



**Climate Change Summit
25 July, 2007**

Brett Godfrey, CEO Virgin Blue



A “polluter’s” perspective

- Easiest decision in 7 years
- Responsibility of all – Governments Business and Citizens
- Intergovernmental Panel on Climate Change (IPCC)
- 2000 scientists can’t be wrong
- 1 tonne of CO₂ is emitted for approx every 394 kg of jet fuel burnt.
- 1.6 million tonnes was emitted by the Virgin Blue Airlines in 2006
- Virgin Blue team enthusiastic about best practice



Australian Business Roundtable



- ACF Invested two key pieces of research – CSIRO & Allens
- Reducing year 2000 emissions by 60% by 2050 is achievable while still maintaining strong economic growth
- Cost of early action is reasonable
- Average GDP to 2050 would reduce from 2.2% to 2.1%.
- Nine year “delayed action scenario” would have considerably higher costs in terms of environmental damage and economic impact.



Business Sector response

- Corporate responsibility & Commercial Opportunity
- Profitability aims of the business sector may be a key driver in rejuvenating the planet.
- The development of cleaner energy means new technology and new technology to companies, means...



Investment in Bio-fuels and low-carbon technologies rose to USD \$71 billion, up 140% in just two years

The Economist.



Aviation Industry



- Aviation represents 8% of global economic activity
- Aviation contributes 2% of worldwide greenhouse gas emissions
- IATA predicts will grow to 3% by 2050 taking into account expected strong growth
- Closer to home the transport sector including road, rail and commercial aviation comprises 15% of Australia's CO₂ emissions.
- Aviation accounts for 1% of Australia's greenhouse gas emissions

What have we achieved

- New aircraft are 70% more fuel efficient than 40 years ago and 20% better than 10 years ago.
- Airlines are aiming for a further 25% fuel efficiency improvement by 2020.
- Modern aircraft achieve fuel efficiencies of 3.5 litres per 100 passenger km. The A380 and B787 are aiming for 3 litres per 100 passenger km – better than a compact car!



Virgin Blue Environment Initiatives

- 'Sustainable Aviation' strategy
- Fuel Management Group
- Flight path and fuel efficiencies
- Carbon Offset programme introduced in Australia & New Zealand
- Permagard waterless aircraft cleaning
- Australian Greenhouse Challenge Plus programme
- Report our footprint annually
- Working with Green Cross, ACF, TTF



Waterless aircraft cleaning



- World's first Govt certified carbon offset program, March, 2007
- New Zealand's first airline carbon offset programme, June, 2007
- Guests can opt to fly carbon neutral for as little as \$1 per sector
- Not for profit
- Funds to Govt approved abatement projects – forestry activities, energy efficiency measures, waste diversion, recycling, generation of renewable energy
- Australian projects certified by Australian Greenhouse Office
- NZ projects approved by Ministry for the Environment
- VB - additional \$2.5m commitment re to abate staff duty travel



Virgin Group \$25m Earth Challenge

- The Virgin Earth Challenge
- A \$25 million award to the individual or group able to demonstrate a commercially viable design which will result in the net removal of greenhouse gases from Earth's atmosphere





Virgin Group USD\$3 Billion pledge



- Sir Richard Branson pledge to commit his share of profits from Virgin transportation businesses over the next 10 years – an estimated USD\$3 billion to efforts to find renewable, sustainable energy sources.
- Cilion Inc in California, to build and operate 9 ethanol plants by 2009.



Alternative Aviation Fuels

- Fuel accounts for about 30 percent of the total global airline industry's operating costs, compared with just 10 percent 5 years ago.
- Six types of fuel in use or being tested for use in aviation:
 - ✓ Aviation Kerosene made from crude petroleum sources and established refining processes.
 - ✓ Synthetic Fuel - aviation kerosene from Fisher-Tropsch synthesis
 - ✓ NESTE - Hydrogenated oils
 - ✓ Bio-Fuels - Kerosene plus bio-derived Fatty Acid Methyl Esters (FAME)
 - ✓ Bio-Ethanol/Methanol - bio-derived alcohol or neat alcohol
 - ✓ Liquefied Gases – natural gas (LNG), methane, hydrogen etc

Bio Fuels

- Pioneering work is occurring on bio-fuels, hydrogen aircraft fuel mixes
- Dual fuel certification granted by the Federal Aviation Administration (FAA) in 2000 to fly on both Avgas and ethanol.
- In Brazil Embraer company received the world's first certification for a production aircraft for the use of 100 percent ethanol in March, 2005.
- In December 2006 FAA released the findings of its own first extensive testing of ethanol in an aviation engine





The Ipanema 100% ethanol



Aircraft and Engine Manufacturers

- Boeing and Airbus are working with engine makers
- Airbus is increasing its R & D budget materially.
- Virgin Blue is working directly with Boeing on the next 737 replacement design including fuel/environmental factors
- Within 5 years, there will be a step change





The “Orion HALL”

Wing span 132 ft / 40.2 M

Length 57 ft / 17.4 M

Height 21 ft / 6.4 M

GTOW 7000 lbs / 3175 kg

Payload 400 lbs / 181 kg

Endurance at 65,000 ft (19.8 km) 100 hours

Endurance at 45,000 ft (13.7 km) 160 hours





Boeing will be the 1st to demonstrate fuel cell powered manned flight

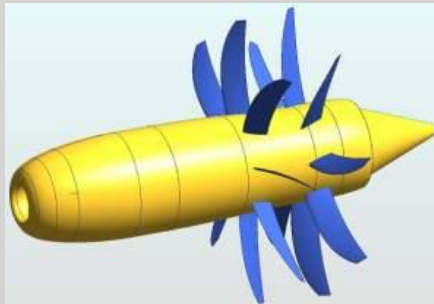
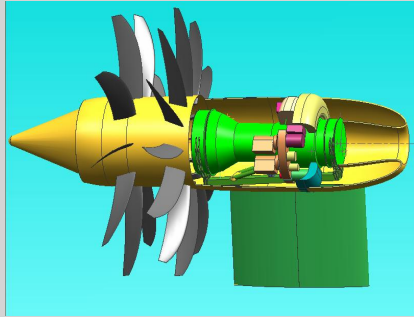


- *Chemical Reaction Provides Electric Power*

- *Primary Emission is Water*



Aircraft & Engine Design



easyJet's "ecoJet" design includes rear-mounted "open-rotor" engines with higher propulsive efficiency

Air Traffic Management

- IPCC estimates that 12% of the greenhouse gas emissions of airlines are attributable to inefficient air traffic management globally.
- around 73 million tonnes of co2 annually due to air traffic management limitations
- More direct air routes and shorter flight durations are improvements that must be closely examined



The Space Race all over again?

- Look at what the 18 year space race (1957-1975) between the United States and the USSR achieved
- A legacy of advancements way beyond rocketry, physics and astronomy:
 - Forest defoliation studies
 - Home economics
 - Weather data collection
 - Human movements
 - Medicine
 - Education.



Where to from here?

- Like Virgin Blue, companies must determine their strategies and contribution
- Like aviation, industries need develop collective approach to issues
- Governments need adopt a bi-partisan approach
- Australia needs a national or participation in a regional carbon trading scheme
- Australia needs clearly defined, nationally recognised, long term goal
- Plus measurable and achievable interim targets
- We propose business and Government work together on tax credits and other fiscal incentives to unlock private enterprise investment in R&D
- Less talk, much more measurable and accountable action...



