



ICAO

ENVIRONMENT

ICAO Secretariat

Session 1 – Policy and Planning (LTAG Monitoring and State Action Plans)



Agenda

Policy and Planning



Session 1– Policy and Planning : Aviation Cleaner Energy Policies

- **CAAF/3 Global Framework: Building Block 1**
 - Introduction to Building Block 1 on Policy and Planning
 - LTAG Monitoring and Reporting (LMR) methodologies
 - Update on State Action Plans initiative
- **Regional update on State Action Plans**
- **States presentations on policies and State Action Plans**
- **Q&A session**

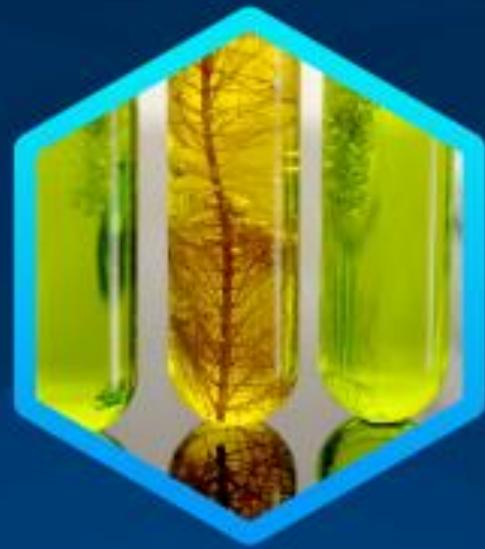


ICAO Global Framework on SAF, LCAF and other Aviation Cleaner Energies

Policy and Planning



Regulatory Framework



Implementation Support



Financing



- Supports global scale up of aviation cleaner energies – Collective Vision to reduce 5% CO₂ by 2030
- Provides clarity, consistency and predictability to all stakeholders on 1) policy and planning, 2) regulatory framework, 3) implementation support, and 4) financing – 4 Building Blocks
- Monitors the implementation progress on emissions reductions and means of implementation
- Aspiring to have cleaner energy production facilities in all regions by CAAF/4 (no later than 2028)
- To update the Vision at CAAF/4 on the basis of market developments

CAAF/3 Global Framework – 4 Building Blocks

1. Policy and Planning

- Global aspirational **Vision** to reduce international aviation CO₂ emissions by **5% by 2030**
- Each State's **special circumstances and respective capabilities**
- **CAAF/4** no later than 2028, with a view to update Vision
- **Collaborative effort** across different stakeholders, and encourage **State policies, action plans and roadmaps**
- Implementation **monitored** and periodically **reviewed**

2. Regulatory Framework

- **CORSIA eligibility framework as accepted basis** for SAF, LCAF and other aviation cleaner energies
- Increase the **number of SCS, additional fuel production pathways / life-cycle values**
- Parameters for **fuel accounting methodologies**, leveraging on CORSIA MRV system
- **Study of fuel accounting systems** to determine any possible ICAO role

3. Implementation Support

- **Robust, targeted and tailored** capacity -building and implementation support
- **Building on ACT-CORSIA and ACT-SAF programmes**
- Facilitate **partnerships**, and exchange of best practices
- Develop **policy toolkit/guidance** and support **State Action Plans**
- Support **feasibility studies, pilot projects**, which may facilitate access to investment
- Support **access to technology**

4. Financing

- **Advocacy and outreach** for greater investment in aviation cleaner energy projects, including UN and international financial community
- Welcome and request for **operationalization of ICAO Finvest Hub** to facilitate better access to public fund / private investment, to respond to Resolution A41-21, para 18. a)
- Expedite work to **consider the establishment of a climate finance initiative or funding mechanism under ICAO**, to respond to A41-21, para 18. b)



Policy and Planning: Aviation Cleaner Energy Policies



Building Block 1 – Policy and Planning

1. Policy and Planning

- Global aspirational **Vision** to reduce international aviation CO₂ emissions by **5% by 2030**
- Each State's **special circumstances and respective capabilities**
- **CAAF/4** no later than 2028, with a view to update Vision
- **Collaborative effort** across different stakeholders, and encourage **State policies, action plans and roadmaps**
- Implementation **monitored** and periodically **reviewed**

5. States are encouraged to implement policies in support of the Vision, in a socially, economically and environmentally sustainable manner and in accordance with their special circumstances and respective capabilities.
6. In developing these policies, States are invited to consider the usefulness and benefits of the non-exhaustive and non-prescriptive list of potential policy components contained within the 'toolkit' in paragraph 18 below, noting that ICAO guidance provides further detail on these potential policy components and the guidance does not provide any endorsement of specific policies.
7. In developing and implementing their policies, States are encouraged to recognize:
 - a) the need for, and benefits of, a combination of policies under a coherent and coordinated national plan for the scale-up in production and deployment of SAF, LCAF and other aviation cleaner energies, noting that no one single policy is likely to deliver the best and most efficient outcomes and that the appropriate policy-mix will differ between States due to different national circumstances;
 - b) the need for policies to take into account cost impacts and affordability, and to avoid extraterritorial measures;
 - c) the need for policies to take into account the latest scientific and technological developments;
 - d) the importance of the policy's transparency, certainty and stability, for aircraft operators, feedstock producers, fuel producers, financial institutions and other relevant stakeholders; and
 - e) the need for policies to be applied in accordance with the Chicago Convention and its relevant instruments and any appropriate bilateral and multilateral agreements in place between States, with particular regard for the fundamental principles of non-discrimination, fair and equal opportunity; and the avoidance of market distortion.
8. States are encouraged to work together towards the harmonization of policies, to the extent possible and appropriate to circumstances, across States and regions as a longer-term objective.



Need for Policies on Aviation Cleaner Energies



- **Cleaner energy production is limited by a number of barriers**
 - Higher costs
 - Limited feedstock and fuel production infrastructure
 - Perceived financial risks
- **In the presence of such barriers, policy intervention is required to develop cleaner energy production.**
 - In general, a supporting policy framework is in place in those states where cleaner energy production has initiated
- **Constraints and opportunities are specific to each State**
 - Specific climates, agricultural systems, available resources, economic factors, political contexts, regulatory structures, etc.





ICAO Guidance on Potential Policies and Coordinated Approaches for the deployment of SAF



- **Developed by CAEP based on studies performed since 2016**
- **A support reference for ICAO States to develop SAF production**
 - Insight on types of policy measures and their impacts
 - Examples of policies used or under preparation
 - Links to additional helpful resources
- **Completes a toolbox of guidance material for ICAO States**
- **Can be used in combination with the ICAO SAF Rules of Thumb**

<https://www.icao.int/environmental-protection/Documents/SAF/Guidance%20on%20SAF%20policies%20-%20Version%202.pdf>



ICAO Guidance provides details on various policy options, divided into 3 impact areas and 8 categories



Impact area: Stimulating Growth of SAF Supply			
1 Government funding for RDD	2 - Targeted incentives and tax relief to expand SAF supply infrastructure	3 - Targeted incentives and tax relief to assist SAF facility operation	4 - Recognition and valorization of SAF environmental benefits
<p>1.1 - Government R&D</p> <p>1.2 - Government demonstration and deployment</p>	<p>2.1 - Capital grants ; 2.2 - Loan guarantee programs</p> <p>2.3 - Eligibility of SAF projects for tax advantaged business status ; 2.4 - Accelerated depreciation/‘bonus’ depreciation</p> <p>2.5 - Business Investment Tax Credit (ITC) for SAF investments 2.6 - Performance-based tax credit</p> <p>2.7 – Bonds / Green Bonds</p>	<p>3.1 Blending incentives: Blender’s Tax Credit</p> <p>3.2 – Production incentives: Producer’s Tax Credit</p> <p>3.3 - Excise tax credit for SAF</p> <p>3.4 - Support for feedstock supply establishment and production</p>	<p>4.1 – Recognize SAF benefits under carbon taxation</p> <p>4.2 - Recognize SAF benefits under cap and-trade systems</p> <p>4.3 - Recognize non-carbon SAF benefits: improvements to air quality</p> <p>4.4 - Recognize non-carbon SAF benefits: reduction in contrails</p>

Impact area: Creating Demand for SAF		
5- Creation of SAF mandates	6 - Update existing policies to incorporate SAF	7 – Demonstrate government leadership
<p>5.1 - Mandate renewable energy volume requirements in the fuel supply</p> <p>5.2 - Mandate reduction in carbon intensity of the fuel supply</p>	<p>6.1: Incorporating SAF into existing national policies</p> <p>6.2: Incorporating SAF into existing subnational, regional or local policies</p>	<p>7.1 Policy statement to establish direction</p> <p>7.2: Government commitment to SAF use, carbon neutral air travel</p>

Impact area: Enabling SAF Markets
8 - Market enabling activities
<p>8.1 - Adopt clear and recognized sustainability standards and life cycle GHG emissions methods for certification of feedstock supply and fuel production</p> <p>8.2 - Support development/recognition of systems for environmental attribute ownership and transfer</p> <p>8.3 - Support SAF stakeholder initiatives</p>



Qualitative metrics for assessing policy effectiveness



1 - Flexibility	2 - Certainty	3 - Financial costs and benefits	4 - Price sensitivity to externalities
Can the policy be easily adjusted given evolving circumstances?	Certainty on timeframe, legal conditions and political decisions increase investor interest.	Policies should be assessed on the its costs benefits they deliver, including social ones.	Higher sensitivity, more unintended consequences. Floor/Ceiling prices can reduce volatility
5 - Ease of implementation	6 - Contribution to SAF deployment and GHG reduction	7 - Unintended consequences	8 - Robustness of policy
Administrative, governance and/or procedural complexity can hinder implementation.	Clear criteria on target quantity, sustainability, commercial parameters and timeframe improve results	Mechanisms to identify and mitigate unintended consequences (economic, environmental or social)	Regulating systems to ensure that policy objectives are achieved and procedures have been followed.





SAF Estimates – “SAF Rules of Thumb”

ICAO SAF Rules of Thumb - order of magnitude estimations on SAF costs, investment needs and production potential.

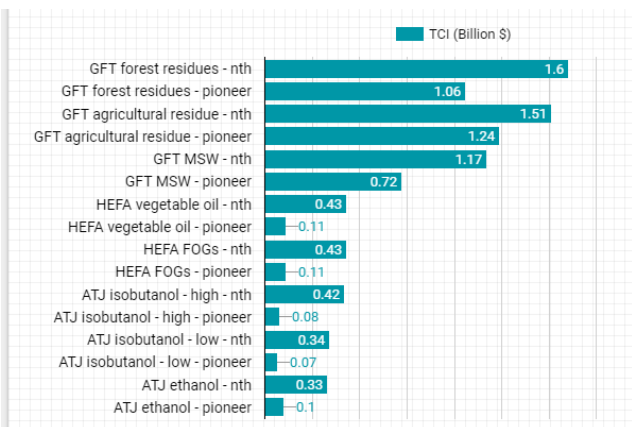
They can be used to inform policymakers and project developers.

Summary Table 2 - SAF facilities information

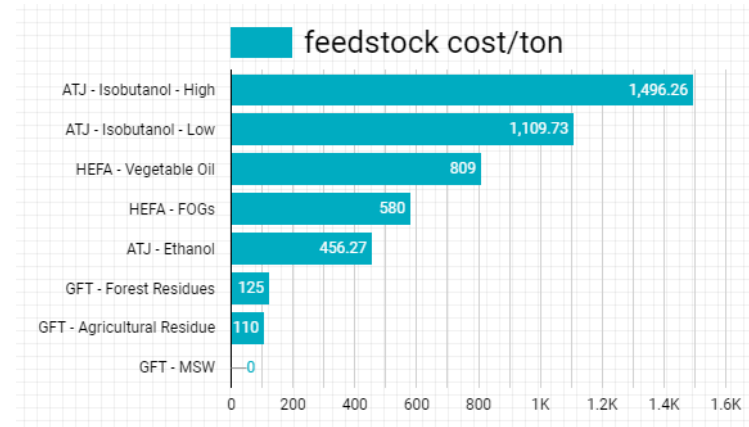
Total capital investment (TCI), capital cost, and minimum selling price (MSP) for nth and pioneer facilities for each pathway.

Processing Technology	Feedstock	TCI (million \$)		Capital Cost (\$/L total distillate)		MSP (\$/L)	
		n th	pioneer	n th	pioneer	n th	pioneer
FT*	MSW	1428	813	2.9	8.1	0.9	2.1
FT*	forest residues	1618	1088	4.0	10.9	1.7	3.3
FT*	agricultural residues	1509	1267	5.0	12.7	2.0	3.8
ATJ	ethanol**	328	117	0.3	1.2	0.9	1.1
ATJ	ethanol, agricultural residues	581	170	0.6	1.7	2.2	2.5
ATJ	isobutanol-low**	332	94	0.3	0.9	1.3	1.5
ATJ	isobutanol-high**	410	110	0.4	1.1	1.7	1.9
HEFA	FOGs	448	-	0.4	-	0.8	-
HEFA	vegetable oil	456	-	0.5	-	1.0	-
FT	DAC CO ₂ , H ₂	3366	-	3.4	-	4.4	-
FT	waste CO ₂ , H ₂	3209	-	3.2	-	3.5	-
Pyrolysis***	forest residues	1038	594	2.6	5.9	1.3	2.1
Pyrolysis***	agricultural residues	1084	619	2.7	6.2	1.3	2.2

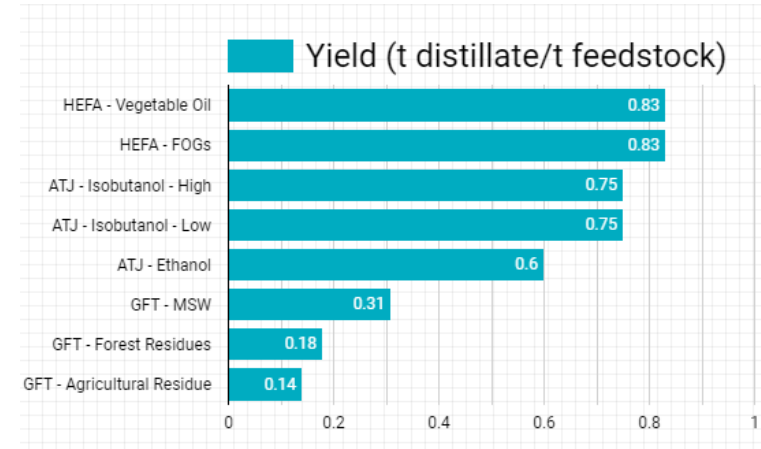
total capital investment (TCI)



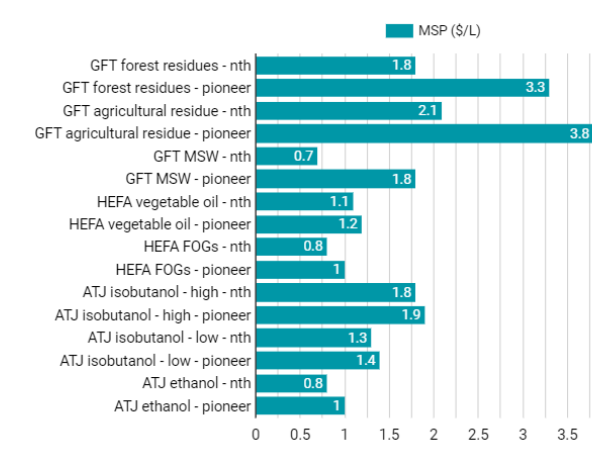
Feedstock costs



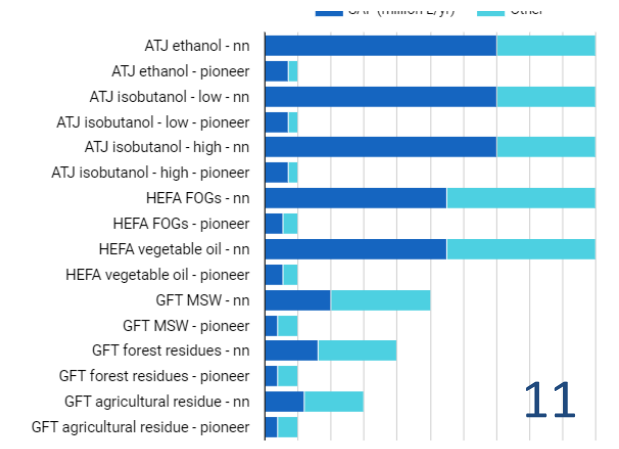
Feedstock Yield



Minimum Selling Price



Refinery capacity



ICAO SAF Policies Tracker

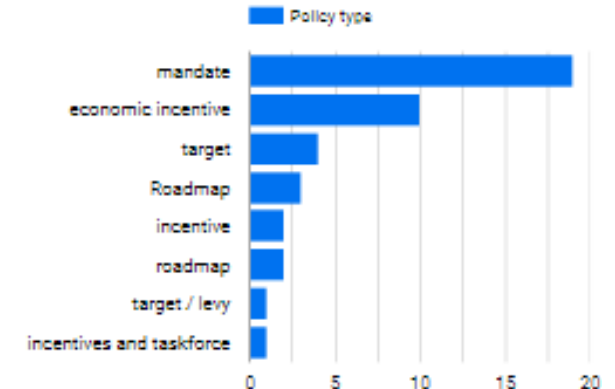
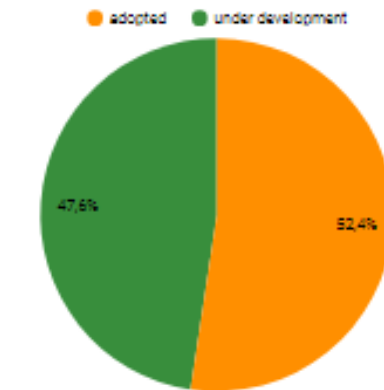
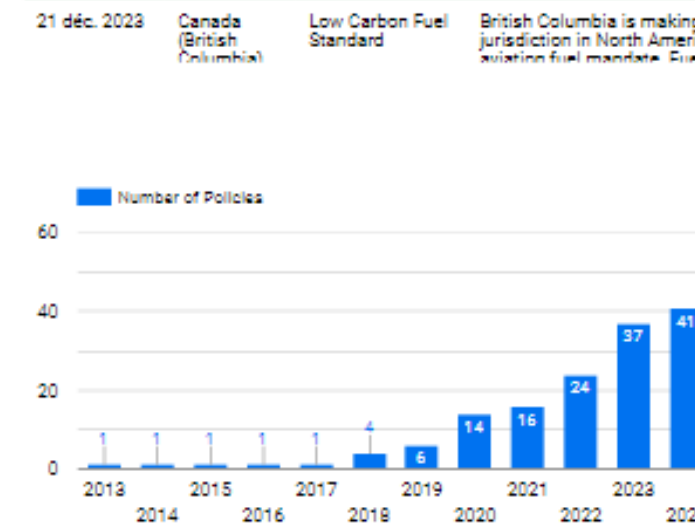
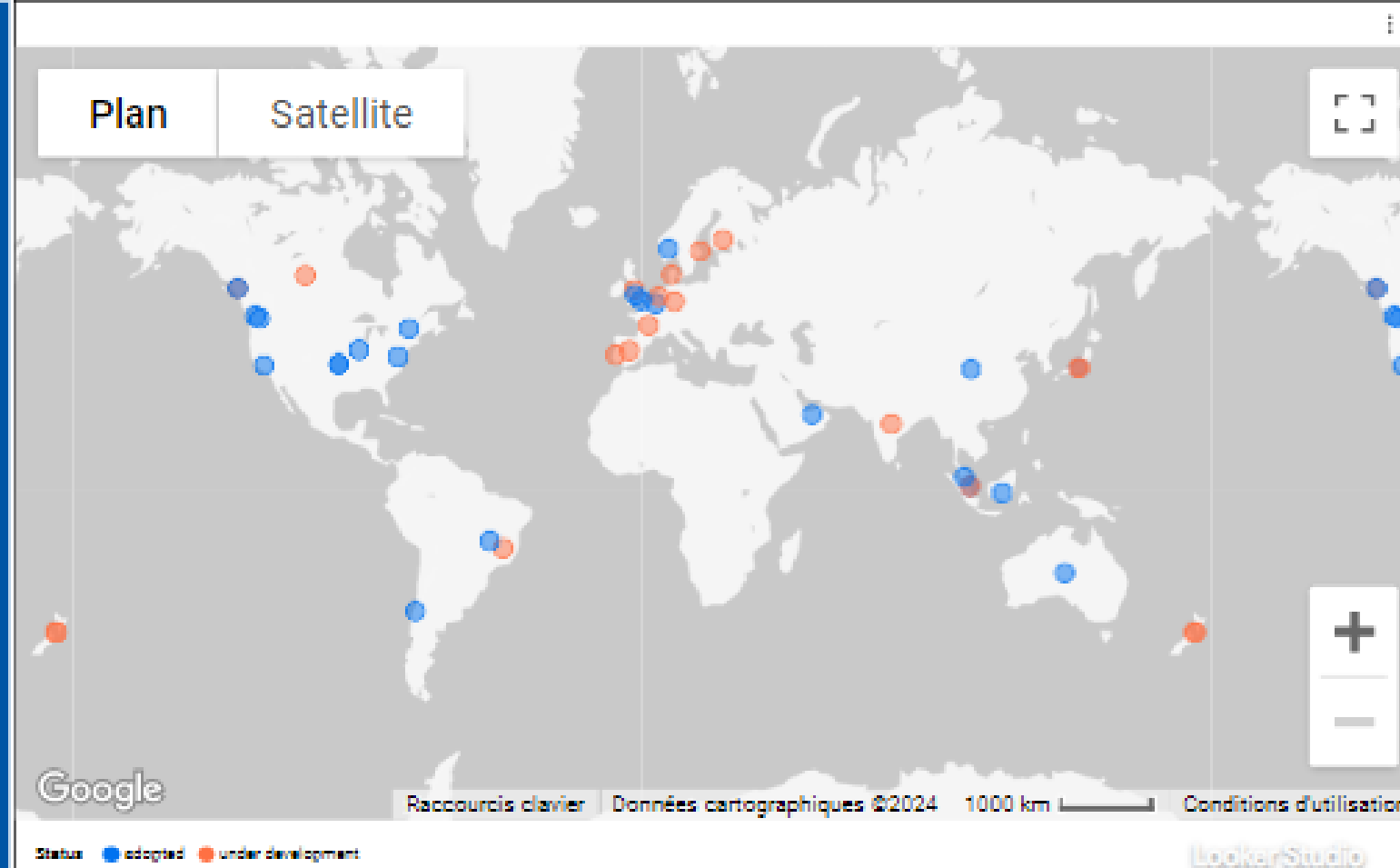


Tracker of policies adopted or under development to foster SAF development

Date	State	Policy Title	Policy Description	Status	Source
22 mai 2024	United States	Nebraska production tax credit for SAF	Nebraska Gov. Jim Pillen has signed into law LB 937, which includes establishing a production tax credit for sustainable aviation fuel (SAF) in Nebraska. Ethanol and oils from corn and soybean processing serve as low-carbon, low-cost feedstocks for the production of SAF, which can reduce emissions by more than 50 percent compared to conventional jet fuel, according to NEB. LB937 establishes an income tax credit for the production of SAF beginning in 2027.	adopted	https://www.wastetodaymagazine.com/news/nebraska-governor-signs-landmark-saf-legislation-into-law/
12 avr. 2024	Chile	SAF Roadmap 2030	Chile announced the country's sustainable aviation fuel 'SAF Roadmap 2030' with plans to begin production by 2030 while setting a target to use 50% of jet fuel made from oils, fats, and biological and municipal waste by 2050. The roadmap was announced by Fernanda Cabañas, program coordinator for Chile's public-private 'Clean Flight' initiative, at an aviation conference in Santiago, Chile. The initiative is targeting to develop a large-scale SAF production facility operational by 2030.	adopted	https://www.safinvestor.com/news/144779/chile-announces-saf-roadmap-targets-production-facility-by-2030/?utm_medium=email&_hsenc=p2ANqtz-9VmAOS7eEsQ8SdbG3T8rQfcznFhWDY4aLDF8985MJNK20fNhtg7S1VlsBkJ3Dz8nlsV1e4Sy0AzuPAIXxXoNAPw&_hsmi=85932065&utm_content=85932065&utm_source=hs_email
19 févr. 2024	Malaysia	National Energy Transition Roadmap	Malaysia has established an SAF blending mandate starting with 1%, according to the National Energy Transition Roadmap published by the government in 2023. It is targeting a 47% SAF blending mandate by 2050.	adopted	https://www.hydrocarbonprocessing.com/news/2024/02/asia-s-saf-projects-and-agreements/
19 févr. 2024	Singapore	Singapore Sustainable Air Hub Blueprint	To kickstart SAF adoption in Singapore, flights departing Singapore will be required to use SAF from 2026. We will aim for a 1% SAF target for a start, to encourage investment in SAF production and develop an ecosystem for more resilient and affordable supply. Our goal is to raise the SAF target beyond 1% in 2026 to 3 - 5% by 2030, subject to global developments and the wider availability and adoption of SAF. CAAS will introduce a SAF levy for the purchase of SAF to achieve the uplift target. As the market for the supply of SAF is still nascent and the price of SAF can be volatile, this approach will provide cost certainty to airlines and travellers.	adopted	https://www.caas.gov.sg/docs/default-source/default-document-library/annex-1-blueprint-report-exec-summary.pdf https://www.businesstimes.com.sg/companies-markets/transport-logistics/outbound-travellers-singapore-pay-levy-2026-part-sustainable
21 déc. 2023	Canada (British Columbia)	Low Carbon Fuel Standard	British Columbia is making history by becoming the first jurisdiction in North America to implement a sustainable aviation fuel mandate. Fuel suppliers will need to incorporate	adopted	https://www.producer.com/news/b-c-to-launch-first-mandate-for-sustainable-aviation-fuel/#:~:text=British%20Columbia%20will%20require%20fuel%20to,1-41/41

Environmental Policies on Aviation Fuels

The following map and table provides a summary of the policies (adopted and under development) to foster the use of Sustainable Aviation Fuels and Lower Carbon Aviation Fuels.



ICAO

COUNTRY: Indonesia

DATE: 2023-01-01

STATUS: adopted

POLICY TITLE: Indonesia

LATEST LINK: <https://www.icao.int/en/air>

POLICY TYPE: mandate

POLICY DESCRIPTION: Mandate of 5% SAF use by 2025

LAST UPDATE: 23 mai 2024

Policy examples

Financing grant competitions for SAF production (USA, France)

SAF blending/use mandates in energy content or CO₂ emissions reductions (EU, Brazil)

ICAO ENVIRONMENT **ACT>>SAF**

IRA SAF and Clean Technology Grant Program

Support projects to rapidly scale-up domestic SAF production

IRA FAST Grant Program

\$40007
\$245 million competitive grant program
Specifies consideration criteria and eligible entities
FAST Meeting – Dec. 14



ICAO ENVIRONMENT **ACT>>SAF**

ReFuelEU Aviation legislative proposal Design*

Ramp-up: binding minimum SAF shares in aviation fuel supplied in the EU:

Total shares in the fuel mix (in %)	2025	2030	2035	2040	2045	2050
Sustainable	0	2	7	14	21	28
Synthetic	0	0	0	0	0	0

Text - H.R.5376 - 117th Congress (2021-2022) | Congress.gov | Library of Congress

2- Focus on French endeavour for SAF

Mid-2020 launched a Call for Expression of Interest to assess stakeholders' interest and needs

July 2021: calls for proposal to support the development of a French SAF production sector :

- 200 million € for pilot/demonstrator construction or engineering studies
- Closed in September 2022 – 5 winning projects to date

Concrete application via a mandatory incorporation mandate :

- January 2022: blending mandate of 1% implemented
- Mid-2022 : launch of a working group to address the industrialization phase at government level
- December 2022 : study on PtL fuels potential in France




Direction générale de l'Aviation civile
Direction du transport aérien

ICAO ENVIRONMENT **ACT>>SAF**

Public Policy for SAF

COMBUSTÍVEL DO FUTURO

- No blending mandate or tax incentives – limited budget
- Alternative: a mandate of CO₂ emissions reduction (in %) by the use of SAF
 - Applied to airlines (thus not on SAF distribution).
 - Fosters competition for the use of the best technology available and the most efficient SAF

For details – ACT-SAF Series #12 Training – <https://www.icao.int/environmental-protection/Pages/ACT-SAF-Series.aspx>



Policy examples



Tax credits on SAF (USA, France)

Design of a national SAF roadmap (UAE, Japan)

ICAO ENVIRONMENT **Inflation Reduction Act (IRA) - Production support through 2027** ACT>>SAF

IRA Tax Credits

SAF Tax Credit §13203 - 2023-2024

- Achieves 50% lifecycle GHG reduction
- \$1.25 with additional up to \$1.75 for additional lifecycle emissions reduction

Production Credit §13704 - 2023-2024

- Lifecycle GHG <50kg CO2e/MMBTU
- Enhanced value for SAF up to \$1.75

Text - H.R.5376 - 117th Congress (2021-2022): In 2022 | Congress.gov | Library of Congress

MINISTÈRE CHARGÉ DES TRANSPORTS dgac 2. French endeavour

2- Focus on French endeavour for SAF

TIRUERT : an existing tax instrument

- Incentive mechanism to encourage the blending of biofuels in diesel and gasoline, and now kerosene
- Set-up via the **budget law** & update annually
- To evolve over the coming years to match our SAF roadmap objectives

Principles

- Separate annual objective per type of fuel (non fungible)
- SAF blending mandate set at **1% since 2022** (in energy)
- Tax level of **168 € / hectolitres** (at present)

Recent development

- Mandate level raised to 1,5% in 2024
- **Upgrade of the biofuel management platform** developed by the French Energy Ministry

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Direction du transport aérien



ICAO ENVIRONMENT **UAE SAF Roadmap** ACT>>SAF

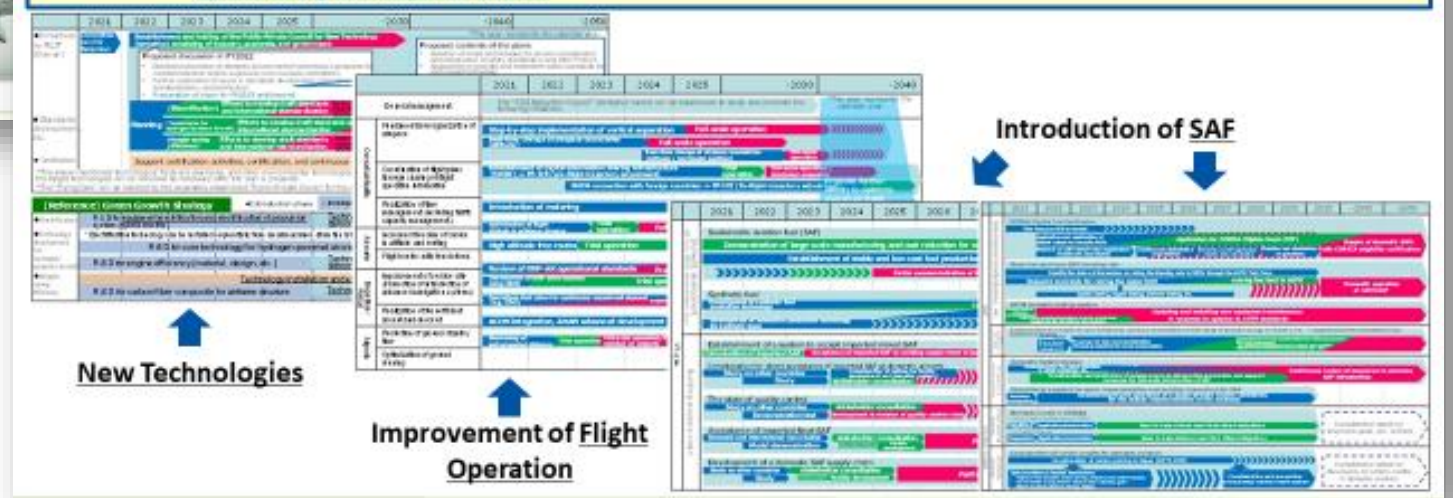
2022-2050: Key strategic points

5 Sustainable Aviation Fuel (SAF) principles are highlighted with the intent to accelerate the decarbonization of the UAE's aviation sector and transform it into a regional hub for low carbon aviation fuels

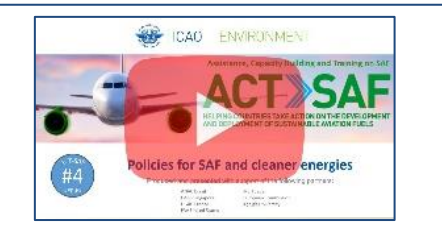


ICAO ENVIRONMENT **SAF Roadmap and Utilization target in 2030** ACT>>SAF

- The roadmaps for promoting decarbonization in aircraft operation sector were established in 2021 and are shared among public/private parties in Japan.
- Two quantitative targets for decarbonization were established within roadmaps.
 - SAF: Replacing 10% of the fuel consumption by Japanese airlines with SAF in 2030
 - Operational improvement: Reducing CO2 emissions by about 10% through future efforts of improvement of flight operations by renovating air navigation services



For details – ACT-SAF Series #12 Training – <https://www.icao.int/environmental-protection/Pages/ACT-SAF-Series.aspx>



Policy examples



Industry engagement (UAE, Japan “Act for Sky”, Singapore “Buyers club for SAF”)

Participants
The UAE SAF Committee

Private Initiative for SAF - Act for Sky
On 2 March 2022, a voluntary organisation, "ACT FOR SKY", was launched with JGC HD, Revo INTL, ANA and JAL as lead companies, with the aim of promoting and expanding domestic SAF.

Corporate Buyers' Club for SAF

- Studying the feasibility and design of a corporate buyers' club to encourage early adopters to take collective action, to aggregate SAF demand and provide stronger demand signals for SAF production and scale-up
 - Tap on business travelers and air cargo users and encourage them to become first movers
 - Potential of collaborating with regional partners to expand the buyers' club to the broader ASEAN region
- As the buyers' club would be the first of its kind in Singapore, need careful assessment of its commercial viability and operating model
- Plan to commence study in second quarter of 2023, which will take around 3 months

Defining SAF aspirational targets (Japan 10% SAF by 2030, USA 3 Billion gallons of SAF by 2030)

U.S. SAF Grand Challenge

- Agreement by the Departments of Transportation, Energy and Agriculture
- Achieve 3 billion gallons of production by 2030
- At least a 50% reduction in greenhouse gas emissions by 2050
- Multi-agency coordination to support

Public-Private Councils

- In Mar21, JCAB established "Study Group on CO2 Reduction in the Aircraft Operation Sector" which consists of air-carriers, academic experts etc.
- The study group established roadmaps for promotion of decarbonisation in aviation operation sector.
- Accelerating actions in the roadmaps, JCAB has established public-private councils.

<Target > Replacing 10% of the fuel consumption by Japanese airlines with SAF in 2030

Private-Public Councils for promotion of SAF deployment

Purpose

- Coordination of demand (airlines) and supply (oil companies) to facilitate the development and production of domestic SAF
- Construction of future supply chain including imported SAF

Key actions

- Coordinating of demand and supply of SAF
- Demonstration of imported neat SAF refueling in Japan
- Assistance of ICAO CEF certification

Member

- Private sector: Air-carriers, Airport company, Oil company, etc.
- Public sector: MAFF, METI, MLIT, MOE, NEDO(observer)

Vice-minister of MLIT, Mr. Nakayama at the 1st council

For details – ACT-SAF Series #12 Training – <https://www.icao.int/environmental-protection/Pages/ACT-SAF-Series.aspx>





Policy and Planning: State Action Plans



Building Block 1 – Policy and Planning

1. Policy and Planning

- Global aspirational **Vision** to reduce international aviation CO₂ emissions by **5% by 2030**
- Each State's **special circumstances and respective capabilities**
- **CAAF/4** no later than 2028, with a view to update Vision
- **Collaborative effort** across different stakeholders, and encourage **State policies, action plans and roadmaps**
- Implementation **monitored** and periodically **reviewed**

10. States are encouraged to include their respective policies, actions and roadmaps for the development and deployment of SAF, LCAF and other aviation cleaner energies, in their State Action Plans, and where possible, to:
 - a) identify resources, capacity and other factors (e.g. capacity assistance and access to technology) required;
 - b) help ICAO to tailor capacity building and implementation support measures, including facilitating access to financing and funding, in line with the State's needs; and
 - c) to quantify their Plans, to support ICAO's work in monitoring progress towards achieving the LTAG.
11. The implementation of the global framework should be continually monitored and periodically reviewed, including through annual ICAO stocktaking, and the convening of CAAF/4. In this regard, ICAO, with the technical contribution of CAEP, should identify and develop methodologies for monitoring the:
 - a) progress on emissions reductions from SAF, LCAF and other aviation cleaner energies toward the achievement of the LTAG, including through the gathering, compiling and analyzing, by ICAO, of actions undertaken by States according to their State Action Plans and other relevant State reporting mechanisms;
 - b) progress, at a global and regional level, on means of implementation support, including financing, provided to achieve the emissions reductions from SAF, LCAF and other aviation cleaner energies toward the achievement of the LTAG, including through the gathering, compiling and analyzing, by ICAO, of actions undertaken by States, industry, and other stakeholders; and
 - c) impacts on the sustainable growth of the aviation industry, the geographical distribution of SAF production, cost impacts (including airfares and the price of SAF, LCAF and other cleaner

6

energies), and the maintenance of fair and equal opportunities for the development and deployment of SAF, LCAF and other aviation cleaner energies, aspiring to have production sites in all ICAO regions before CAAF/4.



Building Block 3 – Implementation Support



3. Implementation Support

- **Robust, targeted and tailored** capacity -building and implementation support
- **Building on ACT-CORSIA and ACT-SAF** programmes
- Facilitate **partnerships**, and exchange of best practices
- Develop **policy toolkit/guidance** and support **State Action Plans**
- Support **feasibility studies, pilot projects**, which may facilitate access to investment
- Support **access to technology**

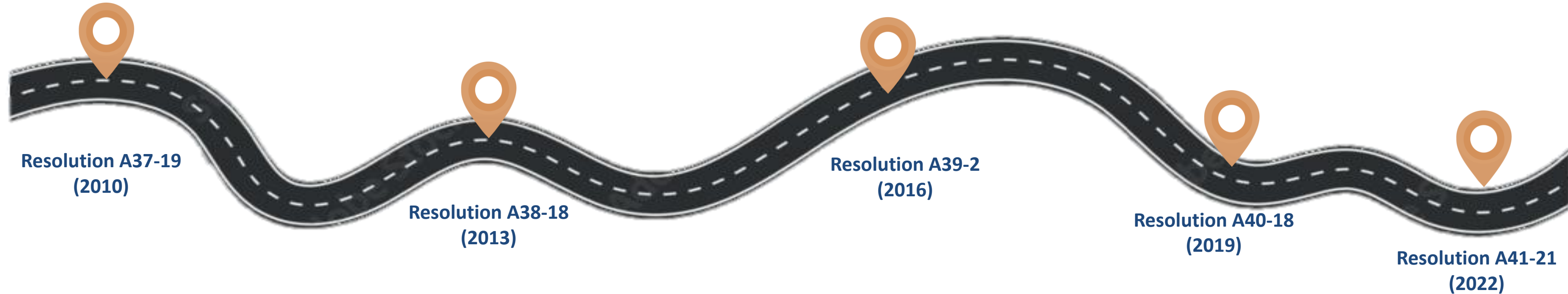
Building Block 3 – Implementation Support

17. All States should have access to the means to participate across all stages of the development and deployment of SAF, LCAF and other aviation cleaner energies, and all States and regions are encouraged to work together in a spirit of solidarity to ensure there is a truly global effort to contribute to, and benefit from, the work to reduce emissions from such aviation cleaner energies.
18. The global scale-up in production of SAF, LCAF and other aviation cleaner energies requires a robust and substantial capacity-building and implementation support programme. States, ICAO, industry, academia and other relevant stakeholders are encouraged to work together to deliver such a programme that:
 - a) recognizes the need for an expanded, robust, targeted and tailored support to account for the various stages of readiness across the entire SAF/LCAF value chain, taking into account different circumstances across States and regions;
 - b) facilitates partnerships, alliances and cooperation between States and all relevant stakeholders, including regional collaborations that may result in regional solutions that produce fuels efficiently;
 - c) includes exchange of information, sharing of best practices and technological developments among States, for which ICAO should provide a platform to facilitate this exchange and track progress;
 - d) supports States in their planning, development and implementation of national and regional policies that can be applied across all stages of fuel supply-chain, including the following potential policy components that form part of a non-exhaustive ‘toolkit’ (referred to paragraph 6 above):

- h) **assists in the development of relevant aspects of State Action Plans and roadmaps, including ICAO guidance and tools, and State-to-State support partnerships, noting that State Actions Plans may also include information on specific assistance needs for the implementation of measures to reduce aviation CO₂ emissions, which may facilitate access to investment and technology.**



Background of State Action Plan Initiative



Resolution A41-21 (2022): Consolidated statement of continuing ICAO policies and practices related to environmental protection — Climate change reaffirmed this initiative.



Encourages States to submit and update their **voluntary action plans** outlining respective policies, actions and roadmaps, including long-term projections

(A41-21 Para. 10)



Invites States to **prepare or update** action plans to submit them to ICAO **as soon as possible preferably by the end of June 2024** and once every three years thereafter

(A41-21 Para. 11)



Encourages to share information contained in action plans and **build partnerships** with other Member States

(A41-21 Para. 11)



Purpose of the State Action Plans



• State

- ✓ to voluntarily report international aviation CO2 emissions to ICAO and develop a better understanding of the projections of international aviation CO2 emissions
- ✓ to voluntarily include respective policies, actions and roadmaps for the development and deployment of Sustainable Aviation Fuels (SAF), Low-Carbon Aviation Fuels (LCAF) and other aviation cleaner energies
- ✓ to voluntary quantify action plans to support monitoring progress towards achieving the LTAG
- ✓ to voluntarily provide information to ICAO on the basket of measures implemented for emission reduction and on any specific assistance needs

ICAO

- ✓ to compile information about the achievement of the global aspirational goals and to monitor the implementation and achievement of the long-term global aspirational goal (LTAG)
- ✓ to facilitate the dissemination of economic and technical studies and best practices related to aspirational goals
- ✓ to identify and respond to States' needs and provide assistance such as facilitating feasibility studies
- ✓ to tailor capacity building and implementation support measures, including facilitating access to financing and funding, in line with each State's needs



Up-to-date achievement on SAP submissions

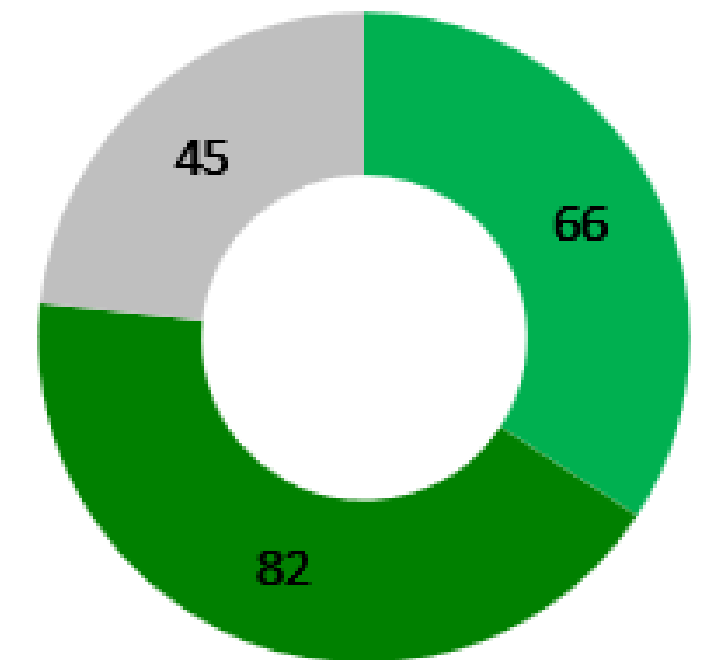


148 States representing **98.99%** of global RTK have voluntarily submitted their State Action Plan

Global SAP Submissions / Updates



Global SAP Submissions / Updates



- States Submitted Once
- States Updated
- States left to submit

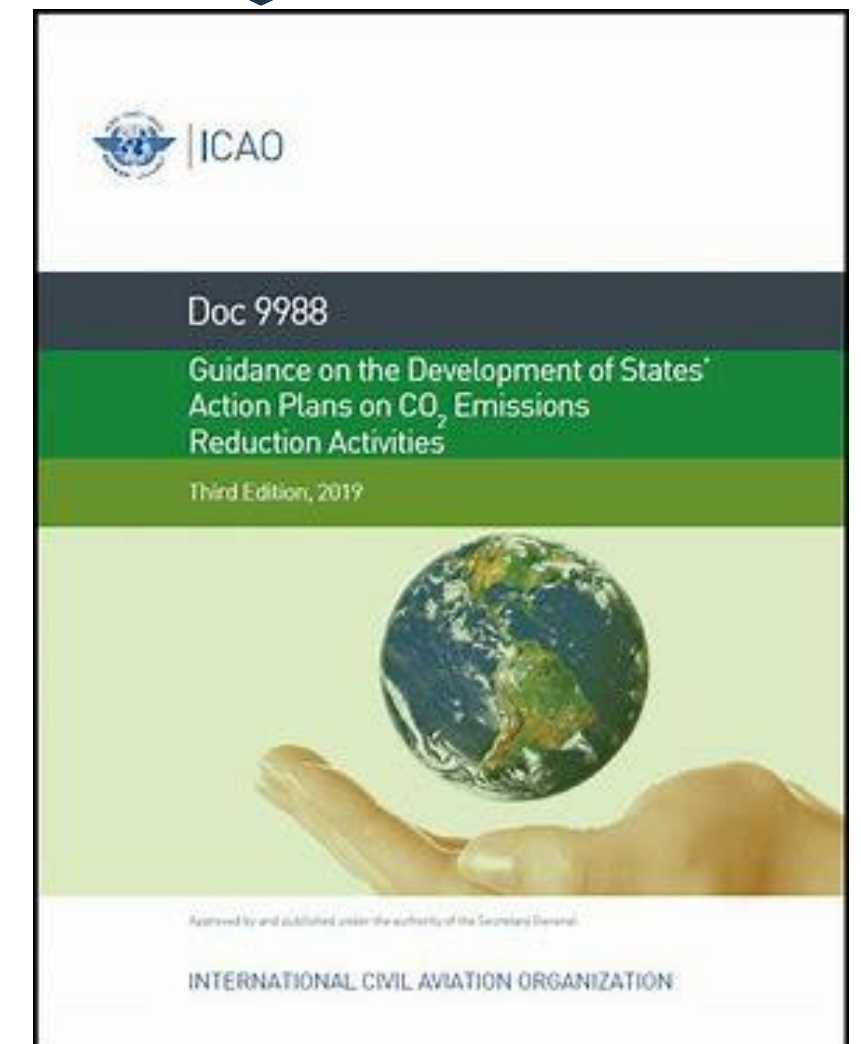


Guidance on the Development of State Action Plans on CO₂ Emissions Reduction Activities (Doc 9988)



- Guidance on the Development of States' Action Plans on *CO₂ Emissions Reduction Activities*
 - Describes what a State Action Plan should include and provides a step-by-step guide on how to develop it.
- More details about everything presented in this Seminar can be found in this document
 - Overview and introduction;
 - Baseline scenario estimation;
 - Mitigation measures and expected results;
 - Implementation and assistance;
 - Appendix with examples and detailed information.

**Fourth Edition
now available at
APER Portal**



22

22



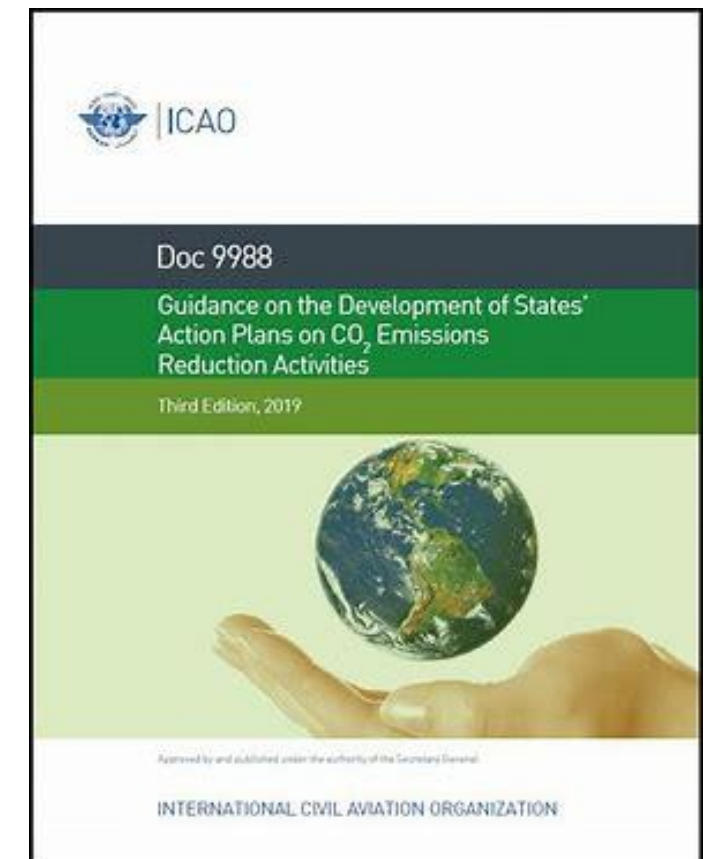
Guidance on the Development of State Action Plans on CO2 Emissions Reduction Activities (Doc 9988)



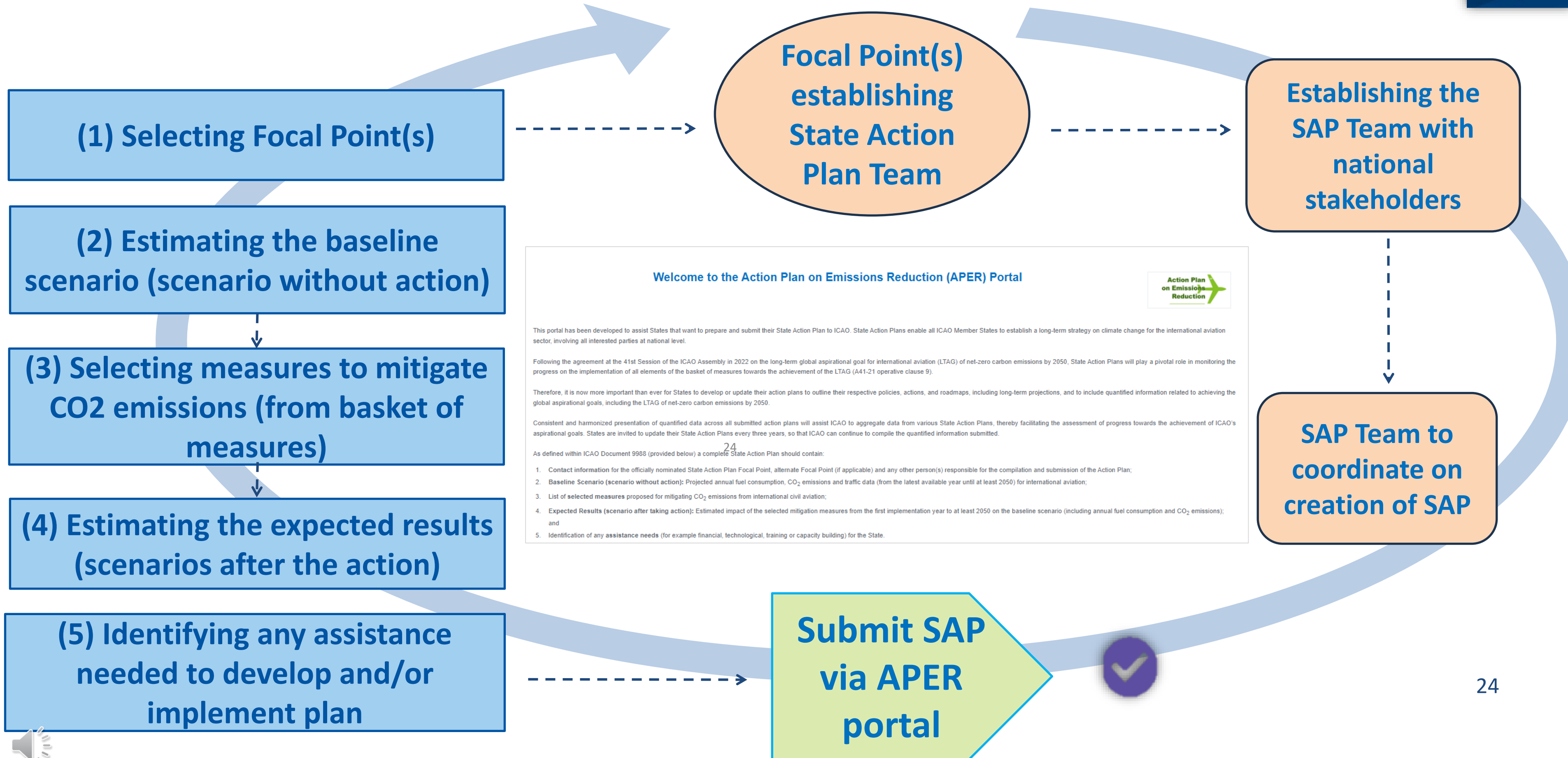
Updates in the Guidance (Fourth Edition):

- 1** Reflects 2022 ICAO Assembly's agreement on a long-term global goal for aviation (LTAG) and highlights importance of State Action Plans in contributing to the achievement of the international aviation sector's collective goal and monitoring the global progress.
- 2** Details benefits of sustainable aviation fuels (SAF), lower carbon aviation fuels (LCAF), and other clean energy options, guided by the ICAO Global Framework adopted by CAAF/3.
- 3** Updates the Action Plan template, which allows States to report quantified data in a harmonized manner.
- 4** Adds information on assistance needs, ICAO's latest capacity-building programs, possible financial instruments, and examples of eligibility criteria for financing decarbonization projects.
- 5** Includes lessons from the past decade, updated information resources, and best practices for CO2 mitigation.

**Fourth Edition
now available at
APER Portal**



State Action Plan Process



What is included in a State Action Plan?



5 basic elements (minimum requirements):

1- Contact Information of the State Focal Point(s).

2- Baseline Scenario (scenario without action) annual fuel consumption, CO2 emissions and traffic data (from the latest available year until at least 2050).

3- Measures to mitigate CO2 emissions (deriving from the Basket of Measures).

4- Expected results (scenario after taking action): annual fuel consumption, CO2 emissions and traffic data after implementation of mitigation measures from the first implementation year to at least 2050.

5- Assistance needs for example financial, technological or capacity building.



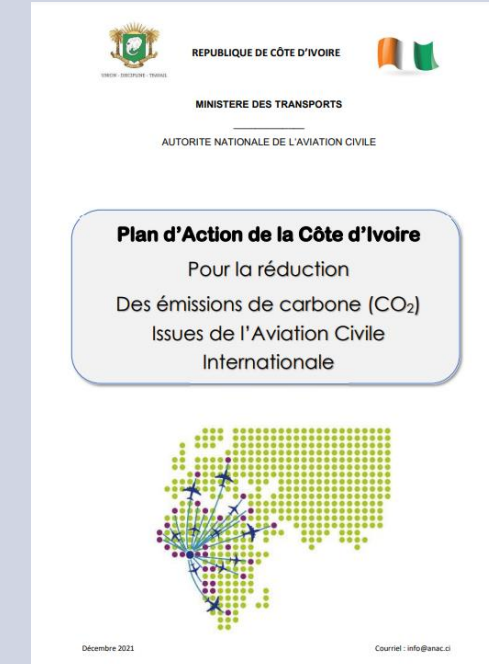
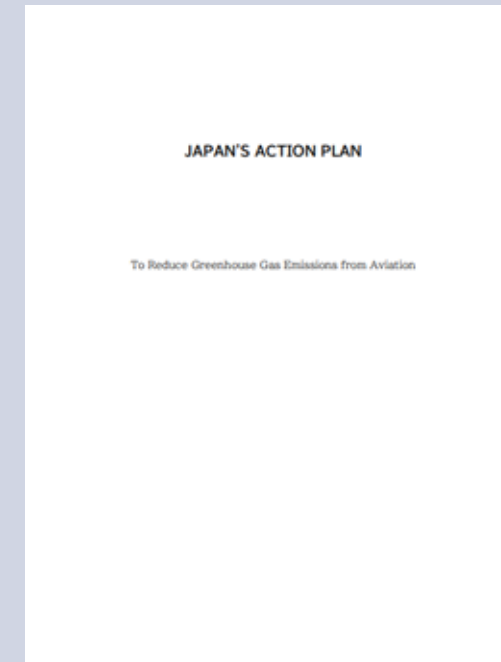
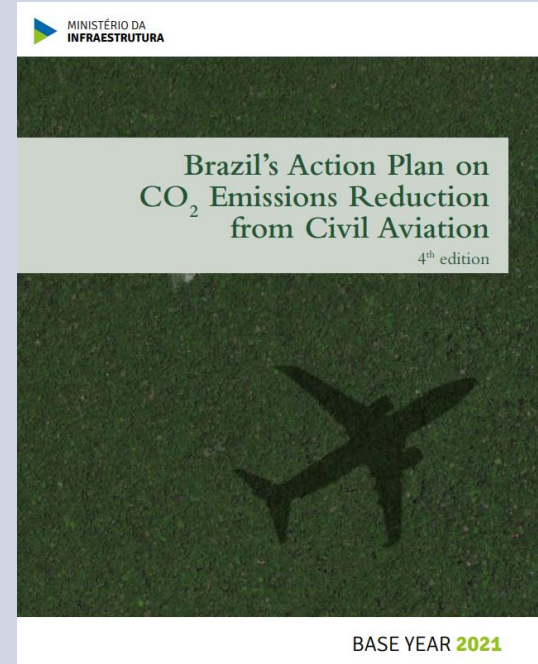
After Submission



- Development and submission of an Action Plan is not the end goal !
- Key points:
 - ✓ States to set in motion a process to implement the relevant measures in the Action Plan
 - ✓ Continuous consultation and coordination between the various stakeholders is essential for implementation
 - ✓ States to contribute to the achievement of the LTAG in accordance with national circumstances
 - ✓ States to continue to work closely with ICAO to achieve the implementation of the Global Framework for SAF, LCAF and other cleaner energies



SAF and Cleaner Energy initiatives from State Action Plans



United Kingdom

Renewable Transport Fuel Obligation - fuel suppliers to ensure a proportion of fuel from renewable origin

Brazil

Brazil has a wide range of raw materials to produce jet fuel, such as babassu, sugar cane, macaúba, palm, soy and forest resources (eucalyptus)

Dominican Republic

Use of photovoltaic energy in airports

Japan

Target of replacing 10% of fuel consumption by Japanese airlines with SAF by 2030

Cote d'Ivoire

Feasibility Study completed on the use of Sustainable Aviation Fuels





Policy and Planning: Monitoring and Reporting Methodologies



Background on the 41st Session of the ICAO Assembly



Resolution A41-21* requested the ICAO Council...

to consider necessary methodologies for the regular monitoring of progress on the implementation of all elements of the basket of measures towards the achievement of the long-term global aspirational goal for international aviation (LTAG), including through:

- a) ICAO environment stocktaking process;
- b) review of the ICAO vision for SAF;
- c) assessment of the CO₂ emissions reduction;
- d) cost impacts of a changing climate on international aviation, regions and countries, in particular developing countries;
- e) impact on the development of the sector;
- f) cost impacts of the efforts to achieve the LTAG;
- g) monitoring of information from State Action Plans for international aviation CO₂ emissions reduction; and
- h) means of implementation.



Building Block 1 – Policy and Planning



1. Policy and Planning

- Global aspirational **Vision** to reduce international aviation CO₂ emissions by **5% by 2030**
- Each State's **special circumstances and respective capabilities**
- **CAAF/4** no later than 2028, with a view to update Vision
- **Collaborative effort** across different stakeholders, and encourage **State policies, action plans and roadmaps**
- Implementation **monitored and periodically reviewed**

Building Block 1 – Policy and Planning:

1. ICAO and its Member States will work together to strive to achieve a Vision of implementing the elements of this global framework in order to globally scale-up the development and deployment for SAF, LCAF and other aviation cleaner energies, as such fuels are expected to have the largest contribution to aviation CO₂ emissions reductions in the 'basket of measures' to achieve the LTAG. To support the achievement of the LTAG, ICAO and its Member States strive to achieve a collective global aspirational Vision to reduce CO₂ emissions in international aviation by 5 per cent by 2030 through the use of SAF, LCAF and other aviation cleaner energies (compared to zero cleaner energy use). In pursuing this Vision, each State's special circumstances and respective capabilities will inform the ability of each State to contribute to the Vision within its own national timeframe, without attributing specific obligations or commitments in the form of emissions reduction goals to individual States.
2. This Vision will be continually monitored and periodically reviewed, as described in paragraph 11 below, including through the convening of CAAF/4 no later than 2028, with a view to updating the ambition on the basis of market developments in all regions.
3. Increasing the production of SAF, LCAF and other aviation cleaner energies across all regions will be integral to achieving the Vision and will rely on means of implementation including financing, technology transfer and capacity building.
4. In addition, the Vision should:
 - a) enable the increased production and supply of SAF, LCAF and other aviation cleaner energies across all regions;
 - b) be flexible, attainable and feasible;
 - c) be continually monitored and periodically reviewed (refer to paragraph 11 below);
 - d) be ambitious, in order to send a positive market signal to induce demand, trigger supply and attract significant additional investment, taking into account special circumstances and respective capabilities of States;
 - e) not negatively impact the growth of air transport, especially in developing countries;
 - f) contribute to a level playing field among all States and avoid market distortion;
 - g) be supported by the appropriate means of implementation including financing, technology transfer and capacity building;
 - h) not exclude any particular fuel source, pathway, feedstock or technology, as long as it meets the CORSIA sustainability criteria;
 - i) take account of the projections included in the LTAG report and subsequent analysis by CAEP;
 - j) note national fuel-related emissions reduction goals and roadmaps by States and any other industry commitments;
 - k) not give rise to any mandatory measures to achieve this Vision and the objective of this framework; and
 - l) contribute to mitigating air pollution, maximising both public health and climate benefits.



Building Block 1 – Policy and Planning



1. Policy and Planning

- Global aspirational **Vision** to reduce international aviation CO₂ emissions by **5% by 2030**
- Each State's **special circumstances and respective capabilities**
- **CAAF/4** no later than 2028, with a view to update Vision
- **Collaborative effort** across different stakeholders, and encourage **State policies, action plans and roadmaps**
- Implementation **monitored** and periodically **reviewed**

11. The implementation of the global framework should be continually monitored and periodically reviewed, including through annual ICAO stocktaking, and the convening of CAAF/4. In this regard, ICAO, with the technical contribution of CAEP, should identify and develop methodologies for monitoring the:
- a) progress on emissions reductions from SAF, LCAF and other aviation cleaner energies toward the achievement of the LTAG, including through the gathering, compiling and analyzing, by ICAO, of actions undertaken by States according to their State Action Plans and other relevant State reporting mechanisms;
 - b) progress, at a global and regional level, on means of implementation support, including financing, provided to achieve the emissions reductions from SAF, LCAF and other aviation cleaner energies toward the achievement of the LTAG, including through the gathering, compiling and analyzing, by ICAO, of actions undertaken by States, industry, and other stakeholders; and
 - c) impacts on the sustainable growth of the aviation industry, the geographical distribution of SAF production, cost impacts (including airfares and the price of SAF, LCAF and other cleaner energies), and the maintenance of fair and equal opportunities for the development and deployment of SAF, LCAF and other aviation cleaner energies, aspiring to have production sites in all ICAO regions before CAAF/4.



CAEP LTAG Monitoring and Reporting (LMR) Task Group



- After its establishment at the 2023 CAEP meeting, the LMR-Task Group started to develop the LTAG Monitoring and Reporting methodology (LMR Methodology).
- The CAEP LMR-TG has been working on a comprehensive and robust methodology comprised of:
 - **Backward and forward-looking approaches** to track the actual historical performance of the international aviation sector and generate new updated paths towards the 2050 goal (LTAG)
 - **Tiered approach** based on a core methodology and future enhancements
 - **Considerations on how to implement the methodology and organize the work** *(for internal CAEP purposes i.e., if requested by Council).*
- **The LMR-TG delivered the initial methodology at the SG/2024.**



Key Objectives & Principles



- **The LMR Methodology should:**
 - address the request from Assembly A41-21 (para 9);
 - allow for the review of historical performance of the international aviation sector and updated outlooks;
 - leverage existing relevant data, methods, tools and analyses from ICAO and/or CAEP; and
 - evolve and be enhanced over time to address existing gaps in data and/or methods.





Next Steps towards the Final LMR Methodology

- **The CAEP Steering Group meeting (CAEP SG/2024) agreed on the overarching proposed approach for the methodology on LTAG monitoring and reporting, including the inclusion of backward- and forward-looking assessments, and options in the form of tiers.**
- **The LMR-TG will address and integrate input, feedback and guidance from CAEP SG/2024.**
- **The LMR-TG will draft a comprehensive report to CAEP/13 on Final LMR Methodology.**
- **The LMR-TG will report back to CAEP/13 (February 2025), the ICAO Council and the ICAO Assembly.**



ICAO Roadmap Building Block 1 – Policy and Planning

Planned Actions

ICAO Roadmap BB1 – Policy and Planning (Monitoring Methodologies & State Action Plans)

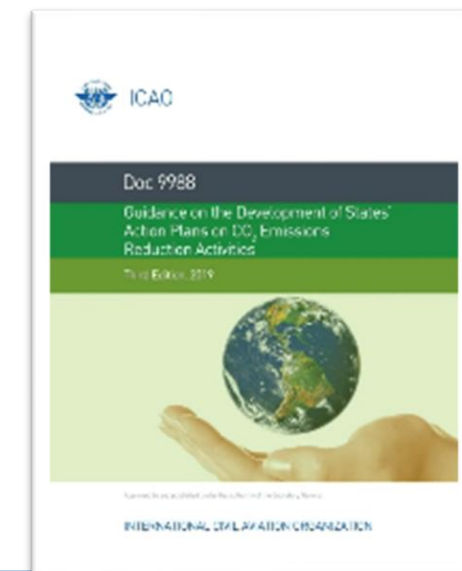
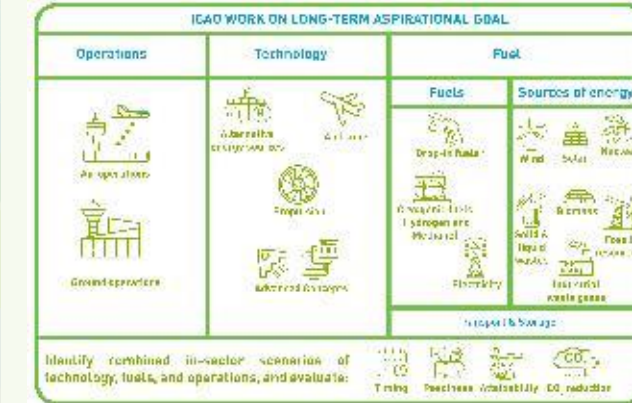
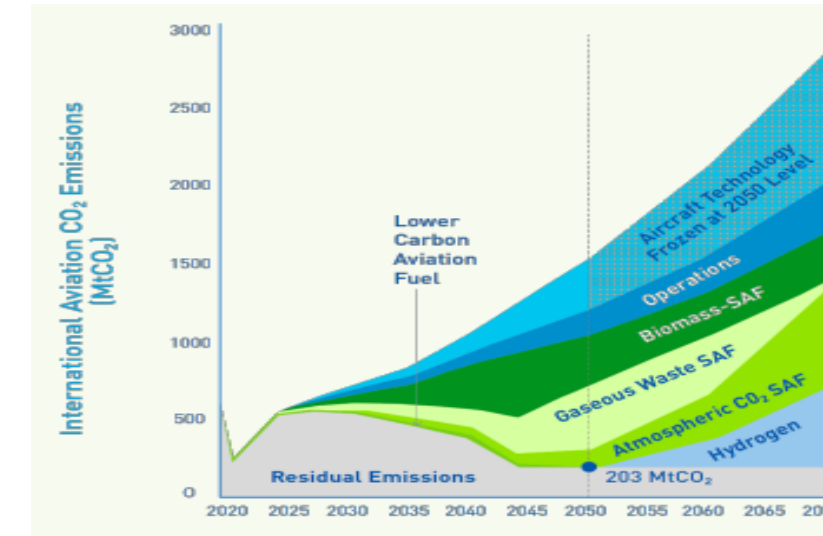


Planned Actions



- To expand ongoing work for the development of **LTAG monitoring methodologies** by including specific methodologies for **monitoring the achievement of the collective global aspirational Vision and the implementation of the Global Framework**
- To add monitoring of the Global Framework implementation, as part of **annual ICAO LTAG Stocktaking events**, including **monitoring of the implementation support and financing**
- To increase **new and updated State Action Plans**, with focus on SAF, LCAF and other aviation cleaner energies, and gather, compile and analyse the data submitted, aiming to assist in monitoring progress
- **To convene CAAF/4 no later than 2028**, with a view to updating the Vision and the Global Framework

36



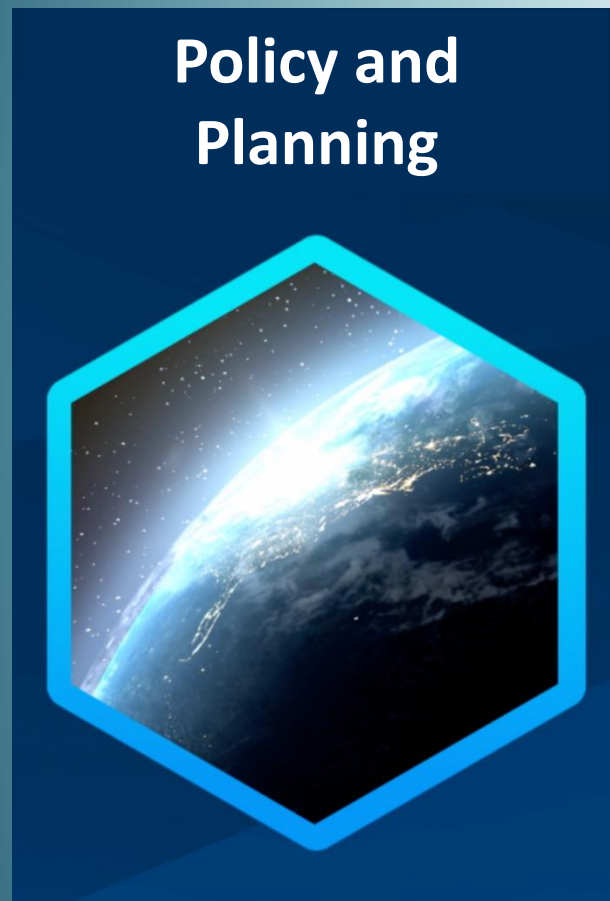
36



Policy and Planning Q&A Session

Session 1– Policy and Planning : Aviation Cleaner Energy Policies

Next:



- **Regional update on State Action Plans**
- **States presentations on policies and State Action Plans**

2024 ICAO REGIONAL SEMINAR ON ENVIRONMENT

- 20-21 August 2024 for NACC/SAM
Asuncion, Paraguay



2050



2024 ICAO REGIONAL SEMINARS ON ENVIRONMENT

August - September 2024



SAM Region activities on State Action Plans (SAP)

Jorge Armoa
AIM/MET Regional Officer

State Action Plan (SAP)
on CO₂ Emissions
Reduction Activities



August, 2024

ICAO North American Central American and Caribbean (NACC) and South American (SAM) Region States

NACC

Antigua and Barbuda
Bahamas
Barbados
Belize
Canada
Costa Rica
Cuba
Dominica
Dominican Republic
El Salvador
Grenada
Guatemala
Haiti
Honduras
Jamaica
Mexico
Nicaragua
Saint Kitts and Nevis
Saint Lucia
Saint Vincent and the Grenadines
Trinidad and Tobago
United States

Total: 22 States

SAM

Argentina
Bolivia
Brazil
Chile
Colombia
Ecuador
Guyana
Panama
Paraguay
Peru
Suriname
Uruguay
Venezuela (Bolivarian Republic of)

Total: 13 States

State Action Plans (SAP) in numbers (SAM Region)

State Action Plans (SAPs)

Current status:

1.# States submitted SAP: **12 (92%)**

Argentina, Brasil, Bolivia, Chile, Colombia, Ecuador, Guyana, Panamá, Paraguay, Perú, Uruguay, Venezuela

2.# States not yet submitted SAP: **01 (0,08%)**

Suriname

Examples of Mitigation Measures selected in the SAM Region

- ✓ AIRCRAFT TECHNOLOGY – Eleven States have proposed technological measures in their SAPs. The use of clean energy at airports to support airport operations, as well as the use of electric vehicles on the aprons are the main technological measures proposed in the States' SAPs.
- ✓ OPERATIONAL IMPROVEMENTS – The Regional Offices implemented task group for the optimization of airspace. The working group is called GESEA and works on the realignment of routes, implementation of the FRT0 module, and EDE, DCT and UPR concepts.
- ✓ SUSTAINABLE AVIATION FUELS (SAF) AND CLEANER ENERGY
 - a) Commitment to reducing CO2 emissions and positioning itself as a possible supplier of biofuels for aviation
 - b) “Programa Combustível do Futuro” (Fuel for the Future), creating the Technical Committee Fuel for the Future (CT-CF) in order to manage the Program

Examples of Mitigation Measures selected in the SAM Region

✓ SUSTAINABLE AVIATION FUELS (SAF) AND CLEANER ENERGY

c) the “Programa Combustível do Futuro” has two objectives: introducing the fuel into the Brazilian energy matrix and creating incentives for resources to be applied to projects focusing on the topics covered in the “Programa Combustível do Futuro”. To achieve these objectives,

d) the ProBioQAv Subcommittee was created, which will be detailed as

following.e) 4 - Brazilian Network of Biokerosene and Sustainable Hydrocarbons for Aviation (RBQAv - aviation kerosene)

e) Public Investments;

f) The Ministry of Energy of Chile, on the one hand, began in 2019 to develop a National Hydrogen Plan. Chile is decisively supporting the development of this energy resource, which can potentially be used in the airline industry. (2030+)

In this sense, it has carried out legislative steps so that hydrogen is considered as a fuel.

Next steps for SAP

- ✓ Nomination of State Action Plan Focal Point.
- ✓ Prepare the initial/updated SAP for submission. Make sure the action plans will be practical and concrete in line with the updated SAP Guidance.
- ✓ Include innovative measures in the SAP.
- ✓ Communicate with SAM RO for questions and support.

Contact points:

- Answering questions and providing support: actionplan@icao.int
- SAM Regional Office:
 - Jorge Armoa (jarmoa@icao.int)

Thank You



2024 ICAO REGIONAL SEMINAR ON ENVIRONMENT



- 7-8 August 2024 for APAC
Bangkok, Thailand
- 12-13 August 2024 for MID
Cairo, Egypt
- 20-21 August 2024 for NACC/SAM
Asuncion, Paraguay
- 10-11 September 2024 for EUR-NAT
Samarkand, Uzbekistan
- 15-16 October 2024 for
ESAF/WACAF Dakar, Senegal



ACT»SAF

CORSIA

2050

2024 ICAO REGIONAL SEMINARS ON ENVIRONMENT

August - September 2024



NAM CAR Regions activities on State Action Plans (SAP)

Luis Raul Sanchez
Regional Officer, Aeronautical
Meteorology and Environment

State Action Plan (SAP)
on CO₂ Emissions
Reduction Activities



August 2024

ICAO North American Central American and Caribbean (NACC) and South American (SAM) Region States

NACC

Antigua and Barbuda
Bahamas
Barbados
Belize
Canada
Costa Rica
Cuba
Dominica
Dominican Republic
El Salvador
Grenada
Guatemala
Haiti
Honduras
Jamaica
Mexico
Nicaragua
Saint Kitts and Nevis
Saint Lucia
Saint Vincent and the Grenadines
Trinidad and Tobago
United States

Total: 22 States

SAM

Argentina
Bolivia
Brazil
Chile
Colombia
Ecuador
Guyana
Panama
Paraguay
Peru
Suriname
Uruguay
Venezuela (Bolivarian Republic of)

Total: 13 States

State Action Plans (SAP) in numbers (XX Region)

State Action Plans (SAPs)

Current status:

1.# States submitted SAP: **15 (69%)**

Bahamas, Barbados, Belize, Canada, Costa Rica, Cuba, Dominican Republic, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Trinidad and Tobago, United States.

2.# States not yet submitted SAP: **7 (31%)**

Haiti and OECS (Antigua and Barbuda, Dominica, Grenada, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines)

Examples of Mitigation Measures selected in the XX Region

✓ AIRCRAFT TECHNOLOGY

Certification and regulatory approvals of new aircraft technologies

✓ OPERATIONAL IMPROVEMENTS

The CANSO, IATA, ICAO Free Route Airspace (CIIFRA) initiative in the Latin America and Caribbean (LAC) region.

[NACCDCA11WP41](#)

Optimize the design of instrument approach procedures with vertical guidance, as well as the design of standardized arrivals with continuous descent (CDO) and standardized departures with continuous climb (CCO)

✓ SUSTAINABLE AVIATION FUELS (SAF) AND CLEANER ENERGY

Energy Supply, Redundancy, and Microgrids Program

Next steps for SAP

- ✓ Nomination of State Action Plan Focal Point for Haiti and Guatemala.
- ✓ Prepare the initial SAP for OECS – November 2024 assistance mission.
- ✓ 6 States preparing fully quantified SAPs to update. Make sure the action plans will be practical and concrete in line with the updated SAP Guidance.
- ✓ Include innovative measures in the SAP, practice the new ICAO Doc 9988,
- ✓ Ongoing communication with NACC RO for questions and support.

Contact points:

- Answering questions and providing support: actionplan@icao.int
- NACC Regional Office:
 - Luis Raul Sanchez (lsanchez@icao.int)

Thank You



2024 ICAO REGIONAL SEMINAR ON ENVIRONMENT

In collaboration with



NACC & SAM Regions

20 to 21, August 2024

Asunción, Paraguay



ICAO

ENVIRONMENT



ACT SAF

CORSIA



Política Ambiental de la Aviación en Brasil



Política de Sostenibilidad de ANAC
(ESG - *Environmental, Social and Governance*)



Pacto Global
Rede Brasil



25 by
2025



Comunidade das Autoridades de
Aviação Civil Lusófonas

DECLARAÇÃO DE
LUANDA SOBRE A
IGUALDADE DE
GÊNERO

Política Ambiental de la Aviación en Brasil



1 PILLAR AMBIENTAL

- Estado más avanzado
- Buenas prácticas
- Incentivos al sector de aviación

2 PILLAR SOCIAL

- En desarrollo
- Oportunidades de implementación de nuevas acciones
- Ambiente laboral colaborativo

3 PILLAR GOVERNANZA

- Consolidado
- Mejores prácticas
- Fortalecimiento institucional



Diversidade,
Inclusão e
Formação

Política Ambiental de la Aviación en Brasil



- Política nacional de medio ambiente
- Foco em mitigación y adaptación
- NDC de Brasil – aviación doméstica

MINISTÉRIO DO
MEIO AMBIENTE E
MUDANÇA DO CLIMA



Plan de Acción para la Reducción de Emisiones de Brasil

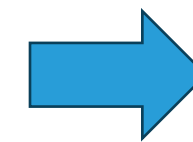


- **4ª Edición** – año-basis de 2021
- **Proceso colaborativo** entre Gobierno e indústria
- Constituido de tres partes:
histórico/proyección de emisiones CO₂;
medidas de reducción de emisiones;
estimativa de impacto de las medidas

Plan de Acción para la Reducción de Emisiones de Brasil



Política Ambiental de ANAC –
Comité Ambiental y **Red Ambiental de Aviación**



Grupo de Trabajo
Gobierno e
indústria
(aerolíneas,
fabricantes,
aeropuertos) para
identificar las
medidas del sector



Inventário de emisiones de la
aviación civil brasileña

Inventário de Emissiones Interativo

Selecione a estimativa a ser exibida



Consumo



GEEs

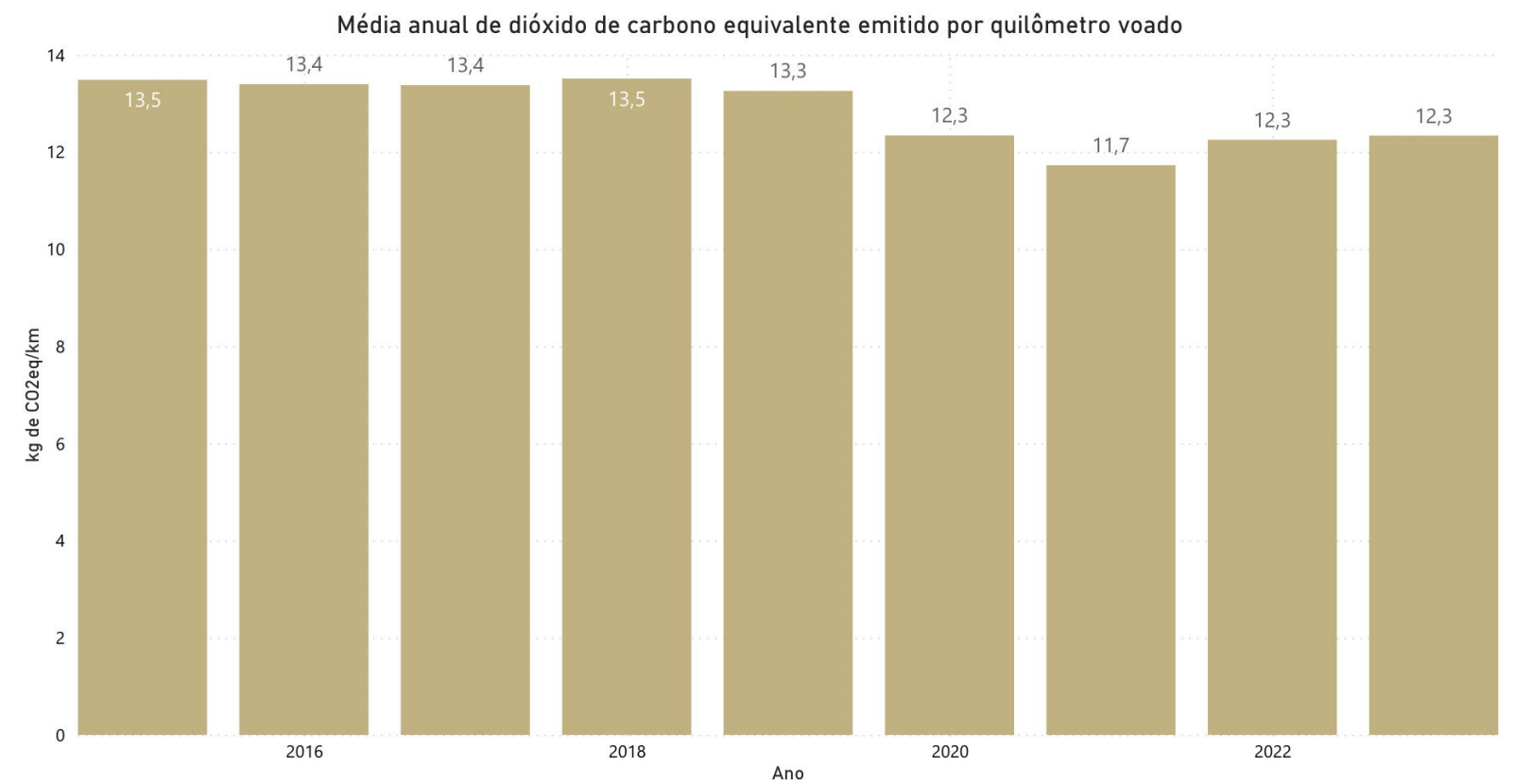


Poluentes

Forma de visualização dos dados

Indicador Anual Rota

 20..



Plan de Acción para la Reducción de Emisiones de Brasil



- **Participación voluntária** dos aeroportos y aerolíneas
- Publicación de los resultados para **transparencia de las acciones**
- **Promoción de la competencia** entre los operadores
- **Incentivo a mejores prácticas** de sostenibilidad



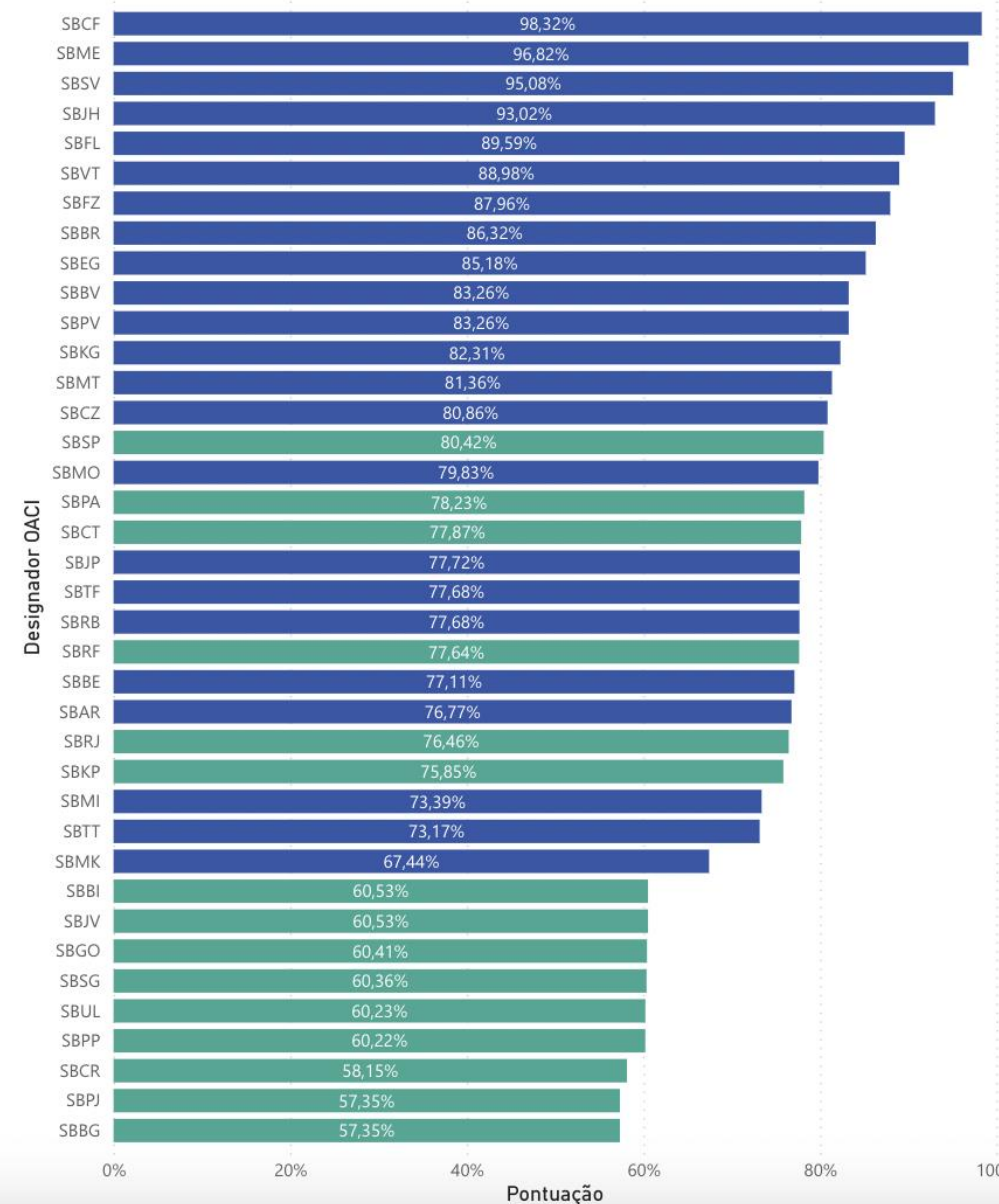
Resultado Geral

Visualizar Medidas



Pontuação dos participantes

Classificação ● Classe Executiva ● Primeira Classe



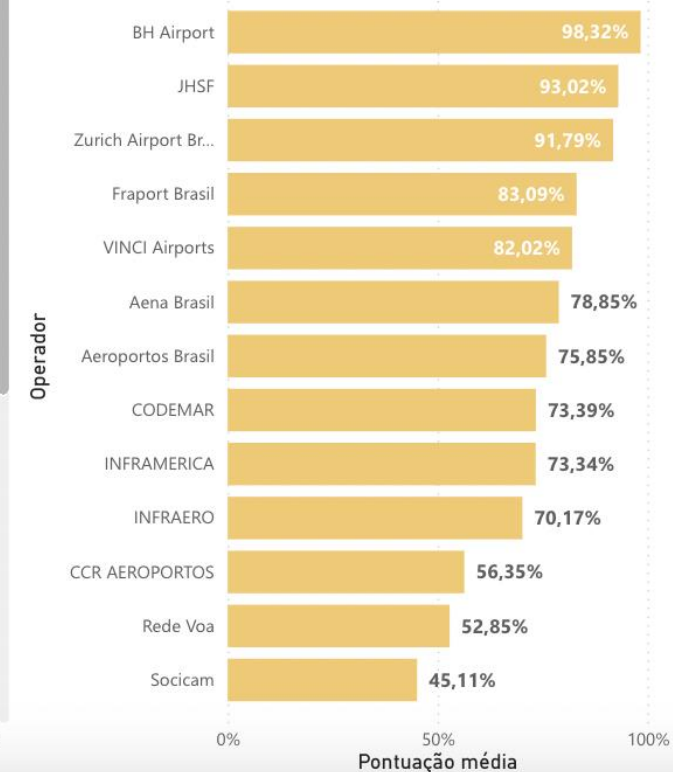
Categoria

- C-I Até duzentos mil passageiros por ano
- C-II Até um milhão de passageiros por ano
- C-III Até cinco milhões de passageiros por ano
- C-IV Acima de cinco milhões de passageiros por ano

Pontuação média

69,79%

Pontuação média por operador aeroportuário



Esta edição contou com quatro participantes classificados.

Categoria

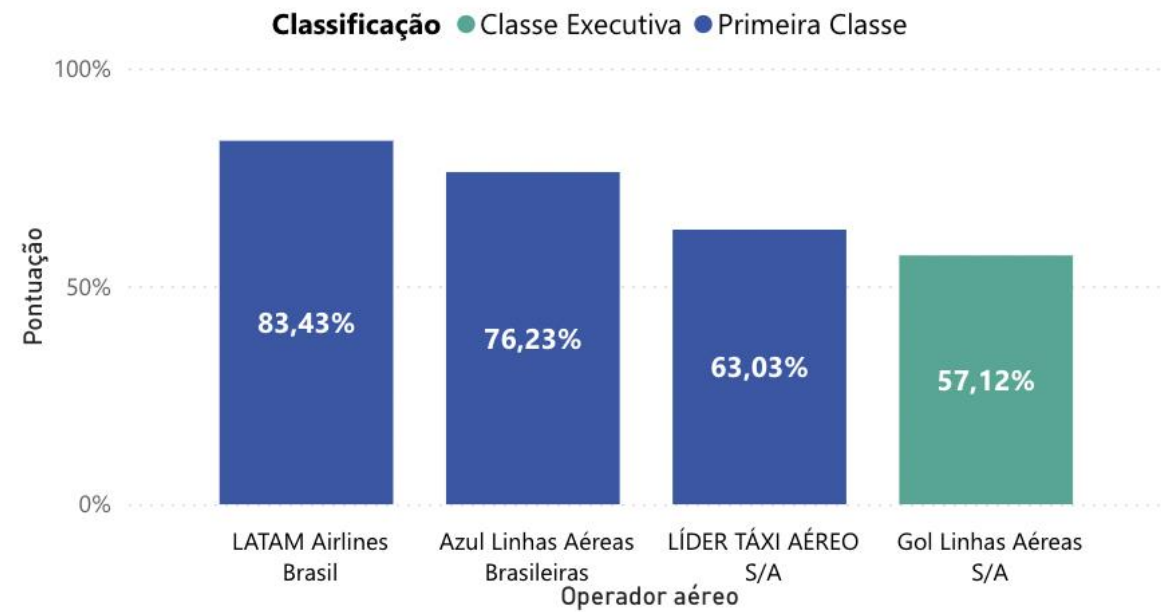
- Empresa aérea
- Táxi-aéreo

Resultado

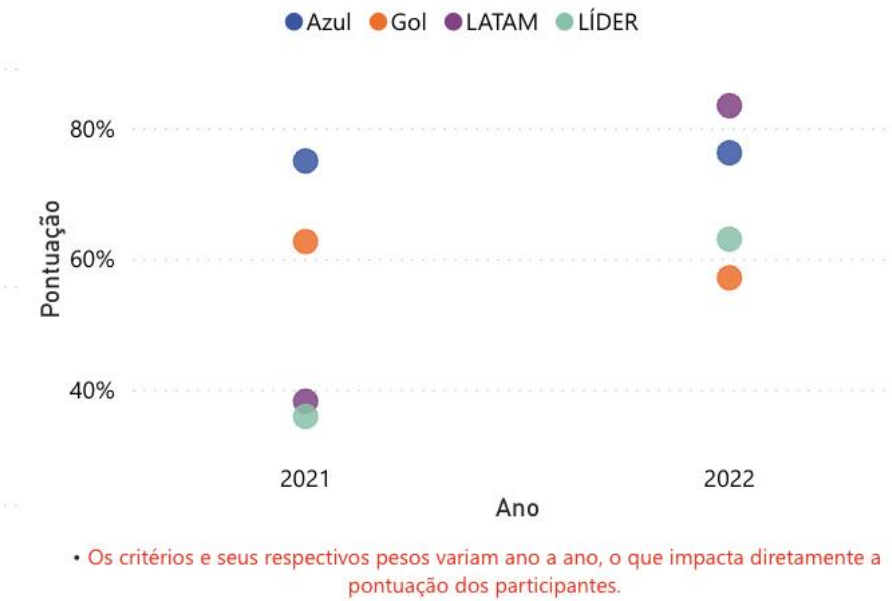
Pontuação média

69,95%

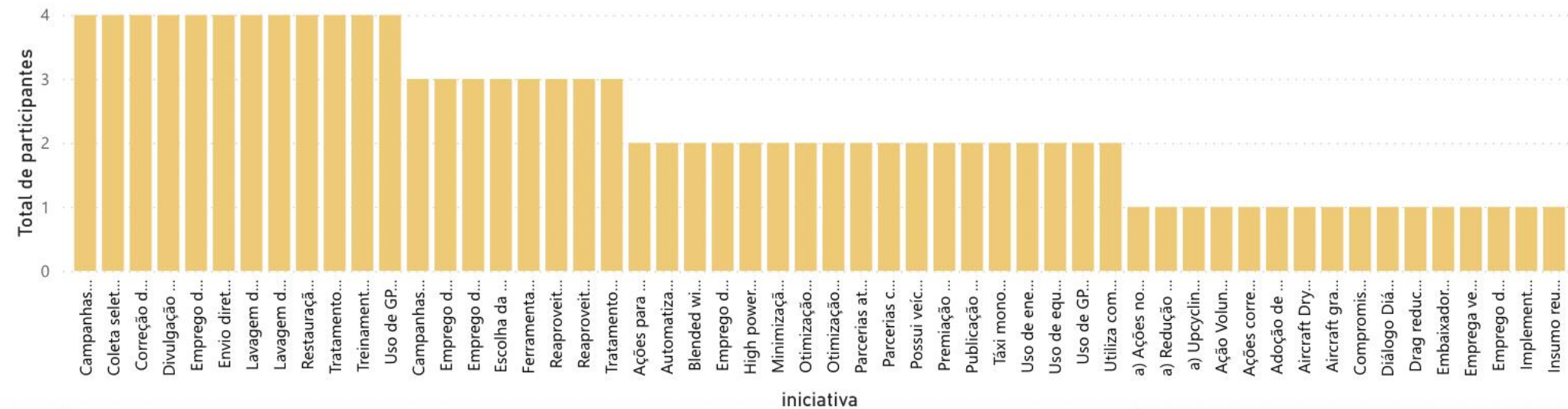
Pontuação dos participantes



Desempenho do operador por ano



Número de participantes que adotam cada iniciativa



Plan de Acción para la Reducción de Emisiones de Brasil



- **Certificación de producto aeronáutico** conforme los padrones del Anexo 16 de la OACI - límites de emissão de poluentes, CO₂ y ruído aeronáutico (RBAC nº 34 y 36 de ANAC).

Plan de Acción para la Reducción de Emisiones de Brasil



- **Crecimiento neutro** de carbono a partir de 2027 para rutas brasileñas
- MRV implementado
- Reglamento publicado para las obligaciones de compensación
- Proyecto de Ley que instituye **mandato mandatório de reducción de emisiones a las aerolíneas nacionales por el uso de SAF**
- Alineamiento con CORSIA y requisitos de la OACI
- Neutro en términos de matéria-primas y rutas tecnológicas de producción
- Modelo más costo eficiente – potencial uso de mecanismos de mercado, como Book&Claim

Thank You



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

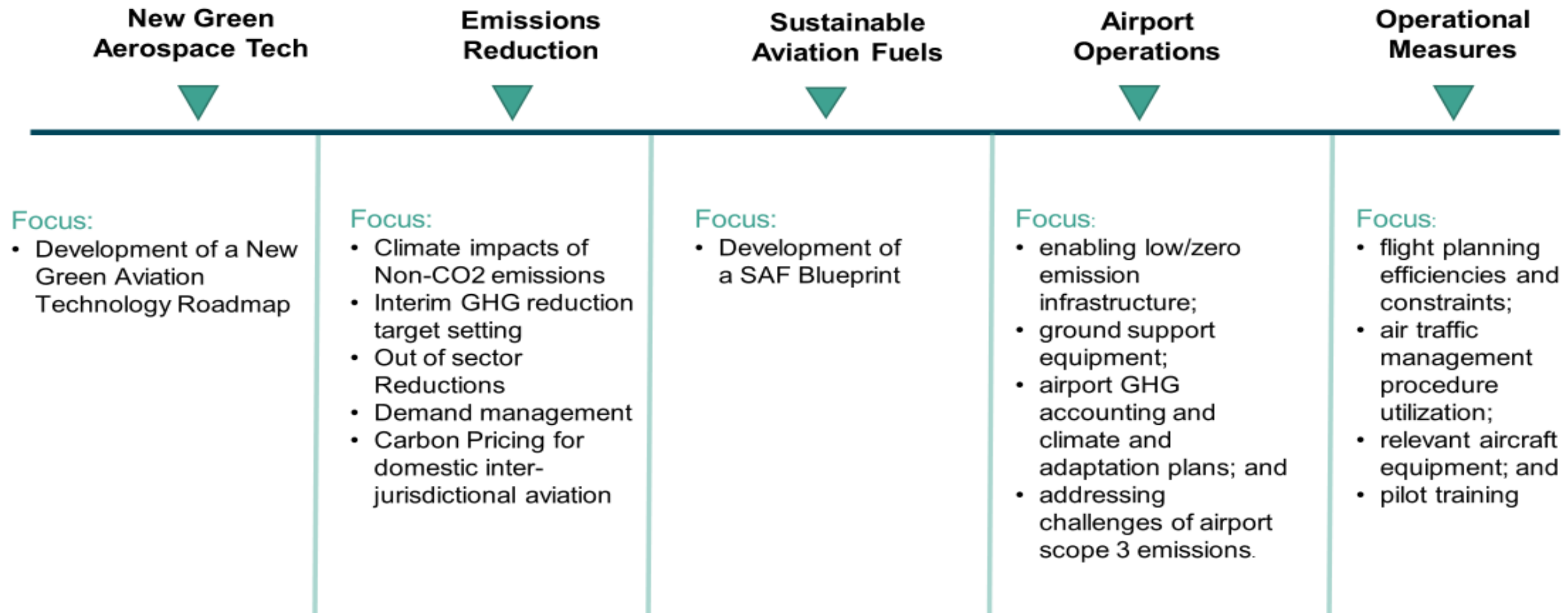
Canada's Aviation Climate Action Plan 2022-2030 sets an ambitious net-zero by 2050 vision for Canada

- 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



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

Vision - Accelerating Canadian aerospace towards environmental sustainability

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

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

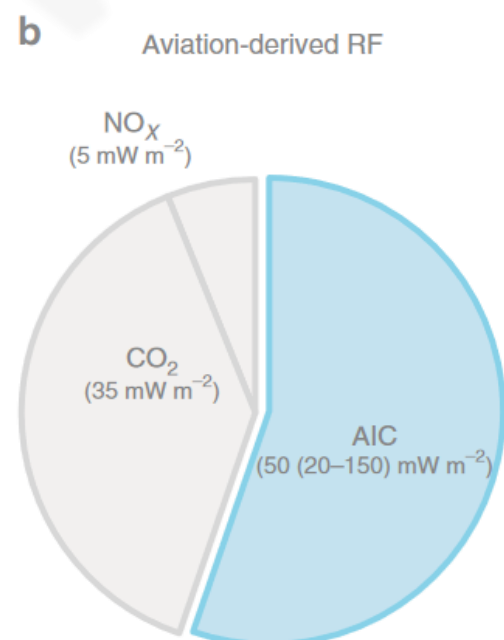
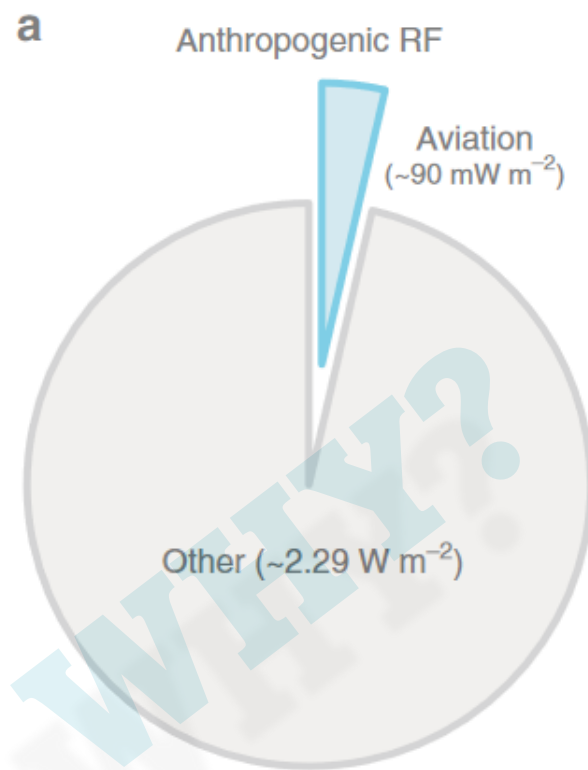
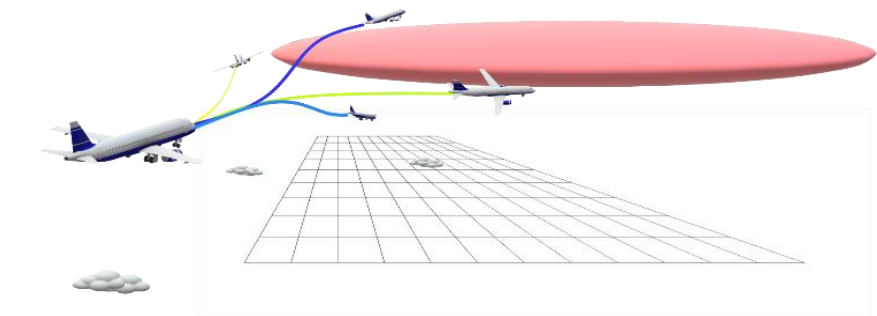
Infrastructure and operations technologies

- 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

Government of Canada Contacts

Wendy Bailey, Chief - Aviation Environmental Protection, Civil Aviation, Transport Canada

Wendy.Bailey@tc.gc.ca

Zane Dedekind, Research Scientist, Atmospheric Science & Technology Branch, Environment and Climate Change Canada

Zane.Dedekind@ec.gc.ca

Thank You



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PLAN DE ACCIÓN SOBRE
**REDUCCIÓN DE
EMISIONES DE CO₂**

PROVENIENTES DE LA AVIACIÓN CIVIL INTERNACIONAL
EN LA REPÚBLICA DOMINICANA

Seminario Regional OACI
NAM/CAR/SAM sobre Medio
Ambiente 2024

Sesión 1- Política y Planificación de
los Planes de Acción

Asunción, Paraguay
Agosto del 2024





Contexto.

Medidas de Mitigación

Resultados Esperados

Información del Punto de Contacto.

Línea Base

Necesidad de Asistencia

Contexto



PLAN ESTRATEGICO 2010- 2030

SUSTAINABLE DEVELOPMENT GOALS ICAO's environmental work contributes to 10 out of the 17 United Nations SDGs

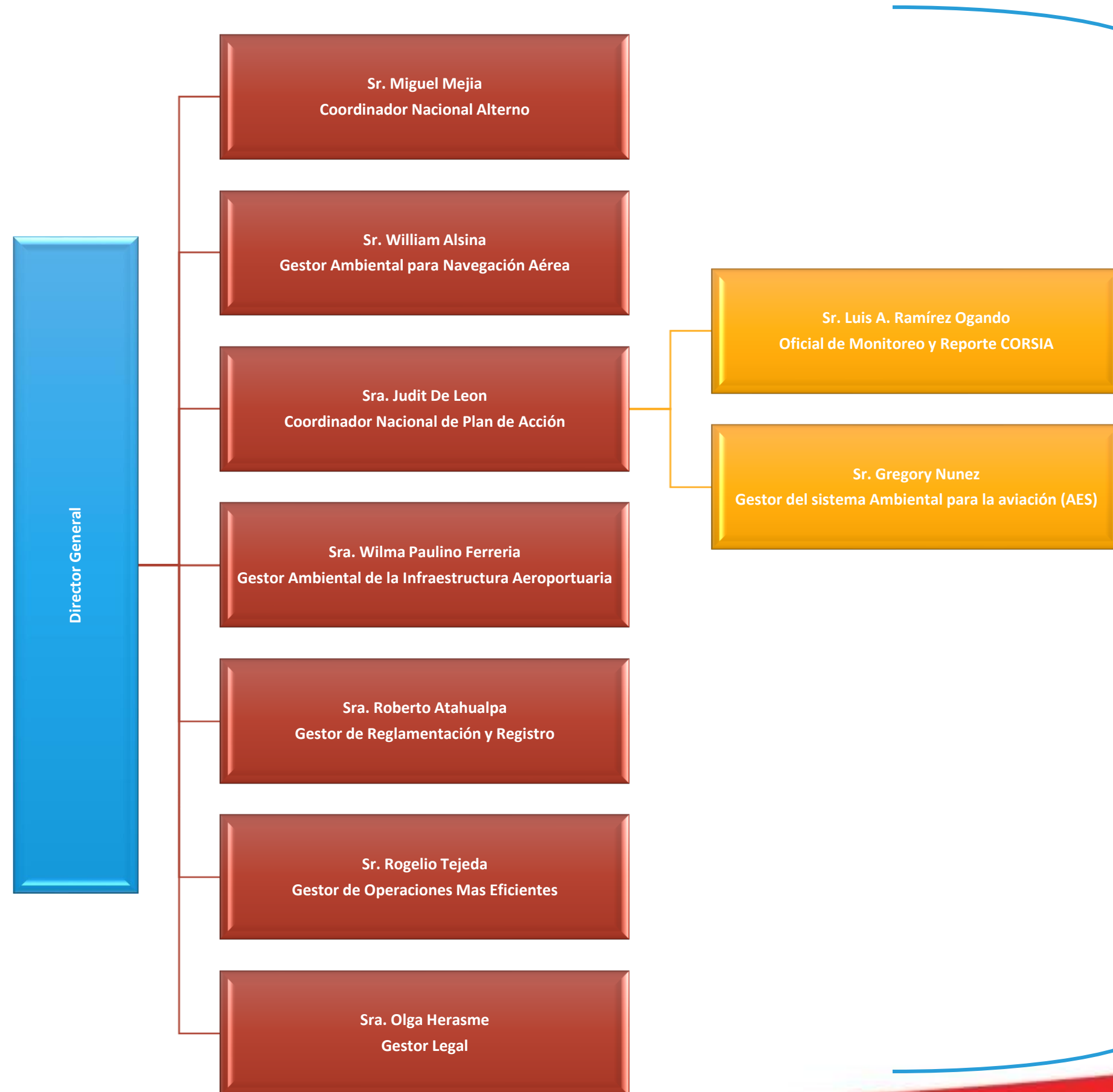


Law 01-12 National Development Strategy 2010-2030

Contexto



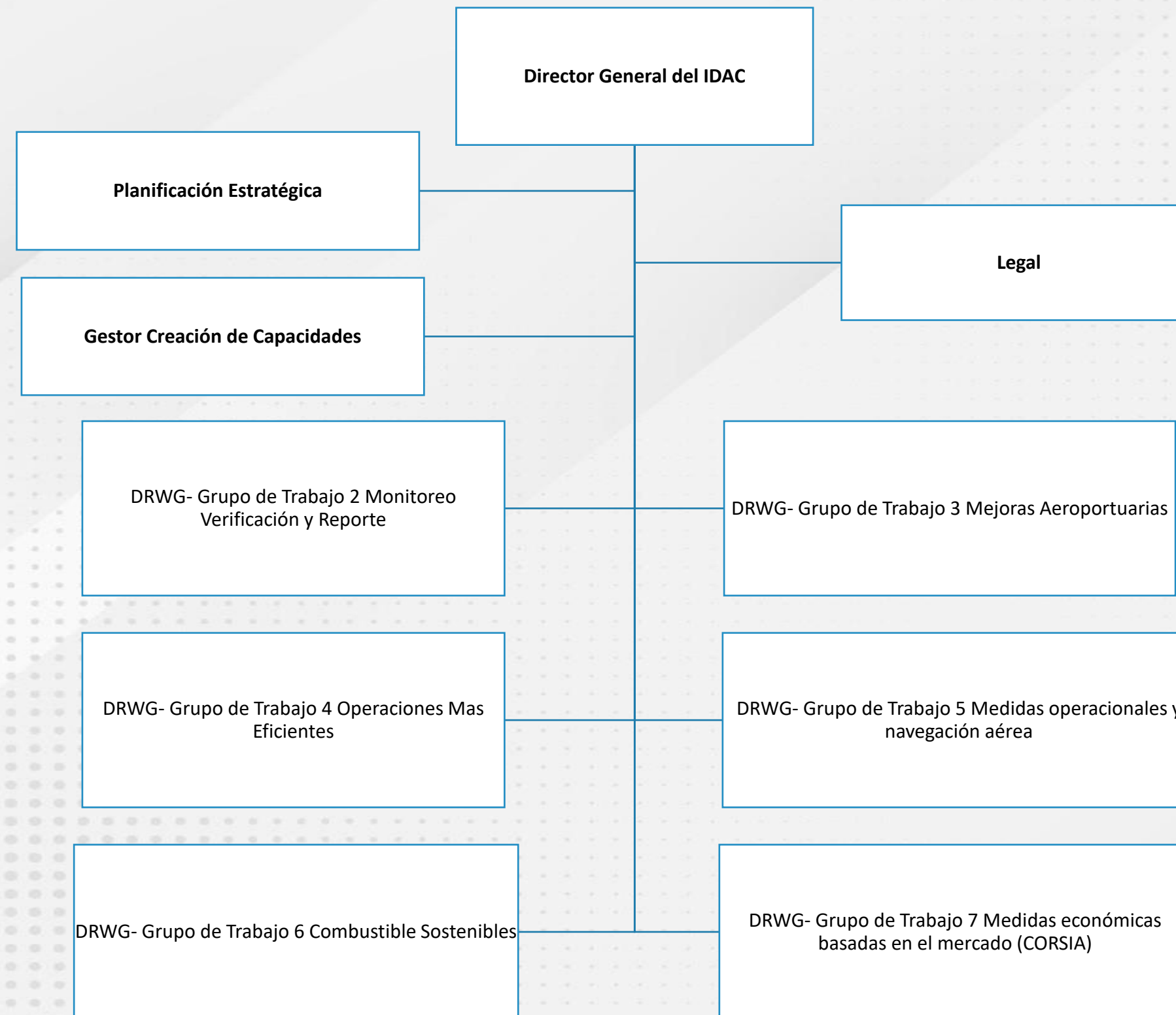
Información del Punto de Contacto



Se conformo una estructura para el APER 2024-2028.

Se determino puntos de contactos por cada grupo de trabajo y se definieron roles dentro del grupo de trabajo.

Estructura del Plan de Acción 2024



Canasta de Medidas



GRUPOS DE TRABAJO/CANASTAS DE MEDIDAS

AES / ICAO **DRWG2** | Monitoreo, Verificación y reporte

DVSO **DRWG 3** | **Mejoras aeroportuarias**

DINA **DRWG4** | **Medidas Operacionales (ATM y uso de Infraestructura)**

DNV **DRWG5** | **Operaciones Mas eficientes**

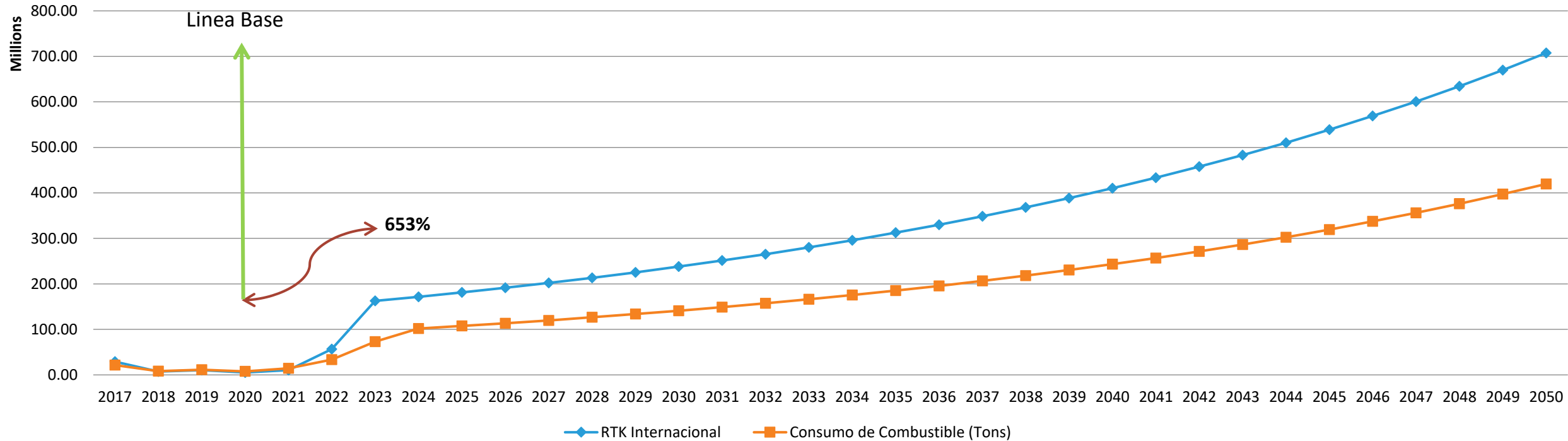
DDS **DRWG6** | **Combustibles Sostenibles para Aviación (SAF's)**

DDS **DRWG7** | **Medidas basadas en el Mercado y CORSIA**



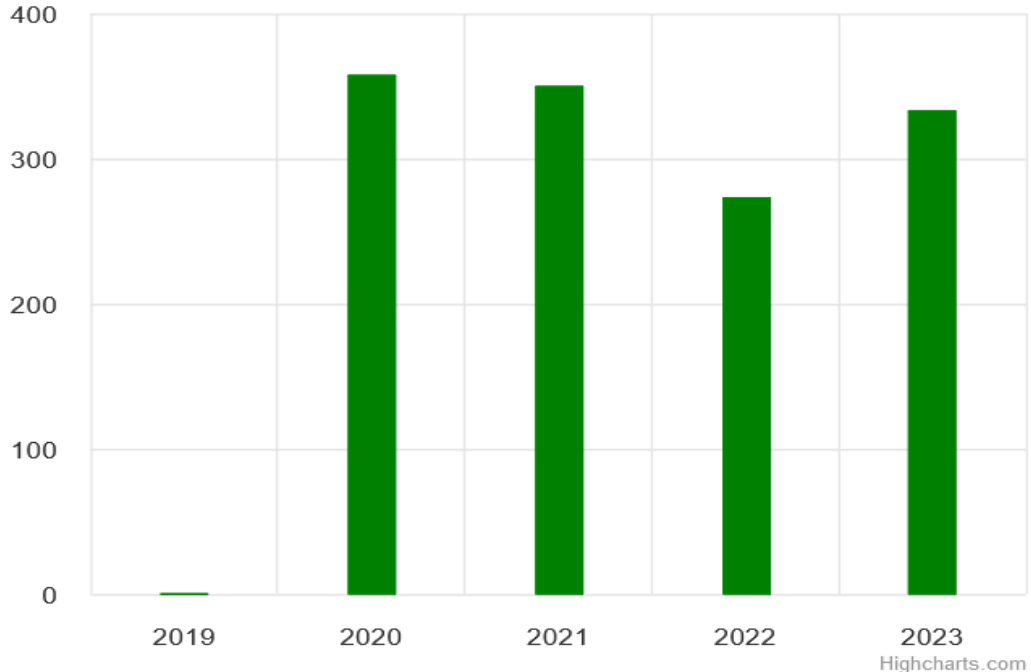
Línea Base

Línea Base y Resultados Esperados



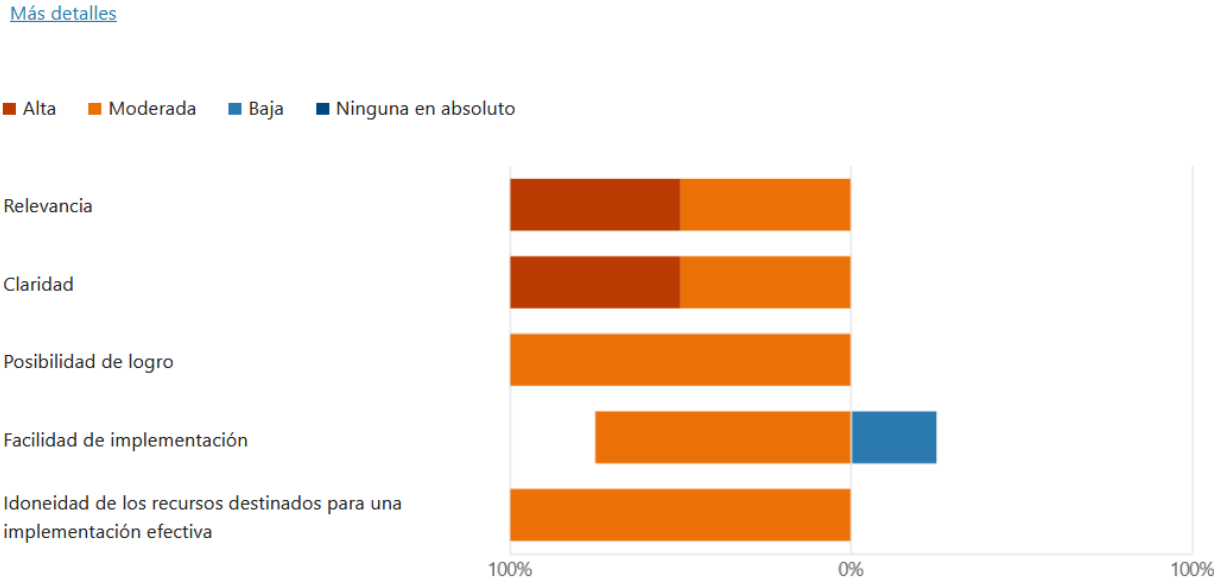
Fuente: elaboración propia de herramienta descargada del APER

Number of State Pairs



Fuente: CCR plataforma

12. Objetivos Ambiciosos a Largo Plazo (LTAG)



Fuente: Encuesta de necesidades y Expectativas (Form).

Política y planificación

La protección del medio ambiente y los recursos naturales y promueve una adecuada adaptación al cambio climático.



Inicio: Enero 2024

Fecha tentativa de publicación: Diciembre 2024

Para la planificación, se realizan reuniones periódicas con los grupos de trabajos, para este proceso de actualización, se requirió las iniciativas voluntarias para la inclusión del plan de acción que sea acorde a la visión de cada organización o institución.

Dominican Republic-APER

The grid contains the following logos:

- GOBIERNO DE LA REPÚBLICA DOMINICANA - MEDIO AMBIENTE
- GOBIERNO DE LA REPÚBLICA DOMINICANA - Consejo Nacional para el Cambio Climático
- IDAC - INSTITUTO DOMINICANO DE AVIACIÓN CIVIL
- GOBIERNO DE LA REPÚBLICA DOMINICANA - ENERGÍA Y MINAS
- GOBIERNO DE LA REPÚBLICA DOMINICANA - INDUSTRIA, COMERCIO Y MIPYMES
- Departamento Aeroportuario República Dominicana
- JAC
- COMISIÓN NACIONAL DE ENERGÍA - SOMOS LO QUE CREEMOS
- GOBIERNO DE LA REPÚBLICA DOMINICANA - AGRICULTURA
- Refdomsa
- INDOCAL
- Aerodom SIGLO XXI
- Aeropuerto Internacional del Cibao
- LA ROMANA INTERNATIONAL AIRPORT CASA DE CAMPO
- PUNTA CANA INTERNATIONAL AIRPORT
- AIRCENTURY - IMPROVING THE EXPERIENCE
- arajet
- SUNRISE AIRWAYS
- HELIDOSA - Aviation Group
- RED Air
- SKYhigh Dominicana
- ASCA
- GOBIERNO DE LA REPÚBLICA DOMINICANA - MINISTERIO DE EDUCACIÓN SUPERIOR CIENCIA Y TECNOLOGÍA
- UNIVERSIDAD UFHEC - FEDERICO HENRIQUEZ Y CARVAJAL
- LOYOLA - Estudios Superiores
- UNIVERSIDAD ISA
- GB GROUP
- sol
- terpel

Política y planificación



*Mesa del SAF's reunida en el ministerio de medio ambiente y recursos naturales
Ley de Cambio Climático; Decreto 542-20 MRV*



Visión de los aeropuertos neutralidad 2030. STI y AERODOM su esfuerzos están mas alineados a la mitigación; Aeropuerto de Punta Cana Esta mas alineado a la Adaptación.



There are currently **8 accredited airports** at Level 2 Reduction, Level 3 Optimisation, Level 3+ Neutrality. [Export my results](#)

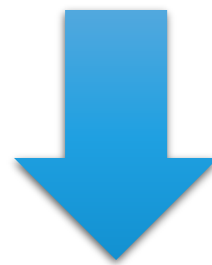
Airport	Airport operator	Airport logo	Airport code	Region	Country	Level
Cibao International Airport	Aeropuerto Internacional del Cibao S.A.		STI	Latin America	Dominican Republic	Level 3+ Neutrality
Punta Cana International Airport	Grupo Punta Cana		PUJ	Latin America	Dominican Republic	Level 2 Reduction
Arroyo Barril Airport	VINCI Airports - AERODOM		EPS	Latin America	Dominican Republic	Level 3 Optimisation
Gregorio Luperón International Airport	VINCI Airports - AERODOM		POP	Latin America	Dominican Republic	Level 3 Optimisation
La Isabela International Airport	VINCI Airports - AERODOM		JBQ	Latin America	Dominican Republic	Level 3 Optimisation
Las Américas International Airport	VINCI Airports - AERODOM		SDQ	Latin America	Dominican Republic	Level 3 Optimisation
María Montez International Airport	VINCI Airports - AERODOM		BRX	Latin America	Dominican Republic	Level 3 Optimisation
Samaná El Catey International Airport	VINCI Airports - AERODOM		AZS	Latin America	Dominican Republic	Level 3 Optimisation

Fuente: <https://www.airportcarbonaccreditation.org/accredited-airports/>

Política y planificación



- Planificación Estratégica
- Procesos
- Comité de Protección de Medio Ambiente (CPMA)
- Resoluciones



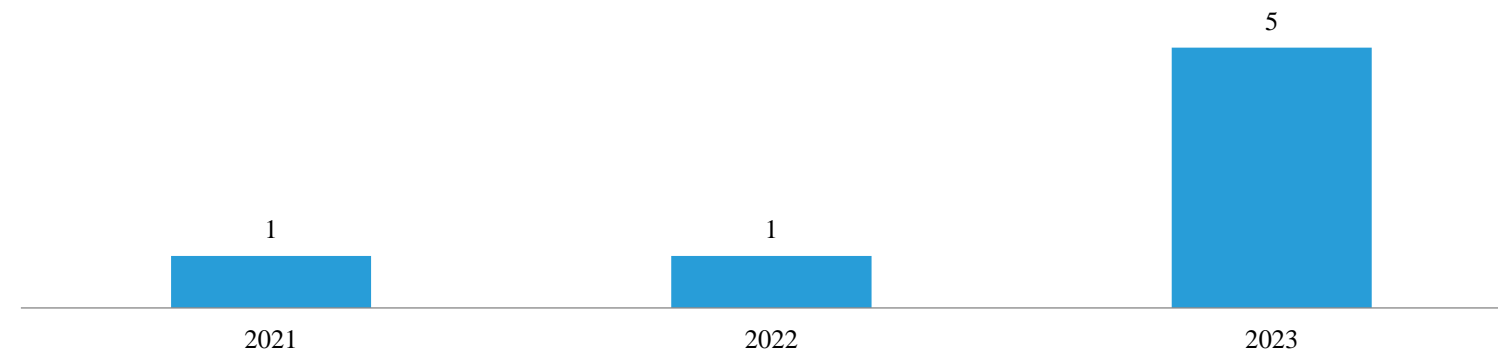
REPUBLICA DOMINICANA
REGLAMENTO AERONÁUTICO DOMINICANO



RAD 16
PROTECCIÓN AL MEDIO AMBIENTE

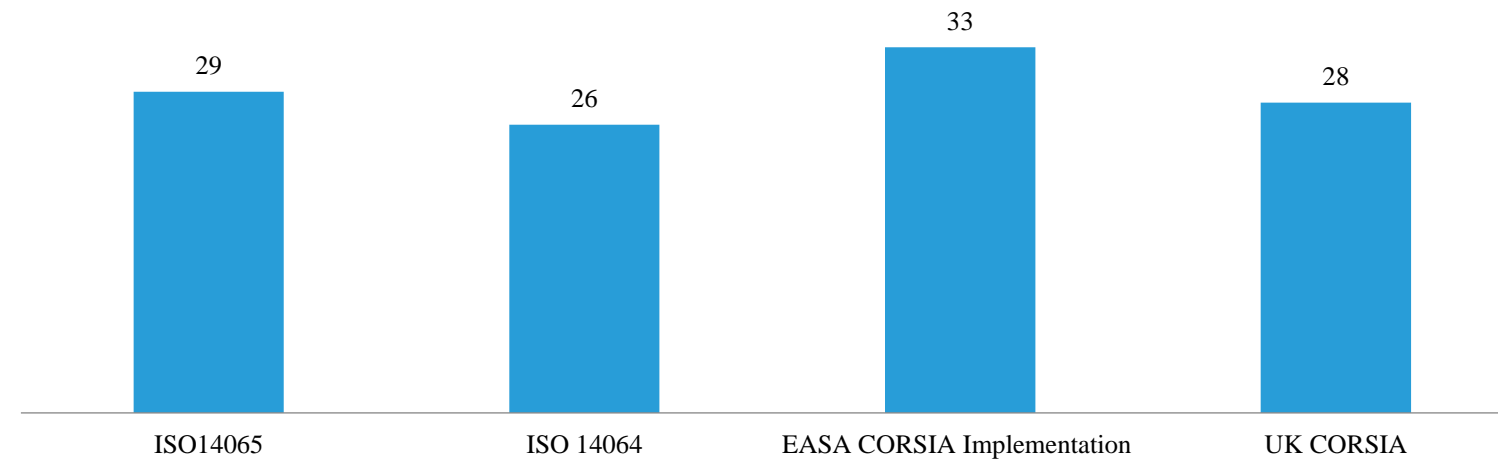


Grafica No. 1
Cantidad de Operadores Aereos Aplicables a CORSIA
(Number of AOs)



Fuente: CCR

Grafica No. 3
CAPACITACION CORSIA
2021-2024



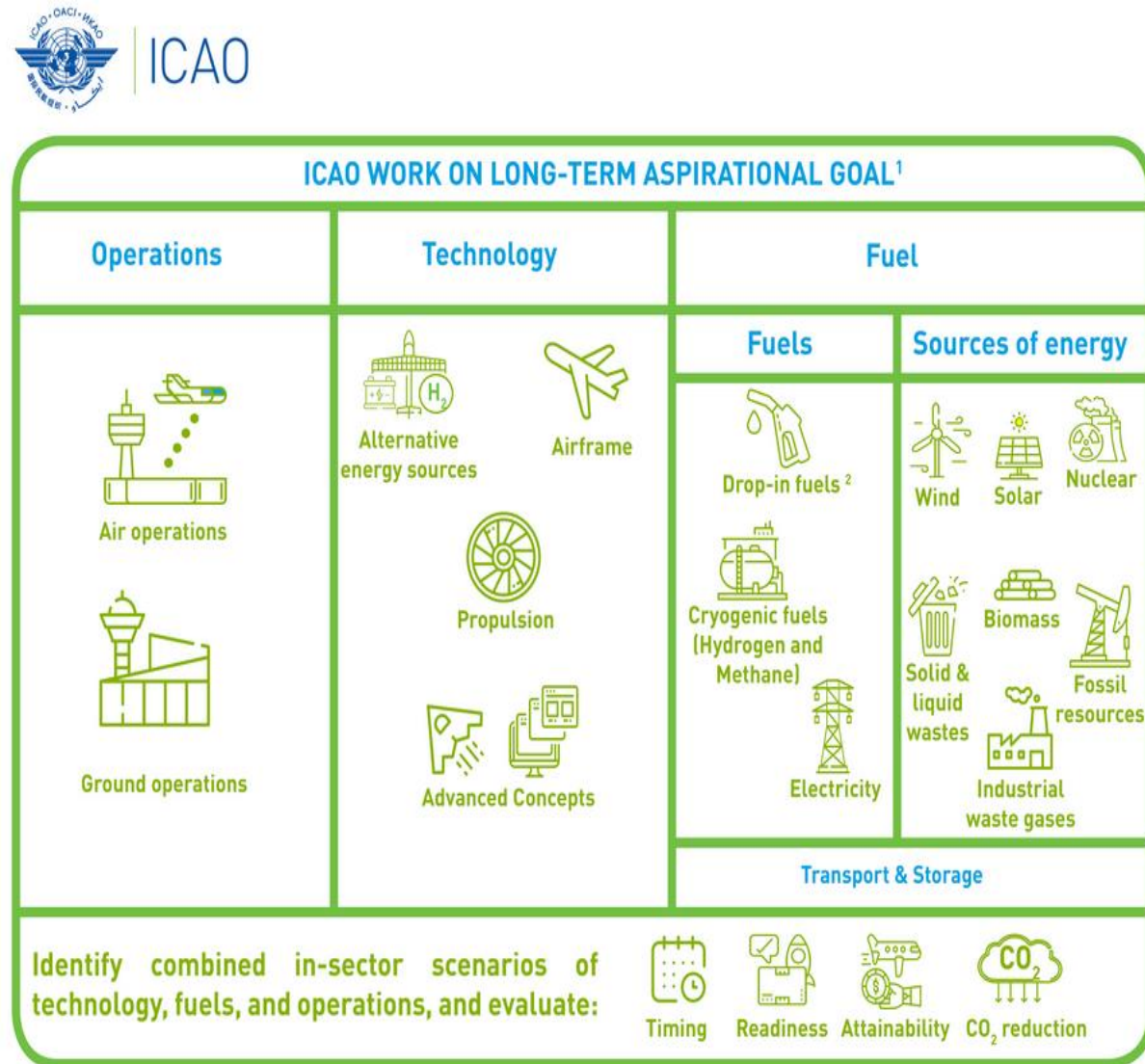
Fuente: Elaboración propia

Enmienda del RAD16: Inclusion de los Combustibles Eligible para CORSIA.

LTAG: El borrador de la ley de cambio climático contempla la elaboración de los objetivos ambiciosos a largo plazo, 12 meses después de la promulgación de la ley que esta en este momento sometido a consulta publica.

Política y planificación

Análisis de los objetivos ambiciosos a Largo Plazo (LTAG)



Tecnologías

- Con la inclusión de aeronaves nuevas tecnologías pasamos de tener a 1.4% a 0.5% eficiencia en el combustible.
- Dentro de las nuevas tecnologías podemos mencionar la inclusión de aeronaves como Boeing 737-800 nueva generación; embraer 190.

Operaciones

- Determinación de la Capacidad Declarada del ATC para todos los sectores de la Región de Información de Vuelo Santo Domingo y comparación con el volumen de tránsito aéreo actual y previsto.
- Diseño de los Volúmenes de Espacio Aéreo.

Combustibles

- Visión de producción de SAF's a partir de la implementación de la Declaración de Santo Domingo.
- 9 Operadores Aéreos Extranjeros con estrategia entre el 5 al 10% de uso de SAF's y con mas de 25 mil operaciones registradas en el 2023.

Nota: Aun no hemos podido determinar el costo de la inversión de acuerdo al escenario de ambición.



Necesidad de Asistencia

- Se requiere asistencia en investigación y desarrollo para nuevas materias primas como es el Sargazo y residuos.
- Se requiere asistencia en desarrollar capacidades sobre los combustibles elegible a CORSIA y su procesos de certificación.
- Asistencia técnica, entrenamiento y coordinación para la adopción de mejores prácticas en operaciones para apoyar los ahorros en el consumo de combustible de las partes interesadas.
- Asistencia técnica y económica para el desarrollo de programas de compensación admisibles a CORSIA.
- Asistencia técnica y económica para implementar proyecto piloto para combustibles alternativos para la aviación civil a mediano plazo.



Gracias por su atención

Sra. Judit De León
Coordinadora de Dirección
Dirección de Desarrollo Sustentable
Instituto Dominicano de Aviación Civil, IDAC
Cel. 809-796-1851
<https://www.idac.gob.do>



Thank You



United States Aviation Climate Action Plan

United States
2021 Aviation Climate Action Plan

What it is and what's next

2024 Regional Seminar on Environment

Presented to: ICAO Environment Regional Seminar - NACC/SAM Region

By: Nathan Brown, FAA Senior Representative for South America

Date: August 20th, 2024



ICAO's State Action Plan Program

- Launched in 2010 to compile global progress towards meeting the goals set by the ICAO Assembly
 - ICAO encourages updates every 3 years
- U.S. Action Plans in 2012, 2015, 2021

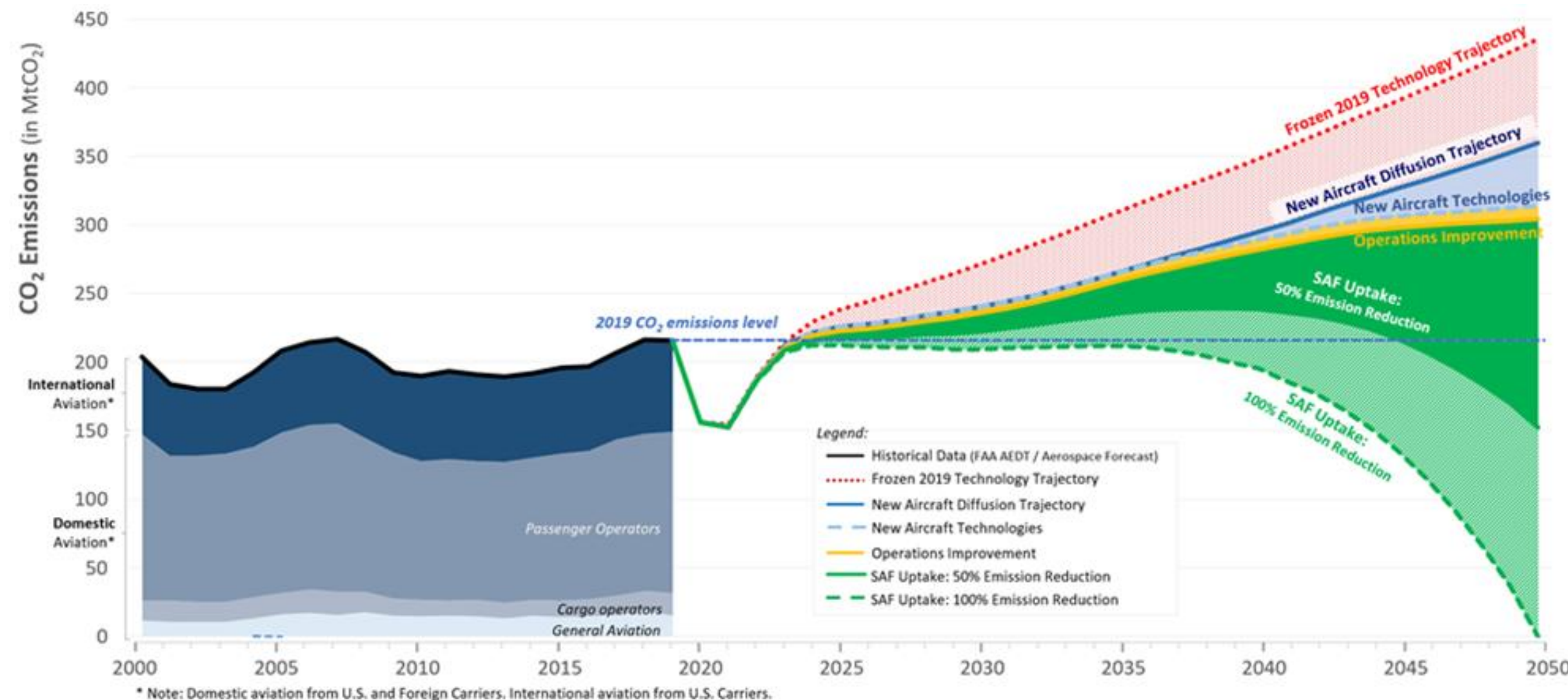


2021 United States Aviation Climate Action Plan

- On November 9, 2021, Secretary of Transportation Pete Buttigieg announced the *United States Aviation Climate Action Plan*, which describes a whole-of-government approach to put the aviation sector on a path toward achieving net-zero emissions by 2050.
- The plan builds on individual and sector-wide commitments announced by the U.S. aviation industry and highlights specific actions and policy measures to foster innovation and drive change across the entire U.S. aviation sector.

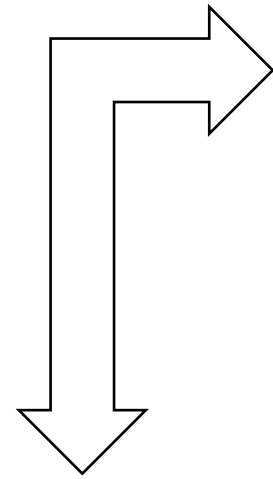
- Climate Action Plan Press Release: <https://www.faa.gov/newsroom/us-releases-first-ever-comprehensive-aviation-climate-action-plan-achieve-net-zero>

- Climate Action Plan Document: [https://www.faa.gov/sites/faa.gov/files/2021-11/Aviation Climate Action Plan.pdf](https://www.faa.gov/sites/faa.gov/files/2021-11/Aviation%20Climate%20Action%20Plan.pdf)





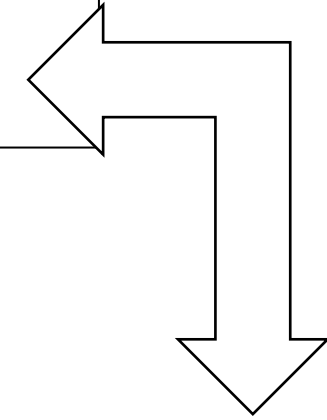
- Introduction
- Climate Goals and Approach
 - Aircraft and Engine Technology Development
 - Operational Improvements
 - Sustainable Aviation Fuels
 - International Leadership and Initiatives
 - Airport Initiatives
 - FAA Leadership on Climate, Sustainability and Resilience
 - Non-CO₂ Impacts of Aviation on Climate
 - Policy and Measures to Close the Gap



ICAO's 41st Assembly
CAAF/3
SAF Grand Challenge Roadmap
CLEEN III
And more!

The two primary parts of the 2024 Action Plan will be to:

1. Track what we have done since 2021
2. Highlight what we expect to see in the coming years



- CLEEN IV
- Paying out the FAST SAF and FAST Tech Grants
- SAF Grand Challenge Next Steps
- And more!

- The ICAO State Action Plan initiative encourages updates every three years. We have provided these updates in 2012, 2015, and 2021. We will submit an update this year.
- The 2021 Action Plan provided a goal, since then we have gathered data, and our new report is the first opportunity to report on progress toward that goal.
- At the same time, we are not intending to do a complete overhaul, rather, the 2024 plan will be a refresh of some charts and comparison of our forecasts to the data we have gathered since then.



Questions?

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2050



CORSIA



Plan de Acción de Chile

01

Aspectos destacados

Autoridades

Infraestructura

Emisiones de GEI

02

Necesidad de actualización

Vuelo Limpio y líneas de trabajo

Políticas Públicas

Hoja de Ruta SAF 2050

Aspectos destacados

Autoridades sector aéreo chileno



- Ministerio de Defensa Nacional: Fuerza Aérea de Chile, Subsecretaría para las Fuerzas Armadas y Dirección General de Aeronautica Civil.
- Ministerio de Transportes y Telecomunicaciones: Junta de Aeronáutica Civil
- Ministerio de Obras Públicas: Dirección Nacional de Aeropuertos, Coordinación de Concesiones de Obras Públicas, Coordinación de Fiscalización de Obras Públicas y Dirección de Planeamiento.
- Ministerio de Hacienda
- Ministerio de Desarrollo Social y Familia
- Ministerio del Medio Ambiente

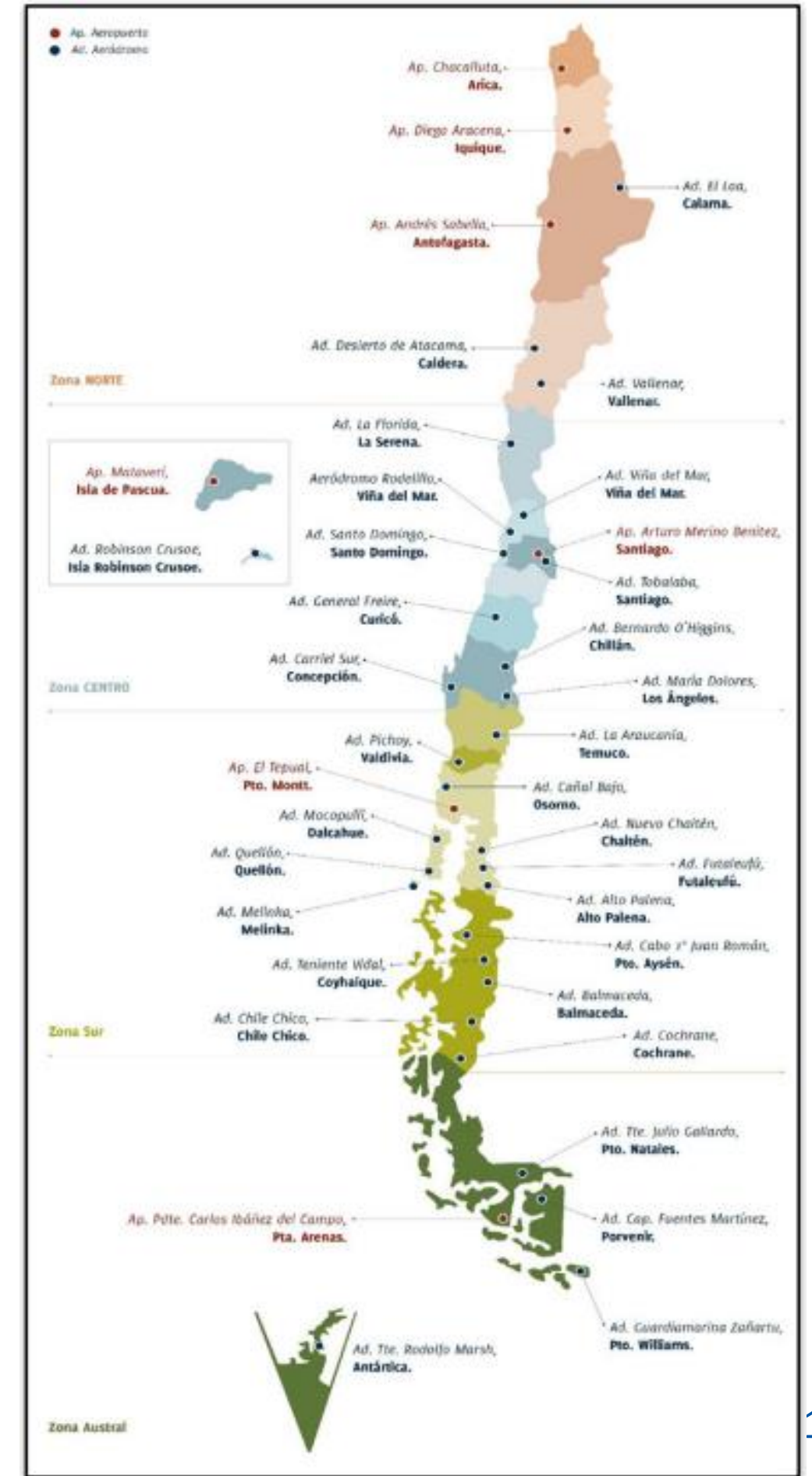


Aspectos destacados

Infraestructura aeronáutica



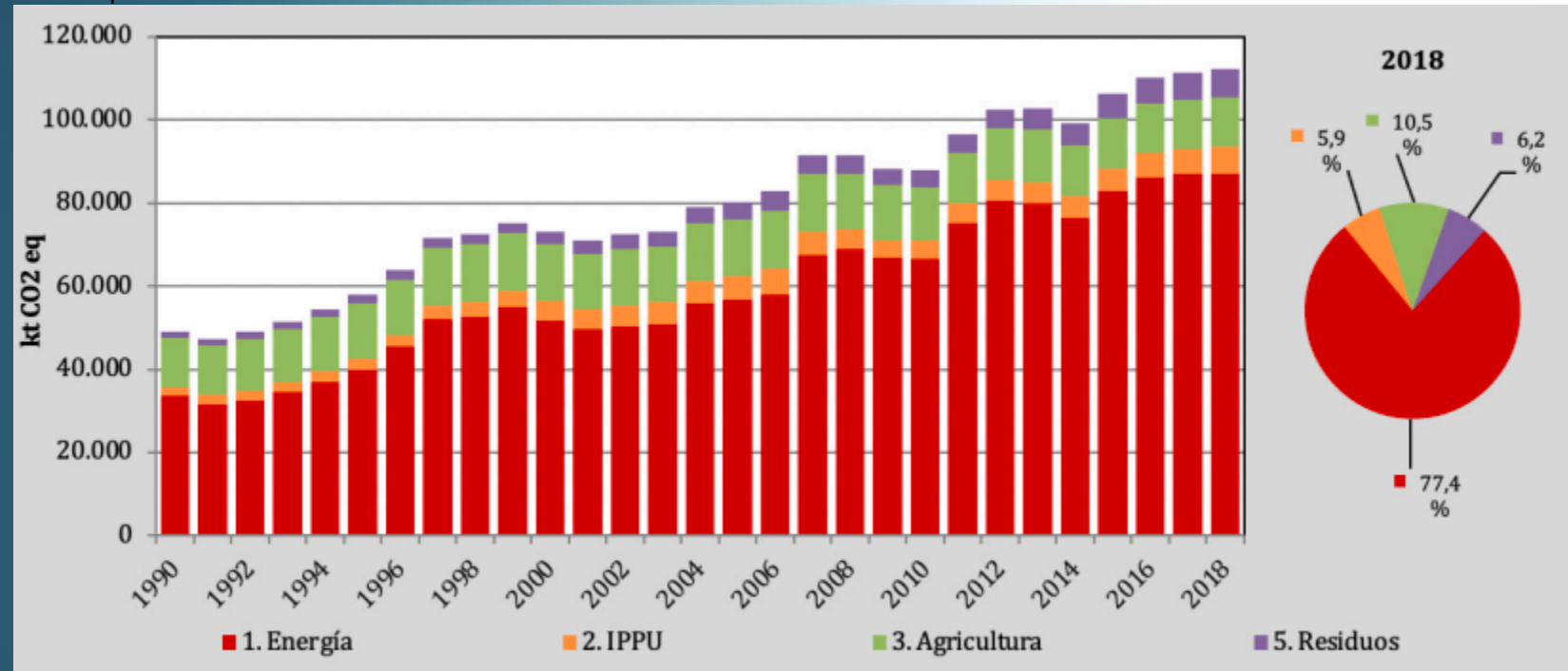
- Red primaria de aeródromos: 16 aeropuertos y aerodromos, principales centros urbanos, mayor capacidad.
- Red secundaria de aeropuertos: 13 aeródromos, estacional.
- Red de pequeños aerodromos: 333 aeródromos, mejorar conectividad en zonas apartadas.



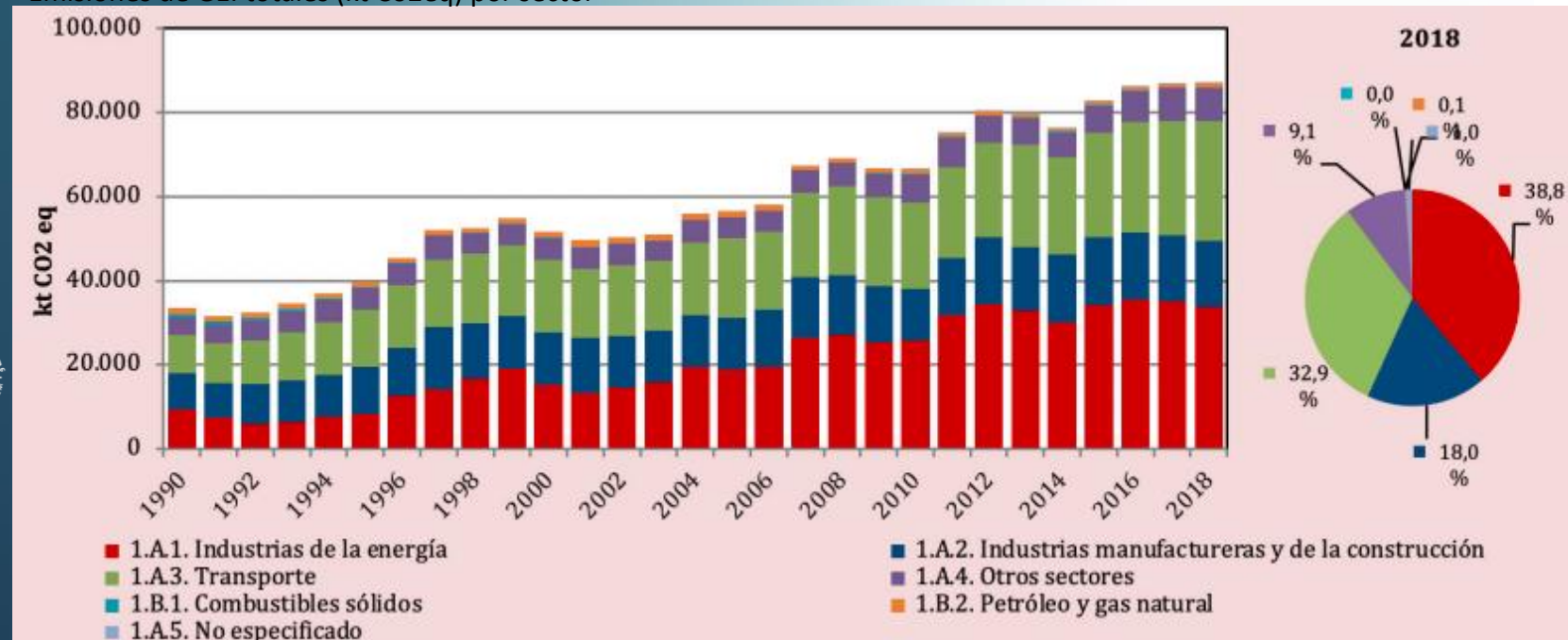
Aspectos destacados

Emisiones del transporte aéreo

Participación de sectores en emisiones GEI totales



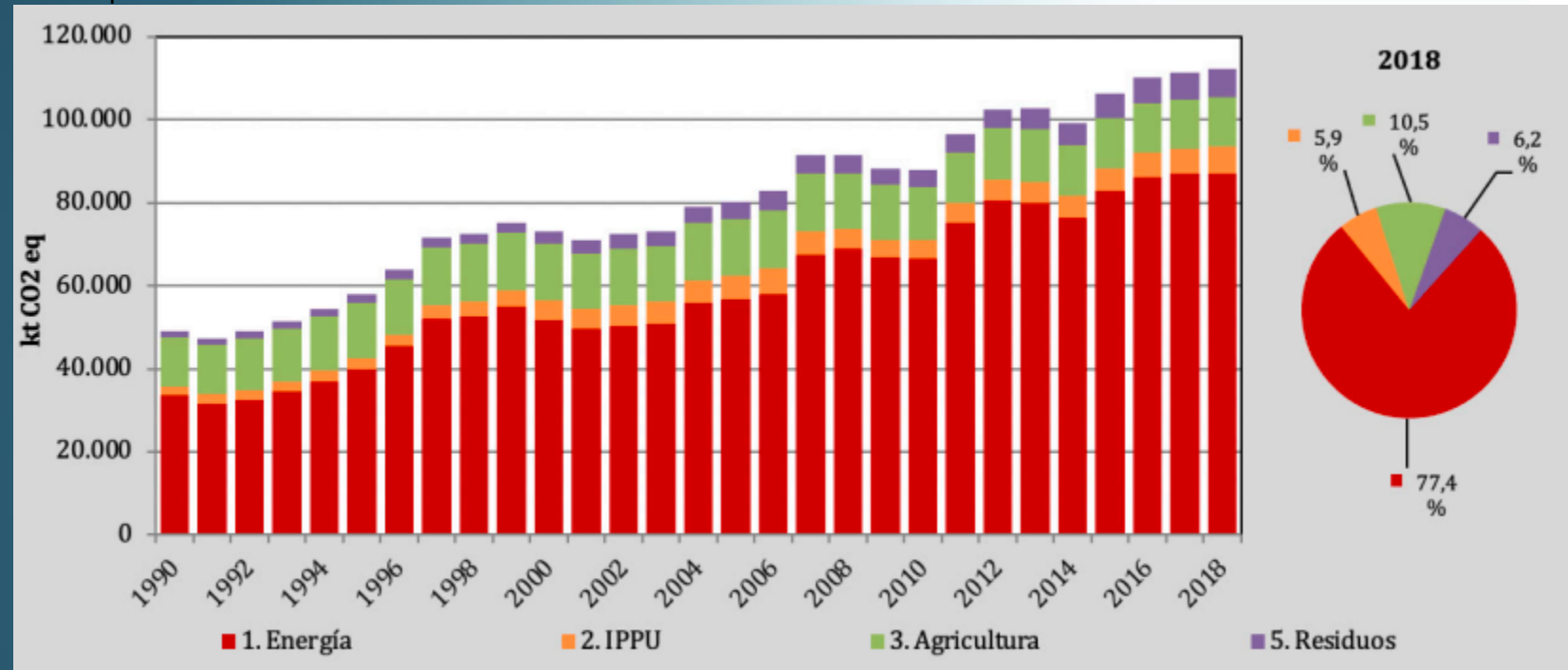
Emisiones de GEI totales (kt Co2eq) por sector



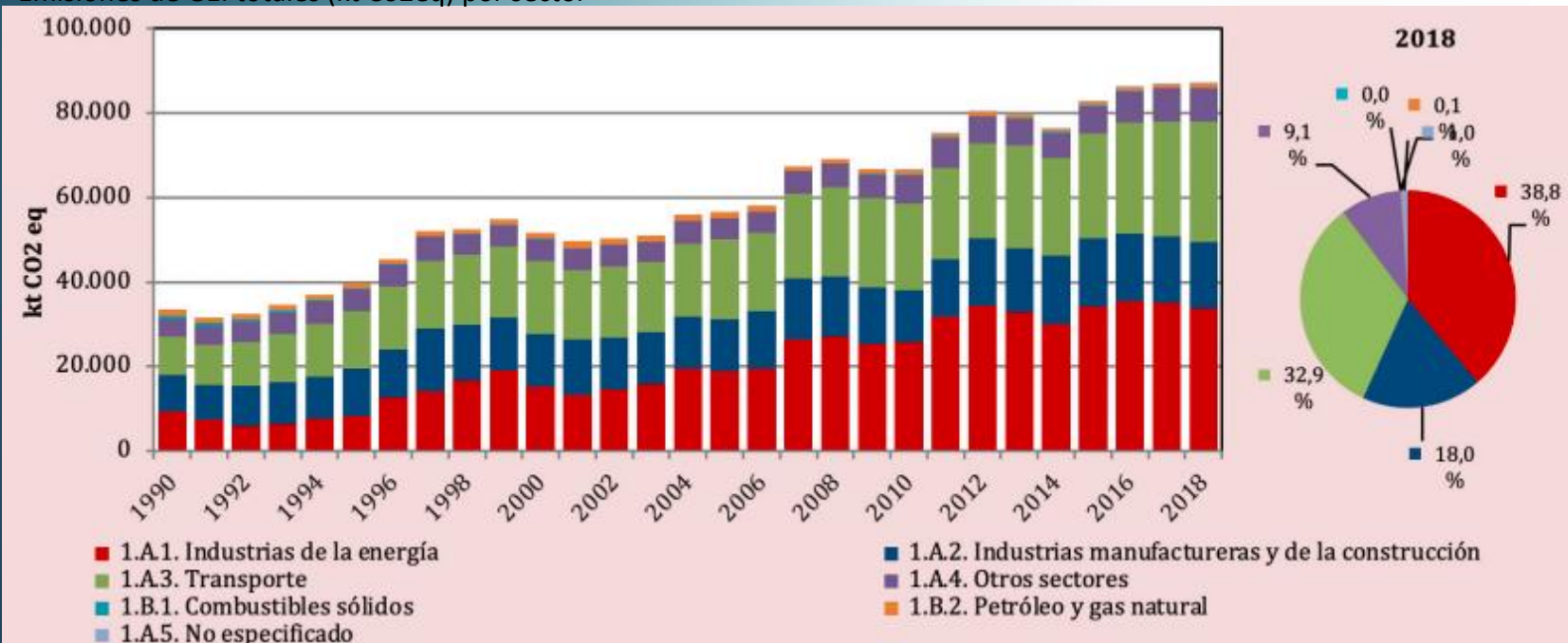
Aspectos destacados

Emisiones del transporte aéreo

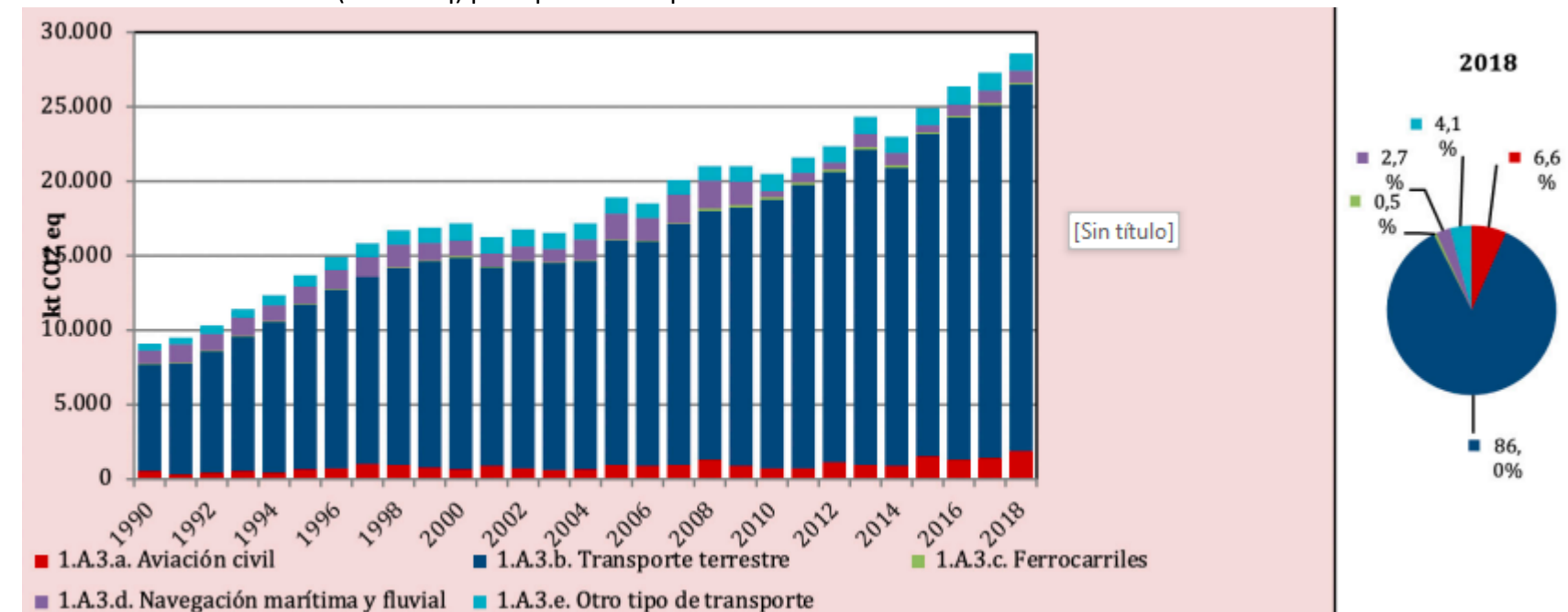
Participación de sectores en emisiones GEI totales



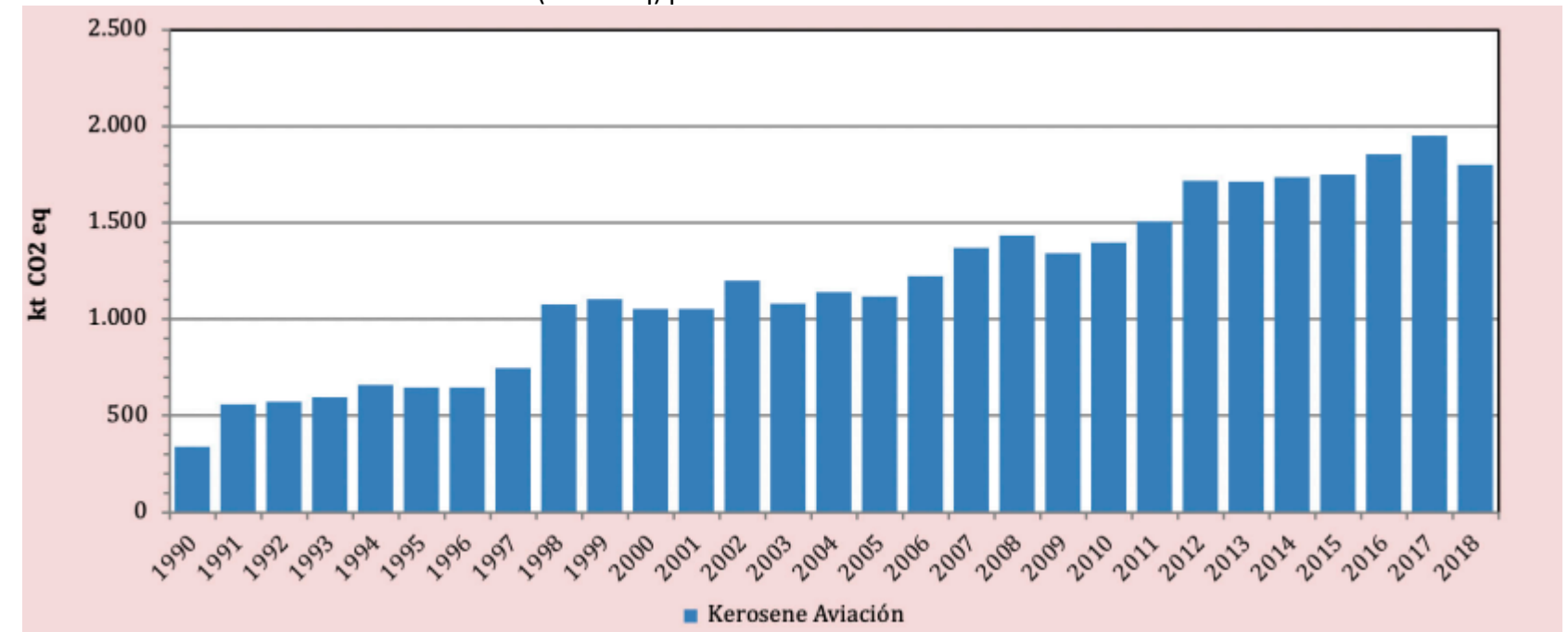
Emisiones de GEI totales (kt Co2eq) por sector



Emisiones de GEI totales (kt CO2eq) por tipo de transporte



Aviación internacional: emisiones de GEI (kt Co2eq) por combustible



Necesidad de actualización

Programa Vuelo Limpio



OBJETIVOS

- Promover la **toma de decisiones informada** y aportar al desarrollo de **políticas públicas** para el desarrollo sostenible de la industria de aviación civil.
- Identificar **oportunidades para la reducir las emisiones** de gases de efecto invernadero (GEI) y contaminantes locales del sector.
- Promover la **colaboración público-privada** del rubro.
- **Aportar en la ruta energética de Chile** y avanzar en los **estándares internacionales** propuestos por la OACI.





Necesidad de actualización

Líneas de trabajo de Vuelo Limpio

EFICIENCIA ENERGETICA

- Línea base de consumo de combustible y emisiones de vuelos domésticos e internacionales.
- Mejoras operacionales para la reducción de GEI.
- Capacitación de organizaciones asociadas y empresas colaboradoras.

NUEVOS ENERGÉTICOS

- **Promoción del desarrollo de Combustibles de Aviación Sostenibles (SAF).**
- Elaboración de guías y manuales para la sostenibilidad de la aviación.



Necesidad de actualización

Políticas Públicas





Necesidad de actualización

Hoja de Ruta SAF



EN DESARROLLO:

- Estudio de factibilidad de producción de SAF (primer semestre 2025).
- Estudio de regulación internacional sobre producción y uso de SAF (diciembre 2024).
- Patrocinio de fondos para el financiamiento de proyectos de SAF.
- **Acuerdo público-privado por los SAF (segundo semestre 2024).**



**ACUERDO
PÚBLICO-PRIVADO
SAF**



Thank You

