“We all know that aviation has some serious environmental impacts - particularly on our climate. Although there’s no prospect of a 100% sustainable aeroplane taxiing down the runway any time soon, that’s not a call for complacency. There’s huge potential to take action now to at least reduce aviation’s impact and increase the chance that, one day, it might approach sustainability. I’m encouraged that Virgin is both being frank about the problems - and engaged with the solutions.”

Martin Wright
Editor in Chief at Green Futures
Modern aviation has changed the way we live, making the world a much smaller place. We now have a greater understanding of other civilisations and in many cases our cultures have started to merge. Air travel is much faster and more reliable than other modes of transport over large distances. Travelling is now a reality and an achievable goal for many people who could never have afforded it before. We are proud to have been in aviation for 26 years and believe in a sustainable future for the industry.

We believe in the positive contribution global travel makes to the world. Flying is crucial to the global economy and central to many people’s lifestyles – it links families, communities and businesses resulting in vibrant and successful cultures and economies.

Aviation also has negative impacts. It produces a significant contribution to man-made carbon dioxide (CO₂) emissions. It is central to the climate change debate as it is one of the fastest growing contributors of greenhouse gases (GHGs) and is forecasted to continue growing for the next thirty years. The aviation industry recognises its environmental impacts and is working to minimise them while maintaining and enhancing the benefits it can bring to economies and societies. The industry’s first step towards a carbon-free future is to work towards carbon neutral growth – meaning that any growth above the baseline will be matched by equivalent reductions in other sectors.

Aviation represents by far the biggest environmental impact of all the Virgin businesses. Climate change is therefore top of the agenda for both the Virgin Group and Virgin branded airlines and we are committed to preventing runaway climate change. We won’t hide from the difficult arguments surrounding aviation and the environment, in fact, we want to be right at their heart, pushing our industry, our suppliers, and our regulators to be bolder and to help make flying a more sustainable way to travel. Air travel is not about to disappear, particularly in the developing world. Airlines, such as Air Asia X (part owned by Virgin) are growing rapidly and giving more and more people and businesses access to an increasing number of destinations and markets.

Aviation’s global economic impact is estimated to be 7.5% of world GDP.


As the Virgin Group owns a stake in many airlines around the world, it is now possible to circumnavigate the world on a Virgin plane. We own stakes in eight airlines, Virgin Atlantic, Virgin America, Brussels Airlines, Air Asia X and the Virgin Blue Airlines Group (Virgin Blue, Virgin Australia, Pacific Blue and Polynesian Blue) as well as being involved with private planes.

Global CO₂ emissions from aviation are equivalent to about 1.9 - 2.4% of total global CO₂ emissions

Source: Committee on Climate Change. International Aviation

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4. “Virgin Airlines” refers to all airlines owned by Virgin or branded with the Virgin name.
The UK Industry Taskforce on Peak Oil and Energy Security (ITPOES) is a group of British companies concerned that threats to energy security are not receiving the attention they merit. It has produced two reports that can be read at: peakoiltaskforce.net

We at Virgin believe that the Virgin airlines can have a positive influence on this movement. Although we represent a small part of the aviation industry we have a high profile and a loud voice, which we are using to push the debate forwards. That is why:

- we were the first carriers to call for global legislation on airline CO2 emissions
- Virgin Atlantic was the first to fly on renewable fuels
- Virgin Atlantic was a founding member of the Aviation Global Deal Group and the Sustainable Aviation Fuel Users Group
- the Virgin Group participates in the UK Industry Taskforce on Peak Oil & Energy Security
- Virgin Blue was the first airline to offer an airline run offset programme
- Virgin America was the first commercial passenger airline to join the US Environmental Protection Agency’s Climate Leaders programme, and the first US airline to document its carbon footprint via internationally-accepted standards on The Climate Registry
- we have produced a paper “Aviation in a Low Carbon World” which outlines our thoughts on the subject. To read the report visit http://www.virgin.com/people-and-planet.

Aviation accounts for 7 out of the 8 million tonnes of CO2 emissions emitted annually by the virgin Group.

Virgin Blue’s carbon offset launch 2007.

Holding the globe is (from left to right) Malcolm Turnbull (the Australian Environment Minister in 2007) and Brett Godfrey (CEO Virgin Blue)

The milestone of one million guest seats offset was reached in July 2009.

Virgin Blue passenger who offset the millionth seat receiving a memento from Professor Tim Flannery.

18
Emissions

Carbon Dioxide emissions from aviation represent over 90% of the Virgin Group’s entire carbon footprint making it our top priority. The Virgin branded airlines are committed to reducing emissions per passenger through a number of efficiency measures including the adoption of new technologies and by investing in new ultra-efficient aircraft.

Airlines have two sources of CO2 emissions: those from the tailpipe of the aeroplane and those from the ground facilities. As the tailpipe emissions account for around 99% of the total, that is where the airlines’ main focus lies:

• Virgin Blue has already achieved a 10% decrease in emissions per passenger on board due to investment in new aircraft.
• Virgin Atlantic has set a target of reducing the carbon emitted per passenger kilometre by 30% between 2007 and 2020.
• Virgin America operates a fleet that is up to 25% more fuel efficient than other fleets in the US.

Our major airlines also offer Gold Standard for their carbon offsetting:

• Virgin Atlantic = My Climate
• Virgin Blue = Australian Government’s Greenhouse Friendly™ Program
• Virgin America = Carbonfund.org.

Although all the Virgin airlines are working hard to reduce the emissions per passenger, total emissions will continue to grow in the short to medium term in line with business growth. Virgin Atlantic predicts that its emissions will peak within the next decade owing to efficiency gains outstripping the airline’s growth.

Global Policy

We believe it is critical for governments to agree a global framework for CO2 emissions reductions from aviation: a framework that is both environmentally effective and economically efficient.

Emissions from international aviation are not currently included in the Kyoto Protocol but the Virgin airlines, along with their industry peers, have united behind the principle of a global framework specifically for the sector.

The Virgin airlines believe that a successful global climate change framework for the industry should be based on the following key principles:

• first and foremost, any system needs to be environmentally effective. It must impose a robust cap on overall emissions and truly allow aviation to play its part in meeting global greenhouse gas reduction targets.
• it must be mandatory, applying fairly to all airlines based on their emissions and establishing a sectoral approach that sets out specific targets for aviation whilst allowing airlines to access cost effective emissions reductions from other sectors through the carbon markets.
• it needs to minimise the risk of competitive distortion.
• it needs to avoid unintended negative consequences such as carbon leakage, whilst upholding the central pillar of the UNFCCC of “common but differentiated responsibility” - where developed countries bear a greater burden of responsibility for emissions reductions as they have benefited from carbon intensive industries for much longer than developing economies.

Virgin Blue and Virgin Atlantic are members of the Aviation Global Deal Group (AGD Group), a group that came together to think about practical solutions for how aviation emissions could be included in such a framework. The AGD Group’s policy mechanism, which we have proposed as one of the ways in which aviation can be brought into a global framework, recommends that this common but differentiated responsibility is achieved by distributing revenues generated by a sector-wide cap and trade scheme.

We believe a proportion of aviation’s carbon allowances should be auctioned, with the proceeds going to climate change related projects in the developing world.

The Virgin airlines support the principle of carbon cap and trade as the most effective way of maintaining a robust cap on CO2 emissions whilst also allowing the market to decide the most effective way to achieve the necessary emissions reductions.

However, there is a concern that domestic or regional schemes cannot be truly effective for an international industry such as aviation. It would make sense to develop a global scheme for the sector, thus minimising competitive inequalities between different carriers and imposing a much more meaningful absolute cap on carbon emissions worldwide.
This innovative study brings together airlines, defence and research organisations, governments and fuel providers to identify opportunities and barriers to achieving a predetermined sustainable fuel mix by 2025. (An Australasian Region SAFUG Initiative).

Peak Oil is the point at which the depletion of existing reserves can no longer be replaced by additions of new flow capacity— in other words it is the point at which the world peaks in oil production. Up until now we have always had more oil to use than there was in the previous year. However as oil is a finite resource this cannot continue indefinitely. Once oil production peaks the world will have to start to use less oil each year due to dwindling supply which will lead to an increase in the price of oil.

Source: The UK Industry Taskforce on Peak Oil & Energy Security. The Oil Crunch: Securing the UK’s energy future. (This report was part funded by the Virgin Group).

The era of ‘cheap oil’ is coming to a close and peak oil is fast approaching as extraction and refining become increasingly difficult and more environmentally damaging and energy intensive. Oil is a finite resource and technological advancements can only go so far. We need to look for alternative aviation fuels, not only because of the urgency arising from climate change, but simply because we are running out. Along with other stakeholders, the Virgin airlines are championing the development of fuels based on second generation biofuels that are harvested from sustainable sources in order to reduce the sector’s dependence on declining oil supplies and reduce its carbon footprint.

However, the sustainability debate surrounding biofuels is extremely complex and biofuel production has been associated with a swathe of unintended consequences including; the link between biofuel production and increases in food prices, the loss of natural habitats and the fact that many are so fossil fuel intensive in their production, that they may have no carbon benefit at all! Although many biofuels have been made unsustainably and inefficiently in the past, we believe they have the potential to become sustainable and efficient in the future.

Any large scale move towards biofuels would occur incrementally over time. Blends of biofuel and conventional kerosene would be introduced, and then over time the proportion of biofuel will be increased. However, even with low percentage blends, the sheer quantities of biomass required to produce sufficient fuel for aviation would be colossal. Even with the sustainability issues overcome, biofuels are not yet being produced on a viable scale, although this emerging sector is growing fast.

Second and third generation biofuels do not use food products as their feedstocks. These biofuels would be made from waste biomass or plants such as algae and salt water tolerant halophytes and could be commercially viable in sufficient quantities for the aviation industry to use within the next five years. Virgin Atlantic anticipates that up to 5% of its fuel will come from sustainable biofuels by 2015 and Virgin Atlantic along with Virgin Blue and Virgin America aspire to a 10% biofuels mix by 2020.

What Virgin is doing with regards to biofuels:

• Virgin Atlantic was the first commercial airline to use biofuel in a demonstration flight
• the Virgin Group, through the Virgin Green Fund, is investing in research and development of emerging fuels (for more information on the Virgin Green Fund go to page 49)
• Virgin supports the Roundtable on Sustainable Biofuels
• Virgin Atlantic was a founder member of the Sustainable Aviation Fuel Users Group (SAFUG)
• Virgin Blue under the SAFUG banner, is working with other regional members to commission a roadmap for the commercialisation of sustainable aviation fuels in Australia and New Zealand.
Roundtable on Sustainable Biofuels is an international multi-stakeholder body which is creating standards and audit protocols to make it possible through independent third party certification to identify biofuels that come from sustainable sources. Third party certification ensures that new supply chains develop to high environmental and social standards, so that concerns about competition with land for food cultivation, deforestation and relative life-cycle carbon footprints can be addressed and reconciled early on (read more on the RSB on page 37 or on their website at: www.rsb.org).

What is Emissions Trading?

Emission Trading Scheme (ETS) means that a robust cap is imposed on carbon dioxide emissions from different polluting industries. Carbon allowances are issued to participating companies up to the level of the cap. At the end of the year each company has to have sufficient allowances to cover each tonne of CO2 they’ve emitted during the year. Because the ETS is designed to encourage lower carbon behaviour by companies, airlines won’t be given sufficient allowances to cover their activities and will have to purchase these from other industries who have been able to reduce their emissions more quickly. The European Union Emission Trading Scheme is going to include aviation and will come into effect in 2012.

The Sustainable Aviation Fuel Users Group is an initiative to promote sustainable, second-generation biofuels for the aviation industry.

Virgin Atlantic made a declaration, along with other airlines, of its commitment to advance the development, certification, and commercial use of drop-in sustainable aviation fuels that do not compete with food cultivation for land or water. These have lower life-cycle carbon footprints than traditional jet fuel, do not lead to deforestation or the loss of high value, endangered or sensitive ecosystems and retain socioeconomic benefits in the communities in which they are cultivated.

(www.safug.org)

On 24 February 2008, Virgin Atlantic became the first airline in the world to operate a commercial aircraft on a biofuel blend. The Boeing 747 flew a short flight from London to Amsterdam, using a 20% biofuel 80% kerosene blend in one of its four engines.

The purpose of the demonstration flight was to move the debate forward by proving that biofuels are technically a feasible solution. Virgin Atlantic knew that the biofuel used for its test flight would not be commercially viable for the industry, but wanted to demonstrate that biofuels could be a future solution for the industry.

What is Carbon Leakage?

Carbon Leakage is where an increase in emissions occurs outside a region due to a policy to cap emissions in that region. With the inclusion of aviation within the European Union Emission Trading Scheme (EU-ETS) there is a risk that carriers will move activities outside the EU to avoid the EU-ETS costs or that increased costs will lead to loss of market share with demand shifting to non-EU-ETS affected carriers. This would result in no overall reduction in global carbon emissions as the emissions would simply be shifted to other markets and regions. This is one of the reasons why we support a global sectoral approach for aviation and believe a worldwide solution is needed for what is a worldwide problem.
**Operational efficiencies**

All airlines need to invest in modern fleets that operate as efficiently as possible and are backed up by low carbon ground support systems. But airlines are only one of the many stakeholders in the aviation industry and so it’s fundamental that the entire sector works together. The speed at which the aviation industry can reduce its emissions is mainly reliant on manufacturers to deliver technological step changes in aircraft and engine design, the availability of sustainable low carbon fuels and also improved air traffic control measures to ensure more efficient use of airspace.

**What the Virgin airlines are doing on energy efficiency:**

- developing and implementing operational best practices to reduce CO₂ and NOX* emissions
- lobbying governments and air navigation service providers for more efficient airspace routings
- utilising a young, advanced fleet of fuel efficient aircraft

Since aviation can have a impact on communities that are local to airports, our airlines have initiatives at airports around the world which directly benefit local communities. For example:

- the total noise output of Virgin Atlantic’s fleet has been reduced since 2001/2 despite an increase in fleet size
- improving the availability and reliability of electricity supply for ground operations at airports around the world will reduce emissions and improve local air quality
- Virgin Blue has invested in a young fleet of aircraft which has a reduced noise footprint.

**Virgin Atlantic target:**

To reduce energy consumption at all the UK sites that it controls by 10% by 2012 and 20% by 2020.

**Virgin Atlantic target:**

A 30% reduction in the carbon intensity of each passenger and cargo kilometre flown between 2007 and 2020.

*Virgin Blue has a Fuel and Emissions Management Team that examines every aspect of flight operations to continuously improve efficiency. Recent initiatives include installing winglets on the 737NG fleet as well as applying a coating to the aircraft that reduces drag and therefore emissions

*Virgin America utilises advanced avionics to fly more efficiently, and cost index flying which is the practice of regulating cruising speeds to reduce fuel burn

*Virgin Atlantic’s Fuel and Weight Savings Group champions new best practice and efficiency measures.

16. Nitrous Oxide
Working with communities

Each year, Virgin Atlantic, Virgin Unite and Virgin Holidays, along with the support of their passengers and staff, collectively invest millions of pounds in community projects within the destinations they travel to and work in. Under the Change is in the Air programme, Virgin Atlantic and its passengers will be supporting two organisations, The Travel Foundation and Free the Children, which both work towards sustainable futures for young people in its destinations.

Virgin Blue’s “Red Jet” charity foundation is currently focusing on “Indigenous Communities and Natural Environments” in Australia. The foundation has provided assistance to several projects including a residential energy efficiency programme in Alice Springs and a savannah fire management project in Arnhem Land.

Virgin America works with the California State Parks Foundation and selects California-based carbon offset projects via its partnership with Carbonfund.org. Virgin America also hosts regular e-waste collection events to clean-up local beaches and parks.

Sustainable tourism

Aviation has played a key role in expanding tourism, which has in turn boosted air travel. Over 40% of international tourists now travel by plane\(^{17}\) and in the UK growth in air travel is being driven by an increase in international leisure flights\(^{16}\).

Tourism can be a catalyst for positive social and economic development, but it is becoming increasingly evident that some aspects of tourism are currently unsustainable\(^{18}\). The Virgin airlines, along with Virgin Holidays and Virgin Limited Edition, are working towards gaining a greater understand of their impacts and promoting sustainable tourism. To find out more go to ‘We’re all going on a Summer Holiday’ on page 24.

\(\text{There are now five holiday flights to every business flight made overseas by a UK resident.}\)


\(\text{Air tourism accounts for 8 million direct jobs and 18 million indirect jobs as well as $396 billion US in global GDP.}\)


\(^{18}\) Cairns, S., Newson, C., Boardman, B. and Anable, J. Predict and decide Aviation, climate change and UK policy. Environmental Change Institute Oxford University.