

2024 ICAO REGIONAL SEMINAR ON ENVIRONMENT

In collaboration with



NACC & SAM Regions

20 to 21, August 2024

Asunción, Paraguay



ICAO

ENVIRONMENT



ACT SAF

CORSIA



Canadian Policies, Programs & Research towards Decarbonization of the Aviation Sector

ICAO Environmental Regional Seminar, Asuncion, Paraguay
Presented by Wendy Bailey, Transport Canada Civil Aviation
August 20-21, 2024

Decarbonization of Aviation Sector

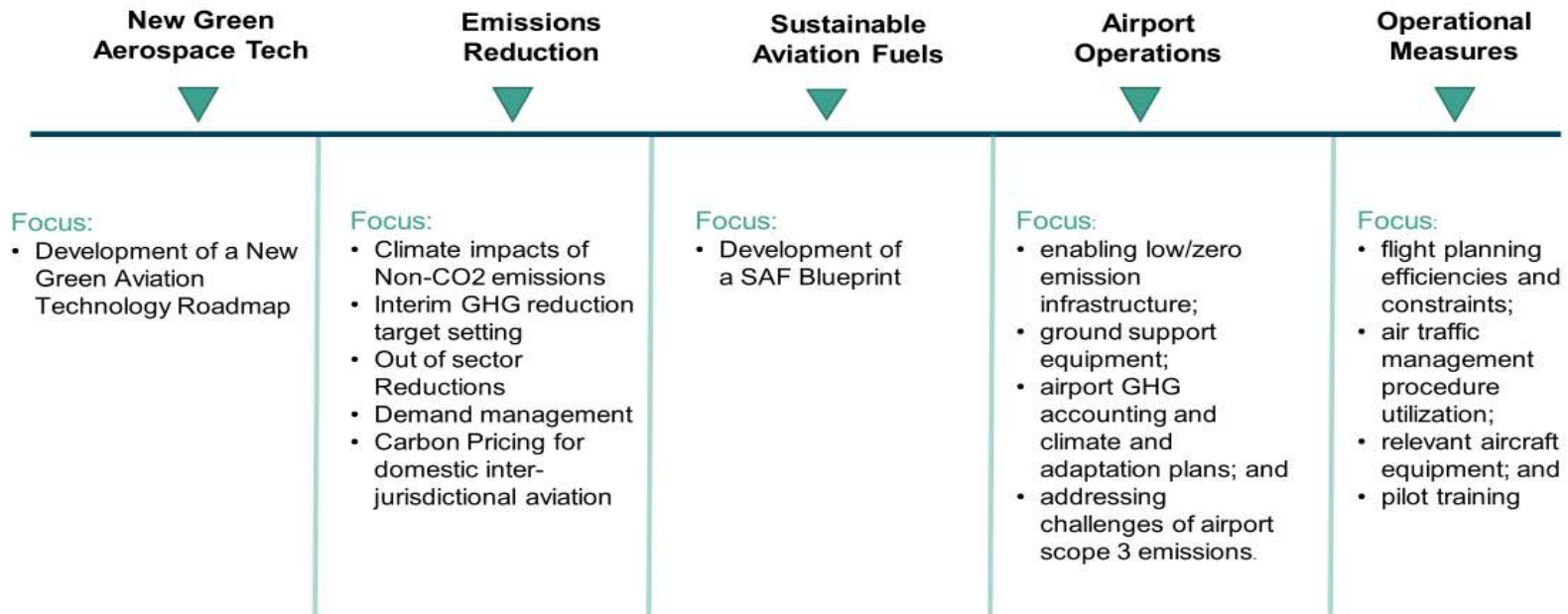
Canada's Aviation Climate Action Plan 2022-2030 sets an ambitious net-zero by 2050 vision for Canada

- Voluntary agreement that includes signatories from associations across the aviation sector
- Outlines key actions that both the government and the aviation sector will undertake
- Sets an **aspirational 10% target for the use of sustainable aviation fuel by 2030**
- Led to the formation of a government/industry **Sustainable Aviation Task Force** to oversee, guide and implement the Action Plan
 - Subgroups were formed to advance work / priorities under the various decarbonization pathways
- 2023 Progress Report for the Emissions Reduction Plan committed to "advance the development of a Sustainable Aviation Fuels Blueprint".
- At ICAO, Canada and other ICAO Member States agreed to an ambitious global quantified vision for SAF at the Third Conference on Aviation Alternative Fuels in Dubai, U.A.E. in November 2023.



Sustainable Aviation Task Force

Chaired by Transport Canada & the National Airlines Council of Canada



Sustainable Aviation Fuels Blueprint for Canada

Objectives

- **Identify how to create a domestic SAF market that ensures availability and access to SAF to meet the 10% SAF use target by 2030 and be on a path to achieve net-zero emissions by 2050**
 - Incorporate the roles of various stakeholders, including regulators, producers, suppliers, distributors, and end-users
 - Lever existing work by the Canadian Council for Sustainable Aviation Fuels (C-SAF) and recent commissioned studies by various federal departments.
- Articulate deployment forecasts for 2040 and 2050

Timeline

- Draft currently in development (Deloitte Canada in close collaboration with the SAF Subgroup (over 60 individuals))
- Anticipating completion and publication by end of 2024 / early 2025



Domestic Context for SAF

Strong potential, but currently no Canadian production capacity – stronger market signals needed

- Over a dozen renewable diesel / sustainable aviation fuel projects in varying stages of readiness across the country
 - E.g., Braya Renewable Fuels – under construction (NL)
 - E.g., Azure Sustainable Fuels Corp – FEED study stage (MB)
- However, even if most of the projects proceed, Canada will still need to import sustainable aviation fuel in the near term to meet our 10% use target by 2030
- Over the medium- to long-term, Canada's natural advantages could allow it to become a global supplier of choice, creating economic opportunities across the country

Current Federal programs/instruments that can be levered to support sustainable aviation fuel production and use:

- Canada Infrastructure Bank
- Clean Fuels Fund
- Strategic Innovation Fund
- Greening Government – Low-carbon Fuel Procurement Program
- Clean Fuel Regulations
- Federal carbon pricing

British Columbia

New regulations announced that will see B.C. become **the first jurisdiction in North America to require the use of sustainable aviation fuel**

- Renewable fuel to comprise at least 1% of jet fuel starting in 2028, increasing to 2% in 2029 and 3% in 2030.
- Carbon intensity reduction requirement for jet fuel that phases in at 2% in 2026, increasing to 10% in 2030.

Airport Operations

WORK UNDERWAY:

- Study on Canadian Airport Operations GHG Emissions
 - Scope 1 & 2 from small, medium and large Canadian airports to help identify the current reporting landscape
 - Accounting mechanisms used by different sizes of airports
 - Reporting and planning for climate mitigation and adaptation
 - Identify opportunities for collaboration and support needed
- Study on ground support equipment and fleet at Canadian airports
 - Identifying emissions from this segment and identifying gaps and challenges to the electrification of GSE/fleet
- Ongoing discussion on recent domestic and international activities related to decarbonizing airport operations through ICAO-WG2



Initiative for Sustainable Aviation Technology - INSAT



Vision - Accelerating Canadian aerospace towards environmental sustainability

Mission - Coordinate and accelerate the development of green aviation technologies in Canada

Example of a Demonstrator:
CNRC
Hybrid-Electric Aircraft Test-bed (HEAT)

INSAT Objectives / Results

Technological development:

- Creation of intellectual property leading to new products and services
- Transfer and development of multi-sector technologies in Canada
For example: battery technologies, fuel cells, etc.

Ecosystem development:

- Inter-industry and inter-university collaboration, particularly with subject matter experts
- Creating, retaining and attracting jobs
- Developing, maintaining and attracting skills
- Strong supply chain
- Economic growth
- Canadian leadership in the fight against climate change

A Canadian Ecosystem to stimulate R&D in sustainable aviation

Pillars

1

Hybrid/alternative propulsion

- New thermal cycles
- Hybrid-electric propulsion
- Electric powertrains
- Battery and fuel-cell systems
- New propulsion configurations

2

Aircraft architectures & systems

- Aircraft configuration and aerodynamics
- Systems architecture for efficient aircraft
- Electrification of systems
- Lightweight structures and design
- Simulation and designs
- Green manufacturing technologies

3

Transition to clean fuels (SAF, hydrogen)

- Aircraft/propulsion technologies for clean fuels transition
 - Sustainable aviation fuels (SAF)
 - Hydrogen fuel
 - Other alternative fuels

4

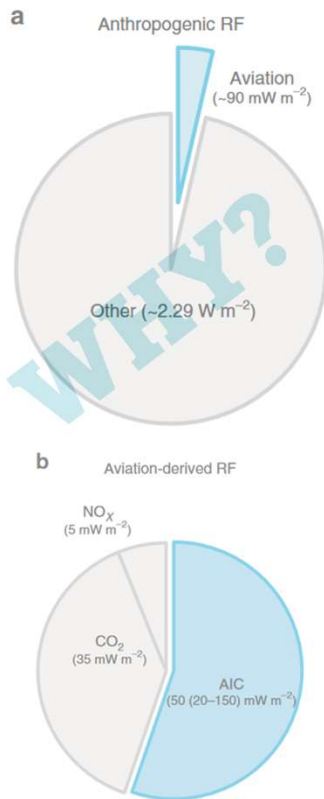
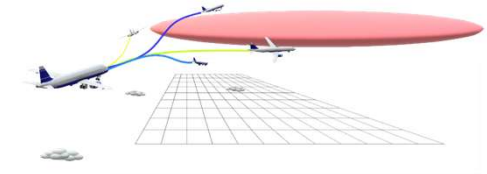
Infrastructure and operations technologies

- Airport infrastructure technologies
- Hydrogen transport & storage technologies
- Hybrid testing facilities development
- Operations automation technologies
- Artificial intelligence applications

Technology Integration & Environmental Impact

Contrail Avoidance Tool (CoAT)

Contrail mitigation and research application tool



Cloud physics program

- Contrail formation and evolution

CoAT is being developed based on

- ECCC numerical weather prediction modelling system
 - Global Environmental Multiscale atmospheric model
 - Advanced cloud microphysics scheme (P3)

Validation

- Satellite data
- NRC CAAFCOMR experimental data

Commercial aviation operators

- Run four times daily with 48-hr forecasts (pan-Canadian domain)
- Run twice daily with 10-day forecast (Canadian airspace, north Atlantic and Arctic Ocean)

Research

- Contrail and cirrus interaction
- Impact of sustainable aviation fuel on contrail formation
- Hydrogen fuel and its impact on the water vapor balance in the atmosphere



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Thank You

