Australian Government
Clean Energy Regulator

CLEAN ENERGY REGULATOR

Quarterly Carbon Market Report

June Quarter 2021

Table of Contents

Report objective

Carbon markets play a key role in Australia's efforts to reduce emissions. The Clean Energy Regulator has prepared this report to support the effective operation of Australia's carbon markets.

This report consolidates information across the 3 national carbon markets that the Clean Energy Regulator administers for the June quarter 2021 (April 2021 to June 2021) and provides information on supply and demand trends and opportunities to inform market decisions.

Report disclaimer

All figures are sourced from the Clean Energy Regulator unless otherwise referenced. All statements in this report reflect current policy settings, other than in specific instances where the Government has announced or is consulting on proposed policy changes.

This Quarterly Carbon Market report represents the views of the Clean Energy Regulator at the date of publication. The Clean Energy Regulator is providing this information to 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 Clean Energy Regulator administers. The Clean Energy Regulator has used its best endeavours to ensure the quality of the information in this document, but cannot guarantee its accuracy or completeness. The Quarterly Carbon Market report is not legal, business or financial advice. You should obtain independent professional advice on your particular circumstances before making any investment decisions. The information is provided as general information only. Neither the Clean Energy Regulator nor the Commonwealth of Australia will accept liability for any direct, incidental or consequential loss or damage resulting from the Quarterly Carbon Market report, or the information provided through the Quarterly Carbon Market report, or the availability or non-availability of the Quarterly Carbon Market report.

Version history

Version	Date	Changes
2.00	13 September 2021	Page 10, Figure 1.4 (ACT - 5 projects)

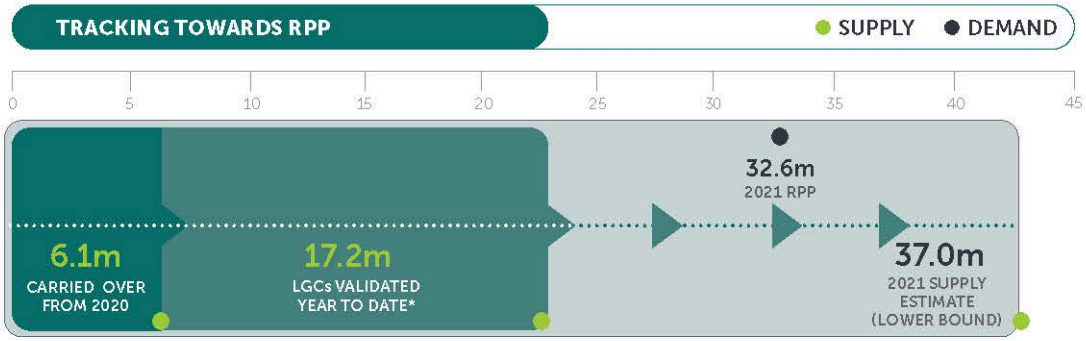
Australian Government
Clean Energy Regulator

2021 JUNE QUARTER MARKET OUTCOMES AND TRACKING AGAINST ESTIMATES

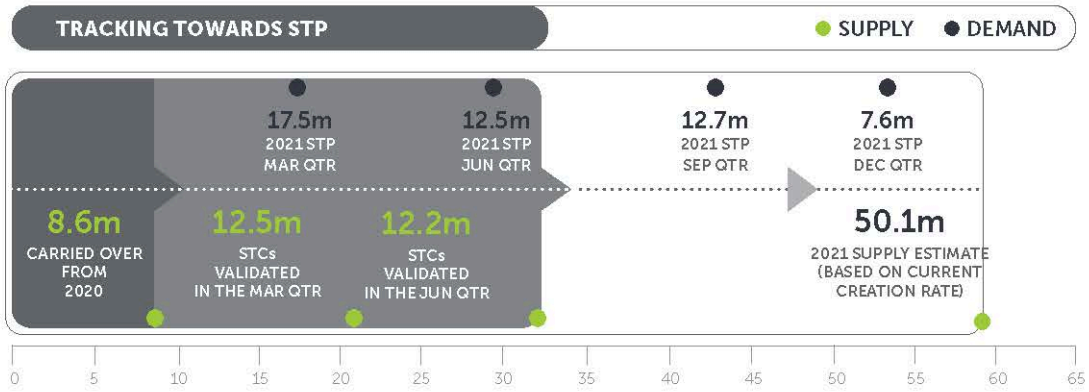
MARKET OUTCOMES

	YEAR TO DATE* 2021 RESULTS	YEAR TO DATE* CHANGE	2021 ESTIMATE	TRACKING TOWARDS 2021 ESTIMATE
ACCUs issued	8.8 m	5% ↑	17 m	✓
Renewable capacity installed - LRET	473 MW	78% ↓	2-2.5 GW	✓
Renewable capacity installed - SRES	1.6 GW	22% ↑	3-4 GW	✓

TRACKING TOWARDS RPP



TRACKING TOWARDS STP



VOLUNTARY AMBITION

	YEAR TO DATE* RESULT	YEAR TO DATE* CHANGE	2021 ESTIMATE	TRACKING TOWARDS 2021 ESTIMATE
Voluntary surrender (domestic) - ACCU	401,449	25% ↑	1,000,000	✓
Voluntary surrender (domestic) - LGC	2.9m	545% ↑	5,000,000	✓
Voluntary surrender (international) - CERs	6.3 m	84% ↑		

* YEAR TO DATE REFERS TO MARCH AND JUNE QUARTERS

LIST OF ACRONYMS

ACCU	AUSTRALIAN CARBON CREDIT UNIT
CER	CERTIFIED EMISSION REDUCTION UNIT
LGC	LARGE-SCALE GENERATION CERTIFICATE
LRET	LARGE-SCALE RENEWABLE ENERGY TARGET
RPP	RENEWABLE POWER PERCENTAGE
SRES	SMALL-SCALE RENEWABLE ENERGY SCHEME
STC	SMALL-SCALE TECHNOLOGY CERTIFICATE
STP	SMALL-SCALE TECHNOLOGY PERCENTAGE

Executive summary

Results from the June 2021 quarter confirm that carbon markets are growing strongly, as forecast in previous Quarterly Carbon Market reports.

Total emissions reduction from the Emissions Reduction Fund (ERF) and Renewable Energy Target (RET) schemes are on track to reduce carbon dioxide equivalent (CO_2-e) emissions by 57 million tonnes in 2021, using the conservative estimation approach for expected emissions reduction from renewable energy generation using the emissions intensity of the grid.[1]

ACCU supply hits record high

Australian carbon credit units (ACCUs) hit a record 5.7 million units in the June quarter. This took total supply for the first half of 2021 to 8.8 million, a 5% increase over the same period in 2020.

ACCU supply for 2021 remains on track to reach 17 million, up from 16 million in 2020.

The outlook for future supply is positive. The June quarter saw 47 new projects registered under the ERF which are expected to supply approximately 8 million tonnes of CO_2-e abatement over their lifetime.

The September quarter is also expected to see a large number of projects registered ahead of the 13th ERF Auction scheduled for 13 and 14 October 2021. Project applications for the auction closed on 25 August.

The ERF reached a significant milestone of 1000 projects on 26 August 2021.

Further information is available in Chapter 1.

Wind and solar power station pipeline remains solid

The capacity of projects reaching final investment decision (FID) in the June quarter was 725 megawatts (MW), far exceeding the low 19 MW in the previous quarter. This again demonstrates that no meaningful trends can be called from quarter to quarter as it involves a relatively small number of separate commercial decisions.

The Clean Energy Regulator maintains its estimated range of 2 to 3 gigawatts (GW) of capacity to reach FID for 2021. From a combination of public statements by companies and direct discussions, the Clean Energy Regulator expects to see a material strengthening in total capacity reaching FID in the second half of this year through to at least early 2022.

In the first half of 2021, 473 MW of power stations were accredited, with 737 MW of applications still on hand. The Clean Energy Regulator expects circa 2 GW will be accredited in 2021, with some uncertainty over whether several large power stations reach first generation late this calendar year or early 2022.

Total large-scale renewable energy generation for the year is expected to be in the upper end of the range of 37,000 to 40,000 gigawatt hours (GWh). This means large-scale generation certificates (LGCs) registered will be in the upper end of the range of 37 to 40 million.

Despite LGC supply exceeding statutory demand this year, the supply/demand balance looks tight for some time yet owing to both increasing voluntary demand and approximately $1 billion in shortfall charge that can be redeemed by surrendering certificates in future years.[2]

Further information is available in Chapter 2.

[1] The estimate is likely to be in the order of 75 million tonnes based on the emissions intensity of generation displaced by renewable energy.
[2] This value was as at the end of the 2020 assessment year, it may decrease over the course of 2021 as liable entities surrender further LGCs to make up for shortfall.

Rooftop solar continues strong year on year growth, with looming headwinds from lockdowns

Small-scale rooftop solar system installation saw a June quarter record of over 803 MW capacity – 18% higher than the 677 MW installed in the June quarter in 2020. This brings the first half total for 2021 to over 1.6 GW of installed capacity compared to 1.3 GW for the same period last year.

Total capacity added under the small-scale renewable energy scheme in 2020 was a record 3 GW. If installations for the second half of 2021 were to follow the usual seasonal pattern, total capacity could have exceeded 3.6 GW for the full year.

However, this picture is likely to change with COVID-19 lockdown restrictions in some jurisdictions towards the end of the June quarter continuing and new areas facing restrictions in the September quarter.

Installed capacity for the year is now more likely to be just over 3 GW, in the lower end of the originally expected 3 to 4 GW range. The Clean Energy Regulator will provide updated information in the September quarter report.

With 5.8 million small-scale technology certificates (STCs) remaining in the market after Quarter 2 surrender on July 28, the Clean Energy Regulator still expects there will be sufficient supply to meet Quarters 3 and 4 surrenders and maintain a material surplus at the end of the year.

Solid growth in voluntary use of ACCUs and LGCs

June quarter saw a number of large cancellations of LGCs and ACCUs, including the expected 2.2 million LGCs from the Australian Capital Territory (ACT) Government against its 100% renewable electricity target.

Excluding ACT government surrenders, voluntary LGC and ACCU demand grew to 530,000, up 39% from the June 2020 quarter.

Climate Active participants accounted for 42% of the voluntary demand for both LGCs and ACCUs.

More information on voluntary surrenders is available in Chapters 1 and 2.

New carbon market initiatives gain momentum

Expressions of interest for the Australian Carbon Exchange (ACX) closed on 20 June 2021. There was strong interest with 27 responses received.

National greenhouse and energy reporters continue to be actively engaged with the Clean Energy Regulator in co-designing the Corporate Emissions Reduction Transparency (CERT) report initiative and pilot. Consultation on the refined guidelines will occur later in 2021. Consultation processes are underway on Guarantee of Origin arrangements for hydrogen production and the Safeguard Crediting Mechanism.

Unit and certificate prices

ACCU spot prices increased to a new high in early July, with one trade recorded for 117,000 ACCUs at $20.00. Since the June quarter, there have been reports of trades of up to $22.40.

STC and LGC spot prices held value at $38.85 and $33.25 respectively (see Table ES.1).

Table ES.1 Price trend, June quarter 2021

Certificate type	Spot price AUD (30 June 2021)[3]	Quarterly trend
ACCU	$19.00	+$1.00
LGC	$33.25	-
STC	$38.85	-

[3] Data sourced from Jarden and TFS Green.

1. Australian carbon credit units (ACCUs)

Key highlights

- Scheme record quarterly supply of 5.7 million and half yearly supply of 8.8 million ACCUs
- 47 projects registered in the quarter estimated to deliver a total of 8 million tonnes of abatement
- Record voluntary cancellations of 401,000 ACCUs in the first half of 2021
- ERF Auction 13 announced for 13-14 October 2021
- ACCU spot price reached a record high of $19.30 at the end of the quarter and increased to $22.40 in mid-August

1.1. Supply and demand balance

The quarter saw ACCU supply of 5.7 million units outstrip total demand from ERF contract deliveries, safeguard surrender and voluntary surrender of 3.8 million units (see Figure 1.1).

The end-of-quarter balance of ACCUs held in the Australian National Registry of Emissions Units (ANREU) increased to a record high of 9.7 million units, up 1.9 million from 7.8 million units at the end of March 2021 – a 24% increase (see Table 1.1).

Figure 1.1 ACCU supply and demand balance (millions), 2019 to 2021

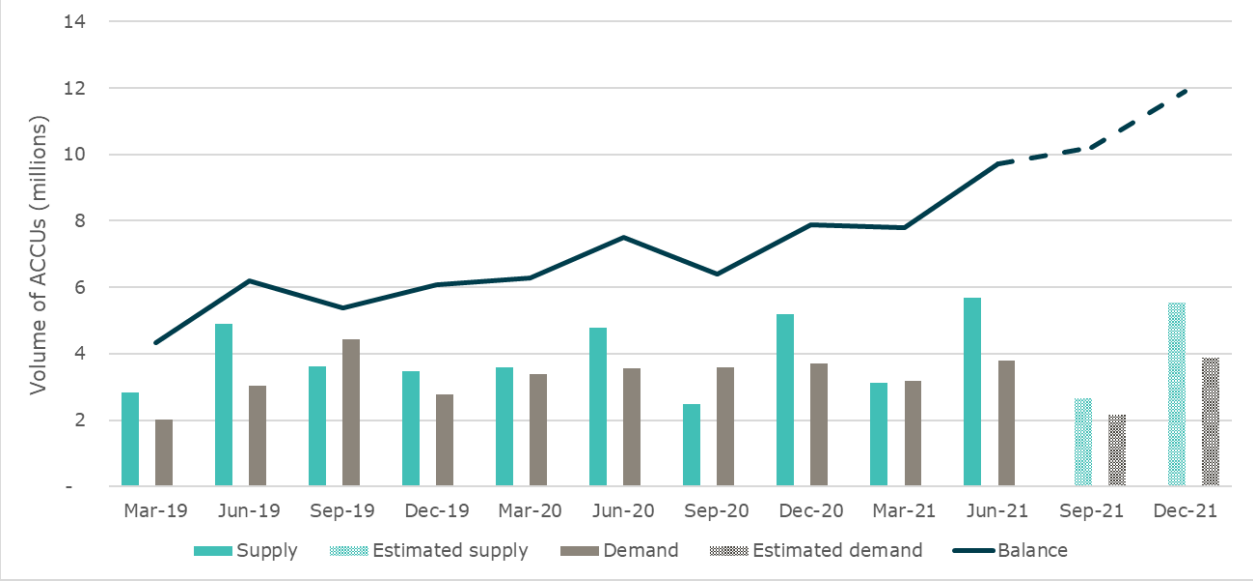


Table 1.1: Balance of supply and demand at June quarter 2021 close[4]

Balance/supply of ACCUs from March quarter 2021	**7,801,742**
ACCUs issued June quarter 2021	5,686,839
ERF contract deliveries	-3,516,385
Safeguard surrender[5]	-33,254
Voluntary surrender	-226,960
ACCU relinquishment[6]	0
Net balance at the end of June quarter 2021	**9,711,982**

The upward trend in total ACCU holdings shown in Figure 1.2 represents both an increase in the number of scheme participants holding ACCUs and an increase in the number of ACCUs that many believe they need to hold to protect their individual forward position.

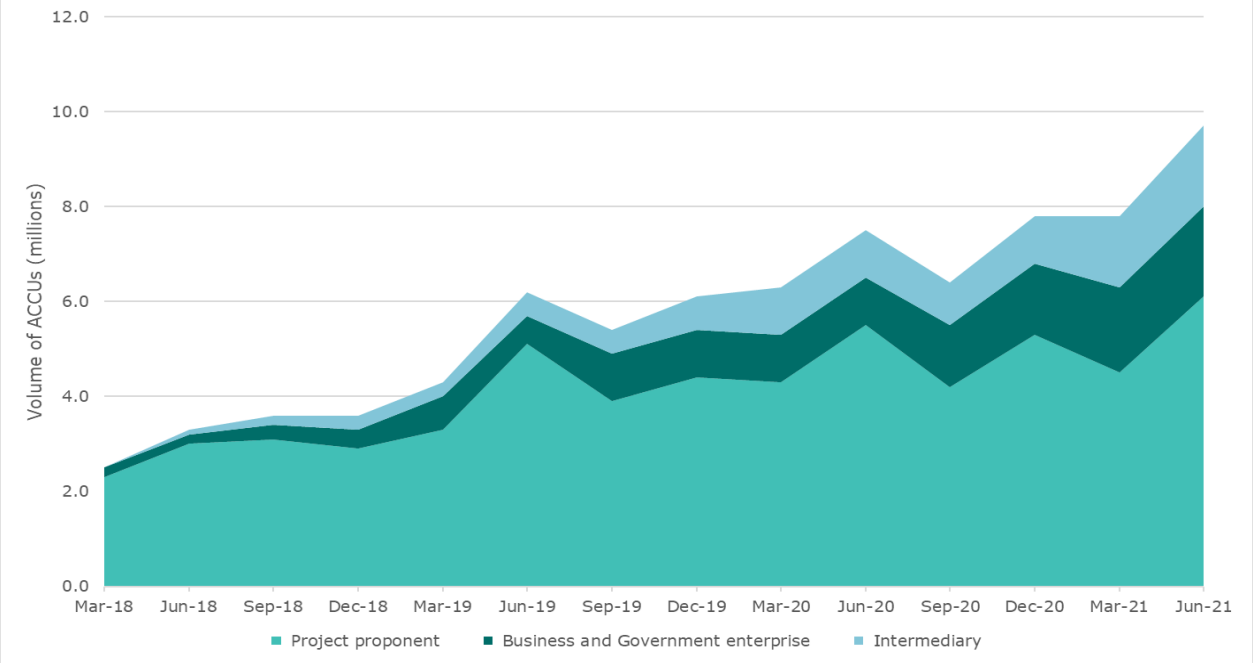
Over the counter markets tend to be less liquid than online exchange markets. The proposed exchange traded market should, over time, provide new options for scheme participants to protect their position, while reducing the proportional level of inventory held in accounts.

The number of ACCUs held by project proponents increased over the last quarter, from 4.5 million units at the end of March to 6.1 million ACCUs at the end of the June quarter.

Growth in ACCU holdings by business and government enterprises was modest over the quarter (up 0.1 million), but up 90% from 1.0 million in June 2020 to 1.9 million in June 2021 (see Figure 1.2).[7]

Holdings by intermediaries increased from 1.0 million in June 2020 to 1.7 million in June 2021 – a 70% growth.

Figure 1.2: Breakdown of ACCU holdings by market participation (millions), March quarter 2018 to June quarter 2021



[4] Within a specified period, supply of ACCUs refers to ACCUs issued. Demand of ACCUs incorporates 3 sources including Commonwealth ERF contract deliveries, safeguard mechanism surrenders and state and territory government and private sector voluntary cancellation.
[5] Safeguard mechanism surrender does not include deemed surrender. A 'deemed surrender' occurs when ACCUs issued under an ERF project at a safeguard facility, in a particular year, are delivered to the Commonwealth under an ERF contract.
[6] For more information see ACCU relinquishments.
[7] 'Project proponents' refer to accounts where the account holder is connected to one or multiple ERF projects. 'Business and government enterprise' refer to accounts where the account holders do not have a direct link to ERF projects, and include safeguard entities, voluntary participants, local government entities that are accumulating for voluntary or compliance purposes. 'Intermediary' refer to accounts where account holder's primary operation is to facilitate trading of units between the supply and demand sides of the market.

1.2. Factors impacting supply

Crediting

The June 2021 quarter yielded a record supply of 5.7 million ACCUs. This is 10% above the previous record of 5.2 million ACCUs in the December 2020 quarter. Supply for 2021 remains on track to reach 17 million ACCUs (see Figure 1.3).

During the quarter, total issuances under the ERF passed 97.1 million ACCUs. While vegetation (47%) and waste projects (28%) dominated, credits issued to savanna burning projects (17% of quarterly supply) were the second highest on record with 970,000 ACCUs (see Figure 1.3).

Significant new project registrations over the past year will lead to material future ACCU supply. In addition, this will be boosted by a number of method variations and new methods.

Future supply from waste projects has been confirmed with landfill gas (flaring) projects receiving a five-year crediting period extension. Approximately 50 landfill gas projects are expected to adopt the extended crediting period, with an estimated total delivery of 3.7 million tonnes of abatement over the next 5 years.

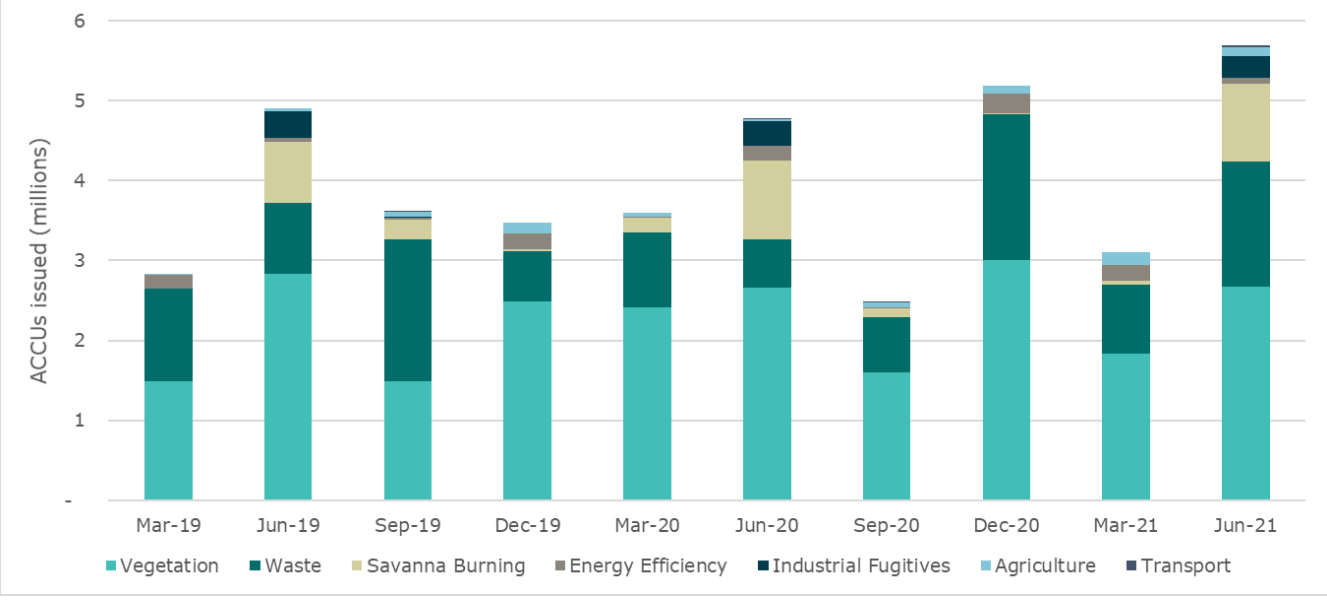
On 13 June 2021, the landfill gas (generation) method closed for public consultation and if approved, projects registered under this method will receive a five-year crediting period extension, which would also add to supply.

Further supply from waste projects may also result from proposed variations to the coal mine waste gas project methodology. Proposed changes include extending the crediting period of currently registered projects by 5 years and may allow expired Renewable Energy Target (RET) waste coal mine gas power stations to transition into the ERF. Public consultation on these changes closed on 30 July 2021.

A material increase in ACCU supply is expected in the short term if the proposed changes are approved. Additionally, methods currently under development including revised soil carbon, Carbon Capture and Storage (CCS), plantation forestry, biomethane and blue carbon may contribute materially to supply beyond 2022.

Method development prioritisation for 2022 is underway. The government's focus will be priority technologies identified in the First Low Emissions Technology Statement and low emissions transport infrastructure. Submissions for this round closed on 26 July 2021.

Figure 1.3. ACCUs issued per method type (millions), March quarter 2019 to June quarter 2021



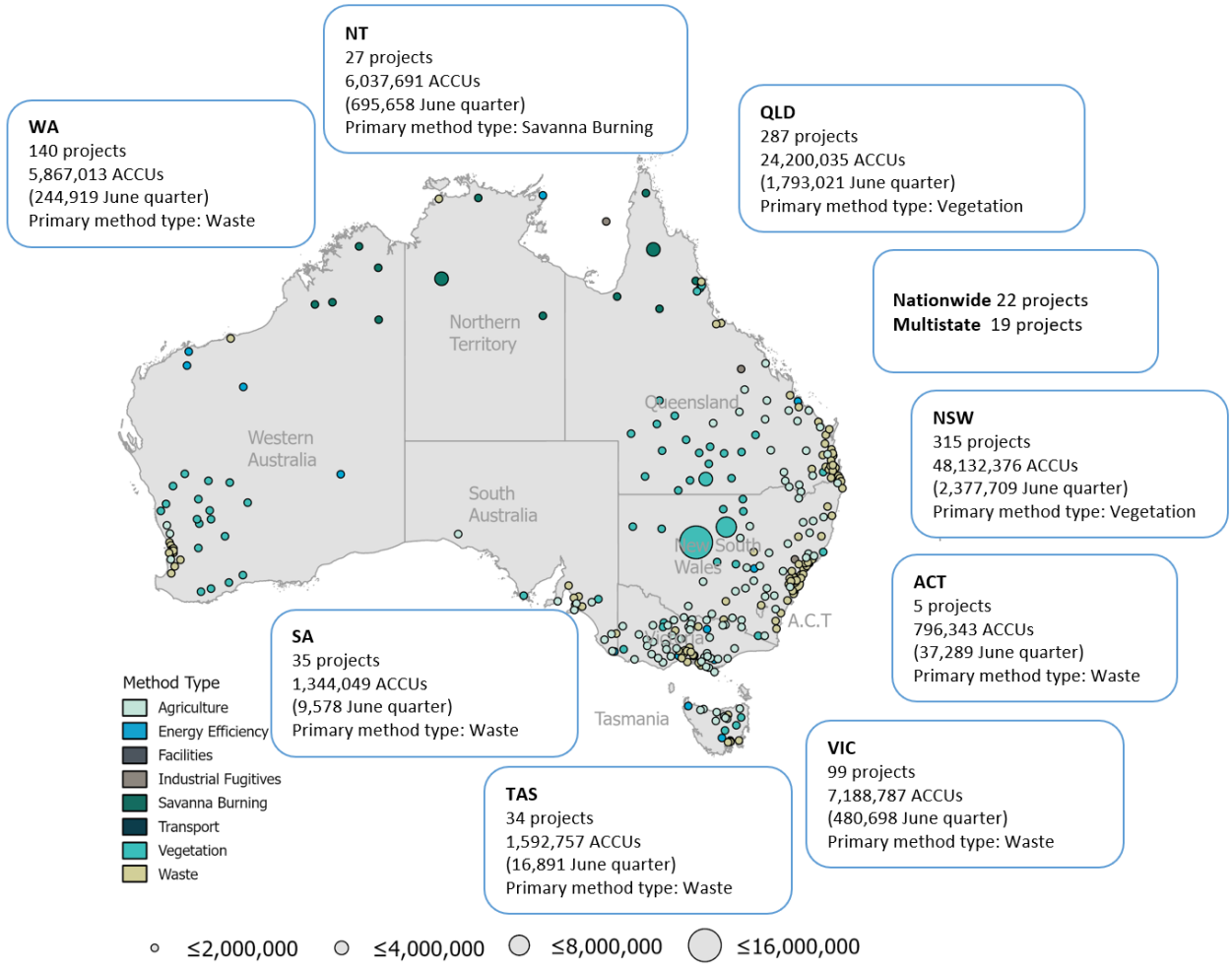
This quarter, 10 projects were credited for the first time contributing 272,138 ACCUs to the quarterly supply. On average, these 10 projects took 3 years to get from registration to crediting. Another 468 registered projects, including 100 soil carbon projects will contribute to ACCU supply in the future (see Table 1.2).

Projects in NSW led ACCU supply with 42% of the quarterly total units issued, followed by QLD with 32%. The majority of ACCUs issued in these states were for vegetation projects (see Figure 1.4).

Table 1.2: Crediting status of projects

Crediting status	No. of projects
Projects generating ACCUs	530
Projects yet to receive ACCUs[8]	468
Conditionally registered	*340*
Unconditionally registered	*128*

Figure 1.4: Total number of ACCUs issued per method type by location, June quarter 2021 and scheme-to-date



[8] Once projects are registered, they have a crediting period between 7 and 25 years depending on the method.

Projects

This quarter saw 47 projects registered – the largest June quarter registration in the scheme and more than double the number of projects registered during the June 2020 quarter (23 projects; see Figure 1.4). Collectively, these new projects are estimated to deliver up to 8 million tonnes of abatement over their lifetime. Growth in the number of projects registered under the soil carbon method continued, accounting for nearly half the projects registered under the ERF in the quarter (23 of 47 projects). This represents a nearly five-fold increase in soil carbon registrations since the June 2020 quarter (see Figure 1.5).

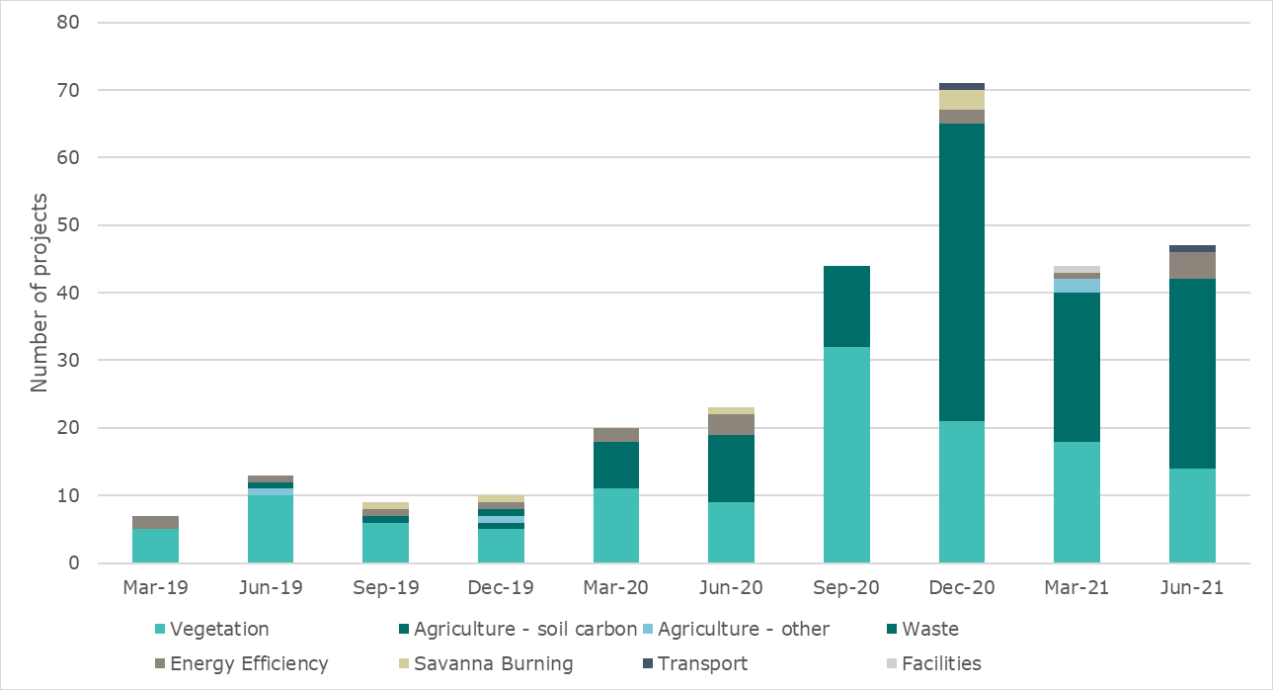
There is growing interest in industrial emissions avoidance, which has seen a 20% uptick in project registrations under the Industrial Energy and Fuel Efficiency and the Facilities methods compared to the previous year. This may reflect increasing interest by corporates in meeting emissions reduction and carbon neutrality goals.

Of note in this context were two interrelated projects registered this quarter at a Visy paper facility in Queensland. One project will reduce emissions (and receive ACCUs) by diverting commercial and industrial mixed solid waste from landfill (under the Alternative Waste Treatment method). The second project will use this diverted waste to generate a process engineered fuel which is credited ACCUs by displacing coal in the facility's boilers (under the Industrial Energy and Fuel Efficiency method). The combination of these projects is an example of opportunities for method stacking - implementing multiple projects under different methods at a single site.

The Land and Sea Transport method has seen a new project registered by Green Squares Solutions Pty Ltd, which proposes to reduce emissions by replacing or modifying existing marine vessels, changing energy sources or the mix of energy sources and changing operational practices. The new project, along with a project run by Corporate Carbon Solutions, will accelerate emissions reductions from marine vessels operating in Bass Strait. This brings the total number of projects registered under the Land and Sea Transport method to 6.

The increased pace of project registrations is expected to continue in the lead up to Auction 13 to be held on 13 and 14 October. For reference, 57 project applications were received in July 2020 prior to Auction 11. This was 5 times the average monthly project application submission in 2020. At the end of the June quarter, 46 project applications remained under assessment. Total number of projects registered under the ERF reached 998 at the end of the quarter and exceeded 1000 projects in the September quarter.

Figure 1.5: New registered projects per method type, March quarter 2019 to June quarter 2021



State investment builds

Building on the success of the 2020 investment round under the Land Restoration Fund (LRF), the Queensland Government announced a second investment round in June 2021, committing an additional $25 million to eligible carbon farming projects. Additionally, the Queensland Government is investing $35 million through the Land Restoration Fund Trust to establish the Queensland Natural Capital Fund. This fund will aim to promote ongoing private investment in environmental markets, furthering the objective of the LRF to deliver environmental and economic co-benefits.

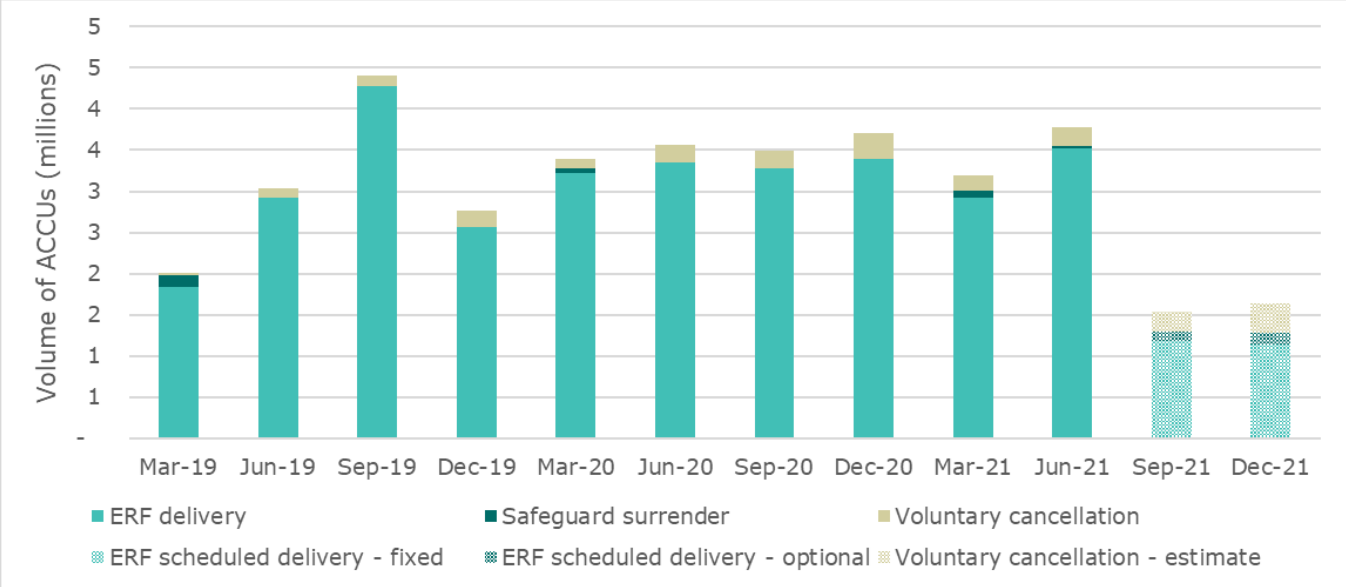
The Western Australian Government has announced its Carbon Farming and Land Restoration Program. Like Queensland's LRF, Western Australia's $15 million program aims to promote carbon farming and realise co-benefits for farmers, First Nations peoples and ecosystems.

Western Australia's program has two streams. The first - ACCU Plus, will offer up-front funding for new ERF carbon farming projects which deliver priority co-benefits for soil or vegetation projects. The second - Future Carbon, will provide grants to support the adoption of sustainable agricultural practices by funding projects with the potential to develop new or amended ERF methods. Expressions of interest to Western Australia's Carbon Farming and Land Restoration Program closed on 20 August 2021.

1.3. Factors impacting demand

Total ACCU demand in the June 2021 quarter reached 3.8 million compared to 3.6 million a year ago. Demand from voluntary participants and safeguard entities totaled 260,000 ACCUs, up 26% compared to the same period last year (see Figure 1.6).

Figure 1.6: Actual and estimated demand[9] for ACCUs (millions), March quarter 2019 to December quarter 2021



[9] Estimated demand is comprised of demand from scheduled delivery against Commonwealth contracts as at 30 June 2021 and estimated voluntary demand. Scheduled delivery against Commonwealth contracts include optional delivery contracts. ACCUs contracted against an optional delivery contract may not be delivered to the Commonwealth.

Commonwealth demand

At the end of the June quarter, deliveries against Commonwealth contracts totaled 69.5 million against the 202.6 million committed.

A total of 3.5 million ACCUs were delivered over the quarter, accounting for 93% of quarterly demand.

Growing voluntary demand combined with an increasing spot price may see sellers with optional delivery contracts preferring to sell to the secondary market rather than to the Commonwealth, indicating the success of optional delivery contracts in de-risking investment and facilitating the private market. Optional delivery contracts provide a guaranteed price from the Commonwealth but give contract holders the opportunity to seek higher priced buyers elsewhere.

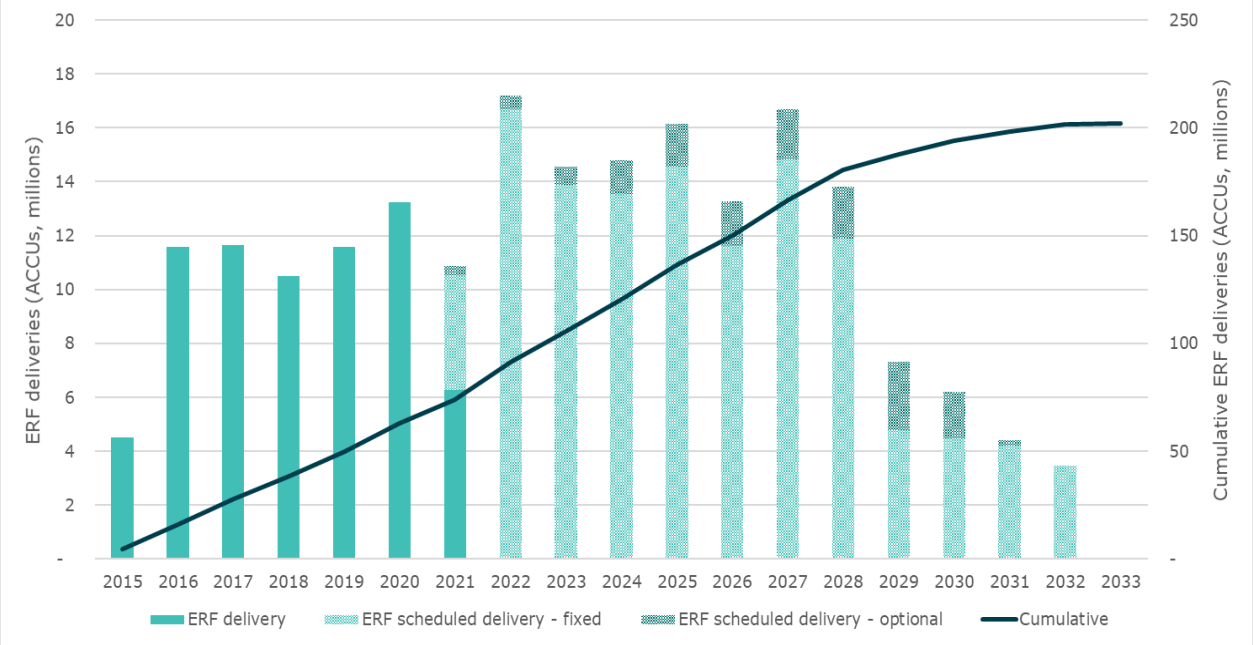
As expected, some optional delivery rights (100,000 ACCUs) lapsed since March 2020 with associated ACCUs sold to other buyers. However, the Clean Energy Regulator has seen a small number (5000 ACCUs) delivered early to future optional delivery contract milestones.

A further 2.3 million ACCUs are scheduled for delivery from fixed delivery contracts in the second half of 2021 (see Figure 1.7).

The ERF Auction 13 announced for 13 and 14 October will likely see continuing dominance of optional delivery contracts. Fixed delivery contracts will remain on offer.

If the dominance of optional delivery contracts continues it could be expected that deliveries to the commonwealth under fixed delivery contracts could peak in 2022 and would remain broadly static for a number of years before declining significantly. This would mean that the ACCUs from registered projects would increasingly be available to meet increasing private demand. Over time, it would also mean the Clean Energy Regulator would step back from being the biggest participant on the demand side of the market as private ambition increases. In that event, the Clean Energy Regulator would continue to play an assurance and support function for the market through optional delivery contracting and regulatory oversight.

Figure 1.7: Commonwealth delivery for current portfolio of projects (volume of ACCUs, millions), 2015 to 2033



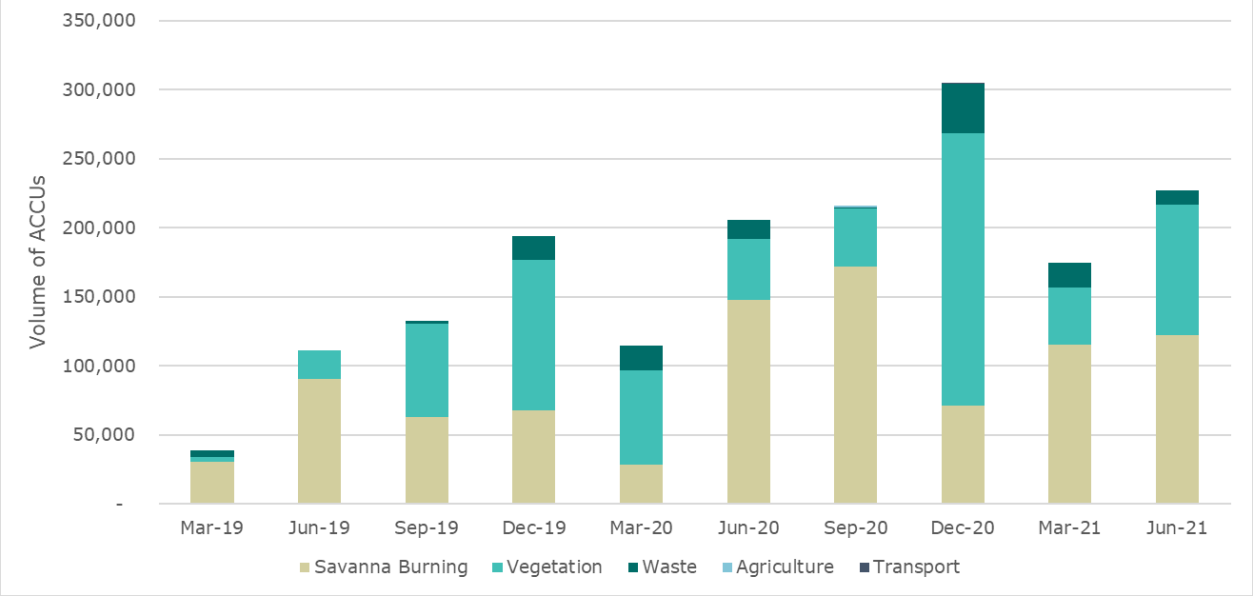
Voluntary ACCU demand

Voluntary demand for ACCUs in the June 2021 quarter was 227,000, an increase of 10% over the same period in 2020. A total of 61 entities cancelled ACCUs, with half cancelling ACCUs for the first time. Participants from the energy and property sector cancelled most units.

Climate Active accounted for 58% of the cancelled volume (132,000 ACCUs). Cancellations under Climate Active have seen significant growth with an 85% increase in cancelled volume compared to the June 2020 quarter.

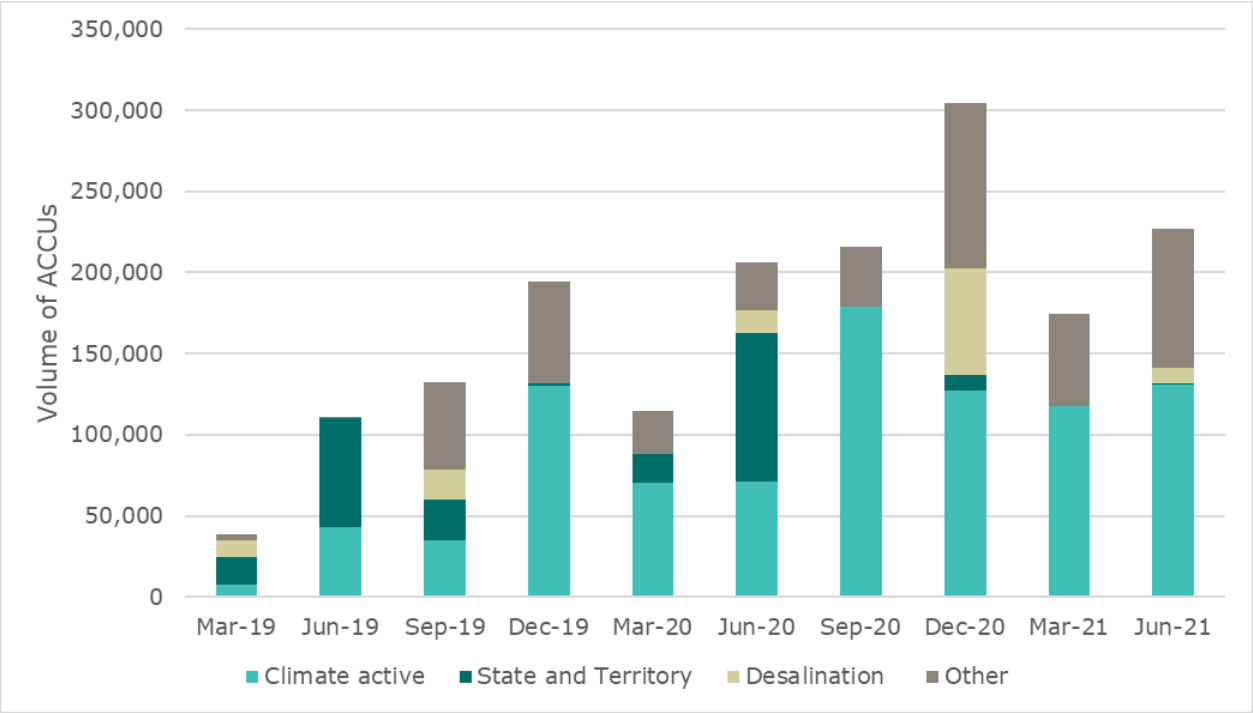
Participants in the voluntary market continue to show a preference for ACCUs from savanna burning projects, likely due to the associated indigenous co-benefits from many of these projects. Savanna Burning ACCUs accounted for 54% of voluntary cancellations this quarter (see Figure 1.8). ACCUs that have associated co-benefits tend to command a price premium above the carbon value in voluntary markets. Also, there is anecdotal evidence that the voluntary market tends to factor in elements of perceived quality of co-benefits in price setting.

Figure 1.8 Voluntary private and state and territory government ACCU demand by method type, March quarter 2019 to June quarter 2021



Voluntary cancellations typically increase in the second half of the year as the bulk of ACCU cancellations for reporting under the Climate Active program takes place during this period (see Figure 1.9). Voluntary cancellations for 2021 have already reached 401,000, up 25% compared to the 321,000 ACCUs cancelled over the same period last year. Total voluntary cancellations for 2021 is expected to exceed 1 million ACCUs. For comparison, in 2020 a total of 841,000 ACCUs were cancelled.

Figure 1.9 Voluntary private and state and territory government ACCU demand by category, March quarter 2019 to June quarter 2021



An update on the Australian Carbon Exchange

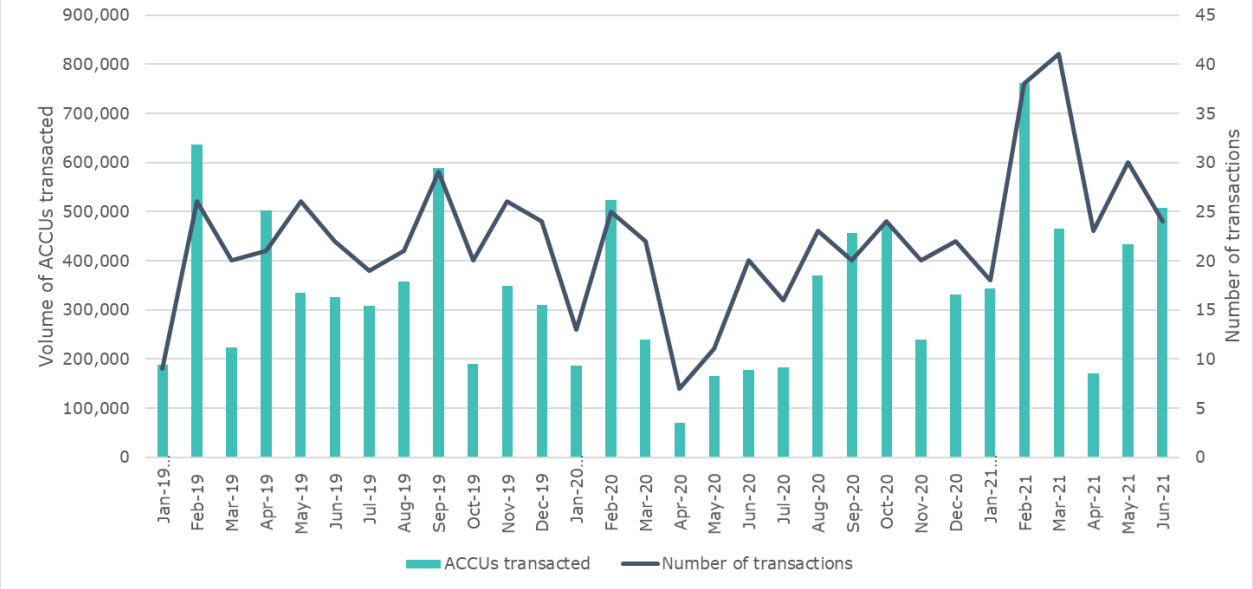
The Clean Energy Regulator's call for expressions of interest to accelerate the emergence of an exchange traded market for emissions offsets closed on 20 June 2021. There was strong response from industry with 27 submissions received. Responses are currently being shortlisted, with successful respondents likely to be advised in September 2021 and invited to submit a Request for Proposal.

1.5. Market trading

Following a record March quarter, market activity remained relatively high with 1.1 million ACCUs traded through 77 transactions in the June 2021 quarter (see Figure 1.10).

Volume transacted during the first half of 2021 (2.7 million) was nearly double that of the first half of 2020 (1.4 million). This increased activity stems from a combination of increased safeguard surrenders, increased voluntary cancellations from private and state and territory government entities, and entities accumulating ACCUs as a hedge or to meet future statutory or voluntary demand.

Figure 1.10: ACCU market transactions (excluding ERF transactions), January 2019 to June 2021[10]



Safeguard mechanism below baseline crediting

The 2021-22 Federal Budget committed $279.9 million to buy ACCUs from large industrial facilities cutting emissions below their safeguard mechanism baselines. This will implement recommendation 9.1 of the *Report of the Expert Panel examining additional sources of low-cost abatement* (the King Review), intended to help realise abatement opportunities in industrial facilities. In progressing this, the Department of Industry, Science, Energy and Resources has released a discussion paper on a proposed Safeguard Crediting Mechanism. Feedback on this discussion paper will close on 5 October 2021.

A list of all safeguard entities and their annual emissions is provided in the safeguard baselines table on the Clean Energy Regulator website.

[10] ACCU market transactions refer to the transfer of ACCUs between separate entities or groups and does not include issuances and surrenders of ACCUs. Transactions involving the transfer of ACCUs between project proponents, between project proponents and project developers, and between accounts belonging to the same company and/or subsidiaries are excluded.

Spot price

The ACCU spot price increased from $18.50 at the end of March to a record high of $19.30 at the end of the June 2021 quarter (see Figure 1.11).[11] Prices have continued to rise post quarter, reaching $22.40 in mid-August.

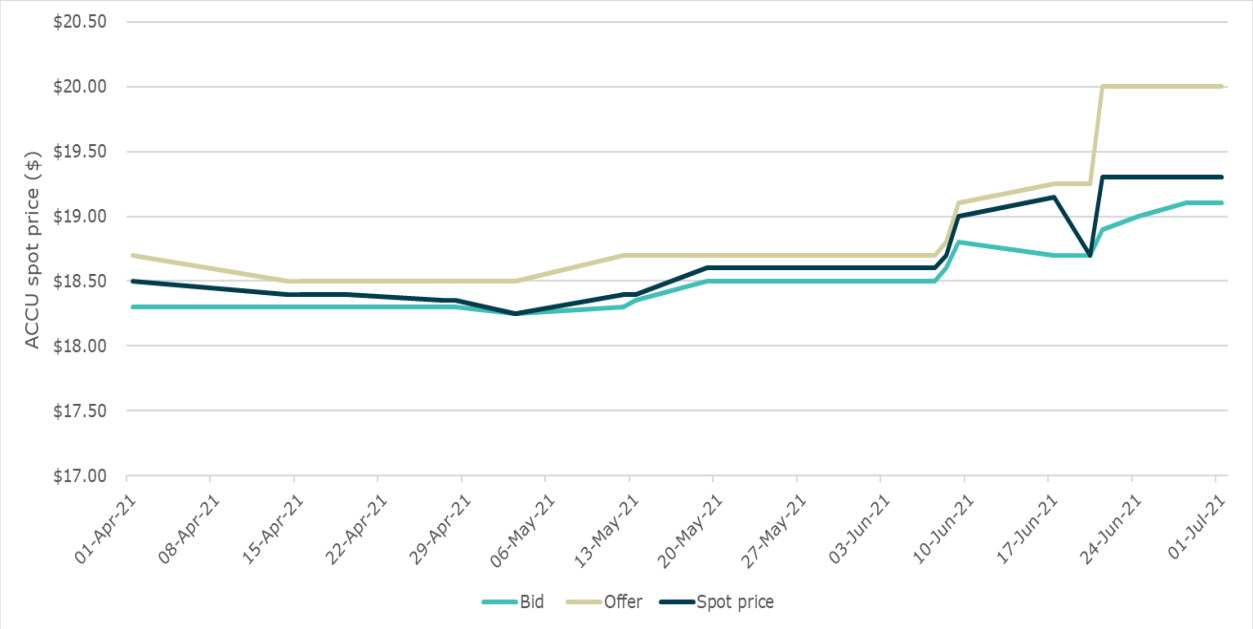
The disclosed forward market remains thin with a small number of relatively low volume trades. However, future prices are increasing with Cal22 trading at $18.70 at the start of the quarter and increasing to $23.70 in mid-August.

Prices have been increasing despite supply levels boosting holdings of ACCUs by 1.9 million units in the June quarter to reach a record 9.7 million units. Future supply prospects remain positive following the largest June quarter for project registrations in scheme history (47 projects), new supply being unlocked by new and varied methodologies and new projects potentially becoming attractive investments as a result of recent price-signals.

On the demand side, safeguard entities and voluntary participants have been actively accumulating ACCUs. Deliveries against Commonwealth contracts are scheduled to be relatively modest at 2.6 million for the remainder of the 2021 calendar year (see Figure 1.7). However, many contract holders choose to deliver their future contract obligations early which may result in a higher level of deliveries being made compared to what is scheduled for the remainder of 2021.

The ERF Auction 13 is expected to have high levels of participation and will provide a further price signal to the market. Historically, average auction prices tend to be lower than the spot price due to the competitive nature of the auction process and the low-risk nature of contracting with the Commonwealth. The optional delivery contract is likely to continue to be favoured and competitively priced as it offers a guaranteed price without limiting the potential for the seller to achieve higher prices on the secondary market.

Figure 1.11: ACCU spot prices ($AUD), June quarter 2021[12]



[11] Data sourced from Jarden and TFS Green.
[12] Data sourced from Jarden and TFS Green.

Other carbon units

European Union Allowance (EUA) prices have continued to increase, reaching a record high of AUD$89 at the end of June. Steeper decline in annual allowance from 2021 onwards, combined with tight gas supply leading to increased coal generation, is expected to keep EUA prices high in the near term.[13]

Certified emissions reduction (CER) unit cancellations in ANREU reached a record 4.5 million this quarter, compared to 2.7 million cancelled in the June 2020 quarter. CER cancellations in ANREU over the first half of 2021 totalled 6.3 million, surpassing the 5.8 million cancelled during 2020.

The availability of CERs at a fraction of the cost of an ACCU has seen some domestic entities preferring CERs over ACCUs. Uncertainty around the future of the Clean Development Mechanism may also be contributing to increased CER cancellations in the short term.

Increased attention on the origin and quality of units cancelled in the Australian market may impact the volume and type of unit cancellations moving forward. The Clean Energy Regulator will provide more information on the voluntary market, including a deeper breakdown on the type and purpose of units cancelled in the September Report.

Table 1.3 Domestic and international carbon market spot prices ($AUD)

Product	Spot price AUD (30 June 2021)[14]	Quarterly trend[15]
Australian carbon credit units (ACCU)	$19.30	+$0.80 (+4.0%)
Large-scale generation certificates (LGC) (CO_2-e)^	$50.57	+$0.38 (+0.8%)
Energy Saving Certificates - NSW (ESC)	$33.40	+$3.20 (+11.0%)
Victorian Energy Efficiency Certificates (VEEC)	$62.60	+$10.50 (+20.0%)
Certified Emissions Reduction (CER)*	$0.56	-
European Union Allowance Units (EUA)	$89.12	+$23.42 (+36.0%)
New Zealand Carbon Units (NZU)	$40.60	+$6.28 (+18.0%)
Korean Allowance Units (KAU)	$18.41	-$1.50 (-8.0%)

^LGCs prices are divided by the emissions intensity factor for the National electricity network to deduce the carbon abatement equivalent price for LGCs.
*CERs - Certified emissions reduction (CER) units are issued through the Clean Development Mechanism. No updated price available for CERs. Price is based on last recorded price at the end of 2020.

[13] Carbon Pulse, Euro Markets: Surging gas prices help EUAs erase last week's losses, Carbon Pulse, 16 August, 2021.
[14] Prices are in Australian dollars and were correct at time of conversion at 30 June 2021. Data sourced from Jarden, TFS Green, ICE, Korea Exchange.
[15] This is the quarterly trend from the end of the December 2020 quarter to the end of the March 2021 quarter.

1.6. Key dates

Date	Event	Significance
13-14 October 2021	ERF Auction 13	Auction guidelines and details about the auction process are available on the Clean Energy Regulator's Participating in an auction webpage.
1 November 2021[16]	National Greenhouse and Energy Reporting (NGER) and Safeguard application deadline	Deadline for NGER reporters and Safeguard entities to submit: • 2021-22 NGER data • calculated and production adjusted baseline applications (for baselines commencing 1 July 2020).
9-10 December 2021	8th Annual Australasian Emissions Reduction Summit 2021	This annual event, hosted by the Carbon Market Institute, will showcase world-leading knowledge sharing, commercial interactions and capacity building, helping delegates to manage climate risk and opportunities.

[16] The usual NGER and Safeguard application deadline is 31 October following the end of the financial year. In 2021 the deadline has been extended to 1 November, as 31 October falls on a weekend.

2. Large-scale generation certificates (LGCs)

Key highlights

- 304 megawatts (MW) of new large-scale renewable energy capacity was accredited in the June quarter bringing the total for the first half of 2021 to 473 MW
    - Approximately 2 gigawatts (GW) of capacity expected to be accredited in 2021, with 750 MW under application at the end of the quarter.
- 725 MW reached final investment decision during the quarter bringing the total to 744 MW for the first half year, compared to 962 MW for the first half of 2020.
    - In total, 2 to 3 GW of capacity is still expected to reach final investment decision in 2021
- Over the first half of 2021, 2.9 million LGCs have been voluntarily surrendered, putting voluntary surrenders on track to reach 5 million LGCs in 2021.
- LGC spot prices remained stable across the quarter, finishing at $33.25
- Supply is expected to be in the upper end of the range of 37 to 40 million LGCs in 2021

2.1. Supply and demand balance

For the 2021 assessment year, between 43 and 46 million LGCs are estimated to be available. This consists of 6.1 million LGCs that have been carried forward from previous years and 37 to 40 million LGCs that are expected to be created in 2021.

To meet the 2021 Renewable Power Percentage,[17] approximately 32.6 million LGCs are required to be surrendered.

Liable entities eligible for shortfall charge refunds may increase demand by an additional 3.4 million LGCs. Voluntary demand for LGCs is on track to reach 5 million certificates.[18]

These supply and demand factors are expected to result in a balance between 2.1 and 5.1 million LGCs at the end of the 2021 assessment year if no shortfall charge is taken (see Table 2.1).

This likely balance suggests some shortfall charge will be taken to ensure sufficient LGC liquidity, but potentially not as much as in recent years.

[17] The Renewable Power Percentage (RPP) is set each year in regulation under the *Renewable Energy (Electricity) Act 2001. For 2021 the RPP is 18.54%.*

[18] For more information see the March Quarter 2021 Quarterly Carbon Market report.

Table 2.1 Estimated LGC supply and demand balance in 2021 assessment year

	Supply	Demand
LGCs available from previous assessment years[a]	+6.1 million	
2021 LGC supply[b] (available for 2021 surrender)	+37 to 40 million	
Legislated demand for 2021[c]		-32.6 million
Shortfall charge refunds[d]		-3.4 million
ACT Government scheme		-2.2 million
Other Voluntary surrenders[d]		-2.8 million
Estimated total balance for 2021 assessment year		**+2.1 to 5.1 million**

Notes:
[a] Number reflects LGCs created before 2021 but still registered as available in the REC Registry as at 15 February 2021.
[b] Numbers based on the lower bound range estimate of 37 million LGC supply in 2021.
[c] Number assumes no shortfall is taken for the 2021 assessment year.
[d] These values are estimates for 2021 and could vary significantly based on commercial decisions.

2.2. Factors impacting supply

LGC supply

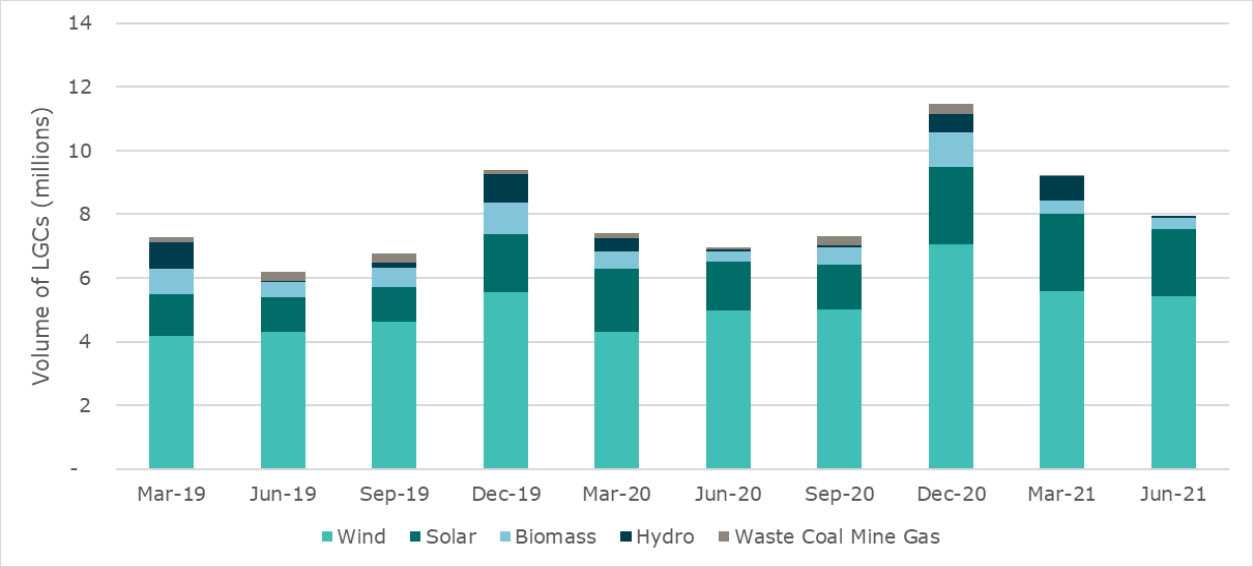
LGC supply in the June quarter totalled 8 million, a 14% increase on the 7 million LGCs created in the same period in 2020 (see Figure 2.1). This brings total LGC supply in the first half of 2021 to 17.2 million LGCs, up 2.8 million on the LGC supply of 14.4 million in the first half of 2020 - a 19% increase.

If the current upward trend in creations continues in the second half of 2021, it is likely that total creations for 2021 will be at the upper end of the 37 to 40 million LGC estimate.

Total renewable electricity generation accounted for 29.0% of total National Electricity Market (NEM) generation over the first half of 2021, an increase of 4.4 percentage points over the 24.6% achieved in the first half of 2020.[19]

From 1 January 2021, generation from waste coal mine gas is no longer eligible to create LGCs. This will have minimal impact on future LGC supply. In 2020 waste coal mine gas accounted for only 2.5% of total LGCs (see Figure 2.1). All LGCs for eligible waste coal mine gas generation have now been created, with the final 11,000 LGCs supplied in the March 2021 quarter.

Figure 2.1 LGCs validated by technology type (millions), March quarter 2019 to June quarter 2021



[19] This estimate includes rooftop solar, utility-scale wind and solar, hydro and biomass. It is based on data sourced from OpenNEM.

Accreditation

In total, 77 power stations have been accredited with a cumulative capacity of 473 MW over the first half of 2021 (see Table 2.2).

In the June quarter, 16 power stations were accredited with a cumulative capacity of 103 MW.

A further 20 power station applications with a combined capacity of 202 MW were approved during the June 2021 quarter that started generation during the March 2021 quarter.[20]

Chichester solar farm (72 MW) was the largest power station accredited in the June quarter. This solar farm is an off-grid power station in Western Australia intended to displace an existing 58 MW diesel generator.

At the close of the quarter, there were 123 power station accreditation applications on hand with a combined capacity of 750 MW. The Clean Energy Regulator expects it will accredit approximately 2 GW of large-scale capacity in 2021.

While this is lower than the 4 GW accredited in 2020, it does not suggest a material downward trend. The reduction in accredited capacity in 2021 is partly due to the timing of accreditation for several utility scale power stations, which were expected to come online in 2021, but commenced generation in late 2020.

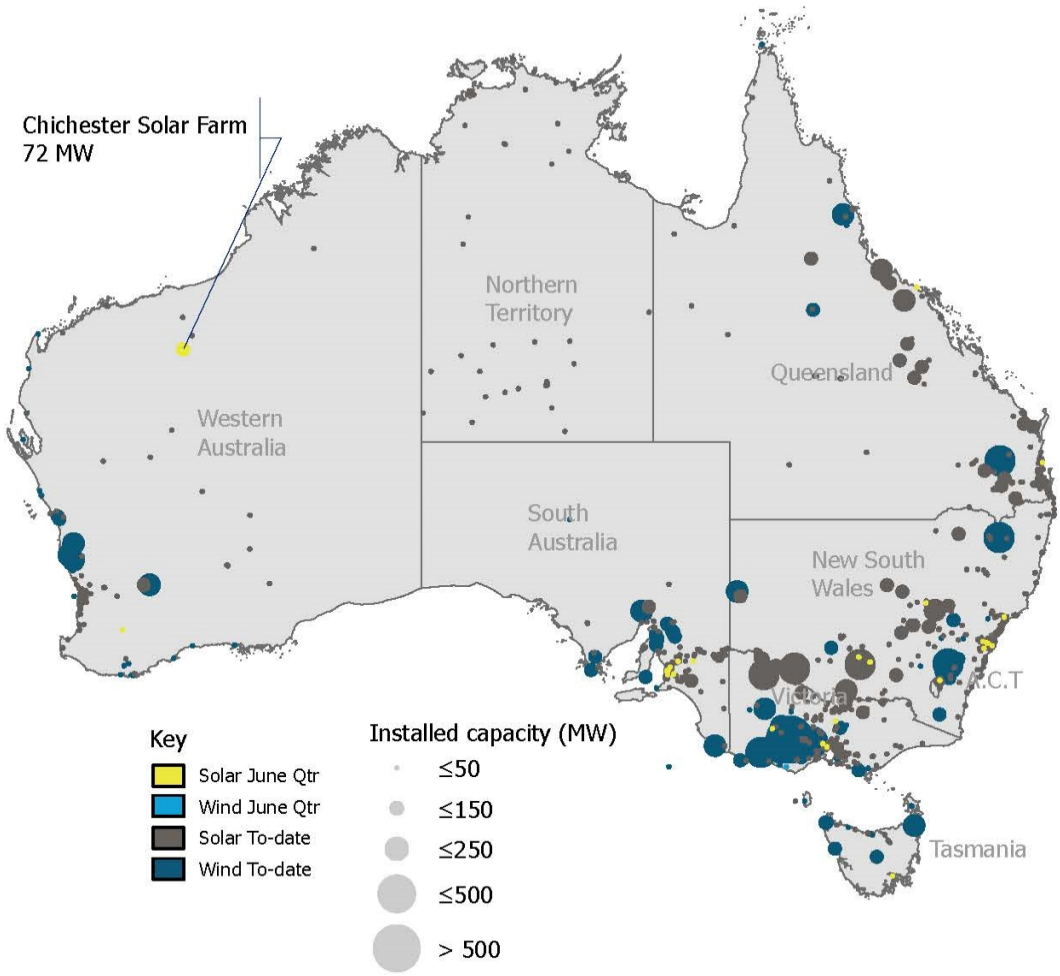
Table 2.2 Power station accreditation capacity (MW) and count by state, 2021 to date

	Capacity (MW)	Count
ACT	0.2	1
NSW	63.0	27
NT	1.1	1
QLD	13.1	14
SA	7.9	7
TAS	0.4	1
VIC	312.4	19
WA	74.9	7
Total	**473**	**77**

Note: Totals may not sum due to rounding

[20] The accreditation start date is the latter of either the date of first generation or the date the application is deemed 'properly made' – that is the date the applicant provides the Clean Energy Regulator with all necessary and relevant information to complete assessment of the application. This can lead to power stations being approved during one period with an accreditation start date in an earlier period, as has occurred with the 202 MW of capacity approved over the June 2021 quarter but with an accreditation start date in the March 2021 quarter.

Figure 2.2 Wind and solar power stations accredited capacity by location (MW), June quarter 2021 and scheme to-date



Update on the large-scale renewable energy investment pipeline

The Clean Energy Regulator developed its large-scale renewable energy investment pipeline tracker in 2016.

Since then, over 10 GW of large-scale capacity has been tracked on the pipeline – from a Power Purchase Agreement (PPA) first being signed through to final investment decision (FID) and accreditation under the Large-scale RET (when LGCs can be created).

The Clean Energy Regulator assigns projects on the renewable pipeline to one of three categories according to its stage of development, from probable to committed to accredited. See Table 2.3 below for more detail.

The renewable pipeline is publicly available and updated monthly on large scale renewable energy target supply data.

The Clean Energy Regulator largely uses open source monitoring of public announcements to track project progress through these stages.

However, the industry is increasingly shifting towards larger projects owned by international developers who may not have obligations to make public announcements.

The Clean Energy Regulator also engages directly with developers on active projects and lifecycle expectations, undertakes enhanced environmental scanning and uses geospatial imagery to update the pipeline.

Table 2.3 LRET Pipeline categorisation matrix

	Criteria			
Pipeline category	**Project has a disclosed PPA for all or some of its generation or other evidence of funding**	**Project has development approval**	**Project has reached final investment decision[21] or substantial construction has commenced**	**Accredited by the Clean Energy Regulator**
Probable	Yes	Yes	No	No
Committed	Sometimes^	Yes	Yes	No
Accredited	Sometimes^	Yes	Yes	Yes

^ Projects sometimes have a disclosed PPA before they reach final investment decision or are accredited. Sometimes power stations can reach these stages without having a PPA: for example, where a power station may choose to proceed on a merchant basis. PPAs are commercial documents and their existence is not always disclosed.

Final investment decision expectations for 2021

At the start of the year, the Clean Energy Regulator estimated 2 to 3 GW was expected to reach FID in 2021.

This range was maintained at the end of the March quarter despite reporting only 19 MW reaching FID during that quarter.

725 MW of projects achieved FID in the June quarter giving a total of 744 MW for the first half of 2021. This is further evidence that FID announcements can be uneven from quarter to quarter.

962 MW reached FID last year in 2020, and the full year finished at 2.7 GW.

In this June quarter report, the Clean Energy Regulator maintains the 2 GW to 3 GW estimate for the full 2021 calendar year based on:

- 744 MW of capacity reaching FID over the first half of 2021 – publicly announced
- 1.6 GW that has either already reached, or is expected to reach FID in the second half of 2021 based on public statements by companies and engagement with project developers on their target dates, and
- Up to 1.6 GW of projects that the Clean Energy Regulator expects to reach FID in 2022, noting industry sources are optimistic some of this capacity will reach FID in 2021.

Making forward estimates of FID is very challenging. Given the commercial nature of these decisions, timing can vary significantly from what might be planned. There can also be surprises on the upside of projects reaching FID which are not currently visible to the Clean Energy Regulator.

However, the Clean Energy Regulator has a proven track record of accurately estimating the FID range. Early in the 2019 and 2020 calendar years the Clean Energy Regulator estimated the likely range as between 2 GW and 3 GW with actual values in each year being 2.1 GW and 2.7 GW respectively.

For 2021, the Clean Energy Regulator expects the capacity reaching FID may be at a similar level to 2020, with the potential to even exceed 3 GW despite only 744 MW reaching FID at the end of June.

The Clean Energy Regulator is of the view that the prospects for material capacity achieving a FID for the balance of this calendar year and into early 2022 is strong. It will be interesting to see the final capacity announced in 2021 versus early 2022.

[21] FIDs can be made after completion of permits and financial arrangements and once the site is ready for construction work.

Trends in Final investment decisions

Investment trends can only be accurately called by considering multiple years rather than by single quarters within a year. Figure 2.3 shows 3 distinct investment trends:

- Pre 2016 – Prior to the resetting of the RET in 2015, an average 400 MW of projects reached FID per annum.

- 2016 to 2018 – The Boom Years. Following the announcement of the revised 2020 target, there was a significant increase in capacity achieving FID with an average of 3 GW per annum across the three-year period.[22]

- 2019 and beyond – Consolidation. By the end of 2018, it was clear to the market that enough capacity had been committed to achieve the 2020 target.[23] After any boom, a 'pull-back' in investment is typically observed. The average capacity reaching FID in 2019 and 2020 was 2.4 GW per annum. As discussed above, 2021 is likely to be a similar total with potential for some upside.

Figure 2.4 shows the same data as figure 2.3 but on a quarterly basis. It is clearly evident how 'lumpy' investment is over such short periods and how difficult it is to deduce a trend.

Based on the information available to the Clean Energy Regulator, investment seems to have settled at an average of approximately 2.5 GW per annum reaching FID and may be trending up.

This is quite an extraordinary effort by the renewables industry in the context of increasing difficulty, time and cost in grid connections. This result contrasted with some industry commentators' predictions that FID would go to zero once it was clear enough capacity would be built to meet the 2020 target.

FIDs are the lead indicator of the investment outlook for renewable capacity in future years (see Figure 2.3). Projects reaching final investment decision in one year may take between 1 and 3 years to be constructed and reach accreditation.[24]

Based on engagement with market participants, the outlook remains strong with no evidence that investment is stalling.

Projects with a PPA

Throughout the June quarter, 60 MW was added to the probable pipeline of projects with a PPA and 511 MW advanced from probable to committed status where the project also has development approvals and has reached FID. The total probable pipeline now stands at 3.5 GW.

With a joint probable and committed pipeline of 7.1 GW, prospects for the renewable energy industry over the next few years is positive.

At some point, investment in renewables may stall if delivery of transmission and interconnector upgrades are not sped up.

The Clean Energy Regulator will continue to monitor the pipeline and the Australian renewables investment environment for any early indications of a change in investment patterns.

[22] The target was re-set in mid-2015 and the market stared responding with FIDs in 2016 which then materially increased in 2017 and 2018.
[23] Clean Energy Regulator Quarterly Carbon Market Report March 2021
[24] A solar farm can generally be built within 1 year but the larger projects take longer. A very large wind farm could take 3 years to be constructed and commissioned.

Figure 2.3 Financial investment decision and accredited capacity over time, 2009 to 2021 (estimated)

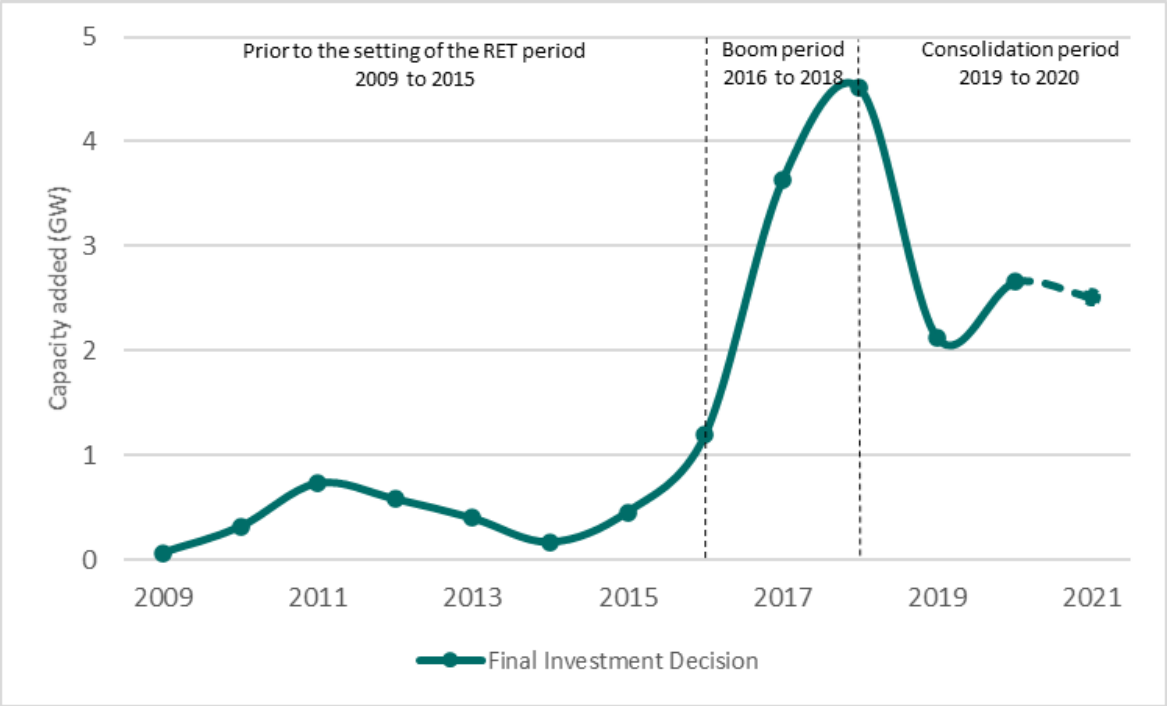
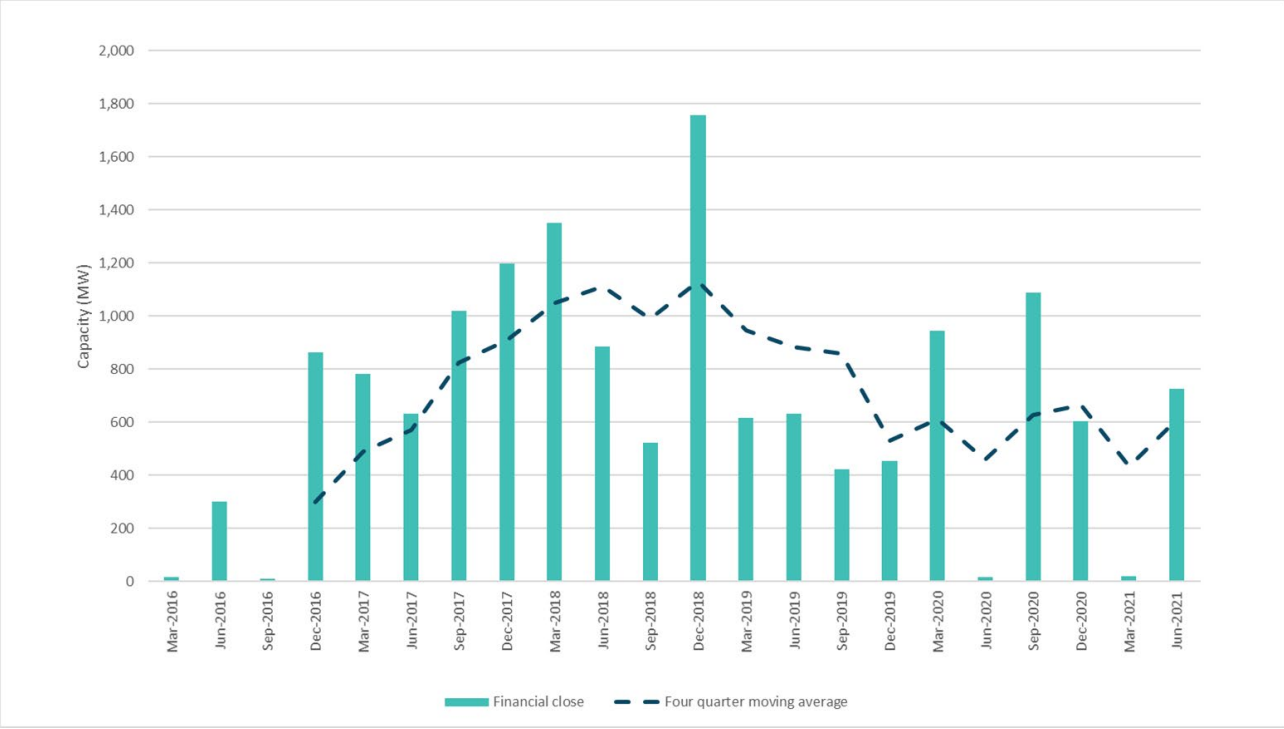


Figure 2.4 Capacity committed per quarter and 4 quarter moving average (MW), Q1 2016 to Q2 2021



2.3. Factors impacting demand

Voluntary private and state and territory government demand

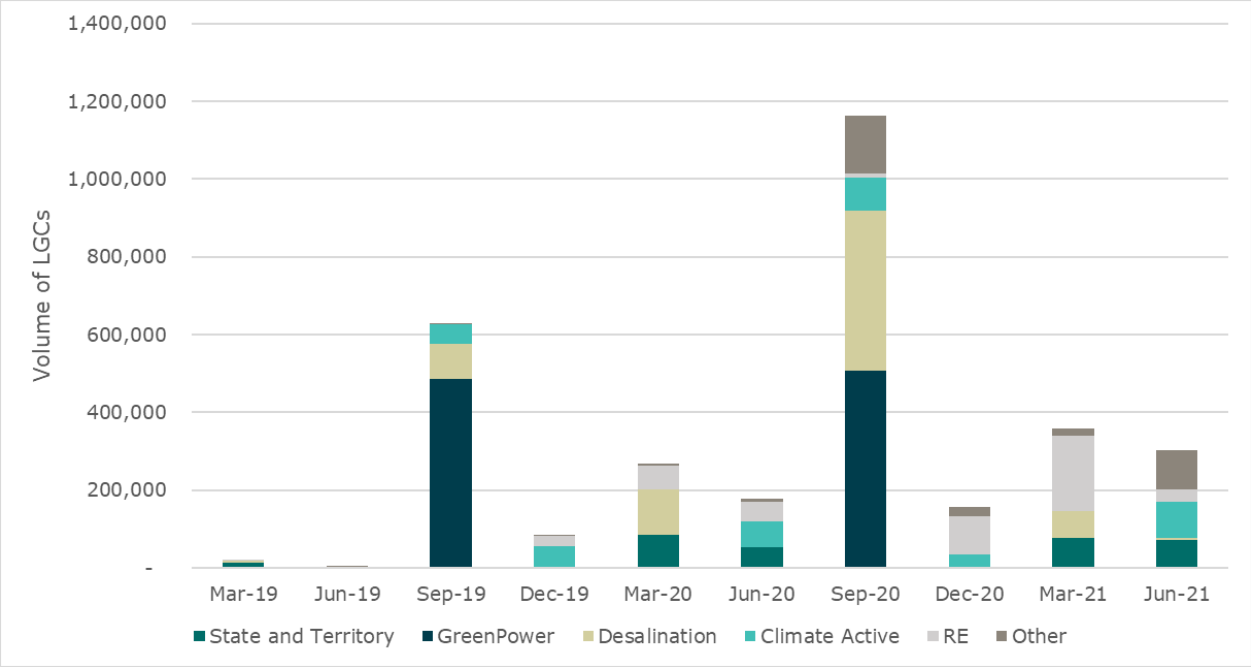
The June 2021 quarter saw 2.5 million LGCs voluntarily surrendered with 2.2 million of these surrendered by the ACT government. In 2020, the ACT government surrendered LGCs towards its renewable electricity target in the September quarter.

Excluding the ACT Government, voluntary surrenders grew by over 70%, from 178,000 LGCs surrendered in the June 2020 quarter to 303,000 LGCs surrendered this quarter.

The use of LGCs in the Climate Active program has reached a new record with 95,000 certificates surrendered this quarter, up 11% from the previous record of 85,000 LGCs surrendered in the September 2020 quarter.

With 2.9 million LGCs surrendered over the first half of 2021 and surrenders from Greenpower anticipated in the September quarter, voluntary surrenders in 2021 are on track to reach 5 million LGCS. This is an increase of 25% on the 4 million LGCs voluntarily surrendered in 2020.

Figure 2.5 Voluntary LGC surrenders by category, March quarter 2019 to June quarter 2021 (excludes ACT Government surrenders)



Note: Graph excludes two surrenders by the ACT government: 2.3 million LGCs in the September 2020 quarter and 2.2 million LGCs in the June 2021 quarter.

Hydrogen Guarantee of Origin discussion paper released

Hydrogen will be an internationally traded commodity and Australia is well placed to be a major exporter.

Germany[25], the Netherlands, Belgium and Spain have signalled their intention to import clean hydrogen and Japan[26], South Korea, Singapore and China are also investing in the hydrogen economy.

On 21 July 2021, the Department of Industry, Science, Energy and Resources released a discussion paper for *A Hydrogen Guarantee of Origin scheme for Australia*. Extensive consultation by the Department over 2020 found strong support for early adoption of a Guarantee of Origin (GO) Scheme to improve transparency of the emissions intensity of hydrogen, promote industry growth and enable informed choice by customers.

The paper describes a certification scheme to measure and track the emissions associated with three hydrogen production methods: electrolysis, coal gasification with carbon capture and storage and steam methane reformation with carbon capture and storage. Certification of renewable electricity is also proposed, in recognition of emerging demand for hydrogen derived from renewables. Offsets from projects that reduce, remove or capture emissions are considered, noting that international views are still evolving.

The paper sought stakeholder views on extending the GO framework over time to cover other low emission products such as clean ammonia, aluminium and clean steel.

Submissions on the Hydrogen GO discussion paper closed on 6 August 2021.

These submissions will, in part, be used to inform the design of a hydrogen GO trial to be run by the Clean Energy Regulator, for which the Australian Government provided funding in the 2021-22 Budget. Updates on this initiative will be published on the Clean Energy Regulator's website.

[25] Thomson Reuters, 'Germany, Australia sign hydrogen accord to boost lower-emissions technology', Thomson Reuters, 14 June 2021, accessed 26 July 2021.
[26] J Smyth and R Harding, 'Australia 'hydrogen road' to Japan set to cut emissions', Australian Financial Review, 1 December 2020, accessed 27 July 2021.

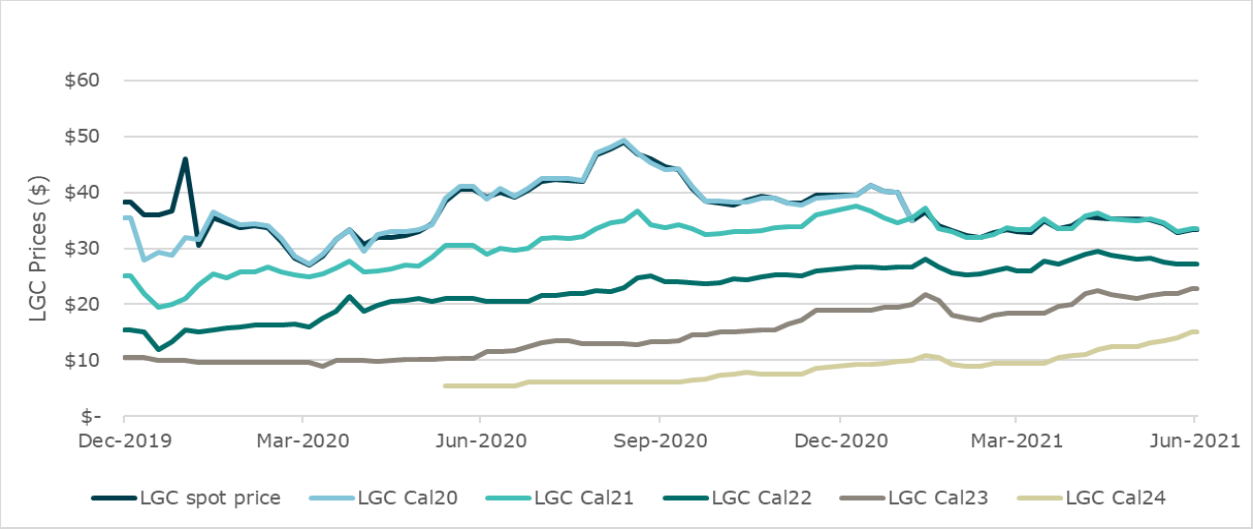
2.4. Market trading

Over the June quarter, the LGC spot price experienced a modest increase from $33.00 at the start of April to a peak of $35.55 in May, before moderating back down to $33.25 at the end of June.

The forward prices for LGCs have steadily increased, continuing their convergence toward the LGC spot price as they approach maturity.

The LGC Cal23 and Cal24 forward prices experienced the steepest inclines over the June quarter, with Cal23 prices increasing by 24% from $18.40 to $22.75 and Cal24 prices increasing by 58% from $9.50 to $15.00. This tightening of the spot-forward spread is likely due to growing expectations of demand from voluntary participants and entities seeking shortfall refunds in future years.

Figure 2.6 LGC spot and forward prices ($AUD), December 2019 to June 2021



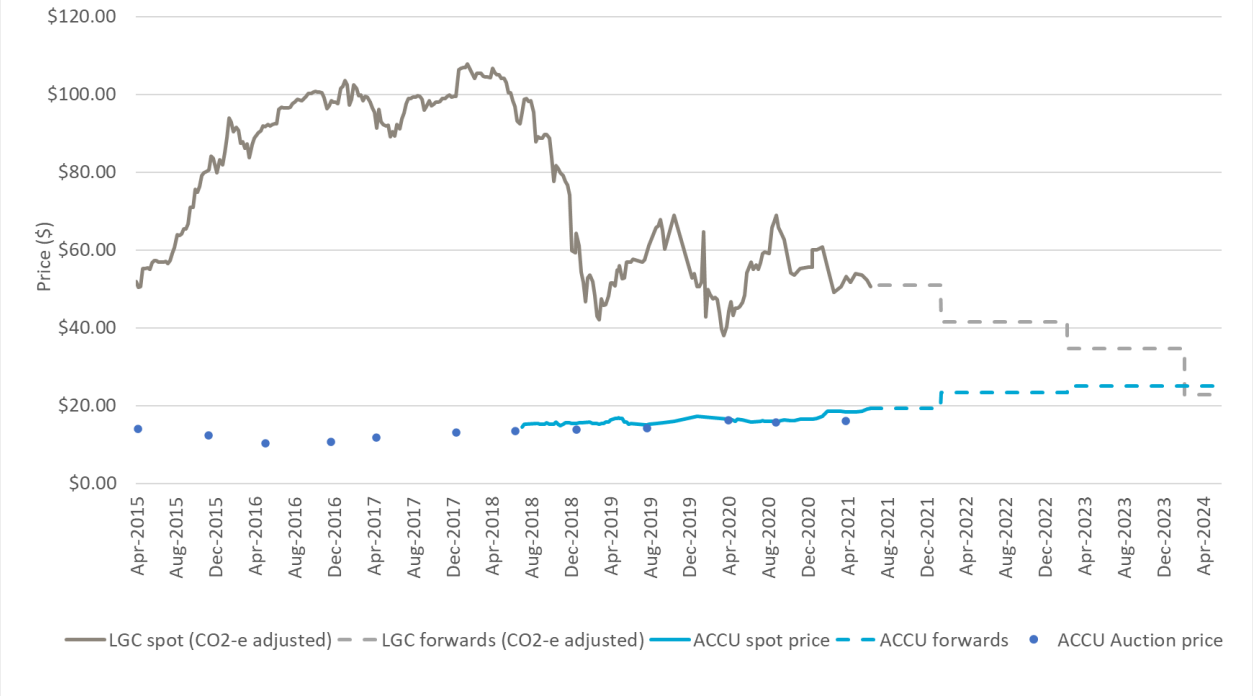
ACCU-LGC price Convergence

The Clean Energy Regulator is continuing to monitor forward prices to determine the point of potential convergence between ACCUs and the equivalent carbon content of LGCs.

Based on current forward prices, the ACCU price is estimated to converge on the equivalent LGC price in early 2024 (see Figure 2.6).

The convergence may occur earlier or later depending on the actual future LGC and ACCU prices. Increase in LGC forward prices will shift the timeline out, whereas an increase in ACCU forward price will draw it closer.

Figure 2.7 ACCU and LGC price convergence ($AUD), 2015 to 2024



2.5. Key dates

Date	Event	Significance
14 February 2022	Lodgement of energy acquisition statement and surrender of LGCs Submit Electricity Generation Returns	This will be the final date for liable entities to: • lodge their energy acquisition statement(s) and surrender LGCs for the 2021 assessment year, and • pay any applicable shortfall charges for the assessment year.

3. Small-scale technology certificates (STCs)

Key highlights

- Over 803 megawatts (MW) small-scale solar photovoltaic (PV) capacity installed, an increase of 18% compared to the June 2020 quarter
- Installed capacity of small-scale solar is now expected to be just over 3 GW for 2021 because of the lockdowns during and post the June quarter
- A balance of 5.8 million STCs remained in the market after the June quarter surrender of 12.5 million STCs on 28 July 2021
- The STC spot price was steady over the June 2021 quarter, finishing at $38.85

3.1. Supply and demand balance

STC supply for the first half of 2021 totalled 24.7 million, 13% above the same period in 2020. In addition, 8.6 million STCs were carried forward from earlier assessment years into the 2021 assessment year.

Over the first half of 2021, an average 963,000 STCs per week were created. Had this rate continued, a surplus of 12.4 million STCs would have emerged at the end of the year.

The impact of state lockdowns—particularly post the end of the June quarter–will likely have a negative effect on installations and certificate creation rates. While it is too early to say with any certainty, this could reduce the size of the expected STC surplus at the end of 2021. Preliminary data suggests the creation rate has reduced by as much as 16% when compared with the first half of the year with 809,000 certificates created in the week beginning 2 August.

At this stage, the Clean Energy Regulator still expects there will be sufficient STC supply for the remainder of the 2021 assessment year. Supply still looks on track to exceed the 50.6 million certificates required to be surrendered under the Small-scale Technology Percentage. Therefore, the clearing house is unlikely to see material use.

A balance of 5.8 million STCs remained in the market after the 28 July surrender of 12.5 million STCs.

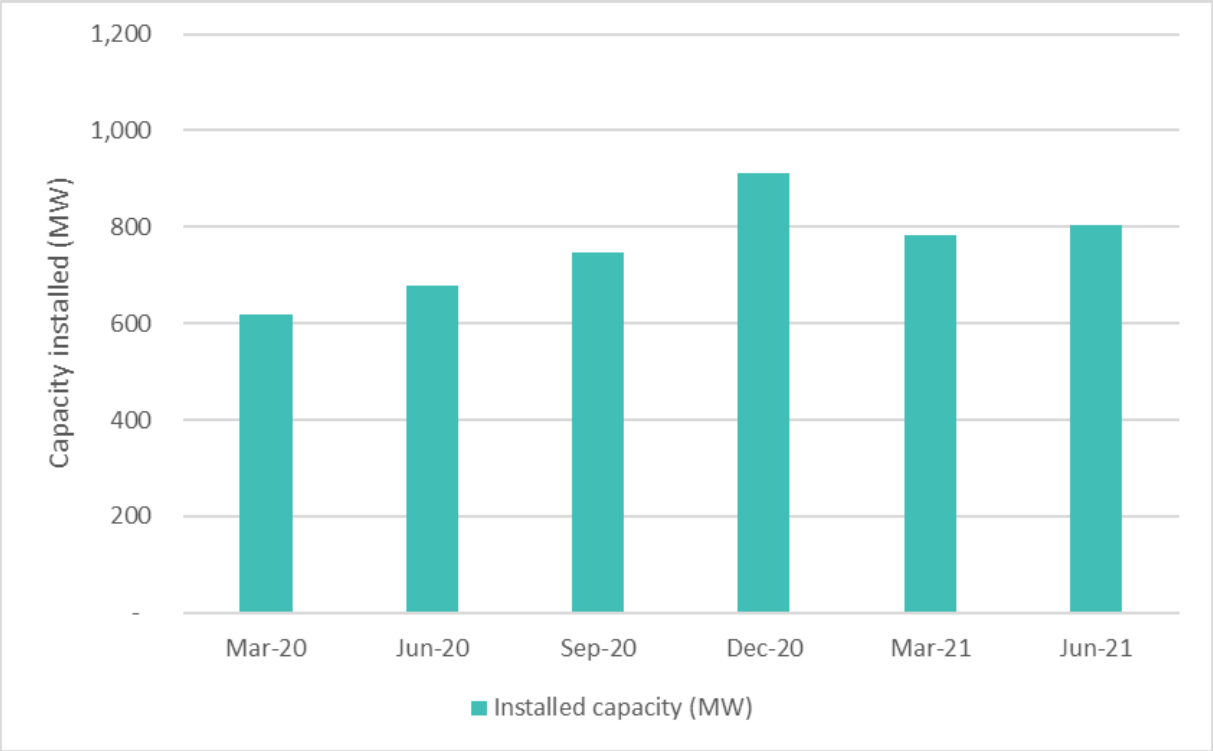
3.2. Factors impacting supply

Solar PV and installations

The Clean Energy Regulator is now expecting just over 3 GW of installed capacity for 2021, given the extensive lockdowns after the end of the June quarter. The Clean Energy Regulator will provide updated estimates in the September 2021 quarter report.

Over 803 MW of rooftop solar PV capacity was installed in the June quarter. This took total installed capacity over the first half of 2021 to 1.6 GW, an increase of 22% over the 1.3 GW installed over the first half of 2020 (see Figure 3.1).

Figure 3.1 Small-scale solar PV capacity (MW), March quarter 2020 to June quarter 2021



Typically, more rooftop solar PV capacity is installed in the second half of the year, as was evident in 2020 when installed capacity was 28% higher than the first 6 months of that year. Based on installed capacity in the first half of 2021, and assuming this seasonal pattern had held, the total capacity for the year could have exceeded 3.6 GW (see Figure 3.2).

It is too early to know the full impact the lockdowns will have on total installations for the year. However, it is likely to be material with restrictions in New South Wales and Victoria protracted after the end of the June quarter. As seen after the lockdown in greater Melbourne in 2020, installation rates for rooftop PV across the latter half of 2021 and into early 2022 can be expected to increase strongly in these jurisdictions if restrictions ease and installations on occupied residences can resume.

The observed year on year growth in installed capacity is driven by increasing numbers of rooftop solar PV installations and increasing average system size. The number of installations grew by 15% from 84,700 in the June 2020 quarter to 97,100 in the June 2021 quarter, while average system size grew from 7.5 kilowatts (kW) to 8.3 kW over the same period (see Figure 3.3).

New South Wales continued to lead rooftop solar PV uptake across Australia, followed by Queensland and Victoria (see Table 3.1). With these three jurisdictions accounting for 78% of quarterly capacity, the impact of the COVID-19 lockdowns on the remainder of the year could be substantial.

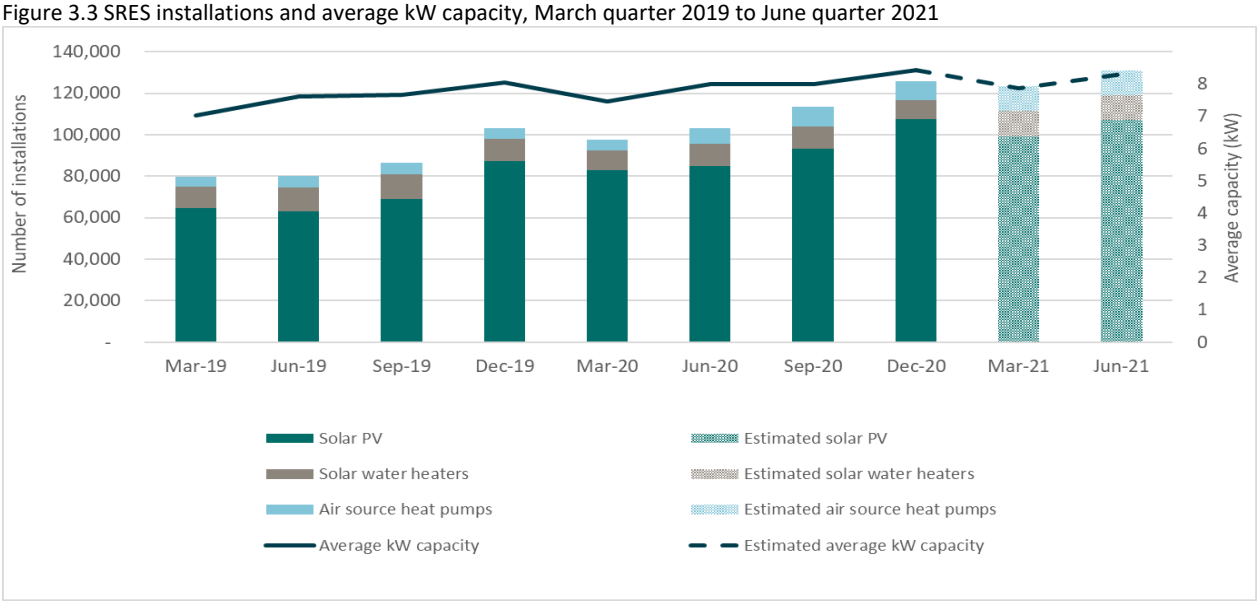
Table 3.1 Estimated rooftop solar PV (<100 kW) capacity by state, June 2021

	Estimated capacity (MW)
NSW	258
QLD	207
VIC	157
WA	91
SA	65
ACT	13
TAS	8
NT	3
Total	**803**

Note: Totals may not sum due to rounding

Figure 3.2 Small-scale solar PV installations and capacity (MW), 2010 to 2021

Figure 3.3 SRES installations and average kW capacity, March quarter 2019 to June quarter 2021



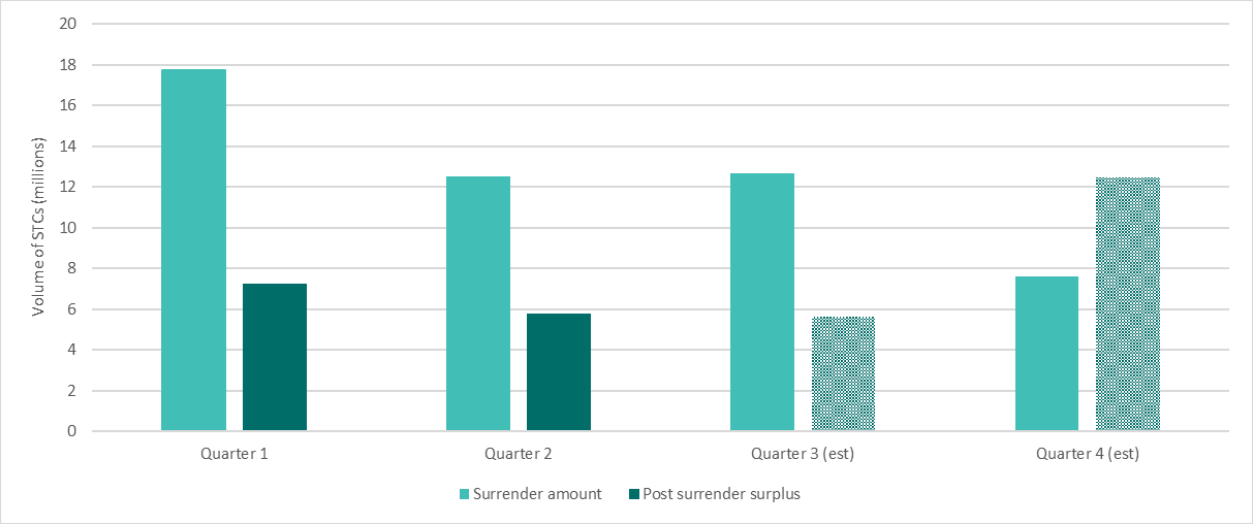
3.3. Factors impacting demand

Quarterly surrender

To meet the June quarter liability on 28 July 2021, 122 liable entities surrendered 12.5 million STCs. This was the second surrender period of the 2021 assessment year, representing 25% of total liability. A balance of 5.8 million STCs remained in the market after surrender (see Figure 3.4).

To meet the September quarter surrender obligations on 28 October 2021, liable entities are required to surrender 12.7 million STCs. Based on current creation trends, there will be sufficient liquidity in the market with a surplus of 5.6 million STCs expected after the September 2021 quarter surrender.

Figure 3.4 STC surplus after quarterly surrender (millions of STCs), 2021



3.4. Market trading

Over the June quarter, 36.6 million STCs were traded through 3,500 transactions, with an average transaction size of 10,370 STCs (see Figure 3.5). Less than half a percent of the STCs traded in the March 2021 quarter were traded through the clearing house, consistent with previous quarters.

The STC spot price remained relatively steady over the June quarter, moving between $38.55 and $39.00 before closing the quarter at $38.85 (see Figure 3.6).

Figure 3.5 STC market transactions, January 2019 to June 2021

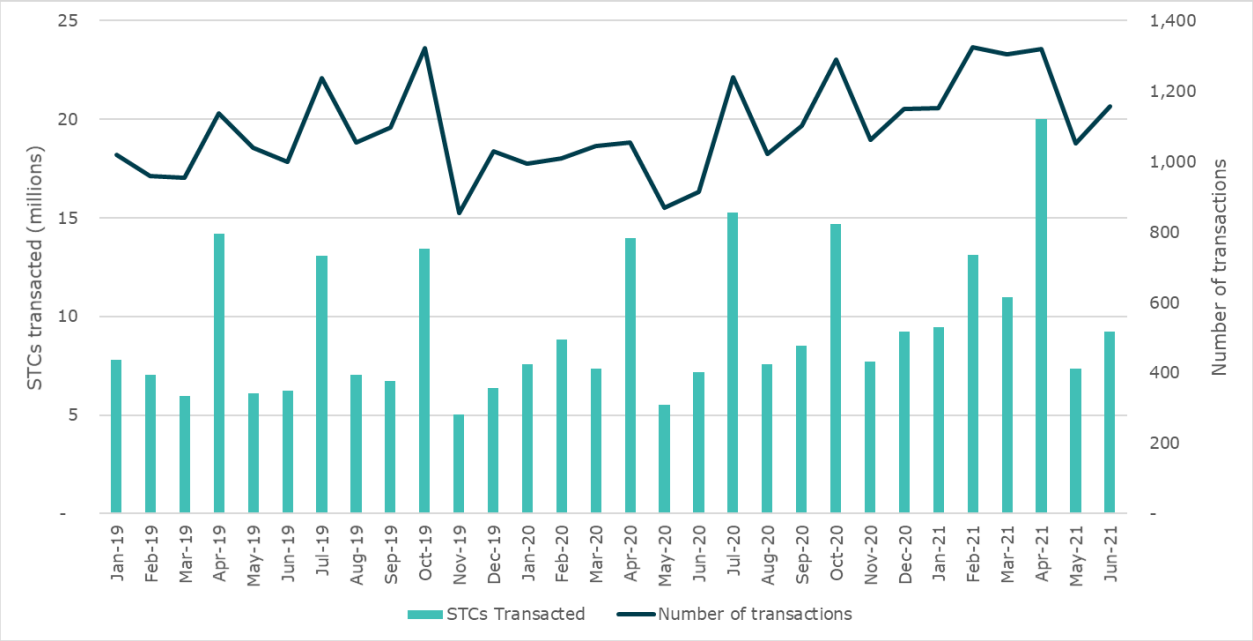
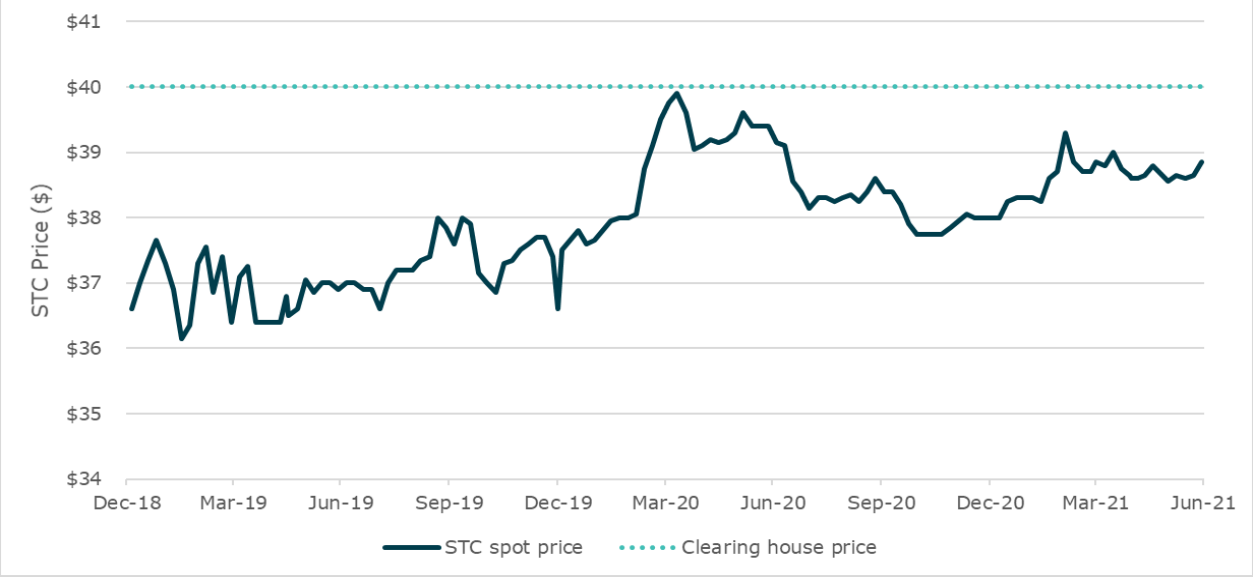


Figure 3.6 STC spot and clearing house prices ($AUD), December 2018 to June 2021



3.5. Key dates

Date	Event	Significance
28 July 2021	Quarter 2 surrender period	A liable entity must surrender 25% of liability for the year in the REC Registry for this quarter.
30 September 2021	Variation application period	The final date for liable entities to apply to vary their required surrender amount(s) for quarters 1 to 3 under section 38AF of the *Renewable Energy (Electricity) Act 2000* (provided an energy acquisition statement was lodged on or before 1 April for the assessment year).
28 October 2021	Quarter 3 surrender period	A liable entity must surrender 25% of liability for the year in the REC Registry for this quarter.
31 December 2021	Application for liable entity required surrender amount due	The final date for liable entities to apply to set their required surrender amount for quarters 1 to 3 where no energy acquisition statement was lodged by 1 April of the assessment year.

4. Emissions reduction

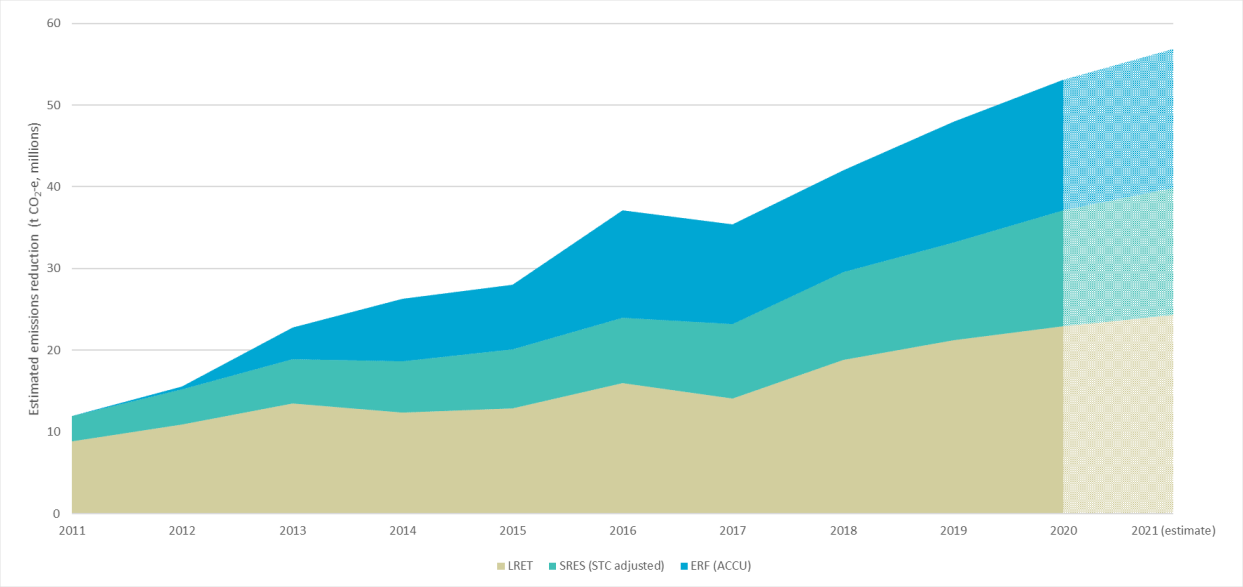
Emissions reduction from schemes administered by the Clean Energy Regulator is now on track to reach 56.8 million tonnes of carbon dioxide equivalent (CO_2-e) in 2021.[27]

The Emissions Reduction Fund (ERF) is on track to deliver ACCUs equivalent to 17 million tonnes of CO_2-e emissions abatement in 2021, a 6% increase on 2020.

The Large-scale Renewable Energy Target (LRET) is also on track to contribute 24.3 million tonnes CO_2-e of emissions reduction in 2021. This includes 2.9 million tonnes of CO_2-e attributed to an expected 4,400 gigawatt hours (GWh) of renewable generation in excess of the 2021 legislated demand.

The Small-scale Renewable Energy Scheme (SRES) is expected to deliver 15.5 million tonnes CO_2-e of emissions reduction in 2021. This reflects the estimate for total installed capacity under the SRES is now expected to be just over 3 gigawatts (GW).

Figure 4.1 Estimated emissions reduction from ERF and RET (t CO_2-e, millions), 2011 to 2021[28]



[27] The Clean Energy Regulator's emissions reduction estimation method is regarded as conservative. It assumes that emissions reduction is proportional to the average emissions intensity of generation in the National Electricity Market (NEM) across all fuel sources. An alternative method that assumes the emissions reduction is proportional to the weighted average emissions intensity of generation in the NEM across only thermal generation, with each MWh of renewable energy displacing 1 MWh of thermal generation, could result in a higher emissions reduction estimate of 75 million tonnes of CO_2-e.

[28] Annual values used in this graph can be slightly different from those reported in previous Quarterly Carbon Market reports for some years due to updated generation, scheme information and minor revisions to the methodology.

Glossary

Term	Meaning
Australian carbon credit unit (ACCU)	One Australian carbon credit unit represents one tonne of verified carbon dioxide equivalent abatement. ACCUs are created from eligible offsets projects and issued by the Clean Energy Regulator in accordance with section 147 of the *Carbon Credits (Carbon Farming Initiative) Act 2011* **(CFI Act)**. Transactions of ACCUs occur through the Australian National Registry of Emissions Units (ANREU).
Australian National Registry of Emissions Units (ANREU)	The registry in which all transactions of Australian carbon credit units takes place. A seller must have an Australian National Registry of Emissions Units account to participate in the Emissions Reduction Fund.
Baseline	The baseline is the reference point against which an entity's emissions or electricity generation can be measured. A power station which generates renewable energy in excess of their baseline can earn large-scale generation certificates under the Renewable Energy (Electricity) Regulations 2001. An entity with obligations under the safeguard mechanism must keep its net emissions at or below its baseline.
Cal prices	This is the forward trade for large-scale generation certificates traded for the calendar year it is referring to. For example, Cal24 is the calendar year 2024.
Carbon abatement	Carbon abatement refers to a reduction in atmospheric carbon dioxide through emissions avoidance or carbon sequestration.
Certificate spot price	Certificate spot price refers to the secondary market price for small-scale technology certificates, large-scale generation certificates and ACCUs.
Committed projects	Committed projects refers to large-scale renewable energy projects that have received all development approvals and reached a final investment decision.
Emissions avoidance	Emissions avoidance refers to projects that generate abatement by reducing or avoiding greenhouse gas emissions which would otherwise have occurred. For example, savanna fire management may reduce carbon dioxide emissions by reducing the frequency and extent of late dry season fires. Capturing and flaring landfill gases converts methane to carbon dioxide, which has lower global warming potential than methane.
Emissions Reduction Fund (ERF)	The Emissions Reduction Fund is a scheme where the Government purchases the lowest cost abatement (in the form of Australian carbon credit units) from a wide range of sources, providing an incentive to businesses, households and landowners to proactively reduce their emissions.
Greenhouse gas emissions	Greenhouse gas emissions are gases which trap heat in the atmosphere, such as carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O). Greenhouse gas emissions are measured as kilotonnes of carbon dioxide equivalence (CO2-e). This means that the amount of a greenhouse gas that a business emits is measured as an equivalent amount of carbon dioxide, which has a global warming potential of one.

Global warming potentials (GWPs)	Global warming potentials (GWPs) are values that allow direct comparison of the impact of different greenhouse gases in the atmosphere by comparing how much energy one tonne of a gas will absorb compared to one tonne of carbon dioxide.
GreenPower	GreenPower is the only voluntary government accredited program for renewable energy in Australia. A joint initiative of the governments of the Australian Capital Territory, New South Wales, South Australia, Victoria and Tasmania, GreenPower guarantees that any GreenPower-accredited energy sold by Australian energy retailers is renewably sourced.
National Greenhouse and Energy Reporting Scheme (NGER)	The National Greenhouse and Energy Reporting scheme is a single, national framework for corporations to report on greenhouse gas emissions, energy use and energy production.
Optional delivery contract	An optional delivery contract is an agreement that gives proponents the right, but not the obligation, to sell up to a nominated quantity of ACCUs to the Commonwealth at a fixed price. Under optional delivery contracts, the Clean Energy Regulator is essentially underpinning the project with project proponents retaining the flexibility to sell ACCUs on the secondary market.
Project proponent	A project proponent is an individual, a collective of individuals or an organisation with the legal responsibility for running a project under the Emissions Reduction Fund. This means they will hold the legal right to the project and will be issued any ACCUs created from project activities.
Safeguard Surrender	Safeguard surrender is the statutory obligation to surrender carbon units above an entity's baseline.
Secondary market	The secondary market consists of financial institutions, traders, agents and installers; parties that are involved in the buying and selling of renewable energy certificates or ACCUs between private entities. For example, the price of an ACCU on the secondary market is the price at which private entities agree to trade ACCUs. While the Clean Energy Regulator does not intervene in the secondary market, the Clean Energy Regulator's Renewable Energy Certificate Registry facilitates transactions between parties.
Scope 1 emissions	Scope 1 emissions are greenhouse gas emissions released into the atmosphere as a direct result of an activity or activities at the facility level, such as fuel combustion for electricity generation or cement production. Scope 1 emissions, sometimes referred to as direct emissions, must be reported under National Greenhouse and Energy Reporting legislation.
Scope 2 emissions	Scope 2 emissions are greenhouse gas emissions released into the atmosphere as a result of a facility's energy consumption. For example, if a facility is powered by coal combusted at a power station, the facility's scope 2 emissions would include the gases emitted from that coal combustion. The facility's scope 2 emissions are therefore the power station's scope 1 emissions. Scope 2 emissions, sometimes referred to as indirect emissions, must be reported under National Greenhouse and Energy Reporting legislation.

Sequestration	Sequestration refers to the capture and storage of carbon dioxide. It typically refers to the absorption of carbon by ecosystems, including oceans, soils and vegetation.
Small-scale technology certificate	A renewable energy certificate created by the owner of a small-scale system, or their installer, for the electricity generated or displaced by that system. While the number of certificates that can be created per system is based on several factors, including its geographical location, installation date, and other factors, one certificate is typically equal to one megawatt hour of eligible renewable electricity.

List of acronyms and abbreviations

Term	Term
ACCU	Australian carbon credit unit
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
ANREU	Australian National Registry of Emissions Units
CERT	Corporate Emissions Reduction Transparency
ERF	Emissions Reduction Fund
ESC	Energy saving certificate
EUA	European Union allowance unit
FID	Financial Investment Decision
GW	Gigawatt
HIR	Human-Induced Regeneration
LRF	Land Restoration Fund
LGC	Large-scale generation certificate
LRET	Large-scale Renewable Energy Target
LRF	Land Restoration Fund
MW	Megawatt
NEM	National Electricity Market
NGER	National Greenhouse and Energy Reporting Act 2007
REC Registry	Renewable Energy Certificate Registry
RPP	Renewable Power Percentage
RET	Renewable Energy Target
SRES	Small-scale Renewable Energy Scheme
STC	Small-scale technology certificate
STP	Small-scale technology percentage
VEEC	Victorian energy efficiency certificate

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