

Green Environmental Sustainability Progress Report

January to June 2016

A detailed bi-annual overview of the City of Sydney's progress against our environmental sustainability targets for both the Local Government Area (LGA) and the City's own operations.



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1. Sustainability at the City of Sydney

The City of Sydney is committed to securing Sydney's future, its prosperity and liveability. The City defines Sustainability in keeping with the [Brundtland Report](#)¹ of 1987 as meeting the environmental, social and economic needs of the present without compromising the ability of future generations to meet their own needs.

The City recognises the importance of an enduring, balanced approach which takes into account the City's economy, ecology, society and culture. We are addressing each with bold ideas and good governance. The results mean better outcomes now and in the future, for everyone. [Sustainable Sydney 2030](#)² is a plan for a Green, Global and Connected city.

GREEN with a minimal environmental impact, green with trees, parks, gardens and linked open spaces with healthy ecosystems and where the air, land and waterways are clean. Green, with highly efficient buildings and transport systems, Green by example and Green by reputation. Addressing climate change is the biggest challenge we have locally and globally. Improving energy efficiency and identifying alternative sources of energy, including renewable energy, continue to be a priority.

GLOBAL in economic orientation. Global in links, partnerships and knowledge exchange. Global and open-minded in outlook and attitude.

CONNECTED physically by walking, cycling and high quality public transport. Connected "virtually" by world-class telecommunications, connected communities through a sense of belonging, contribution, social wellbeing and quality, and connected to other spheres of government and to those with an interest in the city.

Environmental commitment

The City's Environment Policy applies to all City of Sydney's operations, assets, activities and staff. An Environmental Management System (EMS) supports the City's commitment to ensuring sustainable asset management and operations. The Green report is the City of Sydney's state of the environment report and fulfils the reporting requirements of the NSW Local Government Act 1993 No. 30 Section 428A and the Integrated Planning and Reporting guidelines.

¹ <http://www.un-documents.net/wced-ocf.htm>

environment policy

The City of Sydney is the local government authority responsible for the central business district and more than 30 suburbs over 26.15 square kilometres. The City provides services for more than 180,000 residents and 20,000 businesses. On any given day, the local population swells to more than 1 million. Sydney is a vibrant, cosmopolitan city with a diverse population, with people from 186 nations, including one of Australia's largest Aboriginal communities.

The City of Sydney has adopted ambitious greenhouse gas emission reduction targets in response to mounting evidence of a warmer, more unstable climate. These targets can be found at www.cityofsydney.nsw.gov.au/greenreport.

All levels of government, the private sector and the community have a vital role to play to ensure that we: stabilise emissions to maintain an acceptable global climate, ensure the city can cope with the impacts of rising sea levels and increased heat and flooding, reduce the unsustainable growth in energy, water and resource demands, prevent pollution and waste to landfill, ensure energy security and minimise impacts of climate threats and pressures from population increase, including on green space and urban ecology objectives.

The City is committed to protecting the environment through: complying with relevant legislation and regulation, complying with relevant government policy commitments and continuous improvement of environmental management processes.

We are prioritising and planning actions needed to prepare the city for the environmental, social, cultural and economic impacts of climate change. These include: a Resilience Strategy for Sydney being developed with the support of the Rockefeller Foundation's 100 Resilient Cities initiative and a Climate Adaptation Strategy to assess and mitigate risks from climate change for the local government area and our own operations.

The objectives shown below are taken from the City of Sydney's *Sustainable Sydney 2030 Community Strategic Plan* (2014), Direction 2: A Leading Environmental Performer. The Plan is reviewed every four years.

our commitments

Objective 2.1

Energy consumption and greenhouse gas emissions are reduced across the local government area.

City now

- Reliance on centrally provided energy infrastructure outside the city.
- Legacy in existing buildings, lifestyle and work practices of a high energy consumption era.
- Reasonable level of engagement in property industry regarding the importance of efficient buildings.

City in 2030

- Continuous improvement in energy efficiency, energy productivity and greenhouse gas emissions.
- Ultra efficient buildings.
- A growing number of regenerative buildings or precincts that help to improve the carbon footprint of their surrounds.
- Networks of low and zero carbon local energy production and sharing.

Objective 2.2

Waste from the city is managed as a valuable resource and the environmental impacts of its generation and disposal are minimised.

City now

- City focused on diverting residential waste from landfill.

City in 2030

- A city that sees waste from all sectors as a valuable resource.
- Waste management practice of all sectors are coordinated to minimise environmental impacts.

Objective 2.3

Potable water consumption and gross pollutant loads to the catchment are reduced across the local government area.

City now

- Water is seen as a cheap, renewable resource.
- Invisible drains that quickly remove water which is treated like waste.

City in 2030

- The value of water is properly recognised.
- Potable water use is rationalised and opportunities to replace demand with recycled water are realised.
- The quality of city waterways meet the needs of the community while minimising impact on the environment.

Objective 2.4

City residents, businesses, building owners, workers and visitors improve their environmental performance.

City now

- An urban management practice that focuses on what is easier - new development.
- Leading environmental practice in silos not enabling transformative change.

City in 2030

- A community that understands the environmental impact and one that collaborates in the development and implementation of initiatives that improve the environmental performance of the city.
- An urban development norm that means that all new and redeveloped buildings operate with high environmental performance - supported by robust State and local planning policy and standards.

Objective 2.5

The City of Sydney's operations and activities demonstrate leadership in environmental performance.

City now

- A commitment to strategic environmental initiatives

City in 2030

- International recognition for environmental leadership across all areas of the City of Sydney activities.

Objective 2.6

The extent and quality of urban canopy cover, landscaping and city greening is improved.

City now

- The city has some tree lined streets and great urban parks.
- Urban canopy is 15.5 per cent of the city area and there is very little remnant vegetation or landscape.
- The City is working with the community to green local streets and spaces.

City in 2030

- The City is planting trees into every available road and footpath, and residents and developers are planting large canopy trees on private property.
- The urban canopy has increased and the community are enjoying the financial, social and environmental benefits of their trees.
- The urban heat effect has reduced and there are wildlife corridors linking the city's major parks.
- The city has the highest quality parks and open spaces maintained to best practice standards.
- The community are active participants in protecting and enhancing the city's trees, parks, flora and fauna.



Monica Barone
Chief Executive Officer April 2015

² <http://www.cityofsydney.nsw.gov.au/vision/sustainable-sydney-2030>

2. Our targets

City of Sydney Operations



Low-carbon city

- 26 per cent reduction in greenhouse gas emissions by end December 2016* based on 2006 levels
- 44 per cent reduction in greenhouse gas emissions by end June 2021 based on 2006 levels
- 70 per cent reduction in emissions by 2030 based on 2006 levels
- 5 per cent of electricity by renewables by end December 2016*
- 50 per cent of electricity from renewable sources by end June 2021



Water sensitive city

- Zero increase in 2006 potable water use by end December 2016*
- Annual potable water use of 180 L/m² of irrigated open space by end June 2021
- Zero increase in potable water use by end June 2021 from 2006 baseline, achieved through water efficiency and recycled water
- Zero increase in potable water use by 2030 from 2006 baseline, achieved through water efficiency and recycled water



Active and connected city

- Zero increase in fleet emissions from 2014 baseline by end June 2016
- Zero increase in fleet emissions from 2014 baseline by end June 2021



Zero waste city

- 54 per cent resource recovery of facilities waste by end December 2016*
- 98 per cent resource recovery of maintenance, construction, demolition waste by end December 2016*
- 70 per cent resource recovery of waste from City-managed assets by end June 2021
- 95 per cent resource recovery of maintenance, construction and demolition waste by end June 2021
- 95 per cent resource recovery of organic waste from parks by end June 2021



Green and cool city

- The average total canopy cover is increased by 50 per cent by 2030 (from 15 to 23 per cent), and increased by 75 per cent by 2050 (to 27 per cent), from a 2008 baseline
- Plant 600 new street trees each year until 2021
- Plant 1,300 new trees and shrubs in City parks each year until 2021
- Tree species diversity will not consist of more than 40 per cent for any particular plant family, 30 per cent for any genus or 10 per cent for any one species by 2021
- Habitat sites in the city are protected and the area of bush restoration sites is increased by 100 per cent by 2023 from a 2012 baseline of 4.2 hectares
- Indigenous fauna species diversity, abundance and distribution is maintained or increased by 2023 based on a 2012 baseline
- A progressive increase in the number of habitat features for priority fauna species is established along potential habitat linkages by 2023

* Incremental targets for 31 December 2016 adopted by Council on 12 May 2014.

All targets appear in the draft *Environmental Action 2016-2021* Strategy and Action Plan, which is on public exhibition from 30 June – 12 August 2016.

Local Government Area



Low-carbon city

- 70 per cent reduction in greenhouse gas emissions by 2030 based on 2006 levels
- Net zero emissions by 2050
- 50 per cent of electricity demand met by renewable sources by 2030



Water sensitive city

- Zero increase in potable water use by 2030 from 2006 baseline, achieved through water efficiency and recycled water
- 50 per cent reduction in the annual solid pollution load discharged to waterways via stormwater by 2030
- 15 per cent reduction in annual nutrient load discharged to waterways via stormwater by 2030



Zero waste city

- 70 per cent recycling and recovery of residential waste from the local government area by end June 2021
- 70 per cent recycling and recovery of commercial and industrial waste from the local government area by end June 2021



Active and connected city

- 33 per cent of trips to work during the AM peak undertaken by walking by 2030, by city residents
- 10 per cent of total trips made in the city are undertaken by bicycle by 2030
- 80 per cent of trips to work during the AM peak are undertaken by public transport by 2030, by city residents and those travelling to Central Sydney from elsewhere
- 30 per cent of city residents who drive [with an unrestricted drivers licence] are members of a car sharing scheme by 2030



Green and cool city

- The average total canopy cover is increased by 50 per cent by 2030 (from 15 to 23 per cent), and increased by 75 per cent by 2050 (to 27 per cent), from a 2008 baseline

All targets appear in the draft Environmental Action 2016-2021 Strategy and Action Plan, which is on public exhibition from 30 June – 12 August 2016.

3. January to June 2016 Review

The City's commitment to environmental leadership to 2030 is demonstrated by our ambitious targets for emissions, energy, water, waste and green space for Council operations and in our Local Government Area (LGA).

Awards

The City received recognition for our sustainability programs through a number of awards in the reporting period;

- [Sydney Park Water Reuse Project](#) took out the Museum of Applied Arts and Sciences Award at the 2016 Good Design Awards, shared the 2016 NSW Award for Excellence in Integrated Stormwater Design and received Gold for Environmental Design in the 2015 Sydney Design Awards (page 28)
- The City's Zero Waste team won [National Top Collector](#) and [State Top Collector](#) NSW for MobileMuster's Local Government Awards 2016 (page 41)
- The City's cycleway network and promotion of cycling was awarded the People's Choice prize at the 2016 Green Cities Conference.

Highlights

City of Sydney Operations

By end of June 2016 in our own operations we;

- Rolled out the [Low-risk](#) and [Eco-driving handbook](#) to the City's drivers as part of implementing the [eco-driving strategy](#) in June 2016 (page 17)
- Held the world's most successful business bike riding challenge, with 359 businesses taking part (page 18)
- Delivered [Liveable Green Network](#) infrastructure and delivered a number of improvements (page 19)
- Completed the construction of underground [recycled water storage](#) tanks for the [Green Square Water Reuse Project](#) (page 27)

Local Government Area

In addition to greening its own operations, the City has provided continuing support to local businesses, residents and visitors to operate and live more sustainably.

By end of June 2016 the City of Sydney has;

- Endorsed the draft [Environmental Action 2016- 2021 Strategy and Action Plan](#) for public exhibition in June 2016 (page 6)
- The City completed the installation of its [braille street sign network](#), one of the largest networks of its type in the world in June 2016 (page 39)
- Held its annual [chemical cleanout](#) event at Sydney Park depot recycling 24 tonnes of hazardous waste from 819 participants (page 41)

4. Climate change

The best available scientific evidence tells us that greenhouse gas emissions from human activity, particularly our use of energy from fossil fuels, are contributing to climate change and the change is occurring faster than initially predicted³.

Climate change occurs as a result of greenhouse gases building up in the atmosphere. These gases include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) and chlorofluorocarbons (CFCs). The gases trap heat radiating from Earth toward space, warming the surface of the planet.

The Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Synthesis Report was released on 2 November 2014. The report states that human influence on the climate system is clear, recent emissions of greenhouse gases caused or produced by humans are the highest in history, and warming of the climate observed since the 1950s is unprecedented⁴.

The world leaders reinforced the need for action with their decision to limit global temperature rise to less than 2°C, and to drive efforts to limit the temperature increase even further to 1.5°C, at the United Nations Conference on Climate Change in Paris in November 2015. The City of Sydney met the challenge, signing the Paris Pledge for Action for 'a safe and stable climate, limiting temperature rise to under 2°C'.

Ocean and air temperatures and sea levels have risen and continue to rise and mass from glaciers and ice sheets are being lost. A warming climate is increasing the

frequency and severity of many extreme weather events and is changing rainfall patterns, creating risks for human well-being, the economy and the environment⁵. Only stopping or dramatically reducing greenhouse gas emissions can slow the changes we are experiencing now.

Sydney is already starting to feel the effects of average global and Australian temperatures rising. Australia's climate has warmed by 0.9°C since 1910⁶. The city recorded its hottest day ever on 18 January 2013 peaking at 45.8°C at Sydney Observatory Hill. Last spring was the third warmest on record for maximum temperatures, with the equal highest number of days above 30°C (13 days), triple the spring average. Maximum temperatures were 2.1°C above average with minimums 1.7°C above average. Rainfall at Sydney Observatory Hill was 33 per cent below average, with the most significant rainfall associated with thunderstorms and a low which broke October daily rainfall records in parts of Sydney⁷. Cities have a critical role in reducing greenhouse gas emissions because although they cover only two per cent of the Earth's land surface, they have more than 50 per cent of the population and cause 75 per cent of the world's emissions.

The Council has endorsed the [Climate Adaptation Strategy](#) to help us prioritise and plan actions needed to prepare the city for the environmental, social, cultural and economic impacts of climate change. The strategy, titled "[Adaption for Climate Change: A long term strategy for the City of Sydney](#)" can be downloaded from our website.

Centralised coal-fired power generation is responsible for 80 per cent of the city's greenhouse gas emissions and a large proportion of Australia's emissions. Power stations lose nearly two-thirds of their primary energy to the atmosphere, with further losses in the grid. These are also major users of water.



For more on the City's plans visit www.cityofsydney.nsw.gov.au or www.sydney2030.com.au or click on the 2030 icon to view a video on renewable energy.

³ National Aeronautics and Space Administration (NASA) <http://climate.nasa.gov/causes/>

⁴ IPCC *Climate Change 2014 Synthesis Report: Summary for Policymakers* http://www.ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_SPMcorr2.pdf

⁵ Climate Council Report *Unpacking the IPCC Fifth Assessment Report* <http://www.climatecouncil.org.au>

⁶ CSIRO *State of the Climate – 2014* <http://www.csiro.au/Outcomes/Climate/Understanding/State-of-the-Climate-2014.aspx>

⁷ Bureau of Meteorology <http://www.bom.gov.au/climate/current/season/nsw/sydney.shtml>

5. Environmental

Action 2016–2021

Strategy and Action Plan

In June 2016, the Council of the City of Sydney endorsed the [draft Environmental Action 2016 – 2021 Strategy and Action Plan](#) (the strategy) for public exhibition.

[Sustainable Sydney 2030](#) outlined the aspiration of our community and businesses for our local government area to be an environmental leader on a global scale. To guide the implementation of [Sustainable Sydney 2030](#), the City developed a series of environmental master plans and strategies between 2008 and 2015.

This strategy combines the insights and data from these documents. It outlines our progress to date, and approach to achieving our bold [Sustainable Sydney 2030](#) targets across six themes:



Low-carbon city

We have set ambitious targets for emissions reduction for both our own operations and for the LGA. To achieve deep reductions we will identify energy efficiency opportunities, optimise use of renewable energy and energy storage, and generate low-carbon energy locally.



Water sensitive city

To build resilience to the predicted impacts of climate change, we need to keep our city cool and green. We aim to minimise use of potable water through efficiency and by capturing alternative water sources to recycle for non-potable purposes. Stormwater management will improve the health of our waterways.



Climate resilient city

Our city will experience more heatwaves, extreme storms and flash flooding events as a result of climate change. We need to respond to these changes by collaborating with other agencies to respond effectively in emergencies and protect vulnerable members of the community. Long term planning for infrastructure needs to take into account future climate predictions.



Zero waste city

We see the city's waste as a valuable resource and will work with the city's residents and businesses to encourage waste re-use, recycling and recovery from energy from waste.



Active and connected city

The City aims to promote the most sustainable modes of transport for residents, workers and visitors to reduce emissions and improve air quality and local amenity. We are improving walking and cycling infrastructure and working with the state government to enhance public transport.



Green and cool city

We are increasing the canopy cover across the city and preserving and increasing native plant and animal habitats. Greening the city reduces the urban heat island effect, improves local air quality and enhances the liveability of the urban environment.

The strategy details how we will deliver against targets set for our own operations. It also explains how we will influence and collaborate with others to contribute towards the achievement of targets for the local government area.

This strategy is supported by a comprehensive action plan that will help us deliver on our goals. The action plan communicates how we aim to improve our operational and local area environmental performance from 2016 to 2021. During this five year period, the action plan will be reviewed and adjusted annually as technology progresses, regulatory reforms occur, we continue to learn and stakeholder feedback is continuously incorporated.



For more information visit <http://sydneyyoursay.com.au/environmental-strategy>

6. Advocacy

To achieve a sustainable future for our city, significant change is needed across the policy and regulatory frameworks at all levels of government.

The City will continue to undertake action to improve environmental performance in its own operations and across the local government area, however there are a number of significant issues that need to be addressed by the state or federal government.

The City will advocate for action on the following matters:

Increase BASIX targets

BASIX and the National Construction Code are the mandatory planning instruments that set the minimum standard for energy and water efficiency of new buildings. The BASIX standard was set 12 years ago and has not been updated, so it falls short of current best-practice. Standards must be raised now to ensure we don't build more new poor-performing buildings that will lock-in carbon emissions for decades to come. The NSW government needs to increase BASIX targets for minimum environmental performance in residential buildings.

Rating tool for residential apartments

There is currently no mandatory tool for rating the operational environmental performance of residential apartments. We propose that the NSW government (which administers the NABERS scheme) develop a NABERS tool (or equivalent) to benchmark the actual performance of residential apartment buildings – which house around 75 per cent of our residents in the City of Sydney. This would improve energy and water outcomes. This then provides a basis for mandatory disclosure of environmental performance in the future.

Energy market reform

Under the current National Electricity Rules, full network charges are still payable if a building with solar photovoltaic panels sends surplus power to the building next door. This rule fails to reward the savings a building has made by not using

the long-distance electricity network of poles and wires. The City is lobbying for regulatory changes to the National Electricity Rules to improve financial returns for local generators. The results would have a positive effect on the uptake of building and district-scale renewable energy generation across Australia.

LED streetlights

The City has upgraded the lamps in all the streetlights it owns to energy-efficient LEDs. The remainder of the streetlights in our LGA are owned by Ausgrid - however the City pays the electricity bills and takes responsibility for the carbon generated. We are advocating for Ausgrid to upgrade all its streetlights in the local government area to efficient LED lamps to save energy.

Water pricing

The current IPART proposal for wholesale water pricing would put the fledgling recycled water industry under threat by seriously undermining the financial viability of operating private water recycling schemes. Recycled water is an essential component of having sufficient, drought-proof water supplies to keep our city cool and green as our climate changes. IPART has recently reduced Sydney Water's retail water prices, which we believe may negate the ongoing work done by councils to encourage water efficient behaviour in our communities.

Land allocation for waste management in metropolitan region

The Sydney metropolitan area has very limited space currently allocated for treatment of waste. As the city grows, we will need more waste treatment facilities, and these need to be in reasonable proximity to where the waste is generated so that value can be recovered from the waste stream. Otherwise, transferring waste to facilities outside the metropolitan area places significant logistical and financial burdens on councils.

High environmental standards for urban renewal precincts

There are two major urban renewal precincts in our LGA – Central to Eveleigh/Waterloo, and the Bays Precinct. Urban Growth NSW is the developer and the planning authority will likely be the NSW Minister for Planning, not the City. We want Urban Growth NSW to set and enforce high environmental standards for these areas as they will be bringing tens of thousands of new residents into our LGA – and we want their environmental footprint to be as small as possible.

Part 1

City of Sydney Operations

Since the targets for Sustainable Sydney 2030 were set, the City of Sydney portfolio has undergone major change.

The emissions from major additions to the portfolio since 2006 (Ian Thorpe Aquatic Centre, Surry Hills Community Centre, Redfern Oval Grandstand, 343 George Street, Mandible Street and the Tote Building) have exceeded the removal of major properties from the portfolio (Lawson Square and the Domain Parking Station).

In addition, new City buildings and assets will increase total emissions and make meeting the City's absolute emissions targets more challenging.



1. Emissions

1.1. Waterfall chart

This waterfall chart⁸ indicates reductions of the Council's operational emissions against the 2005/06 baseline against which the City's emissions reduction targets are set.

The City's greenhouse gas emissions vary due to a range of factors such as the buying and selling of buildings and assets, how we manage our assets, climatic influences, changes to services, and other factors. To assess this variation, the "Portfolio Change" and "Management Improvement" components have been included in this graph. It should be noted that irrespective of portfolio changes, the City's emissions targets are absolute.

To meet its target to reduce 2006 emissions by 70 per cent, the City must reduce its annual emissions (excluding offsets) to below 15,892 tCO₂e by 2030. The waterfall chart shows the contribution of completed and planned programs towards meeting our target.

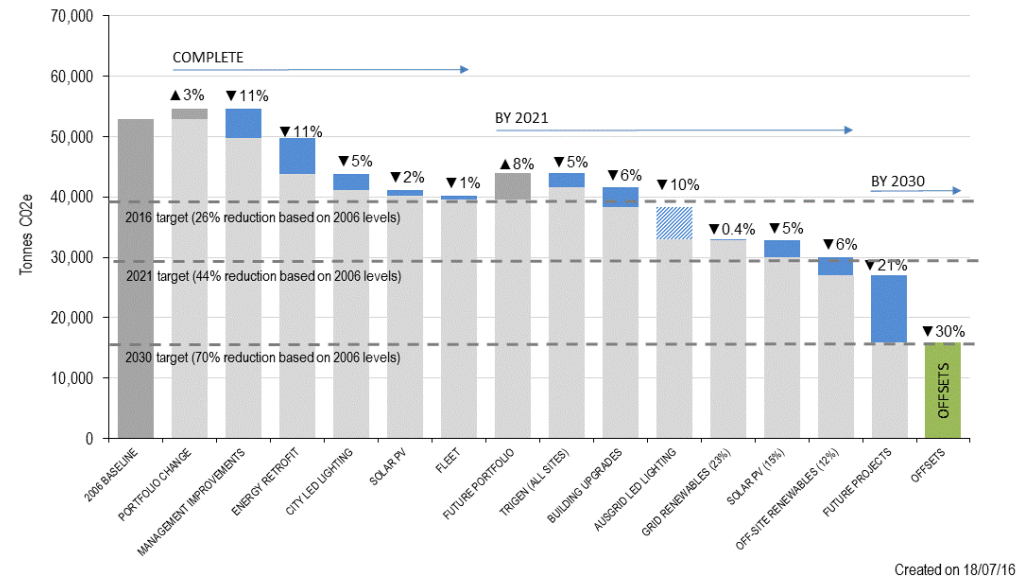


The City has been measuring, reducing and offsetting all of its operational greenhouse gas emissions since 2006/07. In 2011, the City of Sydney became the **first of any level of Government in Australia** to be certified as Carbon Neutral under the Australian Government National Carbon Offset Standard.

The City remains **carbon neutral** by continuing to implement emission saving projects, developing a greenhouse gas emissions inventory with independent verification, and

through the provision of accredited offsets equivalent to 100 per cent of the organisation's emissions.

Chart 1: City of Sydney operations greenhouse gas emissions targets



Large scale energy and emissions savings projects completed to date include a **Building Energy and Water Efficiency** retrofit for City owned buildings, the upgrade of 6,604 City owned street lights with energy efficient light emitting diode (LED) technology (page 15), and fleet initiatives (page 17).

The installation of **solar photovoltaic panels** (page 16) and **trigeneration** on City of Sydney buildings are underway, plus further detailed assessment of energy savings opportunities in key properties.

For more information please see Explanatory Notes to Graphs (pages 76-81).

⁸ The chart above has been modified since the last reporting period to show greater detail for efficiency and renewable energy measures.

1.2. Annual Greenhouse Gas emissions

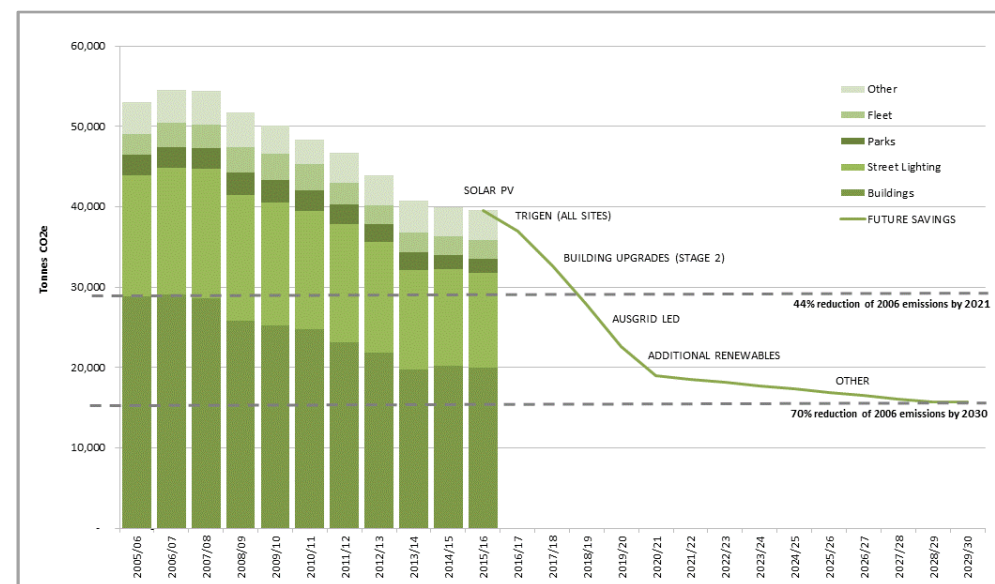
This graph⁹ tracks annual greenhouse gas emissions by category to the [Sustainable Sydney 2030](#) target of a 70 per cent emission reduction against the 2005/06 baseline and tracks identified projects the City is progressing over the short term for its own operations. As at June 2016, the City's estimated emissions have fallen 27 per cent below the 2005/06 baseline.

The graph incorporates projects currently in progress and their proposed effects. It is anticipated that, as projects currently in progress begin to deliver scoped benefits, overall emissions will reduce accordingly.

Emissions from grid electricity are calculated based on the emissions factor for NSW, currently 0.96 tCO₂-e/MWh, which includes both scope 2 and 3 emissions. Greenhouse gas emissions are calculated using [National Greenhouse Factors](#)¹⁰.

For more information please see Explanatory Notes to Graphs (pages 76-81).

Chart 2: City of Sydney operations annual greenhouse gas emissions



For more information on the City's carbon neutral program, visit www.cityofsydney.nsw.gov.au or click on the 2030 icon at left.

⁹ This graph has been updated since the previous report to include 2015/16 annual emissions. Installing trigeneration to Town Hall House is likely to be the next biggest emissions saving. The upgrade of street lighting owned by Ausgrid would also significantly reduce the City's emissions significantly.

¹⁰ <http://www.environment.gov.au/system/files/resources/b24f8db4-e55a-4deb-a0b3-32cf763a5dab/files/national-greenhouse-accounts-factors-dec-2014.pdf>

1.3. Quarterly Greenhouse Gas emissions

This graph¹¹ tracks quarterly greenhouse gas emissions for Council operations by category since the City of Sydney started measuring and reporting on these emissions in 2005/06.

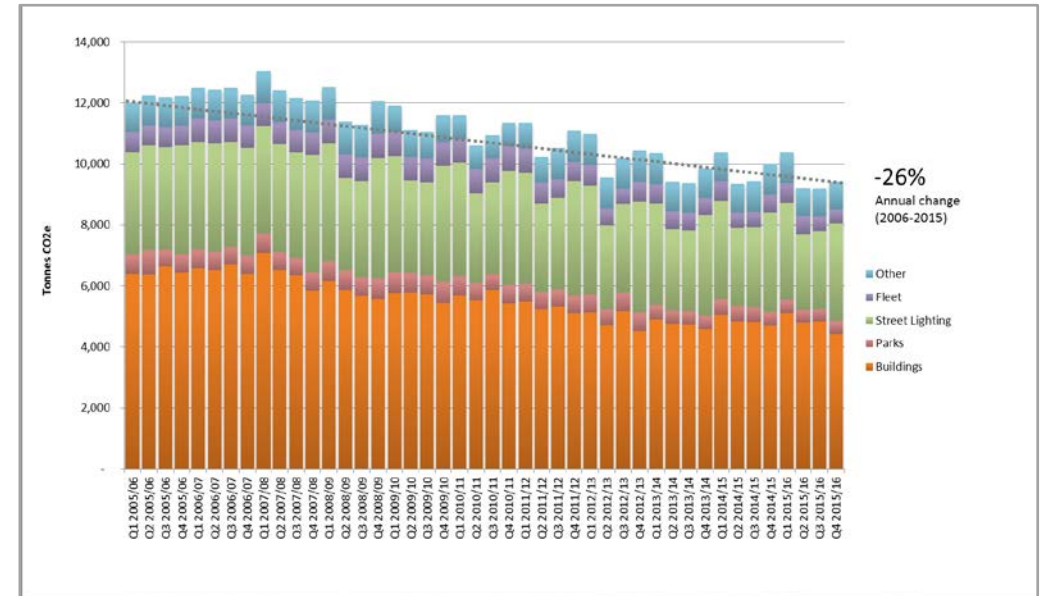
This graph, while providing a more timely measure of greenhouse gas emissions, is subject to seasonal variations (i.e. increased gas for heating in winter and increased electricity for cooling in summer as well as longer street lighting hours in winter months).

This chart shows a **continued downward trend** in line with the various energy savings and renewable energy projects underway. It shows a **decrease** in total estimated emissions between Q1 2015/16 and Q4 2015/16, which largely reflects seasonal variation as observed in previous years.

The estimated emissions in Q4 2015/16 are also **lower** than the same period last year (Q4 2014/15) which reflects energy efficiency improvements and the solar PV installation. The City's recently installed solar panels are contributing to this result.

For more information please see Explanatory Notes to Graphs (pages 76-81).

Chart 3: City of Sydney operations quarterly greenhouse gas emissions



¹¹ This graph has been updated since the previous report to include results for Q3 & Q4 2015/16.

1.4. Major Projects – Emissions

Project	Description	Key milestones	Status	Responsible
LED lighting	Replacement of the most energy inefficient lighting luminaires to reduce energy and emission consumption.	Three year roll out program with GE- UGL covering 6,604 luminaires.	Complete For more see page 15.	City Infrastructure & Traffic Operations
Aquatic Centre Cogeneration	Design and construction of cogeneration installations for Ian Thorpe Aquatic Centre and Cook and Phillip Park Aquatic Centre	Complete ITAC installation by end of June 2017 and CPP by end of June 2018.	Tender process for a cogeneration unit at ITAC is complete. In June 2016 Council approved the execution of a D&C contract for ITAC. The design for cogeneration unit at CPP will occur in tandem with redesign of the other heating services at the centre. At the end of June 2016 the RFQ for design consulting services was finalised for release in July 2017	Green Infrastructure
Trigeneration	Development of trigeneration at City owned buildings and/or City owned sites. Advocacy for regulatory change in the national electricity markets to facilitate development and roll-out of precinct scale trigeneration.	Design, construction, operation and maintenance of a trigeneration plant to meet the business hours energy requirements of Town Hall House, and Sydney Town Hall. Feasibility investigation and performance specification for installation of trigeneration at two or more aquatic centres. Submission of rule change that facilitates local energy to Australian Energy Markets Commission.	Construction work is now complete. Undergoing testing and commissioning, and will enter Operational and Maintenance phase in the next quarter.	Sustainability/ Green Infrastructure/ City Projects and Property
Energy market reform	Reduction of regulatory barriers that inhibit on-site generation and sharing energy between buildings.	Streamlined protocols for connection of embedded generators to public grid. Reforms to national electricity market to ensure reduced network tariffs for electricity generated locally and exported to grid. Regulatory and non-regulatory change to facilitate local electricity trading (aka Virtual Private Networks).	Proposal submitted to Australian Energy Market Commission in July 2015 to introduce network credit for local generation. Consultation process on rule change proposal commenced by AEMC in December 2015 and further submission made on proposal for network credits. On-going interactions with AEMC and consultants to inform the process. Deliberation with AEMC on-going.	Sustainability/ Green Infrastructure
Stage 1 Building Energy and Water Efficiency Retrofit (Origin/Ecosave)	A collection of projects tendered as one project to achieve greenhouse gas emissions reductions from the City's property portfolio	All works and measurement and verification of greenhouse gas and water savings are now complete.	Installation and measurement and verification now complete.	City Projects & Property
Renewable Energy (solar photovoltaic)	Installation of renewable energy projects to meet target for 30 per cent renewable energy by 2030.	Solar photovoltaics tender awarded for design, installation, commissioning, and monitoring.	Installation in Progress. For more see page 16.	City Projects & Property

1.5. Operational Projects - Emissions

Project	Action	Outcomes	Status	Responsible	By
Utility Consumption Management	Educate City staff to interpret the STEVe reports and take corrective action to reduce energy.	Integration into City processes.	In Progress	City Projects & Property and Brookfield	On-going
Environmental Sustainability Platform (ESP)	Develop the ESP to gather and utilise emissions data, providing strategic information to reduce emissions to Sustainable Sydney 2030 targets and the means to report in accordance with international initiatives.	An open approach conforming to the Digital Strategy. Reporting consistent with other cities worldwide.	In Progress	Sustainability Strategy and Sustainability Programs	End 2016
Fleet	Fleet emissions contribute approximately seven per cent of the City's total emissions. Having taken advantage of all available tools and technologies Fleet Management are now focussing on Low-risk and Eco-Driving strategies to reduce emissions.	Maintain fleet emissions at 2014 levels until 2017.	On-going 2015/16 fleet emissions were 2,160 tCO ₂ -e which beat the target by 190 tCO ₂ -e.	Strategy and Assets	End 2017
Environmental Management	Implement environmental management processes to ensure all City staff are aware of their responsibilities in regards to environmental management.	Continuous improvement of environmental management.	On-going	Sustainability Strategy	On-going

2. Green Square Town Centre

Green Star Communities rating

The City has registered the Green Square Town Centre (the town centre) for a Green Star Communities rating. It is a 14 hectare precinct that will be the major retail, cultural and commercial centre for the wider Green Square Urban Renewal Area.

[Green Star Communities](#) is a rating tool that evaluates the sustainability attributes of the planning, design, and construction of large scale development projects against a holistic set of distinct social, environmental, and economic categories.

Green Star Communities strategies and initiatives are closely aligned to the [Sustainable Sydney 2030](#) strategy. The [Green Star rating tool](#) assesses the sustainability performance of community and precinct-wide projects across five impact categories including Governance, Livability, Economic Prosperity, Environment, and Innovation. Each of these categories has credits which align to the [10 strategic directions](#) to guide the future of the City.

Going through the Green Star Communities rating process will enable the City to review the project through all phases, from the strategic directions to the actual project implementation, and further refine actions to lead to better sustainability outcomes for Green Square and the city as a whole.

The City prides itself on being sustainable and by achieving a Green Star Communities rating for the Green Square Town Centre, the City can gain formal recognition for its achievements and serve as a model for other urban renewal communities to follow.



Image: Artist's impression of Green Square Drying Green Park



Image: View from the Aquatic Centre in Green Square

3. LED Lighting

Sydney was the first city in Australia to roll-out new energy-efficient light emitting diode (LED) street and park lights. The City of Sydney has replaced 6,604 conventional lights; saving nearly \$800,000 a year in electricity bills and maintenance costs and reducing greenhouse gas emissions in City owned street lights by a minimum of 40 per cent.

A joint venture of GE and UGL Limited installed majority of the LED street lights in the City of Sydney LGA, as part of a \$7 million three year project. The project was approved with a carbon abatement cost of \$17 per tonne. Simple payback is estimated within 10 years.

To date, 6,604 LED luminaires have been fitted in the City (6,190 from the GE-UGL LED lighting contract and 414 from others). Energy savings have exceeded the target by 8 per cent. The City's LED program was recognised for leadership and innovation at the 2014 Institute of Public Works Engineering Australasia (NSW) annual awards.

Sydney is one of the largest users of street lighting in NSW with 22,000 lights. Of these, 13,500 are maintained by Ausgrid and 8,500 by the City.

During the project the City approved designs and ordered 414 LED luminaires for locations outside the GE-UGL contract. These luminaires will save an additional 246 tCO₂-e per year from the traditional technologies that would previously have been in place. The project was completed in Q2 2015/16.

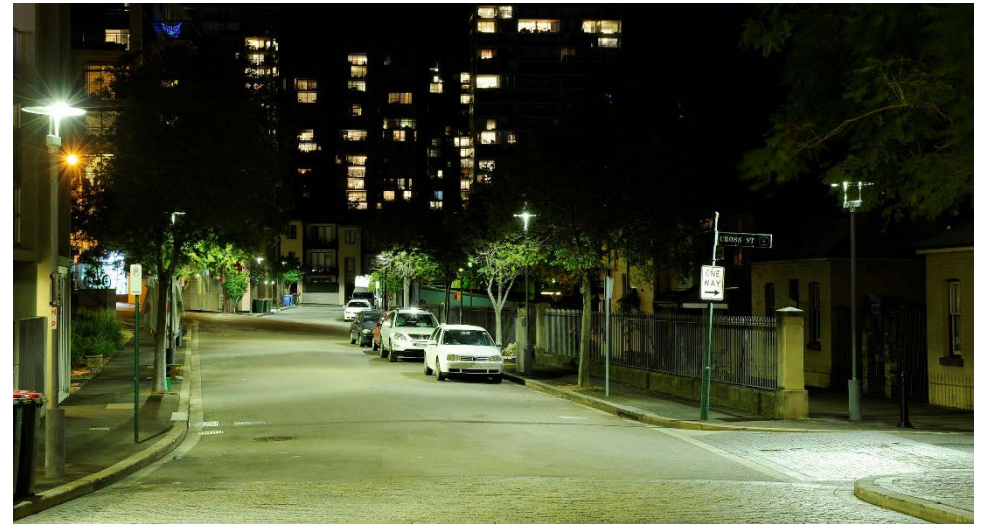


Image: LED Lighting at Scott Street Pyrmont

	Luminaire changes – actual (#)	Luminaire changes – target (#)	Reduction CO ₂ -e from baseline (per cent)
Contract Complete*	6, 190	6,152	47% ¹²

* (GE-UGL LED lighting contract)



For more information about the City's LED lighting, visit www.cityofsydney.nsw.gov.au or www.theclimategroup.org or click on the 2030 icon at left.

¹² Percentage reduction CO₂-e from baseline for total luminaire changes contract to date

4. Solar Photovoltaic (PV) Installation

In July 2012 Council awarded a tender to install solar photovoltaic panels to multiple sites that it owns including properties, sports fields, town halls, libraries, Council depots, and community centres.

The project has passed the halfway mark, with around 2,756 panels installed across 25 sites so far and adds to six previous installations including the heritage listed Sydney Town Hall.

When complete, this multi-million dollar installation is expected to produce almost two GWh (gigawatt hours) of clean renewable energy, saving almost 1,700 tCO₂-e annually. The output of the panels will be reviewed regularly.

The installation of the panels is funded using budget previously allocated to purchasing Green Power. The City also remains carbon neutral through the purchase of carbon offsets. Further installations are underway, however the City is running out of sites that are both suitable for solar and with sufficient demand for the energy produced. This is required to minimise exports to the grid at rates that are uneconomic.

The City is working with the industry, Government, the property sector and clean energy proponents to propose changes to the National Electricity Rules to recognise the value of local generation, which could go part way to overcoming the 'export to the grid' barrier. This extends across Australia and is not just limited to the City of Sydney. Other options are sharing energy with tenants, private energy networks, and storage solutions.

The City will be optimising and installing more solar PV in coming years to meet its organisational renewable energy target. Attachment 3 lists the City's buildings where solar photovoltaic panels and solar hot water has already been installed (page 68).

¹³ Projected energy production for panels installed in the reporting period

¹⁴ Projected emissions savings for panels installed in the reporting period



Image: Solar panels are installed on the roof of the pavilion at Sydney Park

Period	Panels installed	Energy production ¹³ (kWh)	Emission savings ¹⁴ (tCO ₂ -e)	Energy production ¹⁵ (MWh p.a.)
Project to date	2,756	683	958	968
Total contract (target)	5,148	1,186	1,667	1,684



For more information about the City's solar installations, visit www.cityofsydney.nsw.gov.au or click on the 2030 icon at left.

¹⁵ Cumulative energy production for the project to date

5. Transport

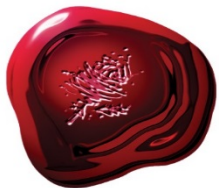
5.1. Fleet emissions

The City's Fleet Services section has continued to lead the fleet industry by reducing greenhouse gas emissions through its [Sustainable Fleet Management Program](#). Having taken advantage of all available tools, fuels and technologies, the program is now focussed on maintaining emissions at 2013/14 levels until new low-emission products and technologies become available in Australia.

The combined fleet emissions for 2015/16 were [2,160](#) tCO₂-e which was 190 tonnes better than the target of [2,350](#) tCO₂-e. A total of [1,069,408](#) litres of fuel was consumed by the City's fleet during this period which was a decrease of [25,000](#) litres over 2014/15. [73](#) per cent of this was blended sustainable bio-diesel.

During 2015/16 the City changed the bio-oil component of its biodiesel from a blend of tallow and recycled cooking oil to a sustainable supply of [100](#) per cent recycled cooking oil. This allowed for the continued use of B50 bio-diesel through the colder months rather than having to drop back to a B20 blend to prevent colder weather from clogging fuel systems.

The City's Sustainable Fleet Management program has now achieved a [27](#) per cent reduction in fleet emissions since its commencement in 2010, without any reduction in services to the community.



BANKSIA
SUSTAINABILITY
AWARDS 2015

CATEGORY FINALIST

Image: Banksia Sustainability Awards 2015 - Category Finalist

This award-winning, multi-faceted program gained further recognition in Q2 2015/16 when it was selected as a finalist in the National Banksia Awards' [Mindful Movement](#) category.

Fleet Services are reviewing odometer and fuelling data processes with a view to improving data quality. More accurate, timely and relevant data will better support fact-based decision making on sustainable asset management and renewal. It will also assist in identifying engine and driver performance, enabling opportunities for further emission savings.

Research and experience demonstrates that eco-driving goes hand-in-hand with low-risk, safer driving. In June 2016 the [Low-risk and Eco-driving](#) handbook was approved by Executive and rolled out to the City's drivers. The handbook is a key tool in implementing the [eco-driving strategy](#) and is supported by ongoing awareness training and in-cabin driver training. Training is offered to all staff who drive, with an emphasis on the City's operational fleet users. By promoting and improving safer driving behaviour and skills we expect to achieve considerably lower vehicle emissions in the future.



Image: Low-risk & Eco Driving Handbook

5.2. Active Transport

City staff continue to embrace greener transport options and are increasingly choosing to walk, cycle or use public transport to commute to work and travel within their working day.

City staff plan their travel using a simple transport hierarchy;

Active Transport (walking or cycling using the City's own bike fleet)

Public Transport (buses and trains)

Drive Green (the City's own fleet of low and zero emissions vehicles)

To support the use of active transport, staff are encouraged to use the City of Sydney's bicycle fleet in preference to fleet cars and taxis. The bike fleet includes a range of bikes suited to various operational requirements, including a cargo bike, some electric assist bikes and bikes with additional carrying capacity. Before using the fleet, staff members take part in a cycling confidence course and provided with personal protective equipment, and are encouraged to build their cycling skills with regular group rides.

The bike fleet is housed in our end-of-trip facility provided for people who walk or ride to work, or who are exercising during work hours. The Pitstop includes 150 bike parking spaces, 150 lockers, en-suite and accessible bathrooms, showers, change rooms and a water station. Since opening on 13 October 2014 an average of 94 people have accessed the Pitstop daily. There are a total of 26 fleet bikes located at a variety of Council facilities including King George Recreational Centre, Epsom Rd & Bay St Depots.

In March 2016, the City held its annual Sydney Rides Business Challenge. A record 4,465 people from 359 organisations took part, making this the largest event of its kind in the world. The challenge provides a fun and engaging way to talk about active transport and encourage new bike riders. The challenge is also run within the City, with 156 staff members taking part, 28 of whom were new riders.



Image: The Pitstop at Town Hall House

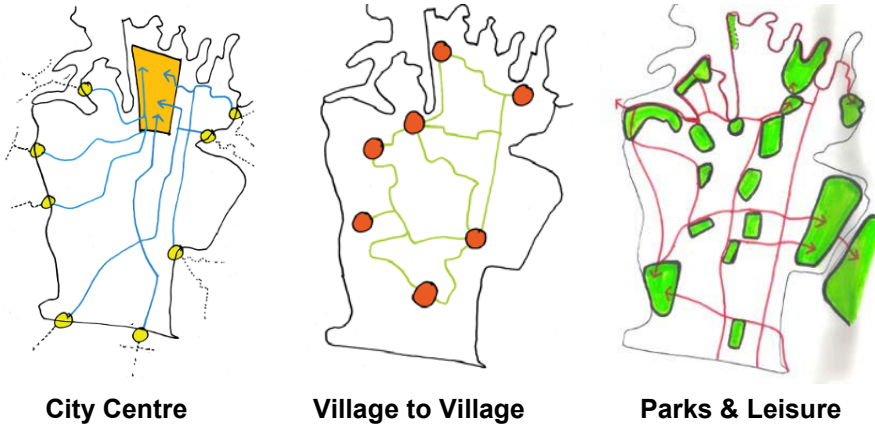
The following table shows the kilometres travelled by staff using the **City Bike Fleet** since its introduction in January 2012 and the number of staff members who have completed training to enable them to use the bike fleet. Distances travelled are measured using odometers mounted on each bike.

Bike Fleet	Q1 2015/16	Q2 2015/16	Q3 2015/16	Q4 2015/16	Year to date	Program to date
Staff trained (#)	14	26	22	29	91	543
Distance(km)	1,782	849	1,700	2,320	6,651	16,437

6. Liveable Green Network

The Liveable Green Network (LGN) is the City's plan to create a network of high quality walking and cycling routes in the City. Implementation of the LGN involves infrastructure improvements to streets and public spaces to make spaces more connected and pleasant to walk and ride in.

The LGN connects the [City to its urban villages](#), connects [village to village](#) and to [parks and leisure](#) facilities. The LGN ensures all residents are within reasonable walking distance to most local services including fresh food, childcare, health services and social, learning, and cultural infrastructure. At least **10** per cent of city trips will be made by bicycle and **50** per cent by pedestrian movement.



The network features include traffic calming measures, widened footpaths and more pedestrian crossings, way-finding, planting for shade and amenity, bubblers, seats, cycleways, bike parking and lighting.

In 2015 the City completed a major audit of all LGN infrastructure to identify defects and areas for improvement. A delivery program has been developed to co-ordinate delivery of the various elements within the LGN routes and linkages.



Image: Zetland Waterloo - Areas in and around the proposed Green Square development

In 2015/16 the City has delivered the following LGN improvements:

- Abercrombie Street pedestrian link to Sydney University
- Bourke Street cycleway – Phillip St to Elizabeth St
- Commenced LGA wide 3 year program on all LGN routes for
 - o Pedestrian Lighting
 - o Street furniture (including seats, bubblers)
 - o Missing Pedestrian ramps
- Bridge Road footpath upgrade - Glebe Foreshore Stage 6
- Wayfinding Signage – 2,100 tactile braille signs installed
- Colbourne St tree planting, footpaths, seating and cycle link

Focus areas for delivery in 2016/17 are:

- Continuing the three year follow programs for lighting, furniture and pedestrian ramps
- Missenden Road – Longdown Street to Marsden Street
- Foveaux Street – Mary Street to Crown St.
- Planning design work for Quay Street will commence
- Argyle Street improvements will be completed in 2016
- Ongoing liaison with Sydney Light Rail on Devonshire Street streetscape design



For more information about the Liveable Green Network, visit www.cityofsydney.nsw.gov.au or click on the 2030 icon at left.

7. Water sensitive city

Water is crucial to the social, economic and environmental wellbeing and survival of our city. The predicted impacts of climate change are expected to intensify Australia's drought, heat and flood cycles. Our city's forecast population growth to 2030 will increase the use of our green public spaces, placing pressure on these spaces to remain green and our waterways to stay clean.

Cities are often warmer than rural areas because vegetation is replaced with hard structures, such as roads, footpaths and buildings; this is known as [the urban heat island effect](#). To keep our cities cool, we need to keep them green and to do so, we need water.

Past climatic conditions have caused the city serious water security concerns. The predicted impacts of climate change and population growth will strain our potable water (treated water that is safe enough for consumption) supplies, with potable water demand estimated to be 30 per cent higher in 2030 than in 2006. We must conserve our valuable water resources to accommodate these impacts. Alternative water resources must increase to drought-proof our city and keep it green and cool.

The City is transforming to be a [water sensitive city](#) that is resilient, cool, green and productive. Our water management approach to meet these targets involves:

- Using less water through changes in behaviour and using water efficient fixtures and fittings
- Capturing alternative water sources to recycle and use for non-potable purposes
- Reducing stormwater pollution, minimising local flood risk, enhancing greening and urban cooling through retrofitting the stormwater management network with raingardens, wetlands, swales and gross pollutant traps

The City's [Decentralised Water Master Plan](#) identifies actions and investments the City of Sydney can make to reduce its reliance on potable water, increase the use of recycled or alternative sources of water for non-potable use, and improve the quality of stormwater discharged to Sydney Harbour and Cooks River.

Our approach will drought-proof our city to ensure we can use water when it is hot and dry. Our waterway health will be improved and non-potable water supplies will be safe- guarded for use in the next century and beyond.



Image: Water Sensitive Urban Design (WSUD) and stormwater recycling at Sydney Park, St Peters

7.1. Waterfall chart

This waterfall chart shows the estimated contributions of the initiatives we plan to implement across our operational portfolio to meet our target to maintain our potable water use at 2006 levels. The 'Complete' section illustrates savings from initiatives as at 31 December 2015. We estimate that by the end of December 2016, we will have saved an additional 5 per cent through ongoing implementation of existing initiatives and thus meet our target to achieve a zero increase on 2006 consumption.

The City's existing initiatives to keep our city cool and green and our waterways clean include:

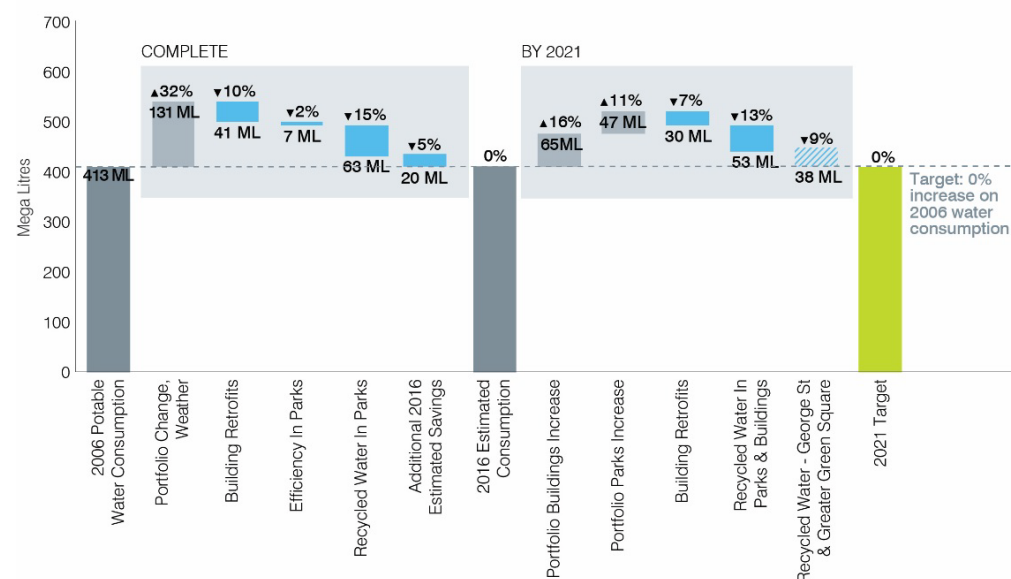
- Installing smart meters to detect and fix leaks in our parks and properties
- Connecting our parks and buildings to alternative water supplies, such as harvested stormwater and rainwater
- Upgrading park irrigation systems to be more efficient
- Retrofitting our high water-using properties with water efficient fixtures and fittings
- Incorporating raingardens and swales during streetscapes and open space upgrade projects to reduce stormwater pollution discharged to our waterways.

Key points related to achievement of the 2021 target are:

- Looking toward 2021, the City will be required to increase service delivery as the population of our local area grows. This will see an increase in water demand from our portfolio of buildings (+16 per cent) and from new parks (+11 per cent)
- Building retrofits (-7 per cent) reflects estimated savings from retrofits of the City's most resource-intensive properties
- Recycled water in parks and buildings (-13 per cent) estimates the savings that could be achieved from identified future City stormwater harvesting schemes including Green Square Town Centre

Chart 4: City of Sydney operations potable water use target

Estimated contribution of initiatives



- Recycled water schemes along George Street and in Greater Green Square (-9 per cent) could achieve significant reduction in potable water demand for the City, but are highly dependent upon the support of the state government and the private sector.

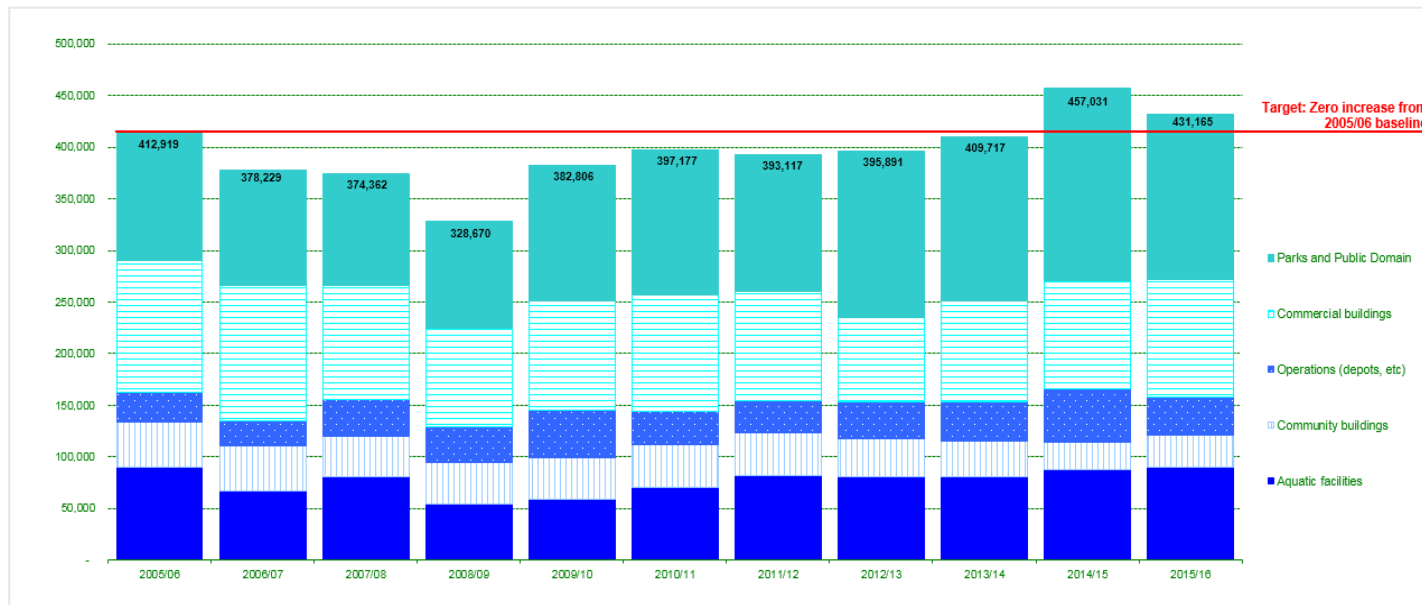


For more information about the City's water management plans and for downloads of the Decentralised Water Master Plan, visit www.cityofsydney.nsw.gov.au or click on the 2030 icon at left.

For more information and detailed assumptions see Explanatory Notes to Graphs (pages 76-81).

7.2. Annual Water Consumption

Chart 5: City of Sydney annual organisation water consumption (kL)



This graph¹⁶ shows annual water consumption by category. The 2014/15 and the 2015/16 periods show an increase in total water consumption above the City's interim target of zero increase from the 2005/06 baseline by 2016.

The 2014/15 increase was largely due to a mains water leak at the Epsom Road Depot which has been rectified.

Other temporary increased water consumption has been noted at Sydney Park due to plant establishment and wetland top up requirements during the upgrade works. This consumption has reduced as the upgrade works are now complete.

For more information please see Explanatory Notes to Graphs (pages 76-81).

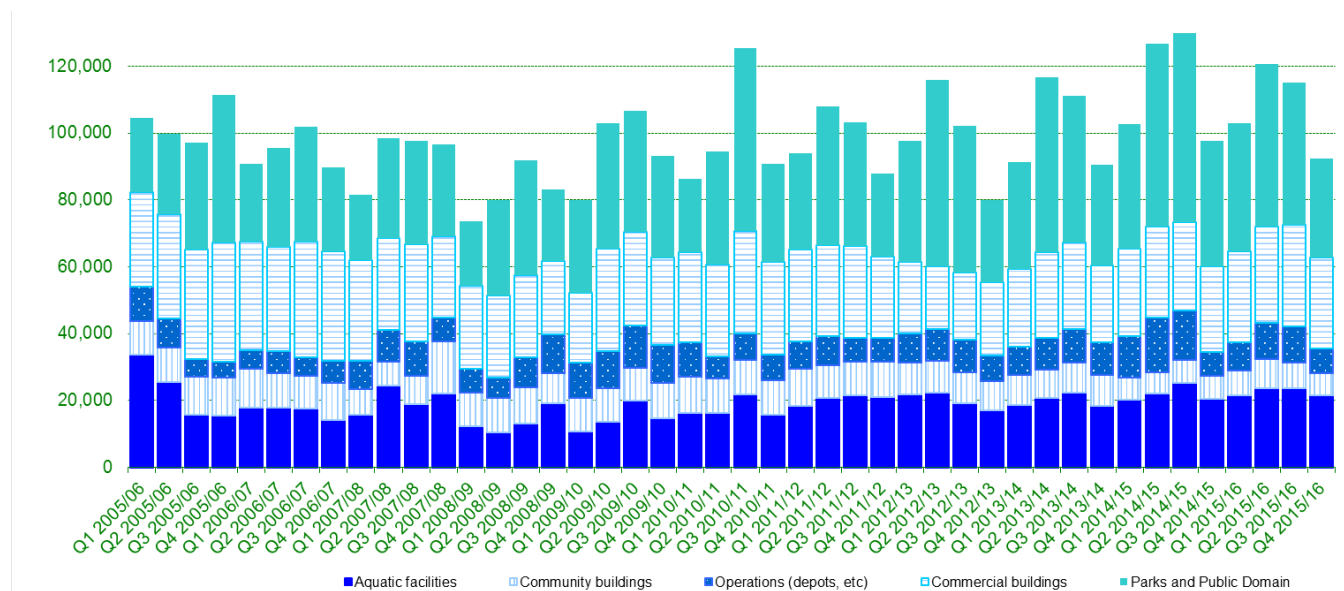


To view the Decentralised Water Master Plan, visit www.cityofsydney.nsw.gov.au or click on the 2030 icon at left to watch a video on the City's plans.

¹⁶ The data for 2014/15 and 2015/16 has been updated in this report to reflect the most up to date consumption data. Note that Q4 2015/16 data is still 90 per cent estimated

7.3. Quarterly Water Consumption

Chart 6: City of Sydney quarterly organisation water consumption (kL)



This graph¹⁷ shows water consumption by category, as in the previous graph but here is represented on a quarterly basis. It demonstrates seasonal variability in water consumption, specifically for 'Parks and Public Domain'.

Sydney Water currently provides quarterly consumption data with a large proportion of estimates. For Q3 2015/16, data shown is 99 per cent actual data. For Q4 2015/16, 90 per cent of the data is estimated based on previous years. This is due to the time lag in obtaining bills and data from Sydney Water.

The 2015/16 results indicate a [decrease in consumption](#) since the previous year to reflect rainfall, the rectified leak at Epsom Road Depot and the completion of Sydney Park plant establishment.

The City has fitted 30 properties with sub-meters which allow for real-time consumption reporting. This provides the ability to deliver water reports to City staff in real time, allowing for timely management of our water usage. A full review of these sub-meters is currently underway to ensure the optimum placement and ongoing provision of data.

For more information please see Explanatory Notes to Graphs (pages 76-81).

¹⁷ This graph has been updated since the last report to include more up to date data for 2014/15 and 2015/16. Note that Q4 2015/16 data is still 90 per cent estimated.

7.4. Water Consumption – Parks

Since 2006, the area of parks and open spaces requiring irrigation in the Local Government Area (LGA) has increased by 52 per cent. These include Wentworth Park, Redfern Park, Redfern Oval, Pirrama Park, Harmony Park, Prince Alfred Park, Paddington Reservoir Gardens, Peace Park, Lillian Fowler Reserve, Mary O'Brien Reserve and Coulson Street Reserve. The total irrigated area as of June 2016 is 810,538 m² against the baseline of 531,953 m².

Council has committed to a new interim target for water usage in city parks of 180 L per square metre of irrigated space by the end of 2016. City parks and open spaces were estimated to use 194 L per square metre of irrigated space as of June 2016. Water consumption has reduced with the completion of landscape establishment works at the Sydney Park wetlands and is likely to reduce further after establishment periods of newly constructed parks are complete. Consistent rainfall has aided in reduction of irrigation demand.

The 2012 [Parks Water Saving Action Plan](#) outlined nine actions to contribute to achieving the City's sustainable water targets. These include staff training, new technologies and improvements to reporting. A full list of actions is shown in the table on page 25. The Parks Water Savings Action Plan is now under review and will be refined to identify actions moving forward.

Improvements to the data capture, and record keeping are continuing, with our focus on data reliability. A contract to manage harvested storm water systems and track overall system performance was established in September 2015. A project has commenced to deliver a new centralised monitoring and control system for parks water use. This will be completed by June 2017.

On-going training and specifications that establish the City's targets are providing greater efficiency in water use. As new technologies and systems become available, the City will explore each option for future alternate water supply.

A report has been submitted exploring options for improvements in water monitoring and efficiency for ten key water use sites with key recommendations now in implementation.



Image: Sydney Park Wetlands

Financial Year	Efficiency intensity (L/ m2)	Increase in irrigated area from baseline (per cent)	Efficiency gains (per cent)	Water use actual (ML)
2006	233	0	-	124
2009	212	22	-	-
2010	198	24	-	131
2011	184	24	10	145
2012	168	33	28	135
2013	191	36	12	165
2014	181	52	12	146
2015	198	52	12	138
2016	194	52	12.5	157

Parks Water Savings Action Plan

Item	Action	Timeframe	Status
1	Evaluate and establish water targets for: Top 10 water consuming sites Top 20 water consuming sites Top 30 water consuming sites	2013 2014 2015	Complete Complete Complete
2	Conduct irrigation efficiency testing on top 20 water using parks	2015	Complete
3	Develop program for implementation of the efficiency measures recommended through efficiency testing for: Top 10 water consuming sites Top 20 water consuming sites	2015 2015	Complete Commenced
4	Monitor and record water usage to maintain accurate data: Installation of STEvE data logger at top 30 water consuming sites Improve capability of Cloudmaster and develop web based system – IT project approved for 15/16 financial year	2015 2016	Complete In progress
5	Implement water savings actions in future maintenance contract	2012 onwards	On-going
6	Improve documentation and record keeping	2012 onwards	On-going
7	Train staff in irrigation management and assessment and efficiency testing	Operational	On-going
8	Explore options and use for alternative water supply	Operational	On-going
9	Develop a standard specification for water savings initiatives to be incorporated in future projects	Operational	On-going

7.5. Floodplain Management

In NSW, local councils are responsible for managing flooding. The NSW Government Flood Prone Land Policy assists in determining if development on floodplains is appropriate and sustainable. The Floodplain Development Manual, developed by the NSW Government requires preparation of a Flood Study and a Floodplain Risk Management Study and development and implementation of a Floodplain Risk Management Plan.

The City of Sydney local government area comprises eight drainage catchment areas in: Alexandra Canal, Blackwattle Bay, Centennial Park, City area, Darling Harbour, Johnston's Creek, Rushcutters Bay and Woolloomooloo.

The City has committed **\$1.8 million** to city-wide Floodplain Risk Management Studies, which includes \$600,000 in NSW and Federal Government grants. We have allocated **\$58 million** for Green Square essential infrastructure drainage improvements, and **\$67 million** over the next 10 years for drainage capacity works across Sydney.

As part of our floodplain management approach, the City is undertaking the first ever city-wide look at the drainage issues and flood risks that exist in Sydney. The work being undertaken includes a series of surveys of catchment areas. These surveys will help us understand where drainage and mitigation works are required to ensure water flow and drainage is properly managed across the local government area. This will dramatically reduce flood risk and safeguard local homes and businesses.

The City has completed flood studies for all **eight** drainage catchments within the Local Government Area. The City has subsequently adopted Floodplain Risk Management studies and plans for the Alexandra Canal, Johnstons Creek, Blackwattle Bay, Woolloomooloo, Rushcutters Bay and Centennial Park catchments. These studies and plans provide a comprehensive suite of actions that will be undertaken to manage flooding risks within the respective catchments.

The first **Floodplain Risk Management Plan** was approved by the City in June 2013. Implementation of its Floodplain Management Plans have begun with construction commencing on the Green Square Trunk Drain. The proposed \$100 million drainage work will take up to three years to complete, and will be co-funded by Sydney Water. The culvert will drain floodwaters away from homes, businesses and roads in and around Joynton Avenue, Lachlan Street, South Dowling Street and Botany Road. The City has also commenced planning the Ashmore Precinct Trunk Drain, and is looking to co-fund these works with Sydney Water also.

The proposed drainage works will also include stormwater quality improvement devices, such as pollutant traps and raingardens to meet the City's targets for stormwater quality.

Catchment	Data collection	Draft Flood Study	Draft Flood Plain Risk Study & Plan
Alexandra Canal	Complete	Complete	Complete
Blackwattle Bay and Johnston's Creek	Complete	Complete	Complete
Rushcutters Bay, Centennial Park and Woolloomooloo	Complete	Complete	Complete
City area and Darling Harbour	Complete	Complete	Pending Adoption in August 2016

7.6. Green Square Water Reuse Project

In September 2013, the City entered into a contract with Flow Systems for the design, construction, operation, maintenance and administration of the Green Square Water Reuse project for up to 10 years. Flow Systems is delivering the project using their wholly-owned subsidiary, Green Square Water.

The project will deliver up to 320 million litres per year of recycled stormwater to the new buildings and open spaces in the [Green Square Town Centre](#), saving precious drinking water and reducing water bills for residents.

[Flow Systems](#) is a private water utility and will be licensed to operate the [Green Square Water Reuse](#) project under the [Water Industry Competition Act](#). The Act is administered by IPART and is aimed at ensuring the ongoing protection of public health, consumers and the environment.

Completed works include the underground storage tanks in the former South Sydney Hospital site and first phase of the recycled water pipe network. The second half of this year will see recycled water treatment plant and pump station installed in the [Green Infrastructure Centre](#), a restored heritage building on the former South Sydney Hospital site, the off-take and harvesting infrastructure completed and the next phase of the recycled water pipe network linking the new developments.

Final commissioning will take place early next year.

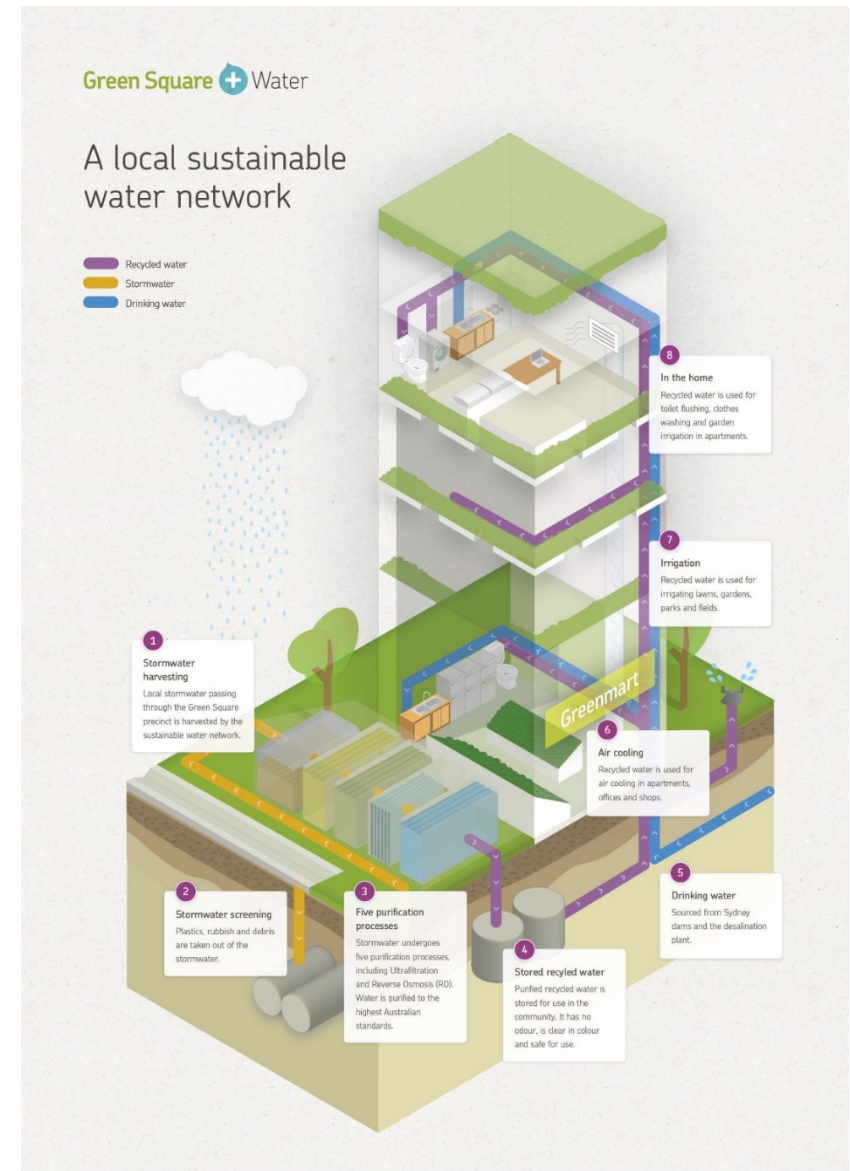


Image: Recycled water reuse process at Green Square Town Centre

7.7. Sydney Park Water Reuse Scheme

The City of Sydney has completed the second stage of Sydney Park's water reuse scheme with the plant and pump equipment operational. The project will contribute to the City's 2030 targets to reduce stormwater pollutants entering our waterways and to replace drinking water through local water capture and reuse.

This project is being partially funded by the Australian Government's Water for the Future initiative through the National Urban Water and Desalination Plan.

The [Sydney Park Water Reuse Scheme Stage II](#) follows the successful implementation of Stage I, completed in 2010. In 2012/13 Stage I harvested and treated an estimated **50 million** litres of stormwater, providing a sustainable water source for the wetlands.

Stage II expands the capacity of the wetlands to supply water for irrigation within the park, as well creating the potential to supply recycled water for future offsite reuse in the local government area.

The project includes landscape improvement works to enhance the park's eco-systems, features and recreation opportunities. New planting, lighting, seating and picnic areas have been installed and pathways improved. Wetlands have been connected via a picturesque series of water cascades and signage has been erected providing information about the water treatment and ecological function of the wetlands.

Water harvesting is the diversion and storage of stormwater that would otherwise drain away. Once captured, the water can be treated to remove storm water pollutants and make it suitable for re-use. The **\$11.3 million** upgrade will allow up to around **850 million** litres of stormwater to be captured and cleaned each year.

The works involve diverting stormwater via a new underground pipe into the Sydney Park wetlands from the stormwater channel that runs within the park near the corner of Euston Road and Sydney Park Road.

Water will be treated using a gross pollutant trap which removes litter, coarse sediment and organic matter from stormwater via a physical screen, and a bio retention system which collects water in shallow depressions and filters it through plant roots and soil. Water drawn from the system for reuse, will receive further treatment through filtration and ultra violet (UV) cleansing processes.

A sustainable water supply protects the wetlands from problems such as poor plant establishment, blue green algae blooms and rapid growth of unwanted, aquatic plants such as azolla, which blocks sunlight.



Image: Sydney Park Wetlands water feature.



For more information, including downloads of the water reuse design scope and construction phasing plan, visit cityofsydney.nsw.gov.au or click on the 2030 icon at left.

7.8. Major Projects – Water

Project	Description	Key milestones	Status	Responsible	By
Sydney Park Water Reuse Scheme - Stage II	Deliver the City's largest water harvesting system to help meet targets. Project includes the ability for water to be reused for irrigation and to top up the wetlands system.	First of a suite of initiatives being formulated under the Decentralised Water Master Plan. Part funded by the Australian Government's Water for the Future initiative.	Completed and operational.	City Projects & Property / City Greening & Leisure	Ongoing
Sydney Park Water Reuse Scheme – Stage III	Expand Sydney Park Water Reuse Scheme to supply harvested stormwater to replace potable water in and around Sydney Park.	Confirm the recycled water resource potential and carry out feasibility assessment to identify and assess options for offsite reuse.	Feasibility assessment to commence following completion of Stage II project 2016.	Green Infrastructure / Sustainability Strategy	December 2016
Floodplain Management Risk Management Studies and Plans	Develop Floodplain Risk Management Studies and Plans for all eight stormwater catchments within the local government area.	Develop studies and plans for catchments in; Alexandra Canal, Blackwattle Bay, Centennial Park, City are, Darling Harbour, Johnson's Creek, Rushcutters Bay and Woolloomooloo.	Floodplain Risk Management Studies and Plans are now adopted for all catchments with the exception of City and Darling Harbour. These final two catchments are set for adoption in August 2016, well in advance of target.	City Infrastructure and Traffic Operations	March 2017
Green Square Water Reuse Project	Deliver recycled stormwater to new buildings and open spaces in Green Square Town Centre, saving drinking water and reducing water bills for residents.	Construction of recycled water reticulation pipes to coincide with development of residential apartment buildings.	Commence installation of treatment plant and off-take infrastructure. Continue installation of reticulation network.	City Projects & Property / Chief Operations Office	March 2017

7.9. Organisational Projects - Water

Project	Action	Outcomes	Status	Responsible	By
Green Square Water Reuse Stage 2	Develop water recycling in the Greater Green Square area beyond the Town Centre.	Internal business case to assess feasibility. Carryout market process to identify a private water utility to further develop opportunity.	Internal business case complete Market process underway.	Green Infrastructure / Sustainability Strategy	End 2018
Non mains water usage reporting	Measure and monitor non-mains water consumption across all of City of Sydney.	Register of non-mains water using sites and consumption data. Measuring and reporting non-mains water consumption against target for recycled or alternative water source.	Register complete Further action required to ensure consumption of non-mains water is recorded – audit scheduled to identify metering and recording requirements.	Sustainability / Parks / Properties	End 2016
Parks Water Savings Action Plan	Develop targets and actions for water use efficiency specifically for Parks.	Develop implementation plan. Plan is currently being updated.	In Progress For more see (page 25)	City Greening & Leisure	In progress
Smart and real time metering of significant water intensive sites	Install sub-meters and data loggers on the significant sites for real-time water metering.	Real-time monitoring and reporting of water consumption on significant sites.	Completed but sub-meter audit underway in buildings to ensure best positioning of meters.	City Projects and Property City Greening & Leisure	In progress Complete

8. Waste

The City as an organisation generates waste in the course of carrying out its functions. As a responsible member of the Better Buildings Partnership, the City is taking steps to better monitor and improve how it manages its waste generation and recycling recovery.

Measurement of organisational facilities waste generated commenced in 2012/13 with the City's waste collection contractor providing data on tonnes of waste collected.

The City is developing the capacity to centralise reporting on the percentage recovery of maintenance, construction and demolition waste across a number of operations.

8.1. Facilities Waste

The City has conducted a waste audit and is reviewing contract requirements to meet the incremental target of 70 per cent resource recovery of facilities waste by 2021.

The City provides a number of services through its libraries, community centres, aquatic centres, community facilities and depots all of which generate waste and recycling.

The City also rents out a number of office and other spaces to tenants and in many buildings provides waste collection services for all tenants. In addition, the City's workforce of close to 2,000 employees generates waste and recycling at their place of work. In the year to date the City achieved an average recycling rate of facilities waste of 45 per cent.

The table at right shows waste generated in tonnes for City of Sydney facilities including non-City of Sydney tenants.

	Q1 2015/16	Q2 2015/16	Q3 2015/16	Q4 2015/16	Year to date
Waste generated (tonnes)	586	584	554	496	2,221
Recycling rate (per cent)	45	45	45	45	45 ¹⁸

Please note - rounded recycling rates include additional recovery made by treating waste after collection. In addition, waste generated tonnages are influenced by tenancy occupation levels in City owned facilities and buildings.



Image: Recycling station in Surry Hills Library.

¹⁸ Year to date figure is an average for the year

8.2. Maintenance, Construction and Demolition Waste

As part of the setting of an organisational waste incremental target, measurement of the waste generated by Council activities such as Parks and Gardens, pavement management and minor construction operations were evaluated.

Our organisational target of 70 per cent recovery rate has been proposed by Council for 2021.

From January to June 2016, the City generated an estimated 847 tonnes of waste from parks and gardens and 2,137 tonnes of waste from Council construction services. The City has estimated that 99 percent of waste from Council construction services has been recycled or diverted.



Image: City Operations Waste and Cleansing

The City of Sydney is looking to expand the reporting baseline to incorporate waste generation and recycling performance from contractors employed by the City.

January to June 2016	Organisational Waste (Tonnes)	Material Recycled (Tonnes)	Diversion Rate (per cent)
Parks and Gardens maintenance (tonnes) ¹⁹	847	847	100
Council Construction and Infrastructure Maintenance (tonnes) ²⁰	2,137	2,137	100
Overall (tonnes)	2,984	2,984	100
2015/16	Organisational Waste (Tonnes)	Material Recycled (Tonnes)	Diversion Rate (per cent)
Overall (tonnes)	6,510	6,478	99

¹⁹ Includes recycled soils, woodchip and green waste. Does not include litter bins.

²⁰ Includes Council-labour minor construction, demolition and maintenance works. Data presented is January to June 2016.

8.3. Major Projects - Waste

Project	Description	Key milestones	Status	Responsible	By
Waste Management in New Developments	Policy and Guidelines to establish minimum design in new developments to optimise resource recovery practices.	Executive review of policy update Public Exhibition of Policy and Guidelines.	Policy review completed. Policy to be consulted with internally and with key industry stakeholders.	Sustainability	December 2016
Waste Strategy 2030	A strategic roadmap to deliver a globally recognised approach to converting Waste to Resources. The Waste Strategy will supplement the Sustainable Sydney 2030 plan and apply to all waste streams in the City local government area, not just residential. Incremental targets will assist in tracking progress to final goals.	Draft Waste Strategy 2030.	Baseline data for City organisation waste and options assessment for residential waste completed. Community waste consultation planned for 2016/17.	Sustainability	December 2016
Improved Recycling for City Commercial Waste Collection & De-fit Waste*	Implementation of Better Building Partnership guidelines across all relevant commercial and construction waste contracts currently underway to achieve improved recycling outcomes.	Commercial Waste Contract Tender and Implementation and De-fit Waste Plan.	In progress.	City Projects and Property	December 2016

* De-fit waste is waste generated by buildings during refurbishment.

9. Sustainable Procurement

The City of Sydney is committed to doing business with ethical and socially responsible suppliers. We recognise that by practicing sustainable procurement we can significantly reduce our environmental impacts, encourage the development of more sustainable and ethical goods and services and deliver other economic and social benefits for the community.

The City sees our suppliers as [partners](#) in our sustainability program. We take great care in selecting the companies who supply us with products and services, and expect each of them to operate in line with international, national and local standards and appropriate codes of practice.

The City is committed to working with our suppliers to find [greener, more cost effective](#) products for use in our many projects including; the construction of roads and community buildings, in Parks and Trees (page 50), provision of low-emission vehicles and sustainable fuels (page 17) supply of luminaires for our LED Lighting (page 15), for use at our many Events (page 35) and by our administrative staff.

In 2015 the City's Procurement Manager was awarded the [NSW Local Government Procurement Professional of the Year Award](#) for the support and leadership shown by the City's Procurement function to the Local Government organisation over a number of years.

The City became a founding member of [Supply Nation](#) in 2010, the first and pre-eminent supplier diversity organisation in Australia which connects Australia's leading brands and government with Indigenous businesses across the country. Among the intentions of the policy was a commitment to; "[enhance social inclusion, diversity and equality and promote environmental economic and social benefits for the community](#)".

Development of social procurement criteria strongly identifies with the City's values of [Collaboration](#), [Innovation](#) and [Courage](#).

The City's Procurement team in conjunction with financial systems has developed a suite of reports to track usage on Cabcharge and Petty Cash. Access to these reports allows Senior Management to target areas where sustainable improvements through reduced travel can be put in place. The expansion of the use of mobile devices like iPhones and iPads, and their reporting, allows users to access and deliver, information without the need to raise paperwork or travel to office locations, thereby improving the City's commitment in moving towards a paperless environment, and the minimising of carbon emissions.



10. Sustainable Event Management

The City runs many events each year to celebrate the diverse cultural, sporting and recreational aspects of Sydney. These include both small events and larger events such as Sydney New Year's Eve and Chinese New Year.

We recognise the importance of a balanced approach to event management which takes into account the city's economy, ecology, society and culture. Our goal is to reduce the impact of events we manage and approve on the environment. The City's [Sustainable Event Management Policy and Guidelines](#) encourage, and in some cases require, that events run by the City:

- minimise waste generation
- maximise recycling
- minimise energy consumption
- maximise use of renewable energy
- minimise water consumption
- conserve bio-diversity
- minimise impacts on climate change and
- promote principles of sustainability

Event organisers are asked to make sure that there are no petrol generators on floats, food stalls provide recycled cutlery and containers, waste is recycled at all events and waste products from food stalls are disposed of safely.

All major events run by the City of Sydney include a [Sustainable Sydney 2030](#) project, many of which are related to environmental sustainability. For example, free valet bicycle

parking is offered at many City events. Our [Events](#) team do all they can to incorporate environmental considerations into the events we run, including using LED lighting, sustainable fuels in generators and waterless urinals where possible.

The environmental and [sustainable policies and practices](#) of contractors is a consideration in the procurement process, for example; events staff working closely with contractors to minimise truck and logistics movements of heavy equipment.

In recent years, the City has undertaken a greenhouse gas assessment of [Sydney New Year's Eve](#). For the 2015 event, the estimated total carbon emissions were 552 tCO₂-e. Compared with the base year emissions of 2012, this represented a net reduction of 14.6 per cent in a like for like comparison.

While the emissions associated with some sources, such as electricity and stationary fuel consumption, were reduced in 2015, other reported emissions increased slightly. These included staff and volunteer commuting, printing, food and beverage and transport fuels. The main reason for the change was increased responses to data requests, and inclusion of data for items not available in previous assessments.



Image: 2015 Sydney New Year's Eve

Part 2

City of Sydney Local Government Area (LGA)

Since the targets for Sustainable Sydney 2030 were set, the City of Sydney local government area (LGA) has undergone significant growth and is expected to continue to grow.

Regardless of future growth, the 2030 targets set by the City of Sydney are absolute.



1. Emissions

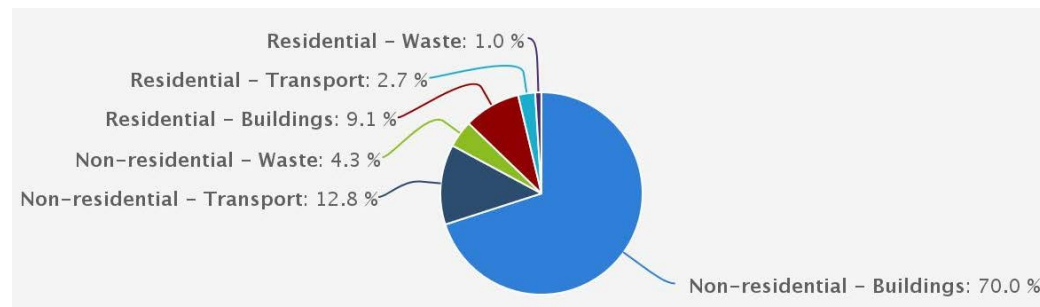
Waterfall chart & annual emissions

This water fall chart is based on the original chart presented in [Sustainable Sydney 2030](#) which has been updated to reflect more accurate emissions savings results from the Energy Efficiency, Renewable Energy, Advanced Waste Treatment, and Trigenation Master Plans.

Since 2007 total greenhouse gas emissions across the local government area have continued to fall and this is despite significant growth in the economy (17 per cent), the number of new residents (12 per cent) and businesses (13 per cent), new developments and other economic indicators.

Most greenhouse gas emissions in the City of Sydney local government area are due to [buildings](#). Emissions are falling due to [improved energy efficiency](#) awareness and practices, and the increase of renewable energy in the grid and locally. However, as buildings become more efficient, and as more people live and work in the area, emissions from transport are growing as a proportion of the total.

The graphs below were produced using the [Kinesis CCAP reporting tool](#) and shows greenhouse gas emissions by sector for the local government area based on utility data and other information sources. The City is working with Kinesis to improve this system to be compliant with the [Global Protocol for Community-Scale Greenhouse Gas Emission Inventories](#) (GPC).



Please note: The chart below showing annual emissions will be updated later in 2016 when the City has a new inventory which is GPC compliant. For more information on these charts please see Explanatory Notes to Graphs (pages 76-81).

Chart 7: Local Government Area annual greenhouse gas emissions

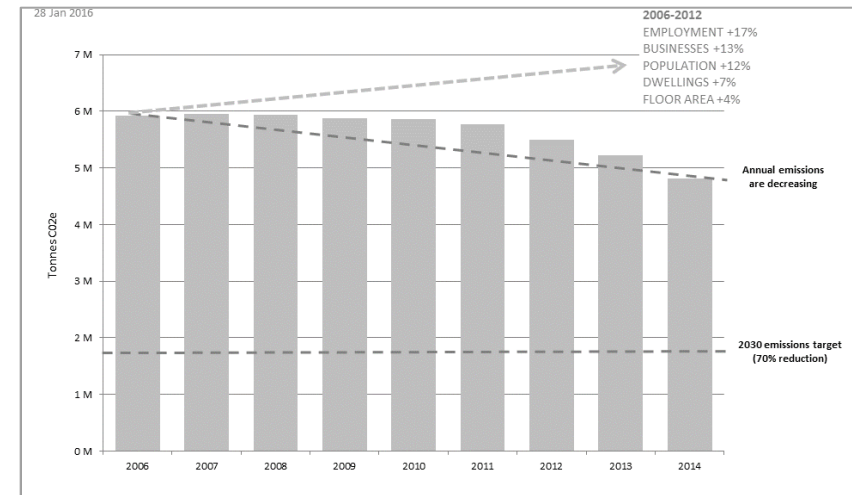
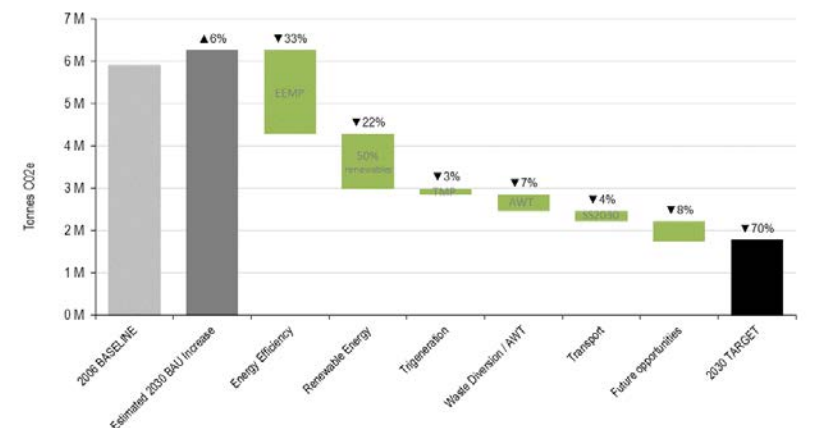


Chart 8: Tracking 2030 – Local Government Area greenhouse gas emissions



Notes
Percentages shown are based on 2006 total LGA emissions. Emission reductions are sourced from the City of Sydney Energy Efficiency Master Plan (EEMP) 2015; Renewable Energy Master Plan 2013; Trigenation Master Plan (TMP) 2013 adjusted to 50MW; Advanced Waste Treatment (AWT) Master Plan 2014; and Sustainable Sydney 2030.

Created on 05/07/2016

2. Green Transport

Making Sydney a city for walking and cycling is key to reducing emissions from cars and preparing for our growing population. The City continues to work towards its walking and cycling targets by building new infrastructure in partnership with the NSW Government, improving existing infrastructure, and delivering events and programs to encourage a strong walking and cycling culture.

2.1. Cycling

More than 7,000 people ride to work in the city centre each day – that's the equivalent of 116 full buses or 7 Sydney trains. The total number of people riding in and around the City of Sydney for work and recreation has doubled since 2010. Numbers continue to increase where new infrastructure is built, with recent additions to the cycleway network being on Castlereagh Street and Liverpool Street in the city centre and the 1.5km Broadway Link between Darlington and Ultimo.

In the first half of 2016, we began work on a number of cycleway projects. Work is underway on Bourke Street, Waterloo to deliver a shared path linking the Bourke Street and Bourke Road cycleways. We are also upgrading the Kent Street Underpass to make this walking and cycling link safer and more attractive. Construction will soon begin on new bike links in Green Square, connecting the growing local population with shops, facilities and on to Central Station.

The City promotes safe and courteous cycling with regular information sessions at locations of well-used shared paths. Now in its sixth year, [Share the Path](#) gives City staff the opportunity to speak to bike riders about the importance of ringing bells early, slowing down and leaving a safe distance when passing people walking on shared paths. We provide free bike tune ups, bells, maps and other safety equipment.

²⁹ <http://www.sydneycycleways.net/>

In 2016 the City launched its [Think of the Impact](#) campaign with the [NRMA](#) to raise awareness of the dangers of car dooring. The campaign used posters, advertising and the [Sydney Cycleways](#)²⁹ website to remind drivers to look for bike riders before opening their car door, and to remind bike riders to ride wide of the door zone. The City also offered free reminder stickers for a cars and bikes, and over 25,000 stickers were ordered during the campaign. The campaign received a huge response with feedback on our social media channels providing us with support and data to continue to promote the [Think of the Impact](#) message.

The City's bike courses continue to be a popular way for beginner riders to gain confidence on their bike. We also continued our bike maintenance courses and our popular balance bike clinics for kids, which take place next to our new bike track for children at Sydney Park.

	Q1 2015/16	Q2 2015/16	Q3 2015/16	Q4 2015/16	Year to date
Share the Path sessions	46	32	38	43	159
STP Tune Ups (#)	285	299	423	360	1367
STP maps issued (#)	419	708	522	853	2,502
STP bells issued (#)	208	244	513	469	1,434
Free cycling courses (# participants)	45	40	73	48	206
Free maintenance courses (# participants)	169	115	199	167	650
Balance Bike Clinic	1,030	602	1,224	1,035	3,891

2.2. Walking

Walking is a low cost, reliable, healthy and environmentally friendly transport option. Research confirms that walking already accounts for around 90 per cent of trips in the city centre and plays a major role in the local transport hierarchy.

The City continues to work to ensure that our built environment is designed to encourage residents and commuters to undertake short trips on foot. Improvements are taking place in many forms, from new pedestrian islands, better footpath paving and wider footpaths, to new shared zones and walking links. Major projects in the first half of 2016 included a redesign of Thomas Street to create a pedestrian-friendly zone in Chinatown and the opening of Quarry Park in Ultimo which provides a pedestrian link to Wentworth Park and Darling Harbour.

In our urban renewal areas we are designing walkable and liveable streets and places, ensuring new development provides new walking links. In [Green Square](#) we announced three pedestrian-only streets for the new town centre, creating traffic free plazas for dining, relaxing and connecting to local shops and transport.

In June 2016 the City completed the installation of its [braille street sign network](#), one of the largest networks of its type in the world. The tactile aluminium panels feature street names and building numbers in both braille and large, raised lettering to allow touch-reading by people who are blind and close range reading for those with low vision.

While the signs are designed primarily for those who are blind and vision impaired, it will also make street location information easier to access for everyone.

This is one of the first steps in the rollout of the [\\$8 million](#) Legible Sydney Wayfinding System, which will help people get around Sydney with pedestrian-friendly maps, information pylons, new signs and digital technology.



Image: Pylon sign and tactile/braille signs

2.3. Car Sharing

Car sharing schemes allow people to drive when they need to, without the hassle and cost of car ownership. As of the end of June 2016 [30,934](#) city residents and businesses were members of a car share company.

A single car share vehicle can take up to [ten](#) cars off the road, and cater for up to [twenty](#) car share members. This takes pressure off limited inner city street parking, and increases the use of walking, cycling and public transport.

The City has provided approximately [691](#) on-street car share parking spaces. In addition, our new local planning controls will increase the number of car sharing spaces provided in new commercial and residential developments such as Harold Park, Frasers Broadway and the Green Square Town Centre.

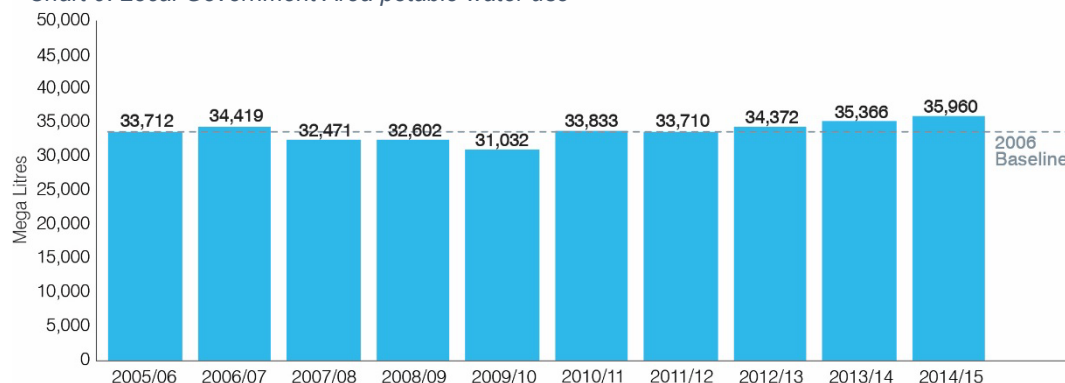
3. Water Sensitive City

Potable water consumption

This chart shows annual potable water consumption across the city against our 2006 baseline, during which time the city's population has grown at least **11** per cent. The removal of state government-imposed water restrictions and increased growth in the local area have resulted in annual consumption rising slightly above the baseline in recent years. This is despite great success in the [City's Smart Green Business](#) (refer page 54) and the [Better Buildings Partnership](#) (refer page 57) programs saving over **2,000 ML** (megalitres) per annum in potable water.

Local government area pathway to potable water use target

Chart 9: Local Government Area potable water use

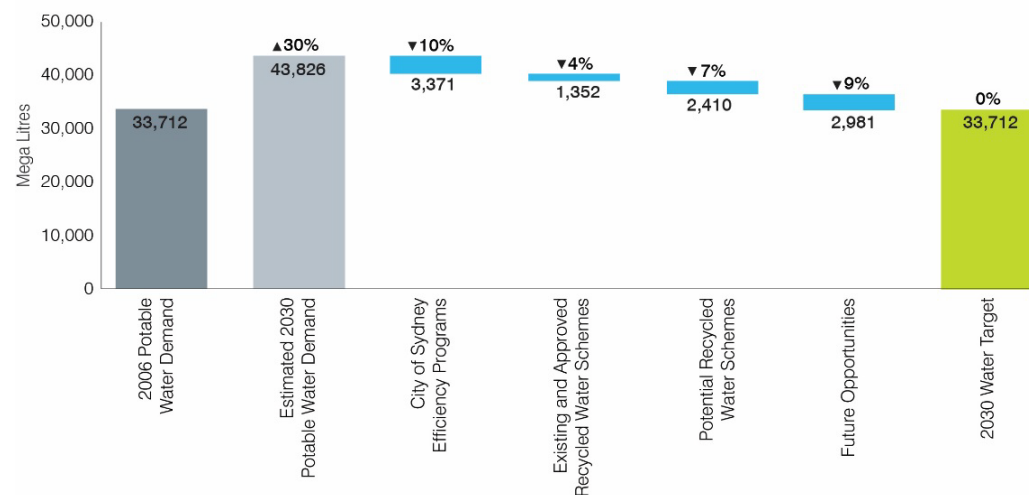


Water efficiency programs, environmental performance grants and recycled water schemes will continue to relieve pressure on our potable water supplies. However, our increasing population and the need to keep our city green and cool means we need to use more water, though it does not all need to be potable water.

The waterfall chart below shows the estimated contributions of the initiatives we believe could minimise the amount of potable water consumed in the local government area by 2030, despite the growth that the area will see in that time. The City of Sydney will take a range of actions to achieve its target of **zero increase in potable water use** by 2030

from 2006 baseline, however city-wide water consumption is influenced by a number of factors outside the City's control.

Chart 10: Local Government Area potable water use target
Estimated contribution of initiatives



Key points are highlighted below:

- City of Sydney efficiency programs (-10 per cent) help residents and business to reduce water consumption
- Existing and approved recycled water schemes (-4 per cent) include the City's stormwater harvesting schemes, as well as private water recycling schemes, based on these schemes operating at full capacity
- Potential recycled water schemes (-7 per cent) reflects opportunities for additional recycled water infrastructure; for example, the potential to include recycled water schemes in urban renewal areas that are redeveloped by the NSW state government

Even if all identified opportunities for recycled water infrastructure are implemented, 2030 potable water use across the city will most likely exceed 2006 levels by around nine per cent. The City will need to work with [Sydney Water](#), as well as other government entities and the private sector to identify opportunities for water conservation, recycling and alternative water supply to safeguard potable water supply and meet the predicted increased demand on water supplies.



For more information about the City's water management plans and for downloads of the Decentralised Water Master Plan, visit www.cityofsydney.nsw.gov.au or click on the 2030 icon at left.

4. Waste

The City won **National Top Collector** and **State Top Collector NSW** for MobileMuster's Local Government Awards 2016 for collecting **253** kilograms of mobile phone components, including handsets, batteries and accessories.

MobileMuster's Local Government Awards recognise the outstanding efforts of local councils in promoting and collecting mobile phone components for recycling. The City collects mobile phones, household batteries and light bulbs through recycling stations at **eleven** library and neighbourhood service centre locations.



Image: The City's Zero Waste team with MobileMuster's National and State Top Collector Award

The City continues to be committed to leading the way towards a **Container Deposit Scheme (CDS)**, through its trial of **Reverse Vending Machines (RVMs)**, which recycle beverage containers in public places.

Since the trial began in June 2014, more than **159,000** beverage containers weighing nearly **2.3** tonnes have been recycled, with more than **52,000** rewards vended. Fewer PET³⁰ plastic bottles and aluminium cans have also been discarded in street bins at RVM sites as a result (when compared to similar sites without RVMs).

The City will continue the trial with for a third year, with two RVMs operating at Redfern and Circular Quay, until the commencement of the NSW CDS in July 2017. An evaluation report of the trial to date is available for businesses, non-government organisations and other councils to access.



Image: The City's Reverse Vending Machine in Redfern

³⁰ PET, polyethylene terephthalate plastic.

On 7 February 2016, the City held a second Chemical CleanOut event for the year at Bay Street depot recycling 24 tonnes of hazardous waste from a record-breaking 819 households. This is a 16 per cent increase in participant numbers over July's event last year.

Popular items collected included paints, batteries, gas cylinders, hydrocarbons, fuels and oils with pesticides, asbestos and arsenic also disposed of safely.



Image: A small amount of mercury was handed in to the Chemical CleanOut event, a NSW EPA Waste Less, Recycle More initiative funded from the Waste Levy

The City continued its yearly partnership with Bunnings Warehouse to hold an e-waste drop-off weekend on 4 and 5 June at the Bunnings carpark in Alexandria.

Despite the stormy weather, the event attracted 787 drop-offs and the e-waste collected filled over 1.2 shipping containers and amounted to approximately 23.7 tonnes.

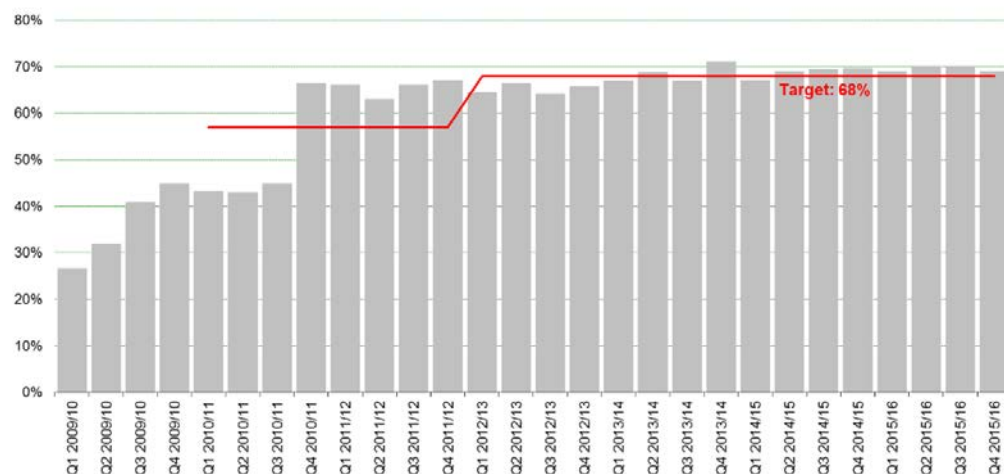
Comments on social media were overwhelmingly positive towards staff, who braved the conditions on the weekend to deliver a service with a smile.



Image: Staff working during the storm in June at the City's e-waste event, Bunnings Warehouse Alexandria

4.1. Resource Recovery Recycling Rate

Chart 11: Quarterly LGA domestic waste resource recovery recycling rate



Please Note: The Resource Recovery Recycling Rate is defined as the amount of waste diverted from landfill which includes: Recycling, White Goods, Garden Organics, E-waste, Mattresses, Household Problem Waste and material recovered through AWT processing. This is shown as a percentage of the total domestic waste generated.

For more information please see Explanatory Notes to Graphs (pages 76-81).

From April 2011 all domestic waste has been processed at [SITA Environmental Solutions Advanced Waste Treatment \(AWT\) Facilities](#). This means that none of the City of Sydney's domestic waste is sent directly to landfill.

The City continues to achieve a consistently high resource recovery rate and achieved **69.61** per cent for 2015/16.

The City recognises that disposal of untreated waste to landfill is no longer a responsible waste management option. Loss of potential resources and environmental harm arise from methane gas emissions from decomposing garbage. Methane as a greenhouse gas is **25** times more potent than carbon dioxide.

Establishing a treatment facility suitable for energy recovery to further reduce emissions is part of an integrated suite of long term waste solutions being investigated by the City.



For more visit www.cityofsydney.nsw.gov.au or <http://www.zerowaste.org.au/> or click on the 2030 icon at left.

4.2. Electronic Waste

Australians generate more than **140,000** tonnes of electronic waste (e-waste) each year and most of it ends up in landfill. As well as putting more pressure on limited landfill capacity, e-waste can be hazardous as it contains toxic materials.

To keep e-waste out of landfill, the City runs quarterly e-waste collections through the Bay Street Depot in Ultimo each year. This electronic waste is sent for reprocessing by [Sims Recycling Solutions](#) in Sydney where **98** per cent of all material is broken down and recovered for recycling in Australian facilities where possible.

The City hosted two e-waste recycling events between January and June diverting **49.33** tonnes of e-waste from landfill from **1,457** drop-offs.

Since the e-waste program began in 2008 the City has recycled **468.36** tonnes of e-waste from **14,429** participants.

Performance	Q1 2015/16	Q2 2015/16	Q3 2015/16	Q4 2015/16	2016 totals
Residents	471	1081	670	787	3,009
Electronic waste (tonnes)	12.62	32.82	25.59	23.73	94.76

The City also recycled **235** kilograms of mobile phones, batteries and light bulbs this period through recycling stations at libraries and community centres. **3.69** tonnes of household batteries, light bulbs and mobile phones from landfill since commencing the service in November 2013.



Images: Residents recycling e-waste at Bay Street depot, Ultimo

4.3. Waste Strategy Development

Interim Waste Strategy

The City's [Interim Waste Strategy](#)²³ establishes the framework for the comprehensive management of waste in the city. It aims to reduce waste, maximise resource recovery and find solutions for hazardous material. In addition, the Strategy looks for solutions to reduce greenhouse gas emissions, provide cleaner streets and integrate waste, water and energy infrastructure.

Regional Waste Strategy

The City has assisted in the development of a Regional Waste Strategy. A Regional Waste Strategy is a State Government requirement. Councils within the Southern Sydney Regional Organisation of Councils (SSROC) have co-operated to identify potential regional solutions for energy recovery from waste, improving recycling rates, diverting waste from landfill, illegal waste dumping and litter. The Regional Waste Strategy was approved by SSROC in August 2014. A three year action plan was developed by SSROC to assist in developing and implementing the Regional Waste Strategy.

City of Sydney Waste Strategy 2030

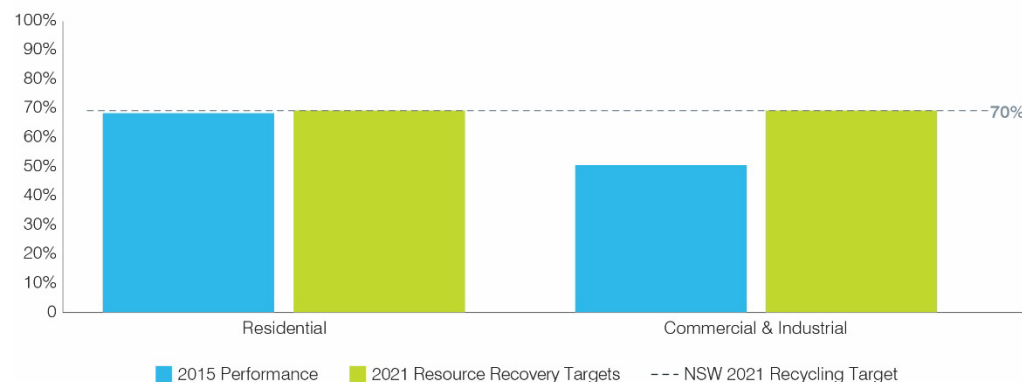
The City is preparing a Waste Strategy 2030 to set targets, objectives and actions for managing the City's waste streams as resources. The Waste Strategy 2030 will address the resource recovery from residential, City organisational, commercial and construction waste streams.

Consultation with internal stakeholders has commenced. A co-operative working relationship with the NSW Environment Protection Authority which has released its Waste Avoidance and Resource Recovery Strategy 2014-2021 will assist the delivery of key program objective.

The chart²⁴ below shows recycling levels in 2015 across the city against the targets we have set for 2021 and the NSW state government's targets.

The City does not have control over the collection and disposal of commercial and industrial waste. Waste generators make their own arrangements for collection and disposal of waste, and thus determine how waste is treated and what level of resource recovery is achieved. The City has a number of programs in place to support commercial and industrial businesses to improve resource recovery.

Chart 12: Local Government Area resource recovery targets



For more visit www.cityofsydney.nsw.gov.au or click on the 2030 icon at left to view the Draft Waste Policy.

²³ http://www.cityofsydney.nsw.gov.au/data/assets/pdf_file/0019/122914/InterimWasteStrategy.pdf

²⁴ Detailed assumptions for charts are in Explanatory Notes to Graphs (76-81).

4.4. Clean Streets Program

The City's Clean Streets program aims to improve cleanliness of the City's streets and laneways, reduce clutter and increase community pride. There are dozens of laneways across the City where bins are being stored on the street permanently and suffer from issues like illegal dumping, litter and graffiti. Our programs aim to reduce this dramatically.

Over the last six months the Clean Streets program has been active in a number of streets and laneways: Edward Street and Myrtle Street in Chippendale, Morrissey Road in Erskineville. Thomson Street, Denham Street, Palmer Street, Cathedral Street and Bourke Street in Darlinghurst, Longdown Street, Leamington Lane and Gibbes Street in Newtown, Riley Street in Surry Hills and Belmont Lane in Alexandria.

Rangers, Cleansing and Waste Education staff have worked together to improve amenity, safety and cleanliness in these areas by clearing illegally dumped items, and by working with residents to bring in their bins and use the City's free pick-up service.



Images: Before (above left) after (above right) Belmont Lane in Alexandria where a Clean Streets campaign was carried out in February.

The City's first underground bin system which has been in place for the last two years at Royston Street in Darlinghurst has recently been upgraded. Works included improving the drainage system to ensure that the bin system is protected during heavy downpours. The traffic island has been rebuilt and bollards have also been installed around the perimeter of the system to protect it from vehicles.



Images: Royston Street bin system upgrade works, before (below left) and after (above).

5. Greening Sydney

The City of Sydney recognises the importance of trees and other plants in providing significant environmental, social and economic benefits for the community. There is growing recognition internationally of the role of cities and local governments in supporting and promoting biodiversity.

The City is committed to increasing tree coverage, improving urban ecology and biodiversity and supporting community greening to make Sydney one of the world's leading green cities. To achieve this, the City has developed the [Greening Sydney Plan](#). The Plan acknowledges the importance of ecology and biodiversity to city living and supports the development of the [Urban Ecology Strategic Action Plan](#) (page 48).

Three strategic focus areas have been identified informing the objectives and targets of the Plan:

- [Urban Canopy](#) - developing and protecting the city's urban forest
- [Urban Ecology](#) - greening to improve habitat for biodiversity
- [Community Empowerment](#) - to green and care for our urban landscape

There are three delivery focus areas for achieving the Plan:

- [Public Domain](#) - greening for quality streetscapes and public spaces
- [New Development](#) - maximising greening opportunities
- [Community Greening](#) - empowering the community to green our city

Under the Greening Sydney Plan, the City will deliver some [42](#) programs and projects in partnership with residents, local business, developers and volunteer groups. The City's

programs have planted over [11,431](#) new street trees since 2005 and installed [60,371](#) square metres of landscaping throughout the City's streets since 2008.

Major projects to be implemented under the Plan include:

- increasing the city's urban canopy by 50 per cent on current canopy rates of 15.5 per cent by 2030 to a total of 23.25 per cent by 2050
- implementation of the Urban Forest Strategy
- implementation of the Urban Ecology Strategic Action Plan
- implementation of the Street Trees Master Plan
- review of the Register of Significant Trees²⁵
- implementation of Tree Management Policy
- plantings in all available footpath locations
- investigation of Water Sensitive Urban Design (WSUD) opportunities
- development of a green roof policy
- supporting establishment of verge and community gardens
- developing and supporting a green volunteers network



Image: A new pocket park has been installed at Colbourne Avenue, Glebe Sydney.



For more, visit www.cityofsydney.nsw.gov.au or click on the 2030 icon at left

²⁵ Project completed. All other projects in progress.

5.1. Urban Ecology Strategic Action Plan

The ecological health of urban areas influences not only the diversity and abundance of plant and animal species, but also the quality of life of urban residents. Improved urban ecosystems can consequently have both environmental and social benefits.

The City's Urban Ecology Strategic Action Plan was adopted by Council in March 2014. The Plan outlines the City's approach to identify, protect and rebuild locally indigenous plant and animal populations. The Plan is part of the City's work to restore and conserve our urban ecosystems to create a liveable city for all of its inhabitants.

Conservation Volunteers Australia continue to manage a group of volunteers under the [Sydney Park Bush Regeneration Volunteer Project](#). They are in their final year and have to date worked with a total of 1,061 volunteers since the program began on 4 June 2014.

An annual infill planting program has commenced across existing bush restoration sites to improve the vegetation condition and diversity across these sites. A total of 1,639 plants have been planted in these sites to date. Maintenance of the Sydney Park wetlands has been a major focus of works since completion of the stormwater harvesting project, with best practice bush restoration approaches being used.

The completion of the grant from the Australian Government administered by the Sydney Coastal Councils Group to install a further 60 seawall pots has been a success. The end of the project saw an ecological engineering forum with 110 participants attending from various disciplines ranging from landscape architecture, engineering, ecology, developers, artists, from both private, state and local government bodies.

An online [fauna reporting tool](#)²⁶ for community and staff to report uncommon fauna species was uploaded onto the City's website in October and has received 180 entries to date.

Nesting boxes have been progressively installed across various sites in the LGA, with an additional four installed in April 2016. A pollinator habitat feature was installed along Glebe foreshore to promote awareness of the importance of urban habitat and pollinators.

Partnership programs continue to be pursued with other Councils and other land managers such as Royal Botanic Gardens, Southern Sydney Regional Fox Project and Hollows for Homes project.



Image: City of Sydney Urban Ecologist Sophie Golding and Carpenter Marc Dieckmann pictured with the new pollinator habitat feature along the Glebe foreshore



For more, visit www.cityofsydney.nsw.gov.au or click on the 2030 icon at left.

²⁶ <http://www.cityofsydney.nsw.gov.au/live/animals/wildlife/local-wildlife-watch>

5.2. Community Gardens and Community Planting

The City recognises that community gardening offers residents the opportunity to grow and harvest their own produce and help reduce household waste through community composting. Community gardens also create more green patches bursting with vegetables, plants and flowers, across our city.

The City continues to support and implement community gardens in the local government area, with 19 in place at the end of June 2016. The City also supports a number of other planting programs and gardens across the LGA including; five Landcare groups, three community footpath verge gardens and one community composting group.

The City also encourages greening initiatives and working with organisations to green our villages. National Tree Day is a national event that has been supported and implemented between Planet Ark and the City for the past 20 years. Plans are now underway for planting of 2,000 native tube stock ant Jubilee Park in Glebe as part of the 2016 National Tree Day Celebrations on the 31st July.



Image: Friends of Orphan School Creek Bushcare

Community planting events happen throughout the year to assist existing Bushcare groups or to allow new open spaces to green by inviting the local residents and community to participate in planting native seedlings.

The City is supporting a community composting group, which has a management and site plan in place.

The community gardens policy and guidelines were endorsed by Council in February 2016. We have also enlisted a new community garden with the commencement of the Jubilee Kitchen Garden in Glebe. The Greg Hewish Memorial Community Garden has closed with a new location to be considered.

Performance	Q3 2015/16	Q4 2015/16	2015/16 target	Year to date	Total to date
Community Gardens (#)	No new	1 new 1 group closed	>18	1	19
Landcare groups (#)	No new	No New	trend	No new	5
Community footpath verge gardens (#)	No new	No new	trend	No new	3
Community composting groups (#)	No new	No new	trend	No new	1



For more information, including a map of community gardens, visit www.cityofsydney.nsw.gov.au or click the 2030 icon at left.

5.3. Parks and Trees

The City of Sydney recognises that green spaces are one of a city's most important natural assets. They are crucial to maintaining the high quality of our public realm and achieving **Sustainable Sydney 2030**, by assisting the creation of green corridors and increased canopy cover.

The City is continuing to deliver a number of **small parks upgrades** within the LGA. Since 2008, **59** small parks have been completed, including **13** completed during 2015/16 and several more currently being planned.

Under the Greening Sydney program a number of areas have been converted to increase the vegetated space within the City. During 2015/16 **7,197** m² of landscaping (grass and planting installation) was completed.

New tree planting opportunities, many located in roadways, are being investigated to increase canopy cover. The project in Colbourne St, Glebe was recently completed, and design work is continues for other projects including Pelican St Surry Hills. . This planting is undertaken as part of the City's **Street Tree Master Plan 2011**²⁷, which is a blueprint for street tree plantings across the City of Sydney.

Raingardens are one of the simplest forms of **Water Sensitive Urban Design (WSUD)** used for treating stormwater prior to discharge to the main stormwater system and ultimately to our waterways and bays. A total of **154** raingardens have been installed to date.



For more, visit www.cityofsydney.nsw.gov.au or click the 2030 icon at left.

²⁷ <http://www.cityofsydney.nsw.gov.au/live/trees/tree-policies>

Performance	Q3 2015/16	Q4 2015/16	2015/16 target	Year to date	Total to date
Small park upgrades (#)	1	1	3	13	59
Landscaping (grass/planting) (m ²)	1144	2279	8,000	8001	60, 371
Raingardens (#)			trend		154
Street trees planted since 2005 (#)	60	354	600	727	11,431
	Q3 2015/16	Q4 2015/16	2030 target	Year to date	Total to date
Canopy cover (on current) (per cent)*			23.5	No data	No data

Please note: Numbers in the table above are compiled from various sources and may include adjusted totals as more accurate data is received.

* Canopy cover is measured every five years. Measurement is planned for mid-2016.

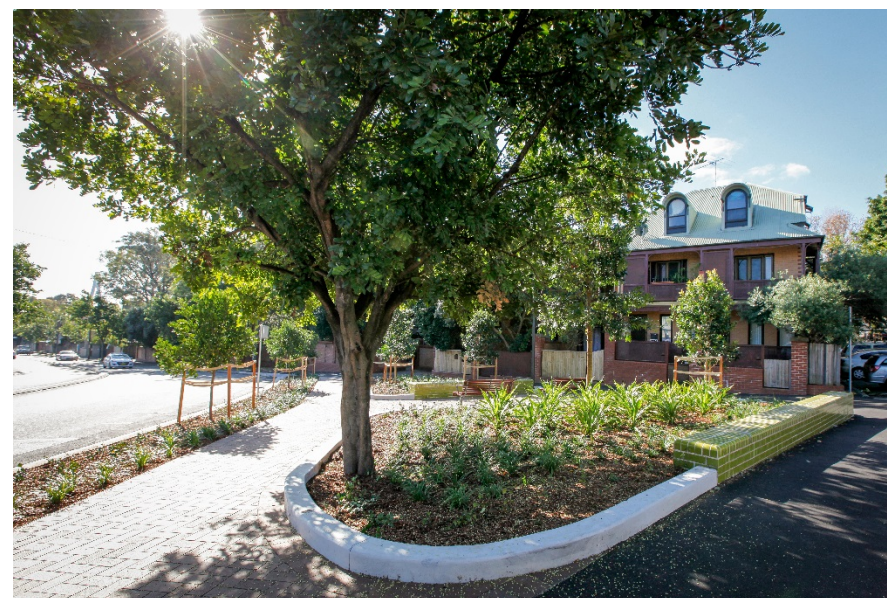


Image: A new pocket park has been installed at Colbourne Ave. Features include a bike path, bike parking, native plants, trees and park benches.

5.4. Green Roofs and Walls

Green roofs and walls make an important contribution to the urban environment. They help mitigate the impacts of the urban heat island effect, slow and clean stormwater, improve air quality, increase habitat for biodiversity and create additional space for urban food production and recreation. The [Green Roofs and Walls Policy](#) – the first of its kind in Australia, was formally adopted by the Council in 2014.

The City has developed resources to inform, inspire and encourage building owners to include green roofs and walls in their developments. These include a guide to waterproofing for green roofs and walls, a green roofs and walls inspiration guide and case studies showcasing two of the City's own green roof projects, Surry Hills Library and Beare Park amenities block. The City's work on green roofs and walls, including the policy, guidelines and its own green roofs and walls, was 'highly commended' in the NSW Government's Green Globe Awards in October 2015.

Performance	2014/15 new sites	2015/16 new sites	Total to date ²⁸	Total area (m ²)
Green roofs in the LGA (#)	29	18	103	117,749
Green walls in the LGA (#)	4	4	36	3,366
Total green roofs and walls (#) ²⁹	33	22	139	121,114

²⁸ 2012/13 was the first year of measurement.



Image: Kings Cross Green Wall

The guides, case studies and more can be downloaded from www.cityofsydney.nsw.gov.au/green-roofs-and-walls

Significant development is occurring in the City and has resulted in a jump in the number of green roofs and walls. Since 2012, 146 development applications that incorporate green roof or walls have been reviewed. During 2015/16, the City received 34 new development applications which included green roofs and walls.

Currently the City has at least 121,114 m² of green roofs and walls. This period saw about 1,800 m² of green roofs completed in the Green Square urban renewal area.



Visit www.cityofsydney.nsw.gov.au or click the 2030 icon at left for more, including a map of green roof and wall sites.

²⁹ Figures adjusted from last reporting year to reflect actuals.

6. Sustainability Programs

6.1. Highlights

The City, as co-chair of the [C40 Private Buildings Efficiency Network](#) which supports cities to develop policies and programs that improve residential and commercial energy efficiency, hosted a Sydney network workshop in September 2015. Delegates from 13 cities met to learn and share best practice in the areas of energy efficiency policy, performance data & insights and business engagement. The City also hosted an [Energy Efficiency Forum](#) – Learning from these Global Leaders at Customs House attended by over 140 stakeholders from the City's various sustainability programs.

New analysis, information guides and campaigns to reduce resource waste impacts in the office sector were released in the first half of 2016. The [Better Buildings Partnership](#) has focussed on operational waste from buildings and on the issue of how to minimise waste going to landfill when an office tenant moves and 'strips back' their tenancy to the bare walls provided by the building owner. And [CitySwitch](#) launched a campaign to reduce office based waste in April that comprised a guide and assessment tool that over 15 per cent of national CitySwitch businesses have made use of to date.

Council has awarded funds to 15 projects within the [Environmental Innovation Grant program](#) within the year with seven of these projects aimed at demonstrating solar photovoltaic solutions that had previously not been implemented in the local government area – 4 on apartment buildings (that will help demonstrate how owners can install solar despite complex strata decision-making and governance processes); and 3 projects that explore innovative financing models for large scale community and business take-up of solar solutions.




Image: CitySwitch is helping office-based businesses better understand their waste – what is generated, what can be recycled and where are the pain points. – May 2016



Image: C40 Private Efficiency Network delegates – September 2015



6.2. Overview – Sustainability programs

Sector	Project Name	Stage	Status	Start	End
Business - 22,000 businesses - 80 per cent are Small to Medium Enterprise	Smart Green Business – Phase III	Underway		Jul-13	Jun-17
	CitySwitch Green Office – National	Underway		Jul-08	Jun-18
	CitySwitch Green Office - Sydney	Underway		Jul-08	Jun-18
	Better Buildings Partnership – Phase I	Underway		Mar-11	Jun-16 ³⁰
	Environmental Upgrade Finance Service	Underway		Dec-11	On-going
Residential - 200,000 population - 3/4 live in apartments - 50 per cent rent and High transient levels - 10 per cent social housing	Residential Apartment Sustainability Plan	Underway		July 2015	On-going
	Green Villages	Underway		Oct-10	On-going
	Green Living Centre	Underway		Sep-09	Jun-17

³⁰ Better Buildings Partnership members have agreed to fund the continuation of the program (phase 2) for a further 5 years (ending June 2021)

6.3. Smart Green Business Program

The Smart Green Business Program, run in partnership with Sydney Water assists medium to large non-office based businesses (for example: hotels, entertainment, conference facilities and retailers) in the local government area to improve their environmental performance.

This phase of the program commenced July 2013. The program provides hands on sustainability advice and implementation support for water and waste reduction and provides referral to State energy efficiency programs.

During the year the Smart Green Business program recruited 93 large businesses across the entertainment, conference venues and retail sectors, with 92 businesses implementing identified water efficiency and/or waste recommendations.

The program has also engaged 74 smaller food related businesses through the City's Health & Building sustainability trial, where Health and Building Officers have been providing sustainability advice during food business inspections. Out of businesses engaged, 53 implemented water recommendations and achieved an average cost saving of \$1,989 per year.

During quarter three, one of the program customers, the Art Gallery of New South Wales implemented all water recommendations that had been identified through the audit process. This has resulted in the Art Gallery achieving yearly savings of 4 mega litres water, 277 tonnes waste diverted from landfill and 310 tonnes of greenhouse gas emissions, which mean that they enjoy reduced operating costs estimated to be \$15,000 per annum.



	Q3 2015/16	Q4 2015/16	2015/2016 target	Year to date	Program to date
Businesses Recruited	11	6	85	93	271
Businesses Implementing	16	22	N/A	92	252
Potable water savings implemented (ML per year)	44	27	150	206	826
Waste diverted from landfill (Tonnes per year)	112	864	1,800	1,691	7,201
Energy savings implemented (MwH per year)	341	31	200	1,209	6,471
Greenhouse gas emissions saved (tCO ₂ -e per year)	263	1007	2,300	2,471	10,816

6.4. City Switch Green Office (National)

CitySwitch Green Office is Australia's flagship sustainability program for office based businesses run in partnership with the cities of Sydney, North Sydney, Willoughby, Adelaide, Perth and Melbourne. The program is also supported by the National Australian Built Environment Rating System (NABERS) national administrator: the Office of Environment and Heritage (NSW), and the City of Greater Geelong. The City of Sydney is the national administrator.

The program provides advice, resources and recognition to participants who commit to achieving 4 Star or above energy efficiency tenancies as measured by the NABERS Energy rating system, as well as commitments to improving performance in waste, renewable energy, and health and productivity.

The CitySwitch national program has now completed the first year of its current 3 year funding phase, and now includes support and encouragement for the sustainability issues of resource waste, renewables, health and productivity, in addition to its continued focus on energy efficiency. The program has released new tools and resources through the year including a green information, communications and technology interactive game, article and ebook; and a guide and assessment tool to office waste. Over 15 per cent of participating businesses had made use of the waste resources within 3 months of them being released.

CitySwitch held its national awards ceremony in Sydney in November 2015, which was attended by 120 people. Signatories reported undertaking 1,463 projects during 2015, an 80 per cent growth over last year. 23 per cent of reported projects were waste related. The National Signatory of the Year was won by Western Australian Local Government Association for their 6 star NABERS tenancy and for installing solar panels and undertaking a sustainable fit out. National New Signatory of the Year was awarded to

³¹http://www.cityswitch.net.au/Portals/0/Progress%20Reports/CitySwitch%20Progress%20Report_2015_FIN_AL%20low%20res.pdf



Allens, for their deployment of virtualised servers in a national project that will save 14 per cent of their total carbon emissions and for being the first lawyers to be carbon neutral certified under the National Carbon Offset Standard. The Partnership of the Year National Award went to the Government of Western Australia Housing Authority and Curtin University who collaborated on a plan which resulted in the installation of LED lights and saving 620,000 sheets of paper in 6 months with a business process automation project.

During the third quarter, CitySwitch announced that it now represents over 3 million square metres of Australian office space which is 12 per cent of available commercial office space in Australia. In annual reporting³¹, signatories evidenced over 50,000 tonnes of carbon avoidance through energy efficiency, 296,000 tonnes of carbon offsets purchased, and over \$13 million in energy cost savings achieved. On average, signatories achieve a 25 per cent reduction in their annual office based carbon emissions through their time as members of the program.

Performance	Q3 2015/16	Q4 2015/16	Year to date	Program to date
Signatories (#)	13	7	20	572
Tenancies (#)	12	9	27	761
Office floor Space - NLA (m ²)	79,630	38,455	171,936	3,088,771
Percentage of all Australian office space	12	12	12	12
Average NABERS energy rating (stars) ³²	4.1	4.1	4.1	4.1

Please note: The table may include adjusted totals to reflect records updated.



Visit www.cityswitch.net.au or click on the 2030 button at left for more.

³² Weighted average accredited NABERS ratings

6.5. CitySwitch Green Office (Sydney)

In the City of Sydney, the aim of CitySwitch Green Office is to continue growth in participation within the program and provide a suite of services to improve environmental performance and meet the demands of its membership organisations.

At the annual New South Wales State CitySwitch Awards in November 2015, Bupa received the State Signatory of the Year Award. Additionally, Colliers International and the NSW Office of Environment and Heritage jointly received the State Partnership of the Year Award.

As measured in December 2015, the average energy efficiency of CitySwitch signatories was 4.6 Stars (4.5 Stars target) using the National Australian Built Environment Rating Scheme (NABERS). This is a 0.5 star increase on 2014. Collectively, this is an annual carbon emissions reduction of **17,991** tonnes.

As part of the CitySwitch program's evolution beyond energy efficiency, CitySwitch released tools and guides on green information and communication technologies and on office waste. The office waste guide and assessment tool, launched in April 2016, was used by over **20** per cent of the participating Sydney businesses in the first **3** months of release.

8 businesses joined the program in the year: Landers & Rogers Lawyers; Herbert Smith Freehills; dwp|suters; Australian Taxation Office; Museum of Contemporary Art Australia; ITWorx Consulting; Brookfield Property Partners and News Corp Australia. Existing Signatories joined new office tenancies to the program in the year, being: Frasers Property Australia and Macquarie Bank. Additionally, WT Partnership, formerly located in North Sydney, have relocated to a new tenancy within the City of Sydney.



Image: City of Sydney, North Sydney Council and Willoughby Council on NSW CitySwitch Sharing event: Office Waste in May 2016.

Performance	Q3 2015/16	Q4 2015/16	Year to date	Program to date
Signatories (#)	2	4	10	116
Tenancies (#)	2	4	11	134
Office floor space (NLA -m2)	24,257	44,474	138,215	1,038,740
Office floor space as proportion of Sydney (per cent)	20.0	20.9	20.9	20.9
Average NABERS energy rating (stars) ³³	-	-	4.6	4.6

Please note: The table above may include adjusted totals to reflect signings late in previously reported quarter.

³³ Weighted average accredited NABERS ratings.

6.6. Better Buildings Partnership

The Better Buildings Partnership is a collaboration with Sydney's leading commercial building owners committed to assisting the City to meet its Sydney 2030 objectives. The partnership develops best practice and advocates for solutions to key issues to help unlock improvements to environmental performance in the commercial building sector and connect to the City's green infrastructure plans.

The Partnership is directed by a leadership panel, consisting of the sustainability managers of the founding members, and delivers solutions as agreed in an annual work plan defined by its members.

In December 2015 the City announced that the members of the Partnership had collectively reduced their annual carbon emissions by 45 per cent in the year ending 30 June 2015 and as a result enjoyed a \$30 million saving from avoided electricity costs (from their 2016 baseline year). This and other measures have been captured in its [Annual Report](#)³⁴ for the year ending June 2015.

Over the course of the 2015/16 year, the Partnership has released a new best practice standard to the industry on operational waste management and reporting. Additionally, it has finalised and begun member implementation and testing of guidelines on stripout waste and green leasing. Over a dozen events, training sessions and master classes were held to educate the industry on these works. In addition to these new best practice standards for the industry, the Partnership finalised foundation reports on cooling tower management that shows an opportunity for water reduction of up to 9 per cent, and fire systems water management that shows the opportunity to reduce water usage by at least 70 per cent.

³⁴ <http://www.betterbuildingspartnership.com.au/resource/better-buildings-partnership-annual-report-2014-2015/>

The Partnership's work on leasing has delivered a world-class online tool for quantifying the potential for collaboration between landlords and tenants to gain joint sustainability outcomes through their commercial leasing relationships. The work was recognised by the NSW Chapter of the Australian Property Industry in its annual awards in December 2015 and was publicly noted as a key influencer in global trends by the Global Real Estate Sustainability Benchmark in September 2015.



The Partnership has now completed its first five year term and delivered significant outcomes for members and the commercial office sector more broadly. Due to the success of the Partnership all members have committed to fund a second five year term that will extend and broaden the outcomes already secured.

Performance	Q3 2015/16	Q4 2015/16	Year to date	Program to date
Commercial office building floor space participating in Sydney CBD (per cent)			50	50
Members – Founding (#) Ordinary (#) Associate (#)	no change +1	No change	13 2 9	13 2 9
NABERS energy rating (stars) ³⁵			4.7	4.7



For more information, visit www.betterbuildingspartnership.com.au or click on the icon at left.

³⁵ Average NABERS ratings reported from December 2015 figures.

6.7. Environmental Upgrade Finance

The City's environmental upgrade finance scheme is part of the NSW Government's Environmental Upgrade Agreements (EUA), which allows councils to enter into agreements with property owners and finance providers in order to fund works aimed at improving the energy, water or environmental efficiency of their building.

Environmental upgrade finance allows the cost of an upgrade to be shared with the tenant, such that tenants can enjoy the benefits of an environmental upgrade in the short-term and operating cost savings in the long-term.

During the 2015/16 year the City has worked with the NSW Office of Environment and Heritage to enhance the Environmental Upgrade finance service by working on a revised template contract, policy and program design. The revised template contract has now been finalised and the City is updating the Council policy for consideration of Council.

During the year 2,487 visits were made to the service web pages, the City held 17 stakeholder meetings to discuss the service, and assisted 3 buildings owners to assess the benefits of the service in their consideration of environmental upgrades to their buildings.

Performance	Q3 2015/16	Q4 2015/16	Year to date	Program to date
EUAs signed (#)	0	0	0	4
Total funds advanced for all signed EUAs (\$M)	0	0	0	30.4
Estimated emission reductions from signed EUAs (tonnes p.a.)	0	0	0	9,469



For more information visit www.cityofsydney.nsw.gov.au or click on the 2030 icon at left for the City's Guide to EUA.

6.8. Residential Apartment Sustainability Plan (RASP)

The [Residential Apartment Sustainability Plan](#) was adopted by Council in August 2015 and contains [30](#) actions to drive demand for better performing buildings within 10 years. During the 2015/16 year the City has been collaborating with [18](#) state government, industry and community stakeholders through our reference group which meets quarterly. This group is working with the City to support sustainability upgrades, policy change, training and support initiatives to reduce the environmental impact of strata apartment buildings.

The City hosted four meetings with leading apartment owners and managers to develop a [leadership network](#), increase capacity and to generate case studies on sustainability issues that will influence the wider sector. The issues covered included energy efficiency in underground car parks, energy management and monitoring, variable speed drives, and hot water system upgrades. Case studies have been published on the City's [Smart Blocks](#)³⁶ website and the [Green Strata](#)³⁷ website.

The City is supporting the residential apartment sector to identify opportunities to improve the environmental performance of buildings through City grant funding. During the year [10](#) water monitoring grants were approved allowing recipients to better understand and manage water consumption in their building. [5](#) energy/water assessment grant projects are also underway which will allow recipients to identify and undertake cost-effective improvements and upgrades to common property.

The City is encouraging increased solar installations for apartment buildings in the City through the environmental performance innovation grants program. The first completed solar grant project was with Botany Cope which has seen a [23.5](#) per cent reduction in energy consumption in the common areas. Other grant funded projects include a [4.9](#) kilo-watt and a [19.6](#) kilo-watt system respectively to be installed on two further apartment buildings, and a new battery storage technology and a power purchase arrangement for residents. A solar round table event was held in March to connect grant recipients and other key stakeholders who are investigating solar technology, distribution and business model solutions for strata buildings. [20](#) stakeholders attended this event and will continue to share learnings addressing unique opportunities and barriers faced by Owners Corporations investigating renewable options.



Image: Botany Cope apartments in Waterloo.

The City has partnered with the Office of Environment and Heritage to pilot a 3 part technology training and implementation support program for strata building managers on energy management, lighting and Heating, Ventilation and Air Conditioning (HVAC).

Two parts of this program have now been conducted with [15](#) Building Managers and Executive Committee members attending the first part and [8](#) in the second.

The City has also partnered with the [NSW Office of Environment and Heritage](#) to co-fund and jointly deliver energy auditing and technical support services, a core component of the new [Retrofit program](#) launching in August 2016.

The City presented on the benefits of improving efficiency of apartment buildings at the [Strata Communities Australia's Owners Day](#) in April (approximately [140](#) attendees) and [Water Smart Strata forum](#) in May 2016.

To help encourage higher building standards for new developments, the City is undertaking a study to define the benefits and costs for taking a high-rise residential building to net-zero carbon. This work is part funded by a grant received by the [Carbon Neutral Cities Alliance](#).

³⁶ <http://smartblocks.com.au/>

³⁷ <http://greenstrata.com.au/>

6.9. Green Villages

The Green Villages program works to drive, build and celebrate sustainable villages through the development of local sustainability programs, events and resources.



During the year, 658 participants attended one of 18 Green Villages workshops delivered at City libraries, Sydney Park and various community events. Workshop topics included green apartment living, green lifestyle, urban food production, and worm farming and composting. Responding to community requests, Green

Village delivered four face-to-face drop-in workshops during orientation weeks at Sydney University and University of Technology, Green Week at Sydney TAFE and Alexandria Community Fair.

The effectiveness of workshops as a catalyst to drive behaviour change is evident, with 94 per cent of survey respondents reporting having undertaken at least one new action since attending a Green Villages workshop³⁸.

Highlights of the year included a successful food waste avoidance campaign which increased traffic to the Green Villages website by 40 per cent and the distribution of worm farms and teaching resources to 20 childcare centres operating on City premises. The interactive worm farming video tutorial: ‘How to start a worm farm in 4 steps’ has continued to be successful in reaching time poor residents with 30,819 views since its launch.



For more, visit www.greenvillages.com.au or click on the icon at left for a series of Green Villages videos.

³⁸ Survey administered three months after the workshop.



Image: ABC Gardening Australia’s Costa Georgiadis checking up on the worms at a City of

Performance	Q3 2015/16	Q4 2015/16	Year to date	2015/16 target
Workshops and forums (#)	4	3	18	20
Participants (#)	172	85	658	600
Participants implementing (per cent)	100	90	94	85
Green Villages website sessions (#)	24,718	38,457	118,647	110,000
e-news subscribers (# current)	13,029	12, 918	12,918	14,000
e-news open rate (per cent)	23.13	25.78	24.94	28

6.10. Green Living Centre

The Green Living Centre is a sustainability ‘drop-in’ information and education hub located on [King St, Newtown](#). The centre is a partnership between the City of Sydney and Marrickville Councils committed to reducing the carbon footprint of the Newtown precinct in line with a [70](#) per cent reduction by 2030, based on 2006 levels.

During 2015/16 the [Green Living Centre](#) delivered [48](#) low carbon community engagements, attended by [426](#) people. Engagements included: energy efficiency basics, insulation and glazing, solar, batteries and feed in tariffs, free solar assessments for residents in the precinct and an informal drop in sessions to the Energy Cafe. Other workshop topics included worm farming, no dig gardening and seasonal planting.

Throughout the year the Centre welcomed [2,632](#) shopfront visitors. The Centre maintained an online presence, with [2,688](#) Facebook likes and [1,586](#) subscribers receiving a monthly enewsletter.

An Energy Blitz campaign was trialled for residents with five households trained. [11](#) local businesses joined the [Sustainable Business Leaders Program](#), a new initiative that provides free carbon audits, action plans and a collaborative platform for achieving a group reduction target. The commercial worm farm was harvested and worms distributed to City of Sydney childcare centres as part of a new organics recycling education program. Following an Expression of Interest process, the worm farm was re-located to [City Farm](#).

Performance	Q3 2015/16	Q4 2015/16	Year to date	2015/16 target
Engagements that support community uptake of low carbon practices (#)	12	12	48	26
Businesses participating in low carbon awareness activities (#)	3	12	20	20
Shop front visitors (#)	602	501	2,632	trend
e-newsletter subscriptions (#)	1,581	1,586	1,586	trend



Image: Launch event for the Sustainable Business Leaders Program held at Rising Sun Workshop, Newtown in May 2016.

6.11. Environmental Grants

Environmental initiatives are supported by a number of grants and sponsorships from the City of Sydney. The three grant programs offered have been designed to facilitate action and to help catalyse the innovative solutions that will be required to deliver Sydney 2030.

The grant programs are:

Environmental Performance - Innovation: in which funding is available for feasibility and demonstration projects which seek to prove the feasibility of new technologies that are currently not implemented in the local market, but that have the potential to achieve greenhouse gas emission reductions and resource efficiencies at scale within the City of Sydney;

Environmental Performance - Building Operations: in which funding is available to help lower the costs of implementing building operation efficiency measures, such as water retrofits in apartment buildings;

Environmental Performance - Ratings and Assessments: in which funding is available to undertake building performance ratings and assessments that will enable a building or facility owner to understand their opportunities to improve environmental performance.

Applications for the Environmental Performance Grant Programs are open all year round.

A total of 26 projects were supported by the City under the Environmental Performance Grants for 2015/16.

Grants for Quarter 3 and 4

Environmental Performance - Ratings and Assessments

- Strata Plan 74829: Energy Assessment (Alexandria)
- Strata Plan 31284: Energy and Water Assessment (Sydney City)
- Strata Plan 61897: Energy Assessment (Sydney City)

Environmental Performance – Innovation

- Edge Environment: Recycling Engineered Timber from Office Strip-out

Environmental Performance - Building Operations

- Strata Plan 69746BMC: Water monitoring (Waterloo)
- Strata Plan 61897: Water monitoring (Sydney City)

Knowledge Exchange

- Alternative Technology Association - Slow date a Sustainability Expert event



For more information click on the 2030 icon at left.

Attachments

The following attachments provide further information about planned data capture, KPI development and explanations to graphs.



1. Planned data capture

	City of Sydney (Operations)		Local Government Area (LGA)	
	Current Status	Forward Plan	Current Status	Forward Plan
Greenhouse gas emissions from electricity	Reporting underway from STEvE. Electricity currently is reported quarterly in arrears. Data provided by electricity retailers. Daily monitoring occurring at all large electricity using sites (over 100,000 kWh per annum).	Ensure appropriate sub-metering in place at large sites for better understanding of usage. Improve functionality of the STEvE system.	Reported through the Kinesis CCAP 1.0 reporting tool which includes data from the electricity and gas networks and other sources.	Continue to monitor and report. Upgrade the CCAP 2.0 through the Environmental Sustainability Platform currently being delivered. Platform projected to be in place later in 2016.
Greenhouse gas emissions from natural gas	Gas data is reported quarterly in arrears. Additionally gas account data (usage) may be estimated in cases where the gas retailer cannot read meters.	As above	As above	As above
Greenhouse gas emissions from other sources	Emissions sources including flights, taxis, contractor fuel, onsite fuel usage, events and refrigerants are added to STEvE quarterly.	In place. Refinements to this process to continue.	As above	As above
Installed co/tri generation and renewable energy	The City does not have co/tri generation installed to date, but has a record of installed solar power capacity and estimated annual output. Some sub-metering is in place with new solar sites.	Install sub-metering to all new co/tri generation (dependent on site) and renewable energy to ensure it is captured and reported.	Information about renewable energy installations is available through the Clean Energy Regulator. The Australian PV Institute have developed a solar map with funding through ARENA at http://pv-map.apvi.org.au/ Currently there is no formal mechanism in place for tracking installed co and trigeneration systems.	CCAP 2.0 to report on cogeneration, trigeneration and renewable energy installed within the local government area.

Planned data capture (cont.)

	City of Sydney (Operations)		City of Sydney (LGA)	
	Current Status	Forward Plan	Current Status	Forward Plan
Water	Currently reporting mains water consumption by category quarterly in arrears through STEvE.	<p>Further details to be defined as part of the Decentralised Water Master Plan.</p> <p>Progress towards water intensity target/s in Parks to be monitored through Performance Planning.</p> <p>Audit of non-mains water use data capture scheduled by end 2015. Actions to ensure accurate data capture to be determined as part of audit process.</p>	<p>Reporting mains water consumption annually only. No existing process for accurately capturing and reporting non-mains water consumption.</p> <p>Data for LGA mains water usage available annually only.</p>	Further details to be defined as part of the Decentralised Water Master Plan, including process to track estimated progress towards water quality target through modelling.
Waste	Limited organisational waste reporting available. Commercial waste and recycling from 65 City of Sydney properties is reported quarterly.	Further options for refining organisation waste reporting being investigated with the waste contractor in 2016/17.	LGA residential waste data available and reported in the Corporate Plan.	LGA commercial waste data capture to be improved and verified.
Greening Sydney	Organisational reporting currently not centralised.	All data collected for this report to be collated through Performance Planning system.	Canopy cover measured sporadically.	Canopy cover to be measured more consistently.

2. Glossary of terms

Source	Description
Annual Carbon Inventory	Internal database developed by the Sustainability Unit summarising annual greenhouse gas emissions from all City of Sydney assets and activities (buildings, street lighting, parks & other) resulting from consumption of electricity, gas and fuel and other sources.
City of Sydney Environmental Management Plan 2007	The City of Sydney Environmental Management Plan established the City's environmental vision, goals, targets and actions for 2007-2017 years and beyond. It addressed the themes of energy emissions, water, waste, plants and animals. The targets have now been met or superseded by those in Sustainable Sydney 2030 or the City's incremental targets, approved by Council.
Performance Planning	Performance Planning (PP) is a TechnologyOne product that stores measures, projects and targets. Data can be imported or manually entered depending on the source. Managers are responsible for ensuring accuracy of the data. PP also contains Corporate Plan KPI's and projects.
STEvE (System for Tracking Everything Environmental)	<p>STEvE (the <i>System for Tracking Everything Environmental</i>) is a Utilities Information Monitoring System that records energy usage by directly extracting consumption data from relevant authorities (Ausgrid, Sydney Gas and Sydney Water), and applies appropriate conversion factors to determine GREENHOUSE GAS emissions.</p> <p>A benefit of STEvE is that it has access to real time usage through smart meters and direct daily interface with the appropriate energy supply authorities. This allows for daily 15 minute monitoring and reporting of energy consumption for 90per cent of usage. Gas and water consumption are currently reported quarterly in arrears apart from some larger water using sites where smart-meters have been installed and daily reports are received.</p>
Potable water	Water that is of drinking water quality for use in bathrooms, kitchens and for consumption.
Non-potable water	Water that is not of drinking water quality. Uses include laundry, gardening, car washing, cooling towers and so on. Recycled water is for non-potable use.
National Greenhouse Accounts (NGA) Factors	Published by the Department of Climate Change "The National Greenhouse Accounts (NGA) Factors" has been prepared by the Australian Government and is designed for use by companies and individuals to estimate greenhouse gas emissions for reporting under various government programs and for their own purpose.

Glossary of terms (cont.)

Source ³⁹	Description
Scope 1 GREENHOUSE GAS emissions	Emissions directly occurring "from sources that are owned or controlled by the institution, including: on-campus stationary combustion of fossil fuels; mobile combustion of fossil fuels by institution owned/controlled vehicles; and "fugitive" emissions. Fugitive emissions result from intentional or unintentional releases of greenhouse gases, including the leakage of hydro fluorocarbons from refrigeration and air conditioning equipment".
Scope 2 GREENHOUSE GAS emissions	Indirect emissions generated in the production of electricity consumed by the institution. Scope 2 emissions physically occur at the facility where electricity is generated.
Scope 3 GREENHOUSE GAS emissions	All the other indirect emissions that are "a consequence of the activities of the institution, but occur from sources not owned or controlled by the institution" such as commuting, air travel for university activities, waste disposal; embodied emissions from extraction, production, and transportation of purchased goods; outsourced activities; contractor owned- vehicles; and line loss from electricity transmission and distribution".
State of the Environment Report	City of Sydney publication detailing the city and Local Government Area's environmental landscape and strategic approaches and initiatives to managing energy and emissions; sustainable transport; water; waste; plants and animals, land and noise.
Sustainable Sydney 2030	City of Sydney publication that sets the 2030 vision for the city aligned to the strategic priorities of Green, Global & Connected. Sets the direction, defines at the road map and articulates the step changes required to achieving a more sustainable future.

³⁹ Source for Scope 1, 2 and 3 GHG Emissions: The Greenhouse Gas Protocol (2004) Published by: World Business Council for Sustainable Development, World Resource Institute.

3. Solar PV installations

No.	Location	Status
1	Bay Street Depot	Installation pending
2	277 Bourke Street	Installed
3	343 George Street	Installed
4	Abraham Mott Gymnasium	Installed
5	Alexandria Park Changing Rooms	Installed
6	Alexandria Child Care Centre	Installed
7	Alexandria Town Hall	Installed
8	Andrew Boy Charlton Pool	Installed
9	Bourke Street Depot	Installed
10	Childcare centres (x3)	Installation pending
11	Epsom Road Depot	Installed
12	Erskineville Oval	Installed
13	Erskineville State Emergency Services	Installed
14	Erskineville Town Hall	Installed
15	Flinders Street Bicycle Hub	Installation pending
16	Glebe Town Hall	Installed
17	Green Living Centre, Newtown	Installation pending
18	Green Square Hospital Site	Installation pending
19	Heffron Hall	Installation pending
20	Huntley Street Child Care	Installed
21	Juanita Nielsen centre	Installation pending
22	King George V Recreation Centre	Installed
23	Mountain St	Installation pending
24	Paddington Town Hall	Installed
25	Perry Park	Installation pending
26	Pine Street Creative Arts Centre	Installed
27	Pirrama Park	Installed
28	Redfern Community Centre	Installed
29	Redfern Oval Grandstand	Installed

30	Redfern Town Hall	Installed
31	Surry Hills Community Centre	Installed
32	Sydney Park CARES Facility	Installed
33	Sydney Park Nursery	Installed
34	Sydney Park Pavilion	Installed
35	Sydney Town Hall	Installed
36	Tote Building	Installed
37	Ultimo Community Centre	Installed
38	Victoria Park Pool	Installed
39	Waterloo Library	Installed

Solar hot water installations

No.	Location	Status
1	Abraham Mott Hall	Installed
2	Alexandria Child Care Centre	Installed
3	Bourke Street Depot	Installed
4	Jane Evans Day Centre	Installed
5	Juanita Nelson Community Centre	Installed
6	King George V Recreation Centre	Installed
7	Kings Cross Neighbourhood Service Centre and Library	Installed
8	Pyrmont Community Centre	Installed
9	Redfern Community Centre	Installed
10	Rosebery Child Care Centre	Installed
11	State Emergency Service Facility	Installed
12	Ultimo Community Centre	Installed

4. Demographics

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Residents ⁴⁰ (#)	154,073	159,854	165,596	170,173	173,444	177,920	180,679	183,281	187,690	191,918	198,331	205,339
Workers (# per day) ⁴¹	353,044	368,174	380,278	385,413	405,230	417,645	418,478	424,960	437,727	447,281	456,835	466,389
Visitors (# per day) ⁴²	450,000	475,000	495,000	503,000	511,000	519,000	522,000	535,000	544,560	554,120	563,680	573,240
Visitors (# total - nights) ⁴³	8,732,065	9,000,032	9,039,918	9,462,835	9,519,826	9,358,668	9,804,849	10,096,232	10,004,209	10,214,564	10,556,861	12,089,038

Please note – this table was last updated in this reporting period to include 2015 residents' data.

⁴⁰ Estimated resident population (ERP) figures have been sourced from **Regional Population Australia (ABS Cat no 3218.0)** released in March 2015. Figures reflect ERP as at 30 June for each year shown. 30 June ERP expected release date 31/03/2016.

⁴¹ Estimate based on net absorption growth and change in vacancy rate as identified in Property Council Office market report.

⁴² Estimate based on trend changes in city users based on employment and population change. Day visitor estimates does not include residents or workers but others who shop, study or travel to the City for business, social or recreational purposes. Overnight visitors are excluded.

⁴³ Hotel visitor estimates for 2013 onwards based on derived average sourced from following datasets: Tourist Accommodation, Small Area Data (ABS Cat no 8635.0) and Tourism Research Australia's International and National Visitor Surveys (TRA IVS and NVS survey data).

5. Definition of Organisational Key Performance Indicators

KPI Name	KPI Description	Data source	Business Unit	Calculation	Unit of Measure	Frequency	Additional info
	<i>Statement of what the KPI is actually measuring.</i>	<i>Where do we obtain and record this data?</i>	<i>Principal owner</i>	<i>Measure, numerator, denominator.</i>	<i>percentage / number / etc.</i>	<i>monthly/ quarterly/ annual</i>	<i>i.e. What does the KPI include / exclude? Comments on history.</i>
Organisational Greenhouse gas emissions	Greenhouse gas emissions derived from all City of Sydney assets: buildings, parks, street lighting, fleet, events, taxis, flights and other minor sources.	Utilities billing data and other sources.	Sustainability	Combination of greenhouse gas emissions from gas, electricity and fuel consumption for the following categories (detailed separately) <ul style="list-style-type: none"> – Buildings – Parks – Street Lighting – Fleet – Other 	Tonnes CO ₂ e	Annual / quarterly	Includes greenhouse gas emissions from electricity, gas and fleet fuel usage across all City of Sydney assets.
Organisational Water Consumption	Quarterly water consumption of CoS sites including: <ul style="list-style-type: none"> – Parks and public domain – Commercial – Operations – Community – Aquatic facilities 	STEVE (collected through smart meters, meter readings and estimates).	City Projects and Property	Combination of water consumption from CoS sites including: <ul style="list-style-type: none"> – Parks and public domain – Commercial – Operations – Community – Aquatic facilities 	ML	Annual / Quarterly	Some estimation is included in quarterly reports and updated in the following quarter.

KPI Name	KPI Description	Data source	Business Unit	Calculation	Unit of Measure	Frequency	Additional info
	<i>Statement of what the KPI is actually measuring.</i>	<i>Where do we obtain and record this data?</i>	<i>Principal owner</i>	<i>Measure, numerator, denominator.</i>	<i>percentage / number / etc.</i>	<i>monthly/ quarterly/ annual</i>	<i>i.e. What does the KPI include / exclude? Comments on history.</i>
LGA Mains Water Consumption	Annual water consumption of the LGA.	Sydney Water	City Strategy		Mega Litres (ML)	Annual	Sydney Water sends total LGA water consumption to Council at the end of financial year. Quarterly consumption information is not available.
LGA Domestic Waste	Domestic waste for the LGA broken down to : – Kerbside recycling – Waste delivered to AWT – Waste to landfill – Other	Unit records – (domestic Waste master).	City Operations	Combination of major types of domestic waste for the LGA: – Kerbside recycling – Waste delivered to AWT – Waste to landfill – Other (including hazardous & e-waste, white goods, garden organics and household clean-up material).	Tonnes	Quarterly	
LGA Domestic Waste Resource Recovery Rate	Amount of waste diverted from landfill including: Recycling, White Goods, Garden Organics, E-waste and material recovered through AWT processing. Shown as a percentage of the total domestic waste generated.	Processing/disposal facilities (where the waste is received).	City Operations	[Waste Diverted from Landfill] / [Total Waste].	Percentage	Quarterly	

6. Definition of Sustainability Programs Key Performance Indicators

Program Name	KPI Name	KPI Description	Data source/Calculation	Reported	Unit of Measure	2014/15 ann. target
City Switch (National)	Signatories	Number of signatories in program.	CitySwitch CRM system. (target NLA – current NLA)/5000sqm = target.	Currently reported	Number	230
	Tenancies	Number of tenancies associated with signatories in program.	CitySwitch CRM system. Count of signatories in each State (target NLA – current NLA)/5000sqm = target.	Currently reported	Number	230
	Net lettable area	Square meters of office floor space (net lettable area) in the program.	CitySwitch CRM system. Count of reported NLA.	Currently reported	Square meters (m2)	1,152,219
	Net lettable area	Percentage of commercial office floor space (net lettable area) in program as percentage of total office floor space in LGA.	(NLA (m2) in program/NLA (m2) total in LGA)*100.	Currently reported	Percentage	20
	Average NABERS Rating	Average NABERS rating of all tenancies in program.	Weighted average from annual progress report.	Currently reported	Stars	4.5
City Switch (Sydney)	Signatories	Number of signatories in program.	(target NLA – current NLA)/5000sqm = target.	Currently reported	Number	12
	Tenancies	Number of tenancies associated with signatories in program.	(target NLA – current NLA)/5000sqm = target.	Currently reported	Number	12
	Net lettable area	Square meters of office floor space (net lettable area) in the program.	CitySwitch CRM system. Count of reported NLA.	Currently reported	Square meters (m2)	59,907
	Net lettable area	Percentage of commercial office floor space (net lettable area) in program as percentage of total office floor space in LGA.	(NLA (m2) in program/NLA (m2) total in LGA)*100.	Currently reported	Percentage	20
	Average NABERS Rating	Average NABERS rating of all tenancies in program.	Weighted average from annual progress report.	Currently reported	Stars	4.5

Program Name	KPI Name	KPI Description	Data source/Calculation	Reported	Unit of Measure	Target
Smart Green Business	Businesses recruited	Number of large businesses recruited to the program.		Currently reported	Number	121
	Businesses implementing	Number of businesses who have implemented (or are implementing) identified initiatives (water, waste and energy).		Currently reported	Number	trend
	Water – cumulative savings implemented	Potable water consumption reduced through Smart Green Business projects.		Currently reported	Megalitres (ML)	275
	Waste – cumulative diversion implemented	Waste diverted from landfill through Smart Green Business projects.		Currently reported	Tonnes (t)	4,481
	Energy – cumulative savings implemented	Energy consumption reduced through Smart Green Business projects.		Currently reported	MwH	200
	CO ₂ -e - cumulative emissions saved	Cumulative Greenhouse Gas Emissions reduced through Smart Green Business projects.		Currently reported	Tonnes CO ₂ equivalent (tCO ₂ -e)	3,795
Green Village Program	Workshops	Number of workshops provided.	# of workshops/forums held	Currently reported	Number	20
	Participants	Number of participants attending workshops.	# of participants across all Green Villages workshops/forums.	Currently reported	Number	600
	Participant implementation	Participants implementing improved practices/skills learned in workshops.	per cent of survey respondents implementing new actions since attending a workshop.	Currently reported	Per cent	85
	Visitors	Number of unique visitors to site.	# unique visitors.	Currently reported	Number	110,000
	Subscribers	Number of e-news subscribers.	# current enews subscribers.	Currently reported	Number	14,000
	Open rate	Percentage of subscribers who open the e-news.	per cent e-news open rate.	Currently reported	Per cent	28

Program Name	KPI Name	KPI Description	Data source/Calculation	Reported	Unit of Measure	Target
Environmental Grants	Awards/Projects funded	Number of grant applications awarded/projects funded.	# projects funded in twelve month period.	Currently reported	Number	
Green Living Centre	Low Carbon Community Engagements	Number of engagements held that support community understanding and uptake of low carbon practices.	# of workshops held.	Currently reported	Number	26
	Business Engagement	Number of individual businesses participating in low carbon awareness activities.	# of businesses represented across all activities.	Currently reported	Number	20
	Visitors	Number of visitors to the Green Living Centre shop front.	# of shopfront visitors.	Currently reported	Number	trend
	Subscribers	Number of e-newsletter subscribers.	# of subscribers.	Currently reported	Number	trend
Residential Apartment Sustainability Plan	Strata Database Subscribers	Number of individuals who have signed up for Smart Green Apartments updates.	# of subscribers.	Currently reported	Number	trend
	Reference Group Attendance	Number of participants attending Reference Group Meetings.	# of participants.	Currently reported	Number	trend
	Leadership Group Attendance	Number of participants attending quarterly Leadership Network Meetings.	# of participants.	Currently reported	Number	trend
	Leadership Group Meeting Participant Satisfaction	Proportion of attendees that found the meeting useful and relevant to their building.	per cent of survey respondents.	Currently reported	Per cent	trend
Better Buildings Partnership	Total net lettable area	Percentage total net lettable area involved in the program.		Currently reported	Per cent	50
	Members	Number of founding members, ordinary and associate members.		Currently reported	Number	trend
Environmental Upgrade Finance	EUAs signed	Number of EU template agreements signed (non-residential, non-strata).	# EUAs signed.	Currently reported	Number	7
	Emission reductions	Estimated annual GHG reductions from upgrade projects that have signed an EUA.	Tonnes CO ₂ -e	Currently reported	Tonnes CO ₂ equivalent (tCO ₂ -e) pa	trend
	Total funds advanced	Total funds advanced.	\$M	Currently reported	Amount	trend

7. Green village program workshop detail

Green Villages Workshops January – June 2016	Venue	Date	Attendees
Seed to Plate: Edible Green Walls	Sydney Park Pavilion	5 March	22
Worm Farming	Sydney Park Pavilion	2 April	34
Seed to Plate: Edible Green Walls	Sydney Park Pavilion	8 May	41
Composting	Sydney Park Pavilion	4 June	10
Face-to-face engagements at UTS, Sydney Uni, Sydney TAFE and Alexandria Community Fair	Various	Various	200
Total January – June 2016			307

Green Villages Workshops July - December 2015	Venue	Date	Attendees
Seed to Plate: Small Space Gardening	Green Square Library	18 July	33
Green Apartment Living: Energy Efficiency	Waterloo Library	25 July	26
Less Mess: The Art of Decluttering	Haymarket Library	1 August	53
Worm Farming and Composting	Green Square Library	15 August	34
DIY Natural Cleaning	Haymarket Library	5 September	31
Re-fashion it	Surry Hills Library	12 September	25
Seed to Plate: Edible Green Walls	Haymarket Library	3 October	34
Worm Farming and Composting	Waterloo Library	17 October	31
Less Mess: The Art of Decluttering	Haymarket Library	7 November	52
Seed to Plate: Small Space Gardening	Waterloo Library	14 November	32
Total July – December 2015			351

Explanatory notes to graphs

Chart 1. City of Sydney operations emissions waterfall graph

The waterfall chart (page 9) is updated as new information becomes available. The table below describes the sources for the waterfall chart data.

This chart has been updated since the last reporting period to be consistent with the same chart layout in the City's draft Environmental Action 2016-2021 Strategy and Action Plan.

Title	tCO ₂ -e	Source
2006 BASELINE	52,972	2006 emissions: Independently verified greenhouse gas emissions inventory including emissions from energy, waste and transport.
PORTFOLIO CHANGE	-1,583	Portfolio change includes removal of some assets, e.g. Lawson Square and Domain Parking Station; and addition of others: Ian Thorpe Aquatic Centre, 343 George Street, Mountain Street, Surry Hills Community Centre.
MANAGEMENT IMPROVEMENTS	5,466	Management improvements shows emissions reductions achieved outside of the major efficiency initiatives. This includes improved energy measurement and monitoring, behaviour changes, small works, and the influence of annual weather changes.
ENERGY RETROFIT	5,963	Energy retrofit Stage 1: Energy and Water retrofit completed by Origin/Ecosave.
CITY LED LIGHTING	2,774	City-owned LED lighting: Contract with GE/UGL to replace 6,448 lights owned by the City.
SOLAR PV	941	Solar PV: Based on installed PV as at June 2016.
FLEET	632	Fleet: Target achieved to reduce 2009 fleet emissions by 20 per cent by 2014.

(Cont.)

Title	tCO ₂ -e	Source
FUTURE PORTFOLIO	-4,494	Future portfolio: Includes estimated increases due to new child-care centres, Green Square sites, pedestrian lighting and other projects; and accounts for planned property divestment.
TRIGEN (ALL SITES)	2,403	Trigeneration: City estimate for Town Hall precinct project, Cook & Philip Park Aquatic Centre and Ian Thorpe Aquatic Centre.
BUILDING UPGRADES	3,300	Building upgrades: City estimate based on previous efficiency delivered costs
AUSGRID LED LIGHTING	5,334	Ausgrid LED lighting: The City pays for electricity from all street lights, even though a large proportion are owned and managed by Ausgrid. This reduction reflects what could be achieved if Ausgrid upgraded all its streetlights in the LGA to LED bulbs. City estimate based on savings achieved from the upgrade of City-owned lights.
GRID RENEWABLES (23per cent)	220	Grid renewables (23 per cent of electricity demand): Marginal contribution of grid toward lower greenhouse emissions based on 23 per cent of 2021 electricity demand and the difference in grid coefficient between 2006 and 2021. Despite more renewables in the grid between 2006 (~7 per cent) to 2021 (~23 per cent) emissions savings are not forecast to be significant due to substitution of gas and black coal generation with brown coal. Source data from ACIL RET Review modelling undertaken for the federal government in 2014.
SOLAR PV (15per cent)	2,778	Solar PV (15 per cent of electricity demand): Based on 15 per cent of 2021 electricity demand. PV already installed amount has not been counted.
OFF-SITE RENEWABLES (12per cent)	2,976	Offsite renewables (12 per cent of electricity demand): Based on 12 per cent of 2021 electricity demand.
FUTURE PROJECTS	10,369	Residual required to achieve 2030 target (City estimate 2016)
OFFSETS	15,892	

Charts 2 & 3. City of Sydney quarterly and annual greenhouse gas emissions

The table below describes the sources for the charts data in page 10 and 11.

Title	Source
Buildings, parks and street lighting	STEvE (the System for Tracking EVerything Environmental).
Fleet	Fleet Services (converted from Shell and Park Fuels fuel consumption data).
Other GHG	Sourced from most recent Carbon Inventory. All data annual and averaged across quarters for reporting purposes.

The following changes were made to improve the chart since the last reporting period:

- 2015/16 annual data added

Quarterly results can be attributed to a number of influences:

- Seasonality of property data. Q1 has traditionally represented the highest quarter of electricity consumption for the financial year.
- Seasonality of street lighting data. Pre 2009/10 years have contained street lighting data that was smoothed to account for billing cycles. Post 2009/10 actual street lighting data was available and consequently seasonal influences are reflected in the results, i.e. longer operating hours in the winter months
- Currently the City's solar photovoltaic (PV) installations are being separately metered to enable reporting of electricity generation. Energy generated and used at each site reduces that site's mains electricity requirements.

Charts 4, 5 & 6. City of Sydney Water Graphs

City of Sydney operations potable water use

- All data sourced directly from Sydney Water and contained within and reported from the STEvE system.
- Parks and Public Domain - Includes parks, reserves, playgrounds, street closures, garden beds and nature strips. Also included are water features that are in the public domain.
- Commercial buildings- Includes income producing buildings, such as Customs House, parking stations and retail shops. It also includes properties acquired for strategic purposes that do not fall into the above categories.
- Operations (depots, etc) - Includes depots and workshops.
- Community buildings- Includes childcare centres, libraries, community centres and town halls.
- Aquatic Facilities – Includes Victoria Park Pool, Andrew (Boy) Charlton Pool, Cook and Phillip Park Aquatic Centre, Ian Thorpe Aquatic Centre and Prince Alfred Park Pool.
- Exceptions - Only sites where the City has 'operational control' are included. Properties where a whole building is leased and the tenant has full building operations and maintenance obligations, such as the Queen Victoria Building and the Capitol Theatre, are excluded.
- Note - A number of City buildings are used for multiple purposes – for example Customs House is used for office and retail, along with library and exhibition uses. In allocating each property to one of the above categories, the dominant water user was the determining factor. Over time the categorisation of a property may change depending on the use.

City of Sydney operations potable water use target

- All percentages are in relation to the 2006 baseline figure.

Complete

- 2006 baseline: actual 2005/06 water consumption sourced from Sydney Water.

- Portfolio change, weather: Indicative of increased demand due to increased City assets such as parks, buildings and aquatic centres and net change in demand due to climate conditions between baseline and 2015/16. Calculated by adding savings of completed projects as well as predicted 2015/16 savings to actual 2013/14 water savings.
- Building retrofits: Energy and Water retrofit completed by Origin (Ecosave).
- Efficiency in parks: Estimate based on industry standards or advice obtained from certified irrigation designers and industry experts.
- Recycled water in parks: Includes estimated reuse volume of 11 stormwater harvesting schemes in parks and estimated wetland top up via harvested stormwater at Sydney Park.
- 2016 estimated savings: additional savings expected to be achieved by 31 December 2016, from a combination of the preceding initiatives.

By 2021

- Portfolio buildings: Estimated increase in water demand by new buildings planned by 2021. Includes the Green Square Aquatic Centre, child care centres and community and recreational centres.
- Portfolio parks: Estimated increase in water demand by new parks and open spaces planned by 2021 in the Greater Green Square, Ashmore Estate, Harold park, Federal & Jubilee park and other small parks & open spaces. Also includes existing parks that will be irrigated by 2021.
- Building retrofits: Estimated water savings associated with planned retrofit project for the City's highest water using buildings.
- Recycled water in parks and buildings: Estimated water savings from identified future City stormwater harvesting schemes in Harold Park, Jubilee Oval, Federal Park North, Sydney Park Stage 2 and Green Square Town Centre.
- Recycled water – George Street and Greater Green Square: Estimated water savings from supplying City assets including Hyde Park, Land and Wynyard Parks, Town Hall House and 343 George St cooling towers with recycled water from future George St precinct water reuse project; and supplying city parks in the Greater Green Square area with recycled water from future Green Square Stage 2 Water Reuse project.

Chart 7 & 8. LGA greenhouse gas emissions

The waterfall chart is updated as new information becomes available. The table below describes the sources for the waterfall chart data.

Title	tCO ₂ -e	Source
2006 BASELINE	5,915,758	2006 baseline: Local government area greenhouse gas emissions data supplied by external environmental data service provider (Kinesis) using electricity and gas network utility consumption data waste tonnages, transport data and national greenhouse gas emission coefficients.
Estimated 2030 BAU Increase	-357,671	Estimated 2030 BAU Increase: Source - External environmental data service provider (Kinesis) reconciliation of Master Plans 2015 based on frozen efficiency growth estimate and emission factors from the Energy Efficiency Master Plan 2015 (foundation report developed by pitt&sherry).
Energy Efficiency	1,976,795	Energy Efficiency: Existing & new energy efficiency programs and policies scenarios from the Energy Efficiency Master Plan 2015 (foundation report developed by pitt&sherry).
Renewable Energy	1,297,542	Renewable Energy: Calculated as 50 per cent of expected 2030 electricity consumption (1.35GWh) after taking account of energy efficiency. Previous versions of this chart showed 30 per cent renewable energy target (1.17GWh) which came from the Renewable Energy Master Plan 2013 (foundation report developed by Arup). Since the Renewable Energy Master Plan was developed, the Energy Efficiency Master Plan and the observed fall in energy consumed across the LGA in recent years has led to a revised lower forecast for 2030 energy demand.

Title	tCO ₂ -e	Source
Trigeneration	152,778	Trigeneration: City estimate based on 50MW capacity operating at a 7am-10pm scenario. This estimate is based on the emissions savings identified in the Trigeneration Master Plan 2013 (developed by external environmental data service provider (Kinesis)) downscaled to an amount of installation that reflects historic averages. It is estimated there is currently around 15MW of cogeneration or trigeneration installed in the local government area with more building scale projects underway and potential precinct opportunities for new urban renewal areas.
Waste Diversion / AWT	389,000	Waste Diversion / AWT: Advanced Waste Treatment Master Plan March 2014 includes 0.135MtCO ₂ e from recycling and 0.196MtCO ₂ e through avoided landfill gas. In addition, Jemma/Kinesis estimate 0.058MtCO ₂ e saving by producing electricity onsite (replacing the higher 0.106 figure for producing gas contained within AWT Master Plan). These figures are consistent with landfill and stationary energy methods used by the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC).
Transport	239,583	Transport: Source - Original Sustainable Sydney 2030 estimate (developed by Kinesis 2008) Emissions reductions would be realised by use of vehicles with lower emissions intensity, and by changing the mode split to move away from car travel and towards public transport and walking and cycling.
Future opportunities	469,045	Offsets and future opportunities: Residual required to achieve 2030 target (City estimate 2016). Future savings may include transport, waste, renewable energy, energy efficiency, regulatory and/or technological improvements, or other opportunities. Offsets could be purchased by those entities generating emissions.
2030 TARGET	1,774,727	

Please note: Figures for trigeneration and waste have been updated since the last reporting period.

Energy consumption data

These tables show energy consumption data for the organisation and LGA. Please note, LGA data is shown to December 2014, which is the most up to date data available. The City Organisation data is up to June 2015 – the most recent data that has been independently verified.

Organisation	Electricity (MWh)	Natural gas (GJ)	Total energy (GJ)
Baseline	42,427	21,894	174,631
Most recent (to June 2015)	32,340	34,579	151,002
Difference	-10,087	+12,685	-23,629
Difference (per cent)	-24per cent	+58per cent	-14per cent

LGA	Electricity (MWh)	Natural gas (GJ)	Total energy (GJ)
Baseline	4,199,815	2,947,537	18,066,871
Most recent (to December 2014)	3,624,867	3,398,765	16,448,286
Difference	-574,948	+451,228	-1,618,585
Difference (per cent)	-14per cent	+15per cent	-9per cent

Calculation

Difference = (Baseline – Current)
 per cent Difference = (Difference / Baseline) x 100

Charts 9 & 10. LGA Water Use Graphs

Local government area potable water use

- All data sourced directly from Sydney Water.

Local government area potable water use target

- All percentages are in relation to the 2006 baseline figure
- 2006 potable water demand: Actual 2005/06 water consumption sourced from Sydney Water
- Predicted 2030 potable water demand: Growth in water demand across the City was forecast in GHD's 2012 Recycled Water Plan, prepared for the City of Sydney. Growth in potable water demand was based on projected urban development to accommodate the forecasted growth in population to 2030 in the City's Capacity Study (2010)
- City of Sydney efficiency programs: Estimated measurable results from City-run efficiency programs with residents and business
- Existing & approved recycled water schemes: Existing and approved City-run stormwater harvesting schemes, and private utility schemes (assumed to be operating at maximum capacity)
- Potential recycled water schemes: Estimated contribution of potential recycled water schemes using recycled water within buildings and open space. Potential schemes include Sydney Park off site reuse, George St precinct, Greater Green Square, Central to Eveleigh precinct
- Future opportunities: Residual required to achieve 2030 target (City estimate 2016). Further efficiency programs or additional recycled water schemes

Water consumption data

This table is shown for the first time in the July to December 2014 Report and shows water consumption data for the organisation and the local government area.

Please note: Data for the local government (LGA) is based on actual data received from Sydney Water in October 2015 for consumption to end 2014/15. This is the most current actual data available due to the time lag in data being received from Sydney Water.

	Baseline (kL)	Current (end 2014/15) (kL)	Difference (kL)	Difference (per cent)
Organisation	412,919	433,343	-20,424	-4.9
LGA	33,712,079	35,959,654	-2,247,575	-6.7

Calculation

$$\begin{aligned}\text{Difference} &= (\text{Baseline} - \text{Current}) \\ \text{per cent Difference} &= (\text{Difference} / \text{Baseline}) \times 100\end{aligned}$$

Charts 11 & 12. LGA Waste Graphs

Notes:

- Residential waste data provided by City of Sydney waste collection and treatment contractors for 2014/15
- Commercial and industrial waste generation based on estimates provided by Talent with Energy (2013)

LEGEND	
CO₂	Carbon dioxide
GWh	Gigawatt hours
Kg	Kilogram
kL	Kilolitres
kWp	Kilowatt peak
LED	Light Emitting Diode
LGA	Local Government Area
m²	Square meters
ML	Megalitres
MWh	Megawatt hour
MWe	Megawatt equivalent
t	Tonne
tCO₂-e	Tonnes of carbon dioxide equivalent

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<http://www.cityofsydney.nsw.gov.au/council/forms-and-publications/environmental-plans-reports>

Please direct any questions about this report to:

Mary Watt

Manager Environmental Projects

mwatt@cityofsydney.nsw.gov.au

+61 2 92659713



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