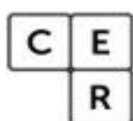
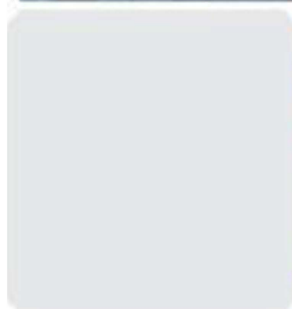
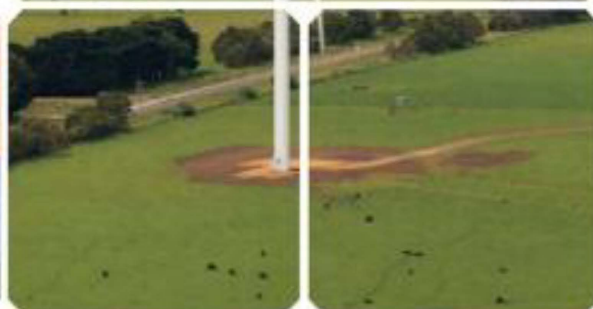
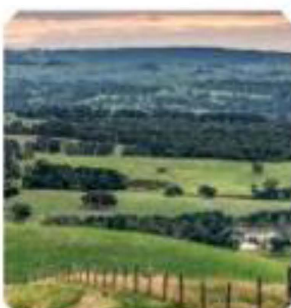




Australian Government
Clean Energy Regulator

Renewable Energy Target

Administrative Report

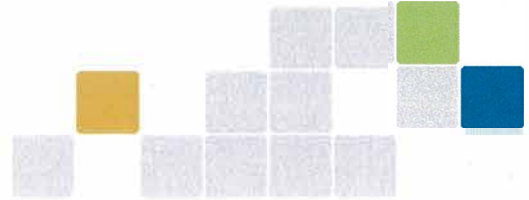


Renewable
Energy
Target

2024



Australian Government
Clean Energy Regulator



The Hon Chris Bowen MP
Minister for Climate Change and Energy
Parliament House
CANBERRA ACT 2600

Dear Minister

I am pleased to submit the 2024 Renewable Energy Target (RET) Administrative Report. This report covers the 2024 calendar year and is submitted for presentation to Parliament under section 105 of the *Renewable Energy (Electricity) Act 2000* (the Act). The report incorporates key information and data relating to the RET from the December Quarter 2024 Quarterly Carbon Market Report (QCMR) which includes key information and metrics covering the operation of the Act for the full calendar year.

The objects of the Act – which include encouraging additional generation of electricity from renewable sources and reducing emissions of greenhouse gases in the electricity sector – continue to be achieved successfully.

I am delighted to report that 2024 was a record year for renewables, with an estimated 7.5 GW of capacity added to the grid. The CER approved 548 large-scale renewable power stations totalling 4.3 GW of capacity to create certificates under the RET in 2024. This was a significant uplift from the 2.2 GW approved in 2023 and marks a new record for the capacity approved in a single calendar year. Installed capacity for small-scale rooftop solar looks to be a near record, with more than 3.1 GW of rooftop capacity installed. Given the 12-month period for creating STCs, the CER 'lag-adjusts' actual estimates based on recent historical creation to estimate the final outcomes. These adjustments indicate 2024 capacity will reach a record 3.2 GW.

The estimated emissions reduction from the RET in 2024 was 50.4 million tonnes of CO₂-e, 7% higher than in 2023. This uses a conservative approach of multiplying the amount of zero emissions generation by the rapidly declining average emissions intensity of all generation in Australian electricity grids.

Looking forward, 2025 is anticipated to also be a strong year for renewables. Capacity being added to the grid remains strong, which will translate into a greater proportion of renewable energy in the grid. 1.7 GW of total capacity was approved to 31 May 2025 and with 1.2 GW of applications on hand the Clean Energy Regulator expects to exceed the lower end of our projected 2.7 to 3.1 GW range for the year. Overall, the Regulator expects renewable energy penetration in the National Electricity Market to reach 44% to 46% in 2025.



This year the RET will be complemented by 2 new initiatives administered by the Clean Energy Regulator, the Cheaper Home Batteries Program and the Renewable Electricity Guarantee of Origin Scheme. Together with flagship policies such as the Capacity Investment Scheme, the Regulator's schemes play important roles in achieving the Australian Government's goal of 82% renewable energy by 2030 and its legislated greenhouse gas emissions reduction target, and to meet its ambition for reaching net-zero by 2050.

Yours sincerely

A handwritten signature in black ink, appearing to read 'David Parker', written over a horizontal line.

David Parker
Chair and CEO

Clean Energy Regulator

30 June 2025



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Report objective

In accordance with section 105 of the *Renewable Energy (Electricity) Act 2000* (the Act), the Clean Energy Regulator (CER) must give the Minister a report on the working of the Act during the year for presentation to Parliament.

To meet this legislative requirement, the 2024 Renewable Energy Target (RET) Administrative Report covers the operations of the Renewable Energy Target and the performance of the large-scale and small-scale renewable energy schemes for the 2024 calendar year.

Report disclaimer

All figures are sourced from the CER unless otherwise referenced. The chapters of the report are the relevant chapters from the December Quarter Quarterly Carbon Markets Report, published on 28 February 2025. Statements in this report reflect policy settings current at the time of QCMR publication, other than in specific instances where the Australian Government has announced or is consulting on proposed policy changes. The executive summary of this report is current as at 30 June 2025. The latest Quarterly Carbon Markets Report and data are available on the CER website.

This RET Administrative Report represents the views of the CER at the date of publication. The CER is providing this information to the Parliament and the market to increase market transparency, help identify genuine low-cost carbon abatement opportunities and assist entities that produce or need to source units and certificates under the schemes the CER administers. The CER has used its best endeavours to ensure the quality of the information in this document but cannot guarantee its accuracy or completeness. The RET Administrative Report is not legal, business or financial advice. You should obtain independent professional advice on your circumstances before making any investment decisions. The information is provided as general information only. Neither the CER, nor the Commonwealth of Australia will accept liability for any direct, incidental or consequential loss or damage resulting from the RET Administrative Report, or the information provided through the RET Administrative Report, or the availability or non-availability of the RET Administrative Report.

Version history

Version	Date	Changes
1.0	30 June 2025	

Glossary

The CER [glossary](#) includes definitions/explanations of many terms and acronyms used throughout this report.



Executive Summary

Renewable Energy Target accelerating Australia's carbon abatement

In 2024, the Renewable Energy Target reduced emissions by 50.4 million tonnes of CO₂-e, 7% higher than the previous year. This estimate uses the conservative weighted average emissions intensity of the National Electricity Market (NEM) and South West Interconnected System (SWIS). A less conservative estimate, using the thermal displacement estimation method, suggests emissions reduction could be as high as 100.6 million tonnes.

Explore further detail in the [emissions reduction chapter](#).

A record year for new renewables

A new record was set in 2024 for renewable capacity added to the grid with a combined 7.5 gigawatts (GW) across the Large-scale Renewable Energy Target (LRET) and the Small-scale Renewable Energy Scheme (SRES). The CER approved 548 large-scale renewable power stations totalling 4.3 GW for large-scale generation certificates (LGCs) under the LRET, up from 2.2 GW in 2023. Headlining the new capacity were the two largest large-scale renewable power stations – MacIntyre Wind Farm (923 megawatts (MW)), and the Golden Plains Wind Farm East (756 MW). The remaining large-scale capacity (1.7 GW) under assessment at the end of 2024 provides confidence for a strong first half of 2025 for LRET approvals.

New installed small-scale rooftop capacity looks to be a near record, with more than 3.1 GW of rooftop capacity installed. Given the 12-month period for creating STCs, the CER lag-adjusts actual estimates based on recent historical creation to estimate the final outcomes. Lag adjustments indicate 2024 capacity will reach a record 3.2 GW.

Data voluntarily reported to the CER indicate 10% of rooftop solar systems installed in 2024 were connected to a battery, up from 8% in 2023. Increasing volumes of storage help households with energy bills and will be important to ensure more generation from rooftop solar can be used rather than being curtailed. The Australian Government's Cheaper Home Batteries Program, combined with incentives available in many states and territories, is expected to significantly increase battery uptake in 2025.

Read more in the [Large-scale generation certificates](#) (LGCs) and [Small-scale technology certificates](#) (STCs) chapters.

Capacity Investment Scheme driving future generation and storage projects

The Capacity Investment Scheme (CIS) is spearheading support for renewable investment. It is anticipated that revenue underwriting agreements supported through finalised CIS contracts will increase the likelihood of projects reaching final investment decisions (FID) in a reduced timeframe.

19 projects totalling 6.4 GW of generation capacity were successful in the CIS Tender 1, exceeding the target by 0.4 GW. Based on this outcome, capacity reaching FID in 2025 could be in excess of 6 GW. Of the 19 projects 8 were hybrid generation and storage projects, adding 3.6 GWh of storage capacity.

Read more in the [state of total renewables](#) chapter.



Penetration of renewable energy in the National Electricity Market stable; expected to rise in 2025

The Australian Government has a target of 82% renewable electricity nationally by 2030. An uplift of more than 3% was anticipated in 2024 as a reflection of annual capacity being added to the grid. However, renewables' share of generation in the National Electricity Market (NEM) remained at the 2023 level of 39%. This result is largely attributed to a shortage of water for hydro generation and a wind drought experienced through late autumn to early winter. On the demand side, there was also a 3% increase in the overall electricity demand in the NEM.

The Australian Energy Market Operator (AEMO) indicates that economic offloading and network curtailment of renewables also contributed to this result. Australian Government policies increasing both large-scale storage and transmission, coupled with AEMO's work to reducing technical and engineering barriers to high renewables penetration, will facilitate greater use of existing assets.

The CER anticipates that renewable penetration in the NEM could reach 44% to 46% in 2025.

Read more in the [state of total renewables](#) chapter.

Voluntary demand for renewable certificates growing strongly

Voluntary demand for LGCs continues to grow, with non-RET surrenders totalling 10.4 million in 2024, a 20% increase from 8.7 million in 2023. Even stronger voluntary demand is expected this year, driven by commitments from many large Australian businesses to be powered by 100% renewables by 2025.

Voluntary participants' holdings of LGCs reached a record 8.2 million in Q4 2024, suggesting a build-up of LGCs for 2025 renewable energy targets.

Read more in the [LGCs](#) chapter.

Another strong year for air source heat pumps

The CER validated the installation of over 100,000 air source heat pump (ASHP) systems and 2.7 million associated STCs in 2024, marking the second consecutive year of surpassing 100,000 installations. ASHPs displaced approximately 1,580 GWh of grid sourced electricity in 2024.

Read more in the [STCs](#) chapter.



1. State of total renewables

Investment in renewables is supported by the Renewable Energy Target (RET) through large-scale generation certificates (LGCs) and small-scale technology certificates (STCs). LGCs and STCs provide incentives to bring forward investment in additional renewable energy and the consequential reduction in greenhouse gas emissions.

2024 saw Australia's rollout of renewable energy generation capacity reach new heights, with a record 7.5 gigawatts (GW) of renewable energy capacity being added over the year. This consisted of 4.3 GW of approved large-scale power stations (also a record year) and around 3.2 GW of small-scale rooftop solar installations (the latter equals the pandemic induced record in 2021). For the second year in a row, households and businesses also installed more than 100,000 air source heat pumps (energy efficient hot water systems).

In 2024, the total estimated generation incentivised by the Small-scale Renewable Energy Scheme (SRES) and Large-scale Renewable Energy Target (LRET) was 32,400 gigawatt hours (GWh) and 50,100 GWh respectively, for a total 82,500 GWh. This represented around 32% of all electricity generation in Australia, nearly 4% higher than 2023. The total amount of renewable generation includes hydro and other baseline renewables not eligible for LGCs. Across both the National Electricity Market (NEM) and Western Australia's South West Interconnected System (SWIS) ((NEM+SWIS)), renewable generation was 92,700 GWh in 2024.

While total generation incentivised by the SRES and LRET increased from 2023 to 2024, the total renewables share in the NEM+SWIS remained unchanged at 39% because of a shortage of water for hydro generation and a wind drought experienced through late autumn to early winter. Renewable penetration in the NEM was particularly strong in Q4 2024 at 46% and continues to make a strong showing in early 2025.

In 2025, an estimated 2.9 GW to 3.2 GW of rooftop solar is expected to be added to the grid.

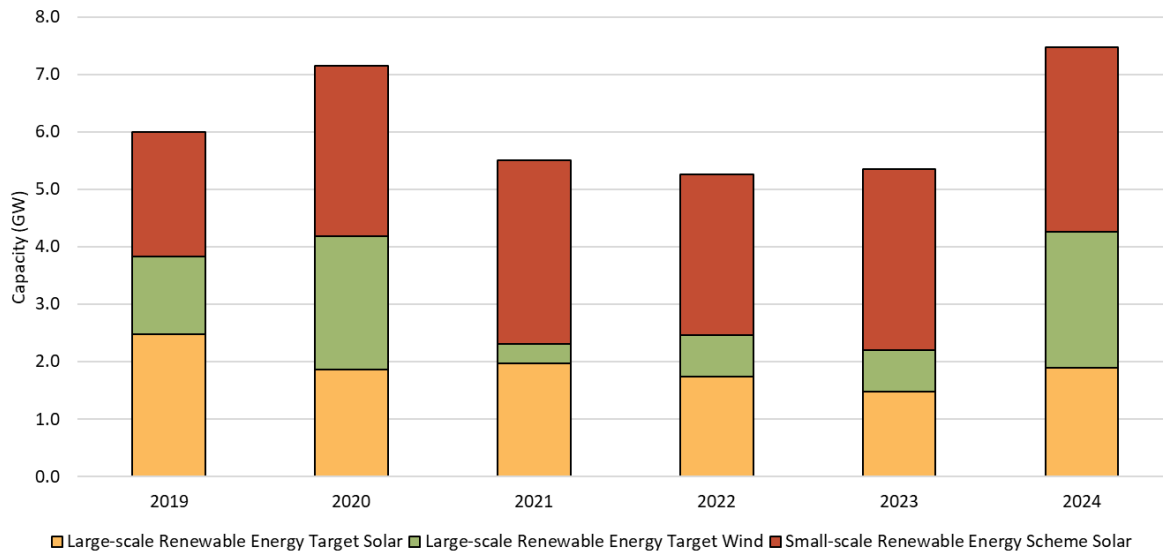
- Trends from later in 2024 and January 2025 suggest that the actual capacity may currently be heading for the top end of this range. The lower bound on rooftop solar is based on modelling from consultants prepared in mid-2024 to inform the small-scale technology percentage (STP) for 2025. The drivers of rooftop capacity are discussed further in chapter 3.

At this stage, a conservative view of additional large-scale renewable energy capacity in 2025 is around 2.7 to 3.1 GW. We will progressively update this estimate during the year as we track progress of construction and expected first generation dates.

- LRET applications totalling 1.7 GW of capacity are currently under assessment by the CER which forms a strong starting point for 2025.
- The timing of final investment decision (FID) and first generation for large renewables projects are inherently lumpy. Since 2019, between 3 and 3.5 GW of capacity has reached FID each year on average, while an average of less than 3 GW has been approved for LGC creation. This sustained gap was part of the reason for the record 4.3 GW approved in the 2024 year and could mean a higher capacity accredited this year or next. However, estimating the timing of large projects reaching first generation is subject to a range of uncertainties. For example, construction timelines can be affected by weather, workforce shortages and supply chain issues.



Figure 1.1: Installed and approved renewable capacity by fuel source, 2019 to 2024



SRES makes strong contribution to the renewable energy transition

Rooftop capacity installed in 2024 has exceeded 2023 capacity, despite a marginal drop of around 14,000 overall installations to 320,000. The rise in installed capacity is due to the increase in the average installed system size. The average capacity of solar PV systems installed in 2024 was 10.0 kW, an increase of 0.6 kW compared to 2023.

Batteries are also being installed with solar systems more frequently. Figures reported to the CER show that around 10% of rooftop solar systems installed in 2024 were connected to a battery. This is up from 8% in 2023. Battery installations are not covered under the SRES, so this data is reported on a voluntary basis. It is very likely that the proportion of systems being installed with a battery is higher. Increasing volumes of storage will be important to ensure more generation from rooftop solar can be used rather than being curtailed or leading to the curtailment of other renewables by network operators to maintain power system security.

Since 1 January 2020, 15.3 GW of rooftop solar capacity has been installed. This is nearly 60% of the total small-scale capacity installed since the SRES commenced in 2001. At the time of writing, 2024 was possibly a new annual record. However, due to the lag in certificate creation this will not be clear until around April when the bulk of December 2024 certificates are expected to have been created.

Industry analysts have reported a global oversupply of solar panels in 2024, attributing this to the introduction of new panel technology. This is a contributing factor to [the fall in system prices over the course of 2024](#), from around \$0.96 per watt in late 2023 to around \$0.90 per watt in February 2025. The CER estimates that the average payback period for a new small-scale solar system has decreased from 4 years in late 2023 to approximately 3.5 years as of the end of 2024. This estimate uses the same method and assumptions as in the [Q3 2023 QCMR](#) with updated data.

Record year for large-scale renewables with strong future pipeline

In 2024, the CER approved 548 large-scale renewable power stations totalling 4.3 GW of capacity to create LGCs under the RET. This was a significant uplift from the 2.2 GW approved in 2023 and marks a new record for new capacity approved in a single calendar year. Headlining the new capacity added in 2024 were the



two largest large-scale renewable power stations in Australia – MacIntyre Wind Farm (923 megawatts ((MW)), and the Golden Plains Wind Farm East (756 MW). For the first time since 2020, Victoria led the nation in new large-scale capacity, with 32% of the capacity approved in 2024. Queensland and New South Wales contributed 24% and 23%, respectively.

In addition to the record-setting year for approved large-scale capacity, 2024 was a strong year for investment in renewables. Utility-scale wind and solar projects totalling 4.3 GW of capacity reached the FID phase of development within the year.

As discussed above, it is difficult to accurately predict exactly when capacity that has reached FID will be available to the grid given substantial uncertainties associated with construction and connection timelines. At this stage, a conservative view of additional large-scale renewable capacity in 2025 is around 2.7 to 3.1 GW. Utility scale renewables take a minimum of 12 months from commencing construction to reach first generation of electricity, with some projects taking considerably longer. These extended lead times understandably correlate with increasing project sizes. The CER will update this estimate throughout the year.

The [announcement](#) from the [Capacity Investment Scheme](#) (CIS) as to which projects were successful in receiving funding support under the scheme also supports a strong outlook for renewables. The potential impact of this announcement is discussed later in the chapter.

Renewables penetration stable in 2024, but material lift expected in 2025

The Australian Government has a target of 82% renewable electricity nationally by 2030. We would generally expect a year-on-year increase of more than 3% as a reflection of annual capacity being added to the grid. However, renewables' share of generation in the NEM in 2024 remained at the 2023 level of 39%.

- This result is largely attributed to a wind drought experienced through late autumn to early winter and weaker-than-expected generation from hydroelectricity plants due to below-average rainfall in Tasmania.
- Australian Energy Market Operator (AEMO) data from the [August 2024 Engineering Roadmap](#) and more recently in the latest [Quarterly Energy Dynamics \(QED\) report](#) indicate that economic offloading and network curtailment of renewables is also likely to have made some contribution the result. Whether in response to low or negative wholesale prices (economic offloading) or to power system security requirements (network curtailment), material levels of curtailment mean existing renewable assets are not generating as much electricity for consumers as they could if more electricity could be stored or transmitted. The suite of Australian Government policies increasing both large-scale storage and transmission already in train, coupled with AEMO's work to reducing technical and engineering barriers to high renewables penetration, will facilitate greater use of existing assets.
- On the demand side, there was also material increase in the overall electricity demand in the NEM (3.0% compared to between 0.2% and 1.8% over the previous 3 years).

In combination, these factors resulted in the proportion of renewables generation in the NEM remaining stable. Only rooftop and large-scale solar saw growth in their generation contributions to the NEM in 2024 – by 9.5% and 5.5% respectively compared to 2023.

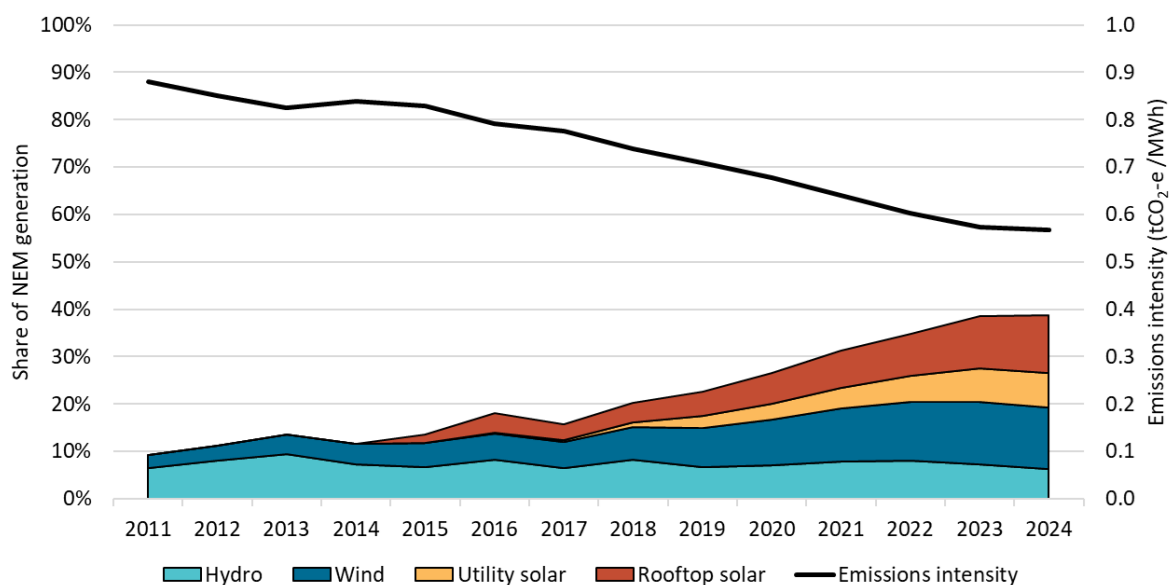
The emissions intensity of the NEM remained stable in 2024 compared to 2023, at 0.57 tonnes of carbon dioxide-equivalent per megawatt-hour (MWh) of generation. Further information on emissions from electricity is available in the [2023-24 NGER data release](#).



In January 2025, the AEMO released the [Quarterly Energy Dynamics \(QED\) report](#) for Q4 2024. The report highlighted that small-scale solar output reached an all-time quarterly high in all regions, driving a record share of 46% of supply in the NEM from renewable sources. The QED report also detailed a half-hourly snapshot where renewable contributions to the NEM reached an all-time high of 75.6% on 6 November 2024.

The CER anticipates that renewable penetration in the NEM could reach 44% to 46% in 2025. This range assumes a return to average generation conditions, particularly for wind and hydro. It also assumes no material increases in curtailment or electricity demand growth.

Figure 1.2: Renewables generation share and emissions intensity of the National Electricity Market (NEM), 2011 to 2024



Capacity Investment Scheme poised to drive rise in large-scale generation and storage

On 11 December 2024, the successful projects under [CIS Tender 1](#) of the CIS were announced. Successful projects are still subject to the signing of a Capacity Investment Scheme Agreement (CISA) with the Australian Government.

The successful projects consisted of a total 19 projects with a combined 6.4 GW of generation capacity and around 3.6 GWh of storage capacity. Solar projects made up 2.8 GW of the generating capacity, with wind projects making up the remaining 3.6 GW. The total 6.4 GW exceeded the indicative target generation capacity by 0.4 GW. Reflecting the increasing importance of dispatchable power to the renewable energy transition discussed above, 8 of the 19 successful CIS projects were hybrid generation and storage projects.

We would expect revenue underwriting agreements available to projects supported through finalised CIS contracts will increase the likelihood of reaching financial milestones such as FID in a reduced timeframe. Given the sizeable capacity of successful bids in Tender 1, total capacity reaching FID in 2025 could be around 6 GW or potentially more, noting announcements from further CIS rounds are scheduled from next month.

- Successful bids under [Tender 2 – Wholesale Electricity Market \(WEM\) Dispatchable](#) of the CIS are scheduled to be announced in March 2025. Tender 2 is seeking to deliver 2 GWh of storage capacity in the SWIS.



- There are also two further tenders underway – [Tender 3 – NEM Dispatchable Capacity](#), aiming to deliver 4 GW of four-hour equivalent dispatchable capacity, or 16 GWh of dispatchable capacity in the NEM, and [Tender 4 – NEM Generation](#), aiming to deliver a further 6 GW of renewable generation capacity in the NEM. Project bids for Tender 3 closed on 18 December 2024, and successful bids are expected to be announced in September 2025, while project bids for Tender 4 closed on 18 February 2025, and successful bids are indicatively scheduled to be announced in October 2025.



2. Large-scale generation certificates (LGCs)

Insights

- 2024 was a record year for large-scale renewables, with 4.3 GW of additional capacity approved for LGC creation.
 - » Wind projects were the largest contributors to new capacity in 2024, with a record 2.4 GW of all capacity approved coming from wind farms.
- Projects reaching final investment decisions in 2024 was 4.3 GW of capacity.
- LRET applications totalling 1.7 GW of capacity are currently under assessment by the CER. This is a strong starting position for approvals in 2025.
 - » At this stage, a conservative estimate is that between 2.7 and 3.1 GW would be approved by the end of the year.
- Voluntary demand for LGCs has continued to grow year-on-year, with non-RET surrenders of LGCs totalling 10.4 million in 2024.
 - » 2025 is expected to be even stronger than 2024 for voluntary demand, given commitments by many large Australian businesses to be powered by 100% renewables by 2025.
 - » Holdings by voluntary participants reached a record of 8.2 million in Q4 2024, suggesting a build-up of LGCs by entities intending to surrender to meet voluntary 2025 renewable energy targets.
- Following the 14 February 2025 surrender deadline LGCs for 2024 compliance, 6 liable entities went into shortfall with a combined 3.8 million LGCs totalling \$248.6 million in shortfall charges.
 - » Total shortfall charges are around \$800 million, covering 12.3 million LGCs.
- As expected, the LGC spot price has fallen from between \$30 to \$32 in the lead up to the 14 February surrender deadline to around \$28 post-surrender.
 - » This follows the price correction from \$45.50 that occurred in late 2024 that was discussed in the [Q3 2024 QCMR](#).
- Cal25 futures contracts are trading about a dollar higher than the spot, which may be a reflection of market uncertainty around volume of 2025 voluntary LGC demand and the \$800 million that can be redeemed by surrendering 12.3 million LGCs over the next 3 years.

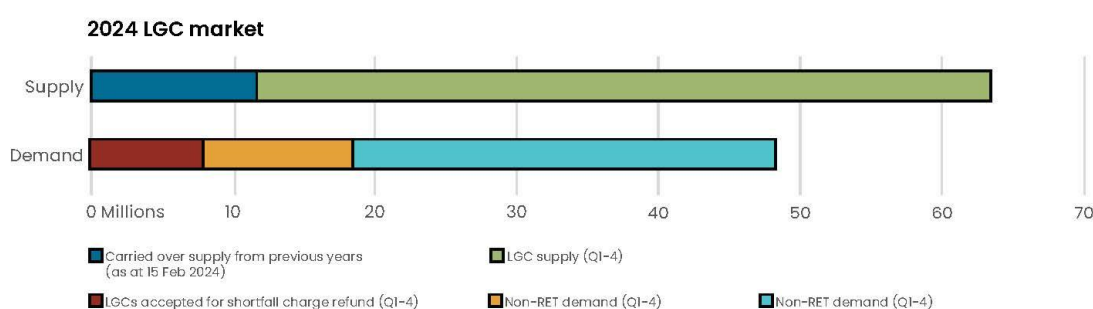


Image 2: Q4 2024 LGC market dynamics

Q4 2024 LGC market dynamics

	Q4 2024	Change from Q4 2023	2024	Change from 2023	2024 estimate	2024 estimate outcome
LGCs validated	14.0 mill	▲ 7%	51.5 mill	▲ 4%	51 mill	✓
Non-RET demand	3.1 mill	▲ 305%*	10.4 mill	▲ 20%	10 mill	✓
Approved capacity	1.6 GW	▲ 143%	4.3 GW	▲ 94%	4.2 GW	✓

*Our data shows entities do not always surrender LGCs for non-RET demand within the same quarter each year. Quarterly comparison should be interpreted with caution.



LIST OF ACRONYMS

GW
LGC
mill

GIGAWATTS
LARGE-SCALE GENERATION CERTIFICATE
MILLION

RET
RPP

RENEWABLE ENERGY TARGET
RENEWABLE POWER PERCENTAGE

Market dynamics

Table 2.1: Large-scale generation certificate (LGC) supply and demand balance

LGCs (millions)	Demand	Supply
Supply carried over from previous years (as of 15 Feb 2024)		11.9
LGC supply (Q1-4 2024)		51.5
Non-RET demand (2024)	-10.4	
2024 RPP surrenders	-30.2	
LGCs accepted for shortfall charge refund (Q1-4 2024)	-7.5	
Balance as of 15 Feb 2025		21.1



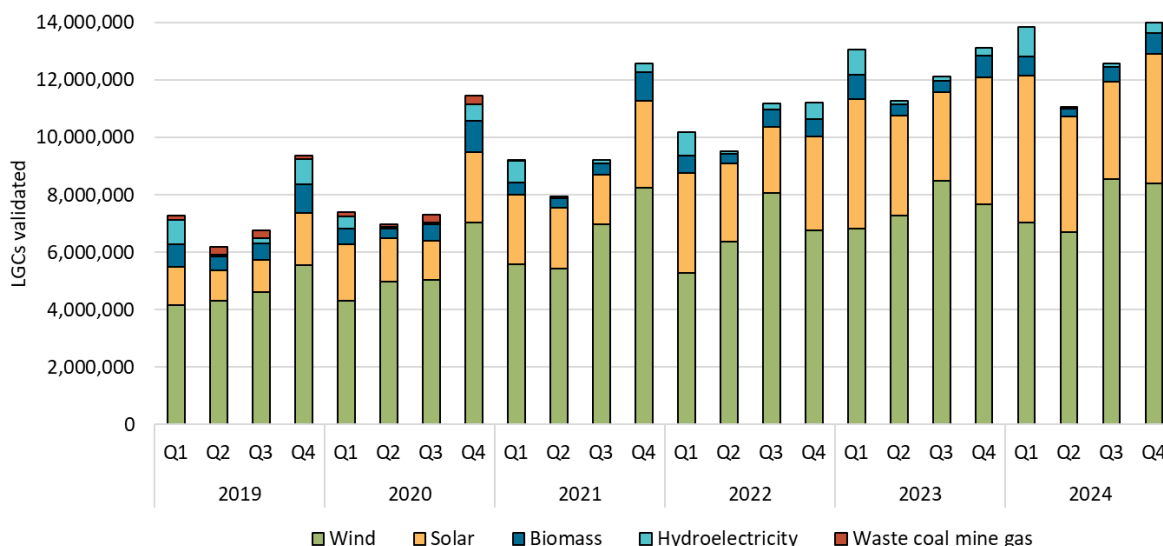
Note: There is a total of 4.3 million LGCs in shortfall that are eligible for shortfall refunds to be claimed from 2022. There is \$800 million in consolidated revenue (representing 12.3 million LGCs) from shortfall charges that are eligible for redemption as of 15 February 2025.

In Q4 2024, 14.0 million LGCs were created, bringing total LGC creations to 51.5 million for the year. This volume was in line with updated projections in the Q3 2024 QCMR. Assuming weather conditions are favourable throughout 2025, it is reasonable to expect 54 to 57 million LGCs to be created in the year.

The 14 February surrender deadline saw 30.2 million LGCs surrendered against a total liability of 34 million. Shortfall totalling 3.8 million LGCs was taken by 6 liable entities, with an additional 0.4 million in liability carried forward to next year's deadline by 17 liable entities.

Additional factors to consider in the LGC market throughout 2025 will be the impact of the [introduction of mandatory climate disclosures](#) and a material uplift in voluntary cancellations. These are discussed further below.

Figure 2.1: Large-scale generation certificates (LGCs) validated by technology type



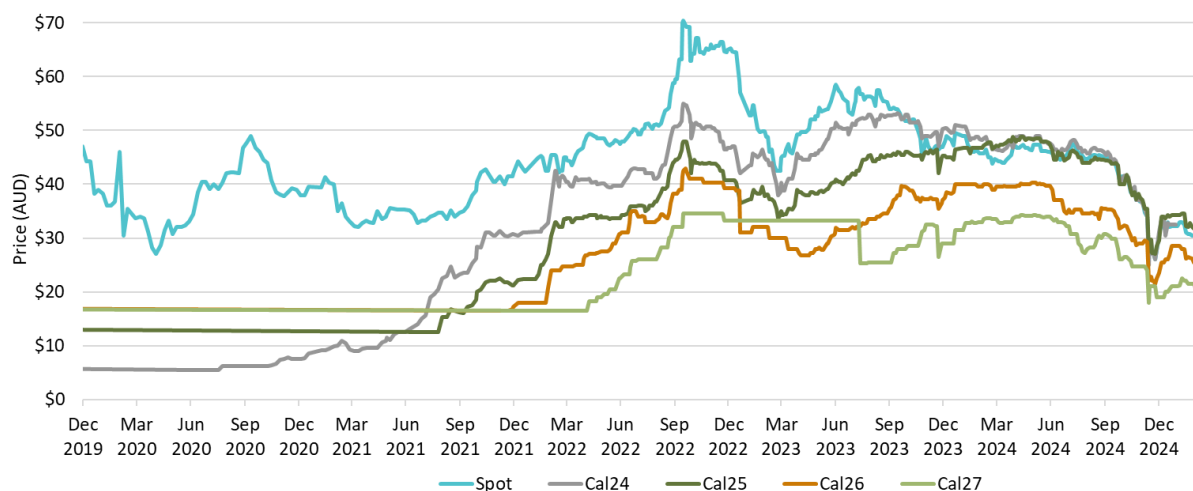
The LGC spot price experienced a sharp decline in mid-Q4 with a partial recovery later in the quarter. The spot price dropped from \$41.50 at the start of Q4 to a low of \$26.00 in late November, before rebounding to finish the year at \$32.25. The LGC spot price has settled at around \$28 since the 14 February surrender deadline.

It is difficult to quantify the absolute uplift in non-RET demand at this stage, but the CER expects a material uplift in surrenders. It would not be extreme to expect between 12.5 and 15 million LGCs could be surrendered for non-RET purposes in 2025. This is likely to be a factor influencing the Cal25 futures which were trading at \$29.00 on 18 February. The CER has been informed that some entities with 100% renewable energy targets in FY2025 will be surrendering in Q3 2025. Early indications suggest that meeting these commitments could require an up to 4-fold increase in cancellations for some entities. The phased [introduction of mandatory climate disclosures](#) from 1 January will see the corporate disclosures in a new sustainability report. While disclosures do not create new emissions reduction requirements, the reporting requirements could increase interest in voluntary retirement of LGCs or other certificates. The CER will continue to consult with relevant entities throughout the year to refine this estimation.

Despite the uplift in voluntary demand, overall LGC supply (stock and expected creations) is still expected to readily account for demand coming from both RET and non-RET surrenders. This includes the 4.3 million currently eligible for shortfall refund.



Figure 2.2: Large-scale generation certificate (LGC) reported spot and forward prices



The [2025 renewable power percentage \(RPP\)](#) has been set at 17.91%. The RPP is set by the Minister for Climate Change and Energy each year to meet the LRET’s annual legislated target for renewable electricity which is 33,000 GWh each year from 2020 to 2030. Given the legislated target for renewable electricity is fixed, recommended RPP’s tend not to vary much from year to year. The 2025 RPP is marginally lower than 2024 and will require liable entities – typically electricity retailers – to surrender approximately 32 million LGCs. The small decrease from the 33 million target in the 2025 RPP calculation reflects a rolling adjustment to account for over surrenders in previous years.

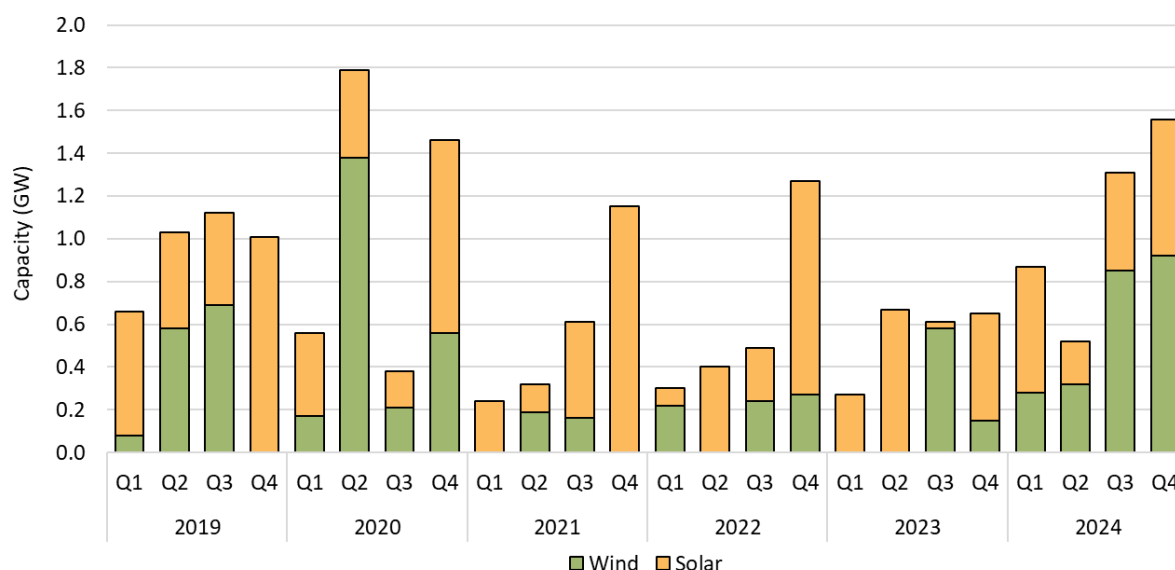
Record volume of approved large-scale capacity

Approved capacity in Q4 2024 under the LRET was very high with 1.6 GW of capacity approved during the period. This was driven by the approval of Australia’s largest wind farm – MacIntyre Wind Farm (923 MW), as well as Walla Walla Solar Farm 1 and 2 (353 MW).

This outcome has resulted in a record 4.3 GW of renewable energy generation capacity being approved in 2024 – exceeding the previous record of 4.2 GW set in 2020, and nearly doubling the 2.2 GW of capacity approved in 2023.



Figure 2.3: Approved large-scale wind and solar capacity



2.4 GW of wind capacity was approved in 2024. For the first time since 2020, wind power made up the bulk of approved power stations in a calendar year. This is a significant metric as wind assets tend to have higher capacity factors and often generate significant energy at night. Solar assets also make a valuable contribution to the energy mix through reduced prices during daylight hours. The development of storage assets in the network will serve to reduce energy prices in high price periods as generation from wind and solar assets can be stored and shifted to meet demand as needed.

There is currently 1.7 GW of large-scale capacity under assessment by the CER. This suggests that the first half of 2025 could carry forward the strength in approvals seen in 2024.

Strong end to year for final investment decisions

2024 investment ended strongly, with 1.3 GW of capacity reaching Final Investment Decision (FID) in Q4. Total capacity to reach FID in 2024 was 4.3 GW.

Significant projects reaching FID in Q4 2024 include:

- Goulburn River Solar Farm (450 MW)
- Wambo Wind Farm – Stage 2 (254 MW)
- Wambo Wind Farm – Stage 1 (250 MW)
- Carwarp Solar Farm (150 MW)
- Horsham Solar Farm (119 MW)
- Warradarge Wind Farm (108 MW).

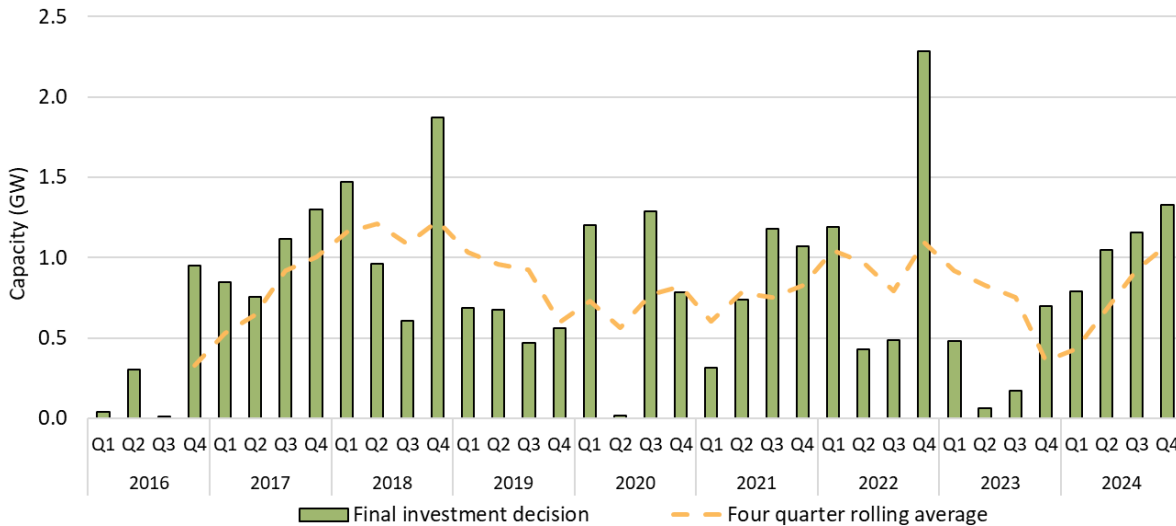
Goulburn River Solar Farm reached FID following the announcement of its successful bid under [Tender 1 of the Capacity Investment Scheme](#) (CIS).

A total of 19 large-scale projects totalling 6.4 GW of generation and 3.6 GWh of storage capacity were successful in the first round of the CIS. The rate at which these project reach generation stage will vary.



While a few are further advanced in the development cycle and could see accreditation under the LRET within 18 months, others will take more time.

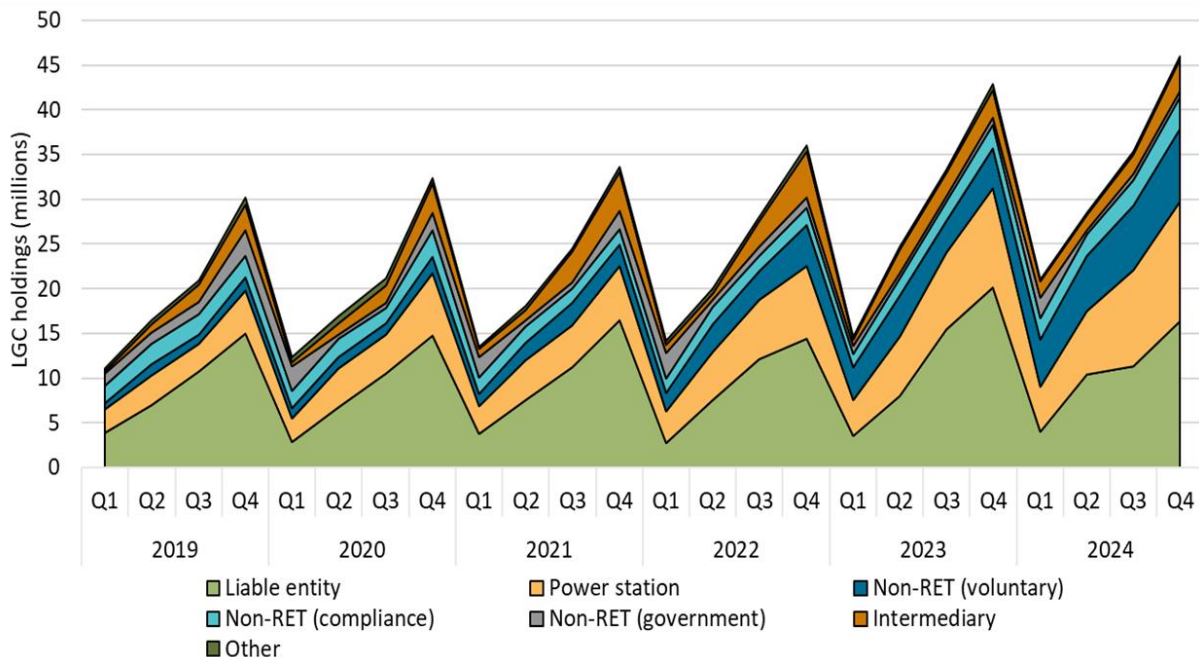
Figure 2.4: Final investment decision capacity (GW) for large-scale renewable generation



Voluntary (non-RET) LGC Holdings increase in Q4

LGC holdings increased by 10.7 million to 46.0 million at the end of 2024, up from 42.9 million at the end of 2023. Holdings by voluntary participants at the end of 2024 were nearly double that at the end of 2023 (4.4 million in 2023 and 8.2 million last year).

Figure 2.5: Large-scale generation certificate (LGC) holdings (in millions) by market participation

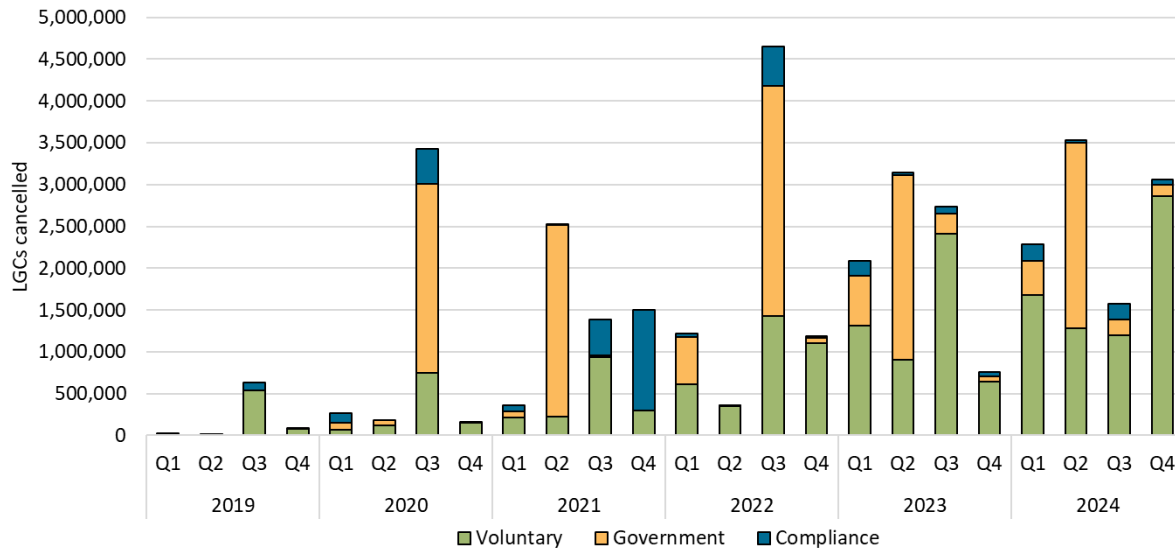


Non-RET surrenders totalled 3.1 million LGCs in Q4 2024, bringing the annual total to a record 10.4 million. This was 20% higher than the 8.7 million surrenders in 2023. As discussed above, consistent with the



substantial growth in non-RET holdings late last year, non-RET LGC surrenders in 2025 are expected to exceed those in 2024.

Figure 2.6: Non-Renewable Energy Target (non-RET) large-scale generation certificate (LGC) cancellations by demand source





3. Small-scale technology certificates (STCs)

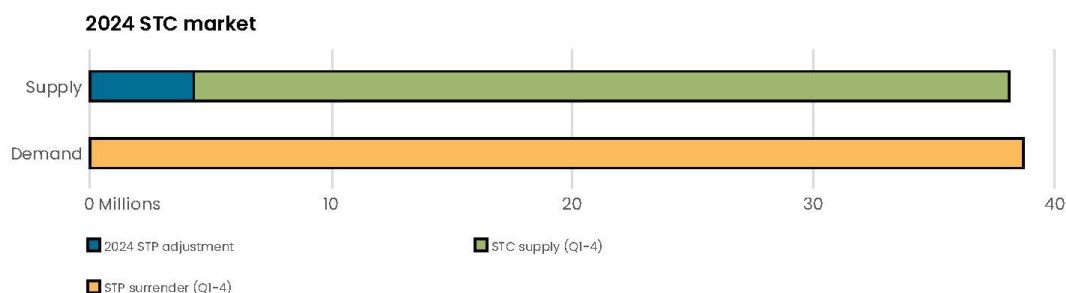
Insights

- Current data indicates a potential record of around 3.2 GW of small-scale renewable energy generation capacity was added in 2024.
- In 2025, an estimated 2.9 GW to 3.2 GW of rooftop solar is expected to be added to the grid.
 - » Recent trends suggest that capacity may currently be heading for the top end of this range. The lower bound is based on modelling from consultants prepared in mid-2024 to inform the STP for 2025.
- Battery installations reached a record 10% in 2024 based on data voluntarily provided to the CER.
- The share new of installations with batteries is likely higher, with [market analysts](#) estimating a 2023 figure of around 17%.
- More than 100,000 air source heat pumps were installed under the SRES in 2024. This was nearly a quarter lower than 2023 installations. This is likely driven by changes in the [NSW Hot Water System Rebate](#) (NHWR) eligibility criteria to prevent 'double dipping' with the SRES.

Image 3: Q4 2024 STC market dynamics

Q4 2024 STC market dynamics

	Q4 2024	Change from Q4 2024	2024	Change from 2024	2024 estimate	2024 estimate outcome
STCs created	8.6 mill	▼13%	34.1 mill	▼9%	33.6 mill	✓
Rooftop solar capacity installed	0.9 GW	▼4%	3.2 GW	▲2%	3.15 GW	✓



LIST OF ACRONYMS

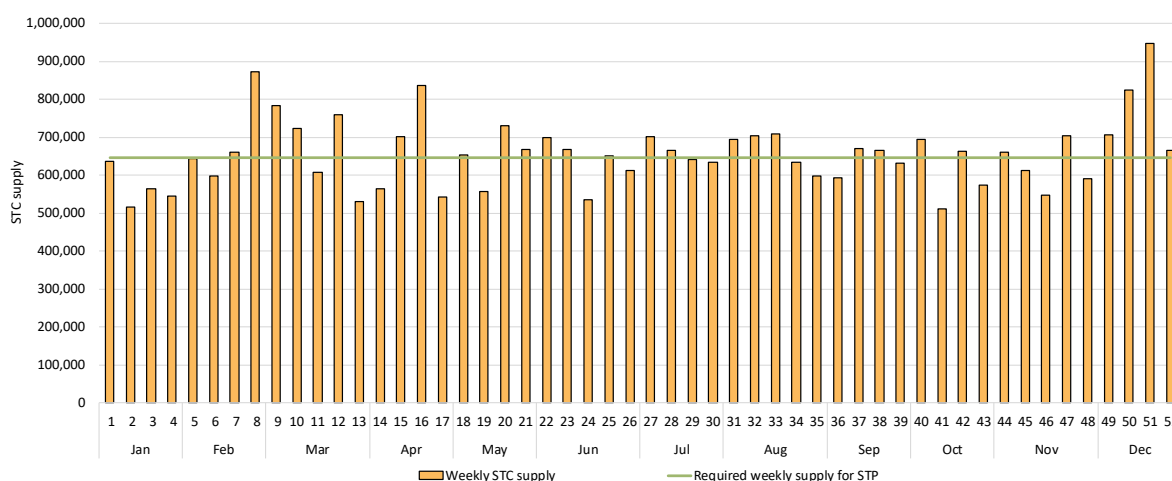
GW	GIGAWATTS
STC	SMALL-SCALE TECHNOLOGY CERTIFICATE
STP	SMALL-SCALE TECHNOLOGY PERCENTAGE
mill	MILLION



Market dynamics

In Q4 2024, 8.6 million STCs were created, bringing the 2024 total to 34.1 million. On average, around 656,000 STCs were created per week throughout 2024. This was above the average of around 646,000 required to meet the compliance demand set for the 2024 STP.

Figure 3.1: Weekly small-scale technology certificate (STC) supply and the required supply to meet the small-scale technology percentage (STP)



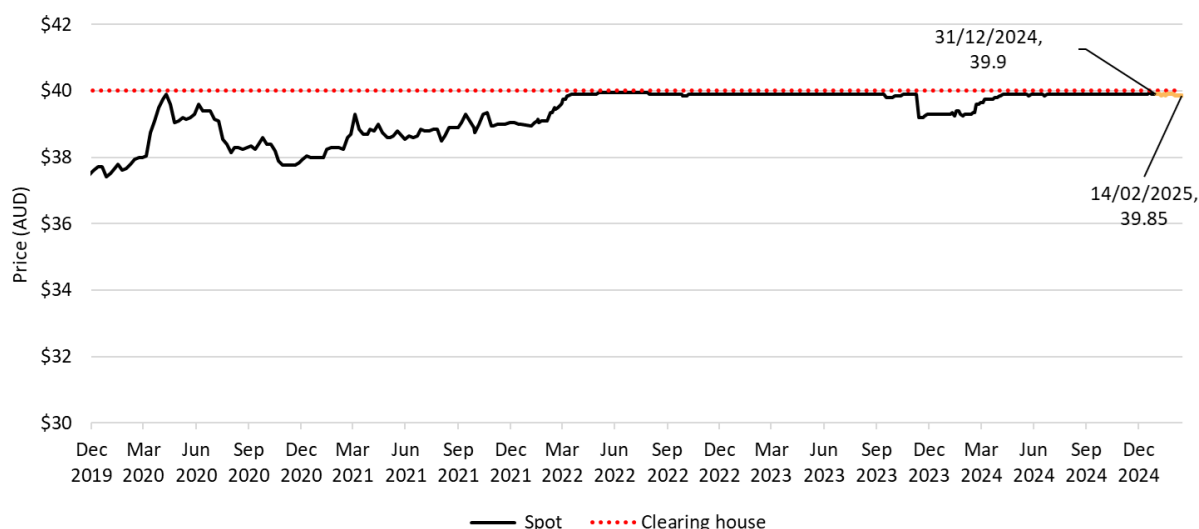
The surrender deadline for the Q4 2024 compliance period was 14 February 2025. A total of 7.0 million STCs were surrendered at a compliance rate of 102%. Over the course of 2024, 39.1 million STCs were surrendered compared to the 37.9 million annual compliance requirements. Surrenders above the requirement can occur when there is a discrepancy between the relevant acquisitions or exemptions used to calculate the STP and the final figures from the year. In 2024, relevant acquisitions were 4.5 TWh higher and exemptions were 0.1 TWh lower than expected. This resulted in liable entities surrendering 1.2 million more STCs than the compliance requirement set out in the 2024 STP.

The [2025 STP](#) has been set at 13.89%. The STP is set by the Minister for Climate Change and Energy each year and aims to set demand to match projected STC creation. That is, all certificates expected to be created in a year are required to be surrendered by liable entities, considering any over or underachievement from the previous year. The 2025 STP will require liable entities – typically electricity retailers – to surrender a cumulative total of 24.9 million STCs to meet the compliance requirements.

Estimated STC creation for 2025 is driven by the projected number of household solar PV systems and the STCs per system. By design, as the SRES phases down to its 2030 close, the annual percentage reduction in STCs per system increases by a sizeable and growing amount in percentage terms. For example, the decline from 7 years of upfront STCs in 2024 to 6 years in 2025 equates to a 14.3% reduction in rebate. On the other hand, system prices and payback periods have continued to fall as noted in chapter 1. While a lower rebate lowers demand for household PV other things equal, the CER expects that 2025 added solar capacity will be similar to 2024.



Figure 3.2: Small-scale technology certificate (STC) reported spot and clearing house prices



The STC spot price remained at \$39.90 for the majority of Q4 2024. This was due to the STC clearing house remaining in deficit for most of the quarter. The STC clearing house entered surplus from 17 December 2024 but fell back into deficit in the lead up to the Q4 surrender deadline on 14 February 2025.

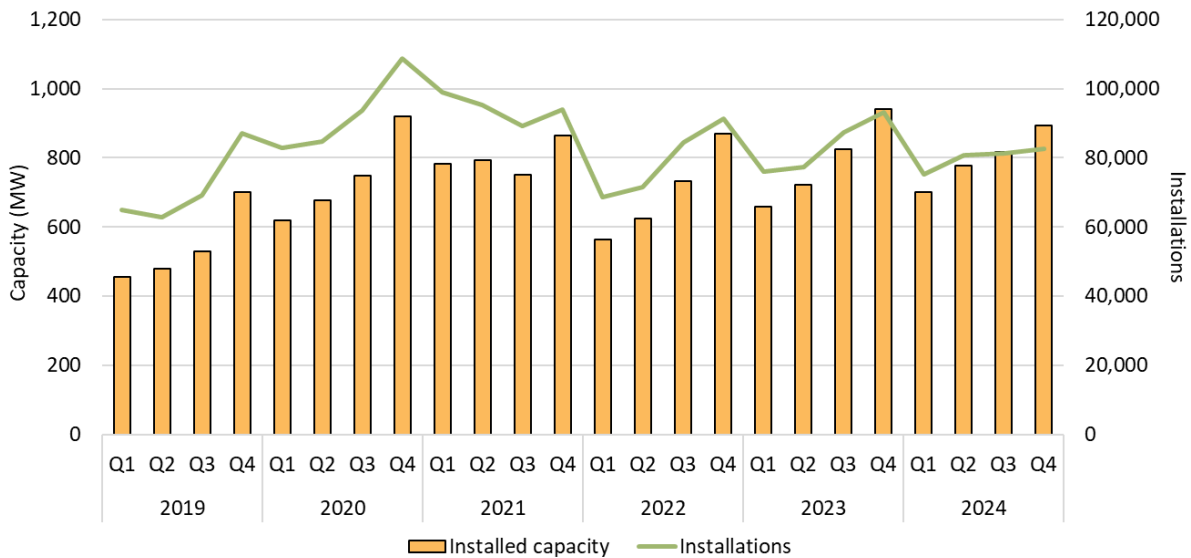
Possibly a new record for rooftop solar installations

Strong Q4 2024 solar PV installation figures has kept the possibility of a record year of installed capacity alive. At the end of 2024, the validated annual capacity was marginally higher than the 2023 capacity at the same point in time. STCs can be created up to 12 months from installation, with the bulk created after 3 months, so a clearer picture of 2024 will be available by April 2025. At the time of publication, it is likely that 2024 capacity will be higher than the 3.14 GW installed in 2023. It could match or exceed the pandemic induced record of 3.2 GW in 2021.

The average system size installed in 2024 was 10.0 kW, 0.6 kW higher than 2023. This continues the trend of increasing average system sizes each calendar year, more than offsetting the annual decline in total installations.



Figure 3.3: Small-scale rooftop solar installations and installed capacity in megawatts (MW)

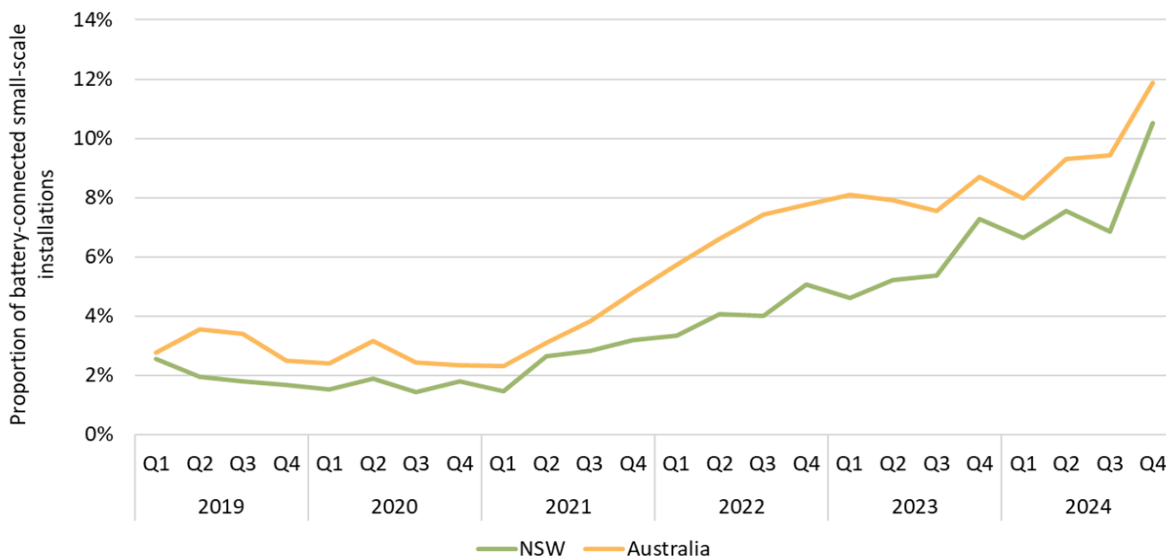


Continued growth in battery-connected systems

There was a significantly higher percentage of new small-scale systems being installed with batteries in 2024 relative to previous years. Data voluntarily reported to the CER shows that 10% of systems were battery-connected in 2024, up from 8% in 2023. The data also indicates a strong uptick of systems reported as having batteries in Q4, largely driven by the [NSW battery incentive scheme](#). As discussed in [previous reports](#), only systems installed from November 2024 onward are eligible for that scheme.

Increasing capacity of storage will be important to ensure the rapid increase in generation from rooftop solar does not result in increasing curtailment of large-scale wind and solar to maintain power system security. In addition, increases in storage help allow further large increases of rooftop solar capacity to be connected without creating security issues in both low and high voltage networks or the need to forcibly ‘trip’ or turn off rooftop solar.

Figure 3.4: Proportion of battery-connected small-scale installations in NSW and Australia





Strong year for air source heat pumps despite lower incentives

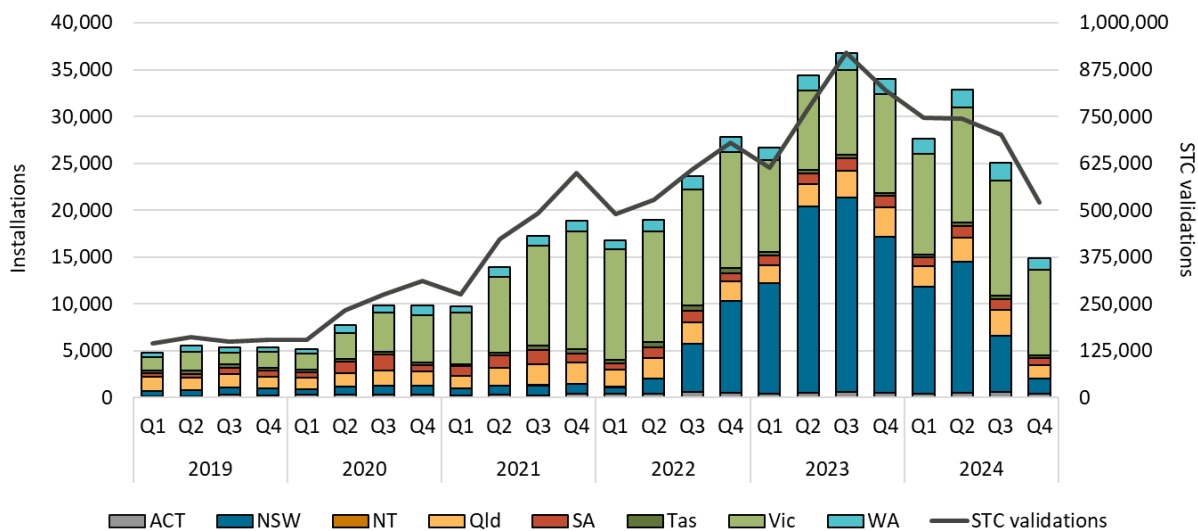
The CER has validated the installation of more than 100,000 air source heat pump (ASHP) systems, and 2.7 million associated STCs in 2024. This is the second consecutive year where ASHP installations under the SRES have surpassed 100,000. Air source heat pumps are estimated to have displaced approximately 1,580 GWh of grid sourced electricity in 2024.

NSW's quarterly air source heat pump installations continued to decline in Q4 2024, driven by reduced incentives offered under the NSW Government's NHWR under its [Household Energy-savings Upgrades program](#). Prior to this change, the ability to access both schemes reduced the [cost of an average ASHP installation in NSW](#) by up to 33%. Consequently, NSW has observed a significant year-on-year decline in its total air source heat pump installations in 2024, which were 52% lower than in 2023. By comparison, the rest of Australia saw a year-on-year increase in air source heat pump installations of 7% over the same period.

Lower NSW installations in Q3 and Q4 2024 meant that Victoria led the nation in air source heat pump installations in 2024, with more than 44,000 validated installations. Market intelligence suggests that installers have been shifting their operations to Victoria following the changes to the NSW rebate scheme.

2024 installation numbers have not been lag adjusted for the 12-month creation period and will increase over the course of 2025 as the CER validates more systems.

Figure 3.5: Air source heat pump installations and STC validations by state





4. Emissions reduction

In 2024, schemes administered by the CER are estimated to have reduced emissions by between 69.2 and 100.6 million tonnes of carbon dioxide equivalent (CO₂-e). The estimates use different ways of calculating emission reductions from renewable energy.

Emissions reduction using grid average intensities

Using grid average emissions intensities, there were 69.2 CO₂-e of emissions reductions from CER schemes in 2024. This is 8% higher than the 64.2 million tonnes of CO₂-e reduction in 2023 and in line with our [2023 projection of 2024 emissions reductions](#). The 2024 estimate is based on:

- The [ACCU Scheme](#) issued ACCUs equivalent to 18.8 million tonnes of CO₂-e emissions abatement in 2024. This is 9% higher than in 2023. Each ACCU is equivalent to 1 tonne of CO₂-e emissions reduction.
- The [RET](#) is estimated to have contributed 50.4 million tonnes of CO₂-e emissions reduction in 2024. This is 7% higher than the previous year. It includes an estimated:
 - » 29.0 million tonnes from the [LRET](#).
 - » 21.3 million tonnes from the [SRES](#). This component considers the potential renewable electricity generated by rooftop solar as well as the reduction in electricity consumption from the use of more efficient hot water systems.

This is a conservative estimate as it uses the weighted average emissions intensity of the NEM and SWIS and multiplies this by the MWh of renewable generation. The emissions intensity factor was 0.56 tonnes of CO₂-e per MWh in 2024, only marginally lower than the 0.57 tonnes of CO₂-e per MWh in 2023. This emissions intensity factor will fall as the share of renewables in the grid increases.

Emissions reduction using thermal displacement

Using the thermal displacement method, the emissions reduction associated with CER schemes could be as high as 100.6 million tonnes of CO₂-e in 2024.

This estimate is higher than the estimate using grid average emissions intensity as it assumes renewables are fully displacing thermal generation. Thermal generation refers to electricity generated from fossil fuels, such as coal and gas. In 2024, the emissions intensity of thermal generation was estimated to be 0.91 tonnes of CO₂-e per MWh compared to 0.56 tonnes of CO₂-e per MWh for the entire grid. This difference will continue to widen as Australia's electricity grid decarbonises.

Projected 2025 emissions reduction

In 2025, schemes administered by the CER are estimated to reduce emissions by between 72 and 117 million tonnes of CO₂-e.

- The 72 million tonnes of CO₂-e is based on using lower range estimates for the ACCU Scheme and the RET (of 19 million and 53 million tonnes of CO₂-e respectively) and the average emissions intensity factor of the grid.
- The 117 million tonnes of CO₂-e is based on using higher range estimates for the ACCU Scheme and the RET (of 24 million and 93 million tonnes of CO₂-e respectively) and the thermal displacement method.



Figure 4.1: Estimated emission reduction from Clean Energy Regulator (CER) schemes, 2011 to 2025

