ATM & Environment

Briefing to the IFATCA ENV WG

Agenda

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1. Introductions
2. CANSO Environmental Working Group Overview
3. Sustainability Approach - examples
4. ATM impacts - CO2
5. ATM impacts – Non-CO2
6. Climate Change Risks/Impacts

Context

- **Climate change is the defining existential threat and political issue of our time**. Many countries have committed to be climate neutral by 2050.

- Although **aviation accounts for a small share of all emissions** (2%), it is extremely polarizing.

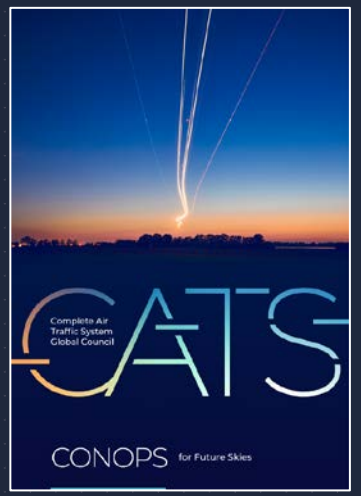
  - While other sectors are reducing emissions already, aviation's emissions are growing.
  - Globally, a very small number of flyers (1%) contribute to 50% of all emissions.
  - Many early measures taken by aviation are now seen as greenwashing.
  - Further decarbonization will require massive investments, new technologies, and large-scale collaboration.

- Aviation is already **suffering from the consequences of climate change,** and this risk requires adaptation efforts.

CANSO Environmental Working Group:

- *The ENVWG supports improved environmental sustainability through the identification and promotion of means to reduce unnecessary emissions from aircraft through improved operational efficiency and reducing aircraft noise through better procedures and planning. The deliverables support ANSP modernization and environmental efficiency improvements using documented metrics and performance data.*

  - Greenhouse Gas Inventory Guide: Best Practices
  - Contrails Paper



Our approaches to ENV

Climate Action and Environment Approach

Climate Action – Two Approaches

Under our ESG Strategy, NAV CANADA is approaching Climate Action in two ways:

With our Stakeholders and Partners

- Reduce environmental footprint of our customers through improved ATM.
  - Canada's Aviation Climate Action Plan
  - CANSO GreenATM

Within our Company

- Reduce environmental footprint of our own direct operations, including our Scope 1,2, and 3 GHG emissions.
  - NAV CANADA Emissions Inventory and target setting

- The **Climate Action and Environment Strategy** proposes the **within our company** approach
- **Canada's Aviation Climate Action Plan** is the focal point of the **with our Stakeholders and Partners** approach

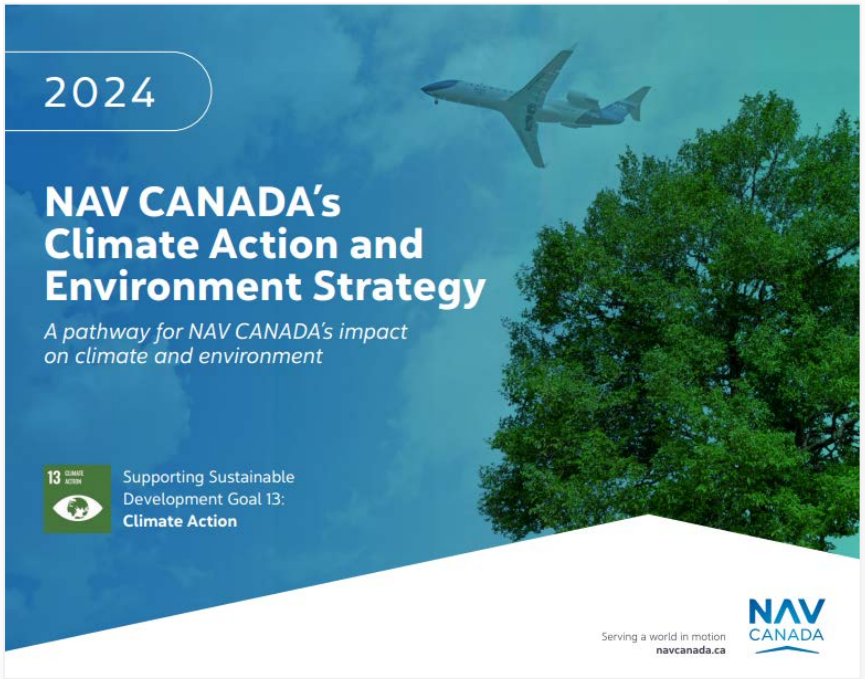
Climate Action and Environment Strategy

Climate Action Approach: Within our Company

NAV CANADA has developed a Climate Action and Environment Strategy that focuses on Climate Action ‘within the company.’

This Strategy provides an overview of:

- *The current state of climate action at NAV CANADA.*
- *Governance and roles for climate action.*
- *Emissions reduction pathways.*
- *Future initiatives that could contribute to net zero emissions.*
- *Direction on next steps to building NAV CANADA’s emissions reduction action plan.*



Skyguide's **dual effort** to tackle climate change

ATM

Infrastructure

Reducing the environmental impact of Skyguide is the **fourth pillar** of the corporate strategy

Key drivers for environmental improvements

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Single European Sky Environmental Pillar

Swiss Exemplarity in Energy and Climate

GreenATM

Net Zero objective in 2040

Airspace users demands

Operations & GreenATM

Destination 2050

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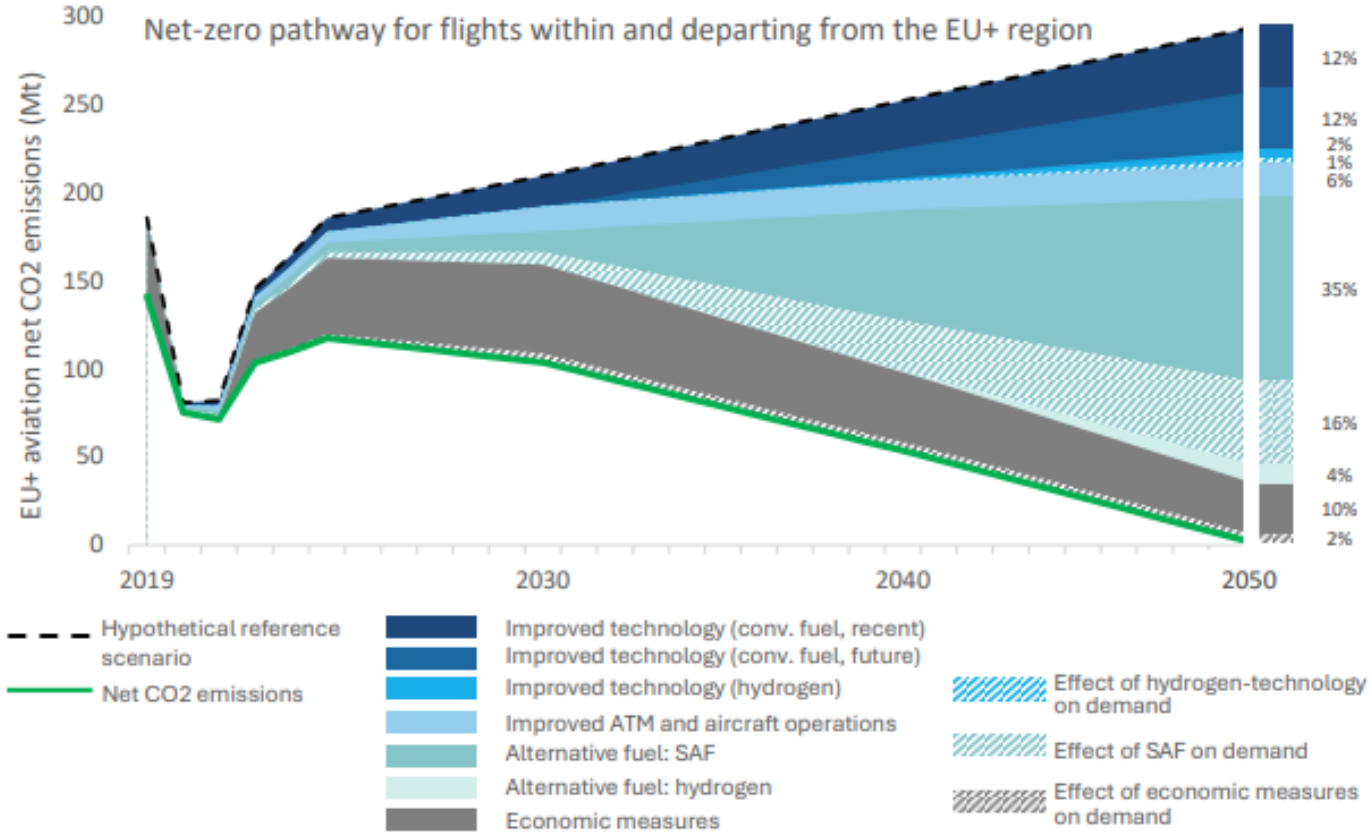

From Roadmap report overall impacts on net CO_2 emissions (TtW) of flights within and departing from the EU+ region, for 2030, 2040 and 2050. Sustainability measures are not assessed year by year and as such, pathways and contributions of individual measures may differ from the linear interpolation shown in the graph.

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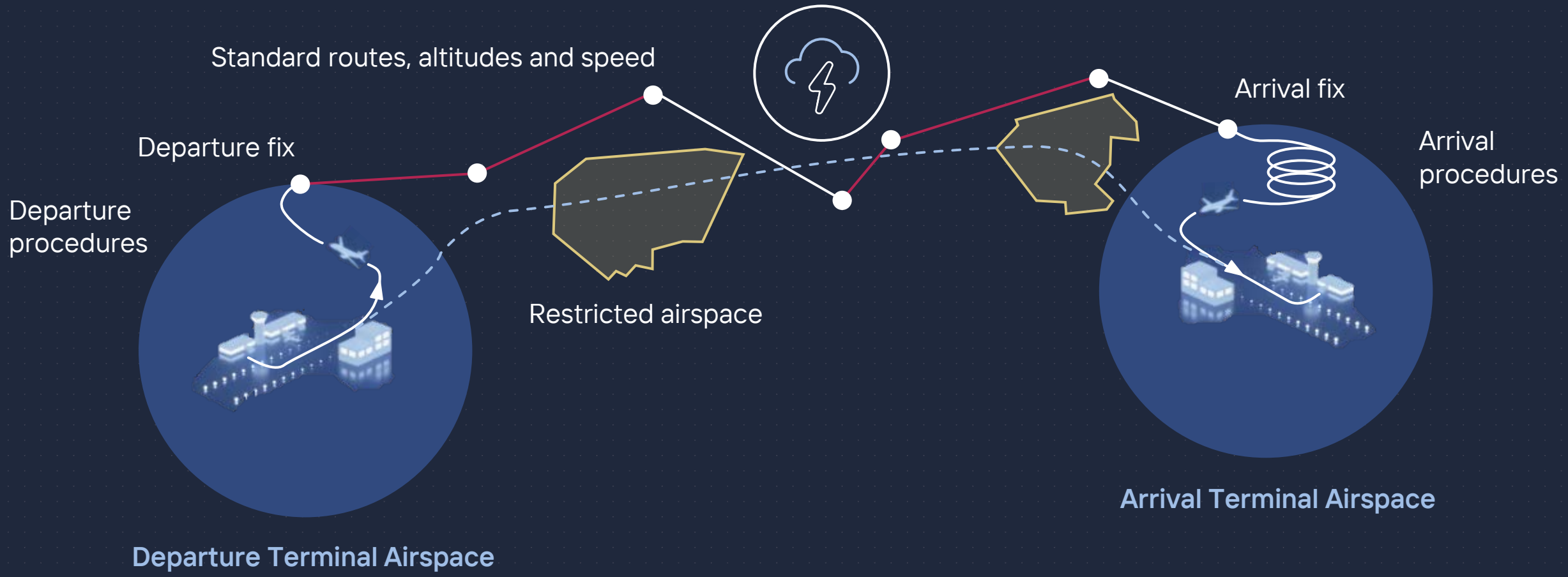

The first ever ATM green label

GREEN ATM

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A **common goal and commitment** for ANSPs to improve on their environmental impacts.

Sharing of **best practices** in the industry, allowing for standardisation and overview of processes.

An **auditing tool** to understand the gaps and areas with the most potential: continuous measurement of performance.

Improvement of **ENV performance** across the entire company (infrastructure and operations).

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CANSO GreenATM

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2.3 Categories and Topics

Figure 3 below shows the topics in each of the four categories.

GOVERNANCE

- Policy & plan
- Environmental Management System
- Environmental culture
- Environmental targets

INFRASTRUCTURE & UTILITIES

- Energy management
- Power procurement and production
- CNS Rationalisation
- CNS Flight Inspection

OTHER

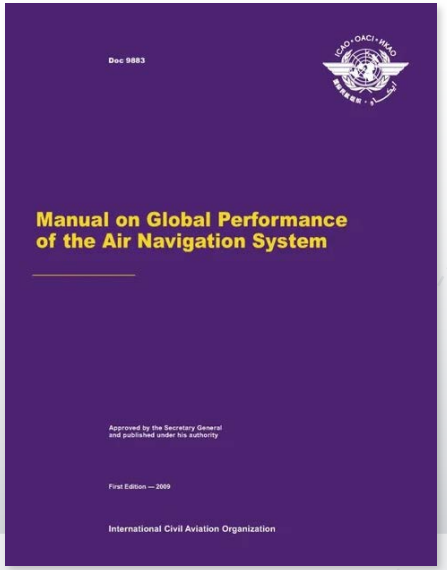
- Sustainable procurement
- Airport/Community relations
- Airspace change management
- Mobility management

IMPROVED ATM

- Flexible Use of Airspace (FUA)
- Meteorological information
- Improved surveillance coverage
- Airport – Collaborative Decision Making
- Surface management
- Continuous Climb Operation (CCO)
- Continuous Descent Operations (CDO)
- Performance Based Navigation (PBN)
- Wake turbulence optimisation
- Trajectory Optimisation
- Air Traffic Flow Management (ATFM)
- Research & Development

Figure 3: Categories and topics

More information on the topics and how they contribute to environmental benefit can be found in Section 4 of this Guide.



Alignment, collaboration and partnerships

Data sharing via collaborative data analytics agreements

Industry collaboration:

- Canada's Sustainable Aviation Task Force
- ICAO Global Air Navigation Plan Performance Expert Working Group
- ICAO Committee on Aviation Environmental Protection (CAEP)
- ECCC Contrail Avoidance Tool
- CANSO GBWG and Recommended KPIs for Measuring ANSP Operational Performance
- CANSO Environmental Working Group and Green ATM
- CANSO Contrails Task Force
- CICONIA Stakeholders Outreach Body

Non-CO2 aspects

What are the big questions?

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Where are contrails formed?

Detection / forecasting of ISSRs

What are the **solutions** to avoid contrails?

Operational changes? Has diversion been successful? Could engine, fuel or SAF play a role?

What is the **balance:** avoidance vs. extra CO_2?

Which is worse for the climate? How much will this cost in additional fuel burn?

Unknowns about contrails

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- Contrail uncertainty remains high, **but general consensus is that they are on balance warming and should be avoided**, *even if more CO2 is emitted*.
- However, new analysis from David Lee et al. suggests that taking premature action may not be advisable.

- Unknowns:
  - exactly where and when contrails form and persist;
  - the climate impact of a specific contrail;
  - the best metric to compare contrails and CO2 emissions climate impact
  - the cumulative impact of at scale avoidance measures

Environmental Science: Atmospheres

CRITICAL REVIEW

ROYAL SOCIETY OF CHEMISTRY

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Cite this: Environ. Sci.: Atmos., 2023, 3, 1693

Uncertainties in mitigating aviation non-CO_2 emissions for climate and air quality using hydrocarbon fuels†

David S. Lee, Myles R. Allen, Nicholas Cumpsty, Bethan Owen, Keith P. Shine and Agnieszka Skowron

Received 20th June 2023
Accepted 17th October 2023

DOI: 10.1039/d3ea00091e

rsc.li/esatmospheres

Environmental significance

1 Technical summary

Core questions for ATM

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- Individual flight adjustments (or airline-by-airline actions) are one thing, but what happens when we try to implement at scale? Are increased fuel burn assumptions accurate?
- Forecasting inaccuracies are likely to drive excess avoidance measures. Can we focus for the short-term on pushing for better monitoring / humidity sensors whilst also conducting avoidance trials to refine operational concept?
- What are the best policy/regulatory approaches?

Current approach

- Focus needs to be on refining the science, investigating solutions, running trials and better understanding the trade-offs (CO_2 vs non-CO_2).

Adaptation to climate change

Adaptation

- Climate adaptation means taking action to prepare for and adjust to the current and projected impacts of climate change.

Heatwaves

Droughts

Floods

Storms

Impact of climate change

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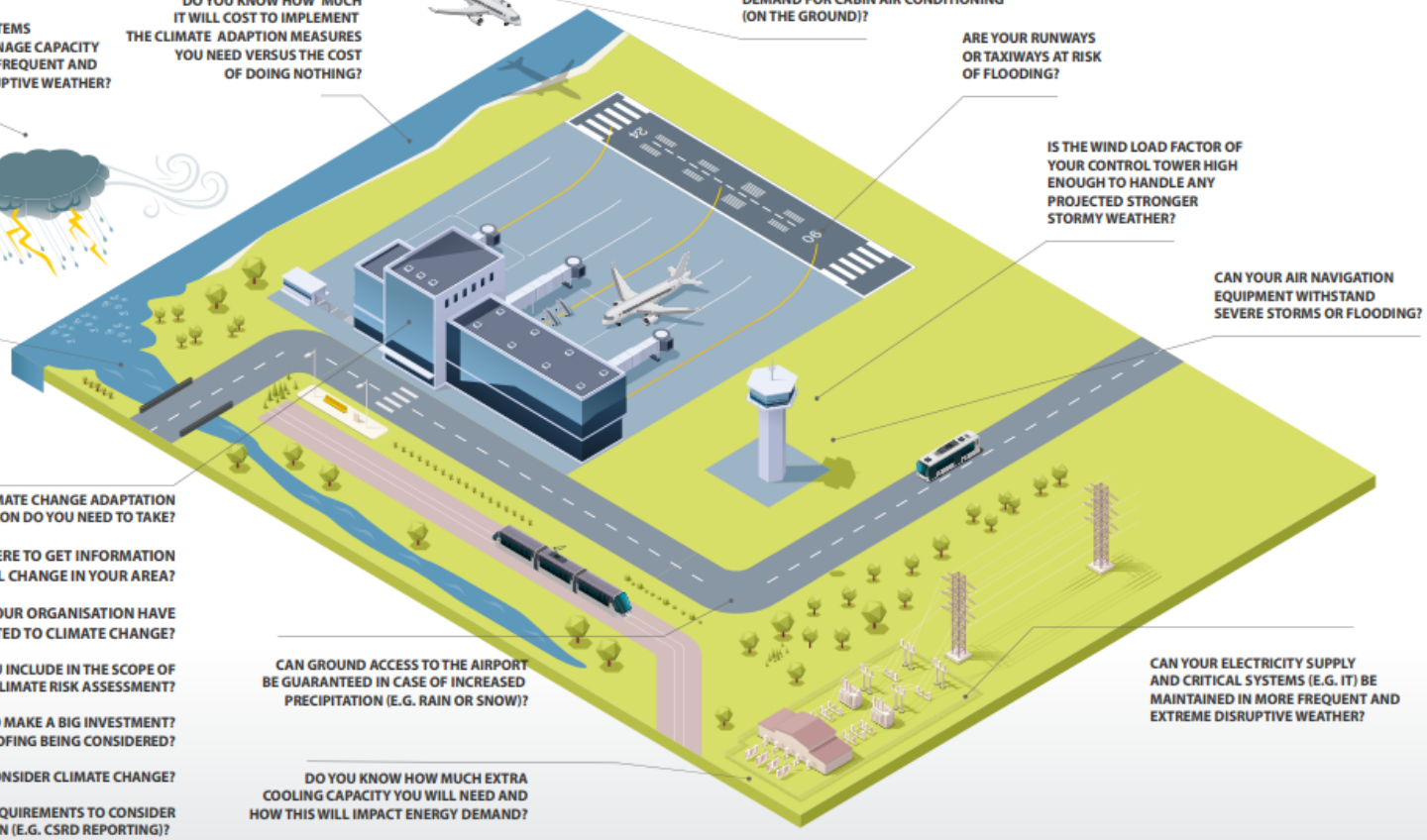
Assessing Climate Change Risks for your Organisation

How can you assess whether climate change impacts will be a risk for your organisation?
Here are some questions to get started with.



Physical Impacts – Drivers	Transition Impacts – Drivers
• **Wildfire** • Water Stress • Tropical Storms • Sea-level Rise • **Permafrost Thawing** • Lightning • **Increased Summer temperatures** • High wind speed • Freezing rain • Extreme weather events • Extreme Snowfall • Extreme Rainfall/**Flooding** • **Extreme heat** • Changes in **Jet Stream** Position	• Changing customer behaviour • Aviation fuel price volatility • Energy price volatility • Policies to constrain aviation activities • Carbon pricing mechanisms • Public disclosure requirements • Litigation associated with greenwashing claims • Public pressure to accelerate decarbonization efforts • More frequent insurance claims • Sector specific collaboration to reduce emissions • New Technological solutions

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Conclusion – Q&A