



2022

Sustainability Report

Towards a Sustainable Energy Future

GHG accounting methodology

GRI reference: 302-2, 305-1, 305-2, 305-3, 305-4, 305-5

Greenhouse gas (GHG) reporting guideline

A Group-wide GHG Reporting Guideline was first developed in 2007 to specify the collection and compilation methodology of the Group's GHG data. The Guideline was developed with reference to the following international standards and guidelines:

- The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition) of the World Business Council for Sustainable Development (WBCSD) and the World Resources Institute (WRI);
- The Greenhouse Gas Protocol: Corporate Value Chain (Scope 3) Accounting and Reporting Standard;
- The Greenhouse Gas Protocol: Technical Guidance for Calculating Scope 3 Emissions (Version 1);
- The 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories;
- Relevant IPCC Assessment Report;
- The International Standard for GHG Emissions ISO 14064-1: Greenhouse Gases; and
- Methodologies agreed with local authorities.

The CLP GHG Reporting Guideline is reviewed in accordance with CLP internal practices and updated with the latest references at least once every three years. The current Guideline was last updated in 2020.

CLP's GHG emissions inventory covers six GHGs specified in the Kyoto Protocol, including carbon-dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), and sulphur hexafluoride (SF₆). Perfluorocarbons (PFCs) are also included but not used in CLP's operations. Nitrogen trifluoride (NF₃), the seventh mandatory gas added under the second Kyoto Protocol, was also considered for inclusion, but after evaluation was deemed immaterial to CLP's operations. The GHG reporting scope definitions for GHG emissions are available here.

Focus has been given to sulphur hexafluoride (SF₆), an insulating gas commonly used in switchgears and transmission lines. CLP is aware of its high global warming potential and therefore is vigilant in controlling SF₆ leakage throughout the life cycle of electrical equipment, and actively exploring ways to reduce the use of SF₆ in its business. For example, in Hong Kong in 2022, a field trial on non-SF₆ gas switchgears at distribution level has started and availability

of proven non-SF₆ gas equipment at transmission level will be closely monitored.

Compilation bases

CLP reports the GHG emissions of its generation and energy storage portfolio on three consolidation bases to provide a comprehensive overview of its carbon footprint and progress in decarbonisation efforts. The three bases are:

- **Equity basis:** This includes the electricity generated by CLP's assets. It accounts for the Scope 1 and Scope 2 GHG emissions according to CLP's equity share in the portfolio. The equity basis reflects economic interest, indicating the extent of GHG risks and opportunities CLP has from assets in which it holds a majority or minority share.
- **Equity and long-term capacity and energy purchases:** This includes both electricity generated by CLP's assets as well as the electricity purchased through capacity and energy purchase agreements. It allows stakeholders to better understand the GHG intensity of the electricity CLP delivers to customers. In addition to the GHG emissions from the equity basis, it also includes the direct GHG emissions from the generation of purchased electricity.

Purchase agreements help the Group meet local market needs and usually entail significant investment. To qualify for inclusion in this metric, these long-term capacity and energy purchase agreements must have a duration of at least five years and the equivalent capacity of 10MW or more.

- **Operational control:** This represents the total GHG emissions from generation assets where CLP has direct influence and control on operational matters. CLP has been disclosing its combined total Scope 1 and Scope 2 GHG emissions on this basis for over a decade, and will continue to demonstrate its long-term progress.

Conscious of emissions along the value chain, in 2019, the Company conducted a review of its Scope 3 emissions and started to disclose Scope 3 emissions to present a more comprehensive picture of its footprint along the value chain. Scope 3 emissions typically represent less than 40% of CLP's GHG emissions.

Calculation methodologies

Scope 1 & Scope 2 GHG emissions

The Scope 1 emissions and location-based Scope 2 emissions are calculated in accordance with CLP's GHG Reporting Guideline outlined above.

Annually, CLP obtains emission factors from each business unit's local government and authority in their respective

jurisdictions. In cases where local emission factors are not available, other recognised sources are referenced.

Scope 3 GHG emissions

The table below summaries the Scope 3 categories that were identified as relevant to CLP, and how their emissions are calculated.

Scope 3 GHG emissions categories relevant to CLP

Scope 3 category	Relevance to CLP	Calculation and emission factors
1: Purchased goods and services Emissions from the extraction, production and transportation of goods and services purchased or acquired.	a) Products-related emissions relate to the upstream emissions of EnergyAustralia's natural gas retail business, including the emissions from upstream gas production and transmission, and distribution leakage in the State pipeline systems.	<ul style="list-style-type: none"> Assessed using the average-data method. The quantities of natural gas supplied are multiplied by State-based upstream emission factors to calculate the emissions. Emission factors source: Australia's National Greenhouse Accounts Report 2022.
	b) Non-products-related emissions relate to the upstream emissions of CLP's purchased goods and services other than natural gas for retail business.	<ul style="list-style-type: none"> Assessed using the spend-based method. Country-based World Input-Output Database (WIOD) factors are applied to the financial spend on the purchase of non-product-related goods and services. Emission factors source: WIOD Release 2016.
2: Capital goods Emissions from the extraction, production and transportation of capital goods purchased or acquired.	Relates to the upstream emissions of CLP's purchased capital goods, mainly for infrastructure construction and facility upgrades.	<ul style="list-style-type: none"> Assessed using the spend-based method. Country-based WIOD factors are applied to the financial spend on the purchase of capital goods. Emission factors source: WIOD Release 2016.
3: Fuel- and energy-related activities Emissions related to the extraction, production and transportation of fuels and energy purchased or acquired.	Includes the upstream emissions of purchased fuels and electricity for CLP's power generation.	<ul style="list-style-type: none"> Assessed using the average-data method. Upstream emissions (Well-to-tank, WTT) of purchased fuels and electricity are calculated by using volumes of purchased fuels and electricity and country-based WTT emission factors, where available. Where such volumes are not available, the ratio of the WTT emission factor to direct emission factor for each fuel type is applied to the Scope 1 and Scope 2 emissions of the generation assets. Emission factors source: Australia's National Greenhouse Accounts Report 2022, 2022 UK Government GHG Conversion Factors for Company Reporting.
	Includes the direct emissions from the generation of purchased electricity that is sold to CLP's customers. Includes the upstream emissions from the generation of purchased electricity that is sold to CLP's customers.	<ul style="list-style-type: none"> Direct emissions and upstream emissions from the generation of purchased electricity that is sold to CLP's customers are assessed using the supplier-specific method. This involves using emissions data of generation assets whose capacity and energy are purchased by CLP to meet customer demand. The calculation multiplies the percentages of capacity and energy purchased by CLP with direct emissions and upstream emissions (WTT) of the generation assets. Emissions from the generation of purchased electricity that is sold to CLP's customers also include the emissions from the net electricity purchased by EnergyAustralia from the Australian Energy Market Operator (AEMO). This is assessed using the average-data method, which involves estimating



Scope 3 category	Relevance to CLP	Calculation and emission factors
		<p>emissions by using grid average emission factors, and is calculated through multiplying the net electricity purchased from AEMO with State-based emission factors.</p> <ul style="list-style-type: none"> Emission factors source: Australia's National Greenhouse Accounts Report 2022, 2022 UK Government GHG Conversion Factors for Company Reporting.
<p>5: Waste generated in operations</p> <p>Emissions from the disposal and treatment of waste generated.</p>	<p>Emissions from fuel ash and gypsum as both represent the most significant waste material generated.</p>	<ul style="list-style-type: none"> Assessed using the waste-type specific method based on waste produced by type. Calculated through applying emission factors to quantities of fuel ash and gypsum generated at CLP's coal-fired power stations, considering the disposal method. Emission factors source: 2022 UK Government GHG Conversion Factors for Company Reporting.
<p>6: Business travel</p> <p>Emissions from the transportation of employees for business-related activities.</p>	<p>Air travel is the most material source of emissions from business travel. While CLP offsets the emissions from air travel, the emissions continue to be included in the GHG profile.</p>	<ul style="list-style-type: none"> Assessed using the distance-based method. Air travel emissions for CLP's operations in Hong Kong and Australia are directly calculated using flight distance by travel classes multiplied by corresponding emission factors. Emissions from the other regions of operations are calculated through extrapolation based on CLP's financial spend on business travel. Emission factors source: 2022 UK Government GHG Conversion Factors for Company Reporting.
<p>7: Employee commuting</p> <p>Emissions from the transportation of employees between their homes and their worksites.</p>	<p>Relates to the emissions of CLP's employees in commuting to offices and worksites. This typically includes emissions from automobile travel, bus travel, etc.</p>	<ul style="list-style-type: none"> Calculated through the number of CLP's employees, estimated travel mode and average distance travelled by region. Emission factors source: 2022 UK Government GHG Conversion Factors for Company Reporting.
<p>11: Use of sold products</p> <p>Emissions from the end-use of products sold.</p>	<p>Relates to the downstream emissions of EnergyAustralia's natural gas retail business, including the emissions from the combustion of natural gas supplied to customers.</p>	<ul style="list-style-type: none"> Calculated through multiplying the quantities of natural gas supplied to customers by State-based emission factors. Emission factors source: Australia's National Greenhouse Accounts Report 2022.

The following categories were identified as not relevant to CLP, and hence not included in the Scope 3 emissions profile for reporting.

Scope 3 categories that are not considered relevant to CLP

Scope 3 category	Explanation
4: Upstream transportation and distribution Emissions from the transportation and distribution of purchased goods and services.	The emissions are covered in Category 1 as the financial spend on transportation and distribution is embedded in the financial spend on purchased goods and services.
8: Upstream leased assets Emissions from the operation of assets leased by the reporting company, i.e. lessee.	CLP does not operate leased generation assets. The emissions of leased offices are included in CLP's Scope 2 emissions.
9: Downstream transportation and distribution Emissions from the transportation and distribution of products sold between operations and the end consumer, in vehicles and facilities not owned or controlled or paid for by the reporting company.	Electricity and gas are the main products of CLP. Transportation and distribution of the products does not involve vehicles or facilities not owned or controlled by the Group.
10: Processing of sold products Emissions from the processing of intermediate products sold by downstream companies, e.g. manufacturers.	With electricity and gas being CLP's main products, they are end products without a further processing requirement.
12: End-of-life treatment of sold products Emissions from the disposal and treatment of products sold at the end of their life.	With electricity and gas being CLP's main products, there is no end-of-life treatment requirement.
13: Downstream leased assets Emissions from the operation of assets owned by the reporting company (lessor) and leased to other entities.	Leasing is not a main business for CLP.
14: Franchises Emissions from the operation of franchises.	CLP does not have any franchising business.
15. Investments Emissions from operation of investments.	CLP reports Scope 3 emissions on an equity basis. This category applies to CLP only when an operational control basis is adopted and therefore does not apply.

Glossary

Air emissions	The emission of air pollutants such as sulphur dioxide (SO ₂), nitrogen oxides (NO _x) and particulate matter (PMs).
Availability	The fraction of a given operating period in which a generating unit is available without outages and capacity reductions. This is also known as the Equivalent Availability Factor.
Baseload	An operating regime of power generation at a reasonably constant rate to serve continuous system load, and not designed to respond to peak demands or emergencies.
Capacity purchase	Additional third-party owned power generation capacity contracted by CLP under long-term agreements to meet customer demand. Some of these agreements may confer CLP rights to use the generation assets and exercise dispatch control as if they belonged to the Group.
Capital investments	Includes additions to fixed assets, right-of-use assets and intangible assets, investments in and advances to joint ventures and associates, and acquisition of businesses.
Carbon credit	A carbon credit is a tradeable instrument which represents either: (a) a permit which gives the holder the right to emit one tonne of carbon dioxide or equivalent greenhouse gas (tCO ₂ e) into the atmosphere; or (b) a certificate from a project that represents the removal or avoidance of one tCO ₂ e from the atmosphere. CLP Carbon Credits (https://www.clpcarboncredits.com) are generated from renewable energy sources and can be used to offset carbon emissions generated by governments, organisations or individuals.
Carbon neutral	When the greenhouse gas emissions associated with an activity or entity are balanced by carbon removal elsewhere, such as carbon credits, carbon sinks or storage, and renewable energy certificates.
Climate Action Finance Framework (CAFF)	Launched in 2017, CAFF supports the transition to a low-carbon economy by attracting socially responsible, sustainable financings, and to support CLP's investments that reduce the carbon content of energy generated and increase the efficiency of energy usage. The CAFF formalises and governs project evaluation, management of proceeds and reporting for Climate Action Finance Transactions, including bonds, loans and other forms of finance.
Climate Vision 2050	CLP's Climate Vision 2050 sets out the blueprint of the Group's transition to net-zero greenhouse gas emissions leading up to mid-century. Launched in 2007 with a focus on the ambition to mitigate CLP's climate impact, Climate Vision 2050 has been instrumental in informing CLP's business strategy and guiding its investment decision-making.
Combined-cycle gas turbine (CCGT)	A technology used in gas-fired generation to enable significantly higher efficiency by utilising residual heat from a gas turbine exhaust to run a steam turbine and generate additional electricity.
Decarbonisation	Decarbonisation of the power sector primarily refers to the reduction in the greenhouse gas emissions from electricity generation, and providing lower-carbon energy services and solutions to customers. At CLP it is measured by the reduction in carbon intensity, which is expressed in kilograms of carbon dioxide per kilowatt hour of electricity sent-out.
Decentralised generation / distributed generation	Refers to electrical generation and storage performed by a variety of technologies of a smaller scale located close to the load they serve. In contrast, centralised generation is the large-scale generation of electricity serving multi-loads connected to the transmission network.
Demand response	Demand response programmes encourage participating customers to commit to short-term reductions in electricity demand, helping energy suppliers to keep the grid running optimally during high load periods.
Digitalisation	The application of new information technologies including artificial intelligence and data analytics to help electric utilities develop new customer-centric services and improve operations.
Distributed energy	Distributed energy includes power generated from sources such as solar panels and wind turbines located close to the users, as well as controllable loads or storage such as electric vehicles and batteries.
Electricity sent-out	Gross electricity generated by a power plant less self-generated auxiliary power consumption, measured at the connecting point between the generating unit and transmission line.