellbeing and prosperity of the communities we operate within. We acknowledge that Aboriginal and Torres Strait Islander communities are rich and diverse, reflecting a tapestry of cultures and backgrounds. This diversity underscores the importance of embracing a range of holistic solutions to address the unique challenges and opportunities that lie ahead.

We recognise the impact of human activity on the cultural landscape of Australia. We understand that these practices have not always been in harmony with the profound attachment and cultural custodianship that First Nations peoples have with the land.

We are committed to forging strong relationships with First Nations communities and stakeholders, recognising their unique perspectives and aspirations. We strive to engage in genuine, meaningful partnerships that honour their rights, culture, and self-determination.

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Highlights



Australia passed four million cumulative rooftop PV installations in November 2024.



Simultaneously, Australia passed **25 GW** worth of total rooftop PV capacity. By comparison, black and brown coal combined for a total of 21.3 GW of installed capacity in the financial year 2023-24.¹



Rooftop PV contributed **12.4%**, or **30,178 GWh**, of Australia's total energy generation for 2024.²



In the second half of 2024 there were **159,011** rooftop PV installations, worth 1.6 GW of capacity.



Over 2024 there were **300,375** rooftop solar units installed, worth 3 GW of capacity.



There were over **45,000** battery units sold in the second half of 2024.



There are currently **4,829** approved rooftop solar, inverter and storage products across Australia.

¹ AEMO Integrated System Plan, 2024

² Green Energy Markets – CEA Report data

Installations and capacity trends

Solar PV installations

In the second half of 2024 there were 159,011 rooftop PV units installed across Australia. Rooftop PV continues to be a key and growing contributor to the nation's energy mix, with a generation share of 12.4% for all of 2024 (up from 11.2% in 2023 and 6.5% in 2020). The total installed capacity of rooftop PV for 2024 was **3 GW** from **300,375** units. This complements the 1.1 GW worth of commissioned large-scale generation projects over the same period. In November 2024, rooftop PV celebrated a significant milestone, surpassing four million installations and a cumulative total capacity of 25.5 GW. Australia continues to be a leading nation in per capita electricity generation from solar. In 2023 it ranked first ahead of United Arab Emirates and the Netherlands with 1,774 kWh of electricity generation from solar power per person³.

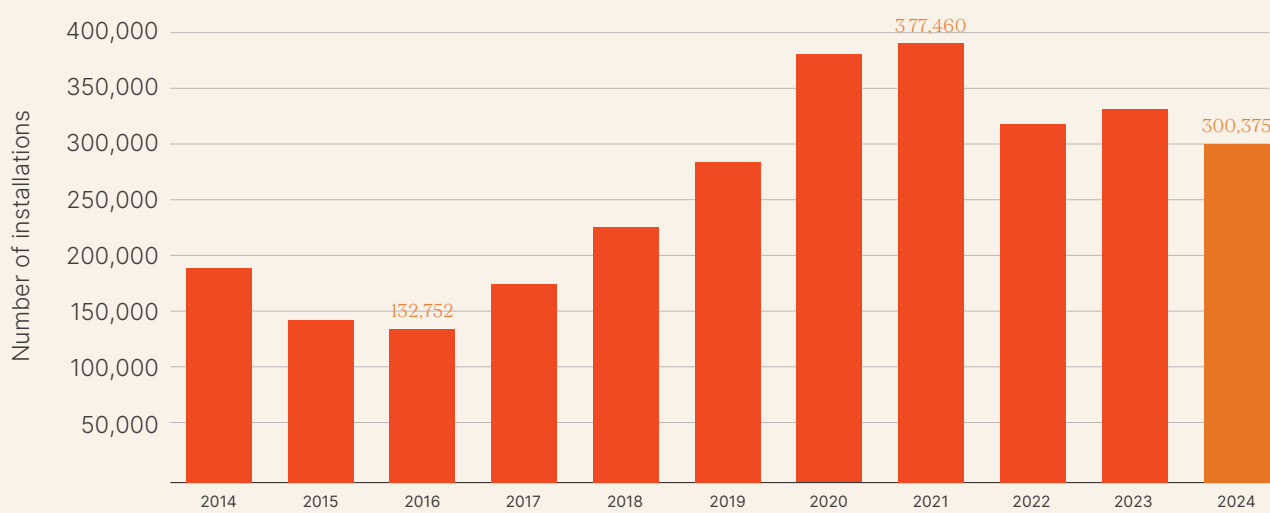


Figure 1: National number of systems installed, by year

³ Our World in Data – Per capita electricity generation from solar

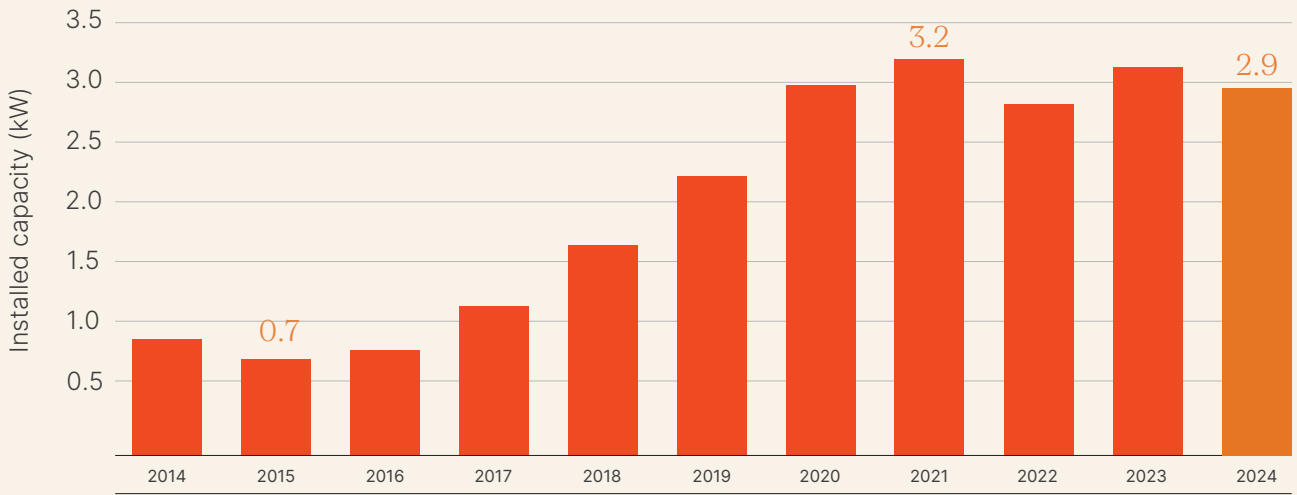


Figure 2: National installed rooftop PV capacity (kW), by year

For the fifth year in a row, installation figures surpassed 300,000 units. Overall, at 300,375 installations, 2024 was 10 per cent lower than 2023 with 333,926 installations. Total installed capacity for 2024 reached almost exactly 3 GW, which is seven per cent lower than 2023 at 3.2 GW.

2024 saw the rolling six-month average for system size surpass 10 kW for the first time, now standing at 10.3 kW. This surge is in line with seasonal trends where average size spikes in the lead up to summer.

The average size of systems installed continues to reach new records. December saw a surge in the average unit size, reaching a record of 11.08 kW. The second half of

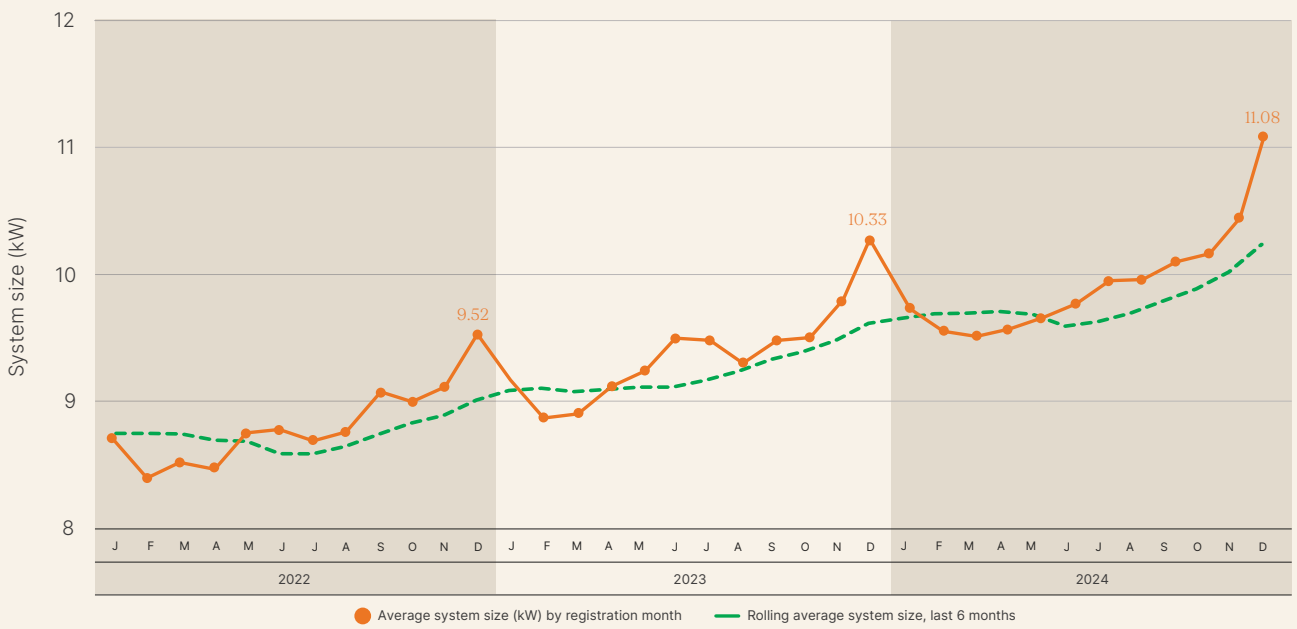


Figure 3: Average system size by registration month

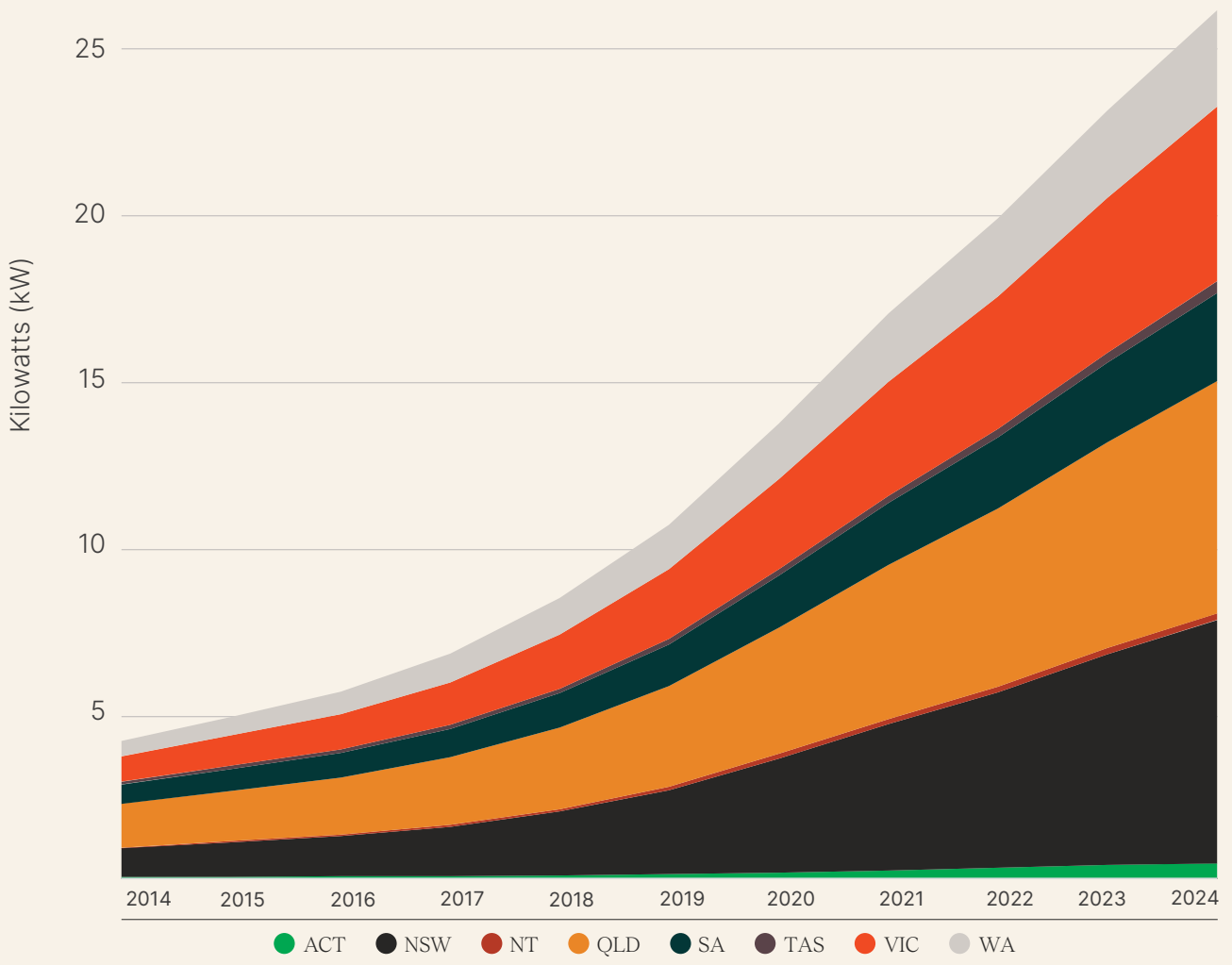


Figure 4: Cumulative annual capacity of rooftop PV, by jurisdiction

Around the states, for the second consecutive year New South Wales led the way with the highest installed capacity of any state in 2024, at 952 MW. Queensland and Victoria came in second and third place respectively with annual installed capacities of 800 MW and 582 MW.

Overall, New South Wales continues to boast the highest level of total installed capacity of rooftop PV at 7.1 GW – over a quarter of Australian capacity. Queensland remains the state with the most installations, with 1.1 million. Queensland and New South Wales hold over half of all rooftop PV installations across Australia.

Battery installations

Battery attachments to rooftop PV systems continues to trend upwards, with 185,798 units now installed across Australia. The second half of 2024 saw 45,233 units sold – 55 per cent more than the same time 12 months ago. The rolling 12-month quarterly average of battery sales has not seen a quarter-on-quarter downturn since 2020 and now stands at 18,646.

In the second half of 2024, 28.4 per cent of rooftop solar installations had an accompanying small-scale battery installed, indicating the ongoing potential for further uptake.

The Clean Energy Council (CEC) released its [Home Battery Saver Program](#) in 2024 with the objective of advocating for a rebate for customers to take up home battery systems. If this program is implemented, it is expected that an additional 410,000 batteries will be installed in homes and small businesses by 2050, equating to 2,054 MW of installed capacity from storage across the National Electricity Market (NEM).

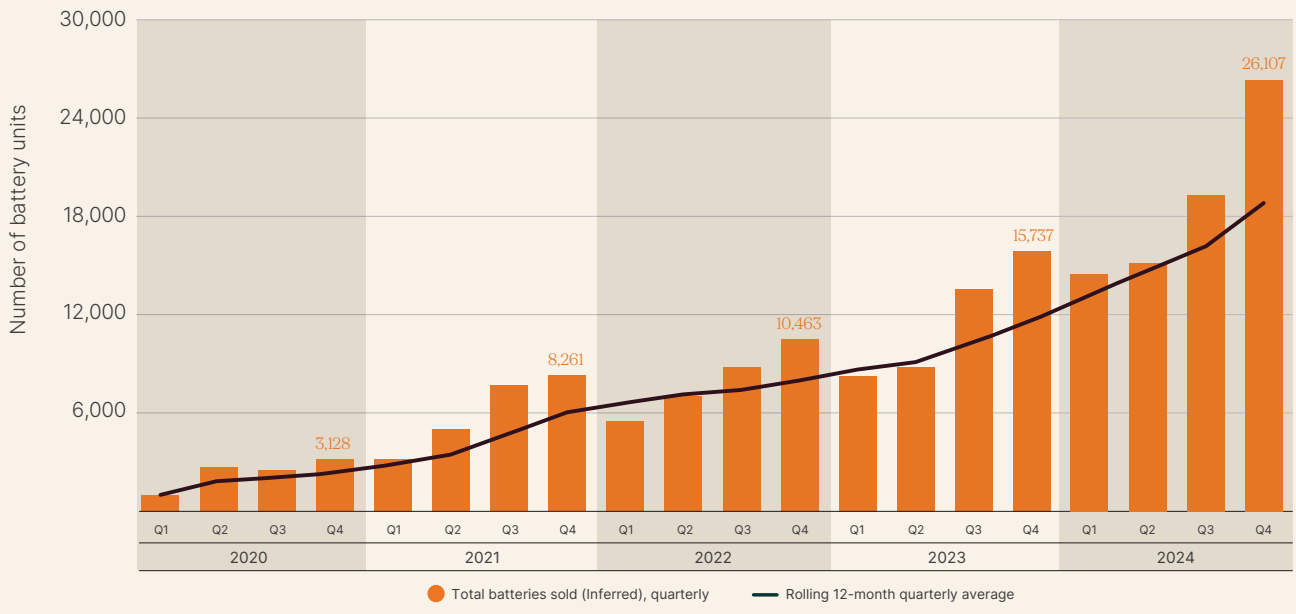


Figure 5: Total battery sales, quarterly

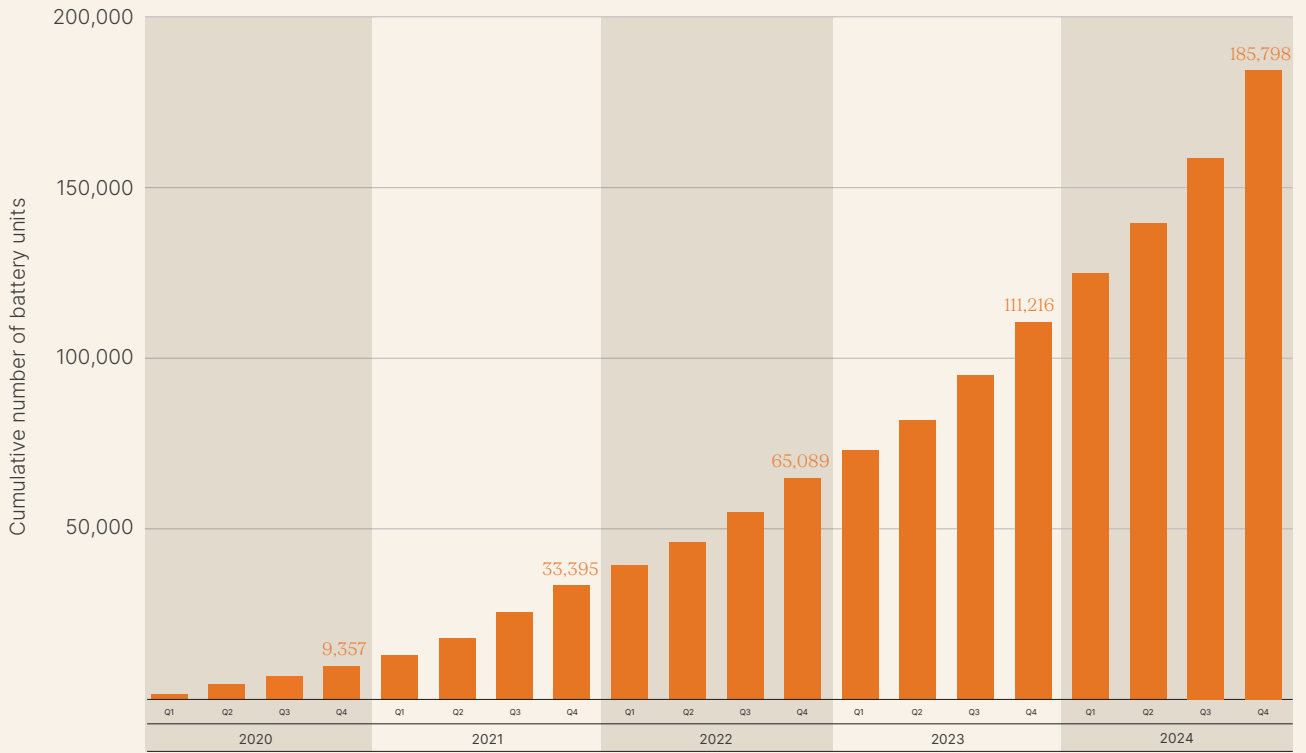


Figure 6: Cumulative battery sales, quarterly

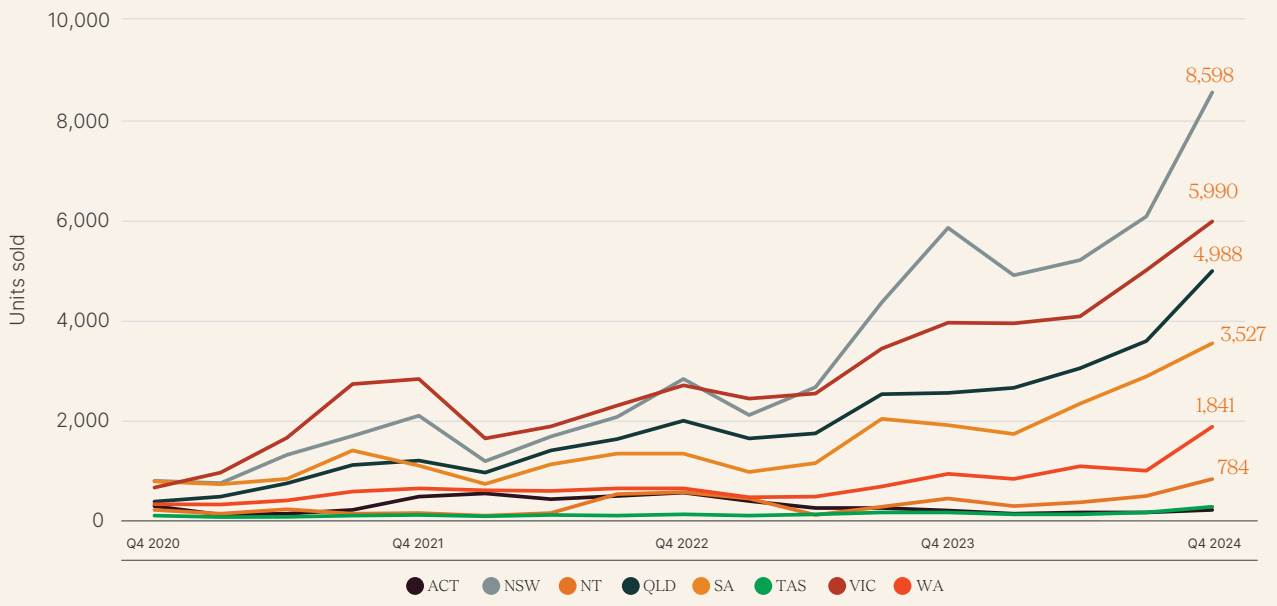


Figure 7: Total battery sales by state, quarterly

The total inferred batteries sold by state demonstrated an overall upward trend in battery sales across the states throughout 2024. New South Wales had the most battery sales in the second half of 2024 with 14,686 after a strong finish to the year. Victoria and Queensland are the next best performing states with 10,996 and 8,555 battery sales respectively.

The NSW Government announced a battery incentive program in May 2024, with a November 2024 start date. Despite concerns this would stall the NSW battery sales market, there has been a steady increase in sales since the announcement of the program. We anticipate that installation of batteries in NSW will continue to increase in 2025 as the scheme takes full effect. There has been an increase in battery accreditations in NSW in the second half of 2024. This is likely to drive up competition and consumer choice of batteries in NSW.

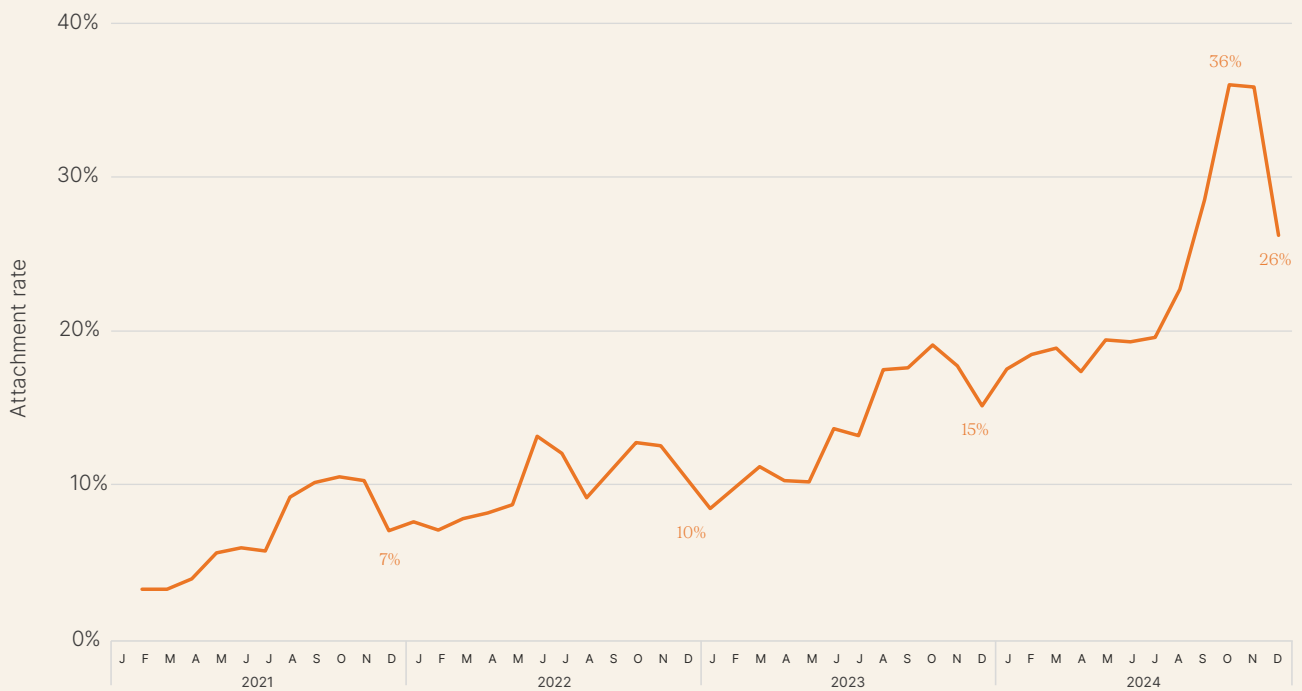


Figure 8: Home battery attachment rate to households with rooftop PV, monthly

The attachment rate of home batteries connected to households with rooftop PV continues to gain momentum and reach new heights year-on-year. The month ending December 2024 reached a 26 per cent attachment rate, after an all-time high of 36 per cent in October. This end-of-year result is an increase of 11 per cent when compared to the same time 12 months ago.

Export services

According to the [Australian Energy Regulator](#)⁴, 27% of customers export their self-generation back into the grid. This represents around 10% of energy delivered by the distribution networks in 2023/24. Most of the exports were from rooftop solar at 99%, while energy exported from solar and battery systems was around 4%.

Figure 9 shows Queensland and South Australia have the highest proportion of customers exporting their self-generation back into the grid. The ACT has seen the highest percentage growth of customers using export services since 2020, rising by eight per cent. The national proportion of customers using export services stands at 27 per cent.

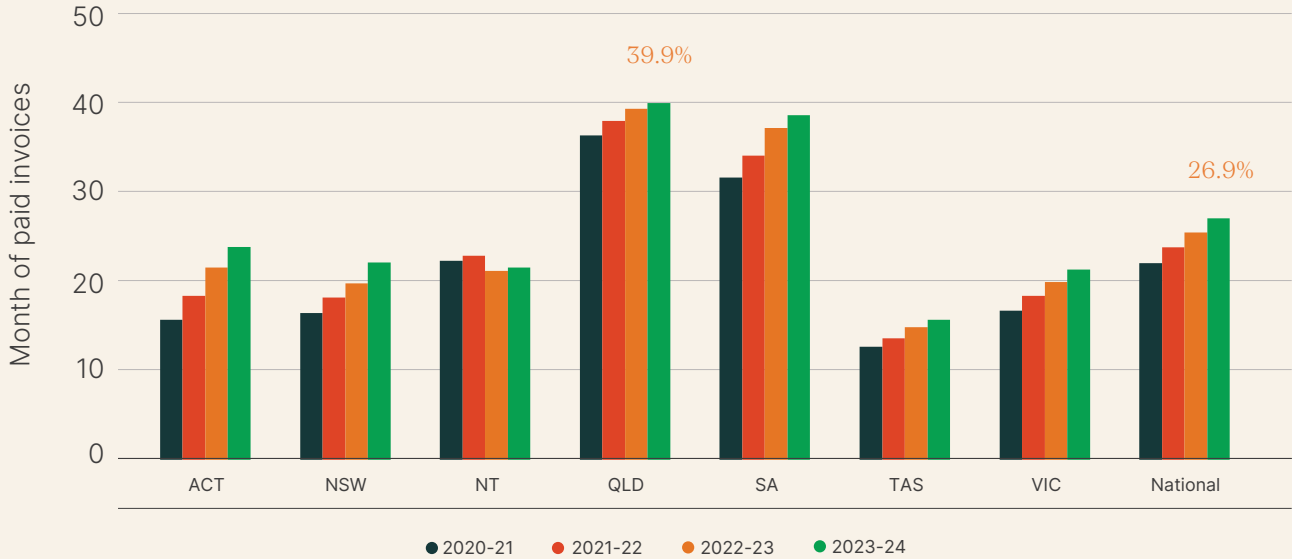


Figure 9: Annual proportion of customers using export services by state

Figure 10 shows the export volume as a proportion of total energy delivered by state. South Australia leads all states at 21 per cent, and has seen the most rapid increase since 2020-21, with a percentage increase of 13 per cent. It is followed by the ACT and Victoria, both at 11

per cent. The national export volume as a proportion of total energy delivered currently sits at 10 per cent, having doubled since 2020-21.

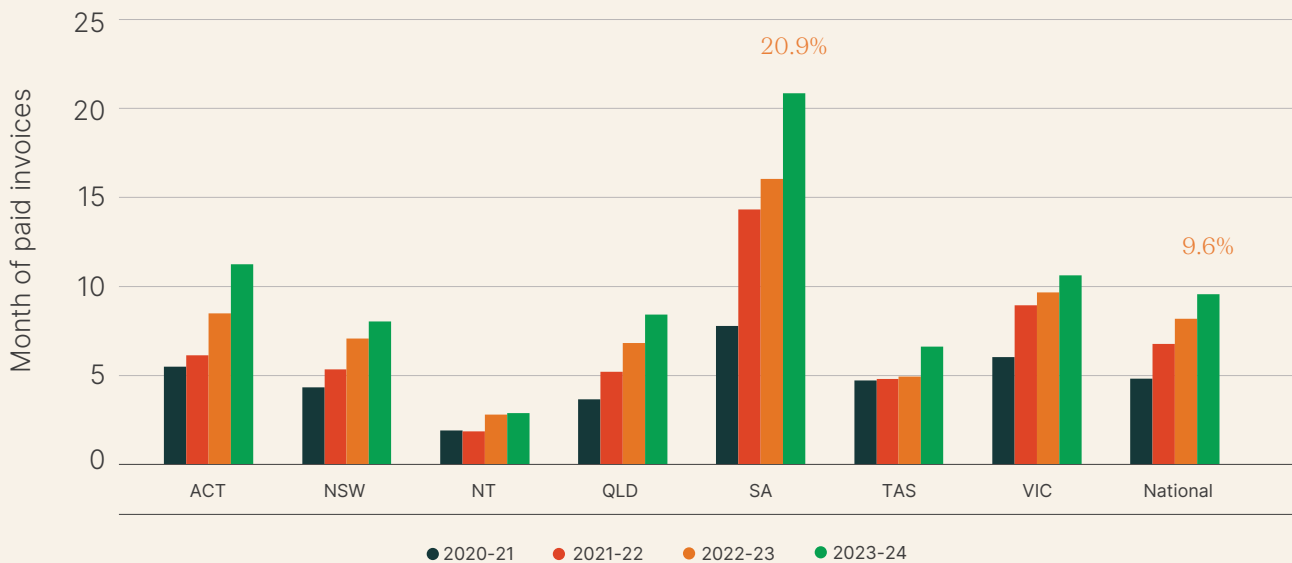


Figure 10: Export volume as a proportion of total energy by state

⁴ Australian Energy Regulator – Insights into Australia's growing two-way energy system

Industry programs

Small-scale renewables are a critical and growing segment of Australia's clean energy future, with millions of households and businesses driving its growth. The CEC plays a key role in supporting this growth through its industry programs, which are integral to the regulatory and compliance framework of accreditation for products and retailers in Australia.

Following the Clean Energy Regulator's call for application and evaluation for the Product Listing Body for small-scale renewables, such as solar PV and inverters, under the Small-scale Renewable Energy Scheme (SRES) in late 2023, the CEC has been reappointed by the Clean Energy Regulator to continue its role as the Product Listing Body for SRES as of October 2024.

The CEC is the Administrator of the New Energy Tech Code of Conduct (NETCC), which is a code of conduct for retailers of new energy technologies. The following section of this report outlines the product accreditation and NETCC activity for H2, 2024.

Product accreditation

The CEC maintains a list of approved products that are eligible for installation, based on their compliance with Australian and international standards. The CEC's product accreditation program is delivered in collaboration with government, electrical safety regulators, certifiers, network providers and product manufacturers to ensure only approved products enter the Australian market.

The CEC's approved product list includes:

- Inverters and power conversion equipment
- Solar PV modules
- Energy storage devices.

Only approved solar PV modules and inverters have access to financial incentives, as only products accredited and listed by the CEC are eligible to receive small-scale technology certificates (STCs) under the Small-scale Renewable Energy Scheme (SRES). Additionally, state government programs – Victoria's Solar Homes, the NSW Peak Demand Reduction Scheme and South Australia's Solar Flexible Exports - have included or adapted the CEC's approved products list as a requirement for participation in their schemes. Furthermore, the CEC's approved products list is a requirement for participation in the Household Energy Upgrades Fund offered by the Clean Energy Finance Corporation.

The CEC also runs a testing and compliance program to maintain the integrity of the approved product listings. This encompasses proactive internal audits of the database of approved products and their relevant certifications in accordance with the CEC Listing Terms and Conditions, and targeted product testing. In most cases, products are sourced through blind buying and then forwarded to an independent testing laboratory in Australia for analysis.

In the second half of 2024 there were 248 applications received, while 202 applications were approved. A monthly breakdown for the six months from July to December for both applications and approvals by product type are shown below:

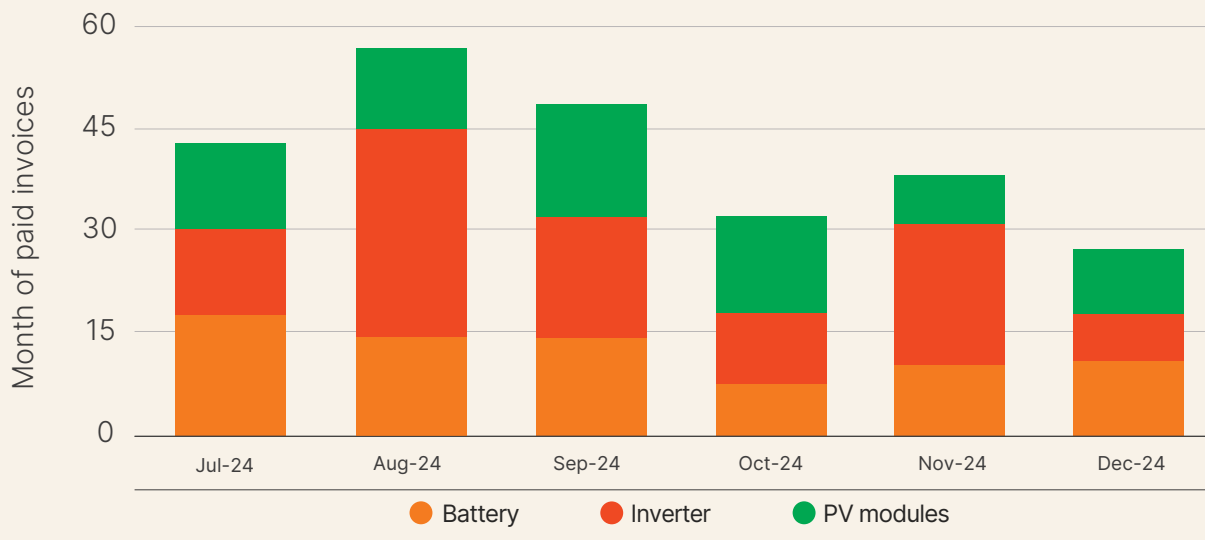


Figure 11: Total applications received July to December 2024, monthly

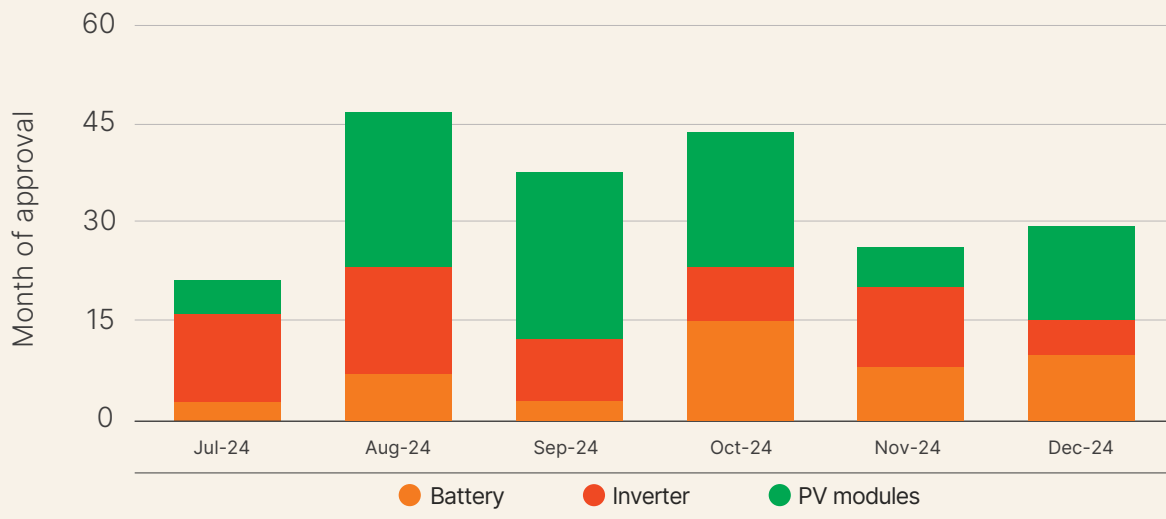


Figure 12: Total applications approved from July to December 2024, monthly

The Clean Energy Council recorded a high volume of applications throughout 2024, with the second half of the year.

The Clean Energy Council's Products team expanded during the first half of 2024, resulting in 25 additional applications (+14%) approved in July to December 2024. The increase in personnel is to align with the unprecedented volume of applications and support the continued growth of the industry. As part of the re-nomination process with the Clean Energy Regulator,

the CEC will continue to explore and implement improvements to meet the demand of the product accreditation program. The pipeline of improvements include streamlining processes and providing applicants with transparent tracking of their applications, a stronger focus on customer service and response times and clearer communication on program updates, as well as uplifting program governance through performance reporting to industry and the Clean Energy Regulator.

There are currently 4,829 approved rooftop solar, inverter and storage products across Australia, which represents a 33 per cent decrease compared to the previous bi-annual report, largely due to changes in standards causing many listings to expire over a short period. A breakdown of the number of each product type is seen below.

Product type	Number of products	Number of manufacturers
Battery model	637	95
Inverter model	1,707	112
PV modules model	2,485	71

Table 1: Approved product breakdown

Source: Clean Energy Council

The Product Listing Review Panel was established in 2016 to provide an independent panel with industry and consumer representation. It is responsible for hearing appeals from companies whose products have been delisted or refused listing by the CEC. To ensure the product listing scheme is operating effectively the Panel meets regularly.

There were no new standards directly related to the listing program released in July to December for public comment. There are, however, the following updates from previous changes and their flow-on effects:

- IEC 61730 series was updated in 2023, with the vast majority of PV applications now being based on the new version of the standard, the CEC plans to announce in the coming months a time by which we will stop accepting applications based on the prior version.
- IEC 61215:2016 for PV modules was superseded, with CEC requesting certification to the new version of the standard by 1 October 2024 for listed products. The CEC provided extensions to listings for some products certified to the prior version of the standard and demonstrated due diligence in meeting the updated requirements following extensive consultation with industry and the CER, however the extensions are due to expire at the end of March. These were final case-by-case based extensions, and there is no plan for additional extensions for these products on the CEC list.
- AS 60947.3 relating to Switch-Disconnectors has been updated. The CEC is assessing impact, but at this stage it seems likely that the change will not impact current listings.
- The CEC continues to work with Standards Australia on the development of interoperability standards.
- AS/NZS 4777.2:2020 Amd 2:2024 was published

by Standards Australian in August 2024 to cover product requirements for inverters with key updates including supply type terminology, removal of IEC 62109 requirements for battery only products, generation limit control parameters and region C set points.

- CEC is working with Standards Australia and relevant committees to have Australian Adoptions of key referenced international standards (IEC), ensuring that updates to IEC standards do not immediately impose compliance due to lack of transition periods. Many of these Australian Adoptions are now published, once this stage of adoptions is complete, a proposal will be submitted to update the relevant Australian Standards to cross reference these.

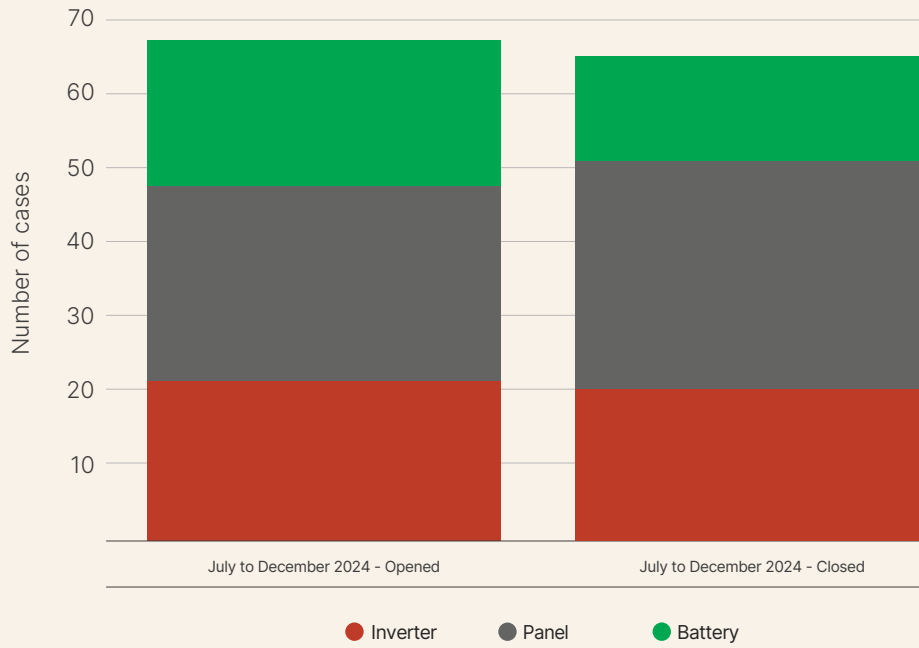


Figure 13: Share of product cases opened/closed by type, July to December 2024 monthly

The graph above shows 63 cases were opened on product compliance in the second half of 2024, while 64 were closed. This ratio nearly achieved parity and reflects a strong ability to close cases at an almost identical rate to which they are received. Solar panels had the highest number of cases both received and closed, with 26 and 31, respectively.

New Energy Tech Consumer Code (NETCC)

The New Energy Tech Consumer Code (NETCC) reflects the sector's commitment to high standards of consumer protection to maintain confidence in the industry throughout the energy transition. The Code establishes a set of minimum standards throughout the whole customer journey, from marketing to after-sales.

Code signatories agree to abide by best-practice standards, including:

- Honesty in marketing and promotion
- Reasonable sales tactics and protection of vulnerable customers
- Transparency in quoting and fit-for-purpose offerings
- Clear and fair contract terms, including finance offerings
- Compliant installation
- Clarity in technology operation
- Minimum warranty standards
- Transparent and fair dispute resolution processes

The primary goal is to create an experience in which the consumer is informed and able to feel confident in their purchasing decision.

The NETCC conducts thorough screening of applicants to ensure that their history, conduct and processes meet the high standards of the Code, and 75% of applicants require some degree of support to meet the obligations.

As the Administrator of the NETCC, the CEC has drawn on its history in compliance and accreditation to provide an education and support ideology to the Code. This is achieved through providing technology-specific support materials for both consumers and industry.

Buying and operation guides provide consumers with the information they need to support their shopping and post-installation journey, arming them with information, and enabling them to ask questions that they need to be empowered in their choice.

The Code was designed as technology-neutral to support broad and emerging technologies, and so the Technical Guides support industry with the information they need to apply the Code's requirements to their specific technologies.

Beyond the application process, the NETCC supports consumers and industry through its robust Compliance program. NETCC Approved Sellers are regulated through both proactive and reactive compliance processes with the overall objective of identifying gaps in consumer protection.

The program's proactive compliance process examines Approved Sellers by testing their knowledge on key obligations and by auditing recent sales activity to ensure they are meeting the best practice standards the NETCC is designed to deliver.

State / Territory	Number of NETCC Signatories as of 31 Dec 2024
VIC	1,033
NSW	237
QLD	189
SA	95
TAS	53
ACT	50
WA	41
Total NETCC Signatories	1,698

Table 2: Approved sellers by state and territory

Note – A significant portion of these approved sellers operate in multiple states. These figures capture where the company's headquarters are based.

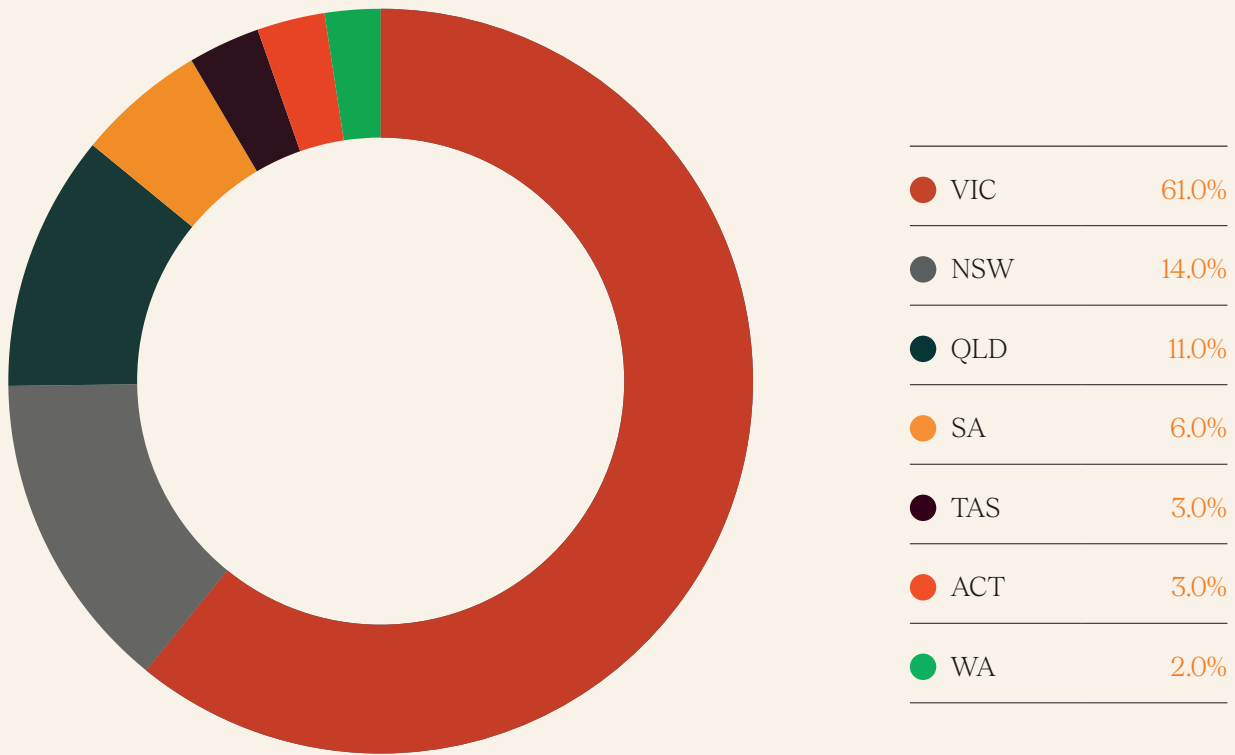


Figure 14: Share of approved sellers by state

The majority of approved NETCC sellers (61%) are from Victoria. Next is New South Wales with 14 per cent, then Queensland with 11 per cent.

The NETCC program has been listed as a requirement in several government programs, including Solar Victoria Solar Homes Program, and sustainability rebates programs by Shellharbour Council, Randwick City Council and the City of Canterbury Bankstown in New South Wales. Within these schemes, the inclusion of Approved Retailers through the Code has promoted trust for customers participating in the scheme and has ensured high quality products are being installed in households.

Launched in 2024, the Household Energy Upgrades Fund (HEUF) is a specialist \$1 billion fund, administered by the Clean Energy Finance Corporation, to provide discounted consumer finance products to assist households upgrade their homes. To be eligible for a HEUF discounted green loan, the retailer must be NETCC accredited, promoting high standards of consumer protection and highlighting the NETCC as a trusted program for governments.

A NETCC case is any complaint or dispute lodged by a consumer against a New Energy Tech Approved Seller. The NETCC sets out clear requirements that Approved Sellers must comply with in the sale and supply of New Energy Tech products and services. The majority of NETCC cases are received from new energy tech consumers. However, the CEC (the NETCC Administrator) can investigate alleged non-compliance from various sources.

The first half of 2024 saw 120 NETCC cases received, while 132 were closed. This is a 63% increase compared to the number of cases closed in the previous 6-month period, which saw 122 cases received and 81 cases closed by the Administrator, highlighting a strong performance in closing cases at a higher rate.

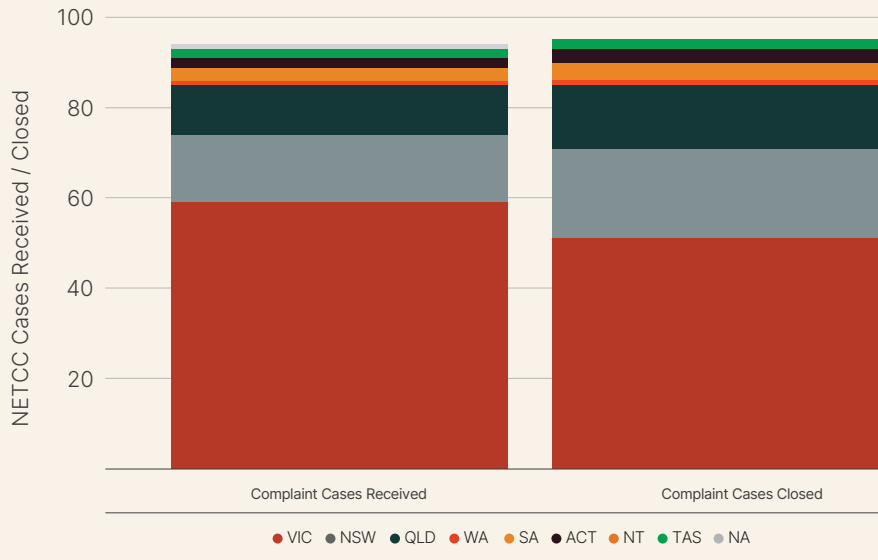


Figure 15: Bi-annual NETCC cases received and closed by state/territory, H2 2024

Of the cases received in the second half of 2024, the majority were from Victoria with 59. Next were New South Wales and Queensland, with 15 and 11, respectively.

This is consistent with the ratio of Signatories from these three states as 61% of Signatories are based in Victoria, 14% in New South Wales and 11% in Queensland.

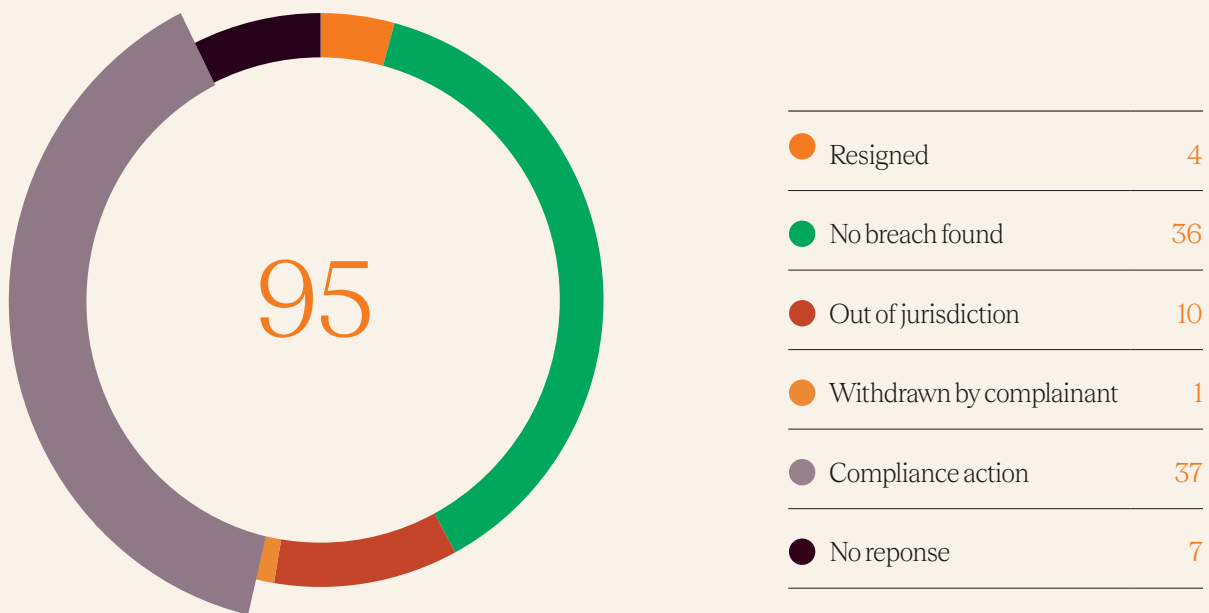


Figure 16: NETCC closed complaint case outcomes, July to December 2024

Of the 95 cases closed in the second half of 2024, 37 (39%) resulted in enforcement action against the Signatory. For further information on enforcement actions undertaken by the Administrator and trends of non-compliance observed, please visit the [NETCC Compliance activity page](#).

For closed cases that result in no breach found or out of jurisdiction, the NETCC Administrator may refer the complainant to an external body that can assist them with their complaint or dispute. The next section goes further to explain how referral notices can assist complainants.

Closed cases that result in 'no response' or 'withdrawn by complainant' are generally closed as the Administrator has not obtained sufficient evidence or consent to progress with an investigation.

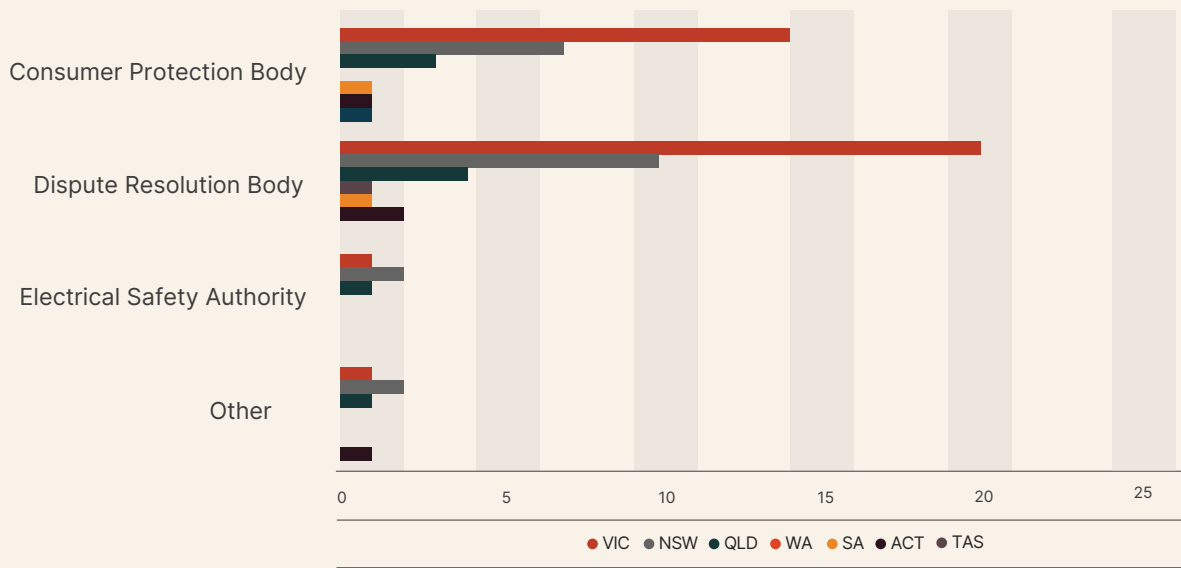


Figure 17: Referral notice types by state/territory, July to December 2024

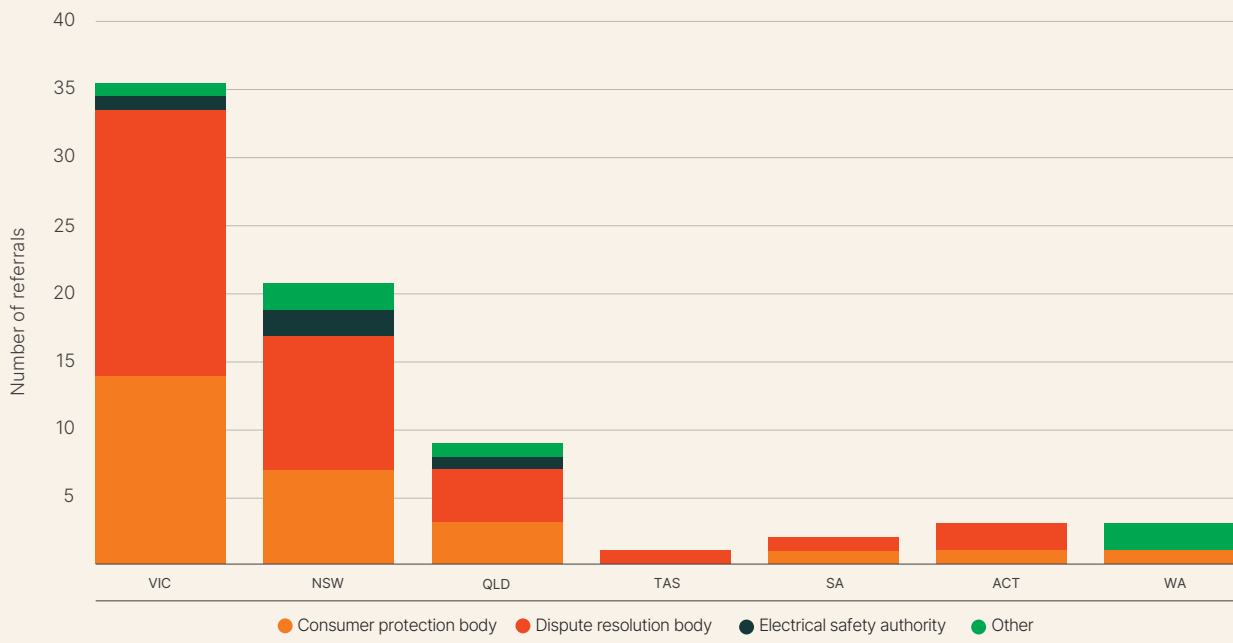


Figure 18: Referral state/territory by notice type, July to December 2024

Where an incident or complaint is outside the NETCC's jurisdiction, the complainant is provided with a referral notice based on the nature of the complaint. This ensures the matter is addressed by the appropriate external body such as a dispute resolution body, regulator, or consumer protection authority. The NETCC Administrator (the CEC) is not a dispute resolution body and does not have the jurisdiction under the Code to arbitrate commercial, civil, or financial disputes. This may result in investigations where the Administrator only investigates some aspects of a complaint and provides referral advice for others.

During the second half of 2024, the NETCC Administrator provided referral advice to 36 Victorian-based

complainants. This was the most for any region and reflects most complaints coming from Victorian-based consumers. Of these 36 referral notices, 20 went to Victoria's dispute resolution body, the Victorian Civil and Administrative Tribunal and 14 went to Victoria's consumer protection authority, Consumer Affairs Victoria. Victoria had close to half of all referral notices across the country.

Referral notices to other external bodies were also provided to complainants five times. These other bodies include the Australian Communications and Media Authority and Solar Accreditation Australia.

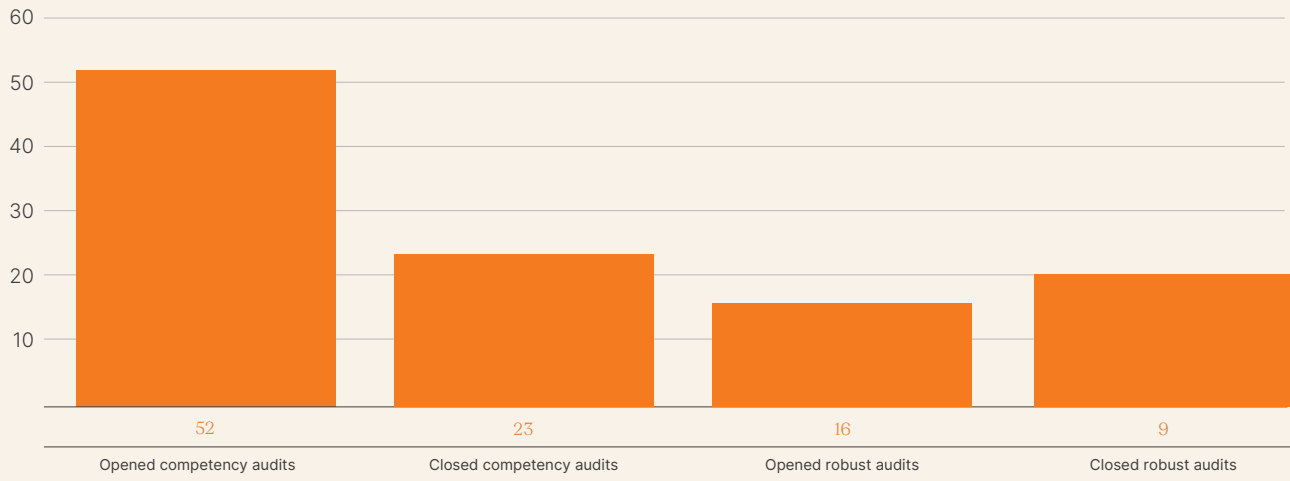


Figure 19: Audit cases opened and closed, July to December 2024

The Administrator launched the NETCC compliance auditing program in July to December, of 2024. The audits aim to proactively identify compliance gaps and assists NETCC Approved Sellers by applying a support to comply approach which provides education to improve how businesses sell new energy tech products and services. There are two types of audits the Administrator conducts.

Competency Audits consist of a multiple-choice questionnaire to be completed by randomly selected Approved Sellers. The questionnaire is designed to test the Seller's knowledge of the NETCC and is time restrained and requires a minimum score of 80% to pass. Failure to pass or cooperate and complete the questionnaire results in a competency audit case being opened against the Approved Seller.

Robust audits require selected Approved Sellers to submit recently used new energy technology sales documentation. The Administrator assesses the documentation and the Seller's online presence against key requirements of the NETCC under a robust audit case. Approved Sellers can be selected at the Administrator's discretion, including those with a history of non-compliance.

July to December of 2024 saw the Administrator open 52 competency audits cases and 16 robust audit cases. The Administrator closed 23 competency audit cases and 9 robust audit cases following an investigation.

Further information relating to NETCC compliance audits can be found on the [NETCC Compliance activity page](#).

Consumer information products

The Administrator has introduced new products to assist consumers with the purchase and maintenance of their new energy tech.

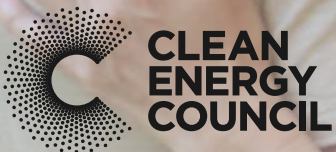
The NETCC website contains various [consumer information products](#) to assist consumers with the installation and use of their new energy tech.

These products inform consumers how to research their options before purchasing and can help consumers get the most value from their energy system. These free consumer information products were developed in collaboration with Energy Consumers Australia to explain key information to help consumers make informed purchased decision. The guides cover:

- Solar
- Battery storage
- Home energy monitoring
- Going off grid
- Electrical vehicles.

Glossary

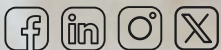
Battery	Any home battery installation which is a complement to an already existing solar PV unit.
Consumer energy resources (CER)	Defined as solar PV, battery storage and inverters on the CEC product accreditation list and installed behind the meter by consumers.
NETCC	New Energy Tech Consumer Code is a voluntary code of conduct designed by peak industry and consumer bodies to build upon existing mandatory consumer protection regulations defined by the Australian Competition and Consumer Commission (ACCC) (New Energy Tech Consumer Code Clean Energy Council)
Product accreditation	Defined as the Clean Energy Council's list of approved modules, inverters and batteries that meet Australian Standards for use in the design and installation of solar and battery storage systems in Australia (Products Clean Energy Council).
Referral Notice	Referral advice that is provided to complainants to escalate their matter to external regulatory service bodies in the case that the incident is outside NETCC jurisdiction.
Rooftop (solar) PV	Defined as systems up to the size of 100kW.



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