



Priorities for a Net Zero Sydney

September 2021



Committee
for
Sydney



Introduction

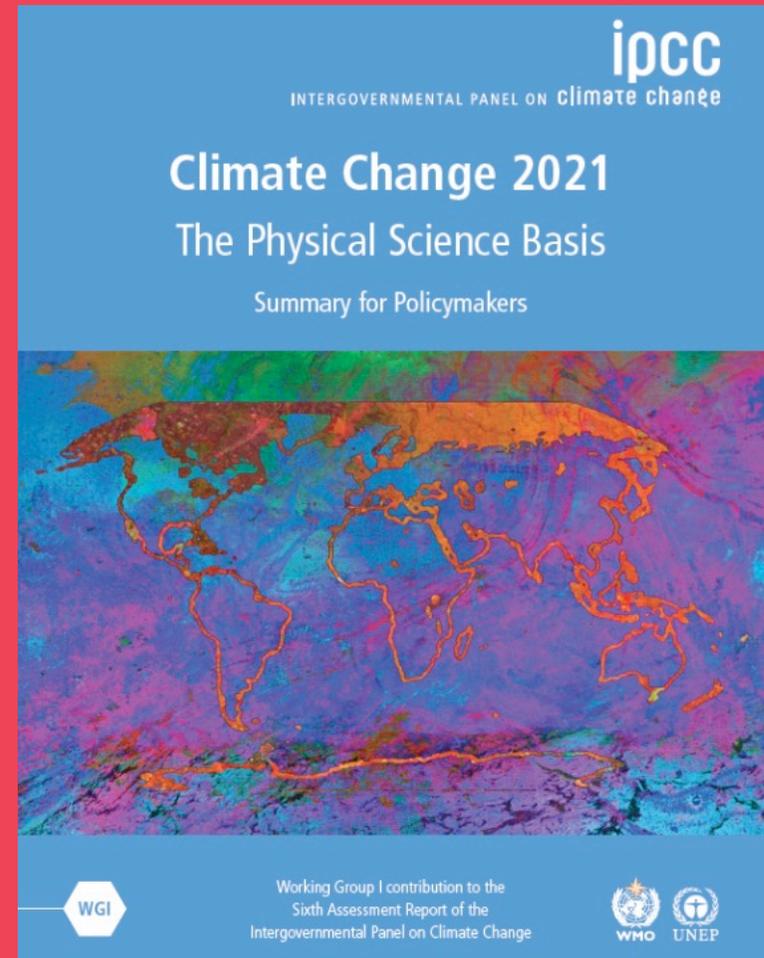
We've had an IPCC wake up call. Now we are awake and listening, what do we need to do in Sydney by 2030 to put us on track to reach net zero by 2050?

In releasing the first chapter of the sixth assessment report (August 2021), the IPCC has put an intense focus on what a warming world would look like, and the need to accelerate action on climate change – reducing carbon emissions in pursuit of the globally agreed target of net zero emissions by 2050.

We heard from global scientists what we already know from lived experience. The world has warmed 1.1°C since 1900, and this has implications for our global climate.

- Our summer extremes are hotter and droughts are longer
- Our bushfire seasons are getting worse
- '1 in 100 year' floods are happening more frequently.

The last two years have provided constant reminders, as have the past few months across North America, Europe and China, where floods, bushfires and heatwaves have devastated urban and rural communities, providing some insight into the extremes we can expect as the world warms.



IPCC Sixth Assessment Report first chapter released August 2021. Cover image shows city green roofs as reported by [ABC News / Ursula Malone](#).



Priorities for 2030 – to put us on track for net zero by 2050

1. Develop as much renewable capacity as possible

- Invest in as much renewable energy as possible
- Supported with big batteries and pumped hydro
- Create markets for green steel and green hydrogen.

2. Electrify everything in our homes and workplaces

- Transition appliances away from gas
- Build all-electric homes and offices
- Improve the thermal efficiency of our buildings.

3. Accelerate the transition to electric vehicles

- Target passenger fleets to create a 2nd hand EV car market
- Require charging infrastructure in new and old buildings
- Create incentives for commercial and freight vehicles.

4. Shift trips from cars to active transport

- Accelerate investments in bike paths close to CBDs
- Prioritise active transport strategies for local trips
- Set an ambitious target to shift travel away from private vehicles.

5. Democratise decentralised energy for use by all households

- Create widespread opportunities for community batteries
- Broaden consumer awareness on how to benefit from solar, batteries and electric appliances
- Ensure benefits are accessible to renters, apartment dwellers and low-income households.

6. Decarbonise construction

- Continue to improve efficiency standards for new homes
- Build on lessons from the UK and Europe
- Harness NSW Government procurement power to drive innovation across the construction sector.

7. Refocus on waste

- Divert organics from landfill
- Accelerate adoption of a circular economy
- Ensure we recover embodied energy from remaining waste.

8. Act now to remove carbon from the atmosphere

- Set a 2030 target and determine the carbon offsets needed to keep Sydney within its carbon budget
- Identify local opportunities for soil-carbon sequestration and drawdown technologies like direct air capture
- Create a carbon offset market mechanism.

So, where do we start with decarbonising Sydney?

Despite some momentum on the global stage, and some policy and practical progress on the ground, we still have work to do to achieve the ambition of the 2015 Paris Agreement, to limit warming to 2°C, and pursue efforts to limit warming to 1.5°C.

This translates to net zero by 2050 – and the first milestone along the way – to halve emissions by 2030.

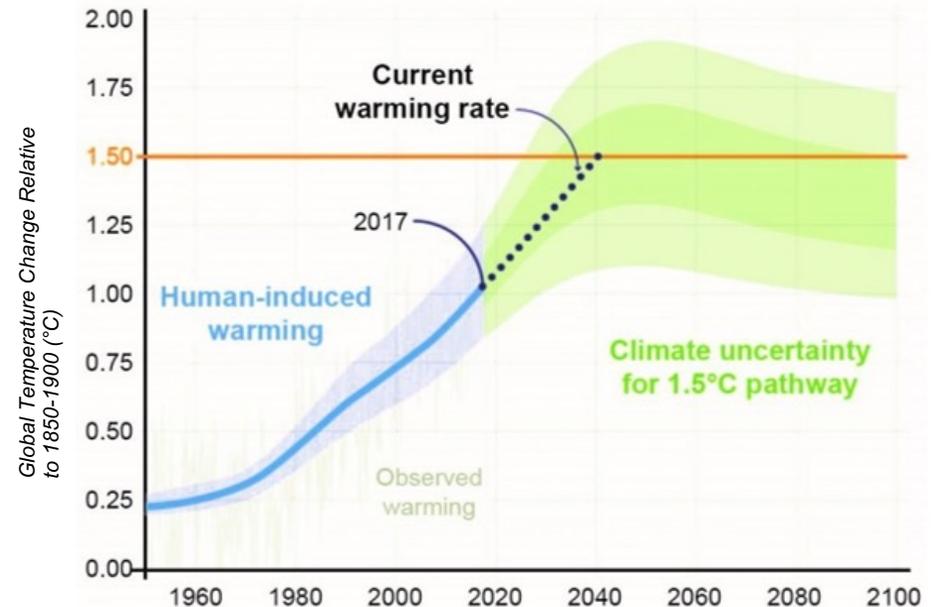
The good news is we haven't used up our carbon budget yet. And we have a short runway ahead of us to turn it around if we commit to limiting warming to 1.5°C.

This means we need to do two things:

1. Accelerate efforts to prepare ourselves for the uncertain future that climate change is already hinting at –addressing our changing local risk, if you will
2. Ramp up efforts to win the 'race to net zero', mitigating, as much as possible, the 'global risk' that a warming climate will visit on countries around the world that we rely on for our export markets, and supply chains.

So, what does the path to 1.5°C look like for Sydney? In the following pages we outline eight objectives to put Sydney on the path to 1.5°C and on track to reach net zero by 2050.

Possible scenarios for limiting warming to 1.5°C:



Source: IPCC Summary for Policy Makers, 2021

1. Develop as much renewable energy capacity as possible

First, we need to continue to drive renewables into the energy system that powers our city. This means investing in as much renewable energy as possible, supported by big batteries and pumped hydro.

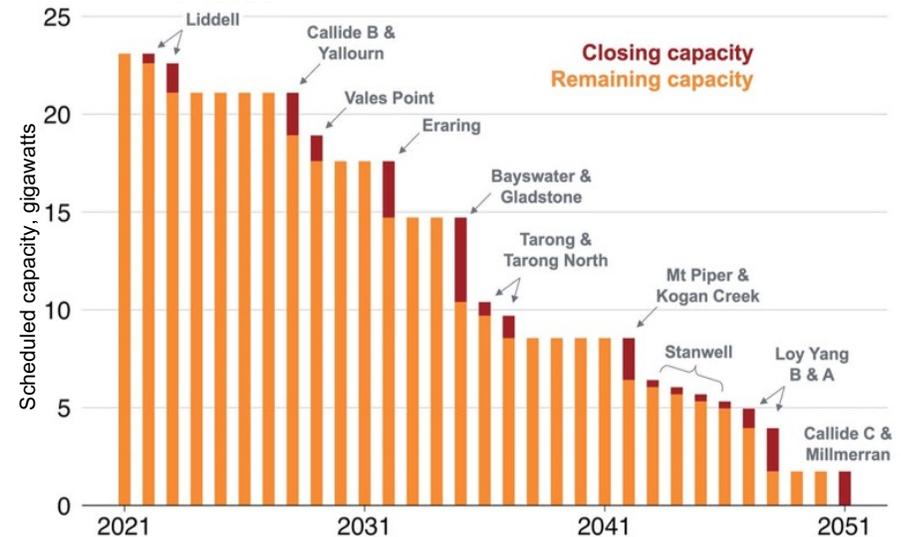
NSW's five planned Renewable Energy Zones (REZ), and associated transmission infrastructure, will be an important part of this transition. But with the Australian Energy Market Operator (AEMO) identifying a further four candidate REZs in NSW, and many more across the country, this is only the beginning.

We need to create the conditions for renewables to deliver far beyond 100 per cent of commercial and residential demand so that excess can be used to fuel green hydrogen and green steel production, creating jobs, export markets and zero carbon manufacturing.

As coal exits the market, due to planned decommissioning and pricing pressures, we will continue to need some flexible and firm gas-fired plants.

However, the pause in renewable investment in the past quarter – variously attributed to Federal Government intervention in the energy generation market – needs to be resolved quickly to reinvigorate the pipeline of renewable energy projects moving to financial completion.

Most of Australia's coal-fired power stations are scheduled to be retired over the next few decades



Source: [Grattan Institute](#)

2. Electrify everything in our homes and workplaces

There is little point decarbonising electricity if the machines we use day to day continue to be fossil fuel reliant, especially given approximately 55 per cent of Sydney's emissions come from residential, commercial, retail and industrial buildings¹.

We need to target a near future where all the machines we use at home and at work are electricity driven, allowing us to take advantage of a decarbonising grid. This means normalising energy efficient induction cooktops, heat pump hot water systems, reverse cycle air-conditioning and fans, and electric dryers, rather than their gas-fuelled alternatives. Estimates suggest this process of 'electrifying everything' would save households \$3,000 to \$5,000 a year².

Cities across the United States have started to incentivise the shift to electrifying everything, with Berkeley, California, becoming the first of more than 40 cities in the USA to prohibit gas connections in most new buildings. At the federal level, President Biden recently called for the construction or retrofitting of more than 2 million energy-efficient homes as part of his recently announced \$2 trillion infrastructure plan.

Here in Sydney, Canterbury-Bankstown Council has taken the first step by allowing developers to erect taller buildings in the Bankstown and Campsie CBDs in return for making them 100 per cent electric and ensuring at least 40 per cent of their energy comes from solar panels.

In Edmondson Park in Western Sydney, 'all-electric homes' are being built that won't be connected to the gas grid, relying on solar panels producing more energy than the households consume to make them cheap to run. This has the co-benefit of reducing the amount of gas leaking from pipes and household appliances across the city, not least because unburnt natural gas is 80 times more potent than carbon dioxide.

And improving thermal efficiency of our homes will also reduce the need for heating and cooling, even if we do need these machines to counter the extremes of our harsh Australian climate.



An artist's impression of what the all-electric homes will look like at Edmondson Park.

1. https://gsc-public-1.s3.amazonaws.com/s3fs-public/exploring_net_zero_emissions_for_greater_sydney_-_kinesis_-_october_2017.pdf
2. <https://www.abc.net.au/news/2021-06-09/electric-vehicles-victim-of-culture-wars-expert-says/100196982>

3. Accelerate the transition to electric vehicles

After buildings, the next biggest source of emissions in Sydney is transport, where again we can benefit from electrification.

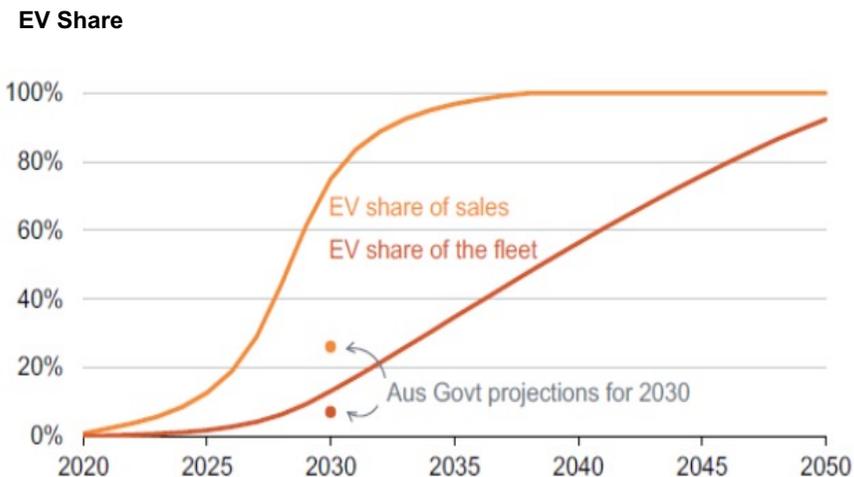
Not only are electric vehicles quieter, and less polluting, the average driver can save about \$1600 per year on fuel and maintenance costs, and even more if charging utilises off-peak rates or solar panels.

Operating as mobile batteries, EVs can also provide flexible storage to help manage demand across the network, absorbing excess renewable energy generated in the middle of the day, and discharging back to the grid during periods of peak demand.

The foundation is being laid for the transition with the NSW Government committing to transition its passenger and bus fleets to electric vehicles by 2030, incentives in the market from 1 September to increase passenger vehicle uptake, and a fast-charging infrastructure strategy emerging.

However, with modelling by the Climate Council indicating that 75 per cent of new car sales by 2030 need to be electric for Australia to achieve net zero emissions by 2035, there is a very steep curve ahead from 1.5% of car sales today.

Around half of all the cars purchased in NSW every year are for passenger fleets, meaning these purchasing decisions are critical to ramping up the proportion of electric vehicles purchased every year and increasing affordability via the second-hand car market for EVs, as fleets turn over every three to four years.



Source: [Grattan Institute](#) (2021) *Towards Net Zero – Practical Policies to Reduce transport Emissions*

3. Accelerate the transition to electric vehicles

However, Sydney's reputation as a leader in the transition to EVs will also hinge on the speed at which new and old buildings alike can introduce the infrastructure needed to overcome anxiety about where to charge.

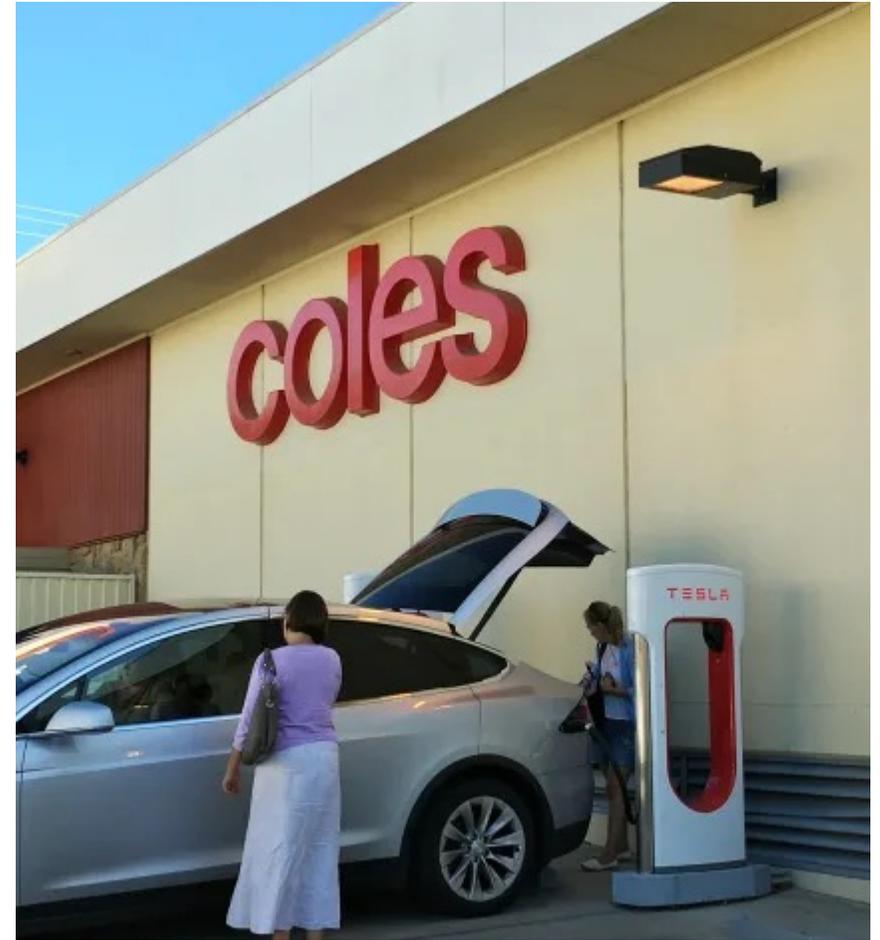
Private passenger vehicles are not the only challenge.

Incentives and regulations to accelerate the transition of commercial and freight vehicles, and corporate fleets, will also need to be part of the strategy, with estimates that businesses can save from \$5,000 to \$12,000 per year in operational costs.

The UK has recently brought forward the ban on new petrol and diesel cars by 10 years to 2030, allowing the sale of hybrid cars and vans – that can drive a significant distance with no carbon coming out of the tailpipe – until 2035.

The move places the UK on par with Germany, Ireland and the Netherlands, but behind Norway where sales of new fossil fuel cars will be banned by 2025.

Australia currently has no plans to phase out petrol and diesel cars, or increase efficiency standards on vehicles, meaning we run the risk of missing the transition to electric vehicles and becoming the world's dumping ground for inefficient, polluting vehicles.



Retail outlets provide opportunities to extend EV charging infrastructure.

4. Shift from cars to active transport

Converting all vehicles to electric will be a gradual process, even with the most optimistic assumptions.

Fortunately, there are ways to make significant reductions in transport emissions today by shifting both commuter and recreational trips from cars to active transport modes like cycling, walking and even e-biking.

With transport making up 20 per cent of emissions, the target of net zero is unlikely to be met without a significant move away from motorised transport.

European studies³ show using a bike instead of a car for short trips can reduce an estimated 84 per cent of travel emissions compared to non-cyclists. Walking reduces those emissions to zero. And both modes come with co-benefits such as lower local air pollution and better health.

Travel behaviours are also changing due to Covid-19 restrictions.

More people are now walking and cycling within 10 kilometres of the Sydney CBD, with data⁴ revealing regular cycling has more than doubled in the past two years across the inner city.

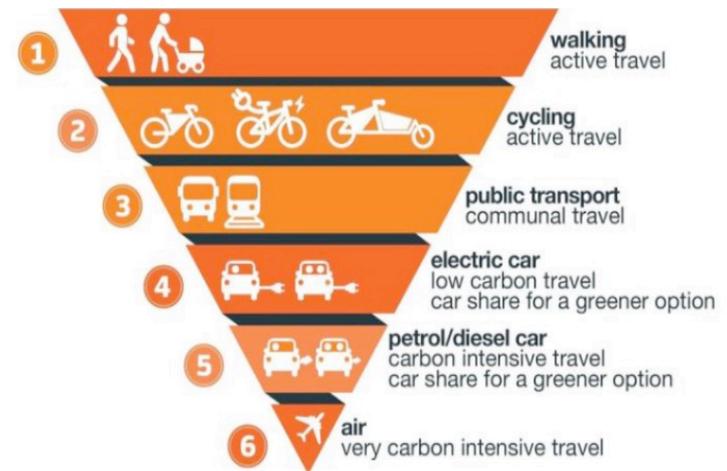
3. <https://www.sciencedaily.com/releases/2021/02/210208104624.htm>

4. <https://www.smh.com.au/national/nsw/regular-cycling-booms-in-sydney-amid-pandemic-20210826-p58m7x.html>

The NSW Future Transport 2056 strategy aims to connect bike paths within 10km of Sydney CBD by 2026 and within 5km of strategic centres such as Parramatta by 2036, with a linked network by 2056.

With trends towards increasing working from home and higher utilisation of local centres, the time is now to introduce the cycling infrastructure we need – bike paths, bike parking and end of trip facilities – and to set an ambitious target to shift local and commuter trips from private cars to more active transport.

Low Carbon Transport Hierarchy



Source: [UK Energy Savings Trust](#)

5. Democratise decentralised energy for use by all households

The benefit of electrifying everything can be magnified by the role of household solar panels, which, when combined with batteries (at the household or community scale) allow homes to access free daytime solar electricity, store it, and use it when they want.

Electric vehicles can be ‘filled up’ for free, bills can be reduced, and excess power can be sold back to the grid or traded with others connected to a community battery. Further, the cost of battery storage fell more than any other generation or storage technology over the past year and is expected to continue to fall.

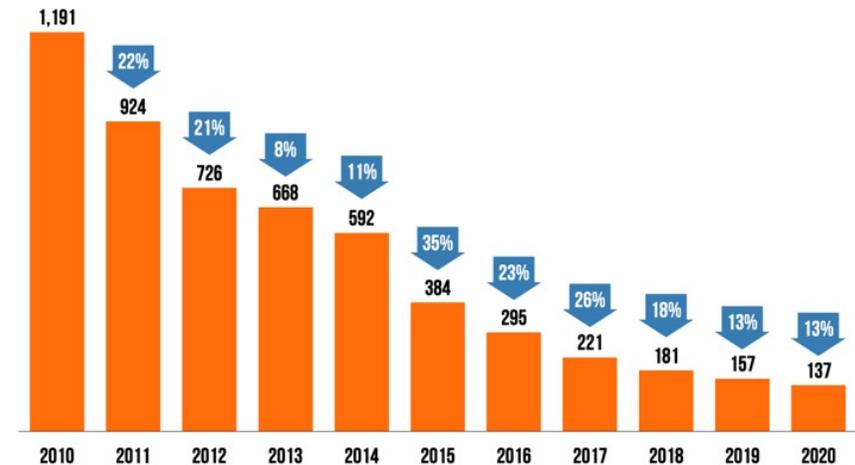
Already we have some of the highest uptake of solar PV in Western Sydney – a quarter of households in suburbs like Camden and Campbelltown have solar PV.

Making these benefits accessible to renters, apartment dwellers and low-income households through community batteries and programs like ‘Solar for low-income households’⁵, will ensure the benefits of low cost and reliable electricity will be accessible across the city.

As soon as you have solar, or access to solar-charged batteries (whether household, community scale or via a virtual power plant), the economics of electrical appliances also change, as the cost of cooking, heating and cooling is dramatically reduced.

Having free (or at least cheap) operational costs, means the whole of life equation for appliances improves. When combined with efforts to improve minimum performance standards for appliances, we can create the rapid return on investment needed to overcome the reality that price sensitive consumers (us) will think twice before paying extra upfront.

Price of a Lithium-Ion battery pack, Volume-Weighted Average
Real 2020 US dollars per kilowatt hour



Source: [Bloomberg New Energy Foundation](#)

5. <https://www.energysaver.nsw.gov.au/households/solar-and-battery-power/solar-low-income-households>

6. Decarbonise construction

After energy, buildings and transport, the next challenge in urban decarbonisation is construction. Concrete and steel each make up seven per cent of global emissions, and emissions from the construction of the average home is equivalent to approximately 10 years of operational energy use.

Given we build approximately 30,000 houses and 60,000 apartments in Sydney each year, in addition to commercial, manufacturing and industrial buildings, we can't achieve net zero without a significant shift in the construction materials we use across the city today, and these need to be driven by higher energy efficiency standards for new homes.

The property industry has made significant strides in reducing the carbon intensity of construction, but absorbing the potential 8-30 per cent additional costs on the final product may be easier to justify on large commercial buildings than homes.

Twenty-eight city governments worldwide, including City of Sydney, have already signed the Zero Carbon Buildings Commitment, organised by the World Green Building Council and C40 Cities. These cities have committed to ensuring all their new buildings are designed to operate at net zero by 2030, and that all existing buildings are to achieve net zero by 2050.

In terms of major infrastructure, projects like the \$16 billion Sydney Metro City & Southwest set out to achieve at least a 20 per cent reduction⁷ in carbon emissions associated with construction, when compared to business as usual.

But more than \$100 billion will be invested by the NSW Government in infrastructure over the next four years – how could this procurement power be used to drive innovation in the construction sector?

It won't happen overnight, but tapping into the expertise of the market, particularly those companies that have been responding to similar challenges in the UK and Europe for many years, would accelerate the learning curve.

The right incentives in our infrastructure procurement also have the potential to support development of local green steel (from green hydrogen) and green cement industries.



Steel and concrete make up over fourteen per cent of global emissions.

7. https://www.sydneymetro.info/sites/default/files/document-library/CSW-Sustainability-Strategy-June-2019_0.pdf

7. Refocus on waste

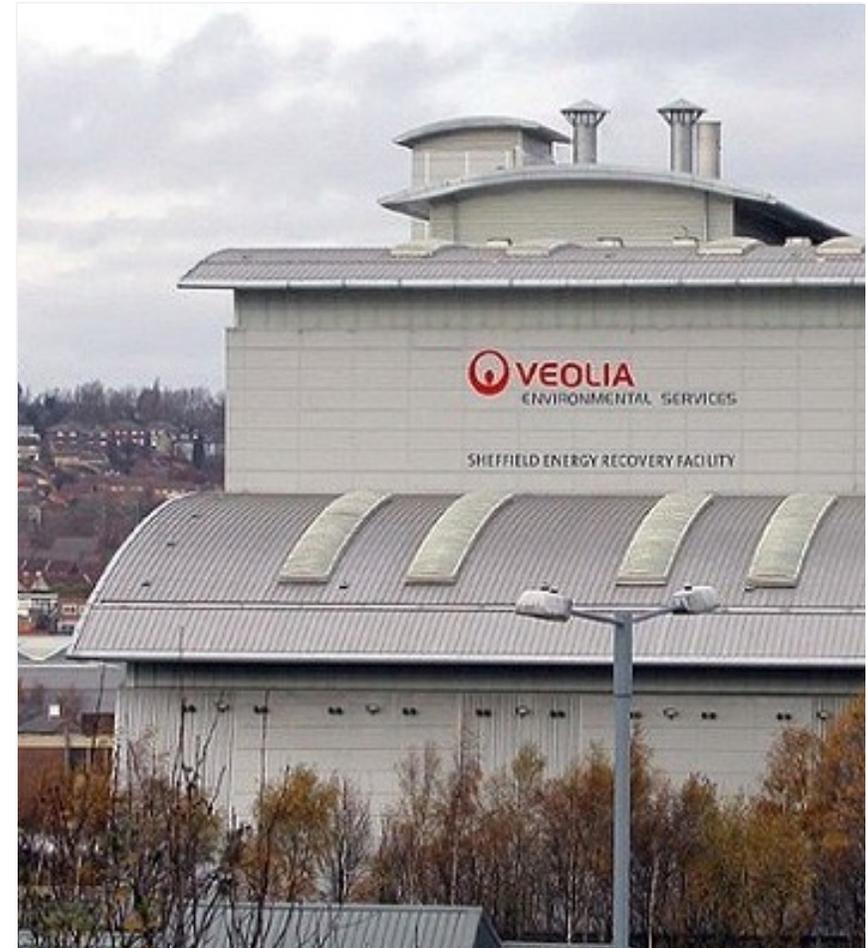
Waste is responsible for 14 per cent of Greater Sydney's emissions and doesn't rely on decarbonisation of the grid to deliver significant reductions. Wasted food disposed in landfill impacts the environment by generating methane, a greenhouse gas 25 times more powerful than carbon dioxide, and a major cause of climate change.

So, the priority is to divert organics – food and garden waste – from landfill to composting and other processing technologies to reduce our most harmful emissions from waste. The City of Sydney is one council taking action in this area, initiating a food scraps recycling trial for more than 20,000 households, while Bayside Council has diverted a third of residents' food waste from landfill since starting their program in 2019.

We can increase our carbon efficiency by designing out waste, using less energy-intensive materials in production, increasing the lifespan of buildings and products, and reusing or recycling materials to avoid emissions associated with raw material extraction and production – an approach more commonly known as circular economy.

We can also make use of our remaining 'dirty' waste to generate power using 'energy from waste' technologies. In tandem with emissions standards, the thermal treatment of waste provides an opportunity to recover the embodied energy from waste⁸, offset the use of non-renewable energy sources, and avoid methane emissions from landfill.

8. <https://www.dpie.nsw.gov.au/our-work/environment-energy-and-science/waste-and-sustainable-materials-strategy>



Energy from waste can recover embodied energy and reduce carbon emissions from landfill.

8. Act now to remove carbon from the atmosphere

Net zero means we can still produce some emissions, as long as they are offset by processes that reduce greenhouse gases already in the atmosphere.

Alongside going as hard and as fast we can in reducing carbon emissions, there needs to be renewed focus on offsetting our carbon emissions in order for Sydney to stay within its carbon budget.

Offsetting includes mechanisms like investing in reforestation and renewable energy, reducing emissions through soil-carbon sequestration, and/or drawdown technologies like direct air capture.

There are nearly 800 carbon offset projects across Australia, and offsets could provide a huge opportunity for local investment within NSW with broader agricultural and biodiversity benefits.

While many cities globally and here in Australia buy carbon offsets, there is not a carbon offset market that transparently links offsetting projects, and the benefits, with the need for cities like Sydney to engage with at a metropolitan scale.

This is a new space for cities and without a market in Australia there is an opportunity to act on this early, both to establish the mechanism and to reduce the likelihood of over-shooting the global 1.5°C target



Reforestation and soil sequestration can reduce atmospheric carbon.

Next steps

We have identified eight action areas setting the direction we need to be headed as a city, as we close in on 2030. We still have time, but not much.

If we took a carbon budget approach to Greater Sydney – a carbon budget sets the amount of greenhouse gases that can be 'spent' (emitted) for a given level of global warming – we would have approximately five years left before we start to exceed our budget to stay below 1.5°C. So ... we need to make inroads fast.

While all these actions will enable Sydney to play its part in combating global climate change, each will also provide multiple benefits to our communities, economy and environment here in Sydney – from improved air quality to lower household bills and more resilient energy grids that are better able to cope with the extremes of weather that we can expect to face in coming years.

The opportunity to show creativity, leadership and action, from big infrastructure down to household scale, is the challenge ahead of us. And we can't wait until 2050. We need to set ambitious and optimistic goals for 2030 – goals that show leadership and set the direction.



Innovation Fund Partners

We would like to thank our Innovation Fund Partners for their support of the Committee for Sydney's research.

Our Innovation Fund Partners are future focused, and outcome driven. They are leaders of change.

Their combined investment underpins our annual research program and together with our members, enables us to grow our impact and output – striving to create a better Sydney that offers unparalleled opportunity and quality of life for everyone.

We are proud to work with our Innovation Fund Partners Dexus, ICC Sydney, McKinsey & Company, Western Sydney University and Campbelltown City Council.

The logo for Dexus, featuring the word "dexus" in a lowercase, sans-serif font.The logo for ICC Sydney, featuring the letters "ICC" in a bold, sans-serif font with a colorful, multi-colored bar behind them, followed by the word "SYDNEY" in a smaller, uppercase, sans-serif font.

The Committee for Sydney is the city's peak advocacy and urban policy think tank.

We are advocates for the whole of Sydney, developing solutions to the most important problems we face.

Our goal is to help Greater Sydney be the best city in the world.



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The Committee for Sydney's Resilience Program focuses on:

- Opportunities for innovation and economic growth as we transition to net zero
- Investing to avoid disruption from infrastructure failure and cascading failure across the city.
- Building on lived experience to reduce direct risks to life and productivity, now and in the future
- Enabling utilities and businesses to grow the capacity to manage and transfer residual risk.