

Minus 10% emissions with Single Sky

Concerns about the environmental impact of aviation put a heavy responsibility on the aspirations for growth. Noise in the vicinity of airports is inversely proportional to Greenhouse Gas emissions (GHG) emissions. Aviation currently contributes 3% of GHG emissions. Continuous measures are required to limit the environmental impact to ensure that growth rate remains below transport growth rate.



Optimised Air Traffic Management in Europe has the potential to reduce fuel consumption and emissions by about 10% per flight, precisely the target of the Single Sky policy together with the SESAR technological programme.

Cut unnecessary surplus length of flights

A core starting point is the reduction of the current surplus length of flights in Europe, on average almost 50 km. Assuming an average fuel consumption of 2.9 litres per 100 km and per passenger for the new generation of Airbus, this reduction will amount to savings of 1.5 litre fuel per passenger and 5 million tons of CO₂. Two main elements of the Single Sky policy will contribute to this:

- Defragmentation of European air space with new possibilities for more direct routing: the efforts to define a true pan European network of routes and to implement flexible use of airspace aim at an emission reduction of 2% per year.
- Instead of the departure time, the arrival time will become the main reference for the future flight planning schemes and systems, thus reducing or avoiding holdings.

Optimise the flight from take-off to landing

A flight profile describes the operational characteristics (height, power setting, airspeed) of an aircraft as it flies along a flight track.

Airlines and air navigation service providers count on the potential of improved flight profiles which combine optimum altitude and speed, with special attention to take-off and landing.

First measures are already being implemented and the participants of the AIRE¹ initiative realise their first savings of between 100 and 200 kg fuel per flight for medium and large aircraft respectively.

AIRE is the first large-scale environmental initiative bringing together aviation players from both sides of the Atlantic.

While the current demonstrations use existing technologies and adapted procedures – further improvements are expected from new systems, technologies and procedures as result of the SESAR initiative.

The chosen routes and the flight profile for take-off and descent also have a major impact on noise emissions around airports.

Noise and exhaust gas emissions could be reduced during landing by using "smooth" or "reduced engine" approaches and it will be important to communicate widely the success of best practices such as in AIRE and research projects.

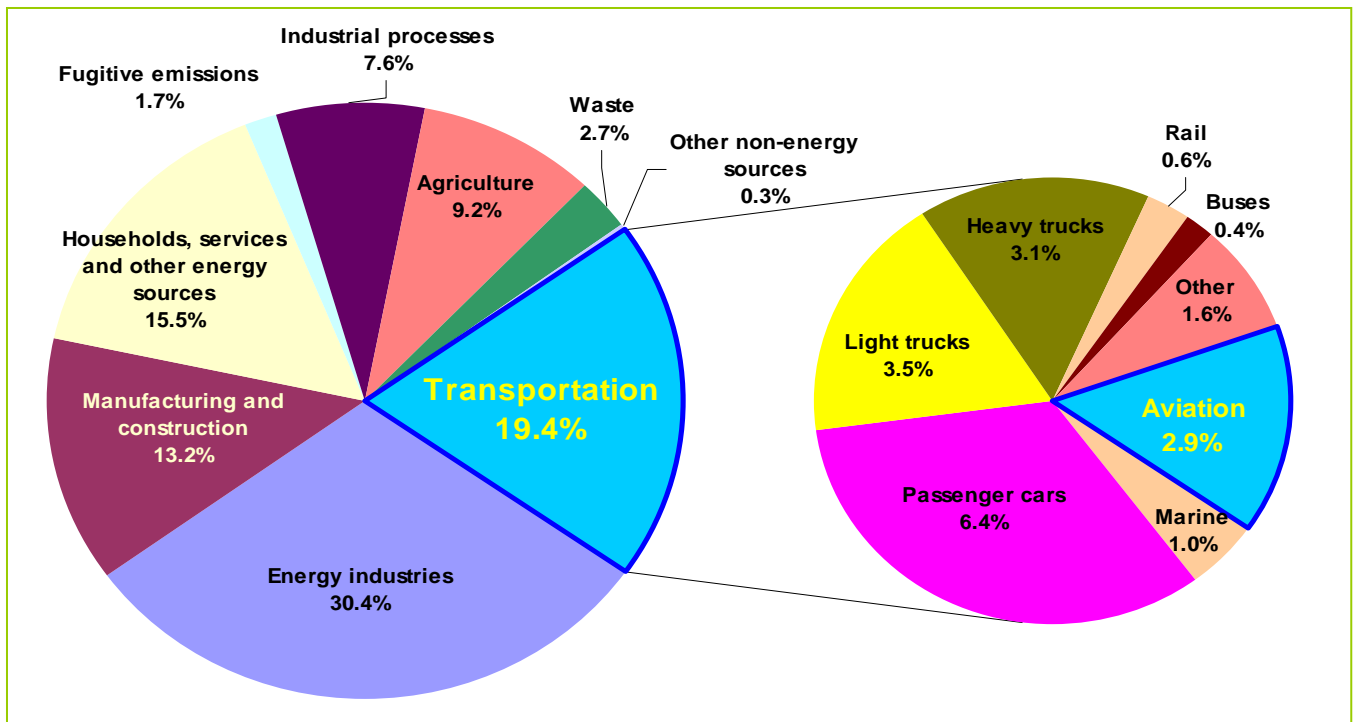
Aircraft on the ground: up to 25 kg fuel per minute

In the airport area, aircraft burn significant amounts of fuel (around 12 to 25 kg per minute), while standing still and taxiing between gate and runway. Efficient organisation of the turnaround process is therefore paramount to minimise in particular waiting times, including through in-time gate allocation and co-ordination with the services at the aircraft (ground handling) and for passenger and luggage.

SESAR envisages the integration of airport services in a system-wide information management (SWIM) in order to allow all operators to share information and to better organise and interlink their services in view of efficiency gains and emission reduction at the airport.

The ATM network shall have to be managed taking into account potential greener solutions: the use of railway might be incentivised under certain conditions.





Green aircraft technologies under development

The European industry has committed itself to a reduction of fuel consumption and CO₂ emissions by 50% between 2000 and 2020. This will require new solutions for the design of aircraft, materials, engines and control equipment. Industry has taken up this challenge in the "Clean Sky" Joint Technology Initiative, a 1.6 billion Euros programme, co-financed with 800 million € from the Community.

Thanks to the continuously increasing fuel prices also the question of alternative fuels has become pertinent, whereby security of supply, cost aspects and the question of environmental sustainability are intrinsically linked. In this area the Commission is launching new research projects, analysing different options.

The Directorate General for Transport and Energy of the European Commission recently launched a study on alternative fuel solutions (www.cleanskv.eu).

In search of the optimum

Not all necessary measures are clear yet and further research is needed to clarify the best balance between competing objectives such as:

- Emissions have different effects at different altitudes (the higher the more impact), but also fuel consumption depends on the flight level (the lower the higher the fuel consumption). No general rule can yet be established to optimise this trade-off.
- Furthermore, measures to reduce noise may have a negative impact on emissions, another issue which needs to be better understood at European level.

Economic measures

The Commission envisages that the European Emission Trading scheme works as an incentive for air transport service providers to implement measures to minimise and avoid the additional cost for CO₂ certificates.

In addition growth should not only be considered in isolation within the aviation sector. Combinations of air and rail shall be incentivised to increase airlines cabin factor as well as being environmentally preferable.