



State of the Environment

Annual Report
2020/2021



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Cover: Glo building, Smart Green Apartments
participant image © City of Sydney



Since 2008, Sustainable Sydney 2030 has articulated the collective vision of residents and visitors, workers and businesses. The Environmental Action 2016-2021 Strategy and Action Plan set targets and actions across six key environmental focus areas.

The Green Report outlines the progress of our environmental program. The Green Report is the City's State of the Environment Report as at June 2021 and fulfils the reporting requirements of the NSW Local Government Act 1993 No. 30 Section 428A and the Integrated Planning and Reporting guidelines.

The City has drafted a new Environmental Sustainability Policy which incorporates the principles outlined in the Climate Emergency Response and strengthens the environmental management expectations of our partners. The updated Environmental Sustainability Policy was exhibited in June 2021.

An Environmental Management System (EMS) supports the City's commitment to sustainable asset management and operations.

Message from the CEO

Urgent climate action continues to be a priority. The United Nations Environment Program (UNEP) World Meteorological Organisation State of the Global Climate 2020¹ highlights that major greenhouse gas emissions continued to rise and that 2020 recorded the 3rd warmest average temperature on record. In addition, record temperatures in North America have been recorded to June 2021.

The City continues to take action to address climate change impacts. The period to June 2021 represents the first financial year that electricity usage by City's operations is 100 per cent powered by renewables, using electricity generated from wind and solar farms in regional NSW. This is a significant step for the City's operations to achieve its 2030 carbon reduction target.

This report closes out the Environmental Action 2016-2021 Strategy and Action Plan. The report outlines how we have achieved many of the City's operational 2021 targets and our progress to 2030 targets.

A new [Environmental Strategy 2021-2025](#) has recently been endorsed by Council, and presents our plan for the next 4 years, including updated targets for the LGA to achieve net zero by 2035. The Strategy is supported by the updated [Environmental Sustainability Policy](#).

The City has also released the strategic review, [Planning for net zero energy buildings](#). The report identifies the most appropriate performance standards to achieve high-performing net zero energy buildings in Greater Sydney.

The City's new Greening Sydney Strategy 2030 has also recently been endorsed. It outlines ambitious urban greening programs and actions that will deliver a cooler, calmer and more resilient city.

I encourage everyone to read and distribute this report widely to share ideas and inspire environmental leadership everywhere.



Monica Barone, Chief Executive Officer

¹ WMO Provisional Report on the State of the Global Climate 2020

1. Our environmental targets

Sustainable Sydney 2030 outlines the aspiration of our community and businesses for our local government area to be an environmental leader on a global scale.

The following are environmental targets outlined in the Environmental Action 2016 - 2021 Strategy and Action Plan.

City of Sydney Operations Targets



Low-carbon city

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



Water sensitive city

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



Zero waste city

- **70** per cent resource recovery of waste from City-managed properties by end June 2021
- **80** per cent resource recovery of construction and demolition waste generated and managed by City operations by end June 2021
- **50** per cent resource recovery of waste from City parks, streets and public places by end June 2021



Active and connected city

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



Green and cool city

- The average total canopy cover is increased by **50** per cent by 2030 (from 15 to 23 per cent), and increased by **75** per cent by 2050 (to 27 per cent), from a 2008 baseline
- Plant **700** new street trees each year until 2021
- Plant **50,000** new trees and shrubs in City parks and street gardens each year until 2021
- Tree species diversity will not consist of more than **40** per cent for any particular plant family, **30** per cent for any genus or **10** per cent for any one species by 2021
- Habitat sites in the city are protected and the area of bush restoration sites is increased by **100** per cent by 2023 from a 2012 baseline of 4.2 hectares
- Indigenous fauna species diversity, abundance and distribution is **maintained or increased** by 2023 based on a 2012 baseline
- A progressive **increase** in the number of habitat features for priority fauna species is established along potential habitat linkages by 2023



Local Government Area Targets

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.



Low-carbon city

- **70** per cent reduction in greenhouse gas emissions by 2030 based on 2006 levels
- Net **zero** emissions by 2050²

- **50** per cent of electricity demand met by renewable sources by 2030



Water sensitive city

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



Zero waste city

- **70** per cent recycling and recovery of residential waste from the local government area by end June 2021
- **70** per cent recycling and recovery of commercial and industrial waste from the local government area by end June 2021
- **80** per cent recycling and recovery of construction and demolition waste from the city by end June 2021
- **15** per cent reduction in per capita municipal solid waste generation by 2030 compared to 2015



Active and connected city

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



Green and cool city

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

² Accelerated target of net zero by 2035 is proposed by the draft Environmental Strategy 2021-2025 and will form part of the City's new long-term strategic plan, Sustainable Sydney 2050



2. Low carbon city



The City of Sydney now purchases ethically sourced carbon offsets with the Aboriginal Carbon Foundation. © Aboriginal Carbon Foundation

What our cities do to address climate change sets the agenda everywhere for communities and governments to promote innovation and solutions to achieve a net zero future.

In *Sustainable Sydney 2030*, we set a 2030 target to reduce emissions both across the city and in our operations by 70 per cent below 2006 levels. In our Environmental Action 2016-2021 Strategy and Action Plan, we have strengthened our renewable energy targets for both our own operations and in our local government area and extended our emissions target to net zero emissions by 2050.

In light of the climate emergency, we realise that even more urgent action is required, and our Environmental Strategy 2021-2025 includes a target for the local government area of net zero emissions by 2035.

The City's 'Asset Environmental Budget' (AEB) translates operational carbon emissions targets into a detailed plan and is published in the [Resourcing Strategy](#) to promote transparency in monitoring of our emissions performance.

Ethically sourced carbon offsets

The City has been measuring, reducing and offsetting all of its operational greenhouse gas emissions since 2007. The

City remains carbon neutral by continuing to implement emissions saving projects, developing a greenhouse gas emissions inventory with independent verification each year, and through the provision of accredited offsets equivalent to at least 100 per cent of the organisation's emissions.

Australia's Black Summer—our devastating 2019/20 bushfire season—highlighted the symptoms of climate change and led to strong interest in Aboriginal cultural fire stick farming practices. Fortunately, it's now possible to invest in fire stick farming, also known as cultural burning, by purchasing carbon offsets.

Fire stick farming is a way of managing the environment Aboriginal communities have practiced for tens of thousands of years. It improves the health of the land and wildlife by setting cool burns, generally spot fires with smaller, more controlled flames during the early, cool dry season. Larger, hotter, fires emit more carbon emissions than cool burns. So cultural burning reduces carbon emissions.

In early 2020, we began investigating options for purchasing ethically sourced offsets from fire stick farmers, also known as carbon farmers, in northern Australia. We chose to partner with the Aboriginal Carbon Foundation, an Indigenous not-for-profit that supports carbon projects.

Each program provides environmental, economic, social and cultural benefits, estimated to contribute around \$15 million annually to local economies.

"This important partnership highlights the City's commitment to our Indigenous economic development plan by continuing



to procure from Aboriginal and Torres Strait Islander businesses for our needs,” said the City’s Senior Community Engagement Coordinator, Indigenous Leadership and Engagement, David Beaumont.

Working with the Aboriginal Carbon Foundation, we chose to buy Australian Carbon Credit Units from the Tiwi Islands savanna burning for greenhouse gas abatement project. The Tiwi Islands are part of the NT, 80km to the north of Darwin adjoining the Timor Sea.

We would ideally like to work with local Aboriginal organisations in NSW. With enough demand, the Aboriginal Carbon Foundation is willing to create a supply of carbon offset projects throughout NSW.



The Tiwi Island team. Image © Aboriginal Carbon Foundation

100 per cent renewable electricity

The City of Sydney commenced using 100 per cent renewable electricity to meet its needs from July 2020. The renewables commitment will see the City’s operations cut emissions by around 18,000 tonnes a year – equivalent to the power consumption of around 4,000 City households. Before using renewable electricity, the City’s 2019/20 emissions were 31 per cent below our 2006 baseline. Our 2020/21 emissions are expected to be around 76 per cent below 2006 levels (see Chart 1).

The City purchases renewable power from Sapphire Wind Farm in the New England area, Bomen Solar Farm near Wagga Wagga and the community owned Repower Shoalhaven solar farm.

Using 100 per cent renewable electricity was essential to achieve our commitment to reduce organisational emissions by 70 per cent.

More broadly, the shift to renewable energy in the electricity sector is happening much faster than anyone imagined as the cost of new renewable energy continues to fall. The City estimates it may save up to \$500,000 a year (compared to

previous electricity bills) by sourcing its grid electricity from renewable energy. The NSW Government Electricity Infrastructure Investment Act 2020 now also provides significant support and investment signals to assist with the renewable energy transition.

Planning for the net zero buildings



Greater Sydney Commission’s 2021 Greater Sydney Planning Awards. City of Sydney’s Graham Jahn and Anja Te Wake, and Geoff Roberts, Chief Commissioner of the Greater Sydney Commission

The City has released the strategic review, Planning for net zero energy buildings. The report identifies the most appropriate performance standards to achieve high-performing net zero energy buildings in Greater Sydney.

The performance standards and proposed planning controls were unanimously supported by Council on 17 May 2021 for public consultation. Public consultation will take place after the NSW Government provides gateway determination.

Energy use in buildings continues to be a significant contributor to greenhouse gas emissions in Greater Sydney. To support the transition to net zero energy, the City has developed performance standards for net zero energy buildings to be implemented through the planning system.

The performance standards are step change improvements in energy performance for new office, multi-unit residential, hotel, shopping centre and mixed-use developments and major refurbishment projects.

These improvements can be through:

- energy efficiency
- on-site renewable energy
- off-site renewable energy recognised in the planning system

Industry and government action on these performance standards will help meet our shared goal of achieving net zero emissions.



The performance standards for net zero energy buildings project received a Certificate of Commendation at the Greater Sydney Commission's 2021 Greater Sydney Planning Awards in the Planning Disruptor category.

City of Sydney is a founding member of BRC-A



The City of Sydney is one of the founding members of this important organisation, along with over 60 other organisations, including

councils, project developers and some of Australia's best known and biggest companies.

Working with its partners, the BRC-A will drive best practice principles for negotiating and delivering, and eventually standardising, corporate renewable power purchase agreements (PPAs) that reduce costs for purchasers, deliver fair returns for developers and financiers, and contribute to local and regional economies.

Net zero and 100 per cent renewable energy commitments



The City has set targets in line with what is necessary at the global scale to avoid the worst impacts of climate change. We all need to contribute to this outcome and the large and increasing number of organisations

making these commitments is testament to the new opportunities from a clean economy. ClimateWorks Australia has identified that 25 per cent of Australia's largest banks are working towards setting emissions targets which are consistent with a net zero pathway for both their operations and their investment and lending activities and almost half of Australia's largest listed property companies have made commitments to reduce greenhouse gas emissions that closely align with the Paris Climate Agreement.

Advocacy

The City has numerous successful partnerships and programs to deliver on our targets, and we are committed to leading by example in our own operations. However, the Australian government needs set a net zero target in line with Australia's commitment to the Paris Agreement to keep global heating below 1.5 degrees, and to develop programs and support for communities affected in the transition. All state and territory governments in Australia have established zero targets.

During the last year the City prepared a submission in support of the Climate Change Bill 2020, calling for a net zero target for Australia before 2050 and guidance around the accounting and fair apportionment of voluntary actions. We continue to work with a range of strategic partners including the Green Building Council of Australia and the Property Council of Australia.



Sussex Street © City of Sydney



City of Sydney Operations

Carbon neutral program

The City has been measuring, reducing and offsetting all of its operational greenhouse gas emissions since 2007. 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 Climate Active program (previously called the National Carbon Offset Standard).

The City remains carbon neutral by continuing to implement emissions saving projects, developing a greenhouse gas emissions inventory with independent verification each year, and through the provision of accredited offsets equivalent to 100 per cent of our residual emissions.

How we do it

Measure

We prepare a detailed emissions inventory each year and have it verified independently to ensure it is accurate.

Avoid and reduce

The City has been achieving energy and emissions savings in our buildings, street lighting, and fleet operations through energy efficiency upgrades, monitoring and management.

Renewable energy

The City is rolling out solar PV to many sites and from July 2020 began purchasing 100 per cent renewable electricity. This will make a significant reduction in the City's emissions as depicted in Chart 1 below.

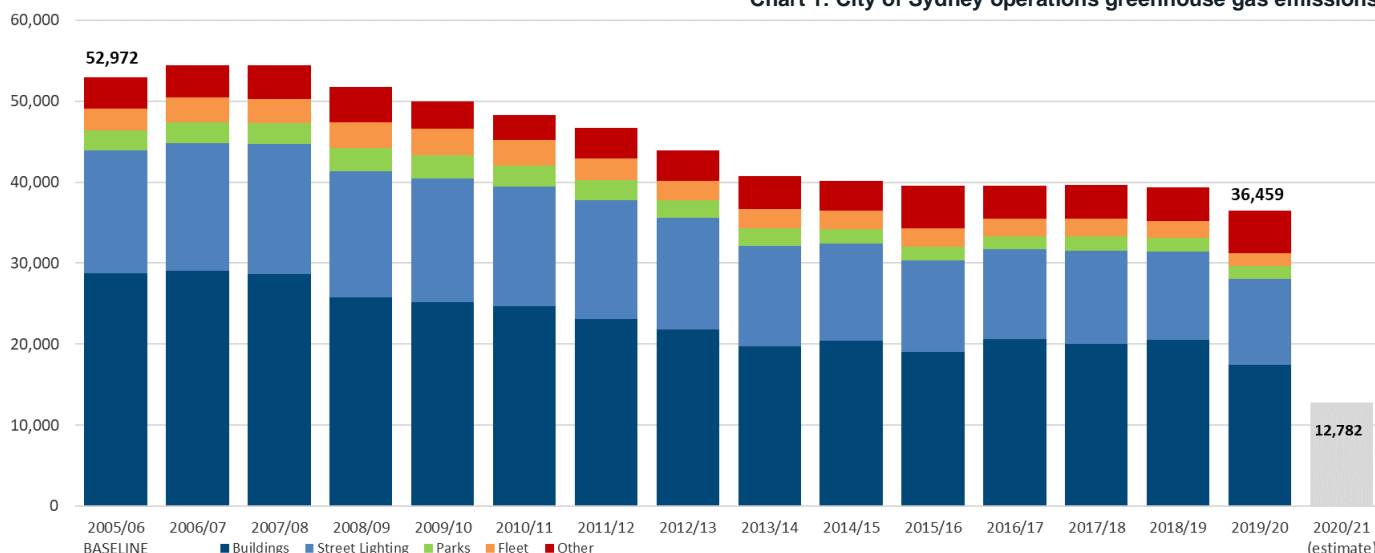
Offset

The City reduces its carbon liability by avoiding and reducing emissions and using offsets for emissions that cannot be avoided. Each year the number of offsets has reduced as we continue to implement energy efficiency, renewable energy and fuel switching programs despite providing a greater level of service to our community. The City has also started to purchase higher quality offsets to support regional areas to develop projects that absorb carbon back out of the atmosphere. In 2020 offsets purchased supported forest regeneration in NSW. In 2021 we purchased a share of offsets from Indigenous savannah fire and land management in northern Australia.



Relevant links - [Climate Active](#)

Chart 1: City of Sydney operations greenhouse gas emissions





Our operational targets



Greenhouse gas emissions

- 44 per cent reduction in greenhouse gas emissions by end June 2021, based on 2006 levels
- 70 per cent reduction in greenhouse gas emissions by 2030 based on 2006 levels



Renewable energy

- 50 per cent of electricity demand met by renewable sources by end June 2021

How we are tracking

Annual greenhouse gas emissions

Chart 1 shows that the City's emissions have reduced since 2006. In line with the Australian Government Climate Active Program the City reports electricity emissions using location-based emissions factors for NSW from the National Greenhouse Factors, and market-based accounting using the national renewable power percentage. The difference between these methods is how the emissions avoided by renewable energy are apportioned to the end user. Using market-based accounting, the City can claim 100% emissions free electricity since it purchases 100% from renewable sources (by purchasing and surrendering LGCs - renewable energy certificates).

The reduced emissions in 2019/20 are due to ongoing improvements in energy efficiency, onsite solar and the impacts of COVID-19 to business operations.

Energy consumption data

The table below shows energy consumption data for the organisation. Whilst the use of gas has increased over the base year, total energy has only increased negligibly, especially considering the additional facilities and services operated by the City since 2006.

The City's use of gas has increased since the base year primarily due to pool heating and the installation of gas-fired co and trigeneration which currently produces fewer emissions than the electricity grid. However, emissions from the City's use of electricity have now been negated since it began to use 100% renewable electricity.

Organisation	Electricity (MWh)	Natural gas (GJ)	Total energy (GJ)
Baseline	42,427	21,894	174,631
Last Year (Jun 2020)	28,405	84,811	187,068
Most recent (Jun 2021)	29,237	84,845	190,098
Difference (baseline)	-13,190 (-31%)	+62,951 (+288%)	+15,467 (+9%)
Difference (previous year)	+832 (+3%)	+34 (+0%)	-3,030 (+2%)

Procurement of a renewable gas supply will be one way to reduce the emissions from the City's existing gas using equipment until it reaches end of life and it is cost-effective to replace with alternatives powered by renewable electricity.

The table below describes the sources for the annual operations greenhouse gas emissions data. For more information, see [Appendix 1: Data management plan](#).

Title	Source
Buildings, parks and street lighting	SMART (Sustainability Management and Reporting Tool)
Fleet	Fleet services fuel consumption data.
Other GHG	Various systems are used to collect emissions from other business activities such as contractor fuel, waste, flights, taxi journeys and refrigerants.

SMART: Sustainability Management and Reporting Tool

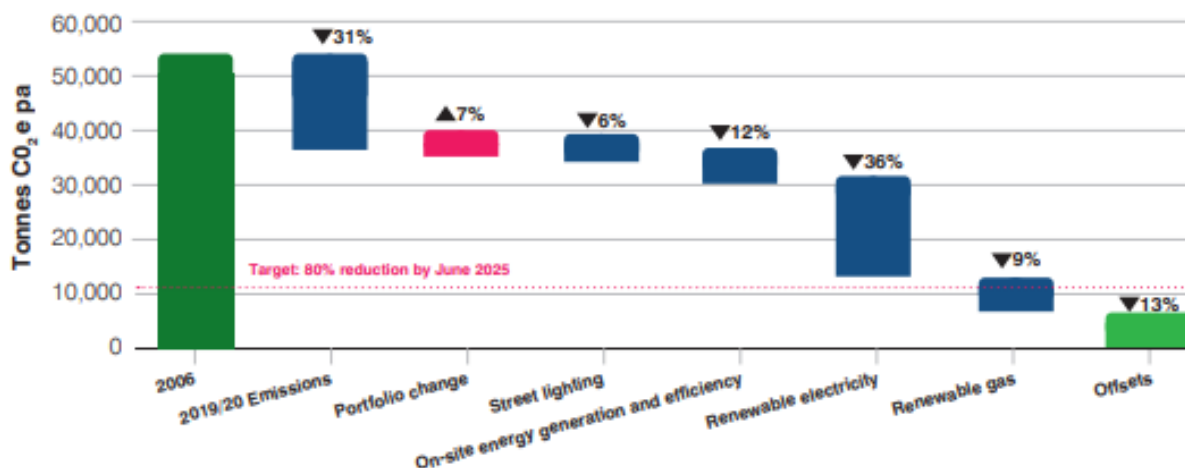


Asset Environmental Targets

How we will get there

As at June 2020, the City has a verified emissions reduction of 31 per cent from the 2006 baseline. The chart below shows the initiatives that the City has undertaken and the estimated contributions of the programs we will implement across our operational portfolio to exceed the target of reducing our emissions by 44 per cent by 2021. The commitment to 100% renewable electricity will enable the City to achieve the 80% per cent reduction of emissions well before 2025. We will maintain our certified carbon neutral status each year through the purchase of verified offsets for those emissions we cannot eliminate, as we have since 2007. On current projections, the City is anticipated to achieve 76% reduction by June 2021 and 87% by June 2025 excluding carbon offsets.

City of Sydney operations greenhouse gas emissions target to 2025. Estimated contribution of initiatives.



The waterfall chart shows emissions reductions from opportunities identified by the City and may be subject to change. For example, if more energy efficiency is deployed than depicted here, a lower amount of renewable electricity would be required, and vice-versa. Likewise, the City will continue to purchase additional high quality carbon offsets to remain carbon neutral until renewable gas becomes available. The emissions result is the same. The ultimate mix of type of opportunities deployed will be based on what is most feasible and cost effective.

Completed Initiatives - 31% reduction achieved

The result since 2006 has been achieved by:

- Portfolio change (+10 per cent) over time including additional facilities Green Square Community and Cultural Precinct, Green Square Library and Plaza, Perry Park Recreation Centre, Darling Library Ian Thorpe Aquatic Centre, 343 George Street, 546 George Street and Surry Hills Community Centre.
- Solar installed 1.75MWp capacity including Alexandria Canal Depot, Creative City Depot, Perry Park Stage 1, Wilcox Mofflin building and 37 other City buildings
- Energy efficiency programs, improved energy measurement and monitoring, behaviour changes and small works
- COVID-19 service impacts and emission factor changes
- Future portfolio increase (+7 per cent) assumes the expansion of the City's property portfolio for community and operational purposes.
- **Increases:** Gunyama Park Aquatic Centre, Huntley St Alexandria and Green Square School Community Facility Centre and through developer contributions to the City: Greenland Tower Creative Hub, 271-275 Kent St and 178-186 George Street.
- **Proposed Divestments:** Including Oxford St holdings.
- Ausgrid LED lighting (-6 per cent) the City is working with Ausgrid to deliver this program.
- Onsite Energy Generation & Efficiency (-12 per cent) Includes the completion of the Major Properties Efficiency Project, cogeneration at Cook and Phillip Park Aquatic Centre and Ian Thorpe Aquatic Centre and Solar Photovoltaics (PV) on City properties and proposed energy efficiency projects estimated for property assets.
- Offsite renewable 100% electricity (-36 per cent) purchased by the City directly from a wind and two solar farms through a Power Purchase Agreement (PPA).
- 100% Renewable Gas (-9 per cent) options to be investigated.

Initiatives to be completed by 2025

The cities current target is 80% reduction from the 2006 baseline by 2025. This target may be revised due to the City's commitment to offsite renewable 100% electricity indicating that this target will be achieved by June 2021.



Asset Environmental Target 2021

Resourcing Strategy



Gunyama Park Aquatic and Recreation Centre opened February 2021

		2021/22	2022/23	2023/24	2024/25
GHG Tonnes CO2e	2020/21				
Property Emissions Portfolio					
Carried Forward Portfolio Balance	17,465	16,466	18,172	16,998	15,592
Add					
Net Portfolio Changes	359	2,366	305	108	338
Reductions Emissions Projects					
Energy Efficiency	(690)	0	(1,388)	(1,514)	(1,388)
Co/Trigeneration Installations	(342)	(342)	0	0	0
Solar PV Installations	(326)	(319)	(90)	0	0
Total Property Emissions at End of Period	16,466	18,172	16,998	15,592	14,542
Parks and Street Lighting Emissions					
Carried Forward Portfolio Balance	12,159	11,278	10,232	9,144	9,244
Add					
Net Portfolio Changes	0	0	0	0	71
New Street Lights	0	35	41	100	110
Reduction of Emissions					
Ausgrid LED Street Lighting Program	(881)	(1,081)	(1,130)	0	0
Total Streets and Parks Lighting Emissions at End of Period	11,278	10,232	9,144	9,244	9,425
Other Emissions					
Refrigerants, Waste and Water	891	891	891	891	891
Organisational Fleet	2,100	2,000	1,900	1,800	1,700
Corporate Emissions (Events, travel, contractor fuel etc)	4,330	4,330	4,330	4,330	4,330
Reduction from previous year	0	0	0	0	0
Total Other Emissions	7,321	7,221	7,121	7,021	6,921
Reduction of Emissions					
Offsite Renewables - 100% Electricity	(22,283)	(22,105)	(19,981)	(19,626)	(18,895)
Renewables Gas	0	0	0	0	(5,072)
Total Offsite Renewables Emissions	(22,283)	(22,105)	(19,981)	(19,626)	(23,966)
Total Emissions at End of Period	12,782	13,519	13,282	12,231	6,922
Baseline June 2006 Emissions	76%	Emission Reduction June 2025:			87%
GHG Tonnes CO2e: 52,972					



Environmental Management System (EMS)

The City continues to improve its environmental management processes, in line with the ISO14001 standard and to ensure all City staff are aware of their environmental management responsibilities.

The updated Environmental Sustainability Policy aims to strengthen the environmental management expectations of our partners including suppliers, grant participants and organisers holding events in our spaces. Our partners will be required to comply with the policy and supporting guidelines including:

- [Sustainable Event Guidelines](#)
- [Guidelines for Single-Use items](#)
- [Sustainable Design Technical guidelines](#)

Embodied carbon

The City has become a founding member of Materials Embodied Carbon Leaders' Alliance (MECLA). Coordinated by WWF Australia with seed funding from the NSW Government, this program aims to work collaboratively with suppliers and users to reduce embodied carbon in the building and construction sector.

In addition, the City has commenced work on evaluating the embodied carbon of its own capital works projects. Embodied carbon - the emissions caused by the extraction, processing, transport and use of materials like concrete, steel and aluminium - is now recognised as a principal issue for the built environment. The City has several projects trialling alternative low embodied materials. This project endeavours to estimate the opportunity for the City to track and reduced embodied carbon through its works programs.

Sustainability at the City training

All staff training has been rolled out to over 670 staff from all areas of the City. The training is an interactive course focussing on the foundations of environmental sustainability and embedding outcomes into work processes and behaviours.

Design for Environmental Performance Template - Planning

The City is committed to sustainable development, in the planning process a precondition to receiving development consent is the demonstration of design excellence which incorporates the principles of ecologically sustainable development. The development must also meet the requirements under Section J of the National Construction

Code and State Environmental Planning Policy (Building Sustainability Index: BASIX), where relevant.

The Design for Environmental Performance template standardises how applicants demonstrate compliance with relevant planning controls. It ensures the design and technology responses for environmental performance that the applicant proposes are reflected in the submitted plans where appropriate. For more information on the template contact us via email at ems@cityofsydney.nsw.gov.au.

SMART - Sustainability Management and Reporting Tool

SMART is the City's system to manage, monitor and report on utilities and other sustainability metrics for all assets owned or managed by City of Sydney. It provides City asset managers and staff with improved visibility on electricity, gas, water consumption, and waste generation.

For the 2020/21 year, SMART identified utility variances within City's portfolio in tune of 58-megawatt hour of electricity, a terajoule of natural gas, 33 mega litres of water. The electricity and natural gas variances equate to 78 tonnes of greenhouse gas emissions.

Building Upgrades

The City has continued to improve the energy efficiency of its property portfolio through building upgrade projects:

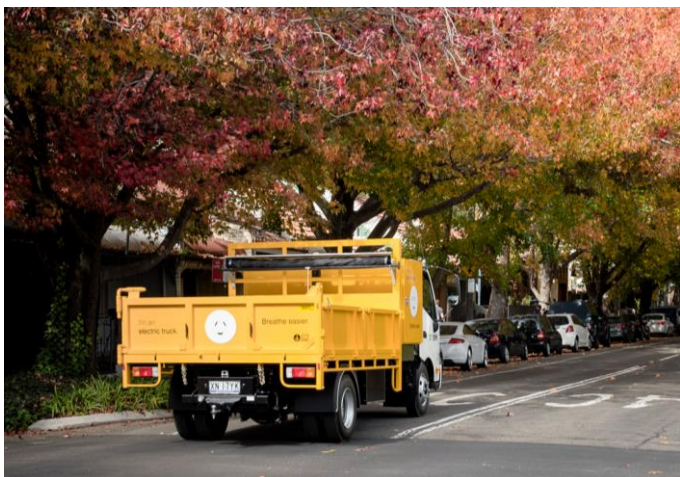
- LED lighting replacements across key City properties including within its aquatic centres and community centres which has achieved energy efficiency, and also improved light levels, occupant safety, maintenance requirements and aesthetics.
- Aquatic centre improvements including heat recovery from backwashing, new efficient heat pumps, UV modulation units and high efficiency motors for pumps.
- A key program for delivering energy and water efficiency within City buildings is the Major Properties Efficiency Project (MPEP). The program targets fourteen of the City's highest energy and water consuming sites and is a four-year program running from 2016/17 to 2020/21. The program is in its completion phase and to date has delivered approximately 1,597 tonnes of CO2 emissions savings through the above projects.



Fleet

Fleet emissions continue to contribute approximately 7 per cent of the City's total emissions and continuing efforts at emissions reductions focus on low-risk and eco-driving strategies. Low risk driving practices almost always contribute to lower fuel or battery use and as a result, fewer emissions.

The City of Sydney has embraced electric vehicles, with 19 fully electric Nissan Leaf vehicles in its fleet, as well as 40 hybrid cars and 70 hybrid trucks. Earlier this year, the City also deployed its first fully electric commercial truck, which is being trialled over the next 12 months to assess the viability of utilising electric technology in commercial vehicle applications across the City. The City also has a fleet of ten well used e-bikes.



The City's first fully electric truck © City of Sydney

Project updates

Solar PV and energy storage

To date, the City has installed 43 solar PV systems at multiple Council sites including office buildings, childcare centres, libraries, works depots, community centres, sporting fields and other venues. Three solar PV systems were added to the rooftops of City buildings from July 2020 to June 2021. Total capacity added exceeded 400 kW.

The City also hosts the first major customer-based battery storage facility in Sydney. In collaboration with TransGrid, a 500-kWh lithium ion battery system has been installed at the new Alexandra Canal depot. The battery facility allows the depot to use more of the renewable energy generated via the massive on-site solar PV installation (if there were no batteries, more on-site generated energy would be exported to the grid).

Ian Thorpe Aquatic Centre Heat pump replacement

The City has also completed the replacement of all aged and end of life heat pumps at the centre. The new, highly energy efficient heat pumps were installed in December 2020. The City is also looking to install a separate energy

monitoring and power monitoring system for the heat pumps to track and manage the energy consumption and the overall performance of the new heat pumps.

Cogeneration at Cook + Phillip Park Aquatic Centre

The City has installed a new 250 kW cogeneration unit, a new chiller, new heat pumps and new boiler at Cook and Phillip Park Aquatic Centre. The installation and commissioning of the heating and cooling equipment along with the cogeneration plant was completed in November 2020. The cogeneration system commenced operation in the first half of calendar 2021. The energy services upgrade project will deliver up to 700 tonnes CO₂e a year of emissions reduction in total.



Pratik Patel, Project Engineer at Cook and Phillip Park Aquatic Centre

Advocacy

LED streetlights

The City aims to be the first council in Australia to replace all public lighting in its area with energy-efficient LEDs.

Having completed the roll-out on City-owned lighting poles, the City is now partnering with Ausgrid (our local electricity utility) to upgrade utility-owned streetlights.

The Ausgrid upgrade involves replacement of conventional streetlight fittings (e.g. mercury vapour, compact fluorescent) with more energy-efficient LED streetlights.

Stage One of the changeover is now complete with over 99 per cent of lights on residential streets (just over 3,000 fittings) converted to LEDs by March 2021.

Ausgrid is now preparing to roll out Stage Two of the changeover by focussing on the replacement of conventional lights on major roads and in commercial areas. More than 5,000 fittings will be replaced as part of Stage Two.

When Stage One and Stage Two have both been completed, which is expected to happen by mid- 2022, emissions will have been reduced by about 3,400 tonnes a year (based on standard grid emission factors).

More information is on the [Ausgrid website](#)



The local government area

Local government area targets



Greenhouse gas emissions

- 70 per cent reduction in greenhouse gas emissions by 2030 based on 2006 levels
- Net zero emissions by 2050



Renewable energy

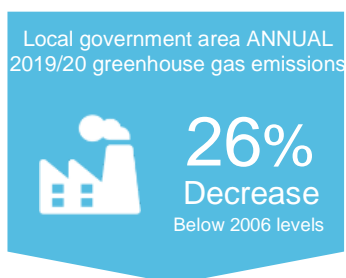
- 50 per cent of electricity demand met by renewable sources by 2030³

How the local government area is tracking

Annual greenhouse gas emissions

Chart 3 tracks actual emissions from the local government area. Note that as at 2019/20 emissions have reduced by 26 per cent since the 2006 baseline. In 2019/20 there were 51 per cent more residents, 42 per cent more jobs and more than 50 per cent growth in the economy since 2006 – which clearly shows that energy and emissions have been decoupled from growth.

The City reports emissions based on the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC)⁴ – the international benchmark for reporting city emissions.



The table below shows energy consumption data for the LGA. Please note, LGA data is shown to June 2020, as Ausgrid have not provided June 2021 data at the time of publication.

LGA	Electricity (MWh)	Natural gas (GJ)	Total energy (GJ)
Baseline	4,159,436	3,038,529	18,012,502
Most recent (to June 2020)	3,124,441	3,378,486	14,626,474
Difference	-1,034,995	+339,957	-3,386,025
Difference (per cent)	-25%	+11%	-19%

For more information see [Appendix 1: Data management plan](#).

Energy consumption data

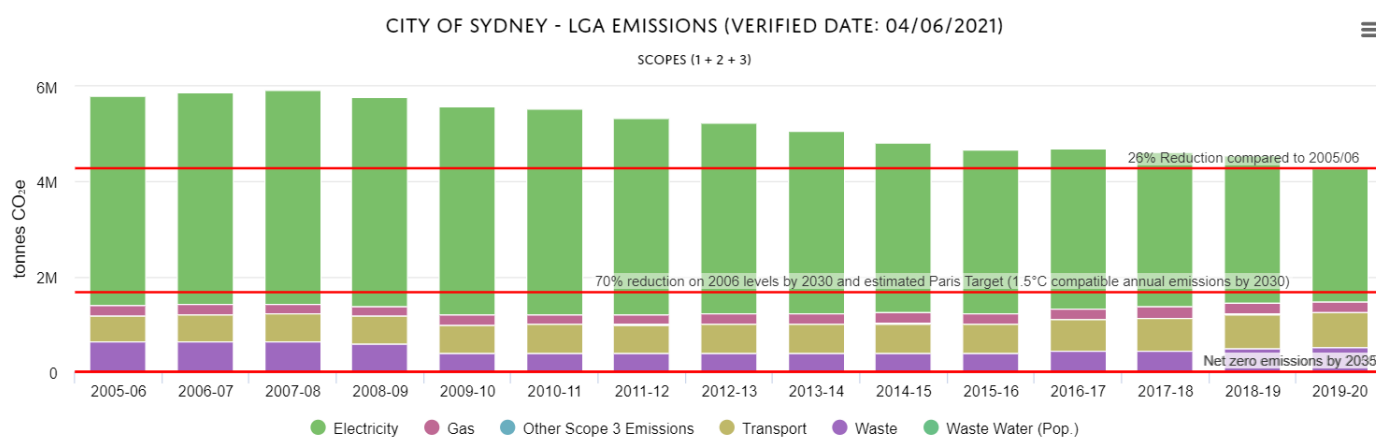


Chart 3: Local government area greenhouse gas emissions

³ The renewable electricity target incorporates renewable electricity both within the grid and classified as additional to the grid.

⁴ <http://www.ghgprotocol.org/city-accounting>



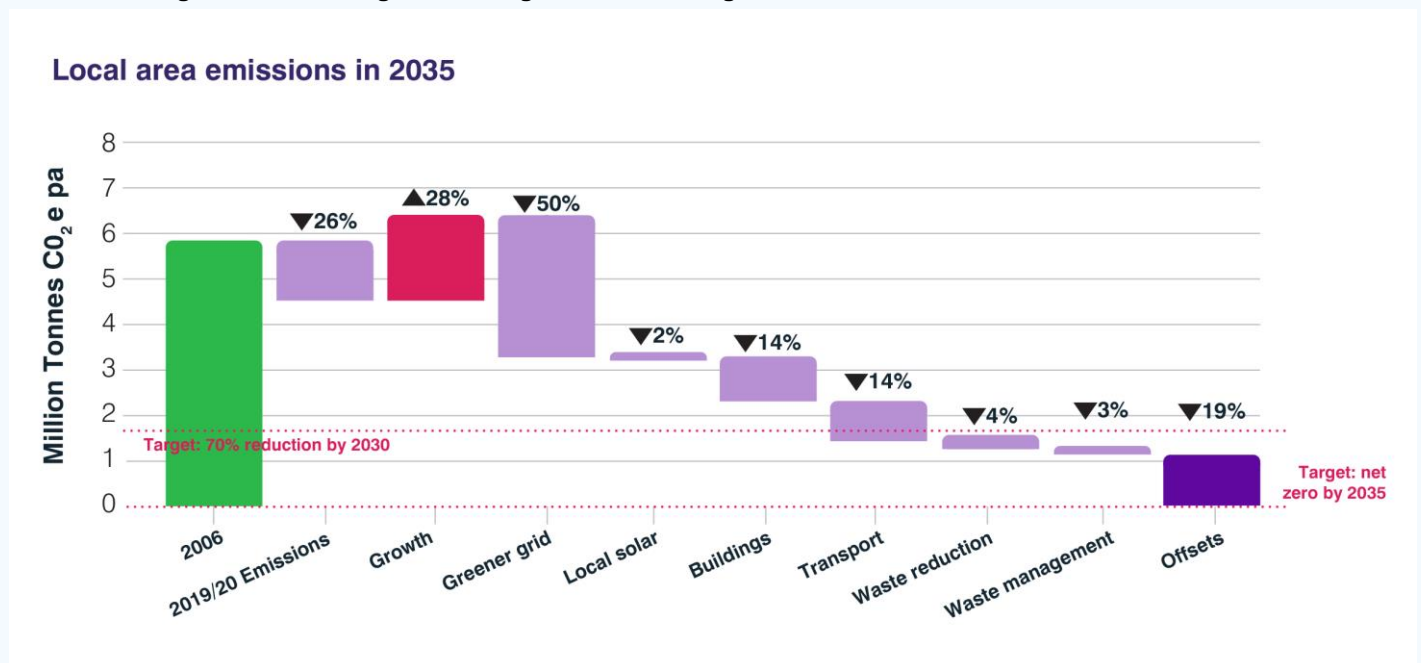
How we will get there

Chart 4 shows the estimated contributions of the initiatives we expect could lead to reduction of the city's emissions to net zero by 2035. Since 2007 total greenhouse gas emissions across the local government area have continued to fall.

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 have been growing as a proportion of the total.

Achieving the target will require major improvements in the energy efficiency of new and existing buildings and increasing the amount of renewable energy locally and in the grid, especially as Australia's aging coal generation fleet reaches end of life. The electrification of transport powered by an increasingly renewable grid will make a notable contribution to reducing emissions from transport.

Chart 4: Local government area greenhouse gas emissions target. Estimated contribution of initiatives.



- Growth (+28 per cent) represents a reference case to show the increase in emissions due to growth in buildings, jobs and residents in the absence of interventions.
- Greener grid (-50 per cent) reflects current Australian Energy Market Operator (AEMO) projections under the step change scenario in the AEMO Integrated System Plan (ISP) 2020 - note: latest projections indicate the grid is greening at a more rapid rate than depicted here.
- Local solar (-2 per cent) estimates emissions reduction from renewable energy installed within the local government area.
- Buildings (-14 per cent) calculated based on existing and new state, local and federal government policies and programs such as building codes and planning controls.

- Transport (-14 per cent) shows emissions reductions by changing away from car travel towards public transport and walking and cycling, and electric vehicles including public transport using renewable energy
- Waste reduction (-4 per cent) reflects savings from avoided waste such as through circular economy initiatives.
- Waste management (-3 per cent) is calculated on avoided landfill emissions through alternative waste treatment.
- Offsets (-19 per cent) is based on the purchase of carbon credits by public and private entities to offset emissions which cannot be avoided.

High voltage electricity data

The electricity distributor has provided community-wide high-voltage (HV) electricity data for City of Sydney local government area. HV electricity is now around 14 per cent of total LGA electricity however we do not include this in the City's official GPC community inventory as it is unclear how reliable or replicable this data is due to confidentiality reasons.

While electricity usage is generally declining as buildings and equipment become more efficient, HV electricity is on the increase, most likely due to increasing demand for rail public transport and data centres. More renewable energy supply will be key to reducing emissions from these sectors on a trajectory to net zero and it is encouraging that the NSW Government intends on running Sydney Trains using renewable electricity within 4 years.



GreenPower residential customers © City of Sydney

Take action

Sydney needs to accelerate its transition from a city powered by coal, to an efficient low-carbon city, and ultimately to a net zero city by 2035 or sooner.

Here are some examples of the materials the City has produced to educate our community about renewable energy:

- Development of the [Renewable Energy Help Centre](#) – an online knowledge base covering everything from solar panels to power purchase agreements.
- An illustrated [video explaining how GreenPower](#) works and why it's the quickest and easiest way to switch to renewables at home and work.

Net Zero Construction Materials: A Briefing for Government Executives and Leaders

NSW Government is tackling the challenges and seizing the opportunities in a net zero emissions economy. More than 100 professionals from all levels of government kicked off the first national discourse on low emissions building materials. Case studies showed that these materials are already being used in some of the largest projects in the state including Inland Rail and Transport for NSW, as well as the City of Sydney.

David Eckstein, Environmental Advisor for the City presented the City's case study on its [geopolymer pavement trial](#).

Advocacy

Increase the building code targets

BASIX and the National Construction Code are the mandatory planning instruments that set the minimum standard for energy and water efficiency of new buildings. The BASIX standard was set 12 years ago and is in need of review to keep pace with current best-practice, and ensure that new poor-performing buildings do not lock-in carbon emissions for decades to come. The National Construction Code also needs to appropriately deliver against its [net zero trajectory](#) with clear review and update milestones. The City is a member of the Australian Sustainable Built Environment Council (ASBEC) and Energy Efficiency Council which are both leaders in advocating for better performing, efficient, cost-effective, safe, affordable, and comfortable buildings.



David Eckstein, Environmental Advisor at City of Sydney

Advocacy

Standards for urban renewal precincts

Upcoming urban renewal precincts in our local area – such as Waterloo Estate, Central Station precinct and the Bays Precinct – present the opportunity to deliver world-leading environmental sustainability outcomes. The NSW state government will be redeveloping these sites, and the City is advocating for high environmental standards for these areas as they will be bringing tens of thousands of new residents into our LGA – and we want their environmental footprint to be as small as possible. This is a key way for the State Government to deliver against its own target for net zero emissions across the state by 2050.



3. Water sensitive city



Recycled water use © City of Sydney

Water is crucial to the social, economic and environmental wellbeing of our city. Sydney is under pressure from rapid population growth and urban densification. Water sensitive approaches helps deliver a more sustainable and liveable city with green public spaces and healthy waterways.

Our operational targets



Water consumption

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



City of Sydney operations

Why reduce our potable water use?

The predicted impacts of climate change and population growth will continue to strain our potable water supplies. To respond to this, the City is transforming to be a water sensitive city that is resilient, cool, green and productive. We aim to drought-proof our operations, so we can use water when it is hot and dry to help keep the City green and cool. The City's non-potable water supplies will safeguard our water supplies so even in times of drought, we can help for use in the next century and beyond.

What is potable water?

Potable water, also called drinking water, is water suitable for drinking, cooking, and personal bathing.

What is non-potable water?

Non-potable water is not the same quality as drinking water and can be used for purposes such as irrigation, toilet flushing and dust suppression.

What makes up City operational water use?

Type	Includes
Parks and Public Domain	Parks, open spaces, sports fields, street gardens and playgrounds. Also included are water features that are in the public domain.
Commercial buildings	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 other categories
Community buildings	Includes childcare centres, libraries, community centres and town halls.
Aquatic facilities	Includes Victoria Park Pool, Andrew (Boy) Charlton Pool, Cook and Phillip Park Aquatic Centre, Ian Thorpe Aquatic Centre and Prince Alfred Park Pool.
Operations	Depots and workshops

The City of Sydney’s approach

Our approach to meeting our water targets and becoming a water sensitive city involves:

- Using less water through changes in behaviour and using water efficient fixtures and fittings
- Capturing alternative water sources to recycle and use for non-potable purposes
- Connecting our parks and buildings to non-potable water supplies, such as harvested stormwater and rainwater
- Reducing stormwater pollution, minimising local flood risk, enhancing greening and urban cooling through retrofitting the stormwater management network with raingardens, wetlands, swales and gross pollutant traps
- Regularly auditing and, where necessary, upgrading irrigation systems to be more efficient
- Improved data management and monitoring to identify, investigate and rectify anomalies in water consumption.

How we are tracking

Annual water consumption

As at June 2021, it is estimated that the City operations potable water use has decreased by 22 per cent from the 2006 baseline, from 431 to 335 ML per annum (this estimate includes 22% accruals).

The below table summarises the difference between our current and 2006 baseline water use.

City of Sydney operations – water use comparison	
Baseline (FY 2006)	431 ML
Current (FY 2021)	335 ML
Difference (ML)	-96 ML
Difference (%)	-22%

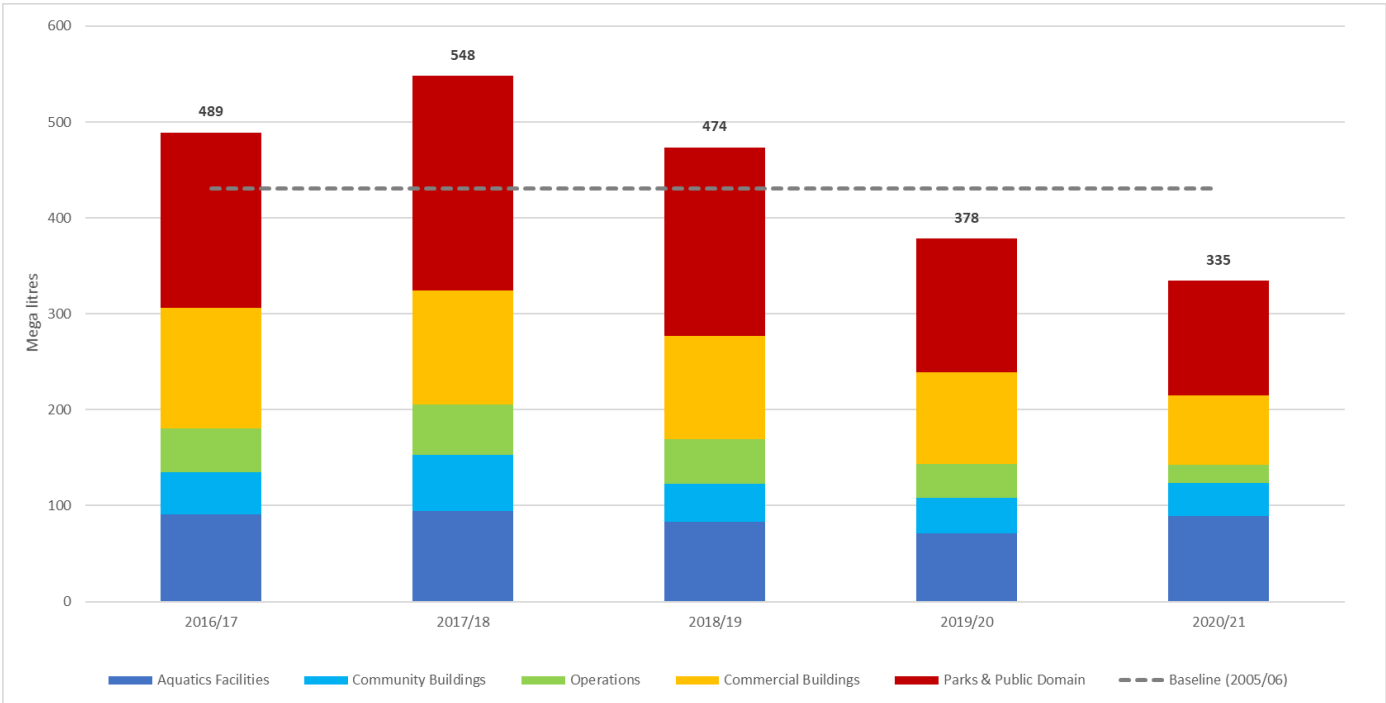


Chart 5: City of Sydney operations potable water use

Chart 5 shows our organisation wide water use over the past 5 financial years.

Water savings for the period 2020/21 are due to identification and rectification of leaks, results from our tenancy on-charging program, improvements in water data management and water efficiency projects.

A large portion of savings are also attributed to increased rainfall and COVID-19 related closures of water intensive City sites such as aquatic centres and public buildings.

- Notes for Chart 5:
- The 2020/21 figure of 335 ML includes 22% accrued data.
 - All data sourced directly from Sydney Water and stored within the City’s SMART data management system.
 - Exceptions - Only sites where the City has ‘operational control’ are included. Properties where a whole building is leased and the tenant has full building operations and maintenance obligations, such as the Queen Victoria Building and the Capitol Theatre, are excluded.
 - Categorisation method – When allocating multi-purpose City buildings to one of the above categories, the dominant water use type for the reporting period is the determining factor for the reporting period. For example, Customs House has office, retail, library, and exhibition uses, and is allocated to Commercial Buildings. Over time the categorisation of a property may change depending on the use.



Harold Park wetlands © City of Sydney

Project updates

Water consumption in parks

Since 2006, the area of parks and open spaces requiring irrigation in the LGA has increased by over 50 per cent. This includes Harold Park, Wentworth Park, Redfern Park, Redfern Oval, Pirrama Park, Harmony Park, Prince Alfred Park, Paddington Reservoir Gardens, Peace Park, Lillian Fowler Reserve, Mary O'Brien Reserve and Coulson Street Reserve.

Despite these increases in green spaces, parks staff and our service providers have worked to reduce water use over the last three years through irrigation efficiency programs, prompt rectification of leaks and water losses and ensuring recycled water is used where possible.

Improved water data is being collected in SMART and more accurate asset area data in the City's Corporate Asset Management System (CAMS). The accuracy of irrigation rates will be reviewed and revised if necessary, and when complete reported through future Green Reports.

The table below provides estimated potable water usage in City Parks and Public Domain (as shown in Chart 5).

City Parks and Public Domain	
Financial Year	Potable water use (ML)
2006	133
2015	194
2016	157
2017	183
2018	224
2019	197
2020	139
2021	120

Smart watering project

The Smart watering project is focused on delivering automated, digital, close-to-real-time view of water usage needs in the City's parks to inform water management decisions impacting the City's potable water consumption targets. A proof of concept for Alexandria Park Oval is currently in implementation phase. Soil moisture sensors have been installed in Alexandria Oval and data from the sensors is being collected. Work to develop data visualisation of the captured and live data is underway. These visualisations will be provided to support operational staff and management to make better decisions about water use.

Improving our data

The City's organisation wide metering project commenced implementation in early 2020 and is delivering important benefits for the management of water in Parks, including:

- Sub meters and data logging on our large irrigation systems. This data, combined with more accurate asset areas from CAMS, will be used to more accurately report on irrigation efficiency and fine tune irrigation practices.
- Automated collection of water consumption data at major parks will give better visibility of how water is being used. At least 90 per cent of water consumption in parks and open spaces will be monitored daily, or even more frequently. This will help improve the City's system for monitoring and controlling park irrigation, to further drive water efficiency and reduce water consumption.

We now have over 90 water monitoring points in the City's parks and open spaces.



Project updates

Sydney Park water reuse scheme upgrade

The Sydney Park water reuse project was originally completed in 2015 and enables around 850 million litres of stormwater each year to be harvested from our urban stormwater network and captured in a series of wetlands within Sydney Park.

These wetlands provide several benefits to our community. They provide habitat for wildlife, enhance the park's visual amenity, and naturally clean the stormwater before being discharged into the Cooks River via Alexandria Canal.

The capture of stormwater in Sydney Park's wetlands also provided the opportunity to treat and re-use this stormwater for non-potable water uses such as: irrigation of Sydney Park, growing plants at our nursery depot, and watering street trees and street gardens. There is also opportunity to improve the treated water quality better for ablution use.

In 2017, the original water treatment plant at Sydney Park was removed to accommodate changing land use resulting from the NSW State Government's WestConnex road project. This required the City to build a new fit-for purpose stormwater recycling treatment plant, so we could continue to utilise recycled water in and around Sydney Park.

Installation of the new water recycling plant is now complete and is supplying recycled water for irrigation in Sydney Park, the nursery and for watering using tanker trucks. Since the new treatment plant was commissioned in October 2020 it has produced 3.5 million litres of treated stormwater.

The new treatment plant even has the capability to expand in the future and increase the supply of recycled water to meet other demands in the area.



Green Square water reuse centre © City of Sydney

Green Square water reuse

The best opportunity to develop water recycling schemes is within urban renewal areas because they provide the density and scale required for efficient investment in recycled water infrastructure and can be planned and installed at the time of

development, which is cheaper and more efficient than retrofitting. It also allows private water utilities to offer water services across an entire precinct, improving commercial viability.

The City has successfully delivered Green Square Stage 1. In 2018, we switched on one of Australia's first decentralised stormwater recycling schemes in an urban environment. The scheme currently provides recycled water to parks, community facilities and more than 1,000 apartments in the Green Square Town Centre for garden and turf irrigation, toilet flushing and clothes washing. The scheme has potential to supply recycled water to more than 3,000 apartments.

In the last year, the City has connected the Gunyama Park and Aquatic and Recreation Centre where it is using the recycled water for irrigation and in toilets. The sale of surplus City owned land in Green Square for apartments and affordable and social housing has been conditional on the developers connecting the new buildings to the Stage 1 scheme, thus expanding and making best use of the City's investment in water recycling.

CBD Water recycling scheme

As part of the construction of the Sydney Light Rail project, at the request of the City, recycled water pipelines were installed along George Street between Circular Quay and Prince Alfred Park next to Central Station. Along with the recycled water pipeline installed along Wynyard Walk, the City has an invaluable opportunity to develop a recycled water scheme in Sydney's centre.

It is envisaged that selected City of Sydney assets and interested customers (such as building owners and developers) could connect to a recycled water pipe network and be provided with recycled water for non-potable (non-drinking water) uses such as park irrigation, garden watering, toilet flushing and cooling tower use.

A successful CBD water recycling scheme will require diligent planning and delivery, as well as approval and a license under the NSW Water Industry Competition Act. The City has developed an Expression of Interest and will shortly be engaging with industry on how to best use these assets to deliver recycled water.

The City has signed a Memorandum of Understanding (MOU) with Sydney Water with both organisations committed to working together to promote the use of recycled water.



Environmental Grants

Sydney Harbour sediment remediation

A feasibility study undertaken by Sydney Institute of Marine Science, The University of Sydney and Macquarie University to measure the potential for natural burrowing animals (bioturbators) to be reintroduced into Sydney Harbour to remediate harmful pollutants retained in sediments that enter via stormwater inputs.

The introduction of native burrowing animals, particularly the native worm *Diopatra aciculata*, has produced an increase in the condition of sediments in terms of oxygenation and potential for nutrient processing. This has derived in the colonisation of other native species in these areas and an average increase in biodiversity of 50%.

Project outcomes summary

Sydney Harbour provides important socio-economic amenities and supports significant biodiversity, and stormwater discharges represent the main source of contaminants that impact the health of the Harbour. Burrowing animals (i.e. bioturbators) on the seabed play an essential role in the natural remediation of sediment contaminants and associated improvements in water quality. These animals have been mostly lost from Sydney Harbour sediments due to contamination, trampling and overfishing.

This pilot project successfully introduced native worms to contaminated sediments next to stormwater outflows in Sydney Harbour (Blackwattle, Rozelle and Rushcutters bay). Initial project results showed that native burrowing animals can increase sediment oxygenation, deriving in greater capacity of sediments to process nutrients and greater biodiversity. This indicates recovery of ecosystem services in these sediments and a boost on their resilience to climatic change.



Sydney Harbour Research Program undertaken by Sydney Institute of Marine Science, the University of Sydney, and Macquarie University



Local government area targets



Water consumption

- Zero increase in potable water use by 2030 from 2006 baseline, achieved through water efficiency and recycled water



Stormwater quality

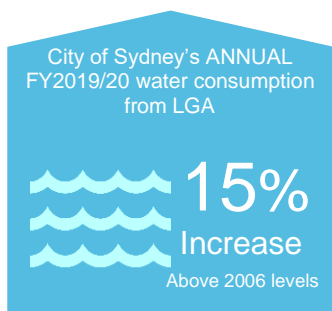
- 50 per cent reduction in the annual solid pollution load discharged to waterways via stormwater by 2030
- 15 per cent reduction in annual nutrient load discharged to waterways via stormwater by 2030



The local government area

How are we tracking?

Chart 6⁵ shows annual potable water usage across the city has grown 15% against our 2006 baseline, during which time the city's population has grown at least 51 per cent.⁶



Water efficiency programs, environmental performance grants and recycled water schemes will continue to be focus areas to relieve pressure on our potable water supplies.

Our policies to incorporate recycled water on a precinct scale will assist in keeping our city green and cool and use less potable water for non-potable uses.

Multiple factors have led to annual consumption rising above the baseline in recent years including increased growth in the local area, increased temperatures, extreme heat days and heatwaves.

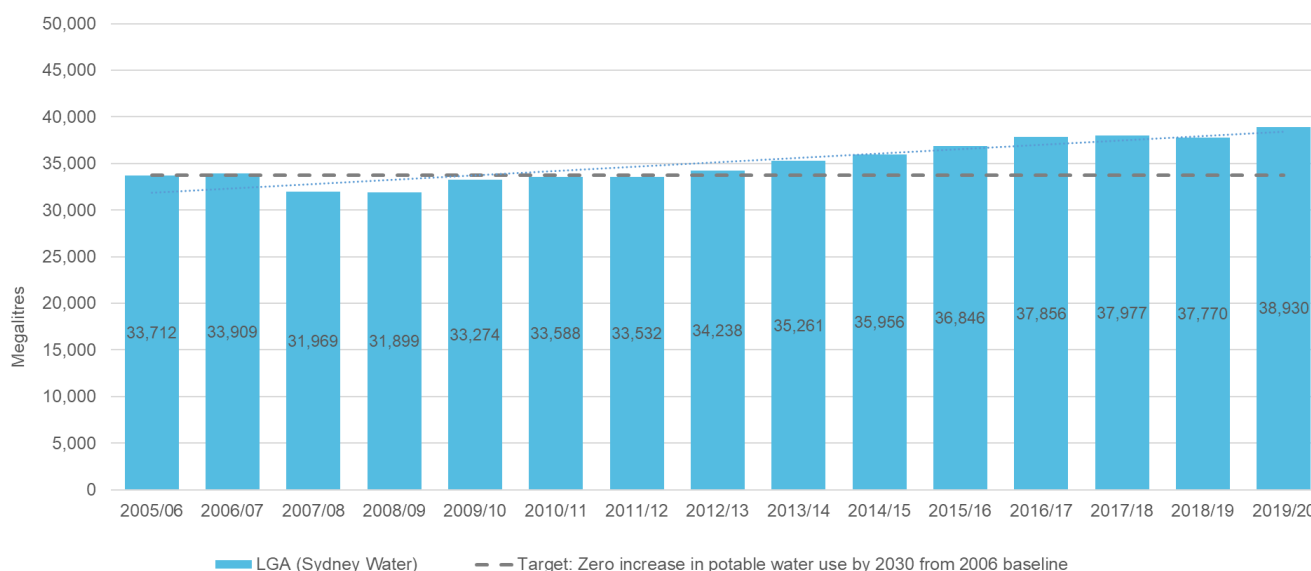
Water consumption data

This table shows water consumption data for the local government area. Data for the local government (LGA) is based on actual data received from Sydney Water for consumption to end 2019/20. Data for 2020/21 will be available from Sydney Water by early 2022 and will be included in the next report.

	Baseline (ML)	Current (end 19/20) (ML)	Difference (ML)	Difference (%)
LGA	33,712	38,930	5,218	15

For more information, see [Appendix 1: Data management plan](#)

Chart 6 City of Sydney's local government area potable water use



⁵ All data sourced directly from Sydney Water

⁶ Based on 2019/20 LGA residential population compared to 2005/2006 baseline



Coastal management program

As part of the City's coastal catchment management obligations, the City is a member of the following programs:

- The Greater Sydney Harbour Catchment Management Program, project managed by Sydney Coastal Council Group and chaired by Professor Bruce Thom from the NSW Coastal Council. In collaboration with 33 stakeholders across the catchment, the project team is working on developing and delivering a whole-of-catchment Catchment Management Plan, to achieve a strategic and coordinated management framework for the harbour.
- The Cooks River Alliance is bringing together stakeholders from across the catchment to develop a long-term strategy with actions to improve the health of the Cooks River using the NSW Coastal Management Act.

Stormwater quality improvements

The City has some of the oldest stormwater drainage infrastructure in Australia. With the continued urbanisation and densification of Sydney, our natural landscape continues to be altered leading to increased stormwater run-off (with increased impervious surfaces) and declining waterway health due to high concentrations of nutrients, sediments and other pollutants such as litter entering our stormwater network and ultimately the Cooks River and Sydney Harbour.

The City is committed to improving waterway health by reducing stormwater pollution entering downstream waterways. We're achieving this by installing and maintaining stormwater treatment systems (such as Gross Pollutant Traps (GPT), raingardens, wetlands and swales) in our stormwater network, and using water sensitive urban design (WSUD) and management approaches, including:

- Mandating WSUD in new developments
- Installing GPTs in the stormwater network to remove litter and large solids from stormwater
- Installing raingardens and wetlands in public open spaces to slow down and filter pollution from stormwater flows.
- Incorporating raingardens into road renewal and streetscape upgrade projects.

What we've already done

We've installed 248 raingardens in the City of Sydney local area since 2005. These gardens treat stormwater, protect local waterways and green our streets. There are also 47 council owned gross pollutant traps (GPTs) in the stormwater network.

From January to June 2021, these GPTs have removed 109 tonnes of rubbish from the City's stormwater network. In addition, an estimated 600 tonnes have been removed through pit and pipe cleans.

To encourage other organisation to improve their contributions to water quality, the City is liaising with other GPT owners in the LGA to improve collaboration, exchange information and advocate for improvements where possible.

The City completed an audit of the City's GPTs in 2019 and identified rectification works to restore the optimum performance of these GPTs. These rectification works are now completed, and further improvements are now underway. A similar program of repair and upgrade is now underway for the City's raingardens.

The City has also reviewed the maintenance schedules of its GPTs (to optimise their cleaning regime), improve maintenance access to the GPTs and established a program for regular inspection to maintain optimal performance.

Through the Development Application process, the City has developed water quality requirements for large developments to ensure stormwater from large developments meet high water quality standards.

MUSIC model

MUSIC⁷ is a water quality decision support tool that helps the City estimate stormwater pollutant generation and simulate the performance of our stormwater treatment systems such as our GPTs, raingardens, wetlands and stormwater harvesting schemes.

The City has developed a MUSIC models that covers the entire LGA. A 2006 model has been developed to establish a baseline against which progress towards water quality targets can be measured. The City is currently developing a MUSIC model for the current scenario (2021) for comparison against the baseline model.

The City will use the current state model to make catchment management decisions. For example, the City can select the optimal locations for new stormwater treatment systems that best contribute to our Sustainable Sydney 2030 water quality targets.

⁷ MUSIC stands for Model for Urban Stormwater Improvement Conceptualisation.



The City will continue to develop the current state model as water quality initiatives are implemented allowing progress towards our stormwater quality targets to be monitored.

The City now has MUSIC Link that improves efficiency for both developers and the City in meeting water quality targets. It allows for quicker confirmation that water quality infrastructure, installed as part of a development application, meets the City's MUSIC modelling settings and pollutant removal targets.

Awards Achieved

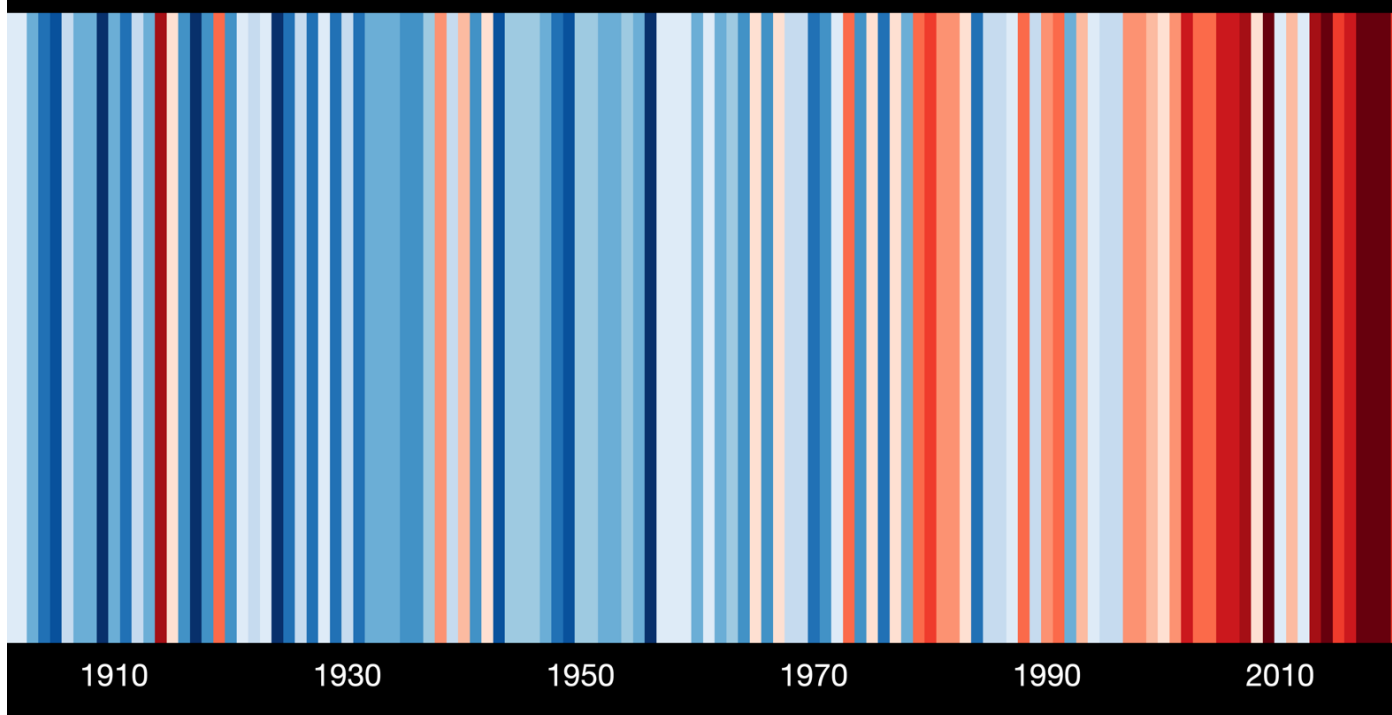
The City was recently named the co-winner of the prestigious 2021 National Award for Excellence in Asset Management by Stormwater Australia.





4. Climate resilient city

Temperature change in New South Wales since 1901



Credit Professor Ed Hawkins (University of Reading) Show your stripes These 'warming stripe' graphics are visual representations of the change in temperature as measured in each country over the past 100+ years. Each stripe represents the temperature in that country averaged over a year. For most countries, the stripes start in the year 1901 and finish in 2020.

Climate Emergency Response

In an emergency, we must all act. Our leaders must rise to unite the community and drive the vision of a zero-carbon economy. We must speed up our responses in areas where we can have positive impacts on reducing the detrimental effects of climate change.

In 2019 we joined 85 other councils to declare a climate emergency. Our [Climate Emergency Response](#), endorsed by Council in February 2020, outlines how we will take swift and meaningful action on climate change, to ensure the future sustainability of the City of Sydney, its communities, economy and environment. The four focus areas of the Climate Emergency Response include:

Lead by example

Action in this area aims to ensure consideration of the climate emergency is incorporated into the City's decision-making processes and operational activities. Recent work has included the development of the [Environmental Sustainability Policy](#), which strengthens the City's climate change commitments. This policy is to be implemented across all council functions, activities and decision making. The policy applies to City employees, contractors, service

providers, suppliers, leasers, customers, grant recipients and volunteers working with us or on our land.

Support climate emergency priorities through planning

The City has reviewed its key planning controls – the Local Environmental Plan and the Development Control Plan.

As part of this review, the City has also released the strategic review, [Planning for net zero energy buildings](#). The report identifies the most appropriate performance standards to achieve high-performing net zero energy buildings in Greater Sydney.

The City's new Greening Sydney Strategy 2030, outlines ambitious urban greening programs and actions, has also finished exhibition. The implementation of this Strategy will deliver a cooler, calmer and more resilient city.

Work with and prepare our communities

The City's operations are 100% renewable electricity from 1 July 2020 (see the project update in Low Carbon City). We have been sharing information with our residents and business to assist them to make the switch too. Our [renewable energy help centre](#) has tools and information to assist all members of the community, from large business to renters in apartment buildings.



Build momentum and advocate

We know we need to work together with other councils to take climate action at scale. The City is a founding member of Climate Emergency Australia – a national network of governments and section partners, to provide the climate leadership Australia needs. In its first year the network will focus on shared advocacy priorities and developing climate action tools for councils.

Resilient Sydney

The Resilient Sydney Strategy (2018) is now well into implementation phase delivering key actions to make Sydney more resilient with the 33 Greater Sydney councils and key partners. Ongoing city-wide networks encourage

A summary update for key actions includes:

- Action 1: Shocks and stresses managed through planning for growth: Greater Sydney's local governments are significantly increasing understanding, preparedness and planning for place-based shocks and stresses, including climate risks with resilience plans now under development or adopted for 12 of the 33 councils, supported by Resilient Sydney.
- Action 7: Affordable Housing: SSROC and Resilient Sydney are partnering to lead action with two forums with councils delivered during the period, and a working group established with State, ROCs and Western City Parkland group.
- Action 9: Cool Suburbs Tool: Initial development of the Cool Suburbs rating tool led by WSROC is complete and will now be tested with developers in Western Sydney. The tool rates the extent urban developments mitigate and manage urban heat for community life safety and liveability. This work was recognised by the Greater Sydney Commission which awarded the project a Greater Sydney Planning Award for Best Sustainability Initiative.
- Action 13: Resilient Sydney Platform: Collaboration Agreements have been developed with the NSW Department of Environment, Industry and Environment to accelerate delivery of place-based net zero emissions action and urban forest strategies across Greater Sydney. On 26 May 2021, over 100 council officers from Sydney councils actively contributed to a Greening our City workshop. Over 215 council officers of Sydney now use the Platform to access environmental data to inform local policies and programs. Over 1500 hours of training webinars have been accessed since inception.
- Action 16: Monitor metropolitan wellbeing and social cohesion- Resilient Sydney is partnering with Department of Communities and Justice to develop and deliver social cohesion initiatives for local government
- Action 18: Support communities to know their neighbours Resilient Sydney supported twenty-five councils to take part in Neighbour Day 2021 on Sunday 28 March 2021. The campaign encouraged councils to promote community social cohesion and social connections, especially during periods of extended city lockdown and physical distancing measures due to the pandemic.
- Action 33: monitoring and Evaluation: Resilient Sydney team conducted over 20 Interviews and collated 154 survey responses to develop draft findings to evaluate five years of the Resilient Sydney program.





Working with Greater Sydney

One of the reasons the City of Sydney has invested in Resilient Sydney is to play a role in building the resilience of Greater Sydney. When we work closely with our colleagues across local government, we build the relationships that will enable us to help each other to serve our communities. A team of five City of Sydney Health and Building staff volunteered with Hawkesbury Council following the major flood event in March.

The Hawkesbury Council is located on the northern border of the Sydney metropolitan area with the majority of its LGA rural land; very different to the City's LGA built area. The City of Sydney team noted that while the way the two Councils serve their communities is varied based on different community needs, the Hawkesbury staff face levels of challenges while serving their community that might be beyond our city-based imagination.

The resilience of the Hawkesbury community was clear to see. They have been through one of the worst bushfires in 2019, many medium scale floods and one major flood in the past few years. The stories the City team heard during their time at Hawkesbury were powerful and inspiring including residents who owned boats checking on their 'acreage' neighbours offering help, food, shelter and much more before SES were able to reach them. These neighbours had never met before the March flood and were amazed by the amount of help they received from their neighbourhood. Most members of the community anticipate a bigger flood event predicted for late June-July 2021 and are all getting ready to deal with it together.

Responding to COVID-19

During the COVID-19 disruption in 2020, the Resilient Sydney Office hosted regular Resilience Ambassadors meetings to connect all councils of Sydney. Councils have shared good practice community recovery and economic investment programs and approaches for a COVID-safe summer in Sydney. Discussions continue with NSW Government to share the learning of five years of the Resilient Sydney program in the future direction of Resilience NSW.

Resilient Cities Network: The global Resilient Cities Network remains active during the ongoing pandemic crisis, rapidly exchanging lifesaving emergency planning insights from cities on the front line of responding to COVID-19. Insights from global cities are being shared across metropolitan Sydney councils and the NSW government. Resilient Sydney continues to participate in a working group of cities sharing expertise on managing the impacts of extreme heat in the context of COVID-19 and social distancing measures.

Climate Adaptation Strategy

The Council endorsed its Climate Adaptation Strategy in 2015 to help us prioritise and plan actions to prepare the city for the environmental, social, cultural and economic impacts of climate change.

The following provides an update of the trends and climate observations as at July 2021.

- Under the Paris Agreement, most countries agreed to halt warming at well below 1.5°C in view of the predicted risks to the environment, our societies and our economies. The UNEP Emissions Gap Report 2020⁸ states that current levels of commitment are insufficient to meet this target.
- The report outlines that the COVID-19 pandemic offers only a short-term reduction in global emissions and will not contribute significantly to emissions reduction by 2030 unless countries pursue an economic recovery that incorporates strong decarbonisation. The report estimates that CO2 emissions could decrease by about 7 per cent in 2020, however atmospheric concentration of GHGs continue to rise, with the immediate reduction in emissions expected to have a negligible long-term impact on climate change.
- Historic and ever-increasing burden of human activity on the Earth's climate is observable in the continuing rise in extreme weather events. Including wildfires and hurricanes, and in the melting of glaciers and ice at both poles. The United Nations Secretary-General is calling on governments to use COVID-19 recovery as an opportunity to create more sustainable, resilient and inclusive societies, including commitment to net-zero goals before 2050.
- There is an urgent need for us to act globally now to reduce emissions, to avoid the devastating impacts of global warming that are forecast. Inaction comes with economic and social costs; disproportionately shouldered by those who can least afford it.
- The City is fast-tracking priority actions of the Climate Adaptation Strategy to reduce the impacts of urban heat island effects through the urban canopy planting program and intense storm impacts through floodplain and stormwater management, along with myriad social and economic plans.
- The strategy, titled "Adaption for Climate Change: A long term strategy for the City of Sydney" can be downloaded from our website. The strategy will next be updated in 2022 when the IPCC release updated climate reports.



Impacts for Sydney

Human activities are estimated to have already caused 1°C⁹ of global warming above pre-industrial levels. In 2020, Australia's climate has warmed on average by 1.44 ± 0.24 °C¹⁰ since national records began in 1910, leading to an increase in the frequency of extreme heat events. Across Australia we are witnessing this as alarming episodes of extreme heat, water shortage, flooding and bushfires, all of which impact our vulnerable populations, livestock, food production and of course, our native flora and fauna.

In Sydney, our major climate hazards include extreme heat, drought and bushfire impacts

Extreme heat

2020 was Australia's fourth-hottest year on record. The most extreme heat occurred in western Sydney, with Penrith experiencing 48.9 C on 4 January 2020. Penrith's temperature was a new record high value for any metropolitan area in Australia. Such temperatures are dangerously hot, and place extreme thermal stress on humans and the environment.

The overall climate of the City of Sydney local government area is considerably influenced by its coastal position and proximity to the ocean, despite the cooling sea breeze the city still suffers from Urban Heat Island impacts.

The City commissioned the Cooling Sydney Strategy to provide urban overheating mitigation recommendations to support the strategic planning of Sydney. Appropriate design features include cool roof, cool facades, green roofs, vertical greenery, tree canopies, cool building materials, natural ventilation and smart use of water are some of the ways to mitigate urban heat island impacts.

Rainfall

Australian rainfall is highly variable and is strongly influenced by drivers such as El Niño, La Niña, the Indian Ocean Dipole and the Southern Annular Mode. Despite this natural variability, long-term trends are evident in Australia's rainfall record. There has been a shift towards drier conditions across the southwest and southeast, with more frequent years of below average rainfall, especially for the cool season months of April to October. In 17 of the last 20 years, rainfall in southern Australia in these months has been below average. This is due to a combination of natural variability on decadal timescales and changes in large-scale circulation caused by increased greenhouse gas emissions.

Whilst rainfall in 2020 was above average for NSW¹¹ - average rainfall for 2019, was extremely low - 40 per cent below the national average - comparable to the other driest periods in Australia's recorded history including during the Federation Drought and the Millennium Drought.

Since 2017, much of NSW rainfall has been close to or below previous record low reading and the impacts of low rainfall in this multi-year period have been intensified by record high temperatures.

In this setting, available water evaporates more quickly, and low soil moisture is experienced. This in turn adversely affects the filling of water catchments when it does rain.

The City has committed to be a water sensitive city where we continue to identify opportunities for operational improvements in the use of water, to develop alternative water supplies and to advocate to the NSW Government to promote investment in recycled water schemes. The availability and smart use of water is just one way of making our city resilient when it is hot and dry.

Bushfire

The 2019–20 bushfires in Australia were unprecedented in their extent and intensity across multiple Australian states. A 60-kilometre long "mega fire" around Sydney was larger in size than the Sydney metropolitan area and the resulting air quality, even in the centre of Sydney, was deemed hazardous – the worst on record.

In May 2020, the NSW Fire and the Environment 2019–20 Summary was published by the NSW Department of Industry and Environment, which details the first assessment of the effects of the fires on NSW biodiversity and landscape values.

Why it is so important to act now

Mitigating climate change is a fundamental challenge facing cities, governments and communities. On a city, state and national level we have made global commitments for action that will contribute to managing and mitigating extreme weather in Sydney.

It is important to also keep in sight that action on climate change not only averts natural disasters. It brings social and economic benefits. Energy prices could be lower and more secure, cities cleaner, more people employed, and human health improved through better diet and cleaner air. The scale of the challenge outlined by the IPCC is that global emissions need to be half by 2030, and net zero by 2050 – to have a 50 per cent chance to limit global warming to 1.5°C.

The City of Sydney responds to this climate emergency by using all levers available to local government. However, the transformative change required cannot be delivered by local government alone. State and Federal government policy, legislation and funding need major changes to reduce greenhouse gas emissions, manage the transition and adapt to climate impacts.

9 IPCC Special Report on the impacts of Global Warming
10 Bureau of Meteorology State of Climate 2020

11 <http://www.bom.gov.au/climate/current/annual/aus/>



Sydney's air quality monitoring

Researchers from the Land and Atmosphere Remote Sensing group at the Physical Technology Center in the Polytechnic University of Valencia in Spain¹² analysed satellite data to assess air quality changes that may be attributable to changes in human activity during the COVID-19 pandemic.

Preliminary results show varied outcomes, with Sydney and Brisbane pollution falling by 30% on average (using nitrogen dioxide as an indicator) after COVID-19 containment measures such as lockdowns came into effect. Nitrogen dioxide levels in the atmosphere are especially associated with motor vehicles and coal fired power generation.

Many factors influence air quality in Sydney including weather, especially wind and rain events, and uncontrolled bushfires and back-burning activities.

The Climate and Atmospheric Science branch of the NSW Department of Planning, Industry and Environment publishes seasonal analyses of factors affecting major air pollution episodes in New South Wales. The reports may be viewed online or [downloaded](#).

As an example, the graph below from the [NSW annual air quality statement 2020](#) shows that air quality in Sydney East (which includes the City of Sydney area) was above the air quality health standards 96 per cent of the time.



The City East data comes from an air quality monitoring station the NSW Government installed on a City of Sydney site at Cook & Phillip Park in 2019.

The City is also trialling the deployment of 21 low-cost air quality sensors with UTS including a platform for public access to the data. UTS have also received a City of Sydney Environmental Innovation Grant to develop a Breathable Sydney roadmap due for completion in late 2021.

What are we doing to adapt to impacts of climate change?

Urban Canopy and Greening

The City planted 16,158 new street trees since 2005 and installed 11,080 square metres of landscaping throughout the city's streets this reporting period.

Floodplain management

In NSW, local councils are generally responsible for managing flood prone land. The [NSW Floodplain Development Manual](#) and the [Flood Prone Land Policy](#) recognises the benefits of use, occupation and development of flood-prone land. With the establishment of Floodplain Risk Management Committee, ad hoc decision making has been eliminated which is the primary cause of many present-day flooding problems.

The City has adopted detailed [floodplain management plans](#) and studies for all eight catchments within the LGA covering 2,666 hectares. These include catchments Alexandra Canal, Blackwattle Bay, Centennial Park, Darling Harbour, Johnstons Creek, Rushcutters Bay, Sydney City and Woolloomooloo.

The flood studies including the implementation plan require periodic review to maintain up to date flood information based on the changes in the catchments; and newly available information and guidelines to estimate flood information. Accordingly, the Alexandra Canal and Blackwattle Bay flood studies have been reviewed to include the new rainfall revision by Australian Rainfall and Runoff (ARR) 2019 guidelines.

Stormwater management

The City continues to maintain and expand its stormwater infrastructure network in order to alleviate localised flooding and to improve the health of receiving waterbodies. The City's stormwater network consists of 12,084 pits, 174km pipes, 248 raingardens and 47 gross pollutant traps.

Climate change and its impact on weather patterns reinforces the importance of having a stormwater network that is performing well and continues to be in good condition. We do this by inspecting and assessing the condition of our pipe network using CCTV cameras and using the information to develop maintenance and renewal programs. Drain cleaning is also undertaken, both as part of the inspection process and when required as the performance of the network is monitored. Currently the condition-based assessment of the City's stormwater network is approximately 63 per cent complete and is

¹² Research from Polytechnic University of Valencia in Spain

¹³ The Conversation article



being used to guide capital works programs and overall strategic planning of the City's stormwater network.

The City's stormwater asset management process includes the prioritisation and implementation of drainage improvement works based on community benefit and affordability. Stormwater flows are being reduced through the siting of more raingardens that convert hard impervious surfaces into gardens that provide natural infiltration and filtration of stormwater runoff using water sensitive urban design practices. Raingardens are also effective at capturing sediment, making our stormwater cleaner and reducing maintenance costs.

Adapting to more intense rainfall conditions that may result from climate change and minimising the risk to the community is important. When stormwater assets are assessed as having reached the end of their useful service life, climate change adaption options are therefore

considered including extending or diverting the network or increasing the capacity of the network.

Finally, stormwater pollution is being treated through the maintenance and siting of gross pollutant traps. These devices act as the last line of defence for capturing stormwater pollutants before they reach the city's receiving waterbodies.

Relevant links

- [Climate Emergency Response](#)
- [Community Recovery Plan](#)
- [Adapting for climate change – a long term strategy for the City of Sydney: 2015-2070](#)
- [Resilient Sydney Strategy](#)

CleanTech knowledge sharing grows Australia's green economy

One of the key programs under the City's Tech Startup Action Plan is the Visiting Entrepreneur Program (VEP). Since its November 2017 launch, the VEP has brought high-profile international entrepreneurs to Sydney to share their expertise and knowledge with the local tech startup community. The program has delivered 74 events for over 6,500 founders, and in doing so, helped to foster a culture of entrepreneurship and innovation and raise awareness of Sydney's tech startup ecosystem globally.

The 2020 CleanTech program was disrupted by COVID-19 restrictions. However, due to the importance of the content, amount of planning that was already complete and the need to support this vulnerable part of the tech startup ecosystem, we decided to adapt the program and run a virtual event series. There were strong indications pre-pandemic of a shift towards a green economy.

Now, as the economy restarts, a clean energy transition will be more vital than ever. As a hub of knowledge, capital exchange and innovation, Sydney has a key role to play in enabling and facilitating Australia's transition to green.

The program with our three virtual visiting entrepreneurs live streamed discussions to over 1,100 viewers where the CleanTech conversations focussed on the intersection of technology, environmental sustainability goals and the growth of the green economy. Technology has an important role in the transition to sustainable energy, particularly as we rebuild from the pandemic.



Australia is well placed to export goods, services and technology locally in Asia's clean energy transition. Food and agritech entrepreneurs are reimagining the food system to meet the needs of a growing global population, whilst also committing to sustainable growth.



5. Zero waste city

Leave Nothing to Waste is our strategy for managing Sydney's resources to 2030. The City is working to achieve its zero waste target by 2030, with a focus on waste avoidance, reuse and better recycling.

The City of Sydney area produces more than 5,500 tonnes of waste every day from homes, offices, at the city's many venues and events and during construction of buildings and transport infrastructure. Approximately 69 per cent of all waste is recycled but there are still opportunities to divert and exploit more than 2,000 tonnes which currently goes to landfill each day.

To assist with achieving our zero waste targets the City has identified six priority areas:

- promote innovation to avoid waste
- improve recycling outcomes
- sustainable design
- clean and clear streets
- better data management
- future treatment solutions



City of Sydney Operations

City Property resource recovery 70% target exceeded

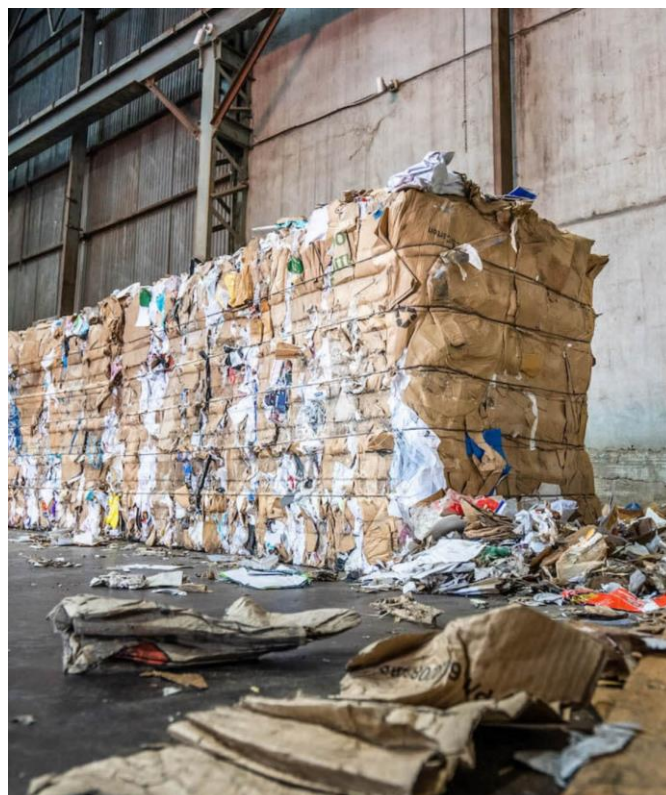
Over the past year, waste and resource recovery management for the City's property portfolio has improved significantly. Across the portfolio, an average of 92% resource recovery from our waste is achieved, meaning 92% is not sent to landfill (FY20/21). This is a significant increase on the previous resource recovery average of 44% (FY19/20).

Much of this has been achieved through recycling paper and cardboard, other mixed recyclable items such as drink and take away containers and recycling food scraps.

Additionally, in separating and recycling food scraps from the general waste stream the general waste stream is kept 'drier'. This in turn allows for a significant increase in resource recovery from the general waste that is usually sent to landfill.

This has been achieved through the City's new waste collection contractors who own and operate their own resource recovery facility, a facility that can process our 'dry general' waste into a Resource Derived Fuel (RDF) that can be used in cement kilns. This displaces the use of traditional fossil fuels normally used in cement production.

Higher recycling rates and resource recovery from our general dry waste supports the reduction of carbon emissions associated with waste disposal from the City's buildings.





GECA Certification

The City Property Waste Collection Services contract with Doyle Bros has been certified with the Good Environmental Choice Australia (GECA) Waste Collection Services Standard. GECA sets the standard for environmentally preferable services, recognising waste collection companies that deliver best practice waste collection services.

Ours is the first local government contract in Australia to achieve this.

In successfully certifying the contracted waste services delivered by Doyle Bros, the transparency, quality of services and accuracy of data have been independently verified and conform with the criteria set out by the standard.

GECA Ecolabelling standards go beyond Australian Standards and define an environmental benchmark for services and products.



Paving the way to better glass recycling

Around 14 per cent of glass collected from recycling bins during kerbside garbage collections can't be recycled and is instead stockpiled or sent to landfill. To reduce the amount of materials going to landfill, the City supported and promoted the Paving the Way program, as a member of the South Sydney Regional Organisation of Councils (SSROC).

The program focuses on using glass fines (crushed glass) instead of virgin sand for building roads and footpaths. This will increase the amount of collected glass that can be recycled from 65 per cent to 79 per cent, the equivalent of nearly 100 million glass containers each year.

This Sydney-based initiative also reduces the transport of glass interstate and provides long-term markets for what was previously considered a waste product.

The program demonstrates collaboration on circular economy principles in procurement between local, regional and state governments. It is the first project under the Procure Recycled memorandum of understanding (MoU), signed by SSROC members in November 2019, to promote the procurement of recycled materials.





Our operational targets



Recycling and resource recovery

- 50 per cent resource recovery of waste from City parks, streets and public places by end June 2021
- 70 per cent resource recovery of waste from City managed properties by end June 2021
- 80 per cent resource recovery of construction and demolition waste generated and managed by City operations by end June 2021

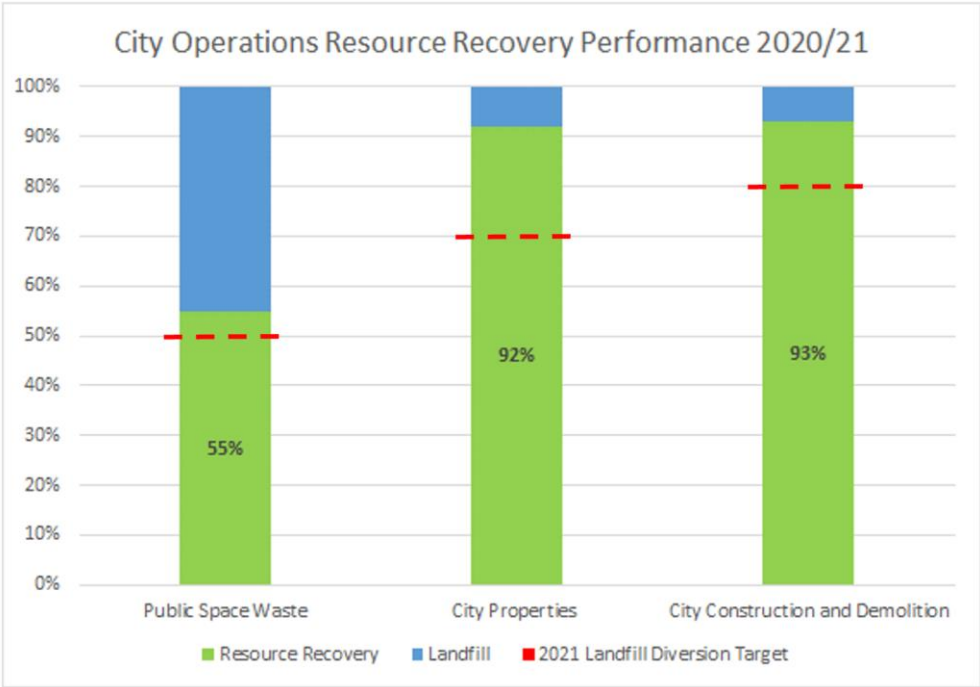
How we are tracking

Recycling of waste from City parks, streets and public places has increased from 46 per cent to 55 per cent between 2019/20 and 2020/21, achieving our 2021 target of 50 per cent diversion from landfill. The City’s ongoing high resource recovery of organics from parks and continued investment in alternatives to landfill for harder to recycle streams such as street sweepings and illegal dumping has contributed to achieving our 2021 target.

The 70% resource recovery target for City owned and managed properties has been exceeded. City properties waste has achieved an increase in the resource recovery rate from 44 per cent in 2019/20 to 92% in 2020/21. Recycled materials account for 44% of the total amount of waste generated, with 14% from food scrap recycling. The remaining increase in resource recovery is largely due to the increased recovery achieved from the general ‘dry’ waste stream, via a process that turns this waste stream into a resource derived fuel (RDF) that can be used in cement production, rather than being sent to landfill.

Construction and demolition waste produced by the City continues to achieve high diversion rates and through increased validation of performance the City’s confidence in our reporting for this sector has improved significantly for 2020/21. This has been achieved through working closely with City projects contractors. The projects that generated construction and demolition waste this year, have diverted 93% of waste from landfill, thereby exceeding the 2021 resource recovery target of 80% for June 2021.

Chart 8. City of Sydney operations resource recovery performance against targets (totals Jul-20 to Jun-21)



- Public Space Waste data incorporates City parks, street sweepings, public litter bins, illegal dumps and stormwater pit material.
- City managed properties waste includes City of Sydney owned and managed buildings where the City has responsibility for the collection and management of the waste generated (approximately 65 buildings and five aquatic centres). Waste data includes June 2021 estimated accrual data.
- City Construction and Demolition includes estimates based on data provided by City managed works and up to 15 of the City’s major projects.



Local government area targets



Recycling and Resource recovery

- 70 per cent waste diversion from operating businesses in the local government area away from landfill by end June 2021
- 70 per cent waste diversion (with a minimum of 35% as source-separated recycling) away from landfill by end June 2021
- 80 per cent waste diversion from construction and demolition activities in the local government area away from landfill by end June 2021

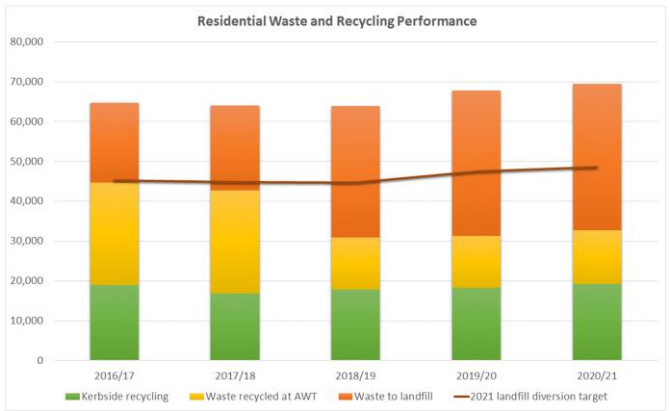
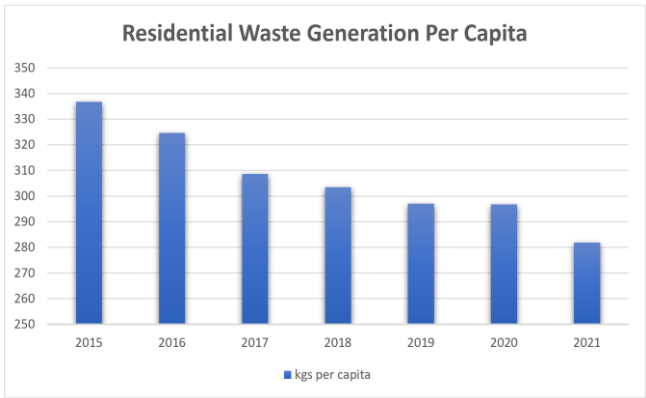


The local government area

How we are tracking

Waste minimisation – since 2015 the per capita annual waste generation rate of our residents has reduced by more than 15 per cent per resident. This means that each of our residents is producing less waste (by weight) each year. The cause of this reduction is likely to be a combination of factors including light weighting of products through the manufacturing process, home composting, the introduction of the container deposit scheme and more residents taking up waste avoidance initiatives.

Recycling – as a result of recent EPA regulation changes the residential waste diversion from landfill has fallen by one per cent to 47 per cent from 2019/20 to 2020/21, and the source separated kerbside recycling rate is 28 per cent, the same as this time last year. The City recognises the challenges of delivering high quality source separated recycling outcomes in an uncertain and dynamic environment and is working on delivering enhanced recycling services and community engagement programs to further increase recycling rates and reduce contamination.





Residential Resource Recovery Updates



Pop-up education stalls on safe reuse

To reduce reliance on single use items and encourage safe reuse, City staff are engaging directly with the public at local pop-up stalls on how to safely choose reusable items over single use items and how to ask your local café for a 'contactless pour' into your reusable coffee cup.

From March to June 2021, City staff provided face to face education at 17 pop-up stalls to encourage use of reusable cups and engaged with 591 City workers and visitors during lunchtime in Martin Place, and 588 morning commuters in 3 locations near local cafes and transport hubs in Erskineville, Forest Lodge and Redfern. Engagement is planned to continue in other City locations.

Recycling reports help apartments reduce



The City is piloting a recycling support service to 40 apartment buildings across the City to make it easier for buildings to recycle right. City staff are engaging with apartment communities through site visits and waste audits, recycling info sessions and providing dedicated resources for residents including recycling report cards to show them how they're tracking and tips to improve recycling rates.

From January to June 2021, City staff conducted 22 site visits and waste audits, engaged with 1870

apartment residents about recycling through letters, guides, posters, report cards and 7 educational pop-up stalls. Initial findings show that the buildings in the

program have been able to reduce contamination levels in the recycling bin and a reduce recyclables being placed in the rubbish bin.

'Recycle It Saturday' Drop-Off events

The "Recycle It Saturday" drop-off events were held on 13 March and 19 June 2021 with a total of 1161 attendees visiting both events. Of those who attended 95% were City residents and the top three most common items dropped off for recycling were electronics, textiles and paint. 18 tonnes of electronic waste, clothes, toys, polystyrene, x-rays, batteries, light bulbs and gas cylinders were recycled at the March event.

Houses recycle 93% of their food scraps in Food Scraps Recycling Trial



Above: Maggie, The Erko's building champion for the trial.

The residential food scraps collection and recycling trial has now been going for 23 months, recycling 569.64 tonnes of food scraps from more than 13,300 households including 162 apartment buildings and just over 1,000 houses.

A series of three waste audits have been conducted over the course of the project to evaluate the outcomes of the



service. Key results from these audits indicate that in properties participating in the trial:

- Total waste generation declined from 7.2 kgs/household/week in 2019 to 6.8 kgs in 2020 and to 6.1 kgs in 2021.
- The amount of food scraps that is being recycled:
 - by houses is very high and has increased over time, with 88% of all food waste being recycled in July 2020 and 93% in February 2021.
 - by apartment buildings is relatively low, and it decreased from 33% in July 2020 to 23% in February 2021.
 - Contamination in the food scraps bin increased from 1% in July 2020 to 4% in February 2021. This was a consequence of contamination found in only three bins in the February audit. With those atypical bins removed from the data, contamination would have been 0.7%.

In June, the City commenced a pilot of providing food scraps caddies and liner bags to apartments that haven't registered for the trial in four apartment buildings. The objective of the pilot is to test what happens to recovery and contamination in the food scraps bin when all apartments in a building are provided with equipment to participate in the service. To evaluate the outcomes of the pilot, the City will conduct a waste audit and a resident survey. Results of the pilot will support the business case for the proposed full rollout of the food scraps recycling service.

Partnering with Responsible Cafes to avoid coffee cup waste



Above: A local cafe promoting reusable coffee cups

The City partnered with Responsible Cafes to educate cafes on ways to promote reuse and waste avoidance. In May 2021 Responsible Café educators approached 102 cafes to engage with staff and encourage acceptance of reusable cups and provided educational posters to promote the uptake of reusable coffee cups and containers. Cafes in the City's local government area can join the Responsible Cafes network our community to reduce its reliance on single use items.

New truck artwork

New artwork showcasing easy recycling tips is currently being installed on 53 Cleansing and Waste vehicles including contractor waste and recycling collection vehicles and roadway sweepers, footway sweepers and large compactors. The artwork includes six different recycling and waste avoidance tips, repeated across the vehicles, to help remind residents of the City's recycling services.



Above: One of six new designs to be displayed on City waste and recycling collection trucks

Demand for Home Recycling increases

The City's Home Recycling Trial collected 2041 bags from 875 homes, recycling a total of 6.1 tonnes of tricky items directly from residents' doorsteps from April - June including soft plastics, clothes, batteries, light bulbs, polystyrene and small electronics. This is nearly triple the amount that was recycled in the previous quarter (Jan-Mar) showing growing demand in the service, especially as the pandemic continues.

A customer satisfaction survey was conducted in June to measure the effectiveness of the service with trial participants. The results from 112 survey respondents showed that:

- 97% were satisfied or very satisfied with the service
- 99% said they either definitely would or probably would use the service again.



School kids target single use plastics in Primary School Waste Avoidance Program

The City is partnering with Plastic Oceans Australasia to deliver a Primary School Waste Avoidance Program to engage with the school community about waste avoidance.

The program is focused on engaging students directly, as well as their teachers, parents and guardians. Program facilitators provide guidance to student-lead teams to help eliminate single-use plastics and improve school waste processes, such as repurposing and recycling.

From January to June 2020, in school terms 1 and 2, 14 local primary schools opted-in to the program and 261 students, and their teachers, engaged in 12 workshops to form student led groups to tackle single use plastics in their schools and to learn about waste avoidance and alternatives to single use items. Activities will continue in terms 3 and 4.

Relevant links

- [Leave Nothing to Waste, City of Sydney Waste Strategy](#)

Advocacy

Waste Infrastructure Study

During the consultation process for the NSW Government's 20 year waste strategy and the federal government's National Waste Policy update the City advocated for increased certainty through regulations and legislation, increased reinvestment of the waste levy to fund development of infrastructure to facilitate circular economy and transparent reporting across the industry to restore confidence in recycling.

Through its membership of the Southern Sydney Regional Organisation of Councils, the City was involved in a project to determine future waste infrastructure and data needs. This project has provided critical input into the recently released State Government 20 Year Waste Strategy.

In May 2021 City staff were invited to give evidence at the NSW Government Public Inquiry into the Waste Avoidance and Resource Recovery Amendment (Plastics Reduction) Bill 2020.



6. Active and connected city



Image © City of Sydney

We are committed to promoting the most sustainable modes of transport for residents, workers and visitors.



City of Sydney Operations

Fleet emissions

The City's motor vehicle fleet has continued to address greenhouse gas emissions through its Sustainable Fleet Management Program. The Program is focussed on maintaining emissions at 2013/14 levels by further reducing fuel use until new low-emission products and technologies become available in Australia.

The City's fleet has continued to reduce its size, balancing vehicle numbers with the demands placed on providing essential services to residents, workers and visitors.

The combined fleet emissions for 2020/21 are 32 tCO₂-e less than the same period last year. The annual total remains below the target level of 2,417 tCO₂-e, at 1,568 tCO₂-e for 2020/21.

Blended biodiesel continues to be the prime fuel type used by the City's diesel and diesel hybrid motor vehicle fleet. Petrol hybrids use Shell Unleaded E10 exclusively.

Fuel efficient heavy vehicles

Fleet Services has recently hard-coded some industry best practice standards into all heavy vehicle and major plant procurement documents, ensuring vehicles are procured with the following major criteria:

Wherever possible, Fleet Services will procure vehicles and plant with international best practice emission standards to ensure the City's impact on climate change is reduced.

Fleet Services are also seeking the safest available vehicles via tendering documentation, with particular regard to the safety of drivers, pedestrians, bike riders and other vulnerable road users.

Our Operational Targets



Fleet emissions

- Zero increase in emissions from the City's fleet of vehicles by 2021, from 2014 levels



Telematics

Phase 2 of the Telematics project will soon enable some low-risk and eco safe driving practices to be centrally and proactively implemented to help further reduce emissions into 2021/22. Phase 2 also allows the City and its asset owners to access and utilise the driver behaviour and vehicle asset efficiency data, to further inform business unit efficiency decisions. It also opens up the possibility for internal customers to utilise dashboards and exception reporting on emissions, trip planning and on-road compliance. Gaining quality data through telematics will assist the Fleet team and its internal customers to make more informed decisions on efficiencies, strategy, and workflow planning which will help to further reduce overall emissions.

Electric vehicle news

The City has taken delivery of its first ever fully electric commercial vehicle – an electric tipper truck. The truck is being trialled with key business units over the next 12 month period to gain feedback on the viability of utilising electric technology in commercial vehicle applications across the City, including range, suitability, safety and user acceptance.

This project was developed on the back of the City recently integrating 19 new fully electric Nissan Leafs into the Fleet and upgrading charge points to align with new industry type 2 charging points. The Leaf has an average range of 270kms, which can increase with urban driving thanks to regenerative power through city driving, and the e-pedal.



Additionally, the electric vehicle charge points for the City's electric fleet have now been upgraded from type 1 to type 2. The upgrade has aligned the City with the electric vehicle industry, which is now producing all new vehicles with type 2 connectivity as standard, bringing better reliability and faster charging capabilities. The upgrades are completed and are now available for use across multiple depots and Town Hall House Car Park. To further expand on fully electric versions of fleet, some

further planning and discussions now need to take place to accommodate more electric vehicle charging spaces across City depot sites.

Active transport

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

City staff plan their travel using a simple transport hierarchy:

- Active Transport (walking or cycling using the City's own bike fleet)
- Public Transport (buses and trains)
- Drive Green (the City's own fleet of low emissions vehicles)

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

Most of the City's bike fleet is housed in our end-of-trip facility provided for staff who walk or ride to work or exercise during work hours. The Pitstop includes 150 bike parking spaces, 150 lockers, ensuite and accessible bathrooms, showers, change rooms and a water station. Since opening on 13 October 2014 an average of 94 people has accessed the Pitstop daily. There is a total of 26 fleet bikes located at a variety of Council facilities including King George Recreational Centre, Epsom Rd and Bay St Depots. The fleet has travelled more than 52,000 kilometres since 2011.





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	20/21 Q3	20/21 Q4	Year to date	Program to date
Staff trained #	0	16	35	842
Distance (km)	1,647	1,665	8,325	65,363



The local government area

Local government area targets

 Walking	– 33 per cent of trips to work during the AM peak undertaken by walking by 2030, by city residents
 Cycling	– 10 per cent of total trips made in the city are undertaken by bicycle by 2030
 Public transport	– 80 per cent of trips to work during the AM peak are undertaken by public transport by 2030, by city residents and those travelling to Central Sydney from elsewhere
 Car sharing	<ul style="list-style-type: none"> – 30 per cent of city residents who drive with an unrestricted drivers licence are members of a car sharing scheme by 2030 – Increase the number of car share bookings – Increase the number of on-street car share parking spaces

Walking

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

The City recognises the importance of a safe walking environment, so we are continuously working to improve pedestrian safety throughout the city, including advocating to the NSW Government.

We have worked with the State Government on the 5 Year City Centre Action Plan which includes a focus on pedestrian and cycling plans and actions in the city centre and Green Square. We have also worked with the State Government on the development of a business case for walking.

The City has investigated how to increase space for people walking to access essential services, high streets and public transport as a response to COVID-19. This helped to inform the development of the City's Al Fresco City Program (in partnership with the State Government), notably the road reallocation program related to outdoor dining.

In collaboration with Transport for NSW, the City is undertaking the update of the City Centre Access Strategy with a focus on people and place.

We are continuing to quantify the volume of walking in our area through counting and trialling new methods of gathering this data. We have undertaken walking counts at more than 100 locations and made this data available online. In addition, there is an ongoing trial of new counting technology in the city centre and walking counts and place observations were undertaken in conjunction with the roll-out of pop-up cycleways.

Proposed Pedestrian Boulevard - George St South

More people-friendly streets are being created, with wider footpaths and new spaces for businesses to operate, while attracting people back to the city centre. The proposal is supported by the NSW Government and will ensure everyone can move around comfortably while maintaining physical distancing.

George Street, between Hunter and Bathurst streets, has been upgraded to a pedestrian boulevard following the construction of the light rail. To build on this success, we proposed to extend the pedestrian boulevard to Railway Square by restricting through traffic and widening the footpaths to install more trees and street furniture.

The proposal also includes creating a pedestrian boulevard on Devonshire Street between Chalmers and Elizabeth streets, in Surry Hills.

The project is currently under construction.

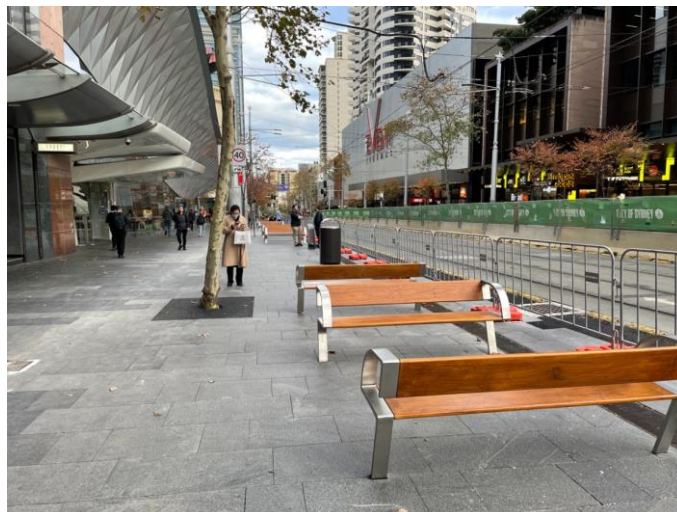




Image © City of Sydney

Cycling

The City's Cycling Strategy and Action Plan (2018-2030) sets ambitious targets for the City to substantially complete the bike network regional routes to link the inner city, homes, schools, businesses and other destinations. The Strategy guides projects and programs to help more people ride bikes in Sydney. It prioritises connecting the bike network, supporting business and people to ride and lead by example.

The City worked closely with Transport for New South Wales (TfNSW) to construct 7km of pop-up cycleways in our area in response to the COVID-19 pandemic. These pop-up cycleways encouraged people to travel by bike, offering an alternative to public transport and driving.

A joint evaluation of the cycleways was undertaken with TfNSW and found people felt safe on the cycleways, 30% of users would otherwise drive or use public transport and the majority of the community supported making space for people to ride (71%).

Council approved retaining the pop-up cycleways for up to two years until permanent cycleways are designed and approved.

We continue to offer cycling courses and guided rides to increase the capability of riders, including courses for first time riders, 1-on-1 tuition, bike maintenance sessions and guided rides along the bike network. A concentrated program of these activities was undertaken in Green Square in May and June 2021.

Project updates

- Pop-up cycleways retained for up to two years until permanent cycleways are designed and approved.
- Construction is complete on Miller and Saunders Streets separated cycleways in Pyrmont
- Construction underway on Liverpool Street at Sussex Street in Sydney, and Chalmers Street between Prince Alfred Park and Devonshire in Sydney.

	2020/21				Year to date
	Q1	Q2	Q3	Q4	
Share the Path sessions	35	28	14	28	105
STP Tune Ups (#)	299	254	162	277	992
STP maps issued (#)	1126	1054	665	732	3,577
STP bells issued (#)	212	206	92	165	675
Cycling courses (# participants)	100	89	91	56	336
Maintenance courses (# participants)	28	28	75	48	179
Guided rides (# participants)	67	35	30	47	179



Image © City of Sydney



Public transport

The City continued to work with Transport for NSW to improve transport infrastructure and services across the City of Sydney, with particular emphasis on the City Centre and Green Square.

The City is collaborating with Transport for NSW to improve transport to Green Square. We are jointly investigating a trackless tram system, and the City is encouraging Transport for NSW to accelerate the introduction of electric buses in this area. The City has developed a concept for a dedicated service connecting the Green Square Town Centre and the City Centre via the Eastern Transit Corridor and Crown and Oxford Streets.

Metro West stations are now confirmed, with a new station for Pyrmont and Hunter Street (Wynyard) by 2030-31. The Metro will connect Westmead and the City Centre via Parramatta, Olympic Park and the Bays Precinct. The City is calling for the line to extend as far as Zetland via Central, by 2031.

The City has supported the NSW Government in seeking ongoing recognition by the Australian Government (Infrastructure Australia) of the national importance of improved connections between the City Centre, Green Square and Southern Sydney.

City Access and Transport addresses transport and land use integration by providing strategic transport advice and advocacy on major developments in the city.



Car sharing

More than 70,000 City of Sydney residents and businesses are members of a car share organisation. Around 45 per cent of city residents who drive (with an unrestricted drivers' licence) are members.

The City supports car sharing as part of Council's strategy to make the City of Sydney sustainable.

Car sharing enables multiple households and businesses to share the use of a vehicle. This reduces the number of cars parked on the street, as well as reducing overhead costs for those who rarely need a car (or a second car). As each journey is paid for at the time it is taken, drivers have an incentive to consider cheaper ways of travelling, which results in less car trips. This in turn reduces congestion, greenhouse gas emissions and air pollution. The key support provided by the City is the installation of clearly marked on-street parking spaces in strategic locations dedicated to specific car sharing vehicles. These enable residents to quickly find a vehicle and return it after use. The City installed its first car sharing parking space in 2008. Since then around 850 dedicated on-street car share parking spaces have been added to the network. Operators also have spaces in offstreet car parks, including the City's Goulburn Street and Kings Cross car parks.

There are four operators in the City, and ongoing interest from potential new operators.

Relevant links

- [Walking Strategy and Action Plan: 2014](#)
- [Cycle Strategy and Action Plan: 2018-2030](#)

7. Green and cool city

Dealing with heat is identified as a priority for reducing shocks and stresses on our city and its community. Greening our city is an important component of the Sustainable Sydney 2030 vision to be green, global and connected.

Reducing the effects of urban heat through measures such as increasing shading and canopy, water misting, and careful selection of building and road materials are increasingly important to reduce the overall heat impacts for our communities. We are also focussed on increasing and preserving local indigenous plant and animal populations in our city, through parks and streets verges.

The City maintains sensors in City locations that measure temperature and humidity to collect locally specific background data to monitor and evaluate the effectiveness of urban heat treatments.

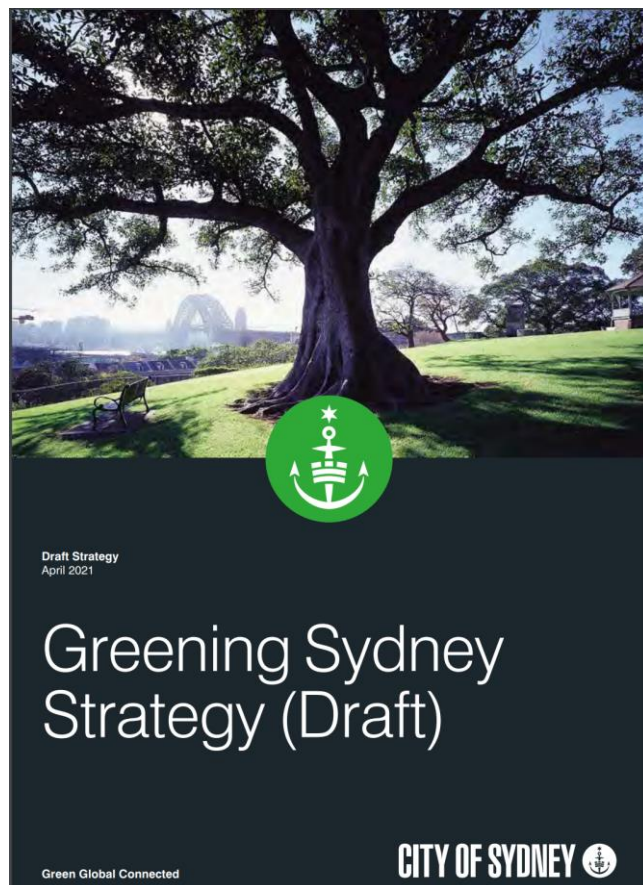
A collaborative effort between the City, the community and other land managers is needed to improve our city's urban canopy and ecological value. We will continue to work with our community and others in the city to deliver this commitment.



City of Sydney Operations

What we are doing

The City is currently reviewing the Greening Sydney Strategy. A draft Strategy has been prepared and includes strategic directions to deliver a cool, calm and resilient city. The draft Strategy has finished exhibition, and following its adoption, the City will commence its implementation. This includes achieving ambitious new greening targets.




How we are tracking

The City's canopy cover was 15.5 per cent in 2008, 17.1 per cent in 2013, and 18.1 per cent in 2019 and 19.1% in 2020. Whilst the City is one of the few councils in Sydney that has managed to increase canopy cover over this time, we need the rate of canopy cover growth to increase more quickly to meet the urban canopy target of 23 per cent by 2030.

Progress against our fauna targets will be measured formally every five years through a comprehensive survey. Bush restoration sites in the city have increased to 12.9ha, from the baseline of 4.6ha in 2012.



Our operational targets

 Urban canopy	<ul style="list-style-type: none"> – The average total canopy cover is increased by 50 per cent by 2030 (from 15 to 23 per cent), and increased by 75 per cent by 2050 (to 27 per cent), from a 2008 baseline – Plant 700 street trees each year until 2021 – Tree species diversity will not consist of more than 40 per cent for any particular plant family, 30 per cent for any genus or 10 per cent for any one species by 2021
 Urban ecology	<ul style="list-style-type: none"> – Habitat sites in the city are protected and the area of bush restoration sites is increased by 100 per cent by 2023 from a 2012 baseline of 4.6 hectares – Indigenous fauna species diversity, abundance and distribution is maintained or increased by 2023 based on a 2012 baseline – A progressive increase in the number of habitat features for priority fauna species is established along potential habitat linkages by 2023
 Urban greening	<ul style="list-style-type: none"> – Plant 50,000 new trees and shrubs in City parks and street gardens each year until 2021

Local government area target

 Urban canopy	<ul style="list-style-type: none"> – The average total canopy cover is increased by 50 per cent by 2030 (from 15 to 23 per cent), and increased by 75 per cent by 2050 (to 27 per cent), from a 2008 baseline
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The local government area

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 international recognition 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.

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

Relevant Links



Image © City of Sydney

Urban canopy and greening

The City of Sydney recognises that trees and 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.

In-road tree planting projects were completed within Boyce Street Glebe and Jones Bay Road Pyrmont. Construction will soon commence in Bunn Street Pyrmont. Design and consultation work continue for streets in Camperdown and Redfern.

A wider greening precinct approach has been completed in the eastern area around Danks Street Waterloo, with over 90 street trees planted and extensive street gardens installed. Work to increase greening in the Crystal St plaza will be completed by autumn 2022.

This planting is undertaken as part of the City's Street Tree Master Plan 2011¹³, which is a blueprint for street tree plantings across the City of Sydney.

The City is continuing to deliver a number of parks upgrades within the LGA to renew parks in poor asset condition and to improve community amenity. Under the renewal program, projects have been completed at Daniel Dawson Reserve, James Hilder Reserve, Beaconsfield Park Playground, Strickland Park, Hollis Park Playground and Palmerston Avenue Steps during Q3 and Q4. Stimulus renewal works have also been undertaken to uplift asset condition of parks across the local government area through renewal of playground softfall, benches, plantings, turf and infrastructure. Planning and design for over 35 park renewal projects are currently underway. Under the Greening Sydney program various areas have been converted to increase the vegetated space within the City. During Q3 and Q4 in 2020-21 3,171m²

of landscaping (grass and planting installation) was completed. In Q3 and Q4, 40,382 new plants were installed at parks and streetscapes across the local government area including Forbes St, Danks St, Reserve St, Renwick St, Hiles St, Maddox St, Boyce St, Prince Alfred Park and Victoria Park.

Description	Q3 20/21	Q4 20/21	20/21 target	Year to date	Total to date
Park upgrades (#)	5	3		13	93 since 2008
Landscaping (grass/planting) (m ²)	1,498	1,673	7,500	11,080	118,308 since 2009
New shrubs and grasses planted in parks and streets	16,235	34,147	50,000	106,383	866,745 since 2009
Raingardens (#)	N/A	N/A	trend	N/A	249
Street trees planted since 2005 (#)	224	552	700	1,106	16,158
Canopy cover (on current) (%) *	N/A	N/A	N/A	N/A	19.1

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

* Canopy cover is measured every two to five years. 2013 data was made available in 2016, with new measurement undertaken in early 2020, and the data shown in the table above.

Relevant links

- [City of Sydney Street Trees](#)
- [Sydney's Green Streets](#)
- [Urban Forest Strategy 2013](#)

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

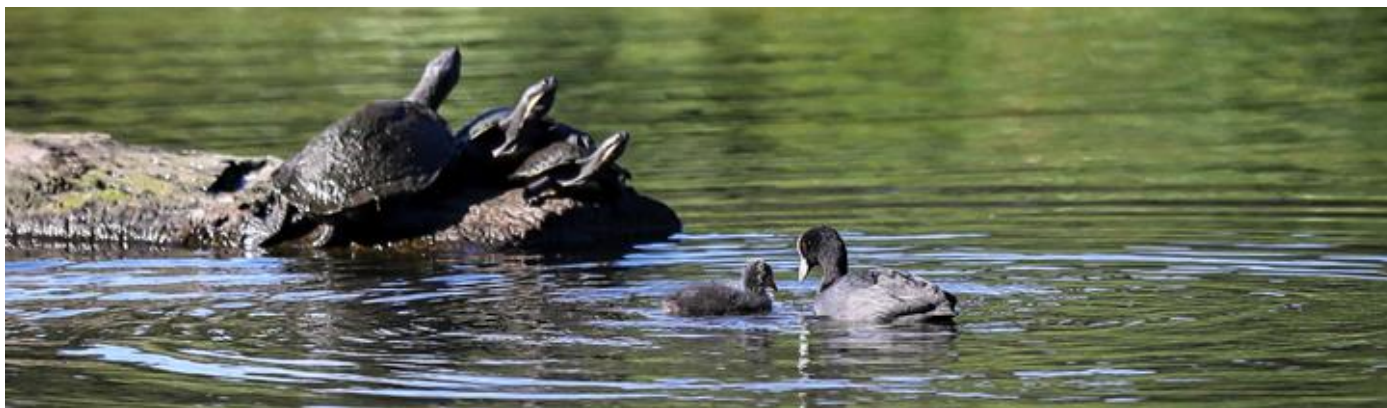


Image © City of Sydney

Urban ecology

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 Urban Ecology Strategic Action Plan (UESAP) which outlines the City's approach to identify, protect and rebuild locally indigenous plant and animal populations, will be updated and reviewed in early 2022, with a focus to establishing better biodiversity connectivity.

The Urban Ecology Workshop Series will resume in July 2021 (COVID-19 depending) and will consist of a series of events which highlight local wildlife conservation and restoration efforts

Bush restoration works continue to be implemented under the current bush regeneration contract. The City has targeted efforts at several bush restoration areas across the City. A total of 7700 native tubestock were planted across a number of sites in the north and south of the LGA from January – June 2021 to improve the structure and diversity of the bush restoration sites. Efforts in 2021 have been largely focused on promoting native regeneration and establishment, whilst controlling weed recruitment, especially after the heavy rain events in March.

Programs to commence in late 2021 include the nest box and hollow implementation program, and the continuation of the ibis monitoring surveys to manage key sites across the LGA. The City's Australian White Ibis Management Plan was finalised in 2020 and is used to guide decisions on how to sustainably manage the ibis populations found within the City.

The urban biodiversity corridor project is also near completion as part of the Local Strategic Planning Statement review work. It has assessed the current linkages identified in the UESAP to determine their feasibility and identified possible future opportunities for enhancing connectivity across the LGA. A number of recommendations have been made to update the existing controls and provisions in the LEP and DCP.

Relevant links

- [Urban Ecology Strategic Action Plan 2014](#)

Community empowerment

Community gardens and community planting

The City of Sydney supports community gardens, verge gardens, community composting and urban Landcare groups within our City. Community gardens have provided an important role for City residents during COVID-19 with increased interest in membership and the acknowledgement of the important role gardening plays in physical and mental health, social connection and the provision of fresh organic produce.

The City continues to support and implement community gardens in the local government area, with 23 gardens in total, including two community footpath verge gardens.

In addition to the new garden in Elger Street Glebe, work on Stage 2 of the Kings Cross Community Garden in Lawrence Hargrave Reserve is in progress and will be completed by the end of 2021. A new garden is proposed for the Western Block in Camperdown in 2022.

In recognition of the importance of native bees in pollinating services, three native beehives have been installed in this reporting period in gardens in Woolloomooloo, Surry Hills and Redfern.

Our volunteer urban Landcare groups have continued to provide an invaluable role in restoring native vegetation, weeding and litter removal which in turn supports the development of nature corridors and improved biodiversity within the city. Both the Pyrmont Ultimo Landcare group and Friends of Orphan School Creek have held successful community planting working bees.

Performance	Year to date	Total to date
Community Gardens (#)	No new	21
Landcare groups (#)	No new	5
Community footpath verge gardens (#)	No new	2
Community composting groups (#)	No new	0



Sydney City Farm

Sydney City Farm in Sydney Park, St Peters is a place to learn about urban agriculture and sustainable food production. From January to June 2021, 635 volunteer shifts were worked at the farm and 116kgs of fresh food was communally grown by volunteers and donated to the Asylum Seekers Centre.

Sydney City Farm education programs provide sustainable living content and practical solutions for organic waste management at home. In January to June 2021, two face-to-face Compost Basics and Worm Farm Basics workshops were held involving 44 participants.

Sydney City Farm held 14 other education programs on urban farming topics from January to June 2021, involving 215 participants.

Relevant links

- [City of Sydney Community Garden](#)
- [City of Sydney Bushcare](#)

	2020/21 Q3	2020/21 Q4	Total 2020/21
Food grown at Sydney City Farm	58.3kgs	57.6kg	265kgs
Number worm farm and composting education programs	1	1	7
Participants	24	20	131
Volunteer shifts	219	416	988
Number other urban farming education programs	4	10	22
Participants	68	147	284



Image © City of Sydney



Image: © Lucy Sharman Lend Lease

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 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.

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

Performance	2019 new sites	2020 new sites	2021 new sites	Total to date ^[1]
Green roofs in the LGA (#)	5	15	9	180
Green walls in the LGA (#)	3	8	0	54
Total green roofs and walls (#)	8	19	9	230

[15] 2012/13 was the first year of measurement.

Innovation grant helps demonstrate the value of integrated green roofs

The City is proud to support a flagship green roof project through its environmental performance innovation grants program. The project involves a partnership between University of Technology Sydney (UTS), Lendlease and Jungliefy to compare two rooftops on two identical buildings in Barangaroo: one made of concrete with a solar PV system, and the other comprising a solar PV system integrated with a green roof.

The research project is one of the longest and most complete studies of its kind in Australia. It will provide the City with empirical evidence and data on the benefits of integrated green roofs in Sydney, and the results to date are compelling.

Integrated green roofs appear cooler on average by 5.5°C. The green roof remains at a steady 25°C throughout the day, compared to the usual swings of 20–60°C on a typical city roof. A green roof cools the roof, resulting in more power from the solar panels.

An integrated green roof stores and ‘polishes’ rainwater. It slows discharge to the stormwater system in high rainfall events to 7 litres per second, compared to 634 litres per second on the concrete roof. The green roof’s plant species provide an added benefit through their biological processes, which work to increase air quality. Green roofs encourage biodiversity in city spaces. Whereas a typical non-green roof might host four species of fauna, more than 30 species have been observed on the project’s green roof, including native bees, insects and birds.

There is huge potential across the city for more integrated and co-located solar green roofs.



8. Delivering to the community



Glo Apartments, Ratings and Assessment Grant recipient, strata committee and residents pictured image © City of Sydney

We are working with our residents and business community to improve the environmental sustainability of our city.

Environmental sustainability remains a core objective for our community and program partners, and throughout the 2021 financial year we have worked to support our communities as they seek to improve environmental performance and build resilience for a green and sustainable future.

This reporting period has seen some great achievements in our community while still responding to the pressures of the COVID-19 pandemic. Some key achievements include:

- The City's Ratings and Assessment Grants have unlocked over \$8.1M in community investment with building owners retrofitting buildings in the commercial and accommodation and entertainment sectors and residential sector. The City's initial investment of \$1.92M through grants to 233 recipients has increased sustainability ratings (NABERS) and reduced emissions by 9,216tCO₂e.
- In an industry first, strata management PICA Group has struck a renewable energy purchasing deal for a group of strata apartment buildings. The deal will provide 100 per cent green solar electricity for 3 years,

sourced from two NSW solar farms. 64 member buildings, including some from the City's Smart Green Apartments program will not only shrink their carbon footprint but also save an estimated \$681,000 collectively each year on electricity bills.

- Our Smart Green Apartments awards were held onsite at Hudson Precinct in March. The Hudson Community Association achieved significant savings by investing \$150,000 in sustainability upgrades, resulting in a reduction of 50.5% of their total site energy use, and a reduction of 47.7% of total site carbon emissions.
- The Sustainable Destination Partnership released its annual report and held its first networking event in over 12 months. Though COVID-19 was a significant impact on the sector, many members used the lockdown period to invest in their internal environmental systems. The State Library committed to net zero emissions by 2030, while Accor hotels won a Hotel Management Award recognising its work in eliminating single use plastic.

Relevant links

- [Support offered to our residents and businesses to improve their sustainability](#)



Business sectors – Program update

Sustainable Office Sector Plan

Sydney's Sustainable Office Buildings Plan was adopted by Council in 2018 and highlights 35 actions to achieving more sustainable buildings across the office sector. These actions are largely delivered through two flagship programs - the Better Buildings Partnership and CitySwitch Green Office.

In 2020, the City built capacity in the office sector by presenting at the Good Environmental Choice circular economy conference; the Energy Efficiency Council annual conference; The Fifth Estate's Happy Healthy Workplaces masterclass; and the World Energy Forum where the Better Buildings Partnership presented a safety study on installation of batteries.

Both programs delivered their annual reports demonstrating the sector's action in creating a more sustainable sector. Additionally, the Better Buildings Partnership continued to lead industry innovation with the release of research pieces on circular economy, energy demand, and battery safety.

CitySwitch delivered a tool for better tracking of occupancy numbers and energy performance in response to the COVID-19 pandemic.

These programs were evaluated and recommendations were identified to accelerate sustainable action in the sector. Opportunities identified included collaborating across programs, engaging with common investors and supply chains, and embedding net zero emissions and circular economy targets into procurement.

The City continues to champion the expansion of the federal Commercial Building Disclosure program to include smaller buildings and office tenants and continues to encourage Sydney LGA businesses to set net zero targets and commitments.

Better Buildings Partnership

The Better Buildings Partnership released preliminary results for FY 2019/20, showing that the partnership had achieved an overall carbon emission reduction of 66 per cent from the FY 2006 baseline year and a 39 per cent reduction in potable water consumption. It must be noted that the impact of people working from home from March 2020 due to the COVID-19 pandemic has resulted in exceptional results for FY 2019/20, with a year-on-year reduction of 29% in carbon emissions and 17% reduction in water consumption compared to FY 2018/19. This year's annual results must be considered as outliers to the overall progress that the Partnership is making in reducing its environmental impact.

Performance	2005/06 baseline	2019/20 results	FY20 % saving achieved (from baseline)
Carbon emissions (t CO ₂ e)	399,181	135,722	66% reduction
Potable water kL	3,160,760	1,922,916	39% reduction

The Partnership continued to facilitate the uptake of renewable energy by members and their tenants; defined pathways to achieve a circular economy; and accelerated targets for net zero emissions. An evaluation was also undertaken to define the next phase of the partnership.

Relevant links

- [Better Buildings Partnership](#)





CITY SWITCH

GREEN OFFICE

CitySwitch Green Office NATIONAL

The CitySwitch Green Office program now represents over 1,500 offices and over 20 per cent of the office floor space across Australia.

In this period, CitySwitch signatories completed annual reporting and attended an online national annual awards event in February 2021. Organisations who were recognised for their work included national winners dSquared Consulting, PropertyNSW, Cundall and TSA Group partnership, and the Victor Chang Cardiac Research Institute & St Vincent's Centre for Applied Medical Research.

Results for 2020 indicate signatories across Australia have achieved a reduction of approximately 270,198 tonnes of carbon emissions from energy efficiency improvements and purchased 2.4million tonnes of carbon offsets.

In this period the CitySwitch National program worked with The Fifth Estate to offer a masterclass in Happy Healthy Workplaces. Work also continued to with the National Starring Committee to define the Memorandum of Understanding and the Business Plan for the next phase of the program.

Performance - Cumulative	FY 19/20
Signatories (#)	622
Tenancies (#)	1,531
Office floor Space - NLA (m2)	5.1 million
Percentage of all Australian office space ¹	20
Average NABERS Energy rating (stars)	111
Signatories with carbon neutral certification	27



CitySwitch went online for the CitySwitch Annual Awards event in February 2021

CitySwitch Green Office SYDNEY

In the past six months the CitySwitch Green Office Sydney program continued to drive sustainability in commercial offices, including:

- Sydney signatories participated in the February annual event, and were recognised for their efforts with Finder and Steenson Varming winning the NSW CitySwitch signatory awards.
- Partnering with The Fifth Estate to offer a masterclass to signatories on returning to the office at the Happy Healthy Workplace event.

Performance - Cumulative	Q1 20/21
Signatories (#)	144
Tenancies (#)	228
Office floor space NLA (m2)	1,393,210
Office floor space as proportion of Sydney (%) ²	27.5
Number of tenancies with NABERS energy rating (stars)	23

Relevant links

- [CitySwitch Green Office](#)



Making Sydney a Sustainable Destination Plan

The Making Sydney a Sustainable Destination Plan was adopted by Council in 2018 and highlights 28 actions to achieving more sustainable buildings across the accommodation and entertainment sector. Many of the actions are delivered through the flagship program, the Sustainable Destination Partnership.

Though the sector has been significantly impacted due to the health and economic impacts of the COVID-19 pandemic, the City continued to promote and offer subsidised building ratings through the provision of grants. The City delivered an annual report and event with the Sustainable Destination Partnership that demonstrated sustainable action in a challenging year. Work also commenced to rank Sydney with the Global Destination Sustainability Index.

Sustainable Destination Partnership

The Sustainable Destination Partnership released an annual report for the 2019/20 financial year showing reductions of 19 per cent in carbon emissions and 21 per cent in water consumption from the previous year - though these reductions are largely attributed to building shut-downs due to the COVID-19 pandemic. Many partners used this quiet period to continue sustainability action, including the State Library and Museum of Contemporary Art who developed sustainability strategies. An annual event to share results and stories from 2020 was held at Customs House with partners. In addition, the City facilitated three leadership panel meetings and one-to-one consultation to support partners in planning for a sustainable recovery. An event on Power Purchase Agreements (PPAs) was also convened to share expertise from the City's own recently implemented PPA and encourage members of the partnership to increase their uptake of renewable energy.

Some partners also accessed the online training available through Love Food Sydney to maintain their commitment to halving food waste.

Performance	2017/18 Baseline	2019/20 Preliminary results	2020/21 Target
Carbon emissions (tCO ₂ e)	287,334	220,042 19% reduction	10% reduction
Potable water kL	2,570,437	2,025,331 21% reduction	Zero increase

Relevant links

- [Sustainable Destination Partnership](#)

Socially distanced Sustainable Destination Partnership Annual Event May 2021





Supporting renewables



Image © Bomen Solar Farm, Wagga Wagga NSW

To address increasing community concern around the impacts of climate change, and deliver on Goal 8 in the City's Climate Emergency Response – "Help the community access onsite and offsite renewables, including 100 per cent Greenpower", the City has continued efforts to engage the community on their procurement of renewable electricity. Onsite solar has increased over 2 MW in the last 6 months to 16.8 MW.

Highlights from the past 6 months include:

- Smart Green Apartments buildings have installed 652kW of solar which saves 756 tonnes CO₂e a year, \$109,000 in reduced energy bills and represents \$717,871 in community investment. A further 381kW of solar was installed through our grants program.
- Promotion of GreenPower to residents and businesses through podcast advertising, 3rd party media partnerships and content marketing articles and videos promoted by social media and email marketing.
- Promotion of the City's new carbon offset deal with the Aboriginal Carbon Foundation
- Promotion of a guide to carbon offsets for residents
- Continued promotion of the City of Sydney's renewables leadership and information on the City's Power Purchase Agreement, which came into operation on 1 July 2020

Relevant links

- [Switching to renewable energy](#)
- [Climate action for business, Climate action for residents, Climate action for students, Climate action for workers](#)
- [Aboriginal firestick farming: close-to-home carbon offsetting](#)
- [You guide to carbon offsets: 3 actions you can take now](#)
- [How to go renewable without rooftop solar](#)
- [Renting in Sydney? Here's a step-by-step guide for switching to renewable electricity](#)
- [One simple change you can make at home to slash your emissions](#)
- [How to go renewable without solar](#)
- [How to negotiate the best GreenPower deal](#)



Water Savings Partnership

The Water Savings Partnership program, in collaboration with Sydney Water, commenced in June 2019 and aims to engage with businesses to improve water use efficiency and deliver water saving opportunities. In less than 2 years the program has surpassed its participant target.

Over the last 6 months the program has focused on small to medium businesses such as cafes, restaurants, childcare centres, and gyms. It is assisting them in reducing operational costs in the form of reduced water bills.

A recent water efficiency assessment at a large restaurant that helped identify savings worth 20 kL/day. This equates to identified savings worth \$24,000 each year. The program is currently increasing subsidies made available to businesses for implementing recommended saving opportunities.

Performance	Results to date	Program Target
Businesses (#)	57	50
Savings identified (kL per day)	551	-
Savings achieved (kL per day)	136	150



City of Sydney's Ishita Singh has assisted 55 buildings to identify opportunities to reduce water consumption through the Water Savings Partnership with Sydney Water.

Love Food Sydney



Love Food Sydney waste consultant, Edge Environment, provides food waste avoidance engagement and training to staff at Butter, a restaurant in Surry Hills.

Love Food Sydney, funded by the NSW EPA, aims to build the capacity of residents, businesses and tertiary institutions to avoid food waste. The program promotional campaign has been activated broadly across the City of Sydney. Residents have been engaged via Facebook, the City's News e-newsletter, community centres, and integrated into the delivery of the food scraps organics trial and events such as Valentine's Day and Earth Day. Businesses have been targeted through the public health team, sustainability programs and externally via a Timeout Media partnership.

Love Food Sydney pop-up engagement sessions have been held on campus at university program partners, University of Technology and Sydney University (at O-week and Enviro Week respectively). A third pop-up was held in the foyer of Century Tower, a residential tower in the CBD with 300 apartments.

Since the restrictions of COVID-19 have eased, business face-to-face support has resumed and consultant support has been provided to 10 businesses with a further 23 registered for the program. Additionally, businesses in the hotel sector who have not been able to conduct waste reviews, have focused on the online training modules, e.g. Amora Hotel's management team has completed training. The program is further facilitating training to hospitality groups via their online learning platforms, e.g. 400 employees from Solotel Group and Merivale have completed training.

Residents participating in the program are at 614. The early analysis of the data indicates a reduction in food waste production in the household via the program.



Performance	Program Targets	Performance to Jun-21
Residential participants (#)	3,434	614
Business participants (#)	167	33
Online learning modules (#)		400
Businesses in tertiary institutions	20	3

Relevant links

- [Love Food Sydney](#)

Environmental Grants

In the first half of 2021 the City awarded 21 Environmental Performance and Knowledge Exchange Grants to facilitate action and catalyse solutions required to achieve the targets set by Sustainable Sydney 2030.

Sixteen Ratings and Assessments projects were funded that will assist building owners and managers better understand their environmental impact and identify opportunities for improvement.

Five Environmental Innovation projects were also funded:

1. Project to demonstrate a mechanical battery or flywheel energy storage. (Key Energy).
2. Education and engagement on circular economy and sustainability opportunities, with micro, small and medium businesses and enterprises. (Givvable Pty Ltd)
3. Project to connect retailers with surplus stock to charities who can distribute to those in need. (Good 360 Pty Ltd).
4. Project to clean Sydney Harbour with data monitoring, prevention and clean up. (Seabin Pty Ltd).
5. Project to recycle waste textile materials into yarn for reuse in the textile industry – closing the loop. (Dempstah Pty Ltd).

The City awarded one Knowledge Exchange grants for environmental outcomes, to assist local residents install solar.

In this period the City also assisted a number environmental projects through the Matching Grants program; helping to improve the sustainability of our LGA by supporting 2 community gardens, a community compost trial and development of a community mural to raise awareness of urban biodiversity.

Recent data analysis from 111 Ratings and Assessments grants in the commercial office and accommodation & entertainment sectors shows that the City has invested \$1,171,576 which has unlocked over \$5,900,000 in

community investment retrofitting buildings and reducing carbon emissions by 5,841 tonnes per annum.

In the Residential sector, 122 Grants to a total of \$752,054 have been awarded to Owners Corporations which has led to community investment of \$2,214,588 spent retrofitting apartment buildings to improve efficiency and sustainability. This has saved \$653,971 annually and reduced emissions by 3375tCO₂e. 381KW solar was also installed.

Relevant links

- [Environmental Performance Grants](#)
- [Knowledge exchange sponsorships](#)
- [Matching grants](#)
- [Environmental grants interactive map](#)



Residential Sector – Program update

Residential Apartment Sustainability Plan

The Residential Apartment Sustainability Plan (RASP) adopted by Council in August 2015 contains 30 actions to drive demand for better performing buildings over a ten-year period.

The City has continued to collaborate with 18 stakeholders from the NSW State Government, industry and community organisations to reduce the environmental impact of apartment buildings through our Residential Apartments Sustainability Reference Group. This group met in February and May to discuss opportunities for improving sustainability in the strata sector.

The City continues to support the take-up of the NABERS tool for residential apartments, launched in June 2018, through Smart Green Apartments and the Environmental Performance Grants program. The City has directly supported 89 ratings (either individual strata buildings or layered schemes in precincts). The ratings are on a scale from 0 stars (poor) to 6 stars (market leading).

The City supported a solar for apartment owners webinar hosted by Your Strata Property. The City is collaborating with the NSW government to ensure energy efficiency stimulus, incentives and support include strata communities and also low-income communities.

Ratings and Assessments Grants totalling \$752,054 have been given to 122 Owners Corporations since 2016. From this funding our community has invested \$2,214,588 into improving the sustainability of their buildings, reducing costs by \$653,971 per annum and carbon emissions by 3374tCO₂e. 381KW of solar has also been installed.

The City promoted the value of improved environmental performance and sustainability upgrades in residential strata through presentations at the following:

- Two webinars in March and May focused on increasing recycling in apartment buildings and installing solar for owners' corporations
- NABERS National Steering Committee

Relevant links

- [Residential Apartment Sustainability Plan 2015](#)

Smart Green Apartments



Smart Green Apartments Awards were held in March, where three awards were presented to the 2019 cohort of participants. One winner, Hudson Community Association (pictured), achieved significant savings by investing \$150,000 in sustainability upgrades, resulting in a reduction of 50.5% of their total site energy use, and a reduction of 47.7% of total site carbon emissions.

Smart Green Apartments is the City's flagship retrofit program for apartment communities. To date, direct engagement has occurred with 171 strata plans, 232 buildings and 37,158 residents in 18,864 apartments.

So far, buildings in the program have implemented energy efficiency projects to save a total of 24,030 tonnes CO₂e per year and saving participating owners corporations a total of \$3.49 million per year. This included 625kW of approved and identified solar, which saves 756 tonnes CO₂e a year, \$109,000 in reduced energy bills and represents \$717,871 in community investment.

Through the City's Waterfix partnership with Sydney Water; 3,026 individual apartments have been retrofitted within 14 buildings. These upgrades will achieve water savings of 847,698 kL per annum in reduced water bills.

Owners' corporations from all intakes have continued to implement waste improvement initiatives in their buildings, including 22 Smart Green Apartments buildings which are participating in the City's food waste collection trial.

9. Glossary

Active transport: Involves any physical activity that gets you from one place to another, such as walking and cycling.

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.

Arterial transport: A high-capacity urban road or route.

BASIX or Building Sustainability Index: A NSW government index, to rate energy and water efficiency performance of residential buildings, that aims to reduce water consumption and greenhouse gas emissions by 40 per cent compared to pre-BASIX (2004) buildings.

Biodiversity: Biological diversity including species richness, ecosystem complexity and genetic variation.

Business-as-usual: A projection (e.g. greenhouse gas emission levels) based on the assumption that all existing policy measures remain in place with no new measures introduced.

Canopy cover: The proportion of land area occupied by the tree's crown or canopy, or combined canopies, when visualised from directly above. It is often expressed as a percentage of the total area covered.

Carbon intensity: Electricity that has a high emissions concentration, or energy intensity, for example coal-fired electricity has a high emissions concentration, or carbon intensity.

Carbon neutral or net zero emissions: Balancing the amount of carbon released with an equivalent amount offset by purchasing carbon credits to make up the difference.

COP21: The 2015 United Nations Climate Change Conference held in Paris, December 2015 that negotiated the Paris Agreement - a global agreement on the reduction limiting global warming to less than 2°C compared to pre-industrial levels and to drive efforts to limit the temperature increase even further to 1.5°C.

C40 Cities: is a network of the world's megacities committed to addressing climate change.

Dual plumbing: A plumbing system with two separate pipes supplying potable and reclaimed water to a building or precinct.

Ecosystem: Animals, plants and microorganisms that live in one place, as well as the environmental conditions that support them.

Energy efficiency: Using less energy to achieve the same output.

Energy storage: The capture of energy produced at one time for use at a later time.

Environmental Action 2016 – 2021 Strategy and Action Plan The strategy and action plan combines the insights and data from environmental master plans and strategies that the City developed between 2008 and 2015. The plan outlines our progress to date, and approach to achieving our bold Sustainable Sydney 2030 targets.

Environmental Management System (EMS): is a structured system designed to help manage environmental impacts and improve the environmental performance of the City's operations.

Greenhouse gas emissions: Gases that trap heat in the atmosphere. Greenhouse gases from human activities are the most significant driver of observed climate change since the mid-20th century.

Locally indigenous: A native plant that is limited to a particular geographic area and often confined to a specific habitat.

Low-carbon energy: Electricity produced with lower amounts of carbon dioxide emissions than conventional fossil fuel power generation, such as wind, solar and hydro power.

Mitigate: Taking action to reduce impact on the environment, as well as contributions to climate change (in this context).

National Australian Built Environment Rating System or NABERS: An Australian government initiative that measures and rates the environmental performance of Australian buildings and tenancies.

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.

Net zero emissions: Balancing the amount of carbon released with an equivalent amount offset. Usually offsets are through purchasing carbon credits to make up the difference. The best practice approach is to reduce, or avoid, carbon emissions first, then offset any unavoidable emissions.

Non-potable water: Water that is not of a quality for drinking and cooking purposes, used for purposes such as laundry, gardening, car washing and cooling towers.

Paris Pledge for Action: At COP21 in Paris (December 2015), a group of global cities, regions, companies and investors committed achieve climate stability, limiting global temperature rise to less than 2°C.

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.

Potable water: Treated water that is safe enough for consumption, use in kitchens and bathrooms. Water that is of drinking water quality for use in bathrooms, kitchens and for consumption.

Raingardens: Gardens that allow rainwater runoff to be absorbed, providing rainwater for plants and improving water quality in waterways by up to 30 per cent.

Recycled water: Former wastewater (sewage) is treated to remove solids and impurities and used for non-potable water needs, rather than discharged into waterways.

Renewable energy: Energy from resources which are naturally replenished on a human timescale, such as sunlight, wind, rain, tides, waves, and geothermal heat.

Resilience: The capacity to survive, adapt and grow no matter what kinds of chronic stresses and acute shocks are experienced.

100 Resilient Cities: Pioneered by the Rockefeller Foundation (100RC) is dedicated to helping cities around the world become more resilient to the physical, social and economic challenges that are a growing part of the 21st century.

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".

Sea level rise: Long-term increases in the mean sea level due to global warming.

Sustainability Management and Reporting Tool (SMART): SMART is a new utilities management system that will manage and record energy and water usage by directly extracting consumption data from relevant authorities.

Stormwater harvesting: Water from intense rainfall events (stormwater) is captured, cleaned and typically re-used for non-potable purposes.

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.

Swales: Low, moist or marshy land, naturally landscaped feature or a human-created one, that manages water runoff, filters pollutants and increases rainwater permeation.

The best practice approach is to reduce or avoid carbon emissions first, then offset any unavoidable emissions.

Trigeneration: A system providing cooling, power and heating. Electricity is produced locally, the waste heat is used to supply heating and hot water and converted into cooling via a heat-driven chiller system.

Urban heat island effect: Cities are often warmer than rural areas because vegetation is replaced with hard structures, such as pavements and buildings, which absorb and release more heat than the natural landscape.

Urban renewal areas: A program of land redevelopment in areas of moderate to high density urban land use.

Utility corridors: A passage built underground or aboveground to carry utility lines such as electricity, water and sewerpipes.

Water efficiency: Using less water to achieve the same output.

Water sensitive urban design: A design approach which integrates the urban water cycle into urban design to reduce environmental degradation and improve aesthetic appeal.

Wetlands: A land area saturated with water that forms a distinct ecosystem of aquatic plants that manage water runoff, filter pollutants and increase rainwater permeation.

10. Appendix 1: Data management plan



Low-carbon city

City of Sydney (Operations)		
Data type	Current Status	Forward Plan
Electricity	Reporting underway from SMART. Electricity currently is reported quarterly in arrears. Data provided by electricity retailers. Daily monitoring occurring at all large electricity using sites (over 100,000 kWh per annum).	Continue to implement and monitor data through Sustainability Management and Reporting Tool (SMART)
Natural gas	Gas data is reported quarterly in arrears. Additionally, gas account data (usage) may be estimated in cases where the gas retailer cannot read meters.	Continue to implement and monitor data through Sustainability Management and Reporting Tool (SMART)
Other sources	Emissions sources including flights, taxis, contractor fuel, onsite fuel usage, and refrigerants are added to SMART quarterly. Events data is estimated on previous years' performance.	Improvement plan priorities include improving contractor reporting templates and consistency in recording staff travel data.
Co/Tri generation and renewable energy	The City is working to improve the measurement and reporting of, trigeneration and solar power generation. Data is estimated based on system size.	Improvement plan being developed to improve metering and incorporate data into SMART.
Asset Environmental Budget (Emissions)	Asset Environmental Budget (emissions) has been developed based using baseline data from the NCOS report. Estimations for portfolio increases has been based on existing portfolio performance, Project projects for co/trigeneration, MPEP, Solar Photovoltaics program programs have been based on estimations for each program. In addition, Ausgrid lighting roll out program has been estimated based on the anticipated delivery program.	The Asset Environmental Budget will be reviewed annually.

Local Government Area (LGA)		
Data type	Current Status	Forward Plan
Electricity	CCAP City - reported through the Environmental Sustainability Platform. The electricity distributor has provided community-wide high-voltage electricity data for City of Sydney local government area at a high level. Due to confidentiality clauses, a breakdown of the high-voltage data by source has not been provided and hence is not included in the City's community inventory.	Continue to monitor and report electricity data.
Natural gas	CCAP City reported through the Environmental Sustainability Platform	Continue to monitor and report

Other sources	CCAP 2.0 reported through the Environmental Sustainability Platform	Continue to monitor and report
Co/tri generation and renewable energy	Information about renewable energy installations is available through the Clean Energy Regulator. The Australian PV Institute have developed a solar map with funding through ARENA at http://pv-map.apvi.org.au/ Currently there is no formal mechanism in place for tracking installed co and trigeneration systems.	Continue to monitor and report



Water sensitive city

City of Sydney (Operations)		
Data type	Current Status	Forward Plan
Water	The transition of water data to SMART, the new utility data management system is almost complete. First water utility data set has been released in this report and will be verified in future reports. Data is collated from water utility bills. Accruals for June have been calculated based on estimates from previous periods.	The organisation-wide sustainable metering program will address key priorities to improve metering and monitoring of water, energy and other sustainability components including recycled water consumption.
Annual potable water use by irrigated open space	The irrigated areas are being reviewed and will be updated in the next report.	Irrigated areas are being verified so the irrigation intensity can be accurately determined.

Local Government Area (LGA)		
Data type	Current Status	Forward Plan
Water	Reporting mains water consumption annually only. No existing process for accurately capturing and reporting non-mains water consumption except manually via IPART for WICA licensees only (annually in arrears). Data for LGA potable water usage available annually only.	Continue to monitor and report



Zero waste city

City of Sydney (Operations)		
Data type	Current Status	Forward Plan
Waste	Commercial waste and recycling from 65 City of Sydney properties is reported quarterly. Construction and demolition waste reporting is limited.	The City has recently completed an organisation wide review into the way in which it collects, reports and verifies recycling and landfill diversion performance data, to significantly improve the accuracy and transparency of our reporting. The City is committed to improved reporting processes and implementing solutions for increased recycling performance of the waste it manages.
City managed property waste	All City managed property waste reported from SMART.	Construction waste data to continue to be incorporated into SMART

Local Government Area (LGA)		
Data type	Current Status	Forward Plan
Waste	Construction and demolition waste from the city reporting is limited.	LGA commercial waste data capture to be improved and verified.
Residential waste	LGA residential waste data available and reported in the Corporate Plan. Residential and city streets waste tonnages are reported from processor reports and invoices that are extrapolated into local master spreadsheets.	
City parks, streets and public place waste	City parks waste tonnages are reported directly from processor reports and invoices. City streets, public place and stormwater waste is not separated for disposal. Separate tonnages are based on estimates from the <i>Operations Waste Databases Audit July 2017</i> .	City parks, streets, public place and stormwater waste tonnages to be reviewed for incorporation into SMART.
e-waste	City runs e-waste drop off events tonnage collected is included in the report and also included in the corporate report.	

Active and connected city

City of Sydney (Operations)		
Data type	Current Status	Forward Plan
Fleet	Provided from the City's data management system Ausfleet.	Improvement plan to be developed and data to be incorporated into SMART.
Cycling	Event data, attendance at training sessions and monitoring is collated by City staff and maintained in registers.	Improvement plan to be developed to assess management of data.

Local Government Area (LGA)		
Data type	Current Status	Forward Plan
Car sharing	Car share operators provide monthly usage and membership data to the City. Issues with reviewing data due to operator's capacity to plot suburb boundaries, parking areas. Operators do not have common membership categories. Peer to Peer car share membership is not collected by the City. RMS publishes licensing data each quarter. City maintains database of on-street and off-street car share parking using Traffic Committee data and operator reports.	Improvement plan to be developed to assess management of data.



Green and cool city

City of Sydney (Operations)

Data type	Current Status	Forward Plan
Green and cool city	Organisational reporting currently not centralised.	Improvement plan to be developed to assess management of data

Local Government Area (LGA)

Data type	Current Status	Forward Plan
Urban canopy	Urban canopy measurement is currently undertaken every five years, through the use of Lidar or other high-resolution aerial imagery. Tree planting figures are provided through the Corporate Asset Management System (CAMS)	A review of the canopy cover timing will occur as part of the Urban Forest Strategy review. Improvement plan to be developed to assess management of data
Urban ecology	Event data and attendance data is collated by City staff and maintained in registers. Survey data collates as described in the City's Urban Ecology Strategic Action Plan	Improvement plan to be developed to assess management of data.
Community Empowerment	Event data and attendance data is collated by City staff and maintained in registers	Improvement plan to be developed to assess management of data.
Green roofs and walls	Green roofs and walls data is collated by City staff and maintained in registers	Improvement plan to be developed to assess management of data.

Delivering to the Community

Local Government Area (LGA)

PROGRAM NAME	Current Status	Forward Plan
Better Buildings Partnership	Program data collated from participants in spreadsheets and uploaded to CCAP 2.0 Environmental Sustainability Platform for archiving and analysis. Details of participants (individual buildings and floor space), energy use and energy savings implemented reported annually in arrears.	Continue to monitor and report
CitySwitch	Program data collated in national CitySwitch CRM database for archiving and analysis. Sydney data entered to CCAP 2.0 Environmental Sustainability Platform. Details of participants (individual tenancies and floor space), energy use and NABERS ratings reported annually in arrears.	Continue to monitor and report
Sustainable Destination Partnership	Program data collated from participants in spreadsheets and uploaded to CCAP 2.0 Environmental Sustainability Platform for archiving and analysis.	Continue to monitor and report
Smart Green Apartments	Program data collated in SUMS data platform. Details of participants recorded annually, energy and water use data uploaded monthly and details from assessment reports recorded through phases of assessment process. NABERS ratings numbers provided by NSW Government Household and Small Business Program	Archiving and analysis to be improved through inclusion in CCAP 2.0 Environmental Sustainability Platform
Environmental Grants	Program data collated in SmartyGrants platform and in program manager spreadsheets. Information recorded as prompted by phases of grant process (application to acquittal).	Ease of analysis to be improved through inclusion in Programs CRM database



LEGEND

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

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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