

Reducing Our Impact on the Environment

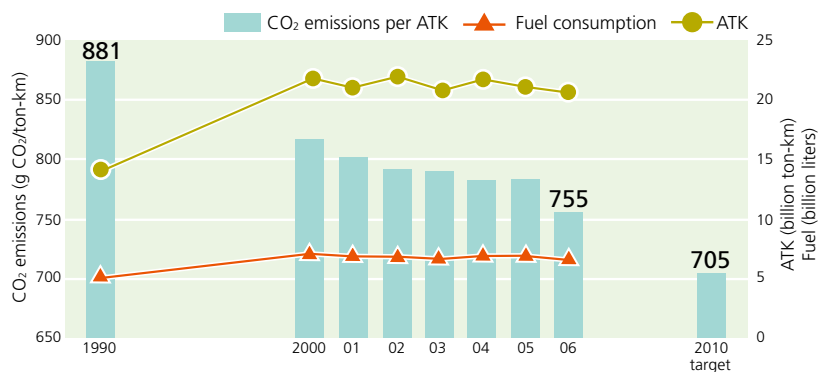
Air Transport and Global Warming



Aircraft engines run on fossil fuels, which generate carbon dioxide. CO₂ is the most prominent of the greenhouse gases, which are believed to be the cause of global warming. The amount of CO₂ emitted is approximately proportionate to the amount of fuel consumed. The JAL Group is targeting fuel-consumption cuts of 20% of the transported capacity by 2010 compared with 1990 levels. In line with this, we are adopting various measures to reduce fuel consumption.

The following graph shows changes in estimated emissions per available ton-kilometer (ATK) for the commercial operation of JAL Group aircraft. Total CO₂ emissions in fiscal 2006 were 15.8 million tons, down 6.5% from the previous fiscal year. This reduction of 1.09 million tons is the equivalent to the CO₂ annually absorbed by 77.9 million Japanese cedars.

CO₂ Emissions per ATK



Fuel Consumption

It is possible to reduce fuel consumption, and by extension CO₂ emissions, by lightening the overall weight of the aircraft. For example, by reducing the weight of each aircraft by 1 kg it is possible to cut CO₂ emissions throughout the entire JAL Group by approximately 76 tons per year. That is the equivalent of the annual amount of CO₂ absorbed by 5,400 Japanese cedars. The JAL Group is also engaged in the following measures to reduce fuel consumption.



Lighter Tableware

In 2004, the company introduced lightweight porcelain tableware, which is approximately 20% lighter, for the meal service in First and Business classes. Also, by streamlining our spoons and forks we have managed to reduce weight by 2 grams per unit. We intend to increase our use of lightweight porcelain.

Cargo-Container Weight

JAL cargo containers have hitherto all been made of aluminum alloy, but in fiscal 2007 we started using Twintex — a new material made of glass and polypropylene fibers — in the side panels of the containers. As a result, we have achieved weight reductions of 26 kg per unit. We plan to steadily update our multipurpose containers on international routes with this material.

Onboard Drinking Water

The water tank in the cargo compartment used to be topped up before each flight. However, checks revealed that most flights arrive at their destination with a substantial amount of water still onboard. Consequently, we have adjusted the amount of water loaded on each aircraft to more appropriate levels. As a result, we have achieved weight savings of up to 400 kg on 747-400s and 300 kg on 777s.

Fuel Measures

To work towards greater fuel efficiency, the amount of fuel onboard has to be accurately measured. At one time, fuel was loaded onto JAL planes in units of 1,000 pounds (around 450 kg), but we decided to modify this to 100-pound units. As a result, more precise measures of the amount of fuel required for safe arrival at each destination have allowed us to achieve weight savings of up to 900 pounds (approximately 400 kg) per flight.

Aircraft Center of Gravity

Passenger seating and the positioning of loaded cargo affect the aircraft's center of gravity. Failure to maintain passenger and cargo positions within appropriate ranges can lead to a loss of balance and cause problems with flight operations. As a result, specialized staff are employed at each airport to calculate the center of gravity for every flight and determine the optimum positioning of cargo in the compartment. Generally speaking, within the permissible range allowed, the further back in the aircraft the center of gravity, the lower the drag on the horizontal stabilizer and the greater the fuel efficiency. When deciding on cargo positioning, JAL Group airport staff go to great lengths to ensure that fuel efficiency is maximized for each flight.



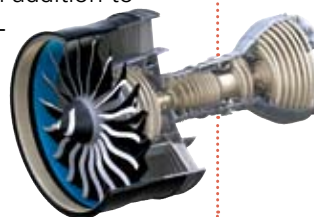
New lightweight containers



787 aircraft

New Engines on 787s

The JAL Group will introduce 787s to its fleet in fiscal 2008. These aircraft use next-generation GEnx engines (developed by General Electric), which employ composite materials to reduce weight. In addition to superior fuel efficiency and lower noise levels, GEnx engines also feature an environment-friendly design that allows for major reductions in CO₂ and NO_x emissions. By updating our medium-sized aircraft with 787s running GEnx engines, we expect to see CO₂ emissions reduced by 2,500 tons per aircraft per annum.



Air and Water Pollution

Managing Chemical Usage

The JAL Group uses over 2,400 chemicals in aircraft materials, paints and hydraulic oil. We are cooperating with aircraft manufacturers and maintenance contractors in an effort to shift to alternative, environment-friendly products. Aircraft used by the JAL Group are repainted approximately every five and a half years. To remove old paint from aircraft, we have introduced stripping agents that do not contain methylene chloride or volatile organic solvents and permit relatively easy disposal. The company is introducing chrome-free primer and uses top-coat paint with a low volatile-solvent content. In addition, by using a technology known as electrostatic spray painting, it has become possible to paint an aircraft using 20% to 30% less paint than before.

Anti-ice and De-icing Fluid

The amount of anti-ice and de-icing fluid (principal ingredient, propylene glycol) used to free aircraft of snow and ice in winter varies with the climate and amount of snow. Propylene glycol is also used as a food additive and thickening agent, and there are fears it may be a factor in causing an overabundance of nutrients when released into lakes and rivers. The JAL Group is introducing more efficient equipment that reduces the amount of fluid used in anti-ice and de-icing operations.

Use of Anti-ice and De-icing Fluid

(Unit: kl)

Airport	Fiscal 2005	Fiscal 2006
New Chitose	727	495
Aomori	359	244
Other airports	1,363	423
Total	2,449	1,162



Other Environment-Conservation Activities

Information related to other activities, including waste materials and noise control, is posted on our website. Please see <<http://www.jal.com/en/environment>>.

