

Decarbonisation of aviation

EU and ICAO action needed

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Summary

Aviation accounts for over 13% of Europe's transport CO₂ emissions and a far greater share of its climate impact – its non-CO₂ effects can equal or exceed those of its CO₂ effects¹. Globally, aviation emissions are expected to grow 300% by 2050 unless action is taken. This fast growth is partly fuelled by measures including highly preferential tax treatment, burgeoning direct subsidies, exceptional treatment in the EU ETS, and undue reliance on the industry-dominated UN agency ICAO to regulate emissions.

It is imperative that effective measures are implemented to reduce aviation emissions in line with the EU's 2030 climate targets and the Paris Agreement's objectives. At today's growth rates in Europe aviation will, combined with shipping, wipe out almost half of the projected emissions savings made by action in the EU road transport sector by 2030².

Europe must not rely exclusively on the weak and incomplete global climate measure agreed at ICAO last October and due to be partially and voluntarily implemented from 2021. A range of options are open at European-level, including in areas where ICAO has no competence. Biofuel and technology breakthroughs alone won't be sufficient. An EU-wide strategy on making passenger rail a viable and competitive alternative is also urgently needed.

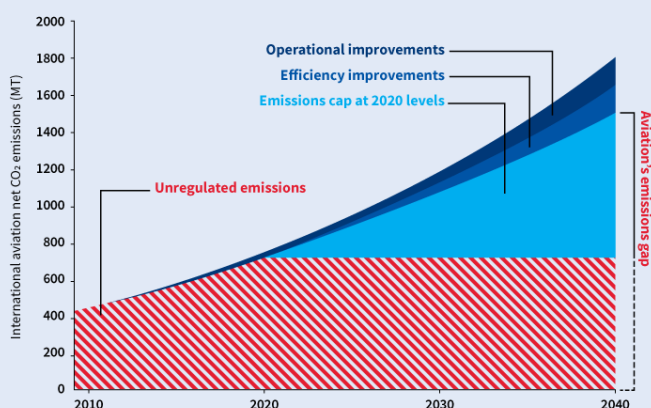
1 The need to reduce the EU's aviation climate impact

Aviation is responsible for over 13% of EU transport CO₂ emissions and is expected to account for over 16% of the EU's liquid fossil fuel demand by 2030³. EU aviation traffic is expected to grow at twice the rate of

other, lower-carbon intensive transport modes between 2010 and 2030⁴. Tax exemptions, subsidies to manufacturers, operators and airports and a failure to introduce effective climate measures have resulted in European aviation CO₂ emissions **quadrupling as a share of EU-28 emissions** - from 1.2% (1990) to 4.5% (2014).

Aviation's climate growth is incompatible with the EU's 2030 targets, its decarbonisation objective and with

How big is aviation's emission gap?



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Source: "Overview of ICAO's environment work" (ICAO 2015)

¹ <http://www.eea.europa.eu/publications/european-union-greenhouse-gas-inventory-2016>

² <https://www.transportenvironment.org/news/planes-and-ships-hampering-road-transport%E2%80%99s-climate-efforts>

³ Ibid

⁴ Study on the economic effects of the current VAT rules for passenger transport TAXUD/2012/DE/334 (p142)

the Paris Agreement's 1.5°C target. Any credible decarbonisation strategy for the EU must recognise this and put in place a set of effective measures.

2 Measures cannot be restricted to ICAO

In October 2016, after 8 years of deliberation, ICAO agreed on developing a “global” market based mechanism for international aviation known as the Carbon Offset and Reduction System for International Aviation (CORSIA). CORSIA, which would be voluntary from 2021-2027, potentially only have mandatory effect after 2027, and will at a maximum offset only 21.6% of international aviation emissions. The measure misses ICAO's own goal of stabilising net emissions at 2020, itself a weak and insufficient target. There are no rules yet in place as to the quality of the offsets, meaning that if the offsets don't really reduce emissions then in fact aviation's climate impact will continue to grow unabated. Even if offsetting can be made to work, it can only ever be a temporary solution as the Paris Agreement requires all sectors and all states to reduce their emissions, not just pay others to reduce theirs. The low cost of offsets and weak ambition of the CORSIA will provide no incentive for the aviation sector to drive efficiency improvements.



ICAO's **CO₂ standard** for new aircraft, decided in February 2016, is further evidence of ICAO inadequacy and of the absolute grip that the Airbus and Boeing duopoly has over the industry and regulators – their aircraft account for 92% of the aviation CO₂ in the atmosphere. Six years in the making, the purpose of the standard was to drive emissions reductions from new aircraft beyond business as usual.

New aircraft types will be regulated from 2020 but the standard for these aircraft is weak and unlikely to have any impact on new aircraft types introduced after 2020 as

project aircraft already due for certification then already exceed the standard. New aircraft types which don't improve on existing models are unsellable. For variants of existing aircraft – “in-production aircraft” - EU/US' insistence behind closed doors on a 5 year delay of the standard until 2028 means its only effect will be to extend the production life of inefficient aircraft such as the Airbus A380 and the US air force' Boeing 767/KC46 tanker. It is also bad business, delaying the development of more efficiency aircraft and putting at risk Europe's leadership in aircraft R&D.

Industry tries to pitch EU and ICAO ambition as mutually incompatible. In reality, even ICAO accepts that its safety and security standards are global minima from which states can go beyond. Europe, at member state and EU level, has a range of underused policy options which in no way fall under ICAO's remit.

3 Aviation's non-CO₂ effects

As well as emitting CO₂, aviation generates considerable non-CO₂ warming effects (NCEs) at altitude. The exact impacts remain under study, though scientific certainty is rapidly advancing. The major NCE impacts come from cruise NO_x emissions (net warming, as NO_x has a slightly cooling impact which is more than cancelled out by its warming impact), and contrail and induced cirrus cloud formation (warming). Aviation CO₂ accounts for about 2% of global CO₂ but after taking account of the NCEs, total aviation radiative forcing in 2005 was estimated at 4.9% of total global warming.⁵

⁵ <http://elib.dlr.de/59761/1/lee.pdf>

Despite their considerable impact, no measures are in place at regional or global level to address aviation's NCEs. At the very least, Europe should ensure adequate funding to better determine NCEs and prepare mitigation options. Funding from the auctioning of ETS allowances could be used for this purpose.

4 Europe can and must act

Europe has always had at its disposal a range of tools to address aviation emissions, but the Commission and member states have so far failed to use them. Instead, EU competence has been outsourced to ICAO. The Single European Sky (SES) is critical to more fuel efficient routings but member states continue to block its effective implementation. Kerosene taxation became possible under the Energy Tax Directive in 2003 but the EU/US Open Skies agreement, like other Air Service Agreements (ASAs), gives the US an effective veto power on taxing fuel on intra EU sectors. The result is a subsidy to airlines operating in Europe of €32bn a year which disincentivises fuel efficiency⁶.

The VAT exemption – plane tickets are exempt, rail and bus tickets aren't - denies European budgets of €7bn and distorts competition with bus and rail. The Commission and member states stood by while the 2005 guidelines on state aid for airports and airlines were honoured mainly in the breach and billions wasted on ghost airports and subsidies to holiday destinations rather than to strengthen connectivity. €5bn of public money has gone on the SESAR and Clean Sky initiatives, with little to show for.

When aviation was included in the EU ETS, a static cap was set and 85% of allowances issued for free. 10 months later the UK, France and Germany - at Airbus' and Washington's bidding - had 66% of the scheme put on ice (exempting flights to and from Europe) ostensibly to facilitate a global measure. The result? Well over €40bn in annual subsidies flows to the most carbon intensive transport mode versus an annual EU ETS cost of well under €200m. All the while, CO₂ emissions grow out of control. The proposed revision of aviation's inclusion in EU ETS is an opportunity to correct some of these flaws.

5 Flexibility for EASA on ICAO aircraft environmental standards

It is essential that the current revision to the European Aviation Safety Authority (EASA) Basic Regulation permit the EU to go beyond ICAO on aircraft environmental standards, if appropriate, as it currently can on ICAO safety and security matters. European countries are the only ICAO members who constrain themselves from needed flexibility on aircraft environmental standards. This weakens Europe's role in ICAO and results in environmental standards which are inappropriate for Europe.

6 Modal shift from aviation to rail and road in Europe

Europe is densely served by short and medium haul flights – a legacy of national carriers in each capital city often propped up by restructuring state aid. More recently, low fare carriers such as Ryanair have dominated growth, largely fuelled by state aid. As a result, cheap priced short and medium haul flights and emissions have exploded in volume in the past 20 years, far outpacing developments in passenger rail. With limited prospects for biofuels or technological improvements (see below) to reduce aviation emissions, Europe's low-carbon transport objectives can only be achieved if the proliferation of short haul flights is arrested and a shift to passenger rail and bus implemented.

Member states and the Commission have completely failed to develop such a strategy. Pricing aviation carbon has seen only timid first steps with aviation's inclusion in ETS subject to many special privileges. Meanwhile passenger rail suffers from chronic problems. Cross border services are losing market share, with national rail companies more intent on protecting their home market franchises. Solutions include an integrated pan-European booking and ticketing systems and addressing high capital costs for infrastructure

⁶ <https://www.transportenvironment.org/publications/does-aviation-pay-its-way>

and steep track charges. A single market for passenger rail must be created which can compete with the single market for aviation.

High speed and fast intercity rail services offer a low carbon alternative for passengers. On a domestic level France, Germany and Spain show what can be done. Regulatory obstacles need to be swept away to see these networks expand seamlessly across borders. Commercial obstacles to integrated rail ticketing must be removed. Uncompetitive rail infrastructure bidding must be reformed, track construction economies of scale harnessed, and a more commercial approach to track charges adopted to incentivise growth. Success will also depend on parallel moves to remove aviation's tax subsidies and have the external costs of high carbon flights properly priced. State aid and EU funding to prop up the expansion and operation of loss making airports must end. As hub airports become congested, assumptions about the benefits to society of airlines relying on transit traffic growth need to be reassessed.

Decarbonising European aviation starts with a smart policy to shift off short and medium haul flights onto passenger rail and bus thereby contributing to a true low-carbon economy, reducing Europe's fossil fuel demand and boosting Europe's rail and bus industry.

7 Biofuels and technology won't save us today or tomorrow

Europe's experience with land-based biofuels which, so far, have increased, not reduced, road transport emissions, should sound a note of caution. There are no credible forecasts suggesting that sustainable biofuels can make any appreciable dent in aviation's fossil fuel demands in Europe in the foreseeable future. Rather than the 2 million tonnes of biofuels to be consumed in 2020 projected earlier, EASA now projects 0.05 million tonnes⁷. Forecasts beyond that date remain highly speculative. Arable land is a limited resource. Land-based biofuels are therefore not truly 'renewable' since the land used is lost for other purposes, including food production, carbon sequestration, and nature and to ensure the livelihoods of communities. Using land to produce bioenergy is highly inefficient. Sustainable feedstocks available for production of non-land using biofuels, made of waste and residues, are limited and there are other sectors competing for their use. Efforts may be better focussed on disruptive alternative fuels because they can truly help to decarbonise the sector long-term.

In a similar fashion futuristic aviation technologies, whether electric or hydrogen-powered aircraft, are many decades away and the flipside to this is the threat of the re-emergence of supersonic flight with its outsized climate impact. Regardless, aviation emissions have to peak and decline immediately. Technological improvements to future aircraft in the 2030/2040 time frame have already largely been factored into the ICAO CO₂ standard work and reveal no dramatic silver bullets – rather an ever diminishing annual improvement in new aircraft efficiency of about 1% or less is evident.

8 Facilitate passenger charging: VAT / ticket taxes

Numerous options exist to advance the case for better internalisation of external costs of aviation. The Commission should revitalise decision-making on this issue just as the Eurovignette Directive proved instrumental in convincing member states to adopt kilometre charges for lorries.

The Commission and member states should also end years of prevarication and choose to normalise VAT for passenger transport for which the EU 28 exercises a blanket exemption for aviation. The Commission should start by coming forward with a proposal to reform the VAT place of supply rules for passenger transport which are an administrative burden for bus and rail operators and a significant impediment to member states applying VAT to aviation. The VAT liability for passenger transport should be at the point of departure. As high speed rail expands, the distortive impact of aviation's exemption will only grow.

⁷ <https://www.easa.europa.eu/eaer/>

Ticket taxes are an obvious and proven additional element. Every time a member state introduces or considers introducing them, airports and airlines allege unproven competitive issues involving neighbouring airports, threats of industry legal challenges arise and operators laden with state subsidies threaten retaliatory measures. The absence of an individual taxation component – whether with respect to VAT or external costs – is a major failure of the EU’s aviation policy which has fuelled unbridled growth and perversely distorted the intra-EU market in favour of the most carbon intensive mode.

9 ICAO CO₂ metric can incentivise better aircraft

Regulatory action to improve vehicle efficiency is at the heart of transport decarbonisation policies for cars, vans, trucks, and ships. But not yet for aircraft. The aviation industry is 12 years behind the 2020 and 2030 fuel efficiency goals established by ICAO⁸ and ICAO’s CO₂ standard will do nothing to change that. Low fuel prices see operators postponing the purchase of newer, more efficient aircraft while extending the operating life of gas guzzlers. Evidence suggests manufacturers are also postponing investment in the development of greener aircraft.

The only silver lining of the ICAO aircraft CO₂ standard is its associated CO₂ metric: there is now an officially endorsed way to distinguish relatively efficient from inefficient aircraft types. Europe should use it. One way to use the CO₂ metric is as a basis for the en-route charges that countries levy through Eurocontrol, either through a mark-up or through differentiation, just as is currently under consideration for lorries and the Eurovignette. Another way is to use the CO₂ metric as a basis for airport taxes and charges, just like noise and NO_x emissions performance is used by many airports in Europe to manage their noise and air pollution footprints.

10 Strengthen the aviation EU ETS

To ensure fair competition between transport modes, aviation should remain in the ETS post-2020. Just as the US taxes kerosene for domestic aviation and China intends to include domestic aviation in its ETS, the EU has the right to regulate its internal market. Intra-EU sectors should not become subject to the ICAO measure, which will always be lowest common denominator. The ETS needs to be strengthened pre-2020 by enforcing the snap back to original scope to cover all flights in line with Paris calls for urgent pre-2020 ambition. Post-2020 reform should eliminate free allowances, subject the aviation cap to the same linear reduction factor as other sectors and address aviation’s considerable non-CO₂ effects.

11 Curb state aid to aviation

State aid, both operating and investment, to airports and airlines is distorting the internal market and fuelling the growth of the most carbon intensive mode of transport. Its use should be restricted and its very availability reviewed. Subsidies should only be given in the most exceptional cases i.e. where there is a clear need to improve connectivity to remote regions. Public service obligation provisions are designed to do just that. Land grants, low-interest loans and direct grants to airports and operators are among the many forms of inappropriate state aid which distort competition with other modes, exacerbate aviation’s climate effects and do little to improve connectivity as the low-cost carrier experience has clearly shown.

The EU Court of Auditors has graphically documented the scandals and wasted cohesion funding to the sector yet the Commission in its latest Block Exemption Regulation (GBER) proposal⁹ ignores the Court’s recommendations and proposes to loosen controls even further. The GBER proposal should be withdrawn, the Auditors’ recommendations heeded on applying the strictest criteria to aid approvals. The Commission’s 2014 ill-founded decision on granting operating aid rescinded, and a start made on

⁸ <https://www.transportenvironment.org/news/aviation-industry-12-years-2020-fuel-efficiency-target>

⁹ http://ec.europa.eu/competition/consultations/2016_gber_review/index_en.html

rationalising the number of loss-making airports. The European Investment Bank should stop providing subsidies support to this sector. All this will require joined up policymaking lacking at present.

State aid can also play a role in addressing the urgent need to restore the competitiveness of intra-European rail services. Rail operators receive billions while cross border passenger services continue to dwindle and pan-European booking systems which have fuelled aviation's growth are still beyond the rail sector's reach. An effective strategy to address aviation emissions must include reviving passenger rail.

12 Conclusion

Europe has an important role to play in decarbonising aviation in Europe as well as globally; after all it is only because of EU action that ICAO has become engaged. The ICAO result will serve as a bare minimum of action; this note sets out what Europe can and should do in addition. So long as these measures cover all operators using EU airports there will be no distortion. As with safety and security measures, the EU should work with ICAO to set basic global environmental measures and then go beyond with targeted, effective policies at EU level where necessary. The fact that aircraft from the dominant forces in aviation technology - Airbus and Boeing - account for 92% of global aviation CO₂, suggests that the EU (and the US) should be the de facto world standard setters with all the R&D and employment opportunities that come with such a position. But will the Commission have the courage to set the EU on such a leadership course?

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