

The role airports play in reducing aviation emissions

Aviation and Climate: Part III – Airports Role

November 2022

Airports are critical enablers of low-emission aviation

Aviation produces around 2% of all human-induced CO₂ emissions¹; most of which are the result of airlines using fossil fuels to power aircraft .

Despite that, airports have an important role to play in helping the sector realise its goal of net zero carbon emissions by 2050.

Not only do airports need to focus on measuring and removing their own greenhouse gas emissions, they

need to ensure they can enable the new generation of low and no-carbon technology (including electric and hydrogen aircraft).

By eliminating their own emissions, airports can act as role models for the aviation and non-aviation stakeholders they interface with, accelerating change and enabling others to decrease their carbon emissions too.

Understanding airport carbon emissions

There are global standards that govern how carbon emissions are calculated. This ensures consistency.

Emissions are categorised as Scope 1, 2 or 3.

Scope 1 emissions are owned or controlled by a company, Scope 2 are indirect emissions from its

energy purchases and Scope 3 emissions result from its activities but are from sources outside its direct control.

As the table below shows, businesses have the ability to **control**, reduce or remove Scope 1 and 2 emissions, however, they can only **influence** Scope 3.

	Scope 1	Scope 2	Scope 3
What they are ...	Direct emissions	Indirect emissions from energy purchases	Indirect emissions from a company’s value chain
For airports that might include ...	Fuels burnt on-site (boilers, generators, operational vehicles) Refrigerant gas losses Runway de-icer	Purchased electricity	Commercial tenants Land transport travel to/from the airport Waste disposal Aircraft emissions Contractor vehicles and activities
	————— CONTROL —————		————— INFLUENCE —————

You can read how Christchurch Airport has decarbonised its business on page 3 of this document.

¹International Civil Aviation Organization - <https://www.icao.int/environmental-protection/CORSIA/Pages/CORSIA-FAQs.aspx>

Hundreds of airports across the world are now carbon accredited

The Airports Council International (ACI) represents nearly 2,000 airports in 185 countries, including New Zealand.

Its members have committed to reaching net zero carbon emissions for all operations under their control by 2050, without offsetting.

A core focus for the ACI is its Airport Carbon Accreditation programme² which empowers airports to address their carbon emissions.

As at October 2022, 357 airports across the world have been certified under the project. Together they represent just over 46% of global air traffic.

Only four New Zealand airports are accredited under the scheme (as at October 2022). Hamilton Airport is certified at Level 1, and Hawkes Bay Airport and Palmerston North Airport are both certified at Level 2.

In November 2020, Christchurch Airport became the first in the world to achieve the highest level of accreditation, Level 4. It is the only New Zealand airport to reach this level.

Energy resilience is critical for airports of the future

Demand for renewable energy in many countries is expected to grow strongly as populations transition away from fossil fuels to cleaner technology such as electric vehicles.

In New Zealand, electricity demand is expected to double by 2050³. It will grow even more strongly if airlines introduce electric and hydrogen-fuelled planes.

New Zealand's geography and the distance of most domestic flights means it is well-placed to be early

adopters of this new generation of aircraft. There are suggestions New Zealand could be the first nation to fully transition its domestic fleet to low-emission technology.

These new aircraft will require large amounts of green energy and airports should be planning now to ensure they have access to resilient energy networks with adequate capacity to supply these aircraft.





The need for energy resilience is seeing airports all over the world invest in solar arrays. Christchurch Airport is planning a 400-hectare renewable energy precinct, Kōwhai Park. Hawkes Bay, Nelson and Gisborne airports are also planning solar arrays.

² Airports Council International - www.airportcarbonaccreditation.org/

³ Transpower: Te Mauri Hiko Energy Futures - www.transpower.co.nz/sites/default/files/publications/resources/TP%20Energy%20Futures%20-%20Te%20Mauri%20Hiko%2011%20June'18.pdf

Airports must be resilient to climate change impacts

The International Centre for Aviation Organisation (ICAO) report 'Climate Resilient Airports'⁴ has identified nine primary climate impacts that might impact airports. These include (but are not limited to):

-  Sea level rise
-  Storm surge
-  Increased storm intensity
-  Changes in temperature
-  Increased/decreased precipitation
-  Changing icing conditions
-  Changing winds



Desertification (soil erosion)



Changes in biodiversity

To build resilience, the ICAO report recommends that airports identify potential climate risks and take action to minimise their impacts.

The Reserve Bank report 'Climate Changed: 2021 and Beyond'⁵ notes that 14 of New Zealand's airports are exposed to sea level rise over the next 30 years. This is based on a NIWA report 'Exposure to Coastal Flooding.'⁶

New Zealand introduced the Climate-Related Disclosure (CRD) regime⁷ in 2021 to ensure the effects of climate change are routinely considered in business and investment decisions. It will require many entities, including Christchurch Airport, to identify and disclose the impact physical and transitional climate change risks will have on their business and how they plan to adapt to those risks.

Why is Christchurch Airport recognised as a world leader in decarbonisation?

Christchurch Airport has been independently auditing its greenhouse gas emissions since 2006 and was the first airport in the world to do so.

Its Emissions Reduction Plan was based on science-based targets and set reduction goals in line with limiting temperature rise to 1.5 degrees. These targets include an 84% reduction in Scope 1 and 2 emissions (against 2015 levels) by 2035, and a goal of zero Scope 1 and 2 emissions by 2050.

As at October 2022, Christchurch Airport has reduced its Scope 1 emissions by 88% and its Scope 2 emissions by 16% compared with 2015 levels.

Key projects to achieve this include:

- Replacing diesel boilers with ground-source heating

- Converting commercial vehicle fleet to electric vehicles
- Replacement of lighting with LED
- Replacement of HVAC systems with refrigerants that have lower emissions factors
- Introduction of ground power units on aircraft gates
- Waste minimisation and diversion initiatives
- Sustainable procurement guidelines
- Design guidelines to ensure efficient development of airport campus
- Global partnerships to enable the wider sector to decarbonise.

Christchurch Airport is currently working on establishing science-based targets to influence the reduction of Scope 3 emissions associated with its value chain.

⁴ ICAO Climate Resilient Airports - <https://www.ncl.ac.uk/press/articles/archive/2021/01/coastalairports/>

⁵ Reserve Bank, 'Climate Changed: 2021 and Beyond' - <https://www.rbz.govt.nz/about-us/how-we-work/how-we-approach-climate-related-risk/climate-changed-2021-and-beyond---the-reserve-bank-climate-change-report>

⁶ Reserve Bank - <https://www.rbz.govt.nz/-/media/1d802cc9ff70476ba52c4eb5caef69a7.ashx>

⁷ Ministry for the Environment - <https://environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/mandatory-climate-related-financial-disclosures/>