



Industry Q&A: The ICAO CO₂ Standard

INTERNAL INDUSTRY

A public Q&A is available at: <http://ataq.org/component/downloads/downloads/307.html>. This version is for use by industry colleagues who require more information for follow-up media questions.

The CO₂ Standard for aircraft:

- » **Reduces** aircraft CO₂ emissions by encouraging the integration of fuel efficient technologies into aircraft design and development.
 - » **Ensures** that older aircraft models end production in an appropriate timeframe or that manufacturers invest in technology to improve their efficiency. The standard also ensures that new designs go beyond the highest fuel efficiency of today's aircraft.
 - » Is a **challenging and robust** standard that brings CO₂ emissions into the formal certification process that new aircraft need to pass in order to enter service.
 - » Is a **significant milestone** for the sector: the first such standard for aircraft and is key to the sector's long-term commitment to reduce CO₂ emissions from aviation.
 - » Is **part of a basket of measures** to deal with industry's climate impact which include improved operations, sustainable alternative fuels, better use of infrastructure and new technology (which the CO₂ Standard will support).
 - » Is **complementary** to an agreement in September/October this year on a global market-based measure to cap the growth in aviation CO₂ emissions from 2020 and meet the industry's mid-term goal.
 - » Was **developed by the ICAO Committee on Aviation Environmental Protection** (CAEP) over a six-year period through 26 meetings and some 700 papers and pieces of analysis by 170 aviation experts from governments, industry and environmental groups.
 - » Will now need to be **formally adopted** by the ICAO Council.
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Will the CO₂ Standard be enough to meet the ICAO targets? Some environmental groups say you are lagging behind the targets.

- The CO₂ Standard is one of a basket of measures to meet the goals set by the industry (and partially adopted by ICAO).

- It should be seen as one of the tools available to the industry and governments, but not the only one: a global market-based measure for aviation is also currently being developed at ICAO, and the industry is encouraging progress in air traffic management efficiency and the commercialisation of sustainable alternative jet fuel, which will make a large contribution to the industry's long-term goal to cut aviation CO2 in half by 2050.
- The environmental groups seem to be misinterpreting the ICAO goals, which are:
 - a 2% improvement in fuel efficiency per year (the industry has a goal of 1.5% improvement per year, with the additional half a percent reliant on governments instituting needed air traffic management efficiencies); and
 - carbon-neutral growth from 2020, which the global market-based measure is designed to help meet.
- The ICAO goals are for overall global fleet fuel efficiency, not just for new technology entering the fleet. More efficient flight operations and improved airport and airspace infrastructure also noticeably contribute to flight efficiency.

How many aircraft will be covered by the CO2 Standard? Some environmental groups think it will only be 5% of the world fleet by 2030.

- Actually, when you include the in-production models that will be subject to the CO2 Standard from 2023, a much larger proportion of the fleet in 2030 will be covered (we will need to wait for ICAO to calculate the figure).
- New aircraft types take time to enter the fleet – the development cost, complexity and construction time of new aircraft means that it is not possible to replace older aircraft overnight. It will take a few years for the CO2 Standard to have a major impact on the overall fleet, as older aircraft models are gradually retired and replaced by newer ones.
- This is one reason why the aviation industry has emphasised the importance of its other 'pillars' of climate action (operations, infrastructure and a market-based measure) which can work in parallel to bring down emissions.
- That said, competitive market pressures between manufacturers (driven by commercial pressure from airline customers) has meant aircraft fuel efficiency has continually improved even without the burden of regulation, and will continue to do so.

Why is the CO2 Standard not based on “technology-forcing” improvements, rather than simply relying on what is already in existence?

- No industry has been more aggressive and successful in developing and deploying technology to improve fuel efficiency and reduce emissions than aviation, but a standard cannot force the creation of new technology.
- 'Forcing' technology improvements is problematic for an industry as heavily regulated and safety-driven as aviation. The air transport sector's safety track-record can be relied on and safety cannot be compromised.
- It often takes a decade for a new aircraft type to be designed, researched, developed, rigorously tested, certified and then enter service – they are highly technical vehicles operating in extreme environments with the highest standards of safety.
- ICAO principles appropriately call for environmental standards to be environmentally beneficial, technologically feasible, economically reasonable, and to take account of

interdependencies with other environmental standards such as noise and other emissions.

- Unrealistic standards relying on “forced” technology development would be counterproductive. If the technology is not available to meet the standard, development of new aircraft may be delayed until the technology is available.
- In other words, a “technology forcing” approach could have the effect of actually delaying fuel efficiency improvements.
- Aircraft designs respond to specific mission requirements, whether it is for large capacity long-haul airline operations, or small or medium size business jets that fly multiple short legs. However, in all cases, economics and the market will ensure that any new aircraft design will be significantly more efficient than previous ones. The CO2 Standard will help ensure that as well.
- The Standard must be flexible enough to account for real-world airline and other operations. Some aircraft are designed for maximum efficiency flying ultra-long haul routes, but also may be deployed on shorter segments depending on the need for airlines to shift aircraft around their network. Similarly, some ‘short haul’ aircraft are flown on medium distance (or even long haul) routes. The CO2 Standard tries to account for these variations in aircraft utilisation.

How does it fit in with the new 1.5°C goal that the world agreed at the Paris Climate Talks?

- The Paris Agreement was the first time countries agreed to a target of limiting temperature rise to ‘well below’ 2°C, while pursuing efforts to limit it to 1.5°C.
- All sectors must play their part and aviation has put together a comprehensive plan of action that will enable us to continue to serve the global economy whilst also limiting emissions. The CO2 Standard is part of that plan.
- We are a global industry that relies on global standards – and non-discrimination between airlines operating in both developed and emerging economies. Therefore, for aviation, global solutions must be found.
- The aviation industry is proud that it is the only sector that already has, and is working on further, specific regulatory standards to improve its efficiency.

How will you ensure that the CO2 Standard is complied with and not manipulated by the manufacturers?

- The checks-and-balances are inbuilt within the aviation system – we are used to dealing with such regulation in areas such as safety.
- The CO2 Standard also includes the parallel development of internationally-agreed rigorous and detailed certification procedures.
- Importantly, the aviation industry is also subject to strict governmental oversight and now the CO2 Standard is part of the certification process to deliver new aircraft.
 - The aviation sector is highly regulated within a framework of multiple certification and regulatory criteria, including safety.
 - From an environmental perspective, ICAO standards exist for combustion emissions (NOx, HC, CO, smoke) and external noise.

- These standards become legally-binding certification and regulatory requirements including flight tests by airworthiness authorities such as the European Aviation Safety Agency, Federal Aviation Administration and others.
- Compliance is demonstrated according to the certification procedures dictated by authorities who approve the final design of the aircraft. Public proof of compliance is available through a Type Certificate Data Sheet and aircraft cannot be delivered to a customer without an Aircraft Flight Manual or other compliance document from the airframe and engine manufacturers.
- Standards are based on certification conditions defined by authorities as being representative of operational conditions. Manufacturers report certified values to public databanks for noise and emissions.
- Progress is tracked by observing the certified values evolution as new aircraft and engines are certified by the relevant agencies.
- The aviation industry has a strong proven record for reducing aircraft emissions and technology progress is continually reviewed and verified by independent experts nominated by States in ICAO.
- There is a fundamental difference between sectors such as automotive and the aviation industry: our vehicles are purchased and operated by professionals.
 - Whereas automotive consumers must trust the testing process for the cars they intend to buy, airlines have teams of experts scrutinising all aspects of aircraft performance, of which efficiency is often the key factor.
 - Once these new technology aircraft enter the fleet, they are operated by specialists who train for years before even stepping in to the flight deck and then continuously update their professional development with the latest techniques in areas such as efficient operations.
 - These pilots are supported by an army of technical experts in air navigation, loading, flight planning and resource efficiency – airlines track closely the fuel used on board.

Environmental groups do not seem happy with the outcome. Was this process too dominated by industry?

- Industry and environmental groups are both accredited observers to this formal ICAO process and both had the opportunity to provide input, analysis and recommendations.
- ICAO members (governments) make the ultimate decision on ICAO standards, after weighing up all the views.
- In all negotiations, no party gets everything it wants from the process and in complex multilateral negotiations such as this, a balance of interests is the usual outcome.
- However, in aviation, you have a forward-looking and willing industry supporting the development of smart regulation such as the CO₂ Standard and the global market-based measure. Arguably, without the industry support for such actions, they would not happen at all – so industry is a vital part of the process, as are the voices of the environmental groups.
- Aviation – particularly the technology side – is a distinct and highly complex business. Industry expertise is needed as part of the process to understand the ‘interdependencies’ of changes to the design of equipment: the knock-on effects of changing one element of a design or technology.

- What we have in the CO2 Standard is a practical, implementable system that can develop to take account of future technology improvements