Update on Environmental Topics (European Aviation Environmental Report 2022; ReFuel EU, Pipistrel Velis Electro)

Joonas Laukia

02 November 2022

Working for sustainable aviation.
Your safety is our mission.

An Agency of the European Union

EASA and Sustainability

EASA Sustainable Aviation Programme

EU Environment Policy objectives

EASA Sustainable Aviation Programme

(EU) 2018/1139 Art. 87
Environmental protection

EASA Environmental strategy

Sustainable Aviation Programme – Overview

- Facilitating uptake of Sustainable Aviation Fuels
  - Monitoring and reporting
  - Facilitating efficient approval processes

- Environmental Standards and Certification
  - Robust, efficient and innovative certification process
  - Environmental standards for Novel technologies (Drones, EVTOL, Super Sonic Transport)
  - First time certification of an aircraft for CO_2 emissions (2021)
  - ICAO: support to CAEP Working Groups
  - Noise and Emissions Database management

Sustainable Aviation Programme – Overview

Research and innovation for sustainable aviation

- Support to EU Research programmes (Horizon Europe)
  - Hydrogen, Electric and Hybrid propulsion technologies
  - Greening of ATM

- Collaboration with industry on Zero-Emission projects

- Management of Environmental research projects (Noise, Emission, Market-Based Measures)

Sustainable Aviation Programme – Overview

- Environmental transparency and cooperation

  - International cooperation projects on Environment
  - Publication of European Aviation Environmental Report

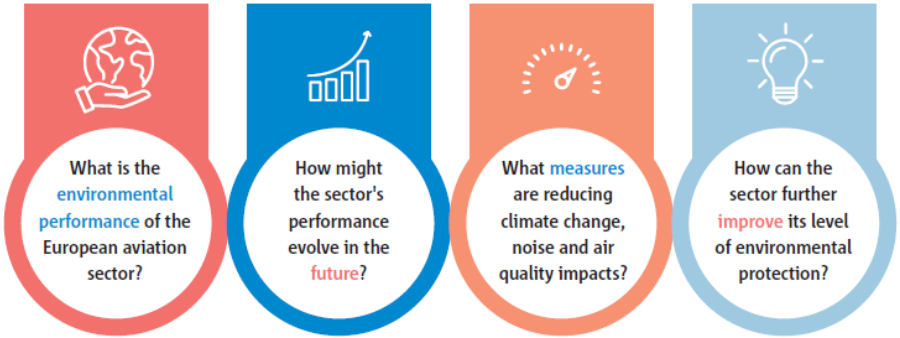
  - Ongoing project: Environmental Labelling for Aviation enabling passengers making sustainable travel choices (Aircraft,Flight,Airline Label)
  - Collaboration at ICAO level
  - ATM ENV Transparency

European Aviation Environmental Report 2022

www.easa.europa.eu/eco/eaer

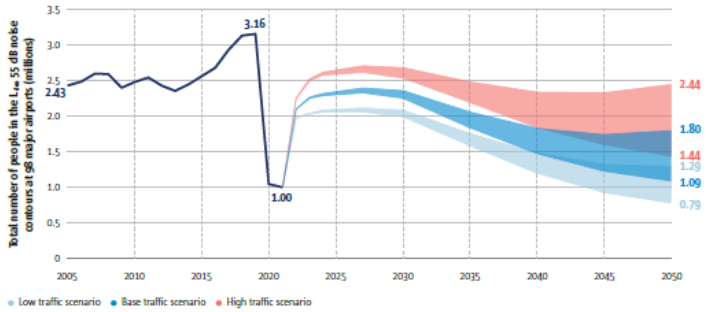
EAER Objectives

- European Aviation Environmental Report (EAER) is published by EASA (Basic Regulation Art. 87) **every 3 years** *with the support of the European Environment Agency and Eurocontrol.*
- **Independent, objective and accurate** source of information to ensure transparency, accountability, credibility and trust that the measures in place will meet the agreed targets.
- Support to **evidence-based policy-making**
  - **Recommendations** on how to further improve the level of environmental protection



Sector Overview – Environmental Impact

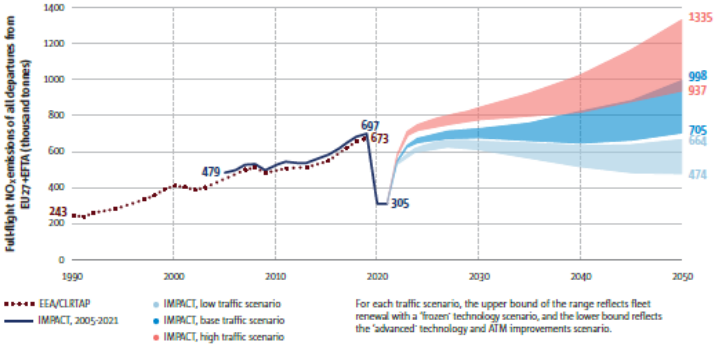
NOISE



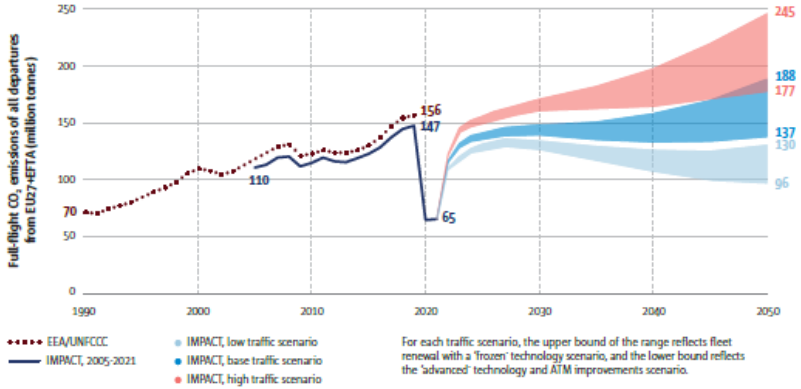
Assumptions:
- Infrastructure of each airport is unchanged (no new runway)
- Population distribution around airports is unchanged
- Local take-off & landing noise abatement procedures are not considered

For each traffic scenario, the upper bound of the range reflects fleet renewal with a 'frozen' technology scenario, and the lower bound reflects the 'advanced' technology scenario.

EMISSIONS



For each traffic scenario, the upper bound of the range reflects fleet renewal with a 'frozen' technology scenario, and the lower bound reflects the 'advanced' technology and ATM improvements scenario.



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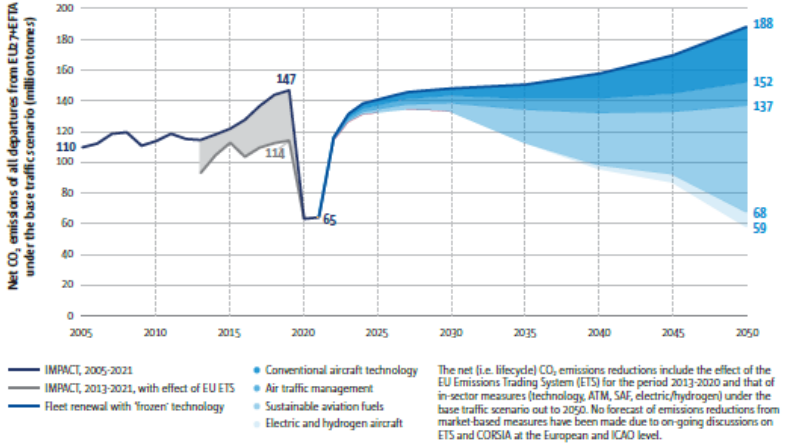


The net (i.e. lifecycle) CO_2 emissions reductions include the effect of the EU Emissions Trading System (ETS) for the period 2013-2020 and that of in-sector measures (technology, ATM, SAF, electric/hydrogen) under the base traffic scenario out to 2050. No forecast of emissions reductions from market-based measures have been made due to on-going discussions on ETS and CORSIA at the European and ICAO level.

Key Messages

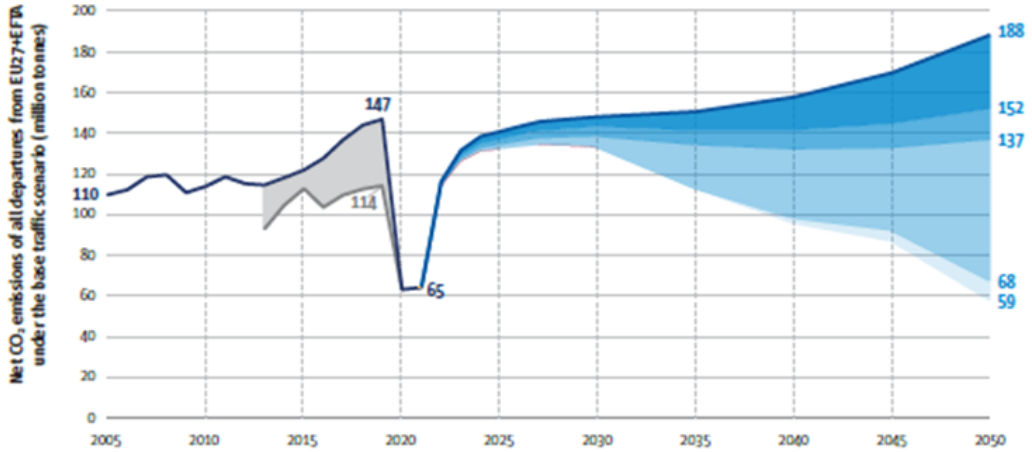
- During 2020, approximately **50% of operations in Europe were by aircraft compliant with the latest Chapter 14 noise standard**.
- Fleet renewal could lead to **reductions in total noise exposure** at European airports over the next 20 years.
- In-sector measures could **reduce CO_2 emissions in 2050 by 69%** compared with a “technology freeze” scenario.
- Long-haul flights (above 4,000 km) represented approx. **6% of departures during 2019 and 50% of all CO_2 and NO_X emissions**.
- Average grams CO_2 per passenger kilometre reduced to 89 grams in 2019, equivalent to **3.5 litres of fuel per 100 passenger kilometres**.
- Where mitigation measures incur **trade-offs between CO_2 and non-CO_2 emissions**, a robust assessment methodology is essential to ensure an overall reduction in climate impact.

Key Messages

- EASA certified first **fully electric aircraft** in 2020 (Pipistrel Velis Electro) and first aircraft against the **aeroplane CO_2 emissions standard** in 2021 (A330-900neo).
- While **current use of SAF remains limited**, European Commission's **ReFuelEU** proposal includes a SAF supply blending mandate increasing from 2% in 2025 to 63% in 2050.
- **Single European Sky** indicators reflecting the relationship between flight routing and environmental impact are being re-evaluated.
- **During 2013-2020, the EU Emissions Trading System led to a total reduction in aviation net CO_2 emissions of 159 Mt** through funding of emissions reductions in other sectors.
- **International cooperation is key in building capacity** to address the global environmental and sustainability challenges facing the aviation sector. EU funded action has enhanced the relationship with partner States.

Recommendations

- To establish **long-term noise and emissions reduction pathways and aspirational goals for European aviation** in terms of in-sector (e.g. technology, operations, fuels) and out-of-sector (e.g. market-based) mitigation measures to support the European Green Deal objectives.
- To enhance the EAER process to ensure a **robust monitoring system** that supports and verifies the achievement of legislation and policy objectives.



Recommendations

- To **accelerate innovation and research** on mitigation and adaptation measures, while developing certification standard for new market segments (e.g. drones, eVTOL) that ensure a high and uniform level of environmental protection.

- To incentivize airspace users to **fly ‘green’ trajectories** within the Single European Sky.

- To continue the **progressive inclusion of the costs from aviation environmental and climate impacts within market prices**, and use the EU Taxonomy system to encourage sustainable investment in the aviation sector.

SAF and ReFuelEU Regulation

EASA activities related to SAF

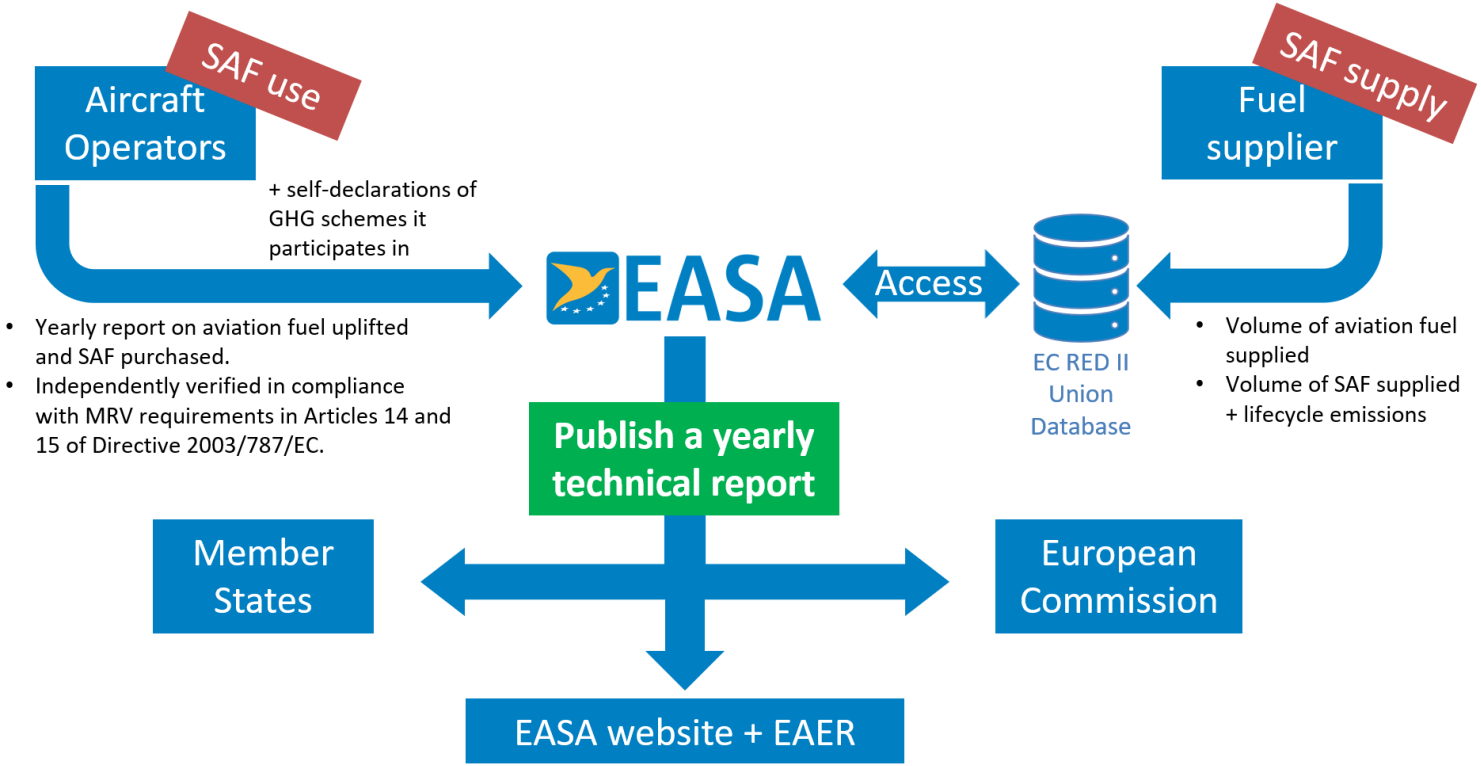
- ***Support regulatory proposal on SAF "ReFuelEU Aviation"***
  - EASA to prepare for its proposed role on SAF monitoring and reporting

- ***Support "ReFuelEU Aviation" 's flanking measures to boost SAF uptake***
  - Participation to Renewable and Low-Carbon Fuels Value Chains Industrial Alliance
  - Setup SAF EU Clearing House to facilitate certification of new SAF pathways

- ***Other activities***
  - SAF Capacity building activities under EASA's International cooperation projects
  - Participation to ICAO's work on SAF
  - Contribute to various SAF research projects funded by EU/Member States
  - Publication of information on use of SAF in the EU via *European Aviation Environmental Report* (EAER)

ReFuelEU Aviation Regulation

- ReFuelEU Aviation Legislative proposal: EASA proposed tasks



Pipistrel Velis Electro Certification

Supporting Innovation

- Existing ICAO certification requirements assess the environmental performance of the aircraft design and technology (e.g. Annex 16 Volume III aeroplane CO_2 emissions standard).

- Innovative sources of energy for the aviation sector is a key issue to reduce emissions (e.g. drop-in sustainable aviation fuels, hydrogen, electricity).

- Regulatory framework needs to anticipate and adapt in order to incentivise the uptake of these technologies by quantifying and crediting the environmental benefits.

- Various Europe initiatives on electrification of aviation

Electric / Hybrid Aircraft Initiatives

- EASA certified the **Pipistrel Velis Electro** in July 2020 – the **first fully electric general aviation aircraft**.

- Similar on-going work also taking place on **eVTOL urban taxis** and **UAS drones**.

- Norway's **regional air transport system** vision:
  - By **2030**, first ordinary scheduled domestic flights will be operated with electrified aircraft.
  - By **2040**, all civil domestic aviation will be operated with electrified aircraft, reducing gas emissions by at least 80% compared with 2020.
  - CAA Norway – EASA **Innovation Partnership** to work towards this vision with industry partners.

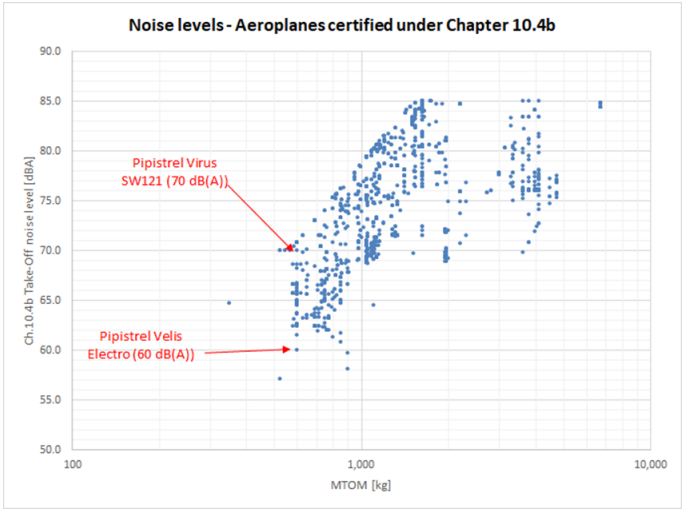
CAA Norway

EASA
European Union Aviation Safety Agency

EASA

Environmental Benefits of Electrification

- Pipistrel Velis Electro certified against existing ICAO Annex 16, Vol. I noise certification requirements.
  - **Significant reduction in noise certified levels** due to absence of engine source noise.
  - Some adaptations required due to power loss during noise flight test.



- **No GA emissions certification requirements**. Should there be in order to demonstrate the environmental benefits of electrification? If so, how would this be measured?

- **Life Cycle Approach** methodology
  - Various international standards
  - Sensitive to origin of electricity
  - Use of renewable energy to generate electricity shifts environmental impact from aircraft operation to production / maintenance / recycling

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