



Green Wings: Sustainable Airport Operations
Building Resilient, Eco-Friendly Airfields for the Future

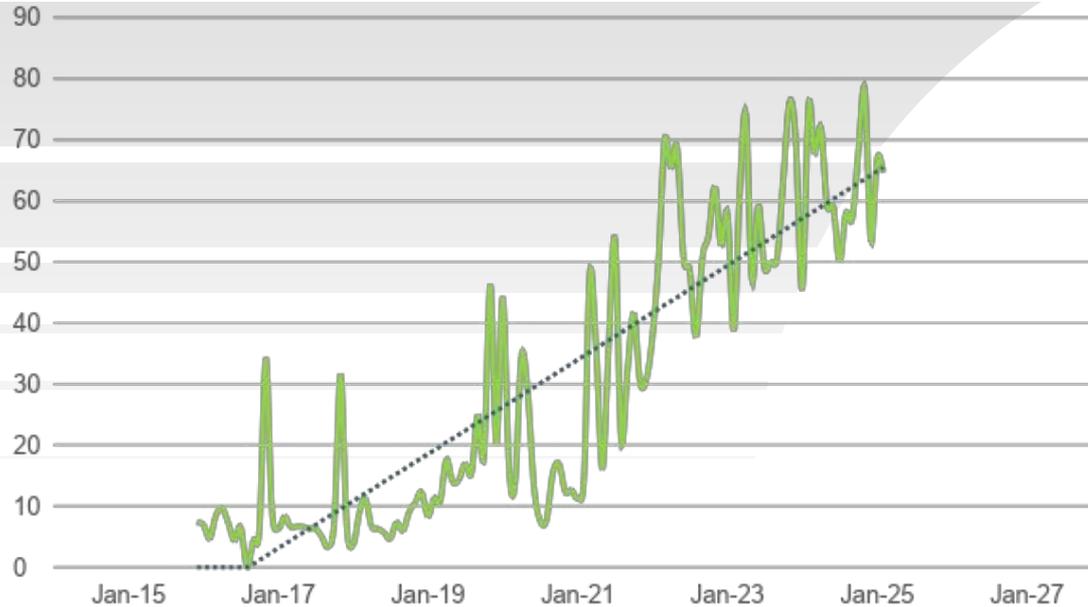
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SWIFT
NIAGARA FALLS SEPT 22-25 2025

AVIATION AND CLIMATE CHANGE: MOUNTING PUBLIC CONCERN

Global Concern about Aviation and Climate Change



Index number of global Internet search volumes for the terms: air travel carbon, net zero aviation and aviation and climate change

Concern about aviation's impact on climate change has been rising continually since 2016.

Air transport accounts for about 2-3% of global emissions. Airports' share of ecosystem emissions is between 10-15%. So, airports account for about 0.2-0.5% of global emissions.

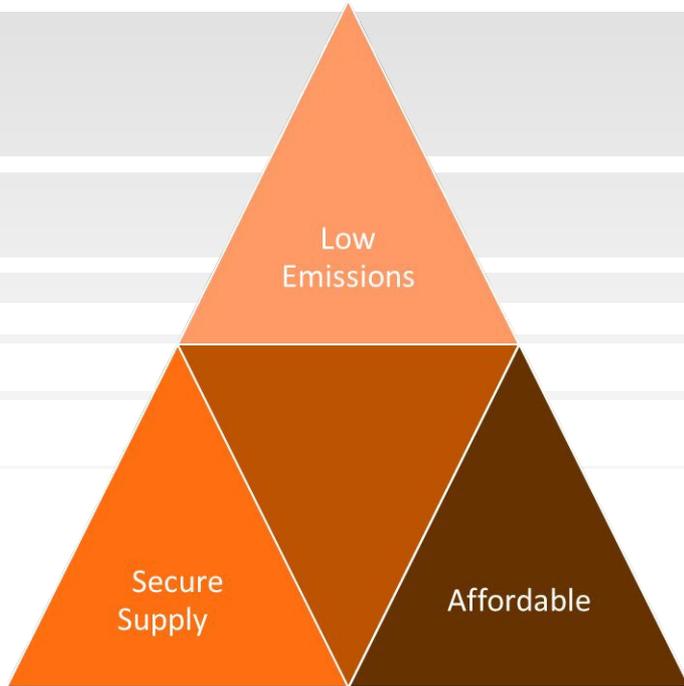
NET ZERO AIRPORT: BASIC POINTS

All the technologies to decarbonize aviation exist today

On average, 85% of airport emissions are from Scope 3 and most of those are aircraft manoeuvring

For most airports, getting to Net Zero would require a fee of about \$20 per enplaned passenger.

AVIATION FUEL: TRILEMMA



What is a trilemma? When there are three desirable outcomes but only two are possible.

Affordable, abundant and zero emissions: pick two.

- *Kerosene is affordable and in secure supply but bad on emissions.*
- *SAF is good on emissions, (relatively) affordable but not in secure supply.*
- *E-Fuel is in secure supply and good on emissions but not affordable.*

THE GREAT BRITISH FISH AND CHIP SHOP SAF CONUNDRUM

*There are about
10,500 fish and chip
shops in the UK.*

*On average they use
200 litres of cooking
oil per week.*

*If that was all
converted to SAF it
would produce about
91 million litres.*

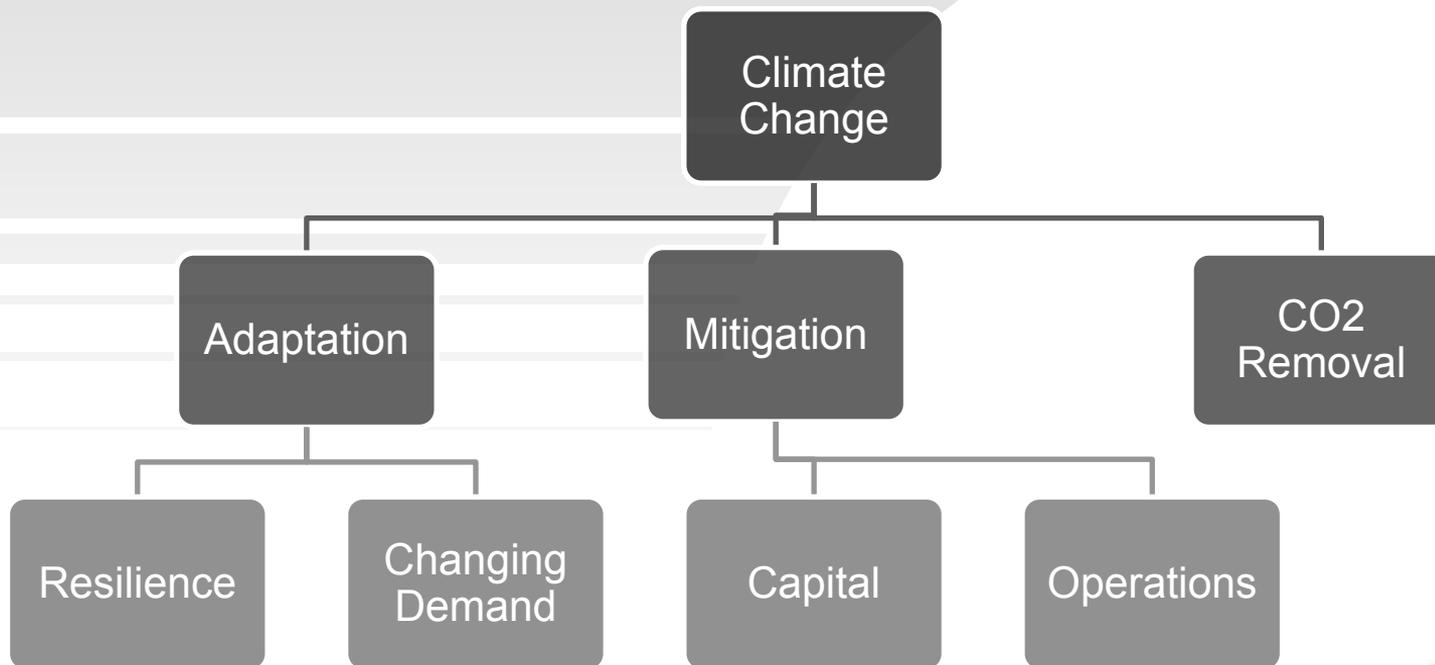
*Enough to meet the
UK's demand for
aviation fuel for
about 2.5 days.*



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NET ZERO AIRPORT: CONCEPTUAL STRUCTURE

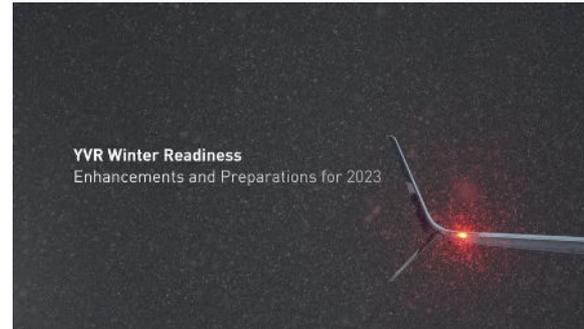


Resilience

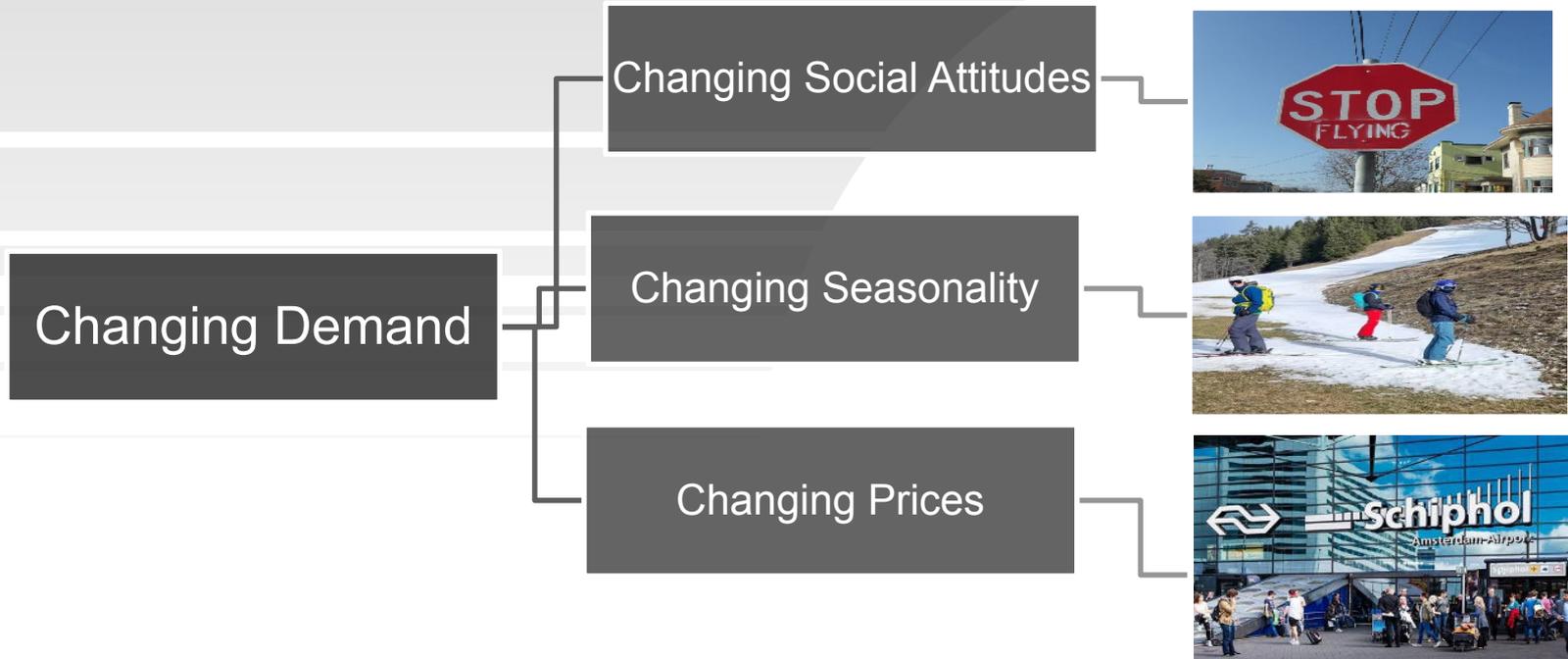
Infrastructure



Operations

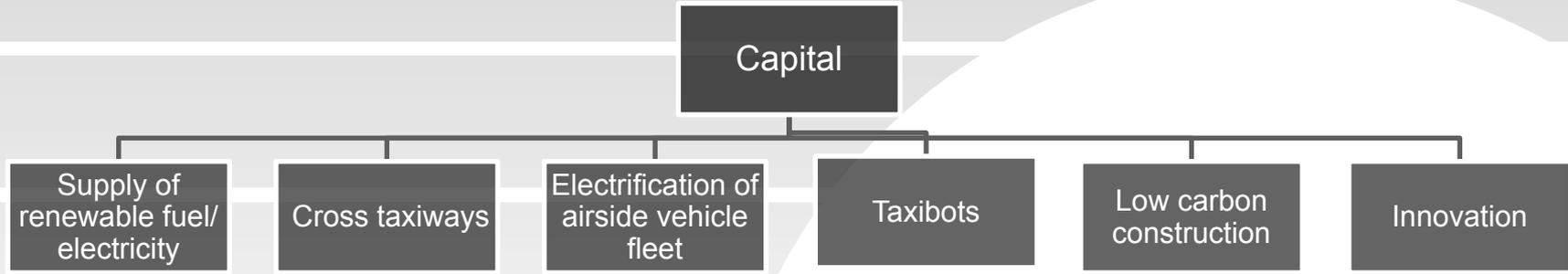


ADAPTATION

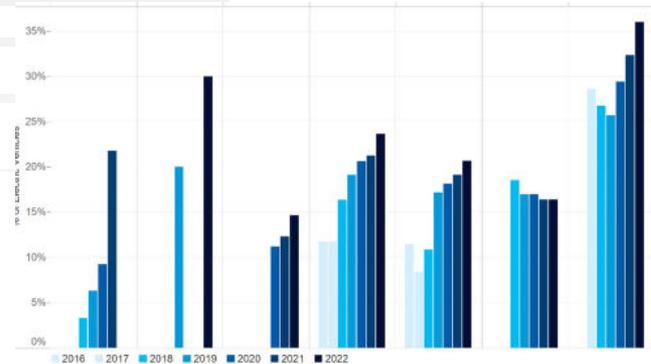


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MITIGATION



Digital apron and smart stands



Share of airside vehicle fleet electrified 2016-2022



HKG Green Innovation Fund

MITIGATION

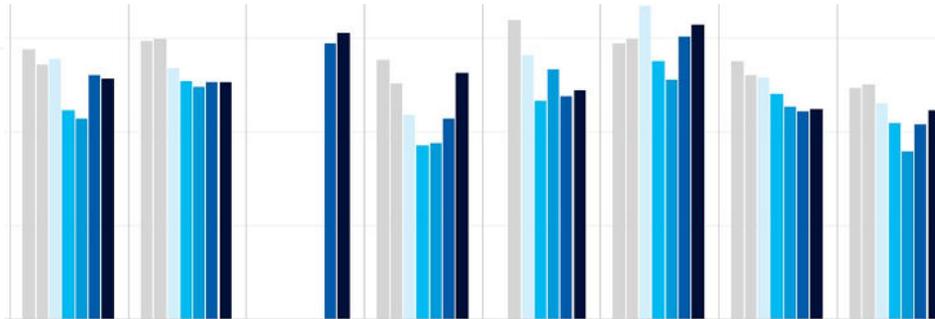
Operations

Efficient airside and airspace operations

Single-engine taxiing
~95% arrivals at AMS

Pricing incentives

New air carrier, ATC, airport interfaces



Taxiing CO2 emissions per seat 2017-2023



Quick facts on NAV CANADA'S proposal

WHAT IS NAV CANADA PROPOSING?

NAV CANADA is proposing the addition of new satellite-based arrival procedures at Toronto Pearson Airport, the country's busiest airport.

The proposed procedures are known as Required Navigation Performance Authorization: Required, or RNP AR. They will be deployed for two runways

**178,000
metric tons**

of greenhouse gas emissions will be avoided each year.

CARBON DIOXIDE REMOVAL TECHNOLOGIES: DAC



Direct Air Capture (DAC) removes CO2 out of the atmosphere and buries it deep in ground, forever.

A massive plant called Stratos is under construction in aptly named Notrees, Texas.

It costs about \$800 per tonne.

A DAC fee per enplaned passenger would have to be about \$20 but it will become cheaper with scale and technology.

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A nighttime photograph of Niagara Falls and the Buffalo skyline. The falls are illuminated with blue and purple lights, and the city buildings are lit up against a dark blue sky. The Spirit of Buffalo tower is visible on the right side of the skyline.

Thank you!

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