

Assessing the Clarity of Net-Zero State Action Plans

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Introduction

The International Civil Aviation Organization (ICAO) launched its State Action Plan (SAP) initiative in 2010 as a voluntary tool for Member States to report on their actions to reduce carbon dioxide (CO₂) emissions from aviation activity. The objective of SAPs is for Member States to develop strategies for emissions reductions and report on the impact of mitigation initiatives in their respective countries. After the adoption of the long-term aspirational goal (LTAG) at the 41st Assembly, the role of these SAPs becomes more important in monitoring progress towards the net-zero target.

Across aviation decarbonization roadmaps, some of the key mitigation measures for the sector are sustainable aviation fuel (SAF), new aircraft with significant fuel efficiency improvements, operational improvements, zero-emission planes (ZEPs), and market-based measures.¹ When considering various deployment timelines for mitigation measures, achieving the LTAG could result in a range of temperature increase pathways (Figure 1), from about 1.6°C to 2.3°C, depending on the exact emissions trajectory.² While the LTAG does not assign country-level emissions goals, it is clear from roadmaps that aggressive action will be needed from across the sector in order to reach net-zero CO₂ emissions by 2050.

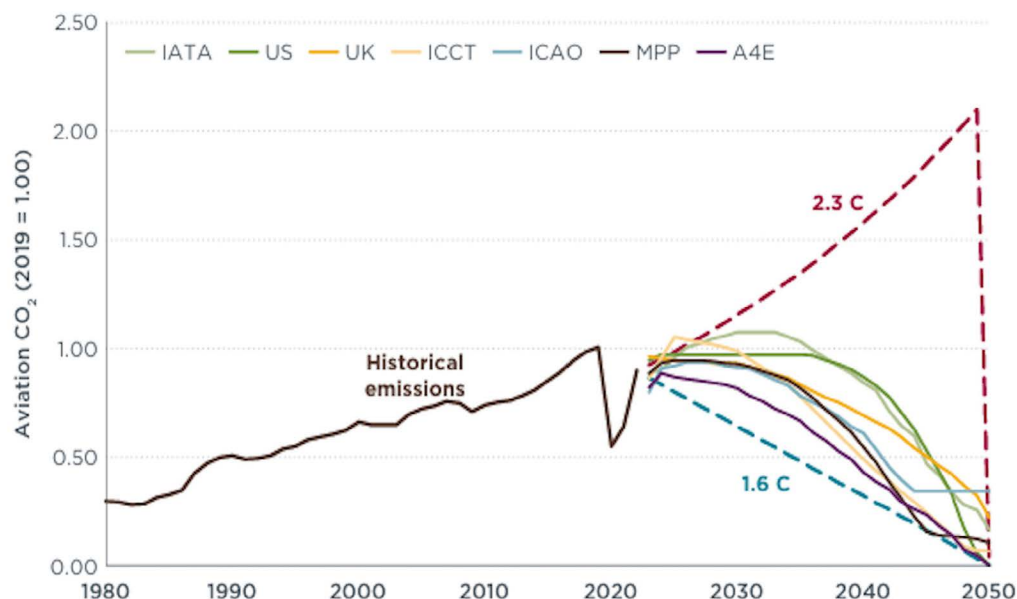


FIGURE 1: Historical and projected CO₂ emissions from aviation, 1980 to 2050, normalized to 2019 (Mithal and Rutherford, 2023).

- 1 IATA, "Aviation Net-Zero CO₂ Transition Pathways: Comparative Review," April 2024, <https://www.iata.org/contentassets/8d19e716636a47c184e7221c77563c93/nz-roadmaps.pdf>.
- 2 Shraeya Mithal and Daniel Rutherford, "ICAO's 2050 Net-Zero CO₂ Goal for International Aviation" (Washington, D.C.: International Council on Clean Transportation, January 5, 2023), <https://theicct.org/publication/global-aviation-icao-net-zero-goal-jan23/>.

Goal	Focus	Measure
Targets		Interim target (2030 or 2040)
		Long-term target (2050)
In-sector	Technical efficiency	Fuel efficiency improvements
	Operational efficiency	Airport-level initiatives, Air Traffic Control (ATC) improvements
	Sustainable aviation fuels	Blending (% share) or volumetric (gallon or L) target
		GHG reduction target
		Economic incentives for SAF uptake
	Zero-emission planes	Research programs and financial initiatives for ZEP introduction
Out-of-sector	Residual CO ₂ emissions and controlling short-lived climate pollutants (SLCPs)	Emissions trading or carbon pricing
		Emissions offsetting
		Carbon capture, utilization, and storage
		Non-CO ₂ impacts

TABLE 1: Summary of Focal Areas for SAP Assessment

ICAO recommends that SAPs be updated every three years to reflect new developments, as they could play an important role in understanding the trajectories of Member States towards the LTAG. In 2023, the International Council on Clean Transportation (ICCT) conducted a qualitative review of available SAPs and developed a set of criteria to assess their clarity, focusing on elements that could improve the ability for SAPs to be used in assessments of LTAG progress.³ The findings of this analysis and recommendations for SAP development are detailed below.

Key Criteria for Assessing SAP Clarity

The ICCT analysis took elements from the SMART goal framework, focusing on assessing whether SAPs communicate *specific*, *measurable*, and *time-bound* mitigation measures in order to conduct a uniform review of their clarity.⁴

The first criterion, specific, refers to tangible reduction goals or policies that are defined by a Member State. The second criterion, measurable, outlines methods that would enable the monitoring and reporting of any goals. The

last criterion, time-bound, defines a timeframe by which a given goal will be achieved. An example of a specific, measurable, and time-bound goal is to deploy 5% SAF by volume in all flights departing a given member state by 2030. SAPs that defined goals with these criteria were considered to be clear in our assessment.

Three categories were prioritized for specific, measurable, and time-bound language – targets, in-sector goals, and out-of-sector goals (Table 1).

The first category, targets, considered the inclusion of both an interim emissions reduction target (either 2030 or 2040) and a long-term target (2050). The in-sector goals category included four focal areas from decarbonization roadmaps – technical efficiency, operational efficiency, SAF, and ZEPs – and assessed relevant measures within each of them. The third category, out-of-sector goals, included any measures targeting residual CO₂ emissions or SLCPs, such as contrails.

SAPs are made publicly available at the discretion of Member States, and for this study, a set of 17 SAPs were selected, prioritizing the most recent submissions and

³ Daniel Rutherford and Shraeya Mithal, “Towards Net-Zero Aviation State Action Plans” (Washington, D.C.: International Council on Clean Transportation, October 25, 2023), <https://theicct.org/publication/state-action-plans-oct23/>.

⁴ Two other SMART criteria, being *achievable* and *relevant*, were deemed beyond the scope of the study.

capturing a diverse group of aviation markets across World Bank income groups.^{5,6}

A review of 17 publicly available SAPs submitted through April 2023 was conducted, assessing clarity of measures using the above methodology. From this review, a few observations could be made:

- Most SAPs did not include clear interim or long-term emissions targets.
- Operational and technical efficiency measures were prioritized for in-sector goals.
- Clarity of SAPs on SAF and ZEP measures dropped dramatically between high-income countries and those in the upper-middle, lower-middle, and low-income country categories.
- Most countries detailed their participation in emissions offsetting measures, such as CORSIA.

ICAO has a number of resources available that Member States could use in their SAP development process. For example, the Environmental Benefits Tool (EBT) to aid in setting long-term and interim targets, the Fuel Savings Estimation Tool (ISFET) for assessing fuel efficiency and MBMs, and the ACT-SAF program to guide SAF deployment initiatives.^{7,8}

As Member States continue to update their SAPs in the coming years to reflect their climate goals and progress, they could improve their clarity by communicating specific, measurable, and time-bound mitigation measures across key focal areas. This would enable SAPs to be used more widely to assess compatibility of the sector's activity with net-zero targets, which is a key priority of the ICAO Committee on Aviation Environmental Protection's (CAEP) LTAG Monitoring and Reporting Task Group (LMR-TG).

This effort is supported by the new edition of the *ICAO Guidance on the Development of State Action Plans on CO₂ Emissions Reduction Activities: Towards LTAG Implementation* (ICAO Doc 9988) which has been updated by ICAO in 2024. This Guidance reflects the adoption of the LTAG and emphasizes the pivotal role of SAPs in monitoring progress on the implementation of all elements of the basket of measures towards the achievement of the LTAG. It also encourages Member States to include specific activities regarding the development and deployment of SAF, LCAF and other aviation cleaner energies in their SAPs, in line with the ICAO Global Framework adopted by CAAF/3.

5 ICAO, "State Action Plans and Assistance," State Action Plans and Assistance, accessed April 29, 2025, https://www.icao.int/environmental-protection/pages/climatechange_actionplan.aspx.

6 World Bank, "World Bank Income Groups," 2025, <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>

7 ICAO, "Environmental Tools (E-Tools)," Environmental Tools (E-tools), accessed April 30, 2025, <https://www.icao.int/environmental-protection/Pages/Tools.aspx>

8 ICAO, "ICAO Assistance, Capacity-Building and Training for Sustainable Aviation Fuels (ICAO ACT-SAF) ," ICAO Assistance, Capacity-building and Training for Sustainable Aviation Fuels (ICAO ACT-SAF), accessed April 30, 2025, <https://www.icao.int/environmental-protection/Pages/ACT-SAF.aspx>