



FACT SHEET: DELIVERING FUEL EFFICIENCY

In 2009, the aviation industry agreed an ambitious set of goals for addressing climate change by dealing with its carbon emissions. The first goal is to deliver a global average annual fuel efficiency improvement of 1.5%. In other words, the combined fleet of commercial aviation aircraft would improve its fuel efficiency by an average of 1.5% per year through to 2020, with further goals set to cap net CO₂ emissions from 2020 and to halve them by 2050 (based on 2005 levels). This fact sheet outlines how we are meeting the first goal.

» The full set of goals can be found on this web page: www.enviro.aero/climateaction

FUEL EFFICIENCY PERFORMANCE OF COMMERCIAL AVIATION

- Airlines have continued to improve their fuel efficiency performance between 2009-2014, securing an average annual improvement of 2.4% – above the industry goal of 1.5%. The cumulative efficiency improvement between 2009 and 2014 has been 13.6%.
- Since the year 2000, industry fuel efficiency has improved 32.6% and CO₂ tonnes per thousand tonne kilometres performed has improved from 1.35 to 0.91.
- Improved fuel efficiency has been driven by airlines investing over \$1 trillion in 9,074 more efficient new-technology aircraft since 2009; and by improving performance through higher load factors and other operational measures.
- High and volatile fuel costs have also made it economical to retire older aircraft at higher rates further contributing favourably to fuel efficiency performance.
- A current production backlog of over 14,000¹ new technology aircraft from the major manufacturers will be entering the global fleet over the next few years, suggesting continuing improvements in fleet efficiency.
- Weight-based load factors improved by nearly five percentage points moving from 62.1% in 2008 to 67% in 2014, as airlines continued to make better use of space available on aircraft.

	ACTUAL <i>(ICAO, IEA, IATA - available 22 months after year end)</i>						ESTIMATE <i>(IATA, ICAO)</i>						
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Revenue tonne-kilometres performed <i>(billions)</i>	633	606	678	711	736	767	811	-	-	-	-	-	-
Commercial aviation CO ₂ <i>(million tonnes)</i>	669	634	665	685	693	709	739	-	-	-	-	-	-
Fuel efficiency <i>(CO₂ tonnes per thousand TKP)</i>	1.06	1.05	0.98	0.96	0.94	0.92	0.91	-	-	-	-	-	-
Rate of fuel efficiency improvement <i>(% change over previous period)</i>		0.9%	6.1%	2.0%	2.2%	1.8%	1.4%	-	-	-	-	-	-
Rolling average fuel efficiency improvement <i>(compound improvement % per annum 2009-14)</i>							2.4%	-	-	-	-	-	-

COMMENTARY

- The significant 2010 fuel efficiency improvement number was driven by a rebound in traffic and a large jump in weight load factor performance, with improved load factors on both the passenger and cargo side.

KEY INPUTS USED TO ASSESS FUEL EFFICIENCY PERFORMANCE

- IEA data² on jet fuel uplift is used to determine global jet fuel uplift. The IEA data is only available -18-22 months after the year ends. This is adjusted to remove military and general aviation fuel use, leaving commercial aviation only. Apportionment of jet fuel uplifted to commercial aviation is based on several industry level assessments on the types of aviation activity, sources include:
 - › Scheduled and charter – sourced from the UN IPCC 4th Assessment Report WG 3 and Allocation of International Emissions from Scheduled Air Traffic³
 - › General aviation – Boeing and NASA studies Matlock and Alsyne
 - › Military aviation – Estimates based on AERO2K exercise⁴
 - › The above assessments are combined with bottom-up modelling of commercial aviation to take an informed view of the respective share of the fuel used under each category
- ICAO data on historical traffic performance⁵
- IATA industry-level data on traffic performance for 2014 is sourced from IATA Statistics and internal airline reporting is used to estimate 2014 industry fuel efficiency performance. IATA estimates for other industry related activity is used to scale up ICAO reported traffic data.

1. A combination of backlogs as of end 2015.
2. Data from the International Energy Agency database: <http://www.iea.org>
3. <http://bitly.com/1yz3oCO>
4. <http://bit.ly/1uhXxf>
5. <http://bit.ly/1DTWJaX>