

# State of the Environment Report

# 2010/11

# FutureFocus

Diverse projects are now underway to help green council operations, retrofit the local government area (LGA) with green infrastructure such as trigeneration, decentralised water and automated waste collection, and support residents to live and businesses to operate, more sustainably.

Preliminary research shows that the City can meet its 30 per cent renewable electricity target by 2030 with about half of the target delivered from within the City of Sydney and the remainder from renewable energy outside the LGA. Investigation is well advanced into viable renewable energy sources including gas from domestic, commercial and other waste. This could be turned into renewable gas to run the City's trigeneration network. Renewable electricity and renewable gas could save almost 3 million tonnes of greenhouse gasses a year entering the atmosphere.

The Sydney Park water reuse project and the Green Square Town Centre development will capture more than 740ML of stormwater for reuse annually, the equivalent of 300 Olympic sized swimming pools a year. A new Decentralised Water Master Plan is nearing completion to plan for a recycled water network to protect Sydney's precious supply of drinking water.

Sustainable Sydney 2030 and the City of Sydney Environmental Management Plan establish the environmental vision, targets and actions for Council and the local government area. The City's targets are:

## Our emissions

- Maintaining 100 per cent carbon neutrality through carbon reducing projects and offset of greenhouse gas emissions from Council operations and services, first achieved in 2008.
- Achieving a minimum 20 per cent reduction of Council's emissions by 2012 based on 2006 levels through energy-saving measures.

## Community emissions<sup>1</sup>

- Achieving a 70 per cent reduction of greenhouse gas emissions from our LGA by 2030 based on 2006 levels.
- Ensuring 100 per cent of electricity used in our LGA comes from local energy by 2030 (70 per cent from trigeneration and 30 per cent from renewable energy).

## Transport

- Recording 10 per cent of total trips in the LGA between two and 20 kilometres made by bicycle by 2016.

## Water

- Recording a zero increase in mains water used by Council and across the LGA by 2015 based on 2006 levels. This target includes 25 per cent of water used by Council and across the LGA to be recycled by 2015.
- Substituting 25 per cent of Council's water demand with recycled water.
- Replacing 10 per cent of LGA water demand with recycled water.

## Waste

- Achieving 66 per cent resource recovery of residential waste from our LGA by 2014.
- Achieving 66 per cent resource recovery of waste generated by Council and its contractors by 2014.
- Achieving 76 per cent resource recovery of construction and demolition waste from our LGA and Council projects by 2014.

## Open space

- Having 24 square metres of public open space per resident.

<sup>1</sup> Community emissions targets also apply to City operations.

## Legend

\$	Cost
°C	Degrees Celcius
Ha	Hectare
kg	Kilogram
kL	Kilolitres
kWp	Kilowatt-peak
LED	Light Emitting Diode
LGA	Local Government Area
m <sup>3</sup>	Cubic metre
ML	Megalitres
mm	Millimetre
MWh	Megawatt hour
pphm	Parts per million per hour
ppm CO <sub>2</sub>	Parts per million carbon dioxide
t	Tonne
tCO <sub>2</sub> e	Tonnes of carbon dioxide equivalent
µg/ m <sup>3</sup>	Micrograms per cubic meter

## Contents

Message from the Lord Mayor	1
Achieving Sustainable Sydney 2030	2
Energy and Climate Change	6
Transport	14
Waste and Recycling	16
Water	18
Urban Ecology	20
Land and Noise	22

# Message from the Lord Mayor

**We consulted,  
we researched,  
we committed  
and now we  
are delivering.**

In 2006, the City of Sydney spent a year talking and listening to our diverse communities to plan for our city's future.

The result was an extraordinary consensus around what needs to be done: tackling climate change, cutting traffic congestion, and reconnecting Sydney to its harbour and surrounding villages.

Sustainable Sydney 2030 gives us a plan for Sydney that inspires action – with other levels of government, the private sector and our residents.

We consulted, we researched, we committed and now we are delivering.

The City is spending \$18 million to almost halve carbon dioxide emissions from City properties by 2012 and has already reduced emissions by 18 per cent by retrofitting City buildings.

Our Green Infrastructure Plan is nearing completion for decentralised energy (trigeneration), renewable energy, alternative waste treatment, decentralised water (harvesting and recycling water over a city-wide network), and automated waste collection.

We plan to establish local trigeneration systems to provide cooling, heating and power to city buildings and we are investigating trigeneration and green infrastructure within the Green Square urban renewal project.

Our Smart Green Business program will help local businesses save enough water to fill 142 Olympic swimming pools by the end of 2011. The program is now being expanded to help businesses cut their energy consumption and waste to landfill.

Under the City's new water master plan a city-wide recycled water network would supply water for non drinking needs. There are now more than 20 rain gardens in local streets, traffic islands, footpaths, parks and open spaces collecting and filtering stormwater. The City has been awarded a \$7.6 million Australian Government grant to help us drought-proof parks, reduce mains water consumption and prevent pollutants from entering waterways.

The 40,000 tonnes of household waste collected each year is now diverted away from landfill into alternative waste treatment facilities for recycling.

We have completed 10 kilometres of separated cycleways and bike trips have dramatically increased in areas where the bicycle network has been established.

In June I attended the biennial C40 Large Cities Climate Summit in Sao Paulo Brazil, reporting on our leading sustainability initiatives and learning from inspiring global leaders committed to climate action.

I look forward to continuing to work with you to create the city we have envisaged, and the city we need for our future.



**Clover Moore MP**  
Lord Mayor

# Achieving Sustainable Sydney 2030

Sustainable Sydney 2030 is about changing the way we live, work and play in the city; now and into the future. The blueprint for Sydney 2030 grew out of talking to people, asking how things could improve and what we can do to take the city forward. The result was a collective vision of Sydney as a city that is green, global and connected. That vision is now firmly at the heart of everything the City of Sydney does, every day. We're making your vision a reality.

The City of Sydney has one of the most ambitious greenhouse gas reduction targets of any government in Australia. Through Sustainable Sydney 2030, we are already delivering on that target. By June 2010, all 53 actions of the City of Sydney's Environmental Management Plan (EMP) had been initiated. For a complete description of the actions and targets, view and download the EMP at [www.cityofsydney.nsw.gov.au/EMP](http://www.cityofsydney.nsw.gov.au/EMP)

Introducing new technologies and approaches to sustainability education and engagement, the City of Sydney is fast becoming recognised as an inspiring environmental leader. Our challenging targets will reduce carbon emissions in the LGA and for City operations by 70 per cent by 2030 with 30 per cent of electricity from renewable energy sources.

To support our residential and business communities the City delivers a comprehensive range of programs including:

- **Green Village Program.** The City's Green Village Program works to drive, build and celebrate sustainable green villages through the development of local sustainability programs, events and resources. In 2011 the green village workshop component of the Program was expanded and now provides face to face engagement with residents in 5 villages: Surry Hills, Green Square, Ultimo, Woolloomooloo, and Rosebery. The Green Village eNews is received by over 11,000 residents and the City has an active Facebook and web presence at [www.greenvillages.com.au](http://www.greenvillages.com.au) to help us connect with residents.
- **SAVE.** The SAVE Program (Sustainable Actions Value Everyone) is a collaboration between the City of Sydney, Marrickville Council, Randwick City Council the City of Canterbury and Housing NSW. The program aims to deliver sustainability projects to low income, Aboriginal and Torres Strait Islander and Culturally and Linguistically Diverse (CALD) communities. Over a three year period, to 30 June 2012, SAVE is developing and delivering integrated environmental projects, assessment tools and transferable resources to target groups. It is building capacity and knowledge around environmental and sustainability issues in the community, and will build the capacity of partner organisations to deliver effective environmental sustainability projects to these communities.
- **Green Living Centre.** The Green Living Centre (formerly the Watershed) is a sustainability 'drop-in' information and education hub located on King St, Newtown. The Green Living Centre is a partnership between the City of Sydney and Marrickville Councils aiming to inspire, enable and help local communities reduce their environmental footprint. The Centre is open to the public Tuesday – Saturday. Visitors can find out about free workshops run onsite and at Council facilities, browse the library for information and inspiration, borrow a cargo bike and take the kids for a ride, find out about local services and initiatives, buy some worms, or simply chat to staff about practical ideas for every day sustainable living. The Green Living Centre: growing a culture of environmental sustainability within the urban community.

– **Better Buildings Partnership.** The Better Buildings Partnership, a collaboration with Sydney’s leading public, private and institutional landlords. The Partnership, officially launched in June 2011, will support the implementation of the City’s green infrastructure plan and play an important role in developing and advocating for solutions to issues and barriers facing building owners. The Partnership will help improve the environmental performance in the commercial building sector, which is responsible for approximately 50 per cent of emissions in the City of Sydney local government area. The Partnership is directed by a Leadership Panel, consisting of the Sustainability Managers of the 14 Foundation Members, and will deliver solutions as defined in an annual work plan. Together, the Foundation Members own and manage 58 per cent of the commercial office space in the Central Business District. [www.sydneybetterbuildings.com.au](http://www.sydneybetterbuildings.com.au)

– **Smart Green Business.** The Smart Green Business program run in partnership with Sydney Water is designed to help small to medium businesses in the city improve their environmental performance. The program provides hands-on sustainability advice and support to more than 100 businesses using between 10–80kL water per day in the form of water audits, assistance in implementing water efficient fixtures and fittings and referrals to relevant energy and waste efficiency programs. By June 2011 the program had implemented water savings across the businesses engaged of 271 mega-litres per year. In 2010/11 Council resolved to extend the program for a further two years and pilot a waste assessment tool that will contribute to substantial greenhouse gas and waste reductions.

– **CitySwitch Green Office.** The City of Sydney is a partner to the national CitySwitch GreenOffice tenant energy efficiency program. It provides advice, resources and recognition to office tenants who commit to achieving a highly efficient office as measured using the NABERS Energy rating system. CitySwitch aims to enlist enough businesses to ensure that 20 per cent of the city’s commercial office floor area is participating in the program. By June 2011 CitySwitch Sydney had recruited 65 Signatories managing 77 tenancies representing 672,552 sqm of office space, or 72 per cent of the floor space target. The City of Sydney is the national administrator of the national CitySwitch Green Office. The program is run in partnership with the cities of North Sydney, Parramatta, Ryde, Willoughby, Adelaide, Brisbane, Perth, Melbourne, ACT Government, Office of Environment and Heritage (NSW) and Sustainability Victoria.

It is important to the City to “show by doing” and take a strategic approach to our own operations. The City is on track to exceed an interim target of a 20 per cent reduction in emissions in our own operations by 2012. Also in development for delivery in 2011/12 are the following programs and initiatives:

– **Smart Green Apartments.** A new program aiming to achieve improved environmental performance of residential apartment buildings within which two thirds of the city’s residents live. The program will be delivered in two phases with the first phase (to June 2013) commencing the change process, focussing on education, assessments (for 30 medium to high density apartment buildings) and facilitating some initial building retrofit works to improve environmental performance.

– **Environmental Upgrade Agreements.** This new voluntary financial mechanism, enabled and legislated by the NSW Government is designed to help building owners access finance to undertake environmental retrofits of their buildings. The City commenced a detailed feasibility assessment of this initiative in 2011.

# Achieving Sustainable Sydney 2030

–**Green Champions.** The City of Sydney Green Champions program, launched in March 2010, empowers employees to make a difference to their workplace on a daily basis. Green Champions are leaders modelling the organisation’s values and desired behaviours to reduce energy, water use and waste to landfill. The program gives staff the tools to make the organisation a greener, more sustainable, environmentally responsible and active place to work. Champions develop and implement innovative programs ensuring environmental considerations are embedded within every level of the City’s culture and decision making. Champions are recognised for their involvement through a dedicated intranet site, the City’s regular staff e-newsletter, an annual awards ceremony and the Performance Management processes. The Green Champions Program has been assisted by the New South Wales Government through its Environmental Trust.

–**Green Square Green Champions Pilot Program.** As an example of the City’s commitment to “showing by doing”, the City’s Green Champions program is being trialled within the Green Square community, which will benefit from experience and resources already developed “in-house”. The Green Square Green Champions Pilot Program is supporting up to 15 community champions in the Green Square village to activate community driven sustainability initiatives, enhance the City’s sustainability programs and provide a connection to City services using the Tote building as the hub. The pilot program is an opportunity for two-way sharing of learning, resources and capacity between the City and the community we serve. The program will measure benefits and outcomes to assess whether it fulfils identified community needs. The program could be expanded in the future.

To support our community and demonstrate leadership the City works with a number of business and community groups to provide funding, advocate for change and work in partnership to achieve Sustainable Sydney 2030. These include:

– **Environmental Grants.** The City provides funding and in-kind support to community groups to implement programs with a direct environmental benefit. In 2010/11 grants were provided to:

- Buddhist Compassion Relief – Chinese Business Community Eco Night
- Museum of Applied Arts and Sciences (Powerhouse Museum) – Powerhouse Community Garden
- Museum of Contemporary Art – In the Balance: Art for a Changing World
- Nature Conservation Council of NSW – Walk Against Warming 2010
- Slow Food Australia Ltd – Youth Food Day On Campus – What's My Food?
- South East Neighbourhood Centre – Living Green
- Sydney Food Fairness Alliance – Talks and Tours for Future Food
- Total Environment Centre – Lessons from Leaders
- Sustainable Arts and Culture Ltd (Auspice: Peats Ridge Festival Pty Ltd) have signed their grant contract to build a mobile environmental education unit
- Cycle Re-Cycle (Bike Club) (Auspice: The Factory Community Centre Inc.) – Promotion of Bicycle Re-Cycling in the LGA of the City of Sydney
- KU Ultimo Children's Centre – Cultural Eco Garden
- Metro Screen – Green Screens
- Earth Hour

– **Lobbying and Advocacy.** In 2010/11 the City made various submissions on environmental issues, policy and programs including to the NSW special commission of inquiry into electricity transactions and the C40 Cities Climate Leadership Group Sao Paulo Summit 2011. The City also presented papers at key national and international conferences on fleet emission reduction and electric vehicles, waste reduction and water reduction.

– **Environmental Memberships and Partnerships.** In 2010/11 the City maintained environmental memberships and/or collaborated with many environmental organisations and Government departments including; Ausgrid (formerly Energy Australia); Australian Conservation Foundation; Australian Solar Energy Society; Birds Australia; Cooks River Foreshore Working Group; Ecological Consultants Association NSW; Environment Business Australia; Green Building Council of Australia; Green Roofs Australia; ICLEI – Local Governments for Sustainability; Institute of Sustainable Futures; Keep Australia Beautiful; Pyrmont Ultimo Landcare; Royal Zoological Society NSW; Rozelle Bay Community Native Nursery; Southern Sydney Region of Councils (SSRoC) Environmental Managers Group; Stormwater Industry Association; Sydney Metropolitan Wildlife Service; Sydney Water Corporation; Green Living Centre; Energy Efficiency Council; Sydney Coastal Councils Group; Total Environment Centre (Green Capital); Waste Management Association of Australia; and WWF Australia.

The City of Sydney is proud that our efforts have been recognised across all sectors. A selection of the prizes and awards for our achievements include;

– **Awards.** In 2010 Lord Mayor of Sydney, Clover Moore, MP was honoured with the President's Prize for significant contribution to architecture and design at the Australian Institute of Architects 2010 National Awards.

The City's continued commitment to tackle climate change through sustainability projects and carbon reduction was recognised when the City was awarded the Green Globe 10 Year Sustainability Achievement Award by the NSW Government in the 2011 NSW Premier's Green Globe Awards. This award recognised the City's 2030 sustainability targets, strategic planning, strong leadership and staff engagement.

Projects implemented by the City of Sydney won more than 40 industry awards nationally and internationally, demonstrating our commitment to high standards in architecture and urban design. These were across all fields, including design excellence, sustainability and environmental initiatives, heritage conservation, as well as building awards. The award-winning Surry Hills Library was crowned a world-leading community facility after winning the prestigious Best New Global Design 2011 at the International Architecture Awards 2011 in Chicago. Surry Hills Library was also a winner at the NSW Architecture Awards and NSW Green Globe Awards in 2011. The City's Paddington Reservoir Gardens restoration project was honoured with the Urban Land Institute Asia Pacific Competition 2011 Award for Excellence. The Gardens also received the National Trust of Australia (NSW) Energy Australia Heritage Awards 2010 Award for Adaptive Re-use. The transformation of Sydney Park into a family friendly green space was awarded the NSW Planning Minister's Greenspace Award.

# Energy and 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 predicted. Cities have a critical role in reducing greenhouse gas emissions because although they cover only 2 per cent of the Earth's land surface, they have more than 50 per cent of the population and are estimated to cause 75 per cent of the world's emissions. As a result of the consultations for Sustainable Sydney 2030, 97 per cent of people said they wanted the City to take action on climate change.

Centralised coal-fired power generation is responsible for 80 per cent of the City's greenhouse gas emissions and 50 per cent of Australia's emissions. Power stations lose more than two-thirds of their primary energy to the atmosphere with further losses in the grid. They are also a major user of water.

The City is working to reduce energy use and greenhouse gas emissions by setting ambitious targets to reduce 2006 emissions by 70 per cent by 2030. These targets can only be achieved with the dedication of our organisation and support of our community to "live green", and with the provision of green infrastructure.

## –Decentralised Energy Master Plan: Trigeneration (Combined Cooling, Heat and Power or CCHP).

Centralised coal-generated electricity accounts for around 80 per cent of greenhouse gas emissions for the LGA. A consortium of Kinesis, Cogent and Origin Energy has been developing a master plan to identify the optimal size and location of trigeneration decentralised energy systems to deliver the Sustainable Sydney 2030 target of providing 70 per cent of the City's electricity requirements with low carbon electricity and zero carbon heating and cooling. The master plan is underpinned by modelling of how energy (electricity and thermal energy) is used by buildings across the LGA, proximity to gas and electricity networks and site suitability. A range of scenarios have been modelled for different engine and fuel types, and reticulating hot water and/or cold water, to determine the optimal solution between cost and emission reductions. A major opportunity to reduce greenhouse gas emissions exists by replacing electrical air conditioning with thermally driven systems that run on the waste heat captured from local electricity generation. The interim Master Plan for the energy dense zones of the city was placed on public exhibition in December 2010 and the final Master Plan should be completed by the end of 2011. See also Trigeneration.

–**Decentralised Energy Master Plan: Renewable Energy.**

The City engaged international consultancy firm Arup to undertake a master planning exercise to quantify the physical potential for renewable energy resources and generation within the LGA and adjacent areas as well as ways to encourage uptake based on current and future technologies, regulations, cost, planning issues, government programs, site and network constraints. The study looks at various renewable electricity sources including photovoltaic panels, wind energy (on shore and off shore), hydro, solar concentration and marine renewables (including wave, tidal and marine current turbines). It will also assess renewable gases including energy captured from solid and liquid waste, agricultural and farming waste, forestry waste and landfill gas. The intention is to use renewable gas resources from waste in the city's trigeneration system to generate electricity, heating and cooling at three times the efficiency of electricity generation only. In this way, the City's Trigenation Master Plan could ultimately be fuelled by non-fossil fuel sources. Gas-to-liquid-gas technologies or the conversion to gas pipeline injection could enable renewable gases to be delivered to the City. A specialist study is also under way to explore how this might be done.

–**Decentralised Energy Master Plan: Alternative Waste**

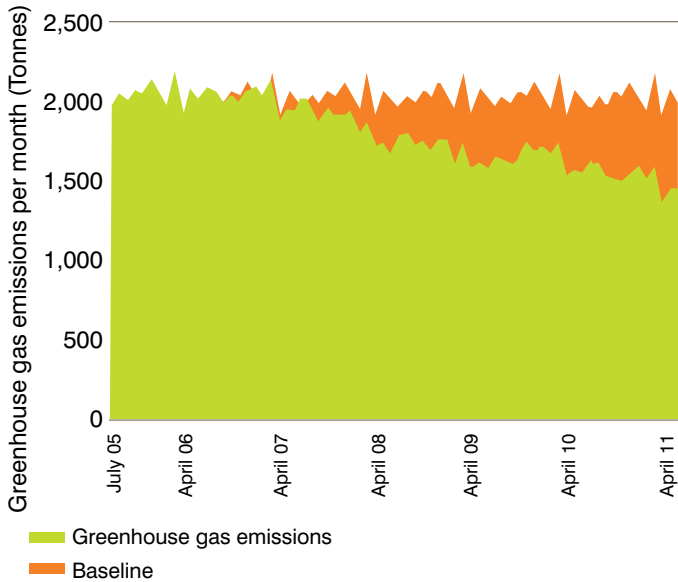
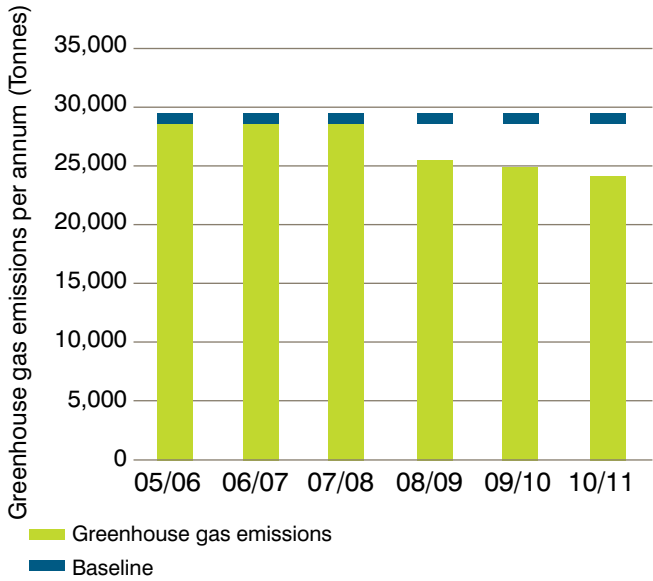
**Treatment.** A business case is being developed for alternative waste treatment not only to reduce waste going to landfill but also to convert at least 50 per cent of waste to renewable gases for the city's trigeneration and transport. Using advanced waste treatment technology will also enable the recovery of water for use in the proposed city-wide non-potable/recycled water network. The renewable gases resulting from this Master Plan will be fed into the Renewable Energy Master Plan. The Master Plan will be developed from a Business Case which is anticipated to be completed by the end of 2011.

–**Decentralised Water Master Plan.** The international consultancy firm GHD is undertaking a master planning exercise for a Total Water Cycle Management Plan and a city-wide non-potable/recycled water network. The Plan will identify, quantify and integrate all non-potable water resources available to the City, including stormwater, rainwater harvesting, grey water, groundwater, sewer mining and water recovered from waste and air conditioning cooling towers – the largest use of water in the city. It is likely that non-potable/ recycled water treatment stations will be co-located with trigeneration energy stations wherever possible to form Green Transformer stations. Heat from trigeneration may be used for the treatment of non-potable/recycled water. A draft plan is anticipated to be completed by the end of 2011.

# Energy and Climate Change

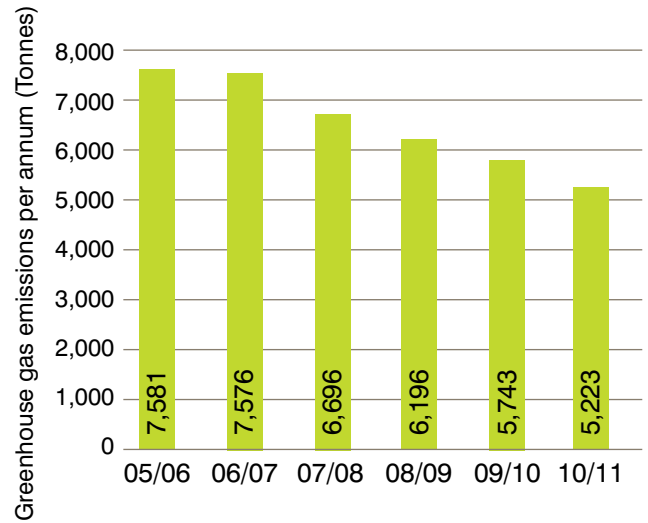
- Automated Waste Collection Master Plan.** Contractors for this Master Plan will be sought in 2011. The Master Plan will evaluate the phased development of a city-wide automated waste collection system. The City will initially consider implementing precinct-based automated waste collection systems where these can be installed at the same time as the trigeneration thermal energy networks. Automated waste collection will enable waste to be evacuated via an underground pipe network systems for collection at waste-receiving stations at strategic locations around the city. This will eventually replace waste collection by refuse vehicles, significantly improving amenity for residents and reducing emissions from transport.
- CDP Cities.** The City joined the Carbon Disclosure Project Cities program to be transparent in the way that it reports on greenhouse gas emissions and shares this information with other major cities around the world <https://www.cdproject.net/en-US/Programmes/Pages/CDP-cities.aspx>
- Carbon Neutral.** In 2008, the City of Sydney became the first carbon neutral local government in Australia through energy efficiency, renewable energy and offsets. We made this commitment voluntarily to reduce impacts of climate change, meet public and staff expectations, show leadership, influence sustainable market processes, and reduce costs through energy savings. In 2010/11, 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 City's emissions. The City's 2010/11 carbon neutral program is compliant with the National Carbon Offset Standard and other relevant protocols. See [www.cityofsydney.nsw.gov.au/Carbon](http://www.cityofsydney.nsw.gov.au/Carbon)
- Green Power.** This is accredited renewable energy sourced from the sun, wind, water and waste. Green Power is purchased by energy companies and fed into the grid. Renewable energy does not cause greenhouse gas emissions like electricity generated by coal, gas or oil. The City of Sydney previously purchased Green Power as part of its carbon neutral program as an interim measure whilst it established its carbon reducing program (trigeneration, building energy and water efficiency retrofit, LED (light emitting diode) street lighting and photovoltaic systems projects). In 2010, Council resolved to invest the \$2 million a year previously allocated to Green Power in renewable energy installed on the City's own buildings and operations. We expect that this action will also deliver a financial return on investment, reduce the City's annual electricity bills and help the City's target of 25 to 30 per cent renewable electricity by 2020. The first of the renewable energy projects is the \$12 million solar photovoltaic program.
- Solar Photovoltaics Program.** The City of Sydney has received tenders for the installation of photovoltaic panels. This project is anticipated to provide one of the largest solar installations in Australia across 30 or more City owned buildings. The City has already installed solar hot water and 93 kW of photovoltaic systems at 22 sites, the largest being 240 solar panels installed on historic Sydney Town Hall. Together these projects have reduced carbon emissions by 210 tonnes per year.

**–Building Energy Efficiency.** The City’s buildings, such as libraries, swimming pools and community centres, consume approximately 57 per cent of the City’s electricity. Since the 2005/06 baseline greenhouse gas emissions in the building portfolio have been reduced by 18 per cent, as shown in the following charts.



As demonstrated in the previous chart, the red area represents over 12,000 tonnes of greenhouse gas emissions reduced from the baseline. A significant proportion of these reductions have been achieved at Town Hall House, the home of the City’s administration offices where electricity consumption has been reduced by over 30%, as below:

**Town Hall House – Greenhouse gas emissions**



# Energy and Climate Change

Town Hall House is currently rated as a 3 star building under the NABERS rating scheme ([www.nabers.com.au](http://www.nabers.com.au)). It is estimated that a 5 star rating will be achieved by the planned building energy and water efficiency retrofits (see more detail later in this section).

Greenhouse gas emission reductions in the City's buildings have been achieved by the following initiatives:

– **A Utilities Information Management System.** The City has implemented a system to automatically collect, record and report on its electricity, gas and water consumption, costs and emissions. The City has approximately 350 electricity accounts, 450 water accounts and 30 natural gas accounts that represent an annual expenditure of approximately \$7 million per annum. Known as STEvE (the System for Tracking Everything Environmental), the system provides weekly reports to staff creating an awareness of energy use and helps identify energy wastage from lights or plants left running when not needed. The City believes it is the first local government to implement such a system across its organisation.

– **RLCIP Grants.** The Australian Government provided the City with two grants under the Regional and Local Infrastructure Program. One grant of \$262,000 was used to reduce energy consumption at Cook and Phillip Park Pool, Andrew Boy Charlton Pool and Victoria Park Pool. A lighting upgrade, installation of variable speed drives to pool pump motors and high-efficiency electric motor replacements were undertaken. The other grant of \$276,000 has funded the installation of a 20kW solar system at Alexandria Child Care centre and will fund other solar PV systems being currently installed.

– **Building Operations.** The way a building is operated and maintained can influence energy and water usage. These are often zero-cost management initiatives that reduce energy and water consumption, which include:

- incorporating sustainability obligations and measures into building service and cleaning contracts
- reviewing time-clock settings
- adjusting control system setpoints
- ensuring maintenance procedures are adequate for the equipment
- regular sustainability meetings for contractors and staff
- providing timely feedback on results and performance through the STEvE system.

Further energy savings are likely to result should trigeneration be installed to provide cooling and heating to Town Hall House and the building retrofit (outlined below) is undertaken to improve the efficiency of the air conditioning system.

– **Trigeneration.** This project is currently in post tender negotiations for the design, finance, installation, operation and maintenance of trigeneration systems for the City's buildings and the Low Carbon Zone precincts. All 230 of the City's properties and street lighting have been included in the post tender negotiations to look at taking all of the City's buildings and operations off the coal-fired grid. A key requirement of the post tender negotiations is to facilitate connections to other nearby non-City buildings, utilising a design, finance, installation, operation and maintenance model (Energy Services Company or ESCO model) that could potentially see the installation of at least 360MW of large-scale trigeneration identified in the Decentralised Energy Master Plan – Trigeneration. Post tender negotiations are due to be completed by the end of 2011.

–**Building Energy and Water Efficiency Retrofits.** The City has tendered for retrofit of 46 of its major buildings including: Town Hall House, Cook and Phillip Aquatic Centre, Ian Thorpe Aquatic Centre, Martin Place, Customs House and the Woolworths building as well as depots, community centres, libraries and child care centres. The buildings will be fitted with energy efficient lighting, air-conditioning and heating, centralised power management systems to reduce energy consumption depending on activity, and voltage reduction units to slash electricity use in pumps, fans and lights. Water saving devices including aerated taps and shower heads, cistern modifiers in toilets and waterless urinals will also be installed. The retrofit will cut energy use by 7.5 million kWh, reducing greenhouse gas emissions by 23 per cent a year and water consumption by 61,360 kL per year. The retrofit will also reduce maintenance costs and avoid \$160,000 in carbon pollution costs. Energy and water performance will be independently verified.

–**LED Lighting.** The City has one of the largest public lighting portfolios in NSW with nearly 22,000 street and park lights across the LGA. About 13,400 lights are maintained by AusGrid and 8,559 lights are maintained by the City. To reduce the City's greenhouse gas emissions and associated energy and maintenance costs, the City proposes to replace its 8,559 lights with energy efficient "light emitting diodes" or LED lights. Around 31 per cent of the City's emissions are from public lighting making it potentially one of the most cost effective areas to achieve energy and emissions reductions. The City's public domain lighting total annual energy usage is approximately 6,660MWh/year, resulting in 7,130 tonnes of Carbon Dioxide equivalent per year (tCO<sub>2</sub>e/year). In 2010, the City completed a two-stage trial of LED technology at several of its public domain lighting sites. From an energy and greenhouse gas emissions perspective, Phase 1 of the trial was very successful with results showing energy and greenhouse gas emission savings of between 11 per cent and 74 per cent per LED light depending on the manufacturer. Fourteen of the 16 locations where LED lights were trialled recorded greenhouse gas emission savings of more than 40 per cent. To better appreciate this new and rapidly evolving technology, the City commenced Stage 2 of the trial by installing additional lights with lighting controls, to provide the City with the ability to remotely monitor the LED operation and energy use. The lighting controls also allow the LED's to be adjusted to save energy where lighting levels were found to be in excess of those required by the relevant standards. The City has gone out to tender and is currently in the process of engaging lighting suppliers to roll out LED lighting across its public lighting portfolio. The minimum project requirements are a reduction in electricity consumption and greenhouse gas emissions by at least 40 per cent.

–**Sustainable Vehicle Fleet.** The City of Sydney is investing in cleaner, greener vehicles to drive down greenhouse gases and help save our environment. The City has reduced its fleet by 30 per cent in the past five years by using better fleet management techniques and is on track to reduce emissions from its vehicles by 20 per cent over four years to 2014. 100 per cent of fleet emissions are offset through accredited 'Carbon-watch' offset projects.

More than 43 hybrid cars and 20 diesel-electric hybrid trucks have been added to the fleet which save up to 30 per cent in CO<sub>2</sub> emissions for each vehicle. Another 84 vehicles including garbage trucks, road sweepers, footway cleaners and steam cleaning trucks have been fitted with environmentally friendly exhaust systems and filters so they produce far fewer emissions.

The City has added a second Mitsubishi i-MiEV to the fleet. The i-MiEV uses a large-capacity lithium-ion battery and an electric motor in place of a petrol engine. It emits no greenhouse gases and is recharged using zero-carbon renewable energy produced by 240 solar panels installed on Sydney Town Hall. The City aims to expand our electric vehicle fleet to up to 100 vehicles all powered by 100 per cent renewable energy. The City of Sydney installed Australia's first public electric vehicle charging station in Glebe in 2010 and are investigating the installation of electric vehicle charging stations in our parking stations.

Improvements to the City's vehicle fleet include:

- Reviewing vehicle utilisation monthly and promoting resource sharing to cut the fleet from 600 vehicles in 2006 to 450 vehicles in 2011, without reductions in service delivery
- Replacing vehicles with smaller diesel vans that are much more fuel-efficient reducing emissions by up to 50 per cent
- Servicing parks, footpaths and roads with hybrid trucks that use up to 40 per cent less fuel
- Ensuring all new trucks bought by the City meet tough Euro 5 diesel engine standards which aim to reduce fuel consumption and emissions
- Retrofitting 84 of our older diesel trucks with catalytic converters and particulate filters to bring them up to Euro 4 compliance standards and reduce noxious gases and particulates by up to 60 per cent
- Using sustainable biofuels, which combine diesel with recycled cooking oil, animal fat and canola, to help power our diesel trucks. This is expected to result in an 18 per cent reduction in truck emissions
- Giving staff eco-driving tips – when not to use air conditioning, the importance of correct tyre pressure, as well as car-sharing and route-planning advice
- Providing eco-driving training programs which help our drivers understand the impact of vehicle emissions and having a Driver Educator work "in cabin" to improve their low-emission driving techniques
- Introduction of a bicycle fleet in Town Hall for staff as a zero emission alternative to pool cars, taxis and public transport around town. The fleet includes a mix of standard bikes, cargo bikes and electric-assist bikes.

# Energy and Climate Change

## Greenhouse gas emissions

There are many greenhouse gasses, of which Carbon Dioxide (CO<sub>2</sub>) is the most abundant. Different greenhouse gasses have different global warming potentials and longevity in the atmosphere and therefore concentrations are often expressed as CO<sub>2</sub>-equivalent (CO<sub>2</sub>e). There is general consensus in the scientific community that atmospheric concentrations of CO<sub>2</sub>e need to be less than 450ppm in order to limit the probability of 'runaway', 'abrupt' or 'dangerous' climate change. According to the IPCC AR4 Synthesis Report, atmospheric CO<sub>2</sub>e concentrations were already 455ppm in 2005, of which 379ppm is CO<sub>2</sub>. By June 2009, long-lived greenhouse gasses in the atmosphere were estimated to be 467 ppm, of which CO<sub>2</sub> was 385 ppm (this is equal to 3.64 trillion metric tonnes, growing at 2 billion metric tonnes per month) This figure continues to rise and in 2010 was approaching 470ppm<sup>2</sup>.

(tCO <sub>2</sub> e)	2006	2007	2008	2009	2010	2011	Trend
Australia <sup>3</sup>	527 million	542 million	547 million	548 million	545 million	542 million	~
City of Sydney LGA <sup>4</sup>	No data	5.46 million	no data	no data	No data	Being assessed	

2 [www.dbcca.com/dbcca/EN/carbon-counter.jsp](http://www.dbcca.com/dbcca/EN/carbon-counter.jsp)

3 *Quarterly Update of Australia's National Greenhouse Gas Inventory. March Quarter 2011 . Figure 6: National Inventory, annual emissions – four quarters to March quarter. Commonwealth of Australia 2011.*

4 *2006 estimate developed by Kinesis for Sustainable Sydney 2030. There are currently no reliable emissions estimates at the local government area level.*

## City of Sydney greenhouse gas emissions<sup>5</sup>

Greenhouse gas emissions for the City of Sydney organisation come from a range of sources – the major source being electricity used within our buildings and street lighting. Other emissions include fuel used by our fleet and contractors, natural gas used in buildings, work flights and taxi journeys, waste, and emissions from major events like Sydney New Year's Eve.

Emissions are categorised as Scope-1 (direct emissions created onsite, for example burning natural gas), Scope-2 (direct emissions created offsite for example, electricity), and Scope-3 (indirect emissions such as by contractors and travel emissions). Many carbon neutral organisations only account for Scope-1 and Scope-2 emissions. By also including Scope-3 emissions, the City is taking responsibility for more of its emissions to be more transparent and accountable.

Total (tCO <sub>2</sub> e) by scope <sup>6</sup>	2005/06	2006/07	2007/08	2008/09	2009/10
Scope-1	4,053 (8%)	4,338 (8%)	4,465 (8%)	5,022 (10%)	4,744 (10%)
Scope-2	37,760 (71%)	38,709 (71%)	38,439 (71%)	35,506 (68%)	35,073 (70%)
Scope-3	11,159 (21%)	11,428 (21%)	11,491 (21%)	11,208 (22%)	10,213 (20%)
Total	52,972	54,475	54,395	51,736	50,030

Total (tCO <sub>2</sub> e) by type	2005/06	2006/07	2007/08	2008/09	2009/10
Electricity emissions (all scopes)	44,972 (85%)	46,020 (85%)	45,700 (84%)	42,213 (82%)	41,698 (83%)
Non-electricity emissions (all scopes)	8,000 (15%)	8,455 (15%)	8,695 (16%)	9,523 (18%)	8,332 (17%)
Total	52,972	54,475	54,395	51,736	50,030

5 *The City's first detailed emissions inventory in accordance with recognised standards and independent verification was prepared for 2006/07 then subsequently 2007/08. The 2008/09 inventory was being independently verified at the time of publication. 2009/10 inventory will be provided in the 2011 report. To achieve a zero net emissions balance the City purchases 100 per cent accredited offsets for all of its emissions.*

6 *Please note, some historical figures in these tables have changed as a result of a detailed review of data for independent verification.*

## Electricity

(MWh)	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	Trend
City of Sydney LGA electricity usage <sup>7</sup>									
Households	No data				432,294	440,155	433,269	431,354	–
Small business	No data				920,942	849,499	805,293	788,328	✓
Large business	No data				2,877,974	2,857,519	2,850,646	2,804,608	✓
Council electricity usage <sup>8</sup>									
Total	No data	42,427	43,010	42,710	39,451	38,970	37,475		✓
Per employee	No data	28	27	27	23	22	20		✓

<sup>7</sup> Information provided by Ausgrid for suburbs in and around the City of Sydney. Data is not confined to the LGA and may be based on accruals and estimates. Quarterly data on electricity use, solar generation and other information now available at <http://www.ausgrid.com.au/Common/About-us/Sharing-information.aspx>. For consistency, this report now aligns with Ausgrid website data.

<sup>8</sup> Information provided from the City of Sydney's utility management system using data from Ausgrid and AGL. Figures vary from previous reports due to improved estimates of street lighting electricity usage and the inclusion of new sites. The 2010/11 electricity usage contains 3 per cent of estimations, as data provided by the suppliers is incomplete.

## GreenPower

	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	Trend
GreenPower usage in Australia (MWh) <sup>9</sup>	No data	495,250	688,754	1,013,707	1,455,887	2,144,726	2,275,234	2,110,628	✗
Australian households using GreenPower	No data	150,374	281,701	565,977	748,377	940,560	838,492	712,932	✗
Australian businesses using GreenPower	No data	7,229	14,676	24,313	30,313	32,276	38,688	47,082	✓

<sup>9</sup> National GreenPower quarterly reports [www.greenpower.com.au](http://www.greenpower.com.au)

## City of Sydney GreenPower<sup>10</sup>

From 2009/10 the City will remain carbon neutral through the purchase of offsets but will no longer purchase GreenPower. Instead, these funds will be invested in local renewables projects.

	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	Trend
Council GreenPower usage (MWh)	50	3,312	7,645	39,328	40,836	–	–	–	
Percent of electricity use (per cent)	<1%	~10%	~20%	100%	100%	–	–	–	
GreenPower cost (\$)	Sponsored	\$140k	\$272k	\$2.3M	\$1.9M	–	–	–	
Main provider	TruEnergy	Climate Friendly	AGL	C0zero	C0zero	–	–	–	
City installed renewables (kWp) <sup>11</sup>	–	–	–	–	–	–	73.5	93	✓

<sup>10</sup> Includes GreenPower used by properties, public lighting. Smaller amounts of GreenPower for fleet offsets and events are not listed.

<sup>11</sup> From 2009/10 the City will remain carbon neutral through the purchase of offsets but will no longer purchase Green Power. Instead, these funds are being invested in local renewables projects.

## Air Pollution

	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	Trend
Regional air quality (days stds exceeded) <sup>12</sup>									
Visibility – NEPH	3	0	1	3	0	2	5	0	✓
Ozone – 1hr	1	1	0	0	0	0	0	0	–
Ozone – 4hr	0	1	0	0	1	0	0	0	✓
Particulates (PM10)	0	0	0	2	0	4	5	0	✓
Customer requests – Air pollution/odour <sup>13</sup>	No data		17	228	200	283	262	321	✗

<sup>12</sup> Data from Air Quality Index (Randwick) [www.environment.nsw.gov.au](http://www.environment.nsw.gov.au) as at 23 August 2011. Note, the higher days exceeded for visibility in 09/10 was the result of the dust storm affecting Sydney in September 2009.

<sup>13</sup> Requests to City of Sydney Customer Service centre.

# Transport

For the past few years, public transport use in Sydney has been growing faster than car traffic. For example, in 2008/9 rail trips rose by 3.1 per cent and bus trips by 2.4 per cent while car trips fell 0.8 per cent across Sydney. Cycling is growing at more than 50 per cent per annum while car share membership in the City of Sydney grew by almost 50 per cent in the past year.

These trends reflect shifts to more sustainable transport alternatives. The City is reinforcing and supporting these through a number of initiatives, including the provision of a 200 km network of bike paths and the encouragement of car sharing through supportive parking and other policies. A sustainable transport network will deliver more and healthier choices: walking, cycling, buses, light rail, train, ferries, taxi and car share—and address growing congestion.

–**Cycling.** Public transport, cycling and walking is vital to reduce road congestion and make our city more sustainable. It is estimated that this can reduce Sydney's greenhouse gas emissions by about four per cent. The City is spending \$70 million to create a 200km bike network over four years. At present, only two per cent of all trips are by bike but 6 per cent of all vehicles entering the city centre are bikes. The City's target is 10 per cent of all trips. We are building safe separated bike paths to encourage people to ride. We have joined with 14 surrounding councils to map out a 245km regional network for which we have sought national funding. In the 12 months to March 2011, at 100 intersections across the LGA we counted an average increase of 60 per cent in the number of cyclists at the morning peak hour and 48 per cent in the evenings. More than 1,000 people attended the City's free cycling confidence or bike maintenance courses, and the City distributed 70,000 cycling maps. The City started three StreetShare projects to increase bicycle use and encourage better behaviour: the Workplace Cycling Challenge, Community Leadership (matching grants) and

Co-Existence project. More information on these projects can be found at [http://www.cityofsydney.nsw.gov.au/AboutSydney/documents/ParkingAndTransport/Cycling/FinalStrategyReport\\_23112010.pdf](http://www.cityofsydney.nsw.gov.au/AboutSydney/documents/ParkingAndTransport/Cycling/FinalStrategyReport_23112010.pdf).

- Walking.** The City has developed a pedestrian plan that complements the bike network called the Liveable Green Network.
- Car Share.** Since 2007, the City has installed more than 285 dedicated car share spaces, catering for approximately 5600 City residents (an additional 40 per cent since last year) and 1600 City-based businesses (an additional 220 per cent since last year). Membership is growing by over 200 new members a month compared to 180 last year. It is estimated that the car sharing program has prevented 825 cars using city streets and reduced on-street parking demand by approximately 375 spaces compared to business as usual.
- In 2009, congestion cost Sydney \$4.6 billion. That's forecast to rise to \$8 billion by 2020. The costs include travel time, unreliability, higher fuel costs and air pollution. In Sydney's CBD, there are nearly 100,000 car trips and 6,000 bus movements each weekday. The City of Sydney has been working closely with the State Government to improve bus reliability, light rail, heavy rail, cycling and walking. The State Government's commitment to light rail is progressing, with recent announcements regarding the commencement of feasibility studies for further routes through the inner east and west to create an effective network. The City of Sydney is contributing through planning and financial support and essential public domain works including plans to support the State's light rail with the transformation of the public domain of George Street.

## Fleet

Council fleet emissions prior to 2009/10 only reflected Scope 1 – ‘tailpipe’ (for example emissions directly from the vehicle) only and did not include Scope 3 – ‘well to wheel’ (for example emissions resulting from fuel and gas extraction, production and transport). By including Scope-3 fleet emissions from 2009/10, the City is taking responsibility for more of its emissions to be more transparent and accountable.

Council Fleet emission data is directly proportional to the increasing distances travelled each year in delivering City services.

Total tCO <sub>2</sub> e	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	Trend
Contractor vehicle emissions	1,150	1,315	1,407	1,548	1,378	1,262	
Emissions offset (per cent)	100%	100%	100%	100%	100%	100%	
Main Provider	CO2 Australia	AGL	Cleaner Climate	Climate Friendly	Climate Friendly	pending <sup>14</sup>	

Council fleet emissions (tCO <sub>2</sub> e) by Scope	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	Trend
Scope-1	2,795	2,981	2,692	2,980	3,001	3,208	2,993	2,931	✓
Scope-3	No data						227	224	✓
Total	2,795	2,981	2,692	2,980	3,001	3,208	3,220	3,155	✓
Emissions offset (per cent)			100%	100%	100%	100%	100%	100%	
Main Provider			CO2 Australia	AGL	Cleaner Climate	Climate Friendly	Climate Friendly	pending <sup>14</sup>	

<sup>14</sup> Pending tenders for 2010/11 offsets.

## Transport

	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	Trend
Vehicles per day in LGA <sup>15</sup>	No data	No data	701,476	689,581	697,788	689,391	689,458	679,233	✓
Staff with travel passes	194 (13%)	266 (18%)	321 (21%)	338 (21%)	363 (23%)	408 (24%)	362 (20%)	425 (19%)	~

<sup>15</sup> Information provided by the NSW Roads and Traffic Authority (does not include Cross City Tunnel). Based on combined direction vehicle numbers for Sydney Harbour Bridge, Sydney Harbour Tunnel, Anzac Bridge, Oxford Street, Parramatta Rd, King Street, Regent St, O'Riordan St, Cleveland St, and City West Link Road.

## Cycleways

	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	Trend
Cycleways installed (m)	Nil	Nil	Nil	Nil	Nil	204	4,324	8,909 <sup>16</sup>	✓

<sup>16</sup> Includes College Street, Kent Street, Gardiners Road, Bourke Street, Prince Alfred Park and Glebe Point Road. Includes Separated, Shared Path and Shared Park Path and Mixed Traffic facilities.

# Waste and Recycling

Along with the USA and Canada, Australia is consistently among the top ten producers of waste per capita.

Decomposing garbage in landfill releases methane, a long-term greenhouse gas pollutant with global warming potential 21 times that of carbon dioxide. The greenhouse gas leaks out over decades as food and other organic material rots.

The City of Sydney is taking action now and should meet our 2014 target of diverting two thirds of residential waste from landfill ahead of schedule. In early 2010/11, the City was sending around 60 per cent of its domestic garbage for processing in an advanced waste treatment facility. Since April 2011, the City has sent all its domestic garbage to an advanced waste treatment facility at Kemps Creek for processing.

The City is developing an Interim Waste Strategy to investigate new waste management technologies including treatment technologies to replace landfill. One possibility is converting waste materials to a synthesis gas which could be adapted for use in the City's trigeneration network or converted to a transport fuel.

Advanced Waste Treatment (AWT) is part of an integrated suite of works being planned by the City to achieve the vision and objectives of Sustainable Sydney 2030. Other key elements include two decentralised energy master plans – Trigeneration and Renewable Energy. The City has been developing a comprehensive strategy for waste management, and undertaking planning which will provide detailed analysis, options and recommendations on: (a) environmental outcomes in terms of waste outputs, emissions and potential energy supply; (b) technical issues and developments in terms of collection systems, feedstock and transport mechanisms; and (c) delivery options for the establishment, construction, management and operation of an AWT.

–**Advanced Waste Treatment.** In 2010/11, the City sent 20,500 tonnes of domestic garbage for treatment at various facilities. Overall, the City achieved a resource recovery level of around 49 per cent, up from 36 per cent the previous year. The City continues to investigate waste treatment options that will allow it to recover both resources and energy from waste. In the meantime, the City is now processing all of the City's domestic garbage (around 40,000 tonnes per year) through the SITA Waste Treatment facility at Kemps Creek. At least 55 per cent of the garbage will be recovered for recycling or as compost suitable for use in mine site rehabilitation. When added to the level of separately collected recycling, the City's annual resource recovery rate will rise to at least 66 per cent over the next 12 months.

–**Electronic waste.** The City runs free quarterly E-waste drop off events for residents to recycle broken or obsolete electronic equipment. Residents drop off broken and obsolete electronic equipment, knowing it will be recycled. In 2010/11, four drop off events were held. These collected 53.4 tonnes of E-waste from 1,597 households. Since the first collection day in November 2008, the City has received more than 3,400 electronic waste drop-offs – equating to more than 115 tonnes – 95 per cent of which have been recycled.

–**Chemical Waste.** In 2010/11 the City hosted an annual Household Chemical Cleanout collection with the Office of Environment and Heritage. Over 500 households dropped off 16.3 tonnes of hazardous household waste which were recycled or safely disposed of. Paints (oil and water based) accounted for 77 per cent of all materials collected.

–**Waste and Recycling Improvement Program.** In 2010/11 the City commenced a Waste and Recycling Improvement Program for apartment buildings. Through the program, City representatives visited 236 apartment buildings to provide advice and resources to building managers, cleaners and residents on effective management of waste and recycling for their building. Bins and lids are modified to reflect the City's comingled (mixed) recycling service, whereby all recyclables are collected in one truck, thus making recycling easier for residents. This project is funded through the NSW Government Waste and Sustainability Improvement Payments.

## Waste and recycling

Indicator	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	Trend
<b>Household waste<sup>17</sup></b>									
Total (t)	26,020	36,553	39,999	38,752	40,230	41,890	37,180	30,358	✓
Per person (kg)	230	238	257	234	238	237	215	168	✓
<b>Household recycling<sup>18</sup></b>									
Total (t)	9,169	12,186	13,227	16,122	16,654	19,556	21,031	29,231	✓
Per person (kg)	84	79	85	97	99	110	116	161	✓
Landfill diversion (per cent)	26%	25%	25%	29%	29.3%	32%	36%	49%	✓
Public place waste collection (t) <sup>19</sup>	7,565	6,901	7,410	7,750	7,205 <sup>20</sup>	7,451	8,044	9,560	–
Clean-up notices <sup>21</sup>	15	67	54	15	3	0	4	0	–
Litter infringements	80	122	671	1,412	1,340	1,406	531	1,176	–
Council A4 paper use (sheets/employee)	6,370	8,597	8,595	7,908	6,059	5,152	5,662	5,424	–
Building materials recycled at Council facility (t) <sup>22</sup>	21,417	18,950	26,727	19,894	19,349	25,725	19,803	18,041	–

17 Waste includes collected household waste and clean-ups disposed to landfill.

18 Recycling includes containers, paper, green waste and white goods collection. This includes estimated recovery at AWT facilities.

19 Includes street cleansing waste, public bins, events and waste dumps.

20 10 per cent of public waste in 2007/08 was recycled through the UR3R resource recovery facility.

21 Clean-up notices were first issued by the City in Q4 of 2003.

22 Burrows Road Materials Recycling Facility, St Peters.

# Water

Water is one of the most valuable resources underpinning the healthy functioning of society. As water storage levels decrease and the population increases, the conservation of water and water pollution are key environmental issues for the City of Sydney. While the water quality of Sydney Harbour has improved in recent times, this natural asset continues to be degraded by pollution from stormwater, sewer overflows, land contamination and vessels.

According to a report by the Water Services Association of Australia, Australian cities will face a growing demand for water over the coming decades as the population increases and the weather becomes hotter due to climate change. By 2026 major cities will face a 39 per cent increase in water demand or 600 billion litres annually.

The inner city currently imports 32 gigalitres of drinking-standard water from Warragamba Dam, but only 20 per cent is used for cooking, drinking and washing. The other 80 per cent could be supplemented by recycled water for toilet flushing (19 per cent), air conditioning cooling towers (15 per cent) and irrigation (3 per cent).

In response to these challenges, the City of Sydney is working to reduce water demand, implement sustainable water supply sources and improve stormwater quality.

–**Decentralised Water Master Plan.** The City is developing a Decentralised Water Master Plan which will identify actions and investments that the City of Sydney can make to facilitate the reduction of potable water imported from dams, increase the use of recycled water for non-potable use, and improve the quality of stormwater discharged to Sydney Harbour and Cooks River.

–**Property Upgrades for Water Efficiency and Recycling.**

City of Sydney Council buildings and operations account for 1.5 per cent of water use in the LGA. Retrofit work of City buildings will improve water efficiency of major high water using properties with water saving devices such as aerated taps and shower heads, cistern modifiers in toilets and waterless urinals to be installed. The City has installed rainwater tanks at nearly 20 childcare centres, kindergartens and community centres. There are also 20 stormwater harvesting and reuse projects completed or under construction to irrigate the City's park and sporting fields.

–**Raingardens.** There are now more than 20 rain gardens in local streets, traffic islands, footpaths, parks and open spaces collecting and filtering stormwater. The City aims to achieve its target of 50 per cent reduction in pollutants entering waterways through stormwater harvesting and integrating more pervious surfaces and natural treatment systems such as raingardens, swales and wetlands into the public domain while undertaking major renewal and capital works projects on roads, parks and redevelopments.

–**Sydney Park Water Reuse.** The City began work in May 2010 on an \$18 million project, jointly funded by the Australian Government, which will harvest and cleanse 800 million litres of storm water draining to a channel near Sydney Park and make the recycled water available to nearby industries and new developments. The project will prevent nearly 500,000 kg of pollutants from being discharged to the Cooks River, each year.

–**Green Square Town Centre.** The City is investigating another stormwater recycling scheme as part of the Infrastructure being planned to service the energy, water and waste management demands at the Green Square Town Centre. The recycled water will be used for irrigation of gardens, parks and for toilet flushing and laundries in the residential development and for cooling towers in the commercial development. The project is expected to prevent nearly 33,000 kg of pollutants from entering into the Cooks River, each year.

Details of some of the water initiatives listed in this section, and more information is available at: [www.cityofsydney.nsw.gov.au/environment/water](http://www.cityofsydney.nsw.gov.au/environment/water)

## Water supply

	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	Trend
Potable water cost (\$/kL) <sup>23</sup>	\$1.013	\$1.013	\$1.264	\$1.48	\$1.83	\$1.87	\$1.87	\$2.103	–
Water storage level (per cent) <sup>24</sup>	42.6%	38.3%	41.8%	50.5%	66.7%	61.4%	57.6%	76.4%	–
Average City of Sydney rainfall (mm) <sup>25</sup>	705	1,041	792	1,403	1,197	1,156	1,045	1,172	–

<sup>23</sup> Sydney Water pricing for consumption more than 100 kilolitres per quarter. Source <http://sydneywater.com.au/YourAccount/PricingInformation/>

<sup>24</sup> Sydney Catchment Authority June figures. Source <http://www.sca.nsw.gov.au/dams-and-water/weekly-storage-and-supply-reports>

<sup>25</sup> Average rainfall for 5 monitoring stations around City of Sydney provided by Sydney Water.

## Water usage

	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	Trend
City of Sydney LGA water usage									
Total (ML)	32,891	34,508	33,712	34,419	32,471	32,602	31,032	33,833	–
Commercial average (kL)	2,825	2,504	2,417	2,451	2,292	2,194	2,049	3,154	✘
Units average (kL)	176	171	172	170	161	160	159	203	✘
Houses average (kL)	200	191	190	183	173	175	180	147	✔
Council water usage <sup>26</sup>									
Total (ML)	534	484	405	384	402	360	386	395	–
Per employee (kL)	361	326	268	240	251	214	217	212	✔
Fountains (total kL)	No data	No data	43,094	21,839	15,176	13,224	11,665	10,720	✔

<sup>26</sup> Information provided from the City of Sydney's utility management system using data from Sydney Water. Figures vary from previous reports as properties that the City of Sydney do not have operational control over have been removed, consistent with reporting guidelines. The 2010/11 water consumption usage contains 10 per cent of estimations, as data provided by the suppliers is incomplete.

## Water pollution

Indicator	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	Trend
Darling Harbour bacteria levels (percent of time at safe limit) <sup>27</sup>									
<i>Faecal coliforms</i>									
Winter	41%	41%	59%	35%	55%	65%	No data	No data	–
Summer	39%	23%	41%	32%	35%	61%	No data	No data	–
<i>Enterococci</i>									
Winter	41%	32%	55%	40%	68%	43%	No data	No data	–
Summer	74%	35%	69%	55%	48%	55%	No data	No data	–
NSW Maritime rubbish collection (m <sup>3</sup> )									
Blackwattle Bay	96	99	116	126	93	95	79.5	92.4	–
Rozelle Bay	214	298	263	204	157	87	45	45.9	–
Rubbish from Council stormwater pollution traps (t)	1,104	1,372	1,102	1,290	1,334	1,263	1,205	1,272	–
Water pollution infringements	52	94	76	44	84	81	54	42	–
Customer requests – Sewer overflows/water leaks <sup>28</sup>	No data		25	170	144	191	194	187	–
Customer requests – stormwater pollution	No data		5	85	68	93	88	107	–

<sup>27</sup> Note, from 2010 Samples are no longer analysed for faecal coliforms, as recommended by NHMRC guidelines. Microbial levels have been assessed at Category D since 2005/06. This is the poorest category and indicates that there may be a significant risk of illness at the location. Further information about the microbial assessment category is found at <http://www.environment.nsw.gov.au/beach/microbialassessment.htm>

<sup>28</sup> Requests to City of Sydney Customer Service centre.

# Urban Ecology

Through Sustainable Sydney 2030, the City is working to secure Sydney's future, its prosperity and liveability as a model green city, with well-functioning habitat and increased biodiversity.

–**Greening Sydney Plan.** We are developing a Greening Sydney Plan to make Sydney a greener and more attractive city. The Plan recognises the importance of trees and other vegetation for the numerous environmental, social and economic benefits they provide to the community. It also acknowledges the potential to support diverse ecosystems and the benefits biodiversity can bring to City living.

The Plan contains some 42 programs and projects which will be delivered by the City in partnership with residents, local businesses, developers and volunteer groups. The Greening Sydney Plan focuses on:

- **Urban Canopy:** Developing and protecting the City's urban forest
- **Urban Ecology:** Enhancing habitat to promote biodiversity, through the Urban Ecology Strategic Action Plan
- **Community Empowerment:** Encouraging community participation
- **Public Domain:** Improving streetscapes and public places
- **New Development:** Enabling private sector greening

–**Urban Ecology Strategic Action Plan.** The City has commissioned the Australian Museum to develop an Urban Ecology Strategic Action Plan, based on baseline flora and fauna surveys and community consultation undertaken in 2010/11. The Plan will identify and prioritise opportunities for conserving and increasing locally indigenous flora and fauna species, particularly those that have declined in urban areas. The Plan will be completed in 2011/12.

–**Pyrmont Ultimo Landcare and Rozelle Bay Community Native Nursery.** The City continued to support the valuable efforts of volunteer groups aiming to restore locally indigenous plant communities during 2010/11. The 117 volunteers from the Pyrmont Ultimo Landcare group provided a total of 1,805 hours planting around 3,000 locally indigenous plants, watering, mulching and weeding while volunteers from the Rozelle Bay Community Native Nursery provided a total of 800 hours propagating and planting over 3,800 locally indigenous plants, and watering, mulching and weeding in the Glebe area.

–**National Tree Day.** To celebrate National Tree Day in 2010, the City ran two very successful tree-planting events. At Sydney Park, 4,000 locally indigenous plants were planted by more than 450 volunteers and at Arthur Paddy Grey Reserve in Glebe, a further 1,000 were planted by volunteers, mainly from the Glebe Society's Blue Wren Group. The City also coordinated a native plant giveaway to mark National Tree Day and the International Year of Biodiversity as well as to encourage residents to establish wildlife-friendly gardens.

–**Community Gardens Program.** In 2010, the City adopted a policy on community gardening that furthers the Sustainable Sydney 2030 city plan. The program provides assistance to community garden organisations, community gardens on street verges, school kitchen gardens and community food initiatives such as food co-operatives. The City's urban food production initiatives form part of the emerging Food Sensitive Urban Planning movement, and are seen as a means of encouraging constructive community engagement with public open space and the development of social capital, as well as new recreational opportunities and community health.

There are 15 community gardens in the City of Sydney LGA including a community verge garden which forms part of the Sustainable Streets-Sustainable Communities Demonstration Project. Managed by the Sustainable Chippendale team and enabled under the City's Community Garden Policy, the verge community garden has been planted by local people with herbs, vegetables, fruit trees, flowers and native and exotic plants to produce a biologically diverse and productive planted street verge. The garden is supplied with

compost fertiliser from the community composting program also managed by Sustainable Chippendale team. Following review of the Community Composting Program and cleaning of the bins the City is planning to return the community composting system to Peace Park, Chippendale. This will achieve both waste reduction and food sensitive urban planning goals for the City.

- **Trees.** The City of Sydney has about 29,500 street trees and 11,000 park trees. In 2009/10, the City planted 759 street trees. We are reviewing the City's Street Tree Master Plan to ensure the best trees are planted. New opportunities to plant trees, such as in median strips, are a key part of the review. These measures will help us achieve the Greening Sydney Plan's aim to increase urban canopy by 50 per cent by 2030, as increased canopy provides benefits such as improved air quality, storm water infiltration and property values. Further, shade from the trees helps reduce summer temperatures in the city by up to two degrees. Information on the benefits of trees, Guidelines for Arborist Reports, our Register of Significant Trees and Tree Management Policies are available on the City's website [www.cityofsydney.nsw.gov.au/trees](http://www.cityofsydney.nsw.gov.au/trees)
- **City Farm.** The City has conducted a feasibility study of a City Farm, selecting preferred sites and management models. Public response to the Sydney City Farm Feasibility Study was overwhelmingly positive. Comments received suggest the development of a community garden and

orchard as part of the project, however, the City Farm's scope is broader than community gardening and includes community sustainability education and offering productive opportunities with community educators. These facilities reach well beyond the commercial value of the food itself to educational, cultural and social values for participants and the broader community. They form part of a growing public movement around safe, regionally produced and sustainable food systems.

- **Companion Animals.** The City recognises that pets are an enormous source of pleasure and companionship for many people. The City has a number of programs and services to encourage responsible pet ownership in the Local Government Area. These include: a pet adoption service to rehouse abandoned animals; the provision of specially designated areas where people can walk and exercise their dogs; pet education programs and pet registration and desexing. More information and links to the City's Companion Animals Policy is available on the City of Sydney website: [www.cityofsydney.nsw.gov.au/Residents/Animals](http://www.cityofsydney.nsw.gov.au/Residents/Animals)
- **Pests.** Unwanted exotic plants and animals significantly disturb natural systems. The City manages weeds and feral animals within our parks and open spaces where practical and has a comprehensive pest control program.

## Urban Ecology

	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	Trend
Area of parks and open space (Ha)	377	377	377	377	377	377	377	377	–
Area managed by the City of Sydney (Ha)	188	188	188	188	188	188	188	188.5	–
Number of native fauna species <sup>29</sup>									
Frogs				No data					5
Reptiles				No data					11
Mammals				No data					8
Birds				No data					59
New and replacement street trees	850	1,127	1,150	2,030	1,301	777	759	462	–
Native plantings for National Tree Day <sup>30</sup>	11,660	6,547	8,000	4,665	5,400	4,500	5,600	4,900	–
Native plantings by Rozelle Bay Community Native Nursery	2,365	1,441	2,806	2,812	2,757	No data	2,112	3,800	–
Native plantings by Pyrmont Ultimo Landcare	No data	No data		~1,500 per year			2,000	3,000	
Free native plants distributed	90	1,500	2,250	1,198	772	No data	2,500	2,700	–
Customer requests – Weeds	No data		1	24	19	32	31	22	–
Customer requests – Vermin/pests/insects	No data		18	270	177	328	282	310	–
New aerial bundle cabling on electricity cables (spans)	100	95	45	15	9	0	147	77	✓

<sup>29</sup> Based on surveys conducted as part of the City of Sydney's Urban Ecology Strategic Action Plan.

<sup>30</sup> Includes World Environment Day, National Tree Day and other environmental events.

# Land and Noise

## Land

Since European settlement, the City of Sydney area has experienced a substantial degree of urbanisation. There is very little remaining of the original landscape, natural creeks and vegetation.

Today, the City of Sydney serves as a commercial, financial and cultural centre also supporting a sizeable residential population. While urbanisation brings with it many economic and social benefits, it also places considerable pressure on the land. Human activities and buildings have altered the natural form and in some areas resulted in land degradation and contamination.

As the local government authority for the area, the City seeks to manage land in an environmentally and socially responsible manner. This is a balancing act between the needs of work and social interactions, as well as ecological processes.

## Noise

The City of Sydney regulates unwanted neighbourhood noise from a variety of sources such as loud music, mechanical plant and machinery, licensed venues, household burglar alarms, barking dogs and construction related activities.

City officers receive and investigate complaints concerning “offensive noise” and activities being conducted in an environmentally unsatisfactory manner which includes the emission of noise as defined under the Protection of the Environment Operations Act 1997.

In determining whether a noise is offensive officers must give consideration to many factors including the frequency and duration of the noise, the time of the day it occurs, its volume and any tonal characteristics and how it is affecting the complainant. Once a complaint has been substantiated then the City has a variety of enforcement options available to ensure the noise in question is reduced to an acceptable level. City Officers will always try to resolve complaints where possible informally and refer to the City’s Enforcement Policy when considering what course of action to take.

Under existing noise regulations there are certain time restrictions within which noise from residential premises, such as noise from air conditioners, musical instruments and power tools should not be heard inside any neighbouring residence.

The City also controls noise through the ongoing development and enforcement of noise-related development consent conditions and associated policies and works with other Regulators in order to provide a coordinated approach in regulating noise impacts.

The City is currently updating and revising its Construction Hours/Noise Code of Practice published in 1992. The Code of Practice provides guidance to developers to minimise excessive noise from construction activities and advice about liaising with the local community prior to any noise intrusive development works taking place.

## Demographics

	2004	2005	2006	2007	2008	2009	2010	2011
Residents <sup>31</sup>	154,073	159,854	165,596	170,173	173,444	177,920	180,679	183,616
Workers (per day) <sup>32</sup>	350,000	365,000	377,000	385,413	375,000	370,000	372,000	376,000
Visitors (per day) <sup>33</sup>	450,000	475,000	475,000	480,000	475,000	475,000	480,000	483,000
Visitors (total nights) <sup>34</sup>	8,732,065	9,000,032	9,039,918	9,462,835	9,519,826	9,358,668	9,804,849	10,096,232
City of Sydney employees	1,479	1,485	1,509	1,601	1,602	1,686	1,781	1,863

31 The data has been recast from the 2006 Census. Up to 08/09 is ABS ERP data, 09/10 and 10/11 are CoS projections as ERP unavailable.

32 06/07 FES Census – count of workers, estimates for other years.

33 CoS estimate – tourist visitors, students, business visitors, shoppers.

34 Tourism NSW data.

## Built Form<sup>35</sup>

	2004	2005	2006	2007	2008	2009	2010	2010
Households (dwellings)	82,342	86,093	88,664	89,764	91,522	92,918	95,234	96,648
Completed commercial development (sqm)	85,276	166,259	246,442	73,867	112,118	135,564	177,149	176,845
Completed residential development (no of units)	4,802	3,751	2,571	1,100	1,758	1,396	1,346	1,414

35 06/07 FES Census (Private Dwellings); other years – development statistics – residential completions. Includes non-private dwellings.

## Noise

	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
Customer requests – Construction noise	No data		15	274	183	348	354	374
Customer requests – Other noise	No data		124	852	625	899	893	900