

Green Environmental Sustainability Progress Report

July to December 2015

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.



city of villages

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Legend

CO ₂	Carbon dioxide	m ²	Square meters
Kg	Kilogram	ML	Megalitres
kL	Kilolitres	MWh	Megawatt hour
kWp	Kilowatt peak	MWe	Megawatt equivalent
LED	Light Emitting Diode	t	Tonne
LGA	Local Government Area	tCO ₂ -e	Tonnes of carbon dioxide equivalent

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](#) 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* 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.

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

Our targets - City of Sydney Operations

Emissions
26 per cent reduction of 2006 emissions by 2016*
70 per cent reduction of 2006 emissions by 2030
Energy
Five per cent of electricity by renewables by 2016*
70 per cent electricity produced by trigeneration by 2030
30 per cent electricity by renewables by 2030
100 per cent local energy generation by 2030
No reliance on coal-fired electricity by 2030
Water
Zero increase in 2006 mains water by 2016*
Mains water consumption reduction to 10 per cent below 2006 levels by 2030
Water usage in City parks of 180L per square metre of irrigated space by 2016*
Waste
54 per cent resource recovery of facilities waste by 2016*
98 per cent resource recovery of maintenance, construction, demolition waste by 2016*
Fleet
Zero increase in emissions from the City's fleet of vehicles based on 2014 levels*

Our targets - Local Government Area

Emissions
70 per cent reduction of 2006 emissions by 2030
Energy
70 per cent electricity produced by trigeneration by 2030 ¹
30 per cent electricity by renewables by 2030
100 per cent local energy generation by 2030
No reliance on coal-fired electricity by 2030
Water
10 per cent mains water consumption reduction of 2006 levels by 2030
30 per cent of water demand through recycling using local sources by 2030
50 per cent reduction in stormwater pollutants (total suspended solids) and 15 per cent reduction in nutrients by 2030 ²
Waste
66 per cent resource recovery of municipal waste by 2014 ^{±3}
76 per cent recovery of construction waste by 2014 ^{±3,4}
63 per cent resource recovery of commercial waste by 2014 [±]
Greening Sydney
50 per cent increase in current canopy cover by 2030 and 70 per cent by 2050

¹ At least 360MWe (Megawatts electricity).

² From the Decentralised Water Master Plan.

³ These targets will be superseded by the Waste 2030 Strategy currently in development.

⁴ This is an aspirational target based on Government targets. Whilst not responsible for this target, the City has committed to contributing to achievement of this rate.

All targets appear in *Sustainable Sydney 2030*, with the exception of [±], which appear in the Environmental Management Plan and * which are new incremental targets for 2016 adopted by Council on 12 May 2014.

July to December 2015 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;

- The City's Procurement Section was awarded Procurement Australia's "**Social Procurement Award**" for its commitment to doing business with ethical and socially responsible suppliers and its adoption of a Sustainable Procurement Policy (page 33)
- The City's Waste Services team won the top award for **Excellence in energy, water and waste efficiency - Waste and Recycling**, at the Green Globe Awards 2015 as well as a **Local Government NSW Resource Recovery Award** at the 2015 Local Government Excellence in the Environment Awards (page 42)
- The City Waste Services team also won **Project of the Year** and **Best Signage & Display** at the acclaimed 2015 Create Design Awards for its **10 cent coin installation**, and Garbage Guru won the NSW State award for **Best Website** in the Government category at the Australian Web Industry Awards (page 42)
- The **City's Significant Tree Register** won two state awards from Parks and Leisure Australia in their Research Project and Use of Technology categories (page 52)
- Sydney Park at St Peters and the Napier Street Reserve in Paddington both won **Gold prizes** in their categories at the 2015 LNA Master Landscapers Association

Highlights – City of Sydney Operations

By end 2015 in our own operations we;

- Installed a **30,000** litre **sustainable biodiesel** fuel storage tank at Parks Nursery depot in St. Peters (page 16)
- Attracted over **14,000** people to 26 events across three weeks for the **Sydney Rides Festival** that ran in October 2015 (page 17)
- Completed a major audit of all **Liveable Green Network** infrastructure and delivered a number of improvements (page 18)
- Completed the construction of underground **recycled water storage tanks** for the **Green Square Water Reuse Project** (page 26)

Highlights – 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.

To end 2015 the City of Sydney has;

- Opened **two new cycleways** along Castlereagh and Liverpool Streets in the inner city in early October 2015 (page 39)
- Held its annual **chemical cleanout** event at Sydney Park depot recycling 26 tonnes of hazardous waste from 703 participants (page 43)
- Hosted an **Energy Efficiency Forum** – Learning from Global Leaders at Customs House attended by over 140 stakeholders (page 54)
- Adopted the **Energy Efficiency Master Plan** in August 2015 (page 10)
- Endorsed the **Climate Adaptation Strategy** in December 2015 (page 4)
- Adopted the **Residential Apartment Sustainability Plan** in August 2015 (page 61)

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 predicted⁵.

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 unprecedented⁶.

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 environment⁷. 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 1910⁸. The city recorded its hottest day ever on 18 January 2013 peaking at 45.8°C at 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 Sydney⁹.

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 and are a major user of water.

The City is working to reduce carbon emissions by 70 per cent by 2030, one of the most ambitious targets set by any government in Australia. We are:

- installing energy efficient street and park lights
- operating an award winning low-emission vehicle fleet
- rolling out Australia's largest building-mounted solar panel project
- carrying out energy efficient retrofits of major buildings
- reducing emissions and energy bills through energy efficiency programs
- installing low-carbon high efficiency trigeneration



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

⁵ National Aeronautics and Space Administration (NASA) <http://climate.nasa.gov/causes/>

⁶ IPCC *Climate Change 2014 Synthesis Report: Summary for Policymakers* http://www.ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_SPMcorr2.pdf

⁷ Climate Council Report *Unpacking the IPCC Fifth Assessment Report* <http://www.climatecouncil.org.au>

⁸ CSIRO *State of the Climate – 2014* <http://www.csiro.au/Outcomes/Climate/Understanding/State-of-the-Climate-2014.aspx>

⁹ Bureau of Meteorology <http://www.bom.gov.au/climate/current/season/nsw/sydney.shtml>

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, Epsom Road Depot, 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.



Green Infrastructure

As part of Sustainable Sydney 2030, we're working to turn Sydney into a low-carbon city which doesn't rely on coal-fired electricity. We are creating a smarter, more sustainable Sydney through innovative plans for reducing energy and water use, producing energy from renewable sources, collecting and treating waste and using a decentralised water system. We call this Green Infrastructure.

The City has developed a suite of Master Plans to help us determine the best way to implement green infrastructure projects in our own operations and the City of Sydney LGA:

- **Decentralised Energy Master Plan – Trigeneneration**
- **Decentralised Energy Master Plan – Renewable Energy**
- **Advanced Waste Treatment Master Plan**
- **Decentralised Water Master Plan**
- **Climate Adaptation Strategy**
- **Energy Efficiency Master Plan**

These plans, combined with our own individual efforts to reduce our impact on the environment will create a **Green**, **Global** and **Connected** city.

A number of technologies being investigated have been successfully installed in other countries; however, putting them all together is what makes the City's Green Infrastructure plans so exciting.

We have already started some of this work. We have engaged a leading national contractor to install and operate a Trigeneneration plant that will provide electricity, heating and cooling to Sydney Town Hall and Town Hall House (page 37).

We are collaborating with Government, industry, the property sector and clean energy proponents to reform the Australian energy market and accelerate the rollout of decentralised energy.

We are investigating options for **renewable energy**. We have installed solar power and hot water systems in many of our buildings (page 15) and we're looking at other renewable energy opportunities.

We are also looking at options for our waste. The **Draft Advanced Waste Treatment (AWT) Master plan** was endorsed by Council in September 2014. The Master Plan describes technologies that recycle rubbish and keep it out of landfill and technologies which can be used to turn waste into energy. We already send much of our household waste to AWT facilities (page 44).

Our **Decentralised Water Master Plan** has been approved and we are starting the work of building a recycled water network that could be used for toilet flushing, watering gardens and more. This will help preserve Sydney's precious supply of drinking water (page 19).

The City's **Climate Adaptation Strategy** identifies ways we can prepare the city for the environmental, social, cultural and economic impacts of climate change, such as heat waves, storms, droughts, flooding, bushfires and related air quality risks. The plan addresses how the City will interact with other agencies and levels of government and what role the community will play.

The City's **Energy Efficiency Master Plan** identifies the policy framework, technologies and actions we can use to reduce energy consumption and therefore greenhouse gas emissions across the local government area. A proven benefit of energy efficiency programs is the productivity gains that can result. Energy productivity is an area where Australia falls well short of global best practice, so this Master Plan will contribute to a positive change for the City's energy users.



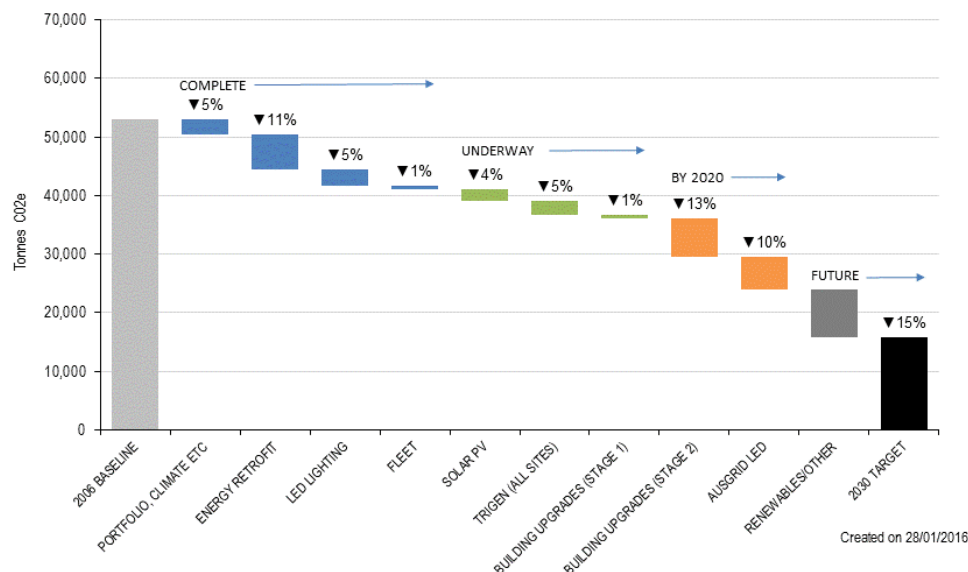
For more on the City's plans visit www.cityofsydney.nsw.gov.au or click on the 2030 icon at left to view a video on the City's renewable energy blueprint.

Emissions

Waterfall chart

Tracking 2030 - Greenhouse gas emissions

Council Operations



This waterfall chart 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, Climate, etc." component has been included in this graph. **It should be noted that irrespective of the Portfolio Adjustment, the City's emissions targets are absolute.**

Please note: The chart above has been modified slightly since the last reporting period to show the timeframe of efficiency measures.

For more information please see **Explanatory Notes to Graphs** (pages 79-83).

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.

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 13), and fleet initiatives.

Tenders for the large scale installation of solar photovoltaic panels (page 15) and trigeneration on City of Sydney buildings are underway plus further assessment of energy savings opportunities in properties.



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

Annual Greenhouse Gas

This graph tracks actual 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 December 2015, the City's emissions have fallen 26% 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](#).

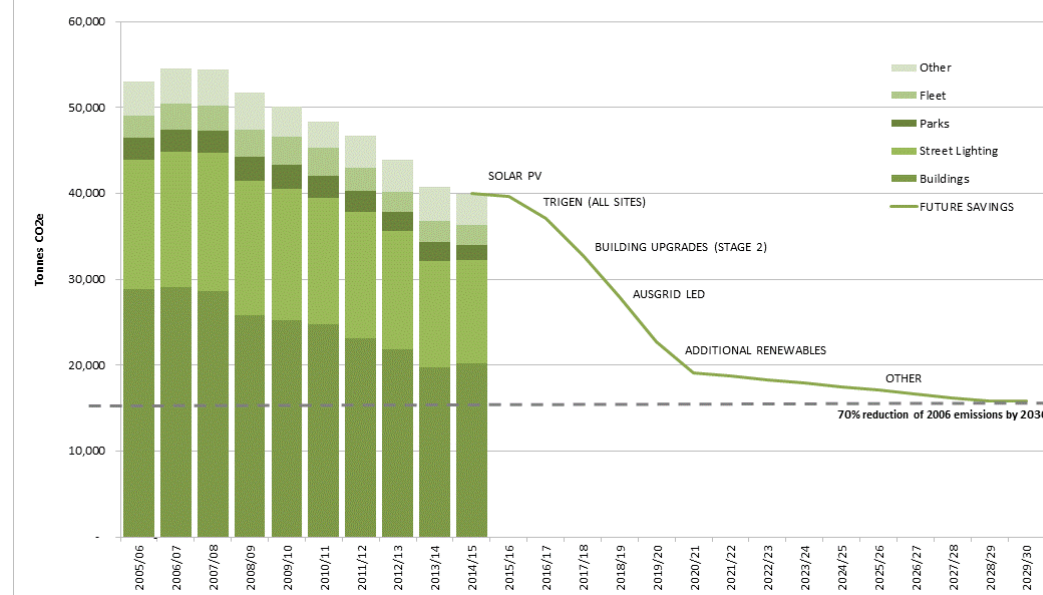
Please note: This graph has been updated since the previous report to provide better estimates of future emissions savings. The City's solar PV and LED lighting upgrades continue to contribute to the energy reductions shown.

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.

For more information see **Explanatory Notes to Graphs** (pages 79-83).

Annual Greenhouse Gas Emissions Council Operations

28 Jan 2016



Quarterly Greenhouse Gas

This graph tracks actual quarterly greenhouse gas emissions for Council operations by category since we started measuring and reporting on these emissions in 2005/06.

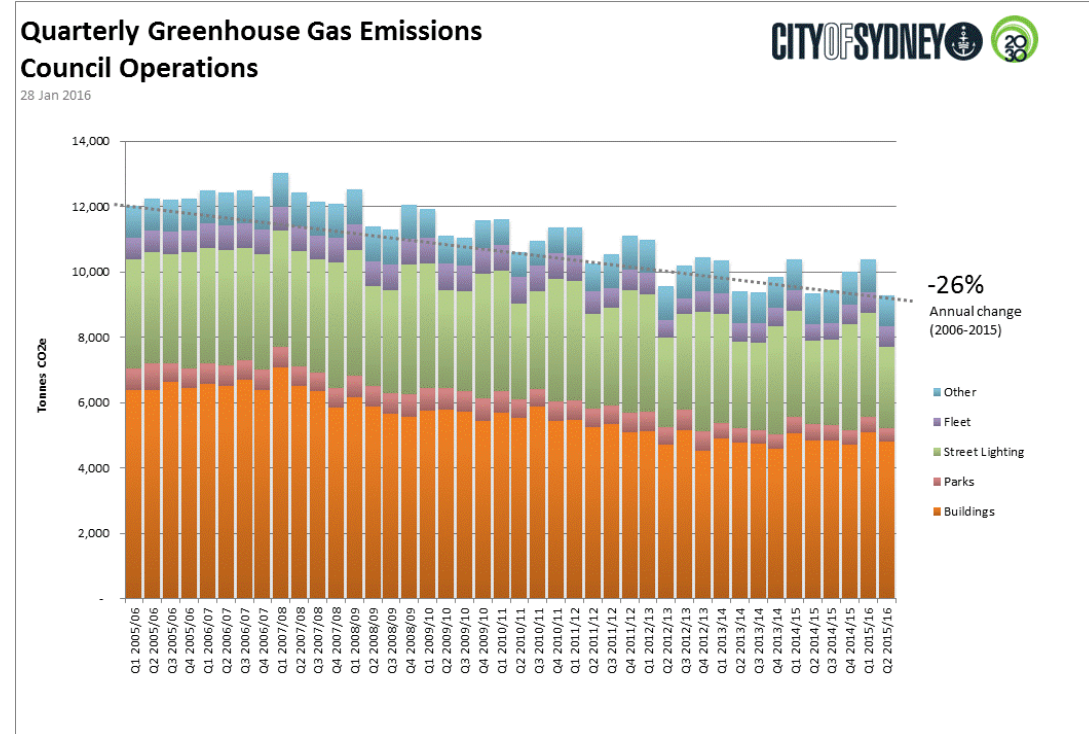
This graph, while providing a more timely measure of greenhouse gas emissions, is subject to seasonal variations (i.e. increased gas for heating in winter and for cooling in summer).

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 emissions between Q1 2015/16 and Q2 2015/16, which largely reflects seasonal variation as observed in previous years.

The emissions result in Q2 2015/16 is slightly lower than the same period last year (Q2 2014/15). The City's recently installed solar panels are contributing to this result.

Please Note: This graph has been updated since the previous report to include results for Q1 & Q2 2015/16.

For more information see **Explanatory Notes to Graphs** (pages 79-83).



Major Projects – Emissions

Project	Description	Key milestones	Status	Responsible
Trigeneration Master Plan	City-wide trigeneration to deliver the Sustainable Sydney 2030 trigeneration target.	Master Plan and Technical Appendix developed by specialist consultancy Kinesis based on extensive modelling and stakeholder input.	Final Trigeneration Master Plan adopted by Council in June 2013 following public consultation.	Sustainability
Renewable Energy Master Plan	Renewable energy for the LGA comprising renewable energy resources both inside and in proximity to the LGA.	Master Plan developed by City of Sydney based on Technical Appendices by specialist consultancies: The Allen Consulting Group; Arup; Talent with Energy and stakeholder input.	Final Renewable Energy Master Plan adopted by Council in December 2013 following public consultation.	Sustainability
Energy Efficiency Master Plan	Investigating the policy framework, technologies and actions to reduce energy consumption and greenhouse gas emissions across the local government area.	Master Plan developed by City of Sydney based on Foundation Report by specialist consultancy pitt&sherry and stakeholder input.	Final Renewable Energy Master Plan adopted by Council in August 2015 following public consultation.	Sustainability
Climate Adaptation Strategy	Assessment of risks and prioritised adaptive actions to prepare the city for the environmental, social, cultural and economic impacts of climate change.	Master Plan developed by City of Sydney based on work by consultants RPS/KPMG including; climate science assessment and modelling, risk identification, assessment and interdependency analysis and stakeholder engagement. Adaptation actions have been identified and pathways proposed. The City also conducted a deliberative engagement process with residents.	Final "Adaptation for Climate Change: A long term strategy for the City of Sydney" adopted by Council in December 2015 following public consultation.	Sustainability
LED lighting	Replacement of the most energy inefficient lighting luminaires to reduce energy and emission consumption.	Negotiations completed and Contract was executed with GE- UGL. Three year roll out program covering 6,604 luminaires.	Complete For more see page 13	City Infrastructure & Traffic Operations

Project	Description	Key milestones	Status	Responsible
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.	The City entered into a contract with the preferred tenderer for trigeneration plant at Town Hall House in March 2015, development consent obtained December 2015 and construction work substantially progressed.	Sustainability/ Green Infrastructure/ City 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).	Revised connection framework for small embedded generators introduced October 2014. 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.	Sustainability/ Green Infrastructure
Stage 1 Building Energy and Water Efficiency Retrofit (Origin/Ecosave)	A collection of projects tendered as one project to achieve a 23 per cent greenhouse gas emissions reduction 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. For more see page 14	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 15	City Projects & Property

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.	Information about emissions. An open approach conforming to the Digital Strategy. Reporting consistent with other cities worldwide.	In Progress Agreements are currently being negotiated	Sustainability Programs and Sustainability Strategy	End 2015/16
Fleet	Fleet emissions contribute approximately seven per cent of the City's total emissions. A Fleet Management Strategy addressing asset renewal, alternative fuels, new technologies and driver education is underway.	A four year program to reduce fleet emissions by 20 per cent before end 2014. Maintain fleet emissions at 2014 levels until 2016.	Completed and exceeded In Progress On Target for 2015/16	Strategy and Assets	End 2013/14 End 2016
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

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 others) and energy savings have exceeded the target by **8%**. The City's LED program was recognised for leadership and innovation at the 2014 Institute of Public Works Engineering Australasia (NSW) annual awards.

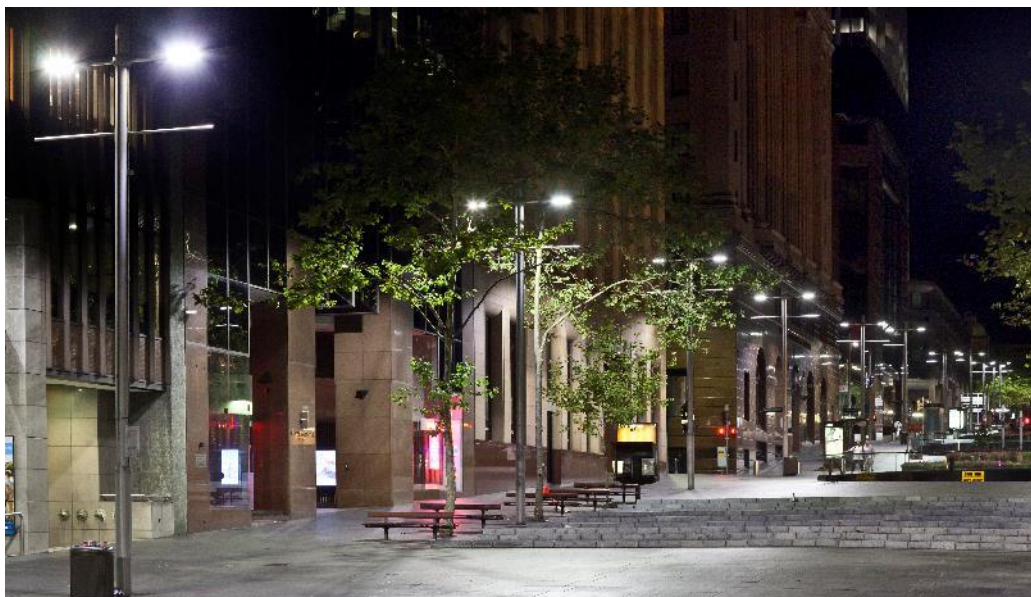


Image: LED Lighting at Martin Place

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 reporting period, **157** luminaires (lights) were changed. The installation is now complete.

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.

Luminaire changes – actual (#)	Luminaire changes – target (#)	Reduction CO ₂ -e (per cent)	Reduction CO ₂ -e from baseline (per cent)
Quarter 1 2015/16			
0	50	0	0
Quarter 2 2015/16			
157	69	61% ¹⁰	61% ¹¹
Contract to date (GE-UGL LED lighting contract)			
6, 190	6,152	49% ¹²	47% ¹³



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.

¹⁰ Percentage reduction CO₂-e from actual luminaire changes this quarter

¹¹ Percentage reduction CO₂-e from baseline for actual luminaire changes this quarter

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

¹³ Percentage reduction CO₂-e from baseline for total luminaire changes contract to date

Building Energy and Water Efficiency Retrofit

The City awarded a tender to retrofit **45** of its major buildings with energy and water savings measures. The retrofit was estimated to cut energy use by **6,641** MWh (megawatt hours), reducing greenhouse gas emissions by **23** per cent and water consumption by **56,313** kL per year.

The energy and water saving installations have now been completed and the associated savings independently verified. Payback has been confirmed as under 6 years for both the energy and water initiatives.

Projects implemented as part of this retrofit include:

- lighting upgrades
- voltage reduction on lighting circuits
- building management control system (BMCS) upgrades and fine tuning
- pool circulation pump upgrades including installation of variable speed drives
- voltage power optimisation
- boiler and compressor optimisation
- desktop computer power management

Benefits of implementation include:

- improved National Australian Built Environment Rating System (NABERS) ratings for commercial offices and tenancies
- significantly avoided utility costs
- lower annual greenhouse gas emissions and potable water use.

As shown in the table, the actual savings delivered fell short of the targeted savings by **10%** for greenhouse gas emissions and **28%** for water. The shortfall however can be largely accounted for by changes in scope, which meant not as many initiatives proceeded as originally planned. In particular more than 50% of the shortfall in water savings can be attributed to some tenants not agreeing to this equipment being installed in their café kitchens.

Works Completed	Emission savings (tCO ₂ -e)	Water savings (kL)
Target	6,711	56,313
Actual	6,054	40,516
Variance	-657	-15,797
Variance (% of Target)	-10%	-28%
Removed from Scope	-818	-13,574



Image: Solar PV panels on Sydney Park Pavilion

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 **2,706** panels installed across **23** 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 up to **2,074** 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 (however 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.

Installation of the remaining systems will take place over the next two and a half years. Attachment 3 lists the City's buildings where solar photovoltaic panels and solar hot water has already been installed (page 71).



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

Period	Panels installed (m2)	Energy production ¹⁴ (kWh)	Emission savings ¹⁵ (tCO ₂ -e)	Energy production ¹⁶ (kWh p.a)
Q1 2015/16	147	23,400	39	39,500
Project to date	1,308	632	1,026	984,763
Total contract (target)	2,575	821,771	2,074	1,953,440

Please Note: There were no PV installations in Q2 2015/16. The proposed sites for Q2 2015/16 are scheduled for installation in Q3 2015/16.



Image: Solar PV panels at Sydney Park Nursery

¹⁴ projected energy production for panels installed in the reporting period

¹⁵ projected emissions savings for panels installed in the reporting period

¹⁶ cumulative energy production for the project to date

Transport

Fleet emissions

Having achieved our four year target for a 20 per cent emission reduction by end 2014, the focus in 2015/16 is to maintain, and not to exceed 2014/15 emission levels until new low-emission fuels and technologies become available in Australia.

The combined fleet emissions from Q1 and Q2 2015/16 were 1,226 tCO₂-e. A total of 533,151 litres of fuel was consumed by the City's fleet during this period which is a decrease of 16,000 litres over Q1 and Q2 2014/15. **73** per cent of this was blended sustainable bio-diesel.

The City's Sustainable Fleet Management program achieved a 26 per cent reduction in fleet emissions over four years, without any reduction in the services to the community. 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**.

On-going discussions with manufacturers of electric light commercial vans have been fruitful. In July 2015 the team trialled the **Renault Kangoo ZE** and were very positive about their feedback about the electric vehicle. Purchase of the Renault for fleet inclusion will be considered when it becomes commercially available. The City's Sustainability team also continues to pursue partnership options for hydrogen production with a view, in part, to providing the necessary infrastructure for the introduction of hydrogen fuel cell powered electric vehicles.

The City has now expanded the onsite storage of biodiesel tanks, from two to three with the latest addition located in the Parks Nursery depot in St. Peters. The installation of this **30,000** litre self bunded storage tank will allow more vehicles and trucks to have access to sustainable biodiesel fuel leading to further reduction in greenhouse gases.

Driver education has continued to develop with the introduction of the **eco-driving strategy** in September 2015. This strategy is based on best practice principles researched and developed in partnership with the National Transport Commission and other leading fleet operators.

The fleet team has introduced 'in-cabin' driver training. The training, offered to the City's operational fleet users, will achieve lower vehicle emissions by improving driving behaviour and skills.



Image: New installation of bulk fuel tank at Parks Nursery St. Peters

Staff Travel Plans

City staff members are encouraged to walk, cycle or use public transport wherever possible when travelling around town to meetings, site visits and between City venues.

City staff plan their travel using a simple Transport Hierarchy;

1. **Active Transport** (walking or cycling using the City's own bike fleet)
2. **Public Transport** (buses and trains)
3. **Drive Green** (the City's own fleet of low and zero emissions vehicles)

To support the use of active transport, staff is 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. Staff members wanting to use the fleet are given detailed training and provided with appropriate personal protective equipment. Electric cars in the City's vehicle fleet also ensure longer distances can still be travelled with zero local emissions.

The bike fleet is housed in recently completed end-of-trip facilities on Level 1 of Town Hall House which provides security access for staff riding or walking to work, promoting active transport. The Pitstop facility 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. In addition there are 12 fleet bikes located at a variety of Council facilities including King George Recreational Centre, Epsom Rd & Bay St Depots.

The **Sydney Rides Festival** ran from 10-31 October 2015, attracted over 14,000 people to **26** events across three weeks. The Festival is a key part of the 2015/16 Walking and Cycling Team business plan and contributes to a vibrant and energetic city (Sustainable Sydney Directions 4 & 5) as well as promoting bike riding and essential new infrastructure. The event's online webpages received almost **40,000** unique visits and positive media coverage.

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	Year to date	Program to date
Staff trained (#)	14	26	91	492
Distance(km)	1,782	849	4,384	12,416

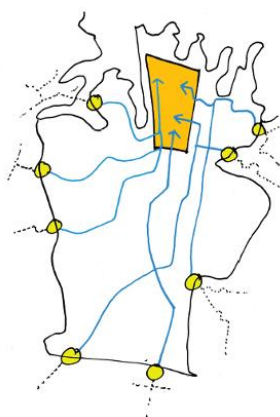


Image: The Pitstop end-of-trip facilities at Town Hall House

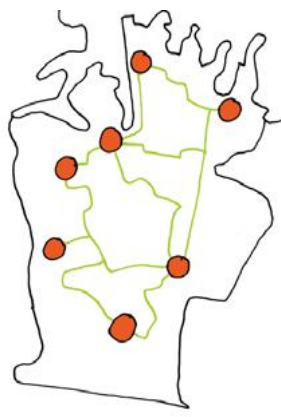
Liveable Green Network

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%** of city trips will be made by bicycle and **50%** by pedestrian movement.



City Centre



Village to Village



Parks & Leisure

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.

In 2015 the City has delivered the following LGN improvements:

- Broadway Cycle Link – Darlington to Ultimo
- Concorde St contra cycle lane, footpath and habitat landscaping
- Abercrombie St – Lawson St pedestrian link to Sydney Uni – footpaths, landscaping, pedestrian crossings
- Crown St upgrade – paths, rain gardens
- Cleveland St – completion of footpath upgrades and hedge planting

Focus areas for delivery in 2016 are:

- Route/Link 1 – Bourke St/Bourke Rd (Phillip, Danks, Short Sts)
- Route/Link 10 – Baptist – Crown Sts
- Route/Link 11 – Central – Moore Park (Fitzroy, Foveaux Sts)
- Route/Link 13 – Surry Hills – Haymarket (Campbell, Foster Sts, Wentworth Ave)



Image: Integrating walking and cycling paths with green spaces

Water

Decentralised Water Master Plan

The 2003–2010 droughts brought home the impacts of taking water for granted. The recent floods have also reminded us that Australia's historic drought and flood cycles are predicted to become more intense with climate change.

The drought led to water restrictions and a growth in individual recycled water systems as Sydney tried to adapt to unpredictable and dramatic weather cycles. However, there was no integrated city wide strategy to mitigate or adapt to these events. It is imperative the city's water supply is sustainable, drought-proofed and utilised to adapt to climate change.

The city has the oldest water supply and sewerage infrastructure in Australia, and now is the time to rethink how we deliver the city's drinking and non-drinking water supplies for the twenty first century.

Currently, **we only drink two per cent** of the drinking quality water we pump to our city. Even taking other drinking quality water demand uses into account, such as showering and bathing, it still accounts for no more than half our water consumption. The other half is for non-drinking uses such as toilet flushing, air conditioning and irrigation of our parks and gardens. In response, the City of Sydney has developed a Decentralised Water Master Plan.

The 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. This will make our city more self-sufficient and able to address climate change issues such as the urban heat island effect. It will also free up drinking water supply capacity, which is particularly important in times of drought.

The Master Plan was produced by the City and is based on three technical appendices – a Water Efficiency Plan, a Recycled Water Plan and a Water Sensitive Urban Design and Stormwater Infrastructure Improvement Plan.

The **Decentralised Water Master Plan** provides a blueprint to:

1. Reduce mains water consumption across the local government area (LGA) by 10 per cent of 2006 levels by 2030 through water efficiency programs.
2. Reduce mains water consumption in Council's own buildings and operations to 10 per cent below 2006 levels by 2030 through water efficiency and connection of Council facilities to park-based or precinct scale recycled or alternative non-potable water supplies.
With the growth in Council buildings and operations portfolio and irrigating parks and gardens to adapt to climate change and reduce the urban heat island effect, the City anticipates water consumption will increase by 30 per cent on a 'business as usual' basis. Reducing 2006 mains water use will provide an effective target of a 40 per cent reduction in mains water consumption by 2030 in practical terms.
3. Replace 30 per cent of mains water demand across the LGA with recycled or alternative non-potable water generated from local water resources by 2030.
The 30 per cent target can only be delivered in partnership with NSW and Federal governments to help deliver the City's LGA contribution towards the national target of 30 per cent of Australia's wastewater being recycled, with 10 per cent by the City of Sydney implementing measures and 20 per cent by NSW and Federal government funding and/or implementing measures.
4. Reduce sediments and suspended solids discharged into the waterways by 50 per cent and nutrients by 15 per cent from stormwater runoff generated across the LGA by 2030.

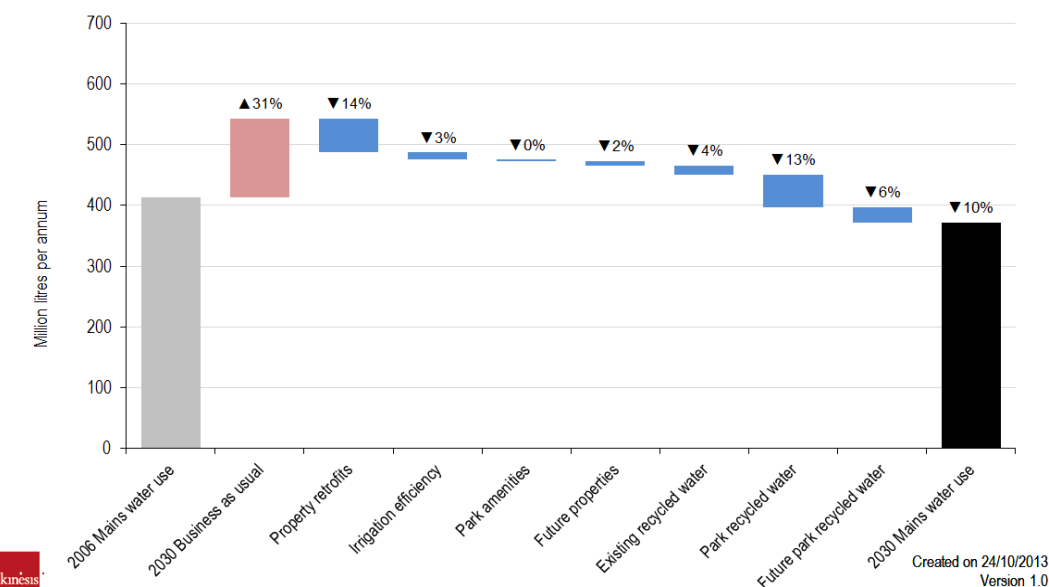
The technical appendices were prepared by international consultancy firm GHD with assistance from the Institute for Sustainable Futures and P3iC. The Master Plan was adopted by Council in 2012.

Water

Waterfall chart

Decentralised Water - Mains water use

City of Sydney Operations



This waterfall chart is taken from the Decentralised Water Master Plan and outlines the steps the City of Sydney is taking to meet its target for a 10 per cent reduction in its 2006 mains water use by 2030. This graph was first shown in this report in Q1 2013/14.

Council has set a target to reduce mains water demand in our own operations to 10 per cent below 2006 levels by 2030. This is despite an anticipated 30 per cent increase in its water demand by 2030.

Please note: The waterfall chart above will be updated in future reports as more information becomes available.

For more information see **Explanatory Notes to Graphs** (pages 79-83).

Water saving projects include:

- Building water efficiency retrofits to high-to moderate water using properties (complete)
- Installation of 30 smart meters for early detection and fixing of leaks within parks (complete)
- Installation of 11 park-based small scale stormwater harvesting schemes with estimated mains water savings of up to 28 ML per year (complete)
- Development of a new stormwater harvesting scheme to service Harold Park, Jubilee oval and Federal Park North, which when complete will save up to 16 ML per year of mains water.
- Upgrade of 27 parks irrigation systems to improve system operation, reliability, and water use efficiency (complete)
- Precinct scale stormwater harvesting schemes at Sydney Park (page 27) and Green Square Town Centre (page 26). These two projects have received co-funding from the Stormwater Harvesting and Reuse grant program (in progress).

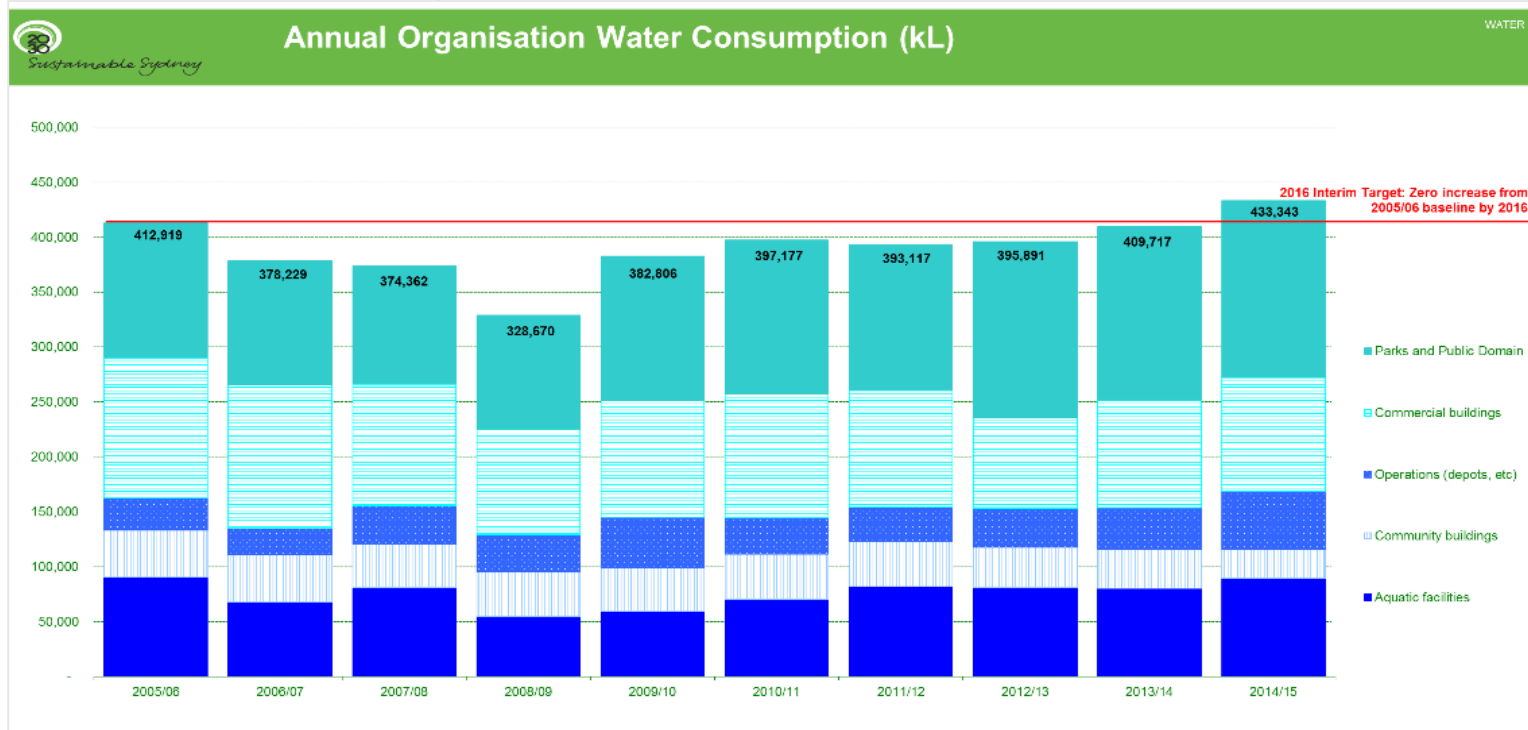
Mains water savings will be delivered by water efficiency measures on irrigation, park amenities and buildings, and connection of Council facilities to recycled or alternative non-potable water schemes (park based or precinct scale).

Water efficiency measures are expected to deliver mains water savings of up to 77 ML per year and connecting Council facilities to recycled or alternative non-potable water schemes are expected to deliver mains water savings of up to 95 ML per year.



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.

Annual Water Consumption



Please note: The data for 2014/15 has been updated in this report to reflect the most up to date consumption data (less than 10% estimated data).

For more information see **Explanatory Notes to Graphs** (pages 79-83)

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

This graph shows annual water consumption by category. The 2014/15 period shows an increase in total water consumption above the City's interim target of zero increase from the 2005/06 baseline by 2016. This is largely due to a mains water leak at the Epsom Road Depot. This leak has now been rectified.

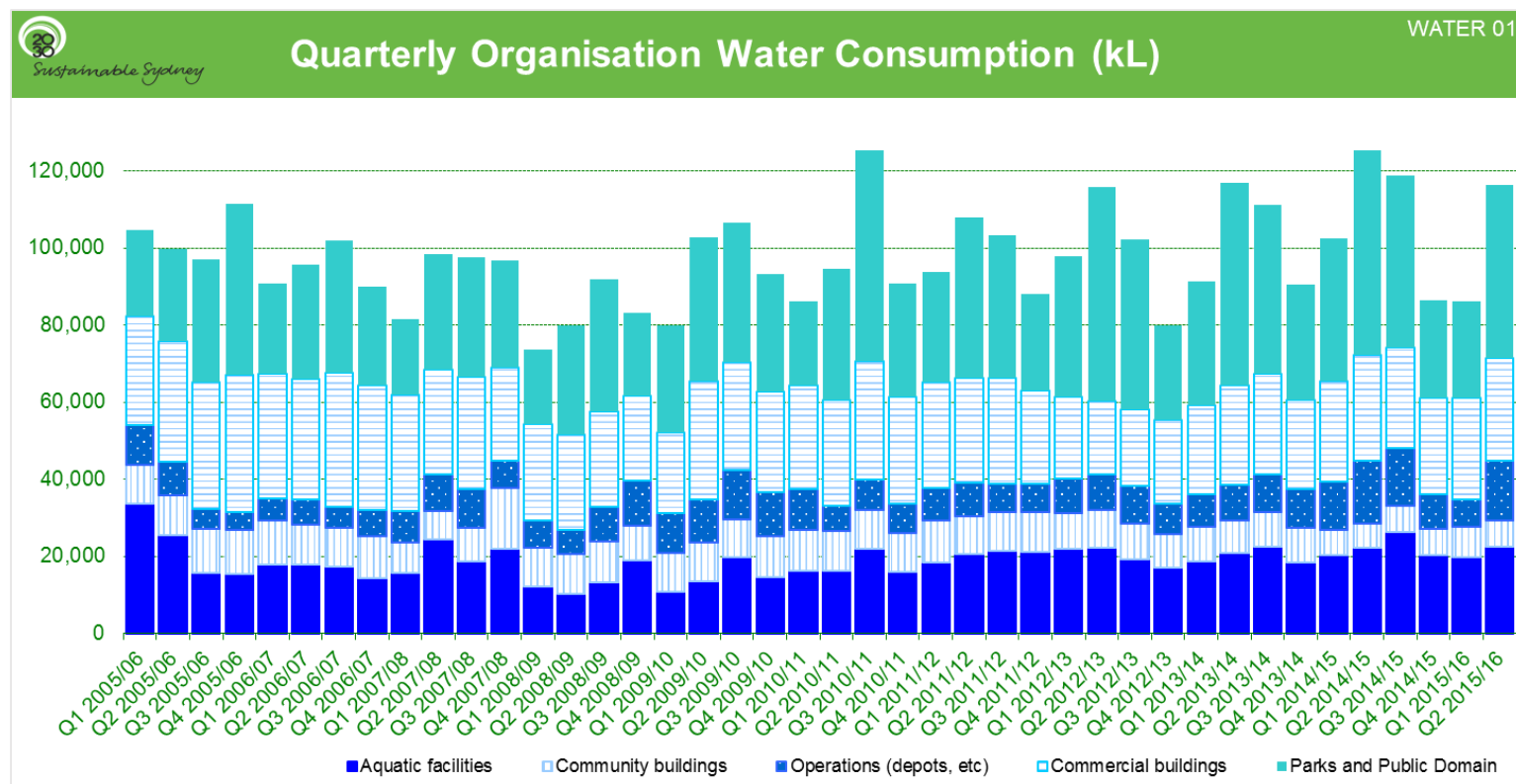
Other temporary increased water consumption has been noted at Sydney Park due to plant establishment and wetland top up requirements during the upgrade works. This consumption will reduce once the upgrade works are complete.



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.



Quarterly Water Consumption



This graph 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'.

For Q1 2015/16, data shown is 83 per cent actual data. For Q2 2015/16, 100 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 Q2 2015/16 results should decrease in the next report to reflect rainfall, the rectified leak at Epsom Road Depot and the completion of Sydney Park plant establishment.

Please note: This graph has been updated since the last report to include more up to date data for Q3 and Q4 2014/15 and new data for Q1 and Q2 2015/16. This includes estimated data which will be updated in the next report.

For more information see **Explanatory Notes to Graphs** (pages 79-83).

Sydney Water currently provides manual meter reading quarterly. At 30 properties sub-meters have been fitted by the City of Sydney which allow for real-time consumption reporting. This provides the ability to deliver water reports to City staff in real time, allowing the City to manage our water usage in a more timely fashion.

A full review of these sub-meters is currently underway to ensure the optimum placement and ongoing provision of data.

Water Consumption – Parks

Since 2006, the number 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 and Coulson Street Reserve. The total irrigated area as of December 2015 is 808,479 m² against the baseline of 531,953m².

Council has committed to a new interim target for water usage in City parks of 180L per square metre of irrigated space by the end of 2016. City parks and open spaces are currently trending at 171L per square meter of irrigated space. This has reduced from 198L per square metre of irrigated space since the last report. Water consumption in Q1 and Q2 2016 has reduced with the completion of landscape establishment works at the Sydney Park wetlands. Consistent rainfall has also aided in reduction of irrigation demand. The table will be updated in the next report for the 2015/16 year.

The 2012 Parks Water Saving Action Plan outlines nine action items that will 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 24. The Parks Water Savings Action Plan will be reviewed in the first half of 2016 to refine the actions moving forward.

Improvements to the data capture, and record keeping are continuing, with our focus on data reliability. A new contract to manage harvested storm water systems and track overall system performance was established in September 2015. A project will commence in 2016 to deliver a new centralised monitoring and control system for parks water use.

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.

Financial Year	Efficiency intensity (L/ m2)	Increase in irrigated area from baseline (%)	Efficiency gains (%)	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



Image: Water feature at Redfern Park

Parks Water Savings Action Plan

Item	Action	Timeframe	Status
1	Evaluate and establish water targets for:		
	Top 10 water consuming sites	2013	Complete
	Top 20 water consuming sites	2014	Complete
	Top 30 water consuming sites	2015	In Progress
2	Conduct irrigation efficiency testing on top 20 water using parks	2015	In progress
3	Develop program for implementation of the efficiency measures recommended through efficiency testing for:		
	Top 10 water consuming sites	2015	Commenced
	Top 20 water consuming sites	2015	Commenced
4	Monitor and record water usage to maintain accurate data:		
	Installation of STEvE data logger at top 30 water consuming sites	2015	Complete
	Improve capability of Cloudmaster and develop web based system – IT project approved for 15/16 financial year	2015	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

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 and Blackwattle Bay 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 has begun with construction commencing on the Green Square Trunk Drain. This project will see the creation of a large underground drainage culvert running 2.3 kilometres through the Green Square town centre from Link Road in Zetland to the Alexandra Canal. 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 proposed \$100 million drainage work will take up to three years to complete, and will be co-funded by Sydney Water.

The proposed drainage works will also include stormwater quality improvement devices, such as pollutant traps and rain gardens to meet the objectives of the City's Decentralised Water Master Plan (page 19) which aims to reduce stormwater pollutants entering water ways.

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	March 2017

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** 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 Re-use 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.

The project has moved from the concept phase to detailed design and construction. It involves the extraction of stormwater from the proposed trunk drainage system being delivered by the City and Sydney Water, and construction of recycled water treatment plant and pump station in the Green Infrastructure Centre, a **restored heritage building** on the former South Sydney Hospital site.

The recycled water pipe network is being constructed in stages as the precinct and is being developed by Flow Systems or by the land developer.

Construction of underground storage tanks in the former South Sydney Hospital site, an important milestone, was completed at the end of 2015.

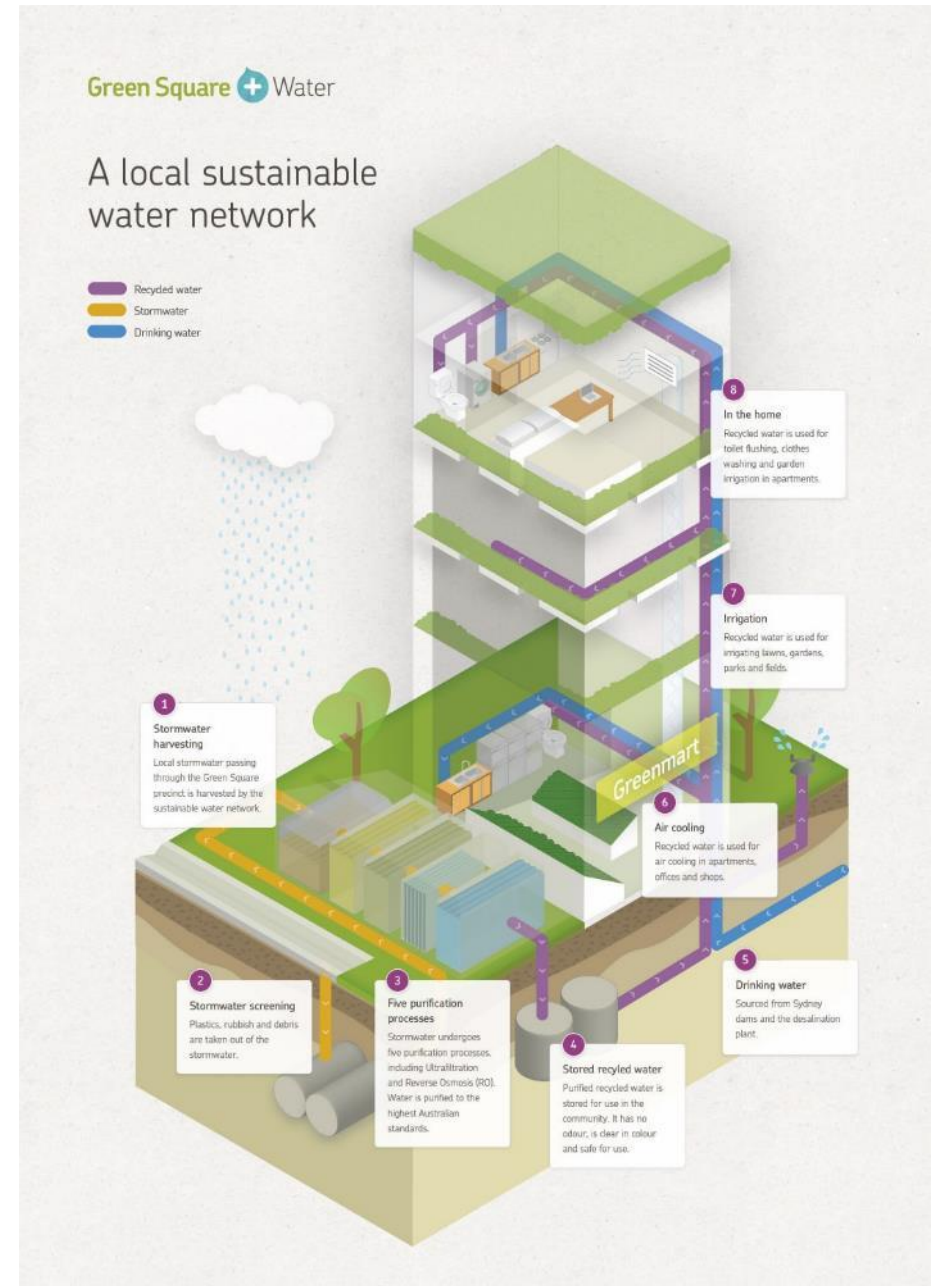


Image: Recycled water reuse process at Green Square Town Centre

Sydney Park Water Reuse Scheme

The City of Sydney has almost completed the second stage of Sydney Park's water reuse scheme. The plant and pump equipment is currently being commissioned and due to be operational by early in 2016. 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 part of a suite of initiatives being formulated under the Decentralised Water Master Plan and 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. Stage II is in the final stages of completion and handover with the park now open and planting gradually being established.

The project includes landscape improvement works to enhance the park's eco-systems, features and recreation opportunities. New planting, lighting, seating and picnic areas are being installed and pathways improved. Wetlands have been connected via a picturesque series of water cascades and visitors will soon be provided with 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: Stormwater collection at Sydney Park, St Peters



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.

Major Projects – Water

Project	Description	Key milestones	Status	Responsible	By
<u>Decentralised Water Master Plan</u>	Develop targets and actions for water recycling, water sensitive urban design and improving water use efficiency.	Develop implementation plan for endorsed Decentralised Water Master Plan.	Master Plan endorsed February 2013. Implementation actions have been developed and priority actions being implemented on an on-going basis.	Sustainability	Ongoing
<u>Sydney Park Water Reuse Scheme - Stage II</u>	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. Handover process to operator underway.	City Projects & Property / City Greening & Leisure	February 2016
<u>Sydney Park Water Reuse Scheme – Stage III</u>	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
<u>Floodplain Management Risk Management Studies and Plans</u>	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.	Draft flood studies complete for all catchments. Floodplain risk Management Plan adopted for Alexandra Canal, Blackwattle Bay and Johnstons Creek.	City Infrastructure and Traffic Operations	March 2017
<u>Green Square Water Reuse Project</u>	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.	Finalise construction of storage tanks. Commence installation of reticulation network.	City Projects & Property / Chief Operations Office	March 2017

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 will be reviewed and updated in April 2016.	In Progress For more see (page 24)	City Greening & Leisure	Reviewed in April 2016
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 Property	In progress
				City Greening & Leisure	Complete



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.

Facilities Waste

The City is reviewing contract requirements to meet the incremental target of 54 per cent resource recovery of facilities waste by 2016.

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	Year to date
Waste generated (tonnes)	586	584	1,170
Recycling rate (per cent)	45	45	45 ¹⁷

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: Left - Recycling station in Surry Hills Library,

Right – Recycling bins at Beare Park

¹⁷ Year to date figure is an average for the year

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.

A target of maintaining a 98 per cent recovery rate was adopted by Council in May 2014. By accepted industry standards a 98 per cent or higher recovery rate constitutes an effective zero waste level.

In Q1 and Q2 2015/16, the City generated an estimated 318 tonnes of waste from parks and gardens and 3,208 tonnes of waste from Council construction services. The City was able to recycle or divert over 99 per cent of this waste.

In the calendar year 2015, the City generated an estimated 9,457 tonnes of waste from its operations and recycled or diverted over 99 per cent of this waste.



Image: Street Cleansing and Waste Management

July to December 2015	Organisational Waste (Tonnes)	Material Recycled (Tonnes)	Diversion Rate (per cent)
Parks and Gardens maintenance (tonnes) ¹⁸	318	318	100
Council Construction and Infrastructure Maintenance (tonnes)*	3,208	3,176	99
Overall (tonnes)	3,526	3,494	>98 per cent
2015	Organisational Waste (Tonnes)	Material Recycled (Tonnes)	Diversion Rate (per cent)
Overall (tonnes)	9,457	9,368	>98 per cent

Please note: The table above gives tonnages for maintenance, construction and demolition waste for the reporting period and the year 2015

¹⁸ Includes recycled soils, woodchip and green waste. Does not include litter bins.

* Includes Council-labour minor construction, demolition and maintenance works.

Major Projects - Waste

Project	Description	Key milestones	Status	Responsible	By
Advanced Waste Treatment Implementation Plan	Implementation plan to deliver actions and objectives as outlined in the Advanced Waste Treatment Master Plan.	Preparation of draft implementation plan. Determination of early priorities for advanced waste treatment development.	Implementation Plan First Draft by end January 2016.	Green Infrastructure/ Sustainability	End 2015/16
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.	In progress. For more information see page 47	Sustainability	December 2016

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 Public Domain Landscaping and Parks (page 52), provision of low-emission vehicles and sustainable fuels (page 16) supply of luminaires for our LED Lighting (page 13), new technologies used as part of our Building Energy Efficiency Retrofits (page 14) for use at our many Events (page 34) and by our administrative staff.

In 2015 the City's Procurement Section was awarded Procurement Australia's **"Social Procurement Award"** as a result of its commitment to doing business with ethical and socially responsible suppliers and its development and adoption of a Sustainable Procurement Policy.

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 new Electronic Invoicing Process continues to deliver sustainable savings by way of its electronic review, workflow and storage of documents, previously held in hard-copy format. Processing times have been reduced, while paper usage has been significantly reduced across Council.

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 of expenditure, or areas where sustainable improvements through reduced travel can be put in place.



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; there are no petrol generators on floats, that food stalls provide recycled cutlery and containers, that waste is recycled at all events and waste products from food stalls is 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.

Each year the City undertakes a Green House Gas assessment of Sydney New Year's Eve. For the 2014 event, the estimated total carbon emissions were 467.2 tonnes of carbon dioxide equivalents. Compared with the previous year, this represented a net reduction of 25.9%.

The main reasons for the reduction were: a decrease in electricity consumption due to the use of LED rope light (rather than incandescent) for the Bridge Effect; a reduction in the merchandise program with a lower number of official commemorative coins being produced and sold and there being no t-shirt merchandise; and a slight reduction in the total waste to landfill.

An assessment of the 2015 event will be provided in the next reporting period.



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.

Image at right: Moore Park



Emissions

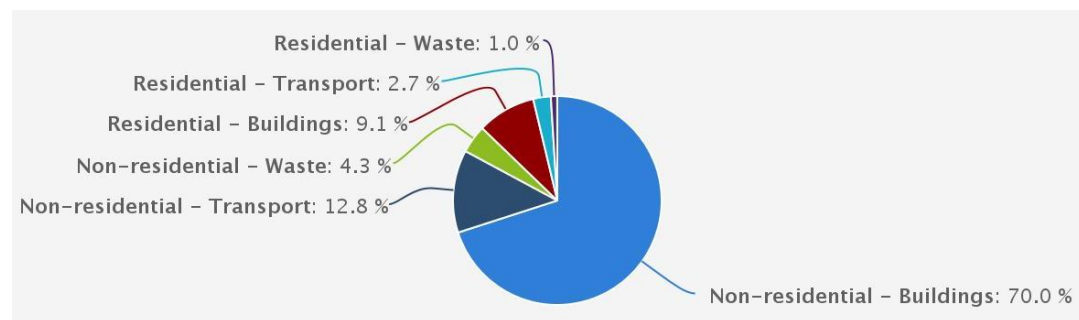
Waterfall chart & annual emissions

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**.

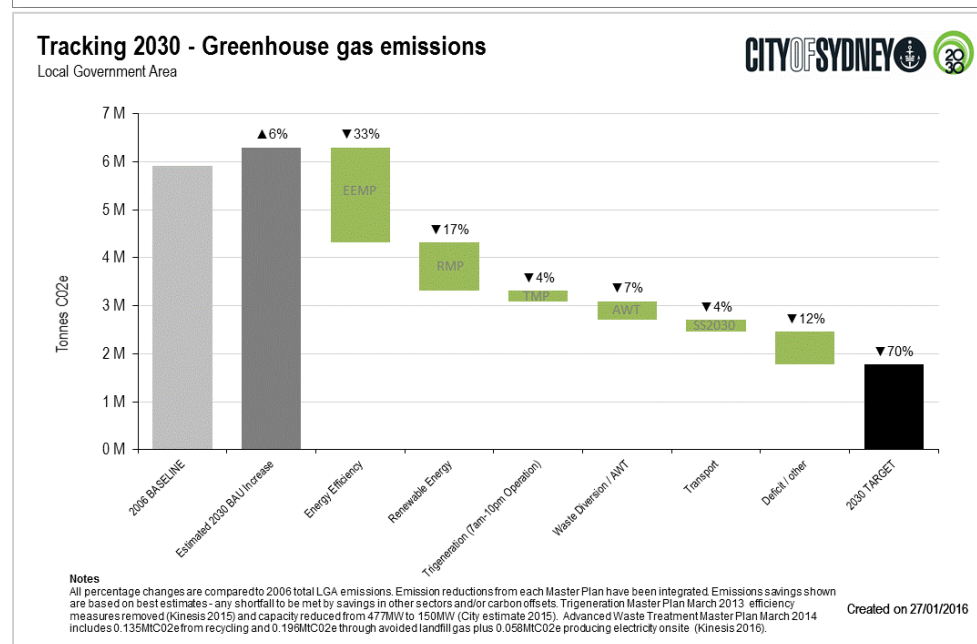
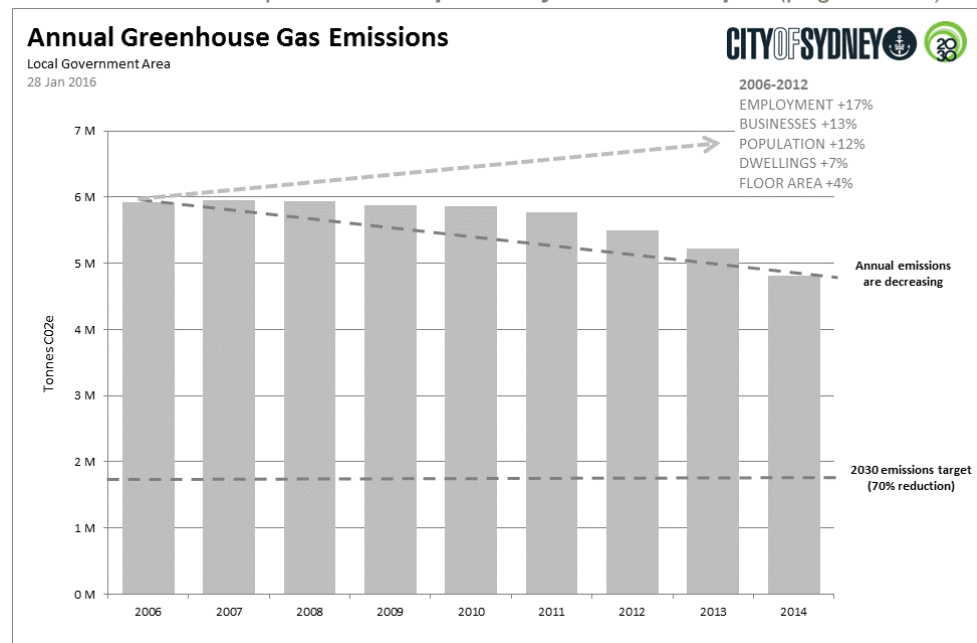
Since 2007 total greenhouse gas emissions across the local government area have continued to fall and this is despite significant growth in the economy (**17%**), the number of new residents (**12%**) and businesses (**13%**), new developments and other economic indicators.

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.



Please note: The charts below have been updated since the last reporting period. For more information please see **Explanatory Notes to Graphs** (pages 79-83).



Decentralised Energy – Trigeneration Master Plan

Trigeneration is a key part of the City's Sustainable Sydney 2030 goal to reduce greenhouse gas emissions by 70 per cent and for no reliance on coal fired electricity by 2030.

Changes to regulations and the Federal Government's decision to lower the future carbon price mean that trigeneration projects in some of the City's trigeneration precincts may not go ahead.

We will continue with plans to install trigeneration systems in our own buildings, starting with a plan to provide electricity, heating and cooling to Sydney Town Hall and Town Hall House. We will continue to lobby to remove the regulatory barriers to trigeneration.

In trigeneration, electricity is produced locally and the waste heat from the process is used to supply heating and hot water. Waste heat is also converted into cooling via a heat-driven chiller system. In this way, trigeneration provides cooling, power and heating as illustrated below.

The final Decentralised Energy – Trigeneration Master Plan forms part of the City's Green Infrastructure Plans (page 6) and follows from the interim Trigeneration Master Plan which was published in 2010/11.



To view the Decentralised Energy – Trigeneration Master Plan, visit www.cityofsydney.nsw.gov.au or click on the 2030 icon at left.

Decentralised Energy – Renewable Energy Master Plan

The City of Sydney has set a target of reducing greenhouse gas emissions across the entire local area by 70 per cent below 2006 levels by 2030. This includes a target of 30 per cent of electricity from renewable sources.

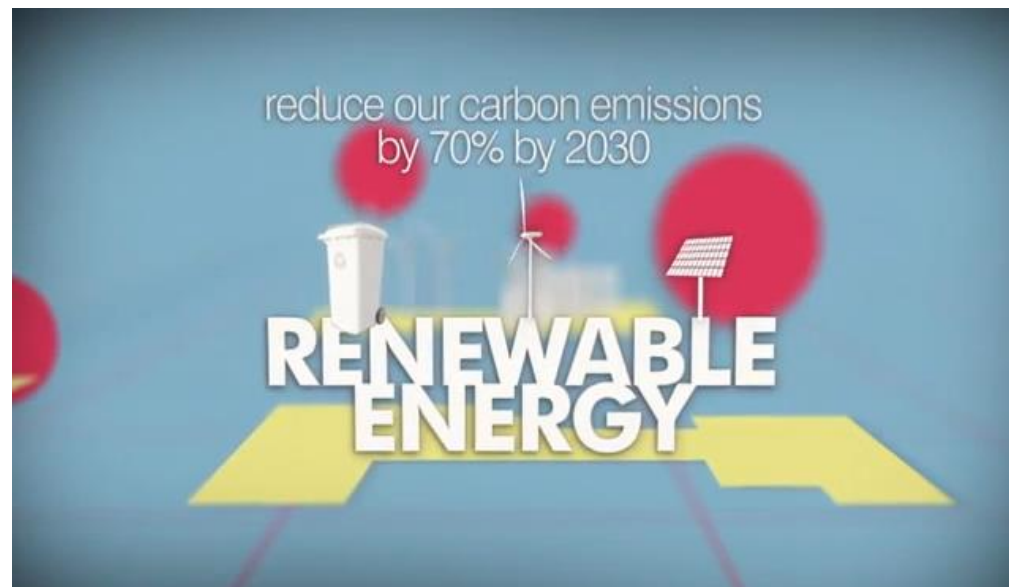
A Decentralised Energy - Renewable Energy Master Plan has been developed to focus on technologies that deliver the greatest outcome for our city for the lowest cost. The plan is based on the most detailed technical, financial and economic assessment of renewable energy opportunities for the Sydney region. Based on worldwide renewable energy best practice, the Master Plan focuses on the mix of renewable energy resources and most effective technologies.

The Decentralised Energy – Renewable Energy Master Plan is an important part of the City's strategy to improve energy efficiency and reduce greenhouse gas emissions. The Master Plan forms part of the City's Green Infrastructure Plans (page 6). It complements the City's Decentralised Energy – Trigeneration Master Plan and the Energy Efficiency Master Plan currently being developed.

The Decentralised Energy – Renewable Energy Master Plan was endorsed by Council in December 2013.

The City of Sydney is installing solar panels on a number of its buildings (page 71). We call this “**showing by doing**”.

The most exciting part of our city using renewable energy is that as the cost of coal-fired electricity rises, the cost of renewable energy is falling as new technology becomes available and countries around the world embrace decentralised energy networks.



To view the Decentralised Energy – Renewable Energy Master Plan, visit www.cityofsydney.nsw.gov.au or click on the 2030 icon at left.

Green Transport

The City is committed to promoting safe, healthy and convenient transport for residents, workers and visitors. We are improving conditions for walking and cycling, promoting car sharing, and investing with the NSW Government in the transformative Sydney CBD and South East Light Rail.

Cycling

The City promotes safe and courteous cycling with free bike tune ups, bells, maps and sessions through our StreetShare program. A key project within the **StreetShare** program is **Share the Path (STP)** campaign. Now in its fifth year, Share the Path information sessions are organised four times a week across the LGA, where staff 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.

Two new cycleways along Castlereagh and Liverpool Streets in the inner city opened in early October 2015. These cycleways are important links in the growing network of bike lanes through Sydney, providing a safe connection for riders to cross the city from south and north, separated from traffic. The cycleways were built by the NSW Government and funded by City of Sydney. The NSW Government also removed the College Street cycleway to create a new traffic lane for cars and buses during light rail construction.

The Broadway link was completed in 2015, providing a 1.5km upgrade including wider footpaths, extra trees to provide shade, better lighting, new pram ramps, and additional crossing points and speed humps. A new Children's bike track at Sydney Park was also completed in November 2015.

The City conducts regular **free cycling courses** for anyone keen to start or return to riding in the City. Our weekly maintenance courses continue to be very well attended with numbers averaging 8 participants each week. The bike balance clinics for children are increasingly popular, with children as young as three developing riding skills.

	Q1 2015/16	Q2 2015/16	Year to date
Share the Path sessions	46	32	148
STP Tune Ups (#)	285	299	1177
STP maps issued (#)	419	708	1906
STP bells issued (#)	208	244	1048
Free cycling courses (# participants)	45	40	286
Free maintenance courses (# participants)	169	115	515
Balance Bike Clinic	1030	602	2916



Image: Cyclists using the Druiitt Street cycleway

Walking

The City's first Walking Strategy and Action Plan was endorsed by Council in April 2015. The City recognises the popularity of walking, with over 92 per cent of trips in the city centre by walking and over 29 per cent of employed residents walking to work.

The City continues to work to ensure that our built environment is designed to encourage residents and commuters to undertake short trips on foot. In our urban renewal areas we are working to design walkable and livable streets and places, with plenty of amenity for walking.

The City undertakes work as part of the **Liveable Green Network** Plan to improve conditions for walking. The City is also supporting a range of projects that all contribute to creating a more interesting and inviting walkable city such as: the laneway revitalisation program, public domain planning, changes to the outdoor dining project and the Glebe parklet trial project.

Our surveys continue to be conducted twice a year in May and October, providing valuable data to guide further improvements.

Following a successful pilot program, rollout of the City's new comprehensive wayfinding and tactile signage network begins in 2016. The **\$8 million** Legible Sydney Wayfinding System will link central Sydney streets using around 2,100 tactile and braille street signs, pedestrian-friendly maps, information pylons, new signs and digital technology.



For more information about accessibility, cycling, walking in the city, visit www.cityofsydney.nsw.gov.au or click on the 2030 icon at left.

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 November **29,069** 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 650 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.

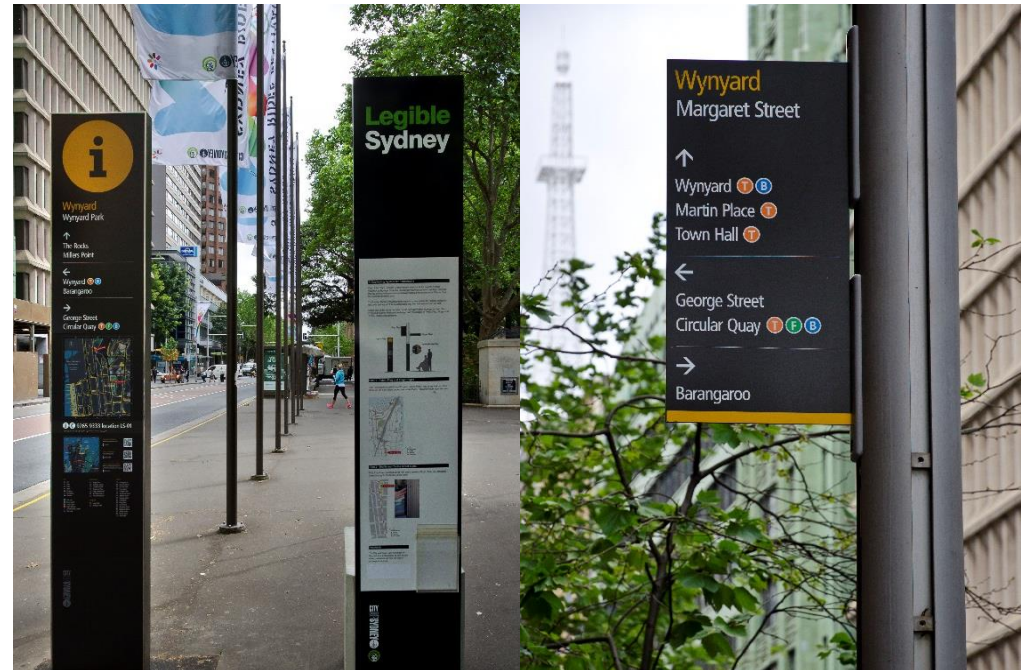
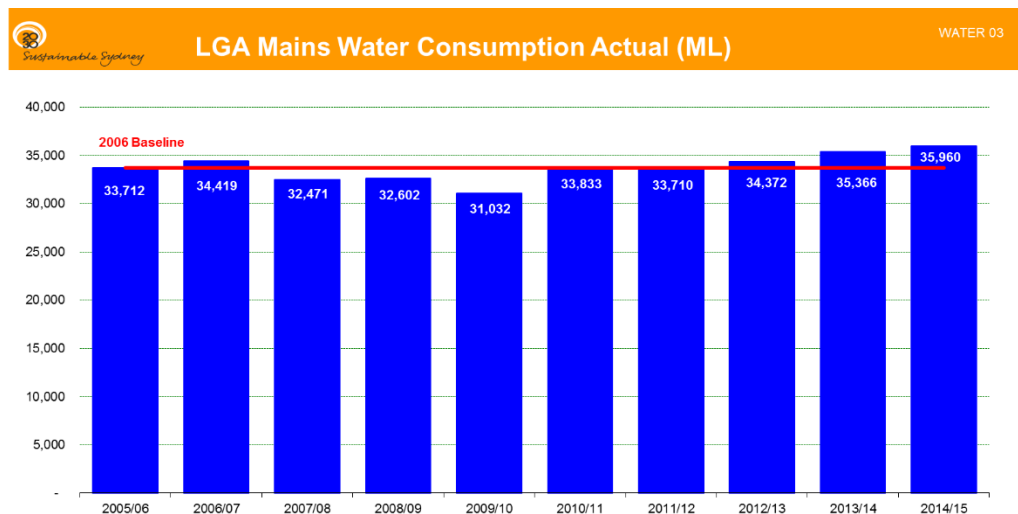


Image: Wayfinding signs in the City

Water

Mains Water Consumption

The Decentralised Water Master Plan was endorsed by the Council in February 2013.



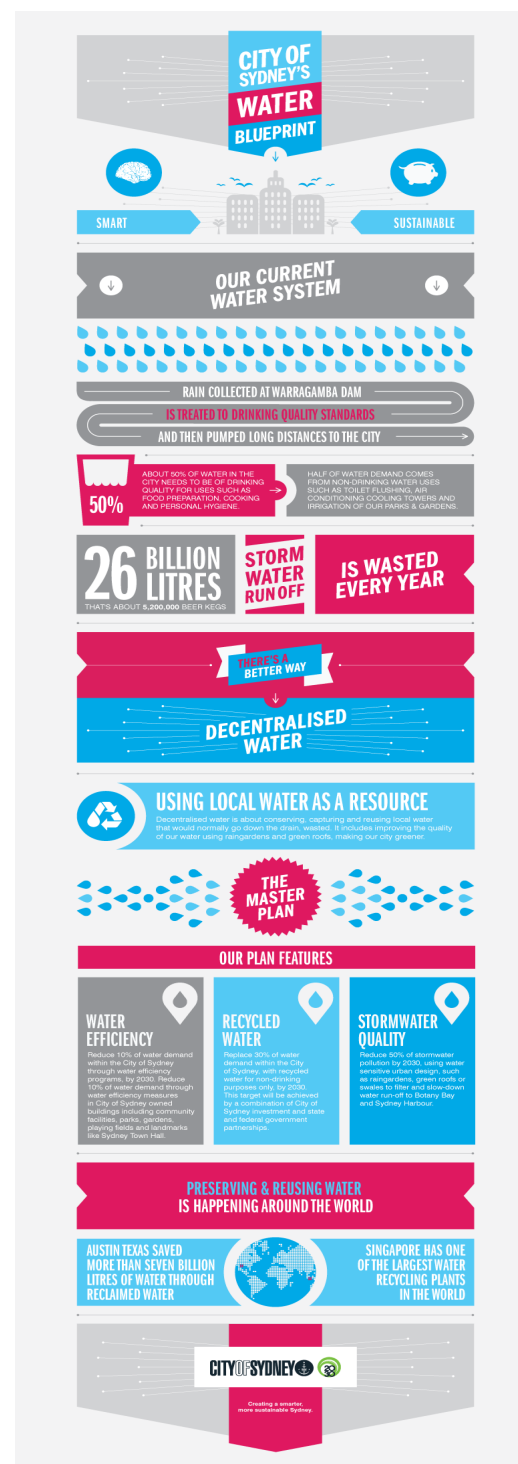
Mains water consumption for the LGA has continued to increase with a total of 35,960 megalitres consumed in 2014/15. This is despite great success in the City's Smart Green Business (refer page 56) and the Better Buildings Partnership (refer page 59) programs saving over 2,000 megalitres per annum in mains water.

Please note - Information for 2014/15 has been updated in this report based on data provided by Sydney Water in October 2015.

For more information see **Explanatory Notes to Graphs** (pages 79-83).



For more information on the Decentralised Water Master Plan see page 19, visit www.cityofsydney.nsw.gov.au or click on the 2030 icon at left. The infographic at right is also on the City's website.



Waste

Highlights this quarter

The City won the top award for **Excellence in Energy, Water and Waste Efficiency – Waste and Recycling** at the Green Globe Awards 2015 as well as a **Local Government NSW Resource Recovery Award** at the 2015 Local Government Excellence in the Environment Awards.

The awards recognised the City's Zero Waste program, which integrates the delivery of education, infrastructure and services to drive behaviour change and the uptake of the City's resource recovery services. Initiatives included the City's reverse vending machines, the underground bin system in Darlinghurst; and an onsite e-waste collection trial for residents in large apartment buildings.



Image: The City's 10c installation won at the 2015 Create Design Awards.

The City also won **Project of the Year** and Best Signage & Display at the acclaimed 2015 Create Design Awards for its **10 cent coin installation**. The City's 10 cent coin installation is a 4m high sculpture made of 2,000 Thank You recyclable bottles.



Image: New Year's Eve Dawes Point family pass winner and Redfern local Tracey Duroux.

It was displayed to support the launch of Reverse Vending Machines and create public awareness of container deposit schemes. The award celebrates Australia's world class creative industry, recognising exceptional projects in a range of creative fields.

The City's NSW EPA funded trial of reverse vending machines (RVMs) continues to soar in popularity recycling over 125,000 containers since the machines were installed in June 2014. The four machines located at Redfern, Haymarket, Circular Quay and Wynyard offer users a chance to win some great prizes for recycling their empty drink containers, including a family pass to the New Year's Eve Dawes Point fireworks event.

The RVM trial is helping to increase public place recycling while providing cleaner streets through reduced littering and supporting incentive based beverage container recycling initiatives ahead of the NSW government's launch of a state container deposit scheme in July 2017.

On 5 July 2015, the City held its annual **chemical cleanout** event at Sydney Park depot **recycling 26 tonnes of hazardous waste** from 703 participants.

This is a 13 per cent increase in toxic materials received and a 33 per cent increase in participant numbers over last year's event.

Pool chemicals, batteries, gas bottles, paints and pesticides were among the problem wastes dropped, with paints making up 73 per cent of the collection.



Image: Chemical cleanout day, a NSW EPA Waste Less, Recycle More initiative funded from the Waste Levy and delivered in partnership with the City of Sydney.



Garbage Guru won Best Website in the NSW Government category at the Australian Web Industry Awards. The awards showcase outstanding work by Australian web designers and developers, championing web standards and acknowledging excellence. The City's Garbage Guru web app helped 3,500 visitors to the site find recycling solutions to waste problems.

776 apartment buildings had their bin rooms upgraded in 2015 through the City's the Waste & Recycling Improvement Program (WRIP) to improve recycling rates and how apartment waste is managed.



Image: (Above) An apartment building's bin area before (left) and after (right) receiving the City's WRIP service.

During this phase of the program the City installed over 1,800 new bins to increase buildings' recycling capacity while removing and recycling around 3,600 old or broken bins and installing 4,000 recycling education signs. Approximately 1,670 buildings have received the service since 2010.

Advanced Waste Treatment Master Plan

The Sydney region is facing a waste disposal bottleneck with some landfills reaching capacity by 2021 and available waste processing falling well short of demand. The Renewable Energy Master Plan identified that recycling the remaining waste generated within the City of Sydney by residents and businesses could be converted into energy.

The Advanced Waste Treatment Master Plan reviews the technologies available internationally that could achieve this vision. It sets out the potential reduction in levels of domestic, commercial and industrial waste going to landfill as non-recycled waste as well as the portion of renewable energy that could be produced by the City's LGA domestic, commercial and industrial waste to replace fossil fuels.

After exhausting all opportunities for recycling, the City's master plan outlines a vision for a facility that could recover the energy resource that is remaining in the waste stream. Securing an advanced waste treatment solution would help the City avoid greenhouse gas emissions from waste ending up at landfill, and replace some of the emissions from the use of fossil fuel for energy use.

The Advanced Waste Treatment Master Plan outlines a vision for Sydney 2030 waste management that will include:

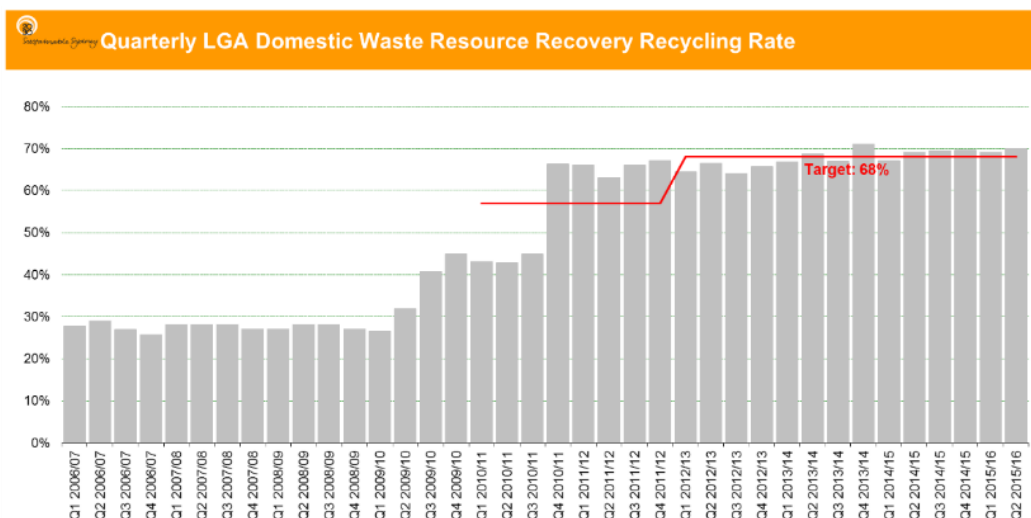
- Availability of advanced waste treatment avoiding up to 95 per cent of municipal domestic, commercial and industrial waste from going to landfill through a combination of recycling materials and converting non-recyclable waste into renewable energy;
- Reducing greenhouse gas emissions across the City's LGA by up to 5 per cent from avoided landfill gas emissions and conversion of non-recyclable waste into renewable energy.

The City is currently finalising an implementation plan to deliver the actions and objectives detailed in the master plan.



The Master Plan was endorsed by Council in September 2014. To view the Master Plan, visit www.cityofsydney.nsw.gov.au or click on the 2030 icon at left.

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 see **Explanatory Notes to Graphs** (pages 79-83).

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 achieving **68.82** per cent resource recovery for Q1 and **70.28** for Q2 in 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. The aim is to integrate waste treatment with other key Green Infrastructure elements including two Decentralised Energy Master Plans – Trigeneration and Renewable Energy.



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

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% of all material is broken down and recovered for recycling in Australian facilities where possible.

The City hosted three e-waste recycling events between July and December diverting 45 tonnes of e-waste from landfill from 1,552 drop-offs.

Since the e-waste program began in 2008 the City has recycled **419** tonnes of e-waste from **12,972** participants.

Performance	Q3 2014/15	Q4 2014/15	Q1 2015/16	Q2 2015/16	2015 totals	Total to date
Residents	541	515	471	1081	2608	12972
Electronic waste (tonnes)	14.93	15	12.62	32.82	75.37	419.03

The City also recycled 1.8 tonnes of mobile phones, batteries and light bulbs this period through recycling stations at libraries and community centres. 3.5 tonnes of household batteries, light bulbs and mobile phones from landfill since commencing the service in November 2013.



Images: Residents recycling e-waste at the City's December 2015 e-waste event.

Waste Strategy Development

Interim Waste Strategy

The City's **Interim Waste Strategy** 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. The City has achieved its target of a 68 per cent diversion of waste from landfill by 2014.

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

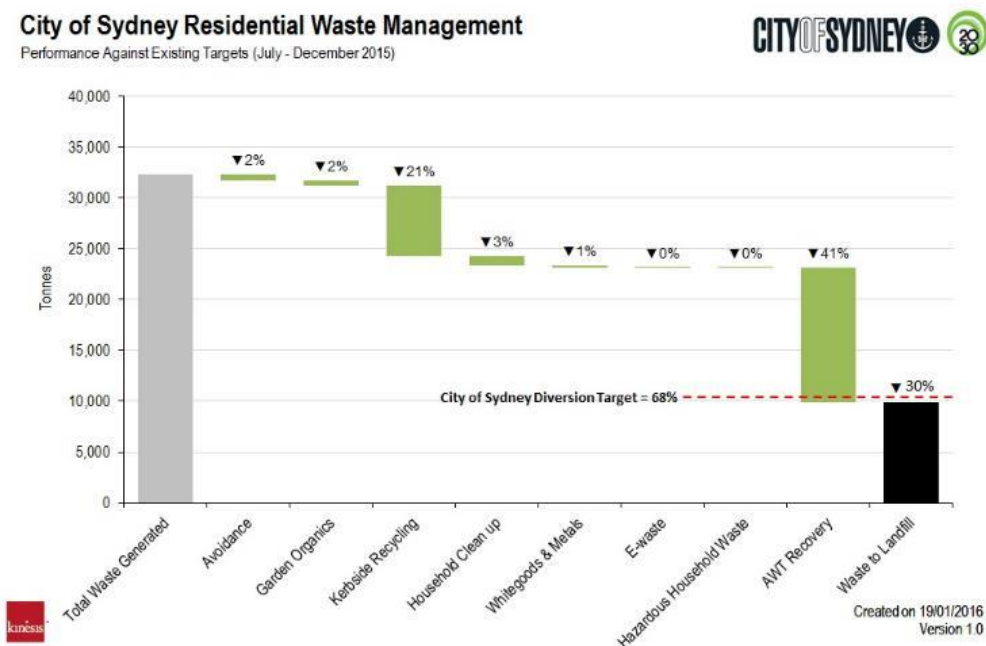
The City is preparing a Waste Strategy 2030 to set targets, objectives and actions for managing the City's waste streams as resources. The Waste Strategy 2030 will address the resource recovery from residential, City organisational, commercial and construction waste streams.

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.

A strong position on Waste to Resources will mean the City can integrate the waste from multiple sources generated in the local government area to achieve a common vision.

The integration of Advanced Waste Treatment into the Strategy will allow the City to plan for both material and energy recovery to an optimal level.

The waterfall chart below presents the City's performance against existing targets.



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

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.

In 2015, the City completed a survey with 300 residents to further understand illegal dumping behaviour. The results highlighted that 62 per cent of people did not know it was illegal to leave out items in the street and many did not know about the City's **free waste pick-up service**. Following the survey, the City developed and launched its illegal dumping awareness campaign, **'Want a tip?'** in November to support its Clean Street program.

The campaign set out to increase awareness of the City's free pick-up service, and also increase the number of bookings generated for the service. 'Want a tip?' also informed people that dumping is illegal and that fines can apply.

Using outdoor and digital media, the campaign activity included a series of 3D vinyl art installations, which were displayed over four weeks in the hotspot areas of Surry Hills, Central Park and Glebe. The campaign featured a video, which was screened in local cinemas and in social media, generating over 200,000 views. Decals with the campaign message were installed on 14 of the City's garbage compactors and the free service was also advertised online and on a digital billboard in Kings Cross.

Community engagement was reinforced by the presence of City rangers conducting trials, which involved using 'warning' tape and stickers to identify dumps and deter repeated incidences in hotspot areas.

In total, the campaign generated over **13,000** unique page views to the website, a 200 per cent from the previous month. As a result, the City logged **3,765** pick-up bookings during the campaign, the highest monthly volume recorded. Bookings increased by 10 per cent on the previous month, and by 30% on the previous year.



Images: 3D optical illusion vinyl installations (top) Central Park 'washing machine', Redfern 'mattress', Glebe 'fridge' (below)



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 50).

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.



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

The City's programs have planted over **11,017** new street trees since 2005 and installed **57,752** 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 Trees²⁰
- 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.

²⁰ Project completed. All other projects in progress.



Images: Street tree planting by the City's service providers

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 second year and have to date worked with a total of 882 volunteers since the program began on 4 June 2014.

Large planting works have continued along Johnstons Creek, in Sydney Park, with existing bush restoration sites continuing to increase in health and diversity. A total of 13466 plants have been planted across these sites. There has been 3880m² of increased bush restoration sites since July 2015. Overall, seeing a 43% increase from the 2012 baseline.

The City was **awarded a \$104K** grant from the Australian Government administered by the Sydney Coastal Councils Group to install a further 60 seawall pots based on the success of the trial in Blackwattle Bay. School and community engagement will be a key feature of the project.

The third **Annual Spring Bird Survey** was conducted, with 165 participants registering for bird surveys and tour events. The event provides the local community with the opportunity to learn more about local bird populations and provide useful information to monitor changes.

An online **fauna reporting tool** for community and staff to report uncommon fauna species was uploaded onto the City's website in October and has received 160 entries to date.

Native fauna species are recorded at 97, an increase of 9 new recorded species due to increased observations taken from staff and residents through informal surveys or organised community activities such as the annual spring bird survey and microbat surveys.



Image: Planting works alongside the railway corridor near St Peters to reinstate native vegetation for small birds. Part of the Concord St upgrade, working across various units in Council to achieve a united outcome. Railway corridors play an important role in forming habitat linkages in the LGA.



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

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 December 2015. 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 as at the end of December 2015.

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. Over 600 local residents, visitors and the community attended the day and planted more than 6,000 native tubestock plants at the event held on the 26th July 2015.



Images: National Tree Day's 20 year anniversary

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. Quarterly audits of their four compost bins are being conducted with no issues recorded to December 2015.

The Group has a total of 15 members and good support from neighbours. The community gardens draft policy and guidelines have been updated and released for community consultation with the report to Council on the outcomes planned for February 2016.

Performance	Q1 2014/15	Q2 2014/15	2014/15 target	Year to date	Total to date
Community Gardens (#)	No new	No new	>18	No new	19
Landcare groups (#)	No new	No new	trend	1	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.

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, 57 small parks have been completed, including 11 completed during Q2 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 Q1 and Q2 the City completed 4, 578m² of landscaping (grass and planting installation). This means we are ahead of the year to date target.

New tree planting opportunities, many located in roadways, are being investigated to increase canopy cover. Projects recently completed include Concord St, Erskineville and McElhone St, Woolloomooloo, with work soon to commence in Colbourne St, Glebe. This planting is undertaken as part of the City's **Street Tree Master Plan 2011**, which is a blueprint for street tree plantings across the City of Sydney.

The City's **Register of Significant Trees** recently won two state awards from Parks and Leisure Australia in their Research Project and Use of Technology categories.

Rain Gardens 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 133 rain gardens have been installed to date, with several planned for construction in 2016.



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

Performance	Q1 2015/16	Q2 2015/16	2015/16 target	Year to date	Total to date
Small park upgrades (#)	1	11	3	18	57
Landscaping (grass/planting) (m ²)	-	4,578	8,000	4, 578	57, 752
Rain gardens (#)	0	0	trend	0	133
Street trees planted since 2005 (#)	313		600	313	11,017
	Q1 2015/16	Q2 2015/16	2030 target	Year to date	Total to date
Canopy cover (on current) (per cent)*	No data	No data	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: Kippax Lake at Moore Park

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.

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

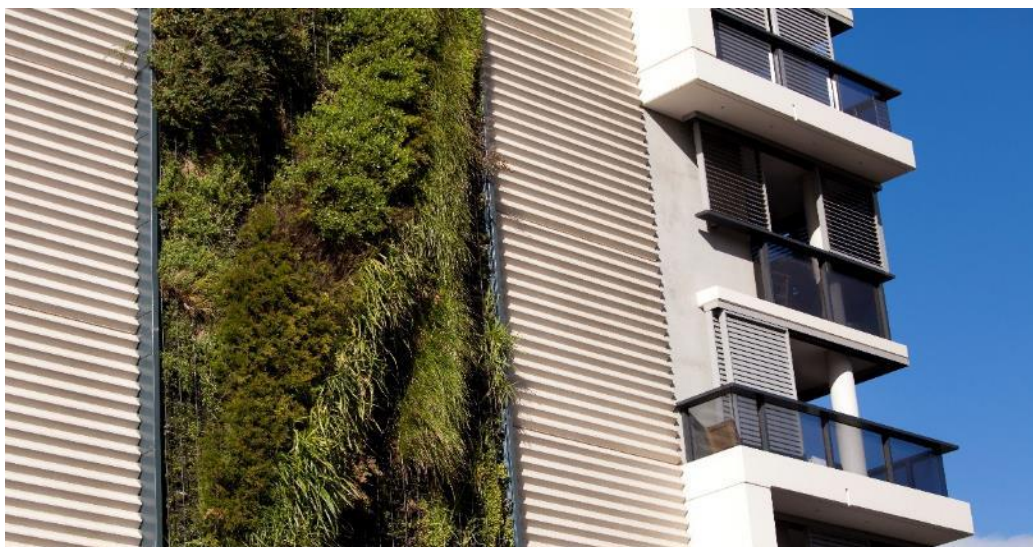


Image: Green wall on a City apartment building

Significant development is occurring in the City and has resulted in a jump in the number of green roofs and walls. Since 2012, 134 development applications that incorporate green roof or walls have been reviewed. During this reporting period, the City received 22 new development applications which included green roofs and walls.

Currently the City has at least 121,642m² of green roofs and walls. This period saw the finished construction of green roofs associated with the Harold Park Precinct 1 in Forest Lodge.



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

Performance	2014/15 total	2015/16 new sites	Total to date ²¹	Total area (m ²)
Green roofs in the LGA (#)	29	3	88	118,301
Green walls in the LGA (#)	4	4	42	3,341
Total green roofs and walls (#)	33	7	130	121,642

²¹ 2012/13 was the first year of measurement.

Sustainability Programs

Highlights this period

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 the following 13 cities met to learn and share best practice in the areas of energy efficiency policy, performance data & insights and business engagement: Tokyo, Singapore, Seoul, Shenzhen, Wuhan, Johannesburg, Cape Town, London, New York, San Francisco, Houston, Melbourne and Sydney.

The City also hosted an **Energy Efficiency Forum** – Learning from Global Leaders at Customs House attended by over 140 stakeholders from the City's various sustainability programs to learn about:





- **New York City's Carbon Challenge**
- **Singapore's 3rd Green Building Masterplan**
- **The City of London's Business Energy Challenge**
- **San Francisco's plans to tackle climate change**
- **Shenzhen's Emission Trading Scheme Pilot and**
- **Tokyo's Cap and Trade program – examples of local emission trading schemes to encourage energy efficiency**

Council adopted the **Residential Apartment Sustainability Plan** in August 2015. The plan recommends 30 strategic actions from a direct action retrofit program to capacity building workshops and advocacy to state and federal governments for critical policy changes to drive significant improvements in environment outcomes for new and existing apartment buildings. The delivery of this plan is now underway.



Image: C40 Private Efficiency Network delegates – September 2015

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-16
	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
	Environmental Upgrade Finance Service	Underway		Dec-11	On-going
Residential - 200,000 population - 2/3 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



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 Quarters 1 & 2, The Smart Green Business program recruited 76 large businesses across the accommodation, entertainment and conference venues sectors, of which 54 have so far implemented identified water efficiency and/or waste recommendations.

The average operating cost savings made by businesses implementing projects is \$10,000 per year.

The program also engaged 29 businesses through a trial with the City's Health & Building Officers who have been providing sustainability advice during food business inspections. Out of the businesses engaged, 23 implemented water recommendations and achieved an average cost saving of \$2,000 per year.

Since 2009, the program has assisted businesses to achieve total annual potable water savings of over 1 Giga litre.

	Q1 2015/16	Q2 2015/16	2015/2016 target	Year to date	Program to date
Businesses Recruited	43	33	85	76	254
Businesses Implementing	31	23	0	54	214
Potable water savings implemented (ML per year)	95	40	150	135	755
Waste diverted from landfill (Tonnes per year)	391	324	1,800	715	6,225
Energy savings implemented (MwH per year)	719	118	200	837	6,099
Greenhouse gas emissions saved (tCO ₂ -e per year)	756	445	2,300	1,201	9,546

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). The City of Sydney is the national administrator.

The program provides advice, resources and recognition to participants who commit to achieving 4.5 Stars Energy efficiency tenancies as measured by the NABERS Energy rating system.

By the middle of the 2015/16 year the CitySwitch program had engaged with 550 businesses across the greater metropolitan centres of Sydney, Melbourne, Perth and Adelaide, with 730 office tenancies registered to the program across Australia. In December 2015 the program evidenced; over 50,000 tonnes of carbon avoidance through energy efficiency; 296,000 tonnes of carbon offsets purchased and \$13 million in energy cost savings achieved, by its businesses through the year.

Annual awards ceremonies were held around the country, to celebrate member achievements and acknowledge the program's **"Sustainability Superheroes"**.

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 Allens Lawyers; The Partnership of the Year National Award went to the Government of Western Australia Housing Authority and Curtin University. Signatories reported undertaking 1463 projects during 2015, a 74 per cent growth over last year.

Performance	Q1 2015/16	Q2 2015/16	Year to date	Program to date
Signatories (#)	13	-2	11	550
Tenancies (#)	16	6	22	730
Office floor Space - NLA (m ²)	68,805	79,630	148,435	2,963,904
Percentage of all Australian office space	12	12	12	12
Average NABERS energy rating (stars) ²²	n/a	4.1	4.1	4.1

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



Image: Sustainability Superheroes

²² Weighted average accredited NABERS ratings



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 meet the demands of its membership organisations.

By the middle of the 2015/16 year the CitySwitch program was actively engaging 109 businesses in Sydney, to deliver information and personal support to assist businesses in their commitments to improve their energy efficiency.

As measured in December 2015 the average energy efficiency of Sydney businesses within the program was 4.3stars NABERS Energy. By being so efficient these businesses collectively had reduced their annual carbon emissions through energy efficiency by 9,444 tonnes.



Image: CitySwitch Awards

Through the quarterly Cafe Series events signatories were able to hear from and engage with representatives from 13 global cities through the C40 Private Buildings Efficiency Network, gaining experience and learnings from international experts. Sydney also hosted this year's State and National Awards, attended by over 120 people from 54 organisations.

The program launched nationally, in conjunction with The Fifth Estate, its Green ICT (Information and Communications Technology) ebook. Aimed at reducing emissions from ICT, the content suite also included a tool, guide and game. In total, 85 individual businesses attended CitySwitch events held over the six-month period.

Performance	Q1 2015/16	Q2 2015/16	Year to date	Program to date
Signatories (#)	3	1	4	109
Tenancies (#)	4	1	5	127
Office floor space (NLA -m2)	26,244	16,476	42,720	1,006,646
Office floor space as proportion of Sydney (per cent)	19	20	20	20
Average NABERS energy rating (stars) ²³	4.3	4.3	4.3	4.3

²³ Weighted average accredited NABERS ratings

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

Better Buildings Partnership

The Better Buildings Partnership (BBP, or Partnership) is a collaborative partnership 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 the City announced that the members of the Better Buildings Partnership had collectively reduced their carbon emissions by 45 per cent in the year ending 30 June 2015, from their financial year 2006 baseline. As a result the members enjoyed a \$30 million saving from avoided electricity costs within the same year, from a baseline of 2006.

In the last six months, the Partnership released for consultation new best practice guidelines for refurbishing commercial office tenancies that target an 80 per cent recovery of materials. It also completed a study on the water efficiency of cooling towers that identified opportunities to reduce water usage by up to 9 per cent; and created an accompanying factsheet.

The Partnership's work in best practice leasing is being used to define a new industry standard for green leasing and create a method to recognise the importance of sustainability collaboration between tenant and landlord. The Partnership has held several events and meetings to consult on the new leasing standard. The partnership's leasing work was also publicly noted as a key influencer in global trends by the key Global Real Estate Sustainability Benchmark (GRESB). Planning is well advanced for a renewal of the program for another 5 year period.

Members of the Partnership Stockland and Lend Lease were highlighted by the Dow Jones Sustainability Index and Global Real Estate Sustainability Benchmark, respectively, as global leaders in sustainable fund performance.

The Partnership was announced as a finalist for 2 NSW Green Globes Awards, for its leasing and refurbishment waste work, and commended by the Australian Property Institute NSW Excellence in Property Awards, for its leasing work.



Performance	Q1 2015/16	Q2 2015/16	Year to date	Program to date
Commercial office building floor space participating in Sydney CBD (per cent)	50	50	50	50
Members –				
Founding (#)	as prev	as prev	13	13
Ordinary (#)	as prev	as prev	2	2
Associate (#)	1	as prev	9	9
NABERS energy rating (stars) ²⁴			4.7	4.7

²⁴ Average NABERS ratings reported from December 2015 figures



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

Environmental Upgrade Finance

The City's environmental upgrade finance scheme is part of the NSW Government's recently introduced 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 also allows the cost of an upgrade to be shared with the tenant. Under the agreement, a building owner may pass on part of the cost of the upgrade to the tenant providing the amount does not exceed the financial saving that the tenant will benefit from as a result of the upgrade. This means that tenants can enjoy the benefits of an environmental upgrade in the short-term and operating cost savings in the long-term.

During Q1 and Q2, the City continued to collaborate with the NSW Office of Environment and Heritage (OEH) and NSW Planning to enhance the Environmental Upgrade finance service by addressing many of the issues and opportunities raised by stakeholders.

The City also continued to build capacity in the market for the Environmental Upgrade Agreement service by holding 9 stakeholder meetings to discuss the service and potential projects.

Assistance was provided to 3 building owners during the period who are actively pursuing Environmental Upgrade Finance to upgrade their buildings. All three buildings are commercial office, two are located in Ultimo and one in the CBD.

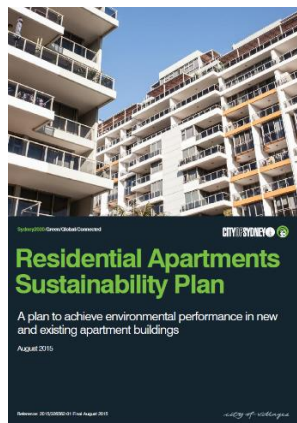
During the period 670 visits were made to the City's EUA web pages.

Performance	Q1 2015/16	Q2 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.

Residential Apartment Sustainability Plan (RASP)



The Residential Apartment Sustainability Plan is a ten year plan targeting greenhouse gas and water reductions in the apartment sector, reducing consumption of up to 40 per cent and 7 per cent respectively, as well as seeing up to 70 per cent of waste diverted from landfill by 2021. This 10 year Plan contains 30 actions that will aim to drive demand for better performing buildings.

The Residential Apartment Sustainability Plan was adopted by Council in August 2015.

The plan recommends 30 strategic actions from a direct action retrofit program to capacity building workshops and advocacy to state and federal governments for critical policy changes to drive significant improvements in environment outcomes for new and existing apartment buildings.

The City is working collaboratively with 18 state government, industry and community stakeholders through the residential strata sustainability Reference Group which met in August and November 2015. This group is working to support sustainability upgrades, policy change & training and support initiatives to reduce the environmental impact of strata apartment buildings. In December the City requested its feedback on a draft program design for the **High Rise Leaders Retrofit Program**.

The **Smart Green Apartment Leadership Network** is a forum for apartment owners and their managers to meet and share their sustainability experience. The Leadership Network met in September and again in November, to review and discuss best practice within the areas of energy efficiency in underground car parks and energy management and monitoring systems. Case studies were published on Green Strata and Smart Blocks websites.

The City is supporting the implementation of solar photo-voltaic systems across the residential apartment building sector, by showcasing new technologies and business models part funded by a City innovation grant. Within the last six months a 4.9kW Solar system was installed on a Waterloo apartment building, which is predicted to reduce common area electricity bills by 20 per cent.

Funding for an innovation feasibility study to investigate the implementation of an embedded energy network was awarded. A Solar system on a student housing co-operative building in Redfern was awarded funding to demonstrate battery storage, innovative smart metering and an open source power purchase agreement.

A Waterloo apartment building was awarded funding for a 19.6kW solar demonstration project that will reduce their building energy costs by \$2,574 per year.

The City has also partnered with the NSW Office of Environment & Heritage to develop and pilot a training program, including technology workshops and on-site implementation support for Building Managers.

Performance	Q1 2015/16	Q2 2015/16	Year to date	Program to date
Strata database subscribers (#)	337	386	387	387
Number of participants attending Reference Group meetings(#)	13	15	15	15
Number of participants attending quarterly Leadership Network meetings	8	16	16	16



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

From July to December, the Green Villages workshop program attracted 351 participants to a total of 10 workshops. These 10 workshops were delivered through a successful partnership with City of Sydney libraries which saw workshops delivered at the Green Square, Surry Hills, Waterloo and Haymarket branches.

Topics included green apartment living, green lifestyle, urban food production, and worm farming and composting. The partnership saw high numbers of bookings and attendance rates across all topics. Green Villages continues to reach new audiences with an average of 67 per cent of participants attending a Green Villages workshop for the first time during the period.

In Q1, a Green Apartment Living: Energy Efficiency workshop was delivered at Waterloo library. The workshop ran through the basics of energy use, bills and simple actions to increase efficiency with a particular focus on how residents living in apartments can take action. Worm farming and composting remains a popular topic with 65 attendees and 41 units distributed to city households.

The effectiveness of workshops as a catalyst to drive behaviour change is evident, with 92 per cent of survey respondents reporting having undertaken at least one new action since attending a green Villages workshop.

Green Villages ran a successful food waste avoidance campaign across July and August. The campaign sought to raise awareness of the scale of food wastage in Australia and communicate simple tips for residents to personally reduce food waste. The key messaging included **“Be a leftover lover”** & **“Its easy freezy”**.

Evaluation work undertaken showed that the campaign had high re-call amongst the desired target audience and traffic to food waste content on the Green Villages website increased by 40 per cent.

In Q4 of 2014/15, Green Villages produced an interactive worm farming video tutorial: **‘How to start a worm farm in 4 steps’**. Since then, this engagement tool specifically tailored to time poor residents, has had over 20,600 views and continues to receive positive feedback.

Performance	Q1 2015/16	Q2 2015/16	Year to date	2015/16 target
Workshops and forums (#)	6	4	10	20
Participants (#)	202	149	351	600
Participants implementing (%) ²⁵	95	90	92.5	85
Green Villages website sessions (#)	30,456	25,016	55,472	110,000
e-news subscribers (# current)	13,070	13,069	13,069	14,000
e-news open rate (%)	26.9	23.9	25.4	28



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

²⁵ Implementation rate for participants three months post workshop

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 the first half of 2015/16 the Green Living Centre delivered 24 low carbon community engagements, attended by 230 people. Engagements included: energy efficiency basics, hot water and solar workshops; free solar assessments for residents in the precinct and an Energy Café drop in session. The Centre also received 1529 shopfront visitors and 47 people were provided one-on-one energy advice through the shopfront.

In November the Green Living Centre ran an ‘**Ecozone**’ at the Newtown Festival and invited three partner organisations who could represent different opportunities for the community to support renewables. Pingala promoted their community solar project at Young Henry’s Brewery; two suppliers from the Our Solar Future program promoted home solar photovoltaic installation; and NSW Trade and Investment promoted GreenPower as an alternative way of supporting renewable energy for owners and renters a-like.

The Centre conducted a festival style engagement around the ‘**Newtown Cool Train**’. The train provided a communication starter: “did you know that powering Newtown burns enough fossil fuels to fill a coal train that stretches from here to Olympic Park?” Participants were asked to pledge their support for actions to lower carbon emissions for the precinct including GreenPower, solar homes & apartments and community renewables. These actions were aligned with the information on offer in the ‘**Ecozone**’. 203 pledges were made at the festival.

During the period, the Centre has continued to engage with local businesses on renewable energy; approaching those with significant solar potential and responding to business interest with tailored support. One local café has decided to install solar as a direct result of engagement with the Centre.

Performance	Q1 2015/16	Q2 2015/16	Year to date	2015/16 target
Engagements that support community uptake of low carbon practices (#)	11	13	24	26
Businesses participating in low carbon awareness activities (#)	4	2	6	20
Shop front visitors (#)	796	733	1,529	trend
e-newsletter subscriptions (#)	1,497	1,544	1,544	trend



Image: ‘Newtown Cool Train’ with community pledges of support for low carbon actions.

Environmental Grants

Environmental initiatives are supported by a number of grants and sponsorships from the City of Sydney. Three grant programs are offered that 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 17 projects were supported by the City under the Environmental Performance Grants between July to December 2015.



For more information click on the 2030 icon at left.

Environmental Performance - Ratings and Assessments

- Strata Plan 22906: Energy Audit (Redfern)

Environmental Performance – Innovation

- Strata Plan 7930: Bayview Towers Energy Feasibility Study (Elizabeth Bay)
- University Of Technology Sydney: The feasibility of Algae Building Technology for onsite energy generation in Sydney
- Pingala Cooperative - Community Renewables for Sydney Incorporated
- Stucco Co-operative: Solar energy with battery storage in multi-unit buildings: the first Australian demonstration
- The University Of Wollongong: Impact of air tightness on commercial building environmental performance
- World Wide Fund for Nature Australia: Support to Implement the WWF Renewable Energy Buyers Forum in Sydney
- University Of Sydney: Challenging lease agreements in Australia: quantifying the effects of higher temperature set points on office workers productivity and thermal comfort
- Strata Plan 73502: Aria Apartments Solar PV Project (Waterloo)
- University Of Sydney: Energy savings in commercial buildings using real-time pervasive monitoring of Indoor Environmental Quality performance

Environmental Performance - Building Operations

- Strata Plan 76137: Water sub-metering (Erskineville)
- Strata Plan 68853: Water sub-metering (Waterloo)
- Strata Plan 57504: Water sub-metering (Redfern)
- Strata Plan 30102: Water sub-metering (Potts Point)
- Strata Plan 56443: Water sub-metering (Sydney City)
- Strata Plan 61131: Water sub-metering (Pyrmont)
- Strata Plan 73502: Water sub-metering (Waterloo)

Attachments

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

Image: People walking through Prince Alfred Park



1. Planned data capture

	City of Sydney (internal)		Local Government Area (LGA)	
	Current Status	Forward Plan	Current Status	Forward Plan
Greenhouse gas emissions from electricity	<p>Reporting underway from STEvE.</p> <p>Electricity currently is reported quarterly in arrears. Data provided by energy retailers.</p> <p>Daily monitoring occurring at all large electricity using sites (over 100,000 kWh per annum).</p>	<p>Ensure appropriate sub-metering in place at large sites for better understanding of usage.</p>	<p>Reported through the Kinesis CCAP reporting tool which includes data from the electricity and gas networks and other sources.</p>	<p>Continue to monitor and report.</p> <p>Include data in Environmental Sustainability Reporting Platform currently being tendered. Platform projected to be in place 2015/16.</p>
Greenhouse gas emissions from natural gas	<p>Some of the City's larger gas usage sites are currently monitored in 15 minute intervals on a daily basis. Real time meters have been installed at Cook & Phillip Park Pool and the Ian Thorpe Aquatic Centre.</p> <p>For all other sites, gas data is reported quarterly in arrears. Additionally gas account data (usage) may be estimated in cases where the gas retailer cannot read meters.</p>	<p>As above</p>	<p>As above</p>	<p>As above</p>

1. Planned data capture (cont.)

	City of Sydney (organisation)		City of Sydney LGA	
	Current Status	Forward Plan	Current Status	Forward Plan
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	<p>The City does not have co/tri generation installed to date, but has a record of installed solar power capacity and estimated annual output.</p> <p>Some sub-metering is in place with new solar sites.</p>	Install sub-metering to all new co/tri generation (dependent on site) and renewable energy to ensure it is captured and reported.	<p>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/</p> <p>Currently there is no formal mechanism in place for tracking installed co and trigeneration systems however the City of Sydney has developed a map at http://tiny.cc/TrigenerationSydney</p>	Develop a formal system to report on cogeneration, trigeneration and renewable energy installed within the local government area.

1. Planned data capture (cont.)

	City of Sydney (organisation)		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.	Further details to be defined as part of the Decentralised Water Master Plan. Progress towards water intensity target/s in Parks to be monitored through Performance Planning. 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.	Reporting mains water consumption annually only. No existing process for accurately capturing and reporting non-mains water consumption. Data for LGA mains water usage available annually only.	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. 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.
Sustainability Program - reporting outcomes	The Green Champions Program reports predominantly qualitative data.	The Green Champions program enhances STEvE reporting to enable reporting of quantitative results following implementation of initiatives.	A standard reporting framework has been adopted across the sustainability programs, which has been designed taking key elements from the Outcomes Hierarchy and Results Based Accountability methodologies.	The segmentation model developed will be used as a key input into the evaluation of programs. The scope and format for program reporting will continue to be assessed in-line with the review of City reporting requirements. The ability to set sector by sector environmental targets will be assessed when sustainability master planning work is complete.

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 System for Tracking EVerything Environmental) 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>The benefit of STEvE is that it has access to real time usage through direct interface with the appropriate energy supply authorities. This allows for real time monitoring and reporting of energy consumption. Currently only electricity is being reported in real time, with approximately 90 per cent of usage recorded via smart meters - the remaining 10 per cent of usage is estimated based on historical data, and updated with actual data quarterly in arrears. Gas and water consumption are currently reported quarterly in arrears.</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.

2. Glossary of terms

Source ²⁶	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.

²⁶ 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

	Location	Status
1	Bay Street Depot	Installation pending
2	277 Bourke Street	Installation pending
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	Juanita Nielsen centre	Installation pending
21	King George V Recreation Centre	Installed
22	Mountain St	Installation pending
23	Paddington Town Hall	Installed
24	Perry Park	Installation pending
25	Pine Street Creative Arts Centre	Installed
26	Pirrama Park	Installed
27	Redfern Community Centre	Installed
28	Redfern Oval Grandstand	Installed

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

Solar hot water installations

	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 ²⁷ (#)	154,073	159,854	165,596	170,173	173,444	177,920	180,679	183,281	187,690	191,918	198,331	Expected release 31/03/2016
Workers (# per day) ²⁸	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) ²⁹	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) ³⁰	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 data and adjust some previously estimated data.

²⁷ 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.

²⁸ Estimate based on net absorption growth and change in vacancy rate as identified in Property Council Office market report.

²⁹ 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.

³⁰ 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) - 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).	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
LGA Mains Water Consumption	Annual water consumption of the LGA.	Sydney Water	City Strategy	-	MegaLitres (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 : <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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	$\frac{\text{[Waste Diverted from Landfill]}}{\text{[Total Waste]}}$	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.	% 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 Village 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

1. Organisation emissions waterfall graph

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

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

- PORTFOLIO, CLIMATE, etc. updated to more accurately reflect observed annual emissions since the base year in addition to energy and emissions savings initiatives.
- ENERGY RETROFIT amount reduced based on review of project.
- TRIGEN (ALL SITES) amount reduced to reflect only imminent projects.

In addition projects were moved around to indicate the timeframe for completion, with renewable gas removed due to uncertainty in timing.

Title	tCO ₂ -e	Source
2006 BASELINE	52,972	
PORTFOLIO, CLIMATE ETC	2,457	Calculated by subtracting completed projects and most recent actual annual emissions from the 2006 baseline to show changes that have occurred due to changes in the property portfolio and other influences outside of the major projects.
ENERGY RETROFIT	6,054	COMPLETE: Energy and Water retrofit completed by Origin (Ecosave).
LED LIGHTING	2,816	COMPLETE: Contract with GE/UGL to replace 6,448 lights owned by the City contracted to save 2,101MWh per year. A higher figure of 2,657 MWh (2,816 tCO ₂ -e) contained within the Council report is used here.
FLEET	642	COMPLETE: Target to reduce 2009 fleet emissions by 20% by 2014.
SOLAR PV	1,933	UNDERWAY: Based on Solgen tender annual emissions savings for Yingli panels (1,933 tCO ₂ -e).
TRIGEN (ALL SITES)	2,440	UNDERWAY: Savings from Town Hall precinct and aquatic centres project.
BUILDING UPGRADES (STAGE 1)	500	UNDERWAY: Portfolio Wide Energy and Water Efficiency Works.
BUILDING UPGRADES (STAGE 2)	6,667	FUTURE: Future property energy and emissions savings to be assessed.
AUSGRID LED	5,415	FUTURE: Approximate estimate based on 2,816 tCO ₂ -e savings from the City's upgrade of 6,448 lamps (approx. 0.412 MWh or 0.437 tCO ₂ -e per lamp per year) applied to 12,400 Ausgrid lights by 2030.
RENEWABLES/OTHER	8,156	Residual required to achieve 2030 target (City estimate 2016).

2. Quarterly and annual organisation greenhouse gas emissions

The table below describes the sources for the chart data.

Title	Source
Buildings, parks and street lighting	STEvE (the System for Tracking EVerything Environmental).
Fleet	Fleet Services (converted from Shell 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 waterfall chart since the last reporting period:

- 2014/15 annual data added
- Future project size and timing updated to reflect waterfall chart

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. Previous years (pre 2009/10) 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.

3. LGA emissions waterfall

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	
Estimated 2030 BAU Increase	-383,713	Energy Efficiency Master Plan August 2015 - 2006 efficiency levels scenario (pitt&sherry 2015).
Energy Efficiency	1,976,795	Energy Efficiency Master Plan August 2015 - Existing & new energy efficiency programs and policies scenarios (pitt&sherry 2015).
Renewable Energy	1,005,070	Renewable Energy Master Plan December 2013 - 30% scenario (Arup 2011) with updated emissions factors (Kinesis 2015).
Trigeneration (7am-10pm Operation)	225,215	Trigeneration Master Plan March 2013 - Efficiency measures removed (Kinesis 2015) and capacity reduced from 477MW to 150MW (City estimate 2015).
Waste Diversion / AWT	389,000	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 0.058MtCO ₂ -e saving by producing electricity onsite (Kinesis estimate replacing the higher 0.106 figure for producing gas contained within AWT Plan).
Transport	239,583	Original Sustainable Sydney 2030 estimate (Kinesis 2008).
Deficit / other	689,081	Residual required to achieve 2030 target (City estimate 2016).
2030 TARGET	1,774,727	

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

4. Energy consumption data

This table shows energy consumption data for the organisation and LGA. Please note, LGA data is shown to June 2015, which is the most up to date data available.

Organisation	Electricity (MWh)	Natural gas (GJ)	Total energy (GJ)
Baseline	42,427	21,894	174,631
Most recent (to Mar 2015)	32,104	30,433	146,007
Difference	-10,323	+8,539	-28,624
Difference (per cent)	-24%	+39%	-16%

LGA	Electricity (MWh)	Natural gas (GJ)	Total energy (GJ)
Baseline	4,199,815	2,947,537	18,066,871
Most recent (to June 2015)	3,624,868	3,398,765	16,448,290
Difference	-574,947	+451,228	-1,618,581
Difference (per cent)	-14%	+15%	-9%

Calculation:
 Difference = (Baseline – Current)
 % Difference = (Difference / Baseline) x 100

2. Water Graphs

Annual organisation water initiatives

All data - sourced directly from Sydney Water and contained within and reported from the STEvE system.

All data - measured quarterly in arrears. This is a consequence of the nature of water measurement and the need to read meters.

Classification of data - When there is more than one user of a meter, the STEvE system allocates that meter to the highest water user. The classification of properties may change over time and category total may vary, although total consumption will remain unchanged.

Cook and Philip Park Aquatic Centre is measured as a pool for the purposes of reporting, though there is some small park usage included in the water data.

Prince Alfred Park Pool was offline for the approved redevelopment of the park and facilities. It is included again in reporting from Q1 2012/13.

Quarterly Organisation Water Initiatives

All data - sourced directly from Sydney Water and contained within and reported from the STEvE system.

All data - measured quarterly in arrears. This is a consequence of the nature of water measurement and the need to read meters.

Classification of data - When there is more than one user of a meter, the STEvE system allocates that meter to the highest water user. The classification of properties may change over time and category total may vary, although total consumption will remain unchanged.

Decentralised water waterfall

This graph was first included in this report in Q1 2013/14. It is taken from the Decentralised Water Master Plan and outlines the steps the City of Sydney is taking to meet its target for a reduction in mains water use to 10 per cent below 2006 levels by 2030 and against forecast business as usual usage levels.

LGA Mains Water Initiatives Annual

All data - sourced directly from Sydney Water.

All data - measured annually in arrears. This is a consequence of the nature of water measurement and the need to read meters.

All water graphs

Aquatic Facility - Comprises the City's pools being Victoria Park Pool, Andrew (Boy) Charlton Pool, Cook and Phillip Park Aquatic Centre, Ian Thorpe Aquatic Centre and Prince Alfred Park Pool.

Community - Includes childcare centres, libraries, community centres and town halls.

Operations (depots, etc) - Includes depots and workshops.

Commercial - 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.

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.

Exceptions - Consistent with the City's greenhouse gas reporting principles, only sites where the City has 'operational control' are included. For example 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.

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 dominate water user was the determinate factor. Over time the categorisation of a property may change depending on the use.

3. 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:

Difference = (Baseline – Current)

% Difference = (Difference / Baseline) x 100

4. Waste Graphs

Waterfall

This graph outlines the steps the actions undertaken by the City of Sydney to meet its 2016 target to divert 68 per cent of domestic waste from landfill.

Avoidance data – sourced from estimates of residential composting activity.

Recycling data - kerbside recycling, garden organics, household cleanup, and white goods / metals recovery - sourced from receipts from City contractors.

E-waste and hazardous waste data – sourced from reports from waste collection events held by the City of Sydney.

Advanced Waste Treatment (AWT) recovery data – sourced from reported diversion levels reported by City waste treatment contractor.

This report is published biannually for January to June and July to December by the City of Sydney at:

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

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