

National Carbon Offset Standard

Carbon Neutral Program

Annual Inventory



An Australian Government Initiative



2016-2017

Sydney 2030 Green Global Connected

city of villages



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1. Use of trade mark

Table 1. Trade mark register

| Where used | Logo type | Link |
|------------------------------|------------------------|--|
| City of Sydney Green Reports | Certified organisation | www.cityofsydney.nsw.gov.au/GreenReport |
| City of Sydney website | Certified organisation | www.cityofsydney.nsw.gov.au/Carbon |

2. City of Sydney Council

The City of Sydney is the local government authority responsible for the city centre and more than 30 suburbs. The City of Sydney's role is to provide services for our residents as well as for the daily influx of workers and visitors. On any given day, Sydney's population swells to more than a million people.

The core functions of the City are defined by the Local Government Act 1993¹, the City of Sydney Act 1988² and other legislation. A non-exhaustive overview of City of Sydney services and facilities include:

- Aquatic centres
- Community centres, services and facilities
- Domestic waste service
- Economic development
- Events and sponsorships
- Health and building inspections
- Infrastructure (roads, footways, drainage, street lighting)
- Parking services
- Parks and open space
- Strategic planning and development consent
- Sustainability

The City owns approximately 250 properties, many of which are tenanted. The City also owns over 8,500 street lights and there are a further 13,000 street lights owned by the electricity network provider but deemed to be within the City's financial control (pays for energy and maintenance).

The City's operations are mostly run out of a main administration building, multiple depots, parks, libraries, venues and community centres.

Organisational targets developed through Sustainable Sydney 2030 and the City's Environmental Action Plan include 44 per cent reduction of 2006 greenhouse gas emissions by 2021 and 70 per cent by 2030 with 50% renewable electricity.

Sustainable Sydney 2030 proposes a Green, Global and Connected city and has significantly increased the expectations and service delivery by the City of Sydney.

¹ <http://www.legislation.nsw.gov.au/#/view/act/1993/30>

² <http://www.legislation.nsw.gov.au/inforce/e7c1b3ab-b509-e447-af90-f93662ed3bbf/1988-48.pdf>

This report is about the processes and results of the City of Sydney being a carbon neutral organisation, and it does not refer to the Local Government Area (LGA).

Certification Boundary

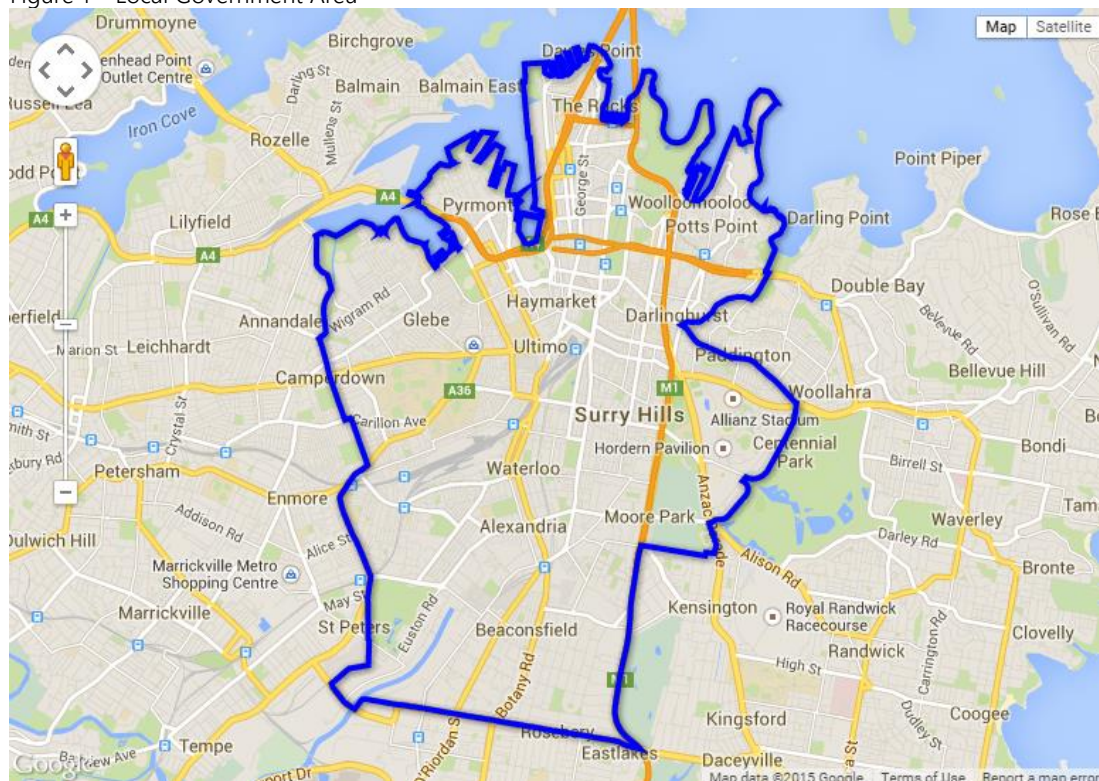
In 2007 the City of Sydney Council resolved to become carbon neutral for its own properties and operations. In 2011 the City was certified carbon neutral under the National Carbon Offset Standard (NCOS) and has retained its annual certification.

Our emissions boundary is based on the Greenhouse Gas Protocol Corporate Accounting and Reporting Standard³ and includes all Scope-1 and Scope-2 emissions, as well as a range of Scope-3 emissions.

Geographic boundary

The City of Sydney local government area (LGA) covers 26.15 square kilometres of inner Sydney from Sydney Harbour at Rushcutters Bay to Glebe and Annandale in the west, Sydney Park and Rosebery in the south, and Centennial Park and Paddington in the east. This inventory pertains to providing local government services to constituents within the geographical area shown in Figure 1.

Figure 1 – Local Government Area



³ <http://www.ghgprotocol.org/standards/corporate-standard>

Time span

This report pertains to greenhouse gas emissions released due to activities associated with City of Sydney Council operations in the period of 1-July 2016 to 30-June 2017.

Greenhouse gases

The City of Sydney greenhouse gas emissions inventory includes the gases covered by the UNFCCC/Kyoto Protocol including carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorinated carbons (PFCs) and sulphur hexafluoride (SF₆) and nitrogen trifluoride (NF₃). However, there are no known sources of PFCs, SF₆ or NF₃ relevant to the City's operations.

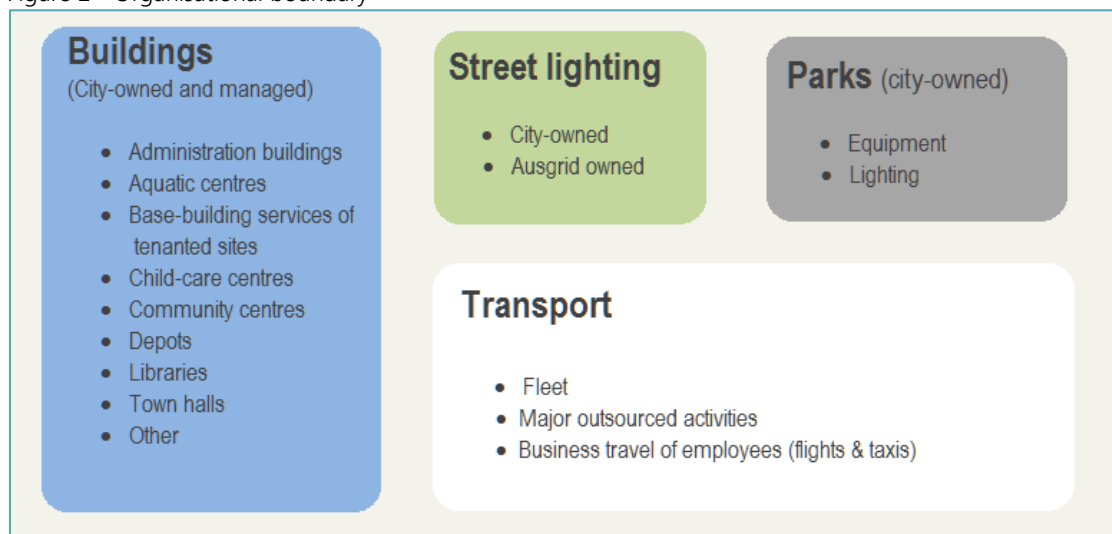
The City includes greenhouse gas emissions from the ozone depleting R22 refrigerant within its inventory. This is an option accorded within the Greenhouse Gas Protocol *Required Greenhouse Gases in Inventories - Accounting and Reporting Standard Amendment* Feb 2013. Until R22 is phased out it will continue to be a source of greenhouse gas emissions and is therefore included.

Organisational boundary

The City of Sydney organisational boundary includes emissions sources where the City is considered to have operational control, as defined by the *National Greenhouse and Energy Reporting Act 2008*⁴ and the *Greenhouse Gas Protocol – A Corporate Accounting and Reporting Standard guidance*, chapters 3 and 4⁵, for emissions resulting in the delivery of services where the City has capacity to implement environmental policies.

For the City of Sydney, this means services required under the *Local Government Act 1993* and Sustainable Sydney 2030 and includes core business, statutory responsibilities, service provision, Council facilities, services and other assets as depicted in Figure 2.

Figure 2 - Organisational boundary



⁴ <http://www.environment.gov.au/climate-change/greenhouse-gas-measurement/nger>

⁵ <http://www.ghgprotocol.org/standards/corporate-standard>

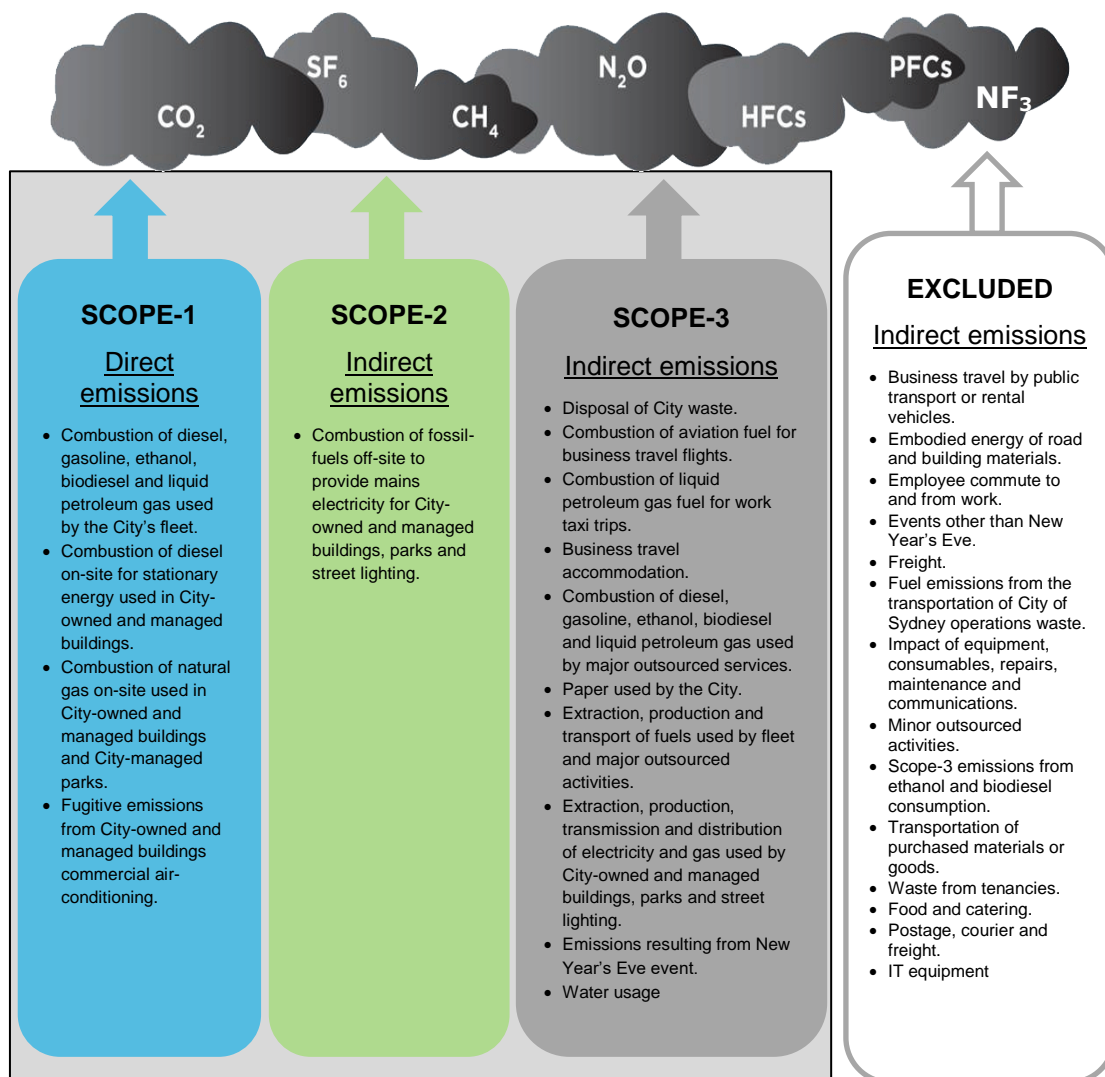
Operational boundary

Operational control is the predominant control approach as described above. In accordance with the *National Greenhouse and Energy Reporting Act 2008*, Section 11, the City includes all Scope-1 and Scope-2 emissions based on aggregated data for facilities and core activities. In addition, there are a range of Scope-3 emissions sources. Figure 3 shows all emissions that have been included or excluded.

The City has chosen to include other emissions sources which are within its financial control (e.g. fuel emissions from major contractors).

The definitions for Scope-1, Scope-2 and Scope-3 emissions have been interpreted from the National Carbon Offset Standard (NCOS), November 2017 and the *Greenhouse Gas Protocol – A Corporate Accounting and Reporting Standard guidance*, chapters 3 and 4⁶.

Figure 3 - Diagram of the boundary of the subject of certification



⁶ <http://www.ghgprotocol.org/standards/corporate-standard>

The City of Sydney includes many Scope-3 emissions sources within its inventory. Some Scope 3 emissions sources have been excluded for reasons in accordance with Section 4.2.3 of the National Carbon Offset Standard, including:

- Emissions likely to be negligible (relative to other Scope 3 emissions);
- If determining emissions is not currently possible given available technology;
- If determining emissions will be very costly relative to their likely significance;
- If there is insufficient data.

Scope-3 emissions for postage/ courier services and food/ beverage services have been excluded from inventory reporting. Data for these items is insufficient for accurate reporting purposes, and based on the information that is available, it is estimated with confidence that these items represent less than 1% of total emissions.

It is not considered that the Scope-3 exclusions compromise the overall integrity of the reported inventory. The City of Sydney has publicly tested its emissions reduction targets and carbon neutral assertions within the media, local and international events and programs such as the *C40 Cities Climate Leadership Group* and the *CDP Cities Carbon Disclosure Project*. Review of other local and international Governments at varying stages of carbon neutrality has not identified any material emissions sources which are not reported by the City of Sydney.

Some Scope-3 emissions are recommended for inclusion when determining

Contractors fuel usage

Emissions from Contractors Fuel usage have been included within the City's inventory as Scope-3 emissions since 2006. Contractor emissions are outside of the City's operational control however are included on the basis that they are providing core local government services that would otherwise need to be provided by the City. These emissions have been calculated using Scope-1 + Scope-3 emissions factors based on the amount and type of fuel used by contractors. However they are reported as Scope-3 emissions within the City's inventory as they have been produced by third-parties and there are data quality uncertainties.

While the NGER Legislation⁷ requires contractors to provide activity data to relevant reporting entities, the Legislation does not discuss the contractor's responsibility for data accuracy. City of Sydney has always formally and clearly requested the required data from its contractors in a suitable manner. However, it is difficult for City of Sydney to ensure the quality of this data.

Gross emissions in 2016-17

Gross emissions this reporting year were 39,600 tCO₂e.

⁷ Source: NGER Legislation and Contractors/Subcontractors (<http://environmentalaccounting.org.au/wp-content/uploads/2013/10/NGER-Contractors-Reporting-Paper.pdf>)

3. Changes since last report

Table 2 shows increases or decreases of emissions, since the 2005-06 baseline and since the last reporting period, changes in reporting, as well as the percentage of the particular emission in the total inventory.

Emissions are publically reported twice yearly in the City of Sydney [Green Report](#)⁸.

Table 2 – Changes in reporting since last year

| From 2005/2006 baseline | From last reporting period | Weight | Comments |
|--|--|--------|---|
| Emissions source changes | | | |
| ▼ 41% decrease in Electricity – Buildings since the 2005/2006 baseline. | ▼ 4% decrease in Electricity – Buildings since last reporting period | 73.7% | More than 79% of emissions in our inventory are from electricity in buildings, parks and street lighting, which reflects the highly emissions intensive of the NSW grid, due mostly to coal-fired generation. The reduction achieved in buildings for this reporting period can be attributed to the commencement of trigeneration at Town Hall House. Projects such as LED Street Lighting continue to show emissions savings. Parks reductions may relate to works being undertaken in Sydney Park and Hyde Park. The City has transitioned to a new utility reporting system known as SMART. |
| ▼ 35% decrease in Electricity – Parks since the 2005/2006 baseline. | ▼ 1% decrease in Electricity – Parks since last reporting period | | |
| ▼ 27% decrease in Electricity – Street lighting since the 2005/2006 baseline. | ▼ 2% decrease in Electricity – Street lighting since last reporting period | | |
| ▲ 214% increase in Natural Gas – Buildings & Parks since the 2005/2006 baseline. | ▲ 106% increase in Natural Gas – Buildings & Parks since last reporting period | 11.5% | Natural gas increase can be attributed in part to the commencement of trigeneration at Town Hall House. Also for the first time gas consumption has been added for Prince Alfred Park Pool, previously not included due to meter malfunction. |
| ▲ 18% increase in Fleet fuel (diesel) since the 2005/2006 baseline. | ▼ 2% decrease in Fleet fuel (diesel) since last reporting period | 5.0% | LPG was not used on this reporting period, and there was an average 20% reduction in the use of biodiesel and ethanol. Fleet size has flattened since 2014 and so this reduction is within 2014 targets. |
| ▼ 7% decrease in waste since the 2005/2006 baseline. | ▼ 55% decrease in waste since last reporting period | 2.7% | Figures reported in 2015/16 over estimated waste from City properties. New contract commenced in October 2016 which has improved reporting of waste. |

⁸ www.cityofsydney.nsw.gov.au/GreenReport

| Methodology changes | | | Comments |
|---|---|-------|---|
| ▼ 7% decrease in waste since the 2005/2006 baseline. | ▼ 55% decrease in waste since last reporting period | 2.7% | A new supplier provides a new methodology for measuring waste. Previously visual estimates had been used and in 2015/16 waste was overestimated. |
| ▲ 90% increase in Refrigerants since the 2005/2006 baseline. | ▲ 1% increase in Refrigerants since last reporting period | 2.2% | Increase in emissions from refrigerants attributed to improved asset inventory and emissions calculation methodologies. R22 is being replaced by R410A. |
| ▼ 30% decrease in NYE event since the 2005/2006 baseline. | ▲ 20% increase in NYE event since last reporting period | 1.7% | NYE emissions are estimated using 20% increase per year on 2015/16 baseline. This was established because of the high cost of calculating emissions compared to the impact of emissions. |
| ▼ 45% decrease in business travel – flights & accommodation emissions since the 2005/2006 baseline. | ▼ 73% decrease in business travel – flights & accommodation emissions since last reporting period | 0.12% | Emissions fluctuate from year to year, due to staff attendance to international events or other commitments. Methodology is scheduled for review for next reporting period to ensure all internal and external party records are captured. Use of taxis has dropped considerably by 61% on baseline due to a new policy on taxi use that encourages walking, riding or public transport within the LGA. |
| Data quality and boundary changes | | | Comments |
| Improvement in waste data received from contractors. | | | A new contract for property waste commenced in October 2016 which has improved the quality of waste data. Previous estimates over stated waste emissions. |
| Improvement in utility reporting system. | | | The City has commenced a new utility reporting system known as SMART that is expected to improve the reliability of electricity and gas consumption data and future NCOS reporting. |
| Output changes (growth/decline) | | | Comments |
| ▼ 25% decrease in total emissions since the 2005/2006 baseline. | ▼ 0% decrease in total emissions since last reporting period | | <ul style="list-style-type: none"> • 34 tCO₂e increase since the last reporting year • 13,372 tCO₂e decrease since the baseline year. <p>This is the result of initiatives outlined in section 4 and other historic activities.</p> |

Year-on-year changes

Baseline

In previous NCOS reports a 2010/11 base year was used. From 2013/14 report, the 2005/06 base year has been used for consistency with Sustainable Sydney 2030, City of Sydney Master Plans, sustainability programs, the bi-annual Green Report, Corporate Plan reporting and other communications channels.

The 2005/06 base year emissions inventory received independent assurance to the same level as required for certification under the National Carbon Offset Standard, to a reasonable level for Scope 1 and 2 emissions, and to a limited level for Scope 3 emissions.

The base year inventory will be re-calculated when changes to emissions factors, improved methodologies or data sources, boundaries, or other causes are deemed to result in a significance threshold change to total emissions of five per cent or greater.

The base year inventory will not be recalculated for organic growth or decline in assets or services that are owned or controlled by the Council.

Boundary

There have been no material changes to the emissions boundary since 2005/06. Business travel accommodation and water, which were not included in the baseline reporting year sum up to less than 0.3% of the whole inventory.

Emissions

Total greenhouse gas emissions have reduced by 25 per cent since 2006. The percentage reductions are greater for some specific sectors, for example greenhouse gas emissions from our buildings are 28 per cent below 2006 levels.

Annual progress toward the City's interim 2021 target and the target for 2030 to reduce greenhouse gas emissions by 70 per cent are shown in the following tables and charts.

Figures 4 and 5 and Tables 3 and 4 show year-on-year changes to the City's greenhouse gas emissions by scope and by major emission type since 2005/06 - the year against which the City's greenhouse gas reduction target was established through Sustainable Sydney 2030.

Uncertainty Estimate

There is always statistical uncertainty associated with GHG source data, resulting from natural variations or human errors in the measurement process, and fluctuations in data measurement methods or equipment.

An estimate of the data uncertainty for the City of Sydney has been carried out in accordance with the National Greenhouse and Energy Reporting (Measurement) Determination 2008 and the GHG Protocol. The statistical uncertainty associated with emission data collected and analysed for the City of Sydney is 5.18%.

Emissions by scope

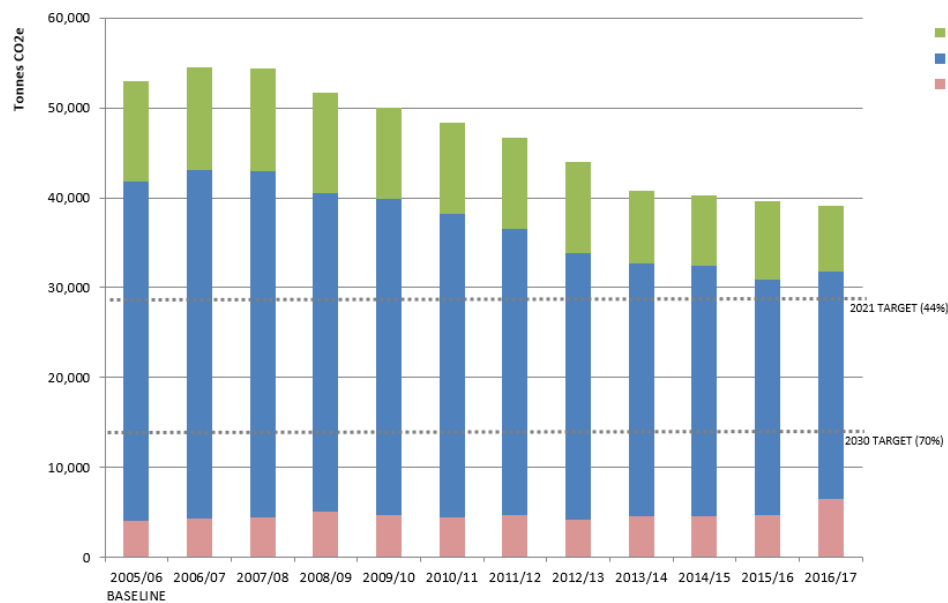
Table 3 - Emissions by scope (tCO₂e)

| Tonnes CO ₂ e | 2005/06 BASELINE | Year-1 2009/10 | Year-2 2010/11 | Year-3 2011/12 | Year-4 2012/13 | Year-5 2013/14 | Year-6 2014/15 | Year 7 2015/16 | Year 8 2016/17 |
|--------------------------|---------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Scope-1 | 4,053 | 4,744 | 4,449 | 4,649 | 4,174 | 4,539 | 4,626 | 4,736 | 6,515 |
| Scope-2 | 37,760 | 35,073 | 33,821 | 31,835 | 29,633 | 28,109 | 27,812 | 26,111 | 25,208 |
| Scope-3 | 11,159 | 10,213 | 10,066 | 10,217 | 10,137 | 8,121 | 7,766 | 8,719 | 7,877 |
| TOTAL | 52,972 | 50,030 | 48,336 | 46,701 | 43,945 | 40,769 | 40,204 | 39,566 | 39,600 |

Figure 4 - Emissions by scope

Tracking 2030 - Greenhouse gas emissions

Council Operations



Updated 19 Feb 2018

Emissions by major type

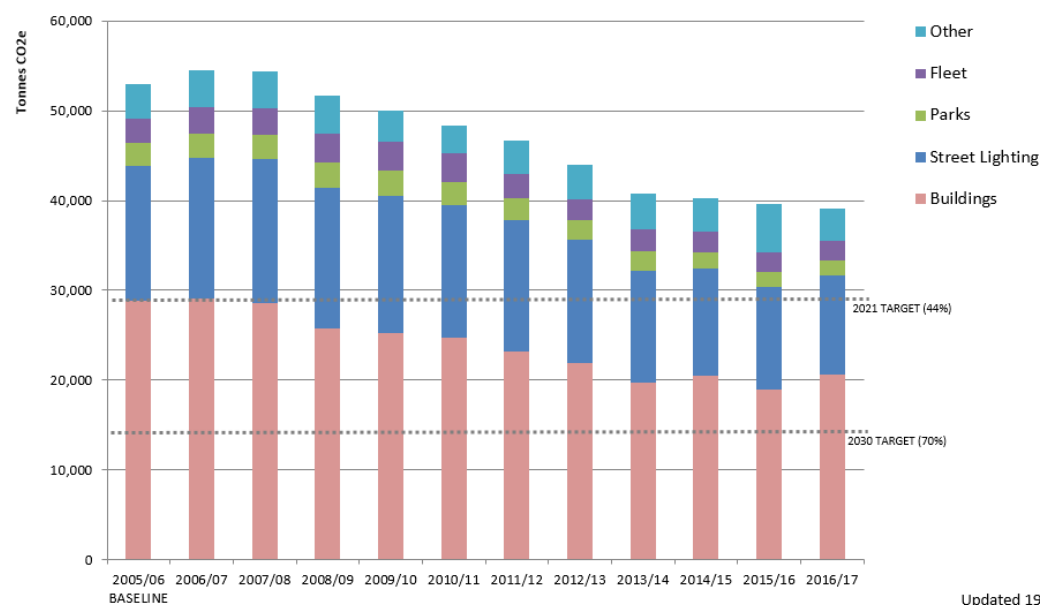
Table 4 - Emissions by major type (tCO₂e)

| Tonnes CO ₂ e | 2005/06 BASELINE | Year-1 2009/10 | Year-2 2010/11 | Year-3 2011/12 | Year-4 2012/13 | Year-5 2013/14 | Year-6 2014/15 | Year-7 2015/16 | Year-8 2016/17 |
|--------------------------|---------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Buildings | 28,775 | 25,203 | 24,718 | 23,150 | 21,847 | 19,711 | 20,468 | 18,996 | 20,616 |
| Street Lighting | 15,131 | 15,269 | 14,783 | 14,653 | 13,730 | 12,404 | 11,942 | 11,382 | 11,103 |
| Parks | 2,502 | 2,878 | 2,578 | 2,468 | 2,197 | 2,206 | 1,824 | 1,648 | 1,633 |
| Fleet | 2,669 | 3,225 | 3,175 | 2,710 | 2,373 | 2,417 | 2,293 | 2,244 | 2,156 |
| Other | 3,896 | 3,455 | 3,082 | 3,720 | 3,798 | 4,031 | 3,677 | 5,296 | 4,092 |
| TOTAL | 52,972 | 50,030 | 48,336 | 46,701 | 43,945 | 40,769 | 40,204 | 39,566 | 39,600 |

Figure 5 - Emissions by major type

Tracking 2030 - Greenhouse gas emissions

Council Operations



Updated 19 Feb 2018

4. Emissions reduction measures

Table 5. Emissions reduction measures implemented in the current reporting period

| Emission source | Status | Reduction measure and calculation method | Scope | Status during the reporting period | Overall* Project Reduction (t CO ₂ -e) |
|--------------------------|---------------------|---|-------|--|---|
| LED lighting | Complete | Tender to replace 6,448 luminaires with LED. | 2 & 3 | Three year roll out completed during the reporting period. | 2,816 |
| Solar photovoltaic | Install in progress | Tender to install approximately 2MW of solar PV to City-owned sites. | 2 & 3 | Installation in progress. | 1,953 |
| Utility management | In progress | Transition to new streamlined energy and emissions SMART reporting system. | 1-3 | Billing and data transitioned, system testing. | Not quantified |
| Environmental Management | In Progress | Environmental management processes and continual improvement to ensure City staff are aware of their responsibilities in regards to environmental management. | 2 & 3 | In progress. | Not quantified |

* Overall project reduction (tCO₂e) shown.

5. Emissions Management Plan

This section focusses on the City's planned or intended actions to achieve its target to reduce 2006 emissions by 70 per cent by 2030. This is an absolute target, based on the City playing its fair share to constrain global average temperature increases to below 2 degrees Celsius.

In the first instance, the City will continue to deploy energy efficiency and solar PV as part of its current tenders and commitments. In addition the City will continue to identify feasible opportunities to reduce emissions through technologies, management practices and the design and operation of its properties and other assets.

Figure 6 shows that the majority of emissions are from electricity which reflects the highly emissions intensive NSW grid due mostly to coal-fired generation. The majority of emissions reductions achieved to date, as well as future savings, will come by reducing grid electricity through energy efficiency and renewable energy.

Figure 6 – Electricity and non-electricity emissions

Tracking 2030 - Greenhouse gas emissions

Council Operations

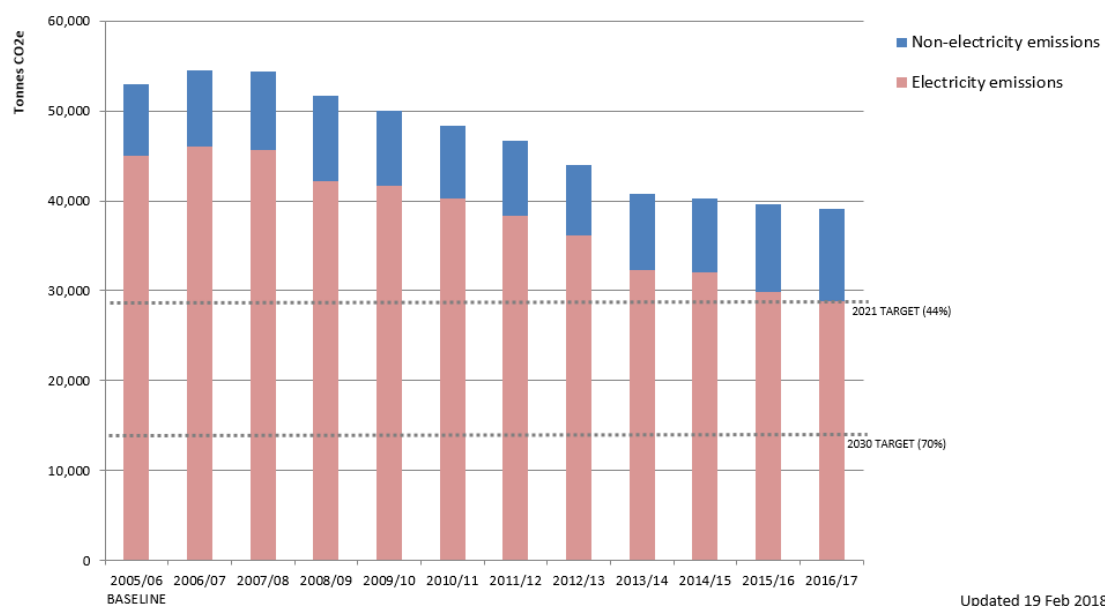
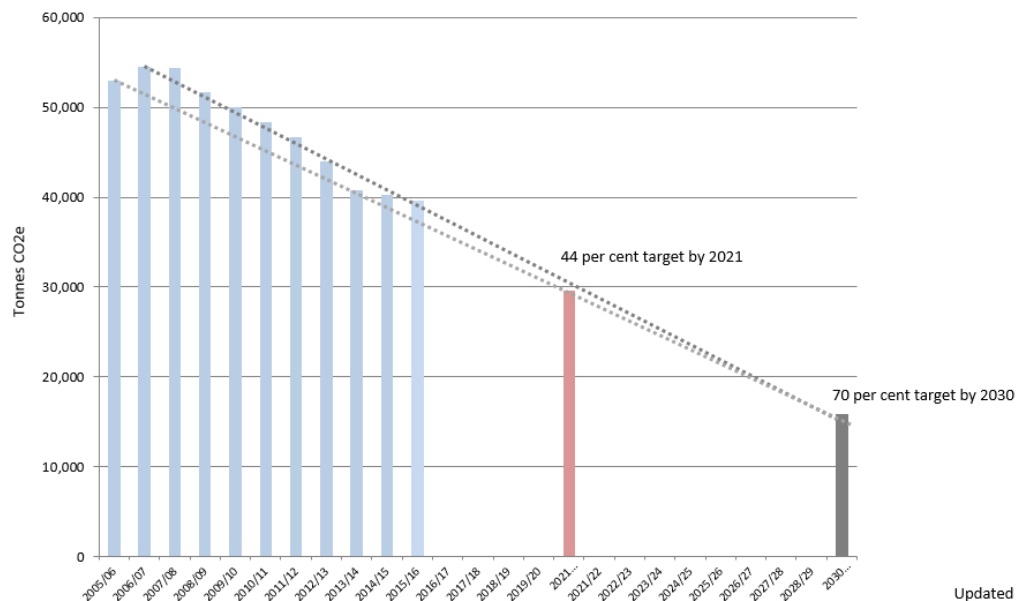


Figure 7 shows the emissions reduction tasks for achieving the City's interim 2020 and longer term 2030 targets.

Figure 7 – Target trajectories 2020 & 2030

2020 & 2030 carbon targets

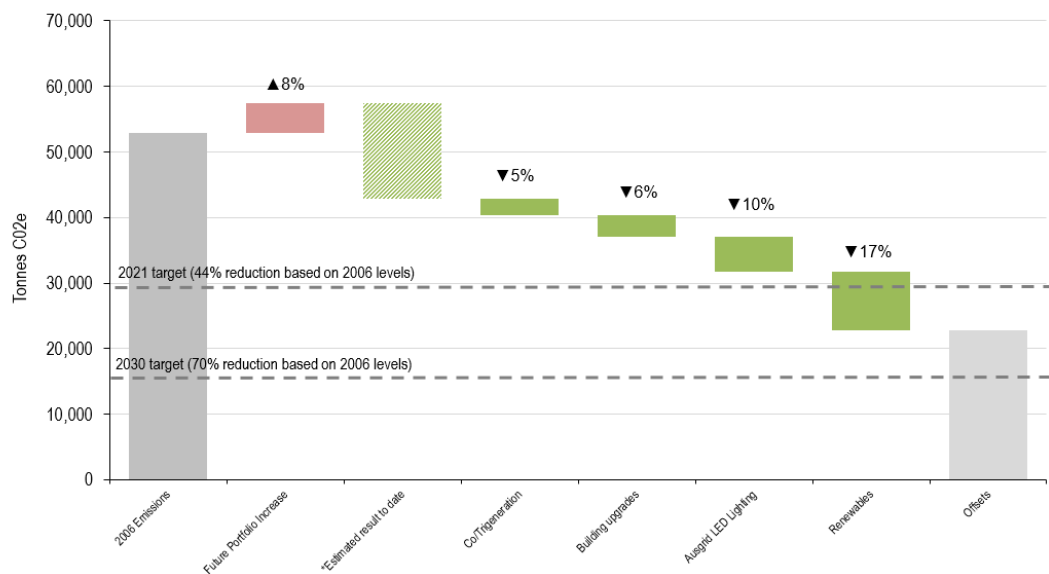
Council Operations



The emissions savings shown in Figure 8 indicate a range of opportunities to achieve the 2030 target to reduce 2006 emissions by 70 per cent. These charts are continually revised as new information and opportunities become available and are included within the twice-yearly City of Sydney Green Report.

Figure 8 – Tracking 2030 emissions

City of Sydney operations greenhouse gas emissions target to 2021 - Estimated contribution of initiatives



6. Carbon account

Part A. Emission calculations, emission factors and methodologies

Table 6. Emissions inventory

| Scope | Emission source | Source of activity data | Methodology reference | Energy content factor | Emission factor | Activity data | Unit | t CO ₂ -e |
|-------|-----------------------|---|-----------------------|-----------------------|---------------------------------|---------------|------|----------------------|
| 2 | Purchased electricity | Electricity - buildings Electricity - parks Electricity - street lighting | NGA Factors Jul 2017 | n/a | 0.83 kg CO ₂ e / kWh | 30,371,336 | kWh | 25,208 |
| 3 | Purchased electricity | Electricity - buildings Electricity - parks Electricity - street lighting | NGA Factors Jul 2017 | n/a | 0.12 kg CO ₂ e / kWh | 30,371,336 | kWh | 3,645 |
| 1 | Natural gas | Natural gas - buildings Natural gas - parks | NGA Factors Jul 2017 | n/a | 51.53 kg CO ₂ e / MJ | 69,939,891 | MJ | 3,604 |
| 3 | Natural gas | Natural gas - buildings Natural gas - parks | NGA Factors Jul 2017 | n/a | 12.8 kg CO ₂ e / GJ | 69,939,891 | MJ | 895 |
| 1 | Fleet fuel | Diesel - fleet | NGA Factors Jul 2017 | 38.6 GJ / kL | 70.46 kg CO ₂ e / GJ | 691,290 | kL | 1,880 |
| 1 | Fleet fuel | Diesel - fleet (biodiesel) | NGA Factors Jul 2017 | 34.6 GJ / kL | 2.6 kg CO ₂ e / GJ | 252,018 | kL | 23 |
| 3 | Fleet fuel | Diesel - fleet | NGA Factors Jul 2017 | 38.6 GJ / kL | 3.6 kg CO ₂ e / GJ | 691,290 | kL | 96 |
| 1 | Fleet fuel | ULP - fleet | NGA Factors Jul 2017 | 34.2 GJ / kL | 67.62 kg CO ₂ e / kL | 64,559 | kL | 149 |
| 1 | Fleet fuel | ULP - Fleet (ethanol) | NGA Factors Jul 2017 | 23.4 GJ / kL | 0.4 kg CO ₂ e / GJ | 3,321 | kL | 0.03 |
| 3 | Fleet fuel | ULP - fleet | NGA Factors Jul 2017 | 34.2 GJ / kL | 3.6 kg CO ₂ e / GJ | 64,559 | kL | 8 |
| 3 | Contractor fuel | Diesel - contractor | NGA Factors Jul 2017 | 38.6 GJ / kL | 70.46 kg CO ₂ e / GJ | 407,606 | kL | 1,109 |
| 3 | Contractor fuel | Diesel - contractor (biodiesel) | NGA Factors Jul 2017 | 34.6 GJ / kL | 3.6 kg CO ₂ e / GJ | 223 | kL | 0 |
| 3 | Contractor fuel | Diesel - contractor | NGA Factors Jul 2017 | 38.6 GJ / kL | 3.6 kg CO ₂ e / GJ | 407,606 | kL | 57 |
| 3 | Contractor fuel | ULP - contractor | NGA Factors Jul 2017 | 34.2 GJ / kL | 67.62 kg CO ₂ e / GJ | 37,240 | kL | 86 |
| 3 | Contractor fuel | ULP - contractor (ethanol) | NGA Factors Jul 2017 | 23.4 GJ / kL | 0.4 kg CO ₂ e / GJ | 11,437 | kL | .107 |
| 3 | Contractor fuel | ULP - contractor | NGA Factors Jul 2017 | 34.2 GJ / kL | 3.6 kg CO ₂ e / GJ | 37,240 | kL | 5 |

| | | | | | | | | |
|---|--|-----------------------|--|------------------------------------|---|---|---------------------|-------|
| 3 | Business Travel-Air (Petty cash & Purchase card) | Flights | UK Government emission conversion factors for greenhouse gas company reporting | n/a | 0.16634 kgCO ₂ e / passenger.km | 47,622 | Total distance | 16 |
| 3 | Business Travel-Air (Travel agent) | Flights | FCM Travel report | n/a | 0.53 lbs CO ₂ .mile (short haul) 0.43 lbs CO ₂ .mile (medium haul) 0.39 lbs CO ₂ .mile (long haul) | 67,665 | CO ₂ lbs | 31 |
| 3 | Business Travel-Accommodation | Accommodation | FCM Travel report Petty cash & card data | n/a | # nights * 30.57 * 0.000453592 | 73 | nights | 1 |
| 3 | Taxi travel | Taxis | Australian Taxation Office - Taxi drivers and operators 2017 Benchmarks | n/a n/a 26.2 GJ / kL | Total distance (km) = Total spend \$ – flagfall / distance rate \$ per km. Fuel consumption = 18L per 100km. 60.9 kgCO ₂ e / GJ + 3.6 kgCO ₂ e / GJ | 45,044 | km | 14 |
| 1 | Refrigerants | Refrigerants | NGA Factors Jul 2017 | n/a | Global warming potential * total charge * leakage rate (0.09) <u>Global warming potentials</u> R134A 1,430 R22 1,810 R407C 1,774 R410A 2,088 R438A 2,264 | Total Charge: 5,530 Assumed leakage: 498 | kg | 855 |
| 1 | Stationary diesel | Diesel - on site fuel | NGA Factors Jul 2017 | 38.6 GJ / kL | 70.2 kg CO ₂ e / GJ | 1,290 | kL | 3 |
| 3 | Stationary diesel | Diesel - on site fuel | NGA Factors Jul 2017 | 38.6 GJ / kL | 3.6 CO ₂ e / GJ | 1,290 | kL | 0 |
| 3 | Waste | Council waste | NGA Factors Jul 2017 | n/a | 1.2 tCO ₂ e / tonne waste | 740 | t waste | 1,036 |

| | | | | | | | | |
|---|--------|--|---|--|---|---------------------|----------------------|--------------|
| 3 | Events | New Year's eve event | NYE15 GHG Pangolin Associates Report +20% | Multiple – see inventory report http://www.cityofsydney.nsw.gov.au/_data/assets/pdf_file/0011/256493/NYE15-GHG-Report-Public-v1.pdf | See previous. | 662 | tCO ₂ e | 662 |
| 3 | Paper | Paper - A4 & A5 Paper - A3 Paper - plotter | EPA Vic Greenhouse gas emission factors for office copy paper (Oct 2013) | n/a | <i>See Emission Factors and Sources below, Table 10</i> | 3,324 184 108 | Reams Reams kg | 10 1 0 |
| 3 | Water | Water | National Water Commission: National Performance Report 2015-16: urban water utilities | n/a | 0.213 kg CO ₂ e / kL | 449,098 | kL | 205 |
| | | | | | | | | 39,600 |

Emission Factors and sources

Table 7. Energy Emission Factors

| EMISSION FACTORS | ENERGY CONTENT | SCOPE-1 | SCOPE-2 | SCOPE-3 |
|--|----------------|--------------------------|---------------------------|---------------------------|
| TRANSPORT FUEL | GJ/kL | kgCO ₂ -e/GJ | | kgCO ₂ -e /GJ |
| Gasoline (ULP) - post 2004 vehicles | 34.2 | 67.62 | - | 3.6 |
| Diesel oil - Euro iv or higher | 38.6 | 70.46 | - | 3.6 |
| Liquefied petroleum gas (LPG) - post 2004 vehicles | 26.2 | 60.9 | - | 3.6 |
| Ethanol - post 2004 vehicles | 23.4 | 0.4 | - | NE |
| Biodiesel - general transport | 34.6 | 2.6 | - | NE |
| STATIONARY ENERGY FUEL | GJ/kL | kgCO ₂ -e /GJ | | kgCO ₂ -e /GJ |
| Diesel oil | 38.6 | 70.2 | - | 3.6 |
| ELECTRICITY | | | kgCO ₂ -e /kWh | kgCO ₂ -e /kWh |
| NSW - latest factors | - | - | 0.83 | 0.12 |
| NATURAL GAS | | kgCO ₂ -e /GJ | | kgCO ₂ -e /GJ |
| Natural gas distributed in a pipeline | - | 51.53 | - | 12.8 |

Source: [National Greenhouse Accounts \(NGA\) Factors \(Aug 2016\)](#)⁹

Table 8. Waste Emission Factors

| WASTE | tCO ₂ e /t waste |
|-----------------------------------|-----------------------------|
| Commercial and industrial waste | 1.2 |
| Municipal solid waste | 1.4 |
| Construction and demolition waste | 0.2 |

Source: [National Greenhouse Accounts \(NGA\) Factors \(Dec 2014\)](#)³

Table 9. Taxi Fuel Consumption

| TAXI JOURNEYS | L/100 km |
|------------------------|----------|
| Fuel consumption (LPG) | 18 |

Source: [Australian Taxation Office - Taxi drivers and operators - issued 2013 - Benchmarks](#)¹⁰

Table 10. Paper emission factors*

| PAPER EMISSION FACTORS | kgCO ₂ -e/kg |
|-------------------------|-------------------------|
| Domestic virgin paper | 1.3 |
| Domestic recycled paper | 1.5 |
| Imported virgin paper | 1.1 |
| Imported recycled paper | 1.3 |

* EPA Vic Greenhouse gas emission factors for office copy paper (Oct 2013)¹¹

| REFRIGERANT | GWP |
|-------------|-------|
| R134A | 1,430 |
| R22 | 1,810 |
| R407C | 1,774 |
| R410A | 2,088 |

*<http://www.environment.gov.au/climate-change/climate-science-data/greenhouse-gas-measurement/publications/national-greenhouse-accounts-factors-july-2017>

Table 11. Refrigerant GWP*

9 <https://www.environment.gov.au/system/files/resources/5a169bfb-f417-4b00-9b70-6ba328ea8671/files/national-greenhouse-accounts-factors-july-2017.pdf>

10 <https://www.ato.gov.au/Business/Small-business-benchmarks/In-detail/Benchmarks-A-Z/R-Z/Taxi-drivers-and-operators/>

11 <http://www.epa.vic.gov.au/~media/Publications/1374%201.pdf>

Part B. Assumptions and limitations

Assumptions and limitations of the City's calculation methods are stated in table 6.

Table 12. Assumptions and limitations of calculation methods

| Emission source/ activity | Assumption/limitation and justification |
|---|--|
| Electricity used by third part tenants and exported electricity | Methodology based on extrapolating other period metered data due to metered data for the full financial year being unavailable. |
| GreenPower or LGC reductions | <p>The City of Sydney does not create or surrender LGCs or renewable energy certificates for its solar PV installations in order to retain ownership of the associated emissions reductions.</p> <p>In this way, the City is installing local renewable energy to reduce its greenhouse gas emissions as a higher order priority than purchasing low cost offsets. This is in accordance with well recognised carbon hierarchy principles.</p> |
| Paper | Some paper purchased during the reporting period was certified as a carbon neutral product. |
| Refrigerants | R22 refrigerant use is being phased out and progressively being replaced by R410a with higher global warming potential but isn't ozone depleting. |
| Taxis | Assumes majority of taxi travel takes place within NSW |
| Contractors fuel | See Operational Boundary, p.5. |

Part C. Carbon offsets for this period

The City's 2016/17 greenhouse gas emissions were 39,600 tCO₂e. However only 35,000 tCO₂e offset retirements were purchased for the period 2016/17 due to a surplus from the previous reporting period.

The City ensures information about its carbon neutral program - including offset certificates - is transparent and available for public scrutiny on its website www.cityofsydney.nsw.gov.au/Carbon. Offsets are purchased and retired in arrears at the end of the reporting period.

Offset retirements that relate to the current reporting period 2016/17 are shown in table 7.

Table 13 - Offsets Summary

| Offset type | Registry | Date of retirement | Quantity (tCO ₂ e) | Serial Number |
|-------------|--------------|--------------------|-------------------------------|---|
| VCUs | VCS Registry | 12/14/2017 | 35,000 | 5431-237091168-237126167-VCU-028-APX-CN-1-438-01012014-31122014-0 |
| VCUs | Markit | 07/11/2016 | 2,975 | 2302-95854862-95857836-VCU-009-MER-VN-1-843-01012011-28022011-0 |
| VCUs | Markit | 07/11/2016 | 1,625 | 2300-95826688-95828364-VCU-009-MER-VN-1-843-02082009-31122009-0 |
| Total | | | 39,600 | |



CERTIFICATE OF CLIMATE PROTECTION

This certificate verifies that

City Of Sydney

has compensated

35,000 tonnes of greenhouse gas emissions

by investing in South Pole's climate protection project:

Grouped Small Hydro, China (Project Number 300494)



Thank you for committing to bold climate action. Your contribution is not only a meaningful step towards mitigating climate change globally, but also changes lives for the better by contributing to the Sustainable Development Goals set out by the UN.

Retirement ID 5431-237091168-237126167-VCU-028-APX-CN-1-438-01012014-31122014-0

Renat Heubeger
CEO, South Pole

Certificate no. 102146_5911

This certificate is issued by South Pole Group. For more information about our services and more than 500 climate protection projects, please visit: southpole.com/projects. The CO₂ emissions indicated on the certificate are compensated through investments in the above mentioned carbon offset projects based on international standards.


14/12/2017



* An additional 4,600 tCO₂e offsets have been carried over from the previous year surplus.

7. Declaration

To the best of my knowledge and having met the requirements of the National Carbon Offset Standard Carbon Neutral Program (NCOS CNP), the information provided in this report is true and correct.

| | |
|---|--------------|
|  | DATE 13/3/18 |
| Kim Woodbury Chief Operating Officer | |