

# Reducing environmental impact of European ATM: Problem statement

## 1 INTRODUCTION

---

Reducing the environmental impact of European ATM is a SES high-level goal, and an important responsibility for both European institutions and industry alike.

In line with the ICB Work Programme for 2020, the ICB seeks to identify the environmental success stories and priority areas for improvement that will best support a green recovery and improved European ATM environmental performance.

This problem statement provides context to the Green Deal, existing activities to reduce the environmental impact of SES, and a brief questionnaire to stimulate discussion around the advice to be developed by industry. Members are requested to provide responses to the questions during the next meeting of the ICB Working Group, which will form the basis of advice to the EC.

## 2 THE GREEN DEAL

---

The European Green Deal is a set of policy objectives designed to support and improve the environmental impact across a wide range of sectors across Europe, to:

- boost the efficient use of resources by moving to a clean, circular economy; and
- restore biodiversity and cut pollution.

The plan outlines investments needed and financing tools available<sup>1</sup> and resets the Commission's commitment to tackling climate and environmental-related challenges in light of global warming and a continually changing environment year-on-year<sup>2</sup>. As outlined in the Commission's publication, the European Union is committing to:

<sup>1</sup> [European Commission Green Deal overview](#)

<sup>2</sup> [European Commission Green Deal communication – turning an urgent challenge into a unique opportunity](#)

# Industry Consultation Body



Become climate-neutral by 2050



Protect human life, animals and plants, by cutting pollution



Help companies become world leaders in clean products and technologies

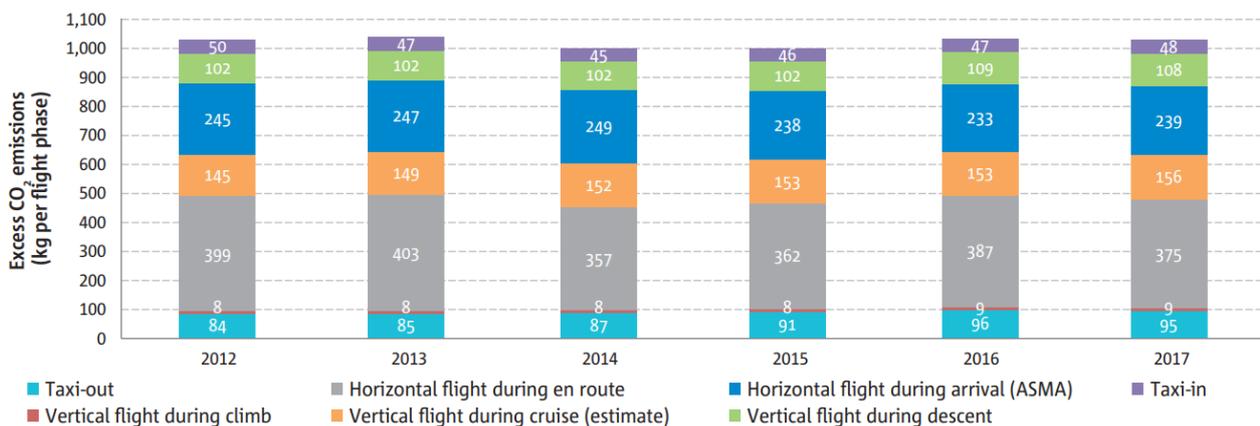


Help ensure a just and inclusive transition

The European Green Deal sets out several focus policy areas including agriculture, manufacturing, construction and transport. For transport, the European Union has outlined its objectives for 'sustainable mobility', which includes a 90% reduction in emissions by 2050 across all transport modes, for example civil aviation, road, rail and maritime. The EU Green Deal needs "digitalisation as an enabler for decarbonisation" in all sectors of the economy including transport.

Within this, the Green Deal claims that reform of the Single European Sky will cut up to 10% of air transport emissions, with the emissions reduced at zero cost to consumers and companies.<sup>3</sup>

The following figure<sup>4</sup> illustrates the average excess CO<sub>2</sub> emissions per flight broken down into the different flight phases. The average excess CO<sub>2</sub> emissions has remained stable over the last 6 years, even though traffic has increased.



## 3 MONITORING ENVIRONMENTAL PERFORMANCE

Environmental performance is targeted and monitored through the SES performance and charging scheme (Commission Regulation (EU) No 2019/317), the results of which are presented within the [ANS Performance Portal](#).

Only one environmental KPI exists within RP3, the horizontal flight efficiency of the en-route flight's actual trajectory (KEA), with the horizontal flight efficiency of the planned route changed from a KPI to a PI from RP3 to RP2. KEA is measured at the Union-wide level and reported on a yearly basis; however, the target was not hit for any year within RP2.

Other PIs, monitored at local level, include additional taxi out time – average number of additional minutes it takes to taxi benchmarked against unimpeded taxi time – and

<sup>3</sup> [European Green Deal – Sustainable mobility](#)

<sup>4</sup> <https://ec.europa.eu/transport/sites/transport/files/2019-aviation-environmental-report.pdf>

## Industry Consultation Body

Additional time in ASMA (Arrival Sequencing and Metering Area) – difference between the ASMA transit time and the unimpeded time based on ASMA transit times.

As a Union-Wide target, KEA provides an overview of overall network environmental performance. However, it does not take into consideration other key aspects of a flight, for example the vertical flight efficiency, where noise and emissions impact local communities around airport hubs, but where there are significant local variables at airports related to take-off and landing.

The PRB recognises that ANSPs do not have ultimate control over the environmental indicators within the performance scheme (ie network disruptions, weather, trade-off with capacity), and that ANSPs which have already implemented H24 FRA (24 hr Free Route Airspace) have limited scope for additional significant improvement of their horizontal flight efficiency (other than cross-border FRA). The PRB set targets for RP3 assuming that H24 FRA will be implemented throughout the entire EUROCONTROL area by 2022 as specified in the European ATM Master Plan and supported by Commission Implementing Regulation (EU) No 716/20142.

The PRB recommends when FRA is operational across Europe, additional focus is required on other metrics to examine scope for exploiting further environmental benefits.

Other areas the PRB highlights that can influence performance in environmental metrics include advancements in the route structure design, route availability, improved civil/military coordination and advanced ATCO training or airspace re-sectorisation.<sup>5</sup>

## 4 CURRENT ACTIVITIES SUPPORTING ENVIRONMENTAL SUSTAINABILITY

---

The following section summarises current activities in SES to reduce the environmental impact of ATM. Stakeholders' internal business decisions and processes are also important in ensuring environmental sustainability is delivered throughout all aspects of the industry. As a reference, the European Aviation Environmental report 2019<sup>6</sup> reviews the achievements and state-of-play in air traffic management and operations which is not intended to be repeated in this paper.

### European ATM Master Plan

The SESAR vision, as embodied in the European ATM Master Plan, is to deliver a fully scalable traffic management system capable of handling growing air traffic, both manned and unmanned, to manage future traffic growth while mitigating the environmental impact. The 2018 European ATM Master Plan ambition is to continue reducing the additional gate-to-gate flight time and additional gate-to-gate CO<sub>2</sub> emissions to reach 3.2% and 2.3% respectively by 2035.

These benefits of SESAR projects are consolidated at the SESAR programme level to monitor how much of the target fuel savings, derived from the SESAR ambition, are being achieved.

<sup>5</sup> <https://ec.europa.eu/transport/sites/transport/files/2018-prb-advice.pdf>

<sup>6</sup> <https://ec.europa.eu/transport/sites/transport/files/2019-aviation-environmental-report.pdf>

## SESAR Projects

The SESAR R&D activities aim to mature operational and technological solutions, many of which are expected to, or have already demonstrated, bring environmental benefits and address the ATM-related fuel consumption within a gate-to-gate perspective.

The planned ATM modernisation across Europe aims to improve flight trajectories through shorter flight distances and/or times, and optimal climb/descend flight segments, thus providing fuel savings and lower emissions. This includes reduced vectoring, reduced waiting time at runway holding, improved taxi times, reduced fuel burn from vectoring at low levels, reduced holding, and maintaining more efficient flight levels for longer. SESAR is also addressing other aspects of environmental sustainability such as noise and air quality, for example through introduction of new approach procedures to reduce aircraft noise in the vicinity of major European hubs.

More generally, operational improvements increasing airspace capacity, network throughput and throughput at congested airports are expected to increase mobility with lower environmental impact.

Further work is planned in SESAR2020 Wave 2 and Wave 3 including Very Large scale Demonstrations<sup>7</sup> aimed at promoting and demonstrating “zero CO<sub>2</sub> waste” trajectories and exploring the possibilities for protecting ‘green flights’ from unnecessary deviations or constraints (i.e. prioritising low-emission aircraft in terms of trajectory).

## Common Projects – synchronised deployment of SESAR solutions

Four out of the six ATM functionalities covered by the Pilot Common Project (PCP) regulation are expected to provide environmental benefits in terms of fuel consumption and environmental impact. These include: Extended Arrival Management and Performance Based Navigation (AF#1), which facilitate earlier traffic sequencing in TMAs; Airport Integration and Throughput (AF#2) solutions, which improve runway safety and throughput; Flexible Airspace Management and Free Route (AF#3), which enable a more efficient use of airspace and more direct flight routes; and Initial Trajectory Information Sharing (AF#6), which establishes increased air-ground integration moving towards more predictable i4D trajectories with less tactical ATC interventions.

The above ATM functionalities also come within the scope of the draft first Common Project (CP1) regulation currently in the stakeholder consultation process.

## Airports’ contribution to the decarbonisation of aircraft ground operations

Airport operators play an important role in facilitating collaboration between various stakeholders at the airport to improve environmental performance. The EUROCONTROL Collaborative Environmental Management (CEM) Specifications provide a practical guidance for the set-up of related cooperation mechanisms. Through A-CDM, more efficient and less emitting ground operations are also enabled, for example through reduced taxi times.

More widely, European airports have been collectively addressing the carbon emissions under their control, and working with their stakeholders to help them do the same, through ACI EUROPE’s global carbon management standard *Airport Carbon*

<sup>7</sup> Open call SESAR-VLD2-04-2020: Environmental sustainability

## Industry Consultation Body

*Accreditation*, for over a decade. This includes action on aircraft ground operations, such as:

- Providing Fixed Electrical Ground Power (FEGP) and Pre-Conditioned Air (PCA) to aircraft on stand, to limit the use of Auxiliary Power Units (APU),
- Implementing APU use restrictions,
- Promoting reduced engine taxi,
- Trialing electric taxiing by vehicle.

### Other stakeholder activities

Whilst specific technologies and concepts are developed and their implementation included within regulation, there is also the ability for the network to adapt to external factors, which promote more efficient flight trajectories. For example, as a result of the unprecedented traffic drop resulting from the COVID-19 crisis, several steps were taken between the NM and operational stakeholders to address the cancellation or the suspension of a number of airspace utilisation restrictions and to provide airspace users with more flexibility and more efficient route options. The Route Availability Document (RAD) suspensions had a positive effect leading to 20000-25000 NM saved per day<sup>8</sup>.

Work on the concept of a 'perfect flight' is being led by CANSO, IATA, A4E, ERA, AIRE and IFATCA to enable more direct routes and allow aircraft to fly their optimal vertical profiles<sup>9</sup>.

## 5 FOCUS FOR THE IWG

---

With increased political impetus through the Green Deal, and with COVID reducing traffic levels in Europe by 89% from forecasted traffic between February and April 2020, this is an ideal opportunity to identify and implement measures which can deliver a more sustainable recovery, and improved ATM environmental performance.

The ICB Work Programme outlines a target to focus on minimising environmental impacts of ATM through predictive and optimum trajectory management, and to accelerate solutions and best practices. This includes prioritisation of R&D deployment activities. This should be achieved through a 'state of play' paper highlighting existing activities, and development of a position paper on environment.

The critical question now for industry is: what more needs to/can be done to reduce the environmental impact of ATM, and how can the EC effectively support this? Furthermore, how can current good practices/examples be promoted.

ICB members are therefore requested to provide responses to the following questions at the next meeting of the IWG on 30 September, with written submissions also welcomed to help provide the basis for advice to the EC.

1. What projects/concepts are you currently undertaking/implementing to support the reduction in emissions/environmental sustainability?

<sup>8</sup> <https://www.atc-network.com/atc-news/fabec/fabec-ansps-lifted-over-500-route-restrictions-to-optimize-flight-profiles>

<sup>9</sup> <https://www.canso.org/joint-effort-deliver-additional-environmental-benefits-during-traffic-downturn>

## **Industry Consultation Body**

2. What do you deem as the environmental success stories within European ATM over the course of the last 5-10 years?
3. How can further progress be incentivised by the EC (ie through funding mechanisms, resourcing, the Performance Scheme, reprioritisation) to meet the ambition of the Green Deal?
4. How can digitalisation and the other emerging concepts support achievement of the environmental ambition?