

FUTURE SUSTAINABLE AVIATION INFRASTRUCTURE: PROSPECTS & CHALLENGES FROM CHRISTCHURCH AIRPORT'S PERSPECTIVE

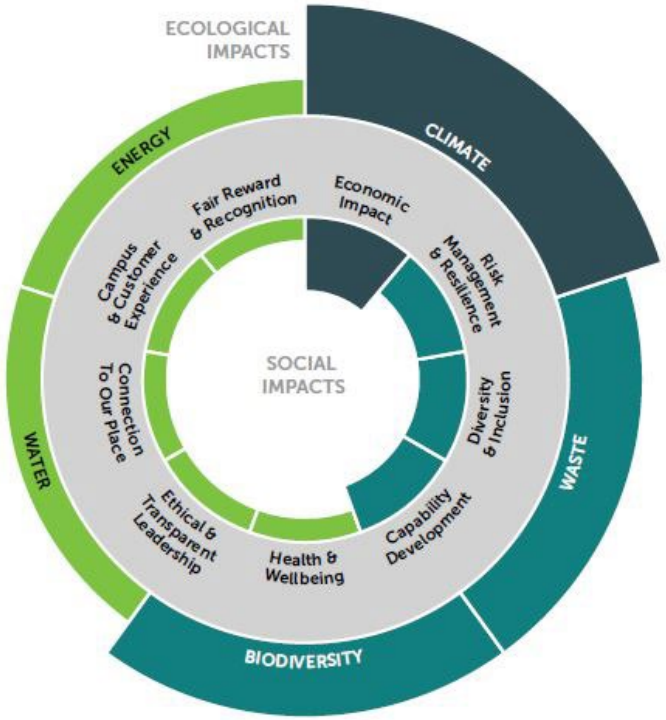
Claire Waghorn

Christchurch International Airport, New Zealand

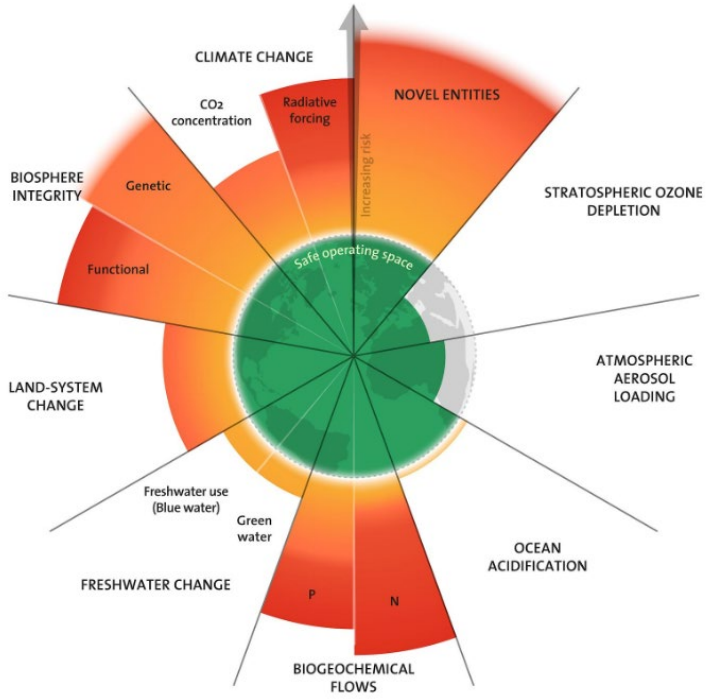
ICAS 2026 | Sydney, Australia

Sustainability frame: airport action within system limits

CIAL framework



Planetary boundaries

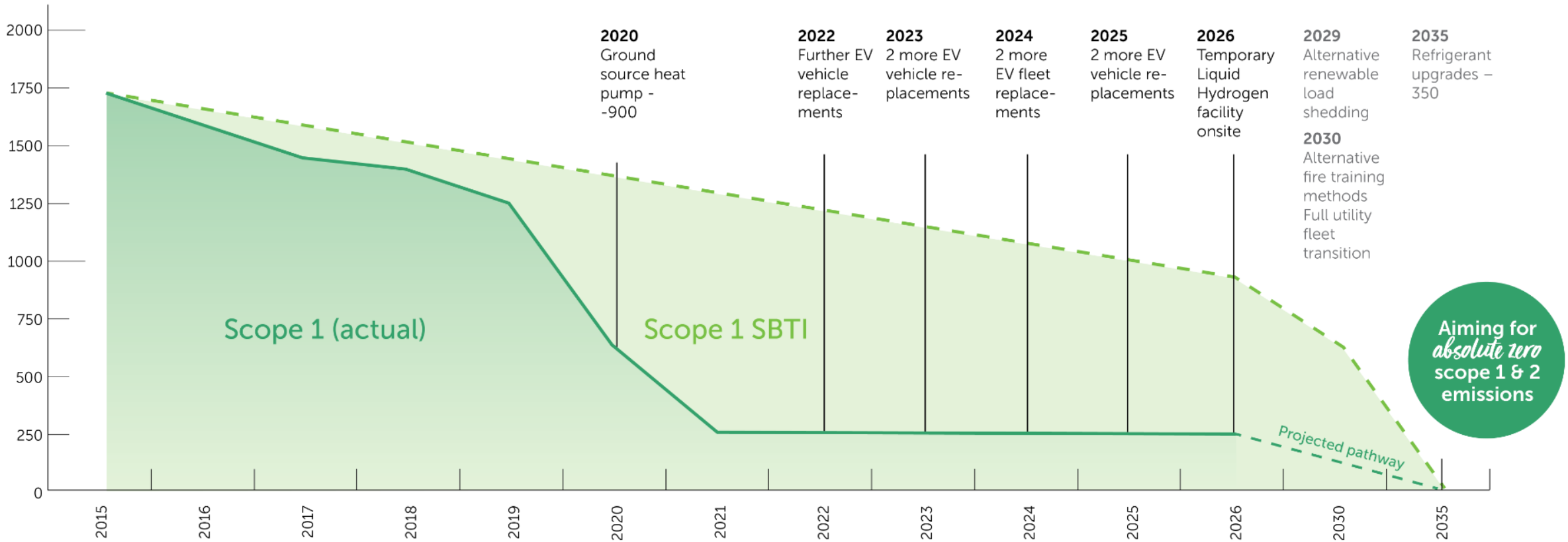


Azote for Stockholm Resilience Centre, based on analysis in Sakschewski and Caesar et al. 2025

Local transition choices need to sit inside both social foundations and ecological limits.

CIAL Emissions

Scope 1 Projects



STRATEGIC FRAMING

What is the end goal?

What will it take to displace fossil jet fuel?

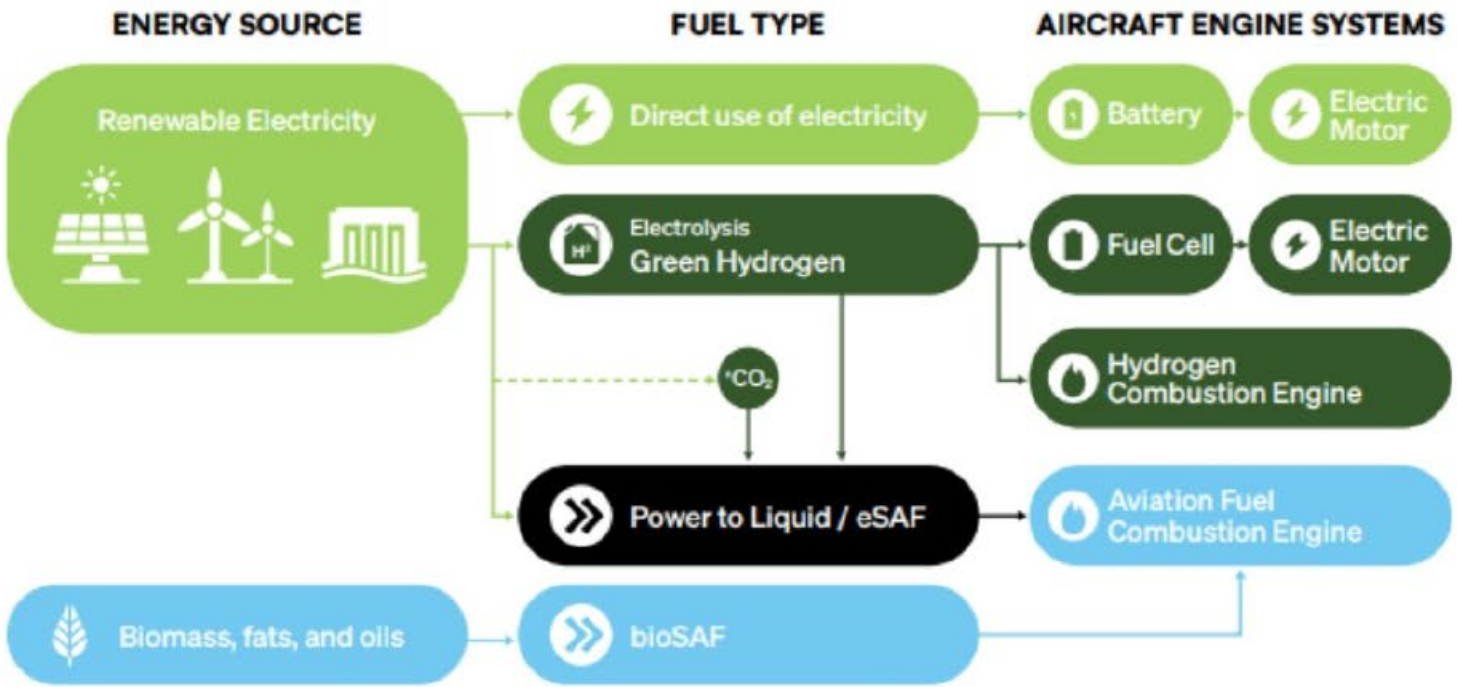
Work backwards

TODAY → END STATE

Energy **Infrastructure** **Sequencing** **Dependencies**

Act before certainty - but not before understanding.

Multiple pathways, one energy challenge



61 PJ

aviation fuel energy / year

≈ 17 TWh

chemical-energy equivalent

≈ 40%

of current NZ electricity generation

Whatever the technology mix, clean energy becomes aviation infrastructure.

Christchurch: build optionality



170 MW
solar farm

284,000
panels

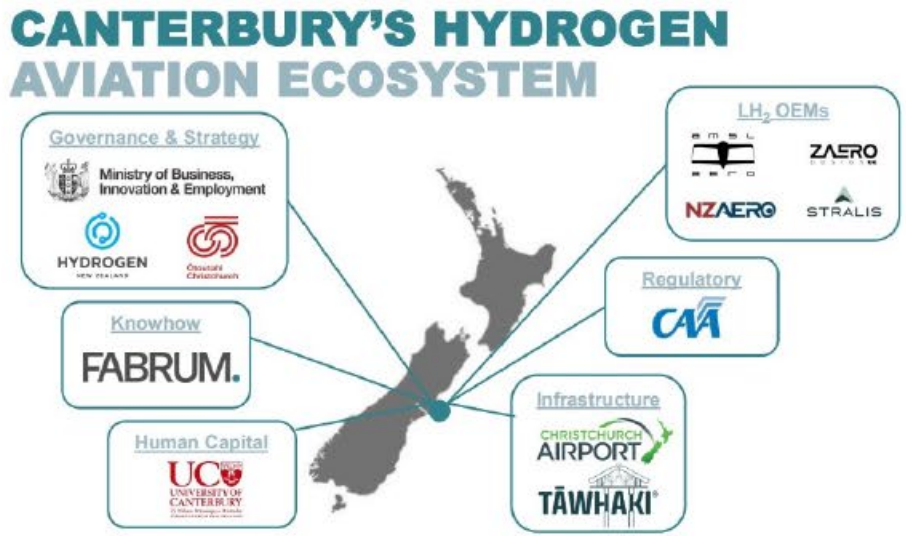
300 ha
site

33 / 66 kV
new network infrastructure

Build the foundations that keep options open.

No transition happens in one swim lane

The below graphic indicates the key contributors to the Waitaha Canterbury Hydrogen Ecosystem:





CONSORTIUM
Model the whole ecosystem

TEMPORARY
Host + learn

PERMANENT
75 kg/day entry scale

SCALE
Follow credible demand

Use small-scale action to unlock the next decision.

LH_2 testing: learning in the real system



SAF: infrastructure, policy and market signals

PHYSICAL SUPPLY

SAF remains critical for long-haul

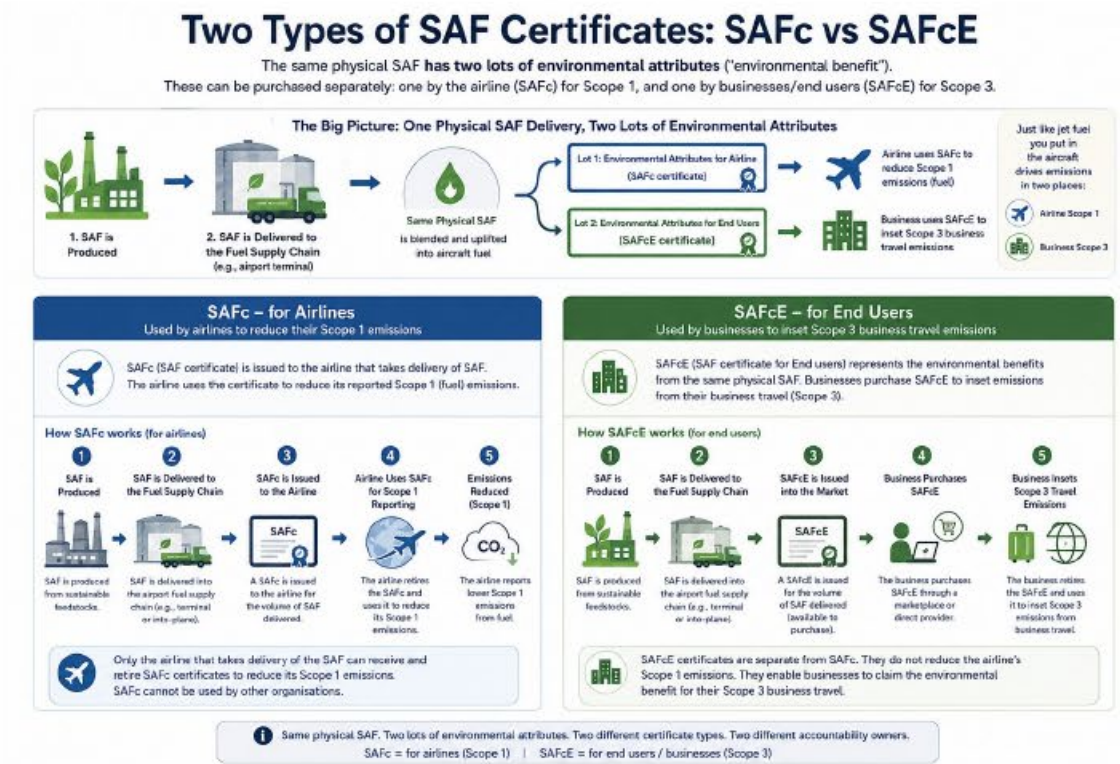
POLICY

NZ + Trans-Tasman alignment

MARKET SIGNAL

SAF certificates / book-and-claim

Synthetic SAF brings the story back to renewable electricity + H_2



Supply, policy and demand signals need to move together.

The challenge: coordinated decisions under uncertainty

Not principally a technology problem

Act before certainty

but not before understanding

Build the foundations

that keep options open

When its difficult, start small

to unlock the next decision

Build no-regrets foundations. Test emerging pathways at the right scale. Keep the system open to what aviation needs next.