Greenhouse Gas Emissions

What is Melbourne Airport doing to reduce Greenhouse gas emissions?

Greenhouse gas emissions can be divided into three categories known as 'scopes'. The international Greenhouse Gas Protocol definitions for these scopes can be summarised as follows:

Scope 1	Direct emissions from sources owned or operated by a reporting organisation (e.g. combustion of diesel in company-owned vehicles or used in on-site power generators).
Scope 2	Indirect emissions associated with acquiring energy from another source (e.g. offsite generation of pelectriciy from the grid).
Scope 3	Indirect emissions (other than Scope 2 energy imports) that are a direct result of the operations of the organisation but from sources neither owned nor operated by them (e.g. business travel by air).

Melbourne Airport has the following energy and carbon targets:

- Continue to transition from high to low carbon intensity electricity
- Target of net zero scope 1 and scope 2 emissions by end 2025
- Continue to track Melbourne Airport's emissions against science-based emissions reduction trajectory
- Maintain the Airports Council International Level 2 Airport Carbon Accreditation and progress towards Level 3 accreditation

An example of Melbourne Airport reducing its scope 1 emissions is the 12MW solar farm commissioned at Oaklands Junction. Additional solar farms are proposed within the Preliminary Draft 2022 Master Plan document.

In addition to solar farms, roof-top solar developments across Melbourne Airport have been delivered and are planned in the future.

The Preliminary Draft Master Plan 2022 includes an action for scope 3 emissions: Develop a scope 3 emission engagement strategy in 2022 which focuses on opportunities to influence our commercial property tenants, airlines, travellers and contracts.

Further information

MP22 – Part C14: Environment Strategy

M3R MDP – Chapter B10: Air Quality

M3R MDP – Chapter B11: Greenhouse Gas Emissions

M3R MDP – Chapter B13: Climate Change and Natural Hazard Risk

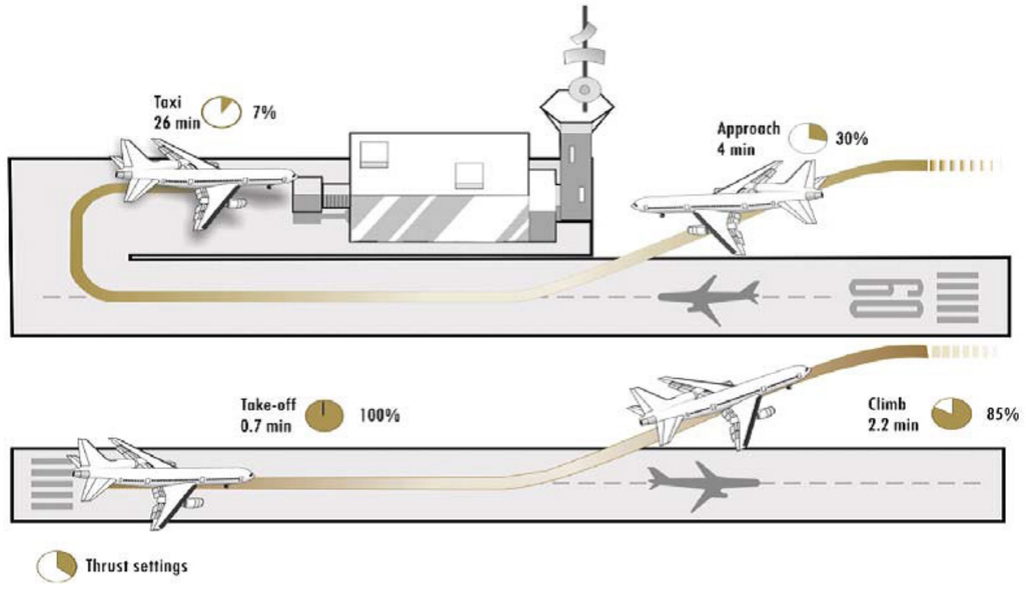
M3R Greenhouse Gas Emissions

A detailed greenhouse gas emissions inventory has been prepared for the construction and operation of M3R.

The purpose of this assessment is to forecast the greenhouse gas emissions associated with the construction and operation of M3R.

The construction assessment includes all material sources of greenhouse gases for the construction phases (the construction program's duration is four to five years). The operational assessment determines the difference in emissions between Build and No Build scenarios at year of opening (2026), five years after opening (2031) and 20 years after opening (2046).

The operational assessment includes emissions associated with aircraft activity (the 'landing and take-off (LTO) cycle'), airfield operation, and airside support vehicles and equipment. This method provides a full picture of M3R's likely impacts regarding greenhouse gas emissions; it does not assess emissions associated with terminal or landside activities as these are outside the scope of the MDP. The change in passenger access to the airport (by road) is included for all future scenarios.



LTO cycle (Source: ICAO).

This assessment identified by 2046:

Over 1,162 kilotonnes CO2-e total emissions annually with M3R	Impact of M3R above the No Build emissions **+348 additional kilotonnes CO2-e annually by 2046**
Over 814 kilotonnes CO2-e total emissions annually without M3R (No Build)	

Projected Greenhouse Gas Emissions in 2030

Source: Australia's emissions projections 2021

Greenhouse Gas Emissions 2030	Estimated M3R 2046 emissions represent
Over 439,000 kilotonnes CO2-e per year for Australia	**0.26%** of projected 2030 Australia emissions

73%
The biggest source of emissions is from aircraft during the LTO cycle.

The LTO assessment included in the MDP has assumed fuel combustion of Jet A1 fuel. This is considered a conservative approach considering the industry's progression towards reduced carbon emissions.

What is the aviation industry doing to reduce emissions?

Several Australian and New Zealand airlines have committed to achieving net zero emissions by 2050.

Industry highlights are shown below - further information can be found on each airline's website.

QANTAS

In 2019 Qantas Group announced a commitment to achieving net zero emissions by 2050 and capping its net emissions at 2019 levels.

Initiatives include improve fuel efficiency, invest in new aircraft technology and collaborating to accelerate the development of a sustainable aviation fuel industry in Australia.

Source: www.qantasnewsroom.com.au/media-releases/qantas-group-to-slash-carbon-emissions/

Virgin australia

Virgin Australia was the first airline in Australia to test sustainable aviation fuel in the supply chain.

In 2021 they announced commitment to a target of net zero emissions by 2050.

Virgin Australia is planning to achieve this through their comprehensive fuel efficiency program, focus on sustainable aviation fuels and through improved cooperation with key partners.

Source: www.virgin.com/about-virgin/latest/virgin-australia-commits-to-net-zero-by-2050

AIR NEW ZEALAND

Air New Zealand has a goal of achieving net zero emissions by 2050.

They have formed partnerships with ATR to explore hybrid propulsion regional aircraft and Airbus to research zero-emission hydrogen powered aircraft.

Source: www.qantasnewsroom.com.au/media-releases/qantas-group-to-slash-carbon-emissions/

IATA FLY NET ZERO

In 2021, International Air Transport Association (IATA) approved a resolution for the global air transport industry to achieve net-zero carbon emissions by 2050.

The plan includes sustainable aviation fuels, new aircraft technology, more efficient operations and infrastructure, and the development of new zero-emissions energy sources such as electric and hydrogen power.

Source: www.iata.org/en/programs/environment/flynetzero/

Aircraft manufacturers continue to improve aircraft efficiency and environmental performance.

Some highlights are shown below, further information can be found on each manufacturer's website.

Airbus A350s have a **25%** fuel burn and CO2 emissions advantage compared to previous generation aircraft.

Boeing 787-8 Dreamliners have around **20%** better fuel per seat and emissions than aircraft they will replace.

The Airbus A320neo family offers fuel improvements of **14%** from A320ceos (current engine option).

In December 2021, Qantas selected the Airbus A30neo family as the preferred aircraft for the long-term renewal of its domestic narrow-body fleet.

This is in addition to the current order Qantas Group has for over 100 aircraft in the A320neo family

The Boeing 737 MAX10 provides a **14%** reduction in carbon emissions and fuel use compared to Next Generation 737 (current fleet).

In December 2020 Virgin announced it had reached an agreement with Boeing to restructure its B737 MAX order.

Order book consists of 25 x B737 MAX10 aircraft.

First aircraft scheduled to arrive in mid-2023.

Information based on airline and manufacturer websites
Source: Norebbo Illustrator and Designer

Hydrogen

Hydrogen is rapidly emerging as a renewable fuel within the energy industry. State and Federal Governments in Australia are developing plans to help support the development of this industry.

APAM continues to monitor the development of renewable hydrogen technology and its potential uptake by the aviation industry.

Airbus cites hydrogen as one of the most promising zero-emission technologies to reduce aviation's climate impact.

As a result, it has ambitions to develop the world's first zero-emission commercial aircraft by 2035.

Airbus ZEROe concept aircraft include turbofan, turboprop and Blended-Wing Body aircraft.

Source: www.airbus.com/en/innovation/zero-emission/hydrogen/zeroe

Sustainable Aviation Fuels (SAF)

SAF consists of three key elements (see opposite).

Both Qantas and Virgin Australia are active in supporting and developing the SAF industry in Australia.

An example of SAF is biofuel. These fuels are an important step in reducing carbon emissions compared to current Jet A1 fuel, however if the biofuel is carbon based, it will still produce carbon during combustion.