



ELECTRICITY ACCOUNTING

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INTRODUCTION

[Climate Active](#) is an ongoing partnership between the Australian Government and Australian businesses to drive voluntary climate action. Climate Active certification is awarded to businesses that measure, reduce and offset their carbon emissions to achieve the state of carbon neutrality.

This paper details how to account for and report a business's electricity emissions under a Climate Active carbon neutral claim. The electricity accounting rules have been adapted from the [Greenhouse Gas Protocol Scope 2 Guidance \(GHG Protocol\)](#) and informed by stakeholder consultation. These rules may evolve over time.

For more information

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1. ACCOUNTING METHODS – DUAL REPORTING

There are two international best-practice methods for calculating electricity emissions – the location-based method and the market-based method. Reporting electricity emissions under both methods is called dual reporting.

Dual reporting of electricity emissions is useful, as it provides different perspectives of the emissions associated with a business's electricity usage.

The **location-based method** shows a business's electricity emissions in the context of its *location*. It shows the physical emissions from a business's electricity consumption, as it reflects the emissions intensity of the electricity grid(s) it relies on to operate.

A business operating in a State with a high amount of renewable generation will report lower electricity emissions than if it operates in a State with a high amount of fossil fuel electricity generation. This method relies on State average emission factors to convert a business's electricity consumption into an emissions equivalent.

The **market-based method** shows a business's electricity emissions in the context of its electricity *purchases*. It reports emissions according to a business's investments in different electricity products and markets, including from voluntary purchases of renewable electricity and mandatory schemes like the Renewable Energy Target.

This method assigns an emissions factor of zero for a business's investments in renewables (Box 3) and uses a residual mix factor to calculate emissions from any remaining electricity consumption (Box 4). This method may result in different reported emissions than what is calculated from the electricity network the business is locally connected to.

Climate Active members must report their electricity emissions under both methods. However, they will be able to choose one of these methods as primary – this primary method will determine how many offsets are required to reach carbon neutrality.

The choice of the primary method must be disclosed in a Climate Active Public Disclosure Statement.

Box 1: Double counting and dual reporting

Double counting occurs when the zero emissions attribute of renewable generation is included in both the electricity emissions factor and in renewable energy certificates used to make an emissions reduction claim in a carbon account. Dual reporting avoids this issue.

Double counting of the zero emissions benefit of renewables is removed *within* the location-based method by removing the ability to make renewable energy claims from grid imported electricity. The emissions benefit is included in the NGA electricity factor. Double counting is avoided *within* the market-based method by using a Residual Mix Factor (Box 5) and allowing for the use of renewable electricity claims through retiring LGCs.

Reporting under both methods provides a different perspective of electricity emissions according to the different accounting methodologies. There is inherent double counting of the emissions benefit of renewables *across* methods in the same way as there is double counting of the emission sources. Comparisons of the electricity emissions of two businesses must be undertaken from the perspective of the same accounting method.

All claims on renewable electricity, with the exception of direct usage ('behind-the-meter' consumption), must be made under the market-based method.

Rules:

1. All Climate Active organisation, precinct, building and event certifications must report electricity emissions (scope 2) in their public disclosure statement (PDS), using both location- and market-based methods (i.e. dual reporting approach).
2. Mandatory dual reporting of electricity emissions, where required, will apply to annual reports from calendar year 2021 and financial year 2020/21 onwards.
3. Either the location- or market-based method can be chosen and disclosed in the PDS as the primary electricity accounting method.
4. The primary method will determine how many offsets are required to account for electricity emissions in a Climate Active carbon account.
5. Product and service certifications can choose to use dual reporting if suitable.

2. RENEWABLE ENERGY CERTIFICATES

Renewable energy certificates (Large Generation Certificates (LGCs) - Box 2) are the mechanism to make unique claims on the zero emissions attribute of renewable electricity in Australia. One retired LGC is equivalent to 1 MWh of zero emissions electricity in a carbon account. LGCs can be used to reduce all entirely electricity based emissions (for example, a business's electricity consumption (scope 2) and attributed electricity use from a third party operated data centre (scope 3)).

While there is no legislative underpinning for claims on the zero emission attribute of renewable generation, there is a general market acceptance that the beneficiary of a retired LGC can uniquely claim this attribute. For example, GreenPower and the ACT Government both rely on LGCs for their zero emission renewable electricity claims. Other certificates will be considered when and if they are developed.

LGCs must be retired in, or on behalf of, the claimants name on the Renewable Energy Certificate Registry. Retiring the LGC ensures no other business can make a claim on that same unit of renewable electricity generation (see Box 3).

Given the differences between the purpose, use and accounting of abatement from STCs and LGCs (Box 2), STCs cannot be used to make emission reduction claims. Behind the meter electricity use from small-scale systems can, however, be treated as zero emissions regardless of whether any STCs for that generation have been created, transferred or sold.

Similarly, exported electricity from small-scale systems can be treated as a credit in a carbon neutral account, regardless of whether STCs have been on-sold (see section 6).

Box 2: Renewable Energy Certificates and Targets

The Renewable Energy Target (RET) consists of two different schemes: the Large-scale Renewable Energy Target (LRET) and the Small-scale Renewable Energy Scheme (SRES). The LRET aims to deliver 33,000 gigawatt hours of additional electricity from renewable sources in 2020. The SRES incentivises the installation of small-scale renewables, such as household rooftop solar.

LGCs represent actual generation of electricity from an accredited power station. Each year under the LRET, RET liable entities must purchase and surrender LGCs equal to the renewable power percentage (RPP), calculated by the Clean Energy Regulator to ensure the annual target for renewable electricity is met. LGCs may also be purchased and voluntarily retired by other companies or individuals wishing to claim zero emission attributes.

STCs are allocated upfront on the basis of a small-scale system's expected generation of renewable electricity or displacement of conventional electricity over a given deeming period. The SRES market is uncapped with supply effectively meeting demand though adjustments to the Small-scale Technology Percentage – this means there are no excess certificates for voluntary surrender.

NGA emissions factors are calculated using on-grid activity only. Certificates representing projected generation or displacement are not used to calculate NGA emissions factors, however the emissions benefit from the actual generation producing the certificates may be.

Rules:Market-Based Method

6. LGCs can be used as a unique claim on the zero emissions attribute of renewable generation within a Climate Active carbon account.
7. LGCs are accounted for in MWh. One retired LGC equates to one MWh of zero emissions electricity consumption in the carbon account.
8. LGCs can only be used to account for electricity-based emissions, e.g. direct grid-based electricity (scope 2) or indirect emissions sources (scope 3) consisting entirely of electricity, such as third party operated data centres.
9. LGCs must be retired on the [Renewable Energy Certificate Registry](#), with evidence of their retirement, including serial numbers, provided to Climate Active.
10. LGCs should be retired directly in the name of the claimant, for example, 'Retired on behalf of Company X for 2020 Climate Active carbon neutral claim'.
11. LGC's may be retired indirectly on behalf of the claimant, for example, by GreenPower. Serial numbers should be provided to Climate Active.
12. In instances where discrete LGC serial numbers cannot be provided, Climate Active may consider accepting other evidence that LGCs have been retired, for example, certificates provided by an electricity generator or electricity bills listing accredited GreenPower usage.
13. LGCs must have an issuance date of less than 36 months from the end of the reporting year, for example, a calendar year 2020 report (ending 31 December 2020) could use LGCs with an issuance date of no earlier than 1 January 2018.
14. STCs cannot be used to make renewable energy emission reduction claims for grid imported electricity consumption (see section 6 for behind the meter usage).

Location-Based Method

15. Neither LGCs nor STCs can be used to make renewable energy emission reduction claims for grid-imported electricity consumption.

3. RENEWABLE ENERGY TARGET

The Renewable Energy Target (RET) is a legislated scheme designed to reduce emissions from the electricity sector and incentivise additional electricity generation from sustainable and renewable sources. The RET consists of two different schemes: the large-scale renewable energy target (LRET) and the small-scale renewable energy scheme (SRES).

Business investments in the LRET are accounted for under the Climate Active market-based method. This is because business incurs a cost of meeting the LRET, either through a separate cost component in commercial energy contracts or through a premium price for electricity in retail contracts. The LRET can therefore be thought of as an implicit contractual or purchasing arrangement on electricity consumers for renewable electricity. See Box 3 for more detail on this reasoning.

A business's annual proportionate renewable electricity investment through the LRET is quantified through the [renewable power percentage](#) (RPP) published by the Clean Energy Regulator.

LRET exempt entities (emissions-intensive trade-exposed entities) are not eligible to claim the RPP as zero emissions as they have not invested in renewable generation through the LRET.

Box 3: Renewable electricity investments

The Climate Active market-based method relies on a logic of only one party being able to make a claim on the zero emissions attribute of renewable electricity generation. This is represented by an LGC, considered a de facto property right for the attribute. The zero emissions benefit uniquely flows to the owner or beneficiary of the attribute in a carbon account.

Retiring the LGC ensures against double claiming. Directly or indirectly purchasing LGCs is an investment in renewable electricity generation and helps drive emission reductions. All business investments in renewables, whether by choice or mandated, are captured in a carbon account using the market-based method.

Rules:

Market-Based Method

16. The percentage of electricity consumption attributable to the LRET, as reflected by the [Renewable Power Percentage](#), for a given reporting year, is assigned an emission factor of zero in the carbon account. For example, a business using a total of 1,000 MWh of electricity in 2019, lists 186 MWh as zero emissions (1,000*18.6% (RPP for 2019)).
17. This deduction is not available to businesses, or parts of businesses, that are exempt from the LRET (i.e. Emissions Intensive Trade Exposed Industries).

Location-Based Method

18. There is no separate accounting treatment for the LRET as it is already included in the state factors used to convert electricity into t CO₂-e.

4. GREENPOWER

GreenPower is a voluntary government accreditation program that enables electricity providers to purchase renewable electricity on behalf of a business or household. It works by retiring LGCs equivalent to an agreed percentage or amount of electricity usage of the business. GreenPower purchases are accounted for under the market-based method, and treated as MWh of zero emissions electricity as per retired LGCs.

Rules:

Market-Based Method

19. Accredited GreenPower usage is assigned an emission factor of zero in a carbon account, regardless of the state in which GreenPower is used.
20. GreenPower usage in excess of what is required to account for a business's direct electricity usage may be used to reduce other indirect entirely electricity-based emissions (e.g. data centre usage).
21. GreenPower usage in excess of what is required to account for a business's entire electricity usage cannot be used to offset other non-electricity emission sources in the carbon account.

Location-Based Method

22. GreenPower cannot be used to make zero emission electricity claims under the location-based method.

5. POWER PURCHASE AGREEMENTS

Power Purchase Agreements (PPAs) are an increasingly common way for users of electricity to hedge against power price fluctuations and/or procure renewable electricity from a generator. PPAs may include the LGCs associated with the generation, bundled with or without electricity supply. Electricity sourced through PPAs is treated as grid-imported electricity (see section 9), unless LGCs have been retired.

Rules:

Market-Based Method

23. Zero emission electricity claims (above any mandatory LRET obligations) under a PPA must be made through retired LGCs in accordance with rules 6-14.
24. Where it is not possible to list the claiming business on the REC registry (rule 9), other evidence from the retiring body, such as certificates from the electricity provider, may be used in consultation with Climate Active.
25. Supplier-specific emission factors cannot be used in a Climate Active carbon account.

Location-Based Method

26. Retired LGCs, including under PPAs, cannot be used to make zero emission claims under the location-based method.

6. LOCAL RENEWABLE ELECTRICITY GENERATION

Businesses with their own solar or other renewable energy generation system can directly consume electricity from that system 'behind the meter', or export it into energy distribution networks. Behind the meter usage of renewable generation is treated as zero emissions under both location- and market-based methods, provided no LGCs were created, transferred or sold for that generation, and the generation asset is under the operational control of the claiming entity. Behind the meter usage from small-scale systems can be treated as zero emissions regardless of the creation, sale or transfer of STCs.

Exported electricity can be converted into t CO₂-e and deducted from gross electricity emissions under the market-based method only.

Increasingly, businesses may also have shares in community owned renewable generation assets. Methods will be explored to account for such generation in a carbon account, for example through recognition of contractual instruments.

Rules:

Market-Based Method

27. Behind the meter usage of electricity from large scale systems may be reported and assigned an emissions factor of zero in the carbon account, only if any LGCs associated with that generation are retired or none will be created.
28. If LGCs are created and sold, behind the meter usage from large scale systems must be treated the same as electricity consumption from the grid (that is, treated as residual electricity – see section 9).
29. Behind the meter usage of electricity from small-scale systems may be reported and assigned an emissions factor of zero in the carbon account, regardless of whether any STCs associated with this generation have been created, transferred or sold.
30. Exported electricity from renewable systems is converted into an emissions reduction equivalent and netted from gross emissions. This is achieved by multiplying exported electricity by the national scope 2 electricity factor only (to account for transmission losses), for the year of the generation. Any LGCs must be retired or none will be created. Any STCs associated with this generation do not need to be retired.

Location-Based Method

31. Behind the meter usage of electricity from large scale systems may be reported and assigned an emissions factor of zero in the carbon account, provided any LGCs associated with that generation are retired or none will be created.
32. If LGCs are created and sold, behind the meter usage from large scale systems must be treated the same as electricity consumption from the grid.
33. Behind the meter usage of electricity from small-scale systems may be reported and assigned an emissions factor of zero in the carbon account, regardless of whether any STCs associated with this generation have been created, transferred or sold.
34. Exported electricity cannot be used as a reduction in electricity emissions under the location-based method.

7. JURISDICTIONAL RENEWABLE ENERGY TARGETS

States and territories may have renewable energy targets over and above the LRET requirement. Where the jurisdictional government retires LGCs as part of a renewable energy target, a business operating in that jurisdiction can claim the corresponding percentage of their business's total electricity consumption as zero emissions under the market-based method.

Consistent with Box 3, such targets may result in an explicit or implicit obligation on electricity consumers within that jurisdiction to invest in renewable electricity generation. Each consumer within the jurisdiction then has a unique, proportionate claim on the zero emissions attribute of the retired LGCs and can therefore claim it as zero emissions electricity in a carbon account. This is provided that LGCs are retired on behalf of the jurisdiction's citizens and the claiming business has either explicitly or implicitly paid for that investment.

Climate Active will determine an appropriate renewable electricity percentage for jurisdictions in the Climate Active electricity calculator.

Rules:

Market-Based Method

35. A business operating in a jurisdiction where the government retires LGCs can claim the corresponding percentage of emissions impact on their electricity consumption as zero, provided that the LGCs are retired on behalf of the jurisdictions' citizens and the claim is auditable for the given reporting year.

Location-Based Method

36. There is no separate accounting treatment, as the emissions benefit is already included in the state factors used to convert electricity consumption into its emissions equivalent.

8. CLIMATE ACTIVE CERTIFIED CARBON NEUTRAL ELECTRICITY

A business can purchase Climate Active certified carbon neutral electricity. The emissions associated with generating and consuming this electricity have been fully compensated for through the purchase of carbon offset units. Climate Active certified electricity is deducted from the business's gross offset liability under both the market- and location-based methods.

Rules:Market-Based Method

- 37. Climate Active certified carbon neutral electricity is converted into its emission equivalent and deducted from the gross carbon account offset liability.
- 38. Conversion is made through the relevant emission factor for the particular brand of carbon neutral power.

Location-Based Method

- 39. See rules 37-38.

9. GRID IMPORTED (RESIDUAL) ELECTRICITY

The majority of businesses making a carbon neutral claim rely on power supplied by an electricity grid. It is not possible to determine the emissions from the exact electrons used by an individual business, as electricity from the grid comes from multiple and varied generation sources (e.g. from both fossil fuel-based and renewable generation across a wide geographic area).

Under the location-based method, the emissions from a business's use of grid electricity is calculated using a measure of the grid's average emissions intensity, calculated using the relevant emissions factors published in the [National Greenhouse Accounts](#).

Under the market-based method, the published National Greenhouse Accounts (NGA) national electricity factor is adjusted to remove the emissions benefit of all claimable renewable generation (through LGCs) to produce a residual mix factor (RMF). A simplified national approach to the RMF is currently used while accounting approaches for the method are developed, which may include grid based on state based RMFs.

Box 4: Residual Mix Factor

The RMF is used under the market-based method. It removes the emissions benefit of renewable electricity generation from the emission factor used in the location-based method (which includes this benefit). This results in an increase to the relative emissions intensity of a unit of electricity usage compared to the location-based electricity emissions factor.

The RMF is used to convert any electricity usage in a carbon account not matched by renewable electricity investments (through retired LGCs) elsewhere. It avoids double counting of the zero emissions attribute of renewable generation (Box 1).

If a business consumes 10 MWh of electricity and half of is matched from retired LGCs, the residual 5 MWh is converted into t CO₂-e using the RMF.

Rules:**Market-Based Method**

40. Electricity usage not matched by zero emission electricity attribute claims (residual electricity) is converted into t CO₂-e using the RMF according to the below formula:

$$\text{RMF} = \text{National EF} / (1 - \text{RPP})$$

RMF (residual mix factor), EF (emission factor), RPP (renewable power percentage)

e.g. In 2019, the RMF equals:

$$\begin{aligned} &= 0.88 \text{ (national scope 2 and 3 EF)} / 0.814 \text{ (18.6\% RPP)} \\ &= 1.08 \end{aligned}$$

Financial year reports will use the average of the RMF across the relevant calendar years, reflecting the RPP of each 6 month period.

Location-Based Method

41. Electricity usage in each state of a business's operations is converted into t CO₂-e using the relevant state NGA factor (either scope 2 and scope 3; or the full fuel cycle factor).
42. The emission factor used should correspond to the reporting year where possible, i.e. a 2018 reporting year should use the 2018 NGA factors.

WORKED EXAMPLE

A business with operations in NSW and SA reports its electricity emissions for 2019. The business uses 1,000 MWh in NSW, including 200 MWh of GreenPower and 100 MWh certified Climate Active carbon neutral power. In SA, the business uses 200 MWh of electricity, including 5 MWh of on-site solar. The business purchases and retires 100 LGCs generated in SA and exports 10 MWh of electricity back into the grid. Under the location based method, its electricity emissions equals 1003.4t. Under the market based method, its electricity emissions equals 722.6t.

Market-based method

Electricity source	Activity Data	Emission factor	t CO ₂ -e	Total % Renewable
NSW OPERATIONS				
Renewable Energy Target (2019 RPP = 18.6% * 1000)	186 MWh	0	0	18.6%
GreenPower	200 MWh	0	0	20%
Remaining NSW electricity	614 MWh	1.08(RMF)	663.1	-
Gross NSW electricity	1000 MWh		663.1	38.6%
SA OPERATIONS				
Renewable Energy Target (2019 RPP = 18.6%*195 (total grid imported electricity))	36.3 MWh	0	0	18.2%
Retired LGCs	100 MWh	0	0	50%
Behind the meter (small-scale renewables)	5 MWh	0	0	2.5%
Remaining SA electricity	58.7MWh	1.08 (RMF)	63.4	-
Gross SA electricity usage	200 MWh		63.4	70.7%
TOTAL GROSS ELECTRICITY (SA+NSW)	1200 MWh		726.5	43.9%
Exported Electricity (national scope 2)	10 MWh	0.8	-4	-
TOTAL NET ELECTRICITY (SA+NSW)	1190 MWh		722.6	43.9%
Total offset requirement deduction though Climate Active certified electricity (NSW)	100 MWh	0.9	-90	-

Location-based method

Electricity source	Activity Data	Emission factor	t CO ₂ -e
Grid electricity (NSW) (scope 2 and 3)	1000 MWh	0.9	900
Grid electricity (SA) (scope 2 and 3)	195 MWh	0.53	103.4
Behind the meter (SA) (small-scale renewable)	5 MWh	0	0
Gross Electricity	1200 MWh		1003.4
TOTAL NET ELECTRICITY (SA+NSW)	1200 MWh		1003.4
Total offset requirement deduction though Climate Active certified electricity (NSW)	100 MWh	0.9	-90