



australian network of environmental defender's offices

Submission on the National Aviation Policy Statement Issues Paper

June 2008

The Australian Network of Environmental Defender's Offices (ANEDO) consists of nine independently constituted and managed community environmental law centres located in each State and Territory of Australia.

Each EDO is dedicated to protecting the environment in the public interest. EDOs provide legal representation and advice, take an active role in environmental law reform and policy formulation, and offer a significant education program designed to facilitate public participation in environmental decision making.

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Executive Summary

The Australian Network of Environmental Defender's Offices Inc (ANEDO) is a network of 9 community legal centres in each state and territory, specialising in public interest environmental law and policy. ANEDO welcomes the opportunity to provide comment on the *National Aviation Policy Statement Issues Paper*. ANEDO has commented extensively on the regulatory context of climate change.¹

This submission focuses on Part 4.1 of the issues Paper: “Aviation and climate change”, and does not comment on the broader issues discussed in the paper, such as safety, security of the aviation industry.

Aviation is a significant contributor to greenhouse gas emissions - on both a global and domestic scale - responsible for up to 9% of total emissions. Furthermore, demand is projected to increase significantly over the next 50 years. Hence, there is a clear impetus for sectoral change.

Our key recommendations are:

- The Australian Government must introduce regulatory and non-regulatory mechanisms to reduce aviation emissions;
- Offset schemes should be limited in use. Offsets should be limited to projects that are verifiable, permanent and ecologically sustainable, to ensure genuine accounting of emissions;
- Federal Government guidelines that codify strict offsetting standards should be introduced. This will ensure that only genuine offsets are used and will also improve consumer confidence;
- Mitigation measures, such as demand side management, should be the primary focus of government funding and industry action. Demand management initiatives include the introduction of a flat-rate greenhouse charge on domestic flights and a kerosene tax, both of which will increase costs for consumers and reduce demand;
- The Federal Government should provide funding and facilitate research into alternative fuels, improved operating procedures, advances in fuel efficiency and research into engineering options
- The Federal Government should investigate viable surface-based transport options to reduce demand for air travel. Potential proposals include high speed rail links between Sydney, Canberra, Melbourne and Brisbane;
- Lifestyle and business operational changes should be incentivised to encourage more passenger and freight traffic to use existing ground transport systems and to provide a business justification for upgrading ground transportation;

¹ See www.edo.org.au for previous submissions.

- Comprehensive environmental assessment of all airport expansions and new airports, should include comprehensive evaluation of greenhouse impacts;
- Aviation should be included in an Australian emissions trading scheme, encapsulating all emissions on international and domestic flights that originate in Australia. No compensation should be provided to the aviation industry as a result of its inclusion in the scheme.

This submission makes comment on the following topics:

1. Aviation and climate change
2. Offset schemes
3. Demand side management
4. Mitigation measures
5. Aviation and emissions trading

Introduction

Recent studies show that the most current IPCC report has in some respects underestimated the potential implications of climate change.² Furthermore, the Garnaut Review Discussion Paper recognises that Australia must take action to reduce its greenhouse gas emissions *now*.³ Thus, delaying action now will result in more dramatic changes being required in future. ANEDO therefore supports a swift government response to climate change, covering all potential emission sources.

It is clear that sectoral change must constitute a fundamental element of Australia's response to climate change. That is, various industries and sectors of the Australian economy, including aviation, must progressively adapt to a carbon-constrained future. In this context, ANEDO supports the use of regulation and other mechanisms for the aviation industry to ensure that it takes concerted efforts to reduce its carbon footprint, especially in light of the exponential growth in demand that is forecast for commercial aviation.

1. Aviation and Climate Change

Aviation has remained low on the radar of climate policy due to an erroneous presumption that the aviation industry is only a small contributor to overall emissions levels. Because of this, little regard has been shown for the greenhouse impacts of aviation by policy makers. In fact, aviation policy in Australia, both federally and at a state level, actively promotes the *expansion* of airports and the

² Stefan Rahmstorf *et al*, (2007) "Recent Climate Observations Compared to Projections" 416 *Science* 709.

³ See Garnaut Review Discussion Paper found here:

[http://www.garnautreview.org.au/CA25734E0016A131/WebObj/D0836448ETSpaper-FINAL-fullcolour/\\$File/D08%2036448%20%20ETS%20paper%20-%20FINAL%20-%20full%20colour.pdf](http://www.garnautreview.org.au/CA25734E0016A131/WebObj/D0836448ETSpaper-FINAL-fullcolour/$File/D08%2036448%20%20ETS%20paper%20-%20FINAL%20-%20full%20colour.pdf)

aviation industry.⁴ This contrasts with US government policy, where the expansion plans of 9 major airports have been halted because of local concerns about the emissions from airplanes.⁵

The Australian policy position stems from the widely held view that aviation emissions account for only 2 or 3 per cent of world emissions.⁶ However, this figure is questioned by several commentators, as it does not paint an accurate picture of the true contribution of aviation to climate change.⁷ This is because the 2% figure that is most quoted is the aviation sector's contribution to the share of *carbon dioxide* emissions. The figure does not include the significant *non-CO2 emissions* associated with aviation, such as nitrogen oxides, sulphur oxides, soot particles, and water vapour that are emitted directly into the upper atmosphere, which have additional warming effects. As a result, the IPCC has estimated that the true magnitude of aviation's contribution to climate change is 2.7 times larger than the effects related to CO2 emissions alone.⁸ Moreover, aviation is between two and ten times more climate-intensive than surface transport.⁹ Studies have also shown that the release of greenhouse gases at higher altitudes can actually magnify warming impacts of the climate.¹⁰ Hence, when these factors are taken into account, aviation's contribution to global greenhouse gas emissions is likely to be in the order of 4 to 9%.¹¹

ANEDO further notes that industry figures predict a rapid rise of emissions from aviation up to 2025.¹² Indeed, demand for air travel has grown at an average rate of 9% per year since 1960 and at approx 4.5% per year over the last decade.¹³ Future growth will average 5% annually through at least 2015.¹⁴ In our local region, the International Civil Aviation Organisation (ICAO) has projected that Asia-Pacific

⁴ For example, there are currently plans underfoot to expand Canberra Airport. Also, significant speculation of a second airport for Sydney has been occurring for some time.

⁵ National Aeronautic and Space Administration Centre, *Safeguarding our atmosphere*. Found at: <http://www.nasa.gov/centers/glenn/about/fs10grc.html>

⁶ The Issues Paper itself states that aviation accounts for only 2 per cent of global emissions.

⁷ Climate Action Network Europe, (2006) "Clearing the Air – The myth and reality of aviation and climate change" at 6.

⁸ Intergovernmental Panel on Climate Change (1999), *Special Report on Aviation and the Global Atmosphere*. Found at: <http://www.grida.no/Climate/ipcc/aviation/index.htm> (Chapter 6, Executive Summary). The radiative forcing index (RFI) of a particular type of emission is the ratio of the contribution to warming (or cooling) of that emission compared with all current human activities. It is an estimate subject to large uncertainty because of the difficulty in measuring actual energy flows.

⁹ Climate Action Network Europe, (2006) "Clearing the Air – The myth and reality of aviation and climate change" at 8.

¹⁰ Intergovernmental Panel on Climate Change (1999), *Special Report on Aviation and the Global Atmosphere*. Found at: <http://www.grida.no/Climate/ipcc/aviation/index.htm>

¹¹ Climate Action Network Europe, (2006) "Clearing the Air – The myth and reality of aviation and climate change". NASA agrees, finding that aviation emissions produce up to 4 per cent of the annual world global emissions.¹¹

¹² Intergovernmental Panel on Climate Change (1999), *Special Report on Aviation and the Global Atmosphere*. Found at: <http://www.grida.no/Climate/ipcc/aviation/index.htm>

¹³ *Ibid.*

¹⁴ Dr Davide Ross, (2007) *GHG Emissions Resulting from Aircraft Travel*. Found at www.carbonplanet.com

airlines will experience growth in passenger traffic of 5.8 per cent per annum for the period 2005-2025. Moreover, world-wide aviation emissions are expected to rise by more than 250 per cent during this time.¹⁵ This will lead to a significantly increased proportion of world emissions that are attributable to aviation. This discussion has highlighted the strong imperative for the Federal Government to introduce regulatory and non-regulatory mechanisms to reduce emissions associated with aviation. If no action is taken to curb aviation emissions in the near future, this could undermine Australia's ability to meet its 2050 target of 60 per cent reduction in emissions on 2000 levels.

2. Offset schemes

ANEDO is of the opinion that offset schemes should not be treated as a panacea by the aviation industry. It is clear that a reliance on offsets will not be enough. ANEDO has commented extensively on the use of offsets in a variety of contexts, including an Australian Emissions Trading scheme.¹⁶ Our primary view is that offsets should not be relied upon as the predominant means of 'reducing' aviation emissions. Emissions must be avoided or reduced by using all cost-effective prevention and mitigation measures, such as demand management, alternative fuels, new technologies and fuel efficiency measures. These measures should be implemented *prior to* the consideration of offsets as a management option.

ANEDO further submits that projects used to offset aviation emissions should be limited to projects for which there is a high level of certainty as to the accuracy of measurement methodologies, and those that are additional, permanent and ecologically sustainable. Although many abatement activities (for example, plantations) may have positive carbon impacts, they may also affect other aspects of the environment such as groundwater recharge, pollution and biodiversity. Certain activities are therefore inappropriate in offsetting aviation emissions. This is the approach taken by Gold Standard, which is widely recognised as the international accreditation system for premium quality carbon credits generated by projects that have sustainable development benefits.¹⁷ Under that scheme, only projects with an overall positive impact on the environment are recognised as Gold Standard. We await federal government guidelines on the use of carbon offsets to codify strict offsetting standards.

ANEDO notes that the use of offsets currently depends on customers taking up voluntary offset options when purchasing their tickets. However, current figures are not promising, with customers largely ignoring the option to offset their emissions. For example, British Airway's offsets program has saved just 1,600 tonnes of CO₂ since September 2005, which is equivalent to four return flights to New York on a Boeing 777.¹⁸ In Australia, less than 1% of Qantas customers have

¹⁵ Andrew Macintosh & Christian Downie, (2008), *Aviation and Greenhouse Gas Emissions in the ACT – Research Paper No 50*, The Australia Institute.

¹⁶ See www.edo.org.au for our previous submissions.

¹⁷ See www.cdmgoldstandard.org for more detail.

¹⁸ Environmental Leader, March 14, 2007, *BA: Tree Planting Offset Program 'Disappointing'*.

participated in its Fly Carbon Neutral Program.¹⁹ However, against this trend, more than 12% of Jetstar customers are taking up the option.²⁰ ANEDO believes that these figures will improve once national standards for carbon offsets are finalised, as this would improve customer confidence in the veracity and permanence of offsets.

3. Demand side management

As shown above, consumer and freight demand for air travel is projected to continue to rise significantly until 2050. In such a context, ANEDO contends that mitigation measures, particularly demand side management, offer the best current options for immediate results in reducing emissions. Technological advances in terms of fuel efficiency, improved operating procedures and alternative fuels will not yield short-term results while demand continues to soar.²¹ Furthermore, new breakthroughs in engine design and fuel alternatives may take a considerable time to implement as significant changes and major modifications would need to occur to redesign new aircraft.²² For example, although the use of hydrogen as a fuel would eliminate carbon dioxide emissions, the use of hydrogen would present major design problems and would entail global changes in supply, ground handling and storage, which would take decades.²³ (These measures are discussed further in **Part 4**). Therefore, addressing consumer demand should be the primary focus of attention.

A key element of reducing demand is by presenting travellers and freight movements with viable ground transport options, in particular, immediate improvements to frequency of ground services where this is possible. Increasing the frequencies of existing rail and bus services while running at current speeds will provide more choice for passengers and freight movement. Moreover, frequencies could be reasonably easily and quickly upgraded with current technology with modest additional investment. This would provide some breathing space until such time as more ambitious high-speed rail links can be financed and constructed. For example, four trains per day running each way between Sydney and Canberra on the existing track (4 hour-23 minute journey time) could significantly reduce the demand for air transport between those two cities. Improving ground transport links between cities and regional areas would also have benefits for regional tourism and regional communities.

As seen in **Part 1**, aviation is between two and ten times more climate-intensive than surface transport.²⁴ Increased surface transport options should therefore be a

¹⁹ *Environment Manager*, (2008) Issue 658, p3.

²⁰ *The Age*, January 28, 2008, "Jetstar's carbon-offset program soars ahead."

²¹ Andrew Macintosh & Christian Downie, (2008), *Aviation and Greenhouse Gas Emissions in the ACT – Research Paper No 50*, The Australia Institute at 2.

²² Intergovernmental Panel on Climate Change (1999), *Special Report on Aviation and the Global Atmosphere*. Found at: <http://www.grida.no/Climate/ipcc/aviation/index.htm>

²³ *Ibid.*

²⁴ Climate Action Network Europe, (2006) "Clearing the Air – The myth and reality of aviation and climate change"

key response, especially for short trips. This is because airplanes consume more fuel when taking off and landing than when in flight, which means that the fuel consumption per kilometre is larger for short flights than it is for long flights. ANEDO submits that Australian governments should undertake strategic planning processes that explore viable surface-based alternatives to short-distance air travel as a demand control initiative. We note that government policy in this area has stagnated. For example the proposed high rail link between Sydney and Canberra has never eventuated despite government assurances for the last 20 years. Others have proposed a high-speed railway line between Sydney and Melbourne which is the world's 3rd busiest air route.²⁵ These are realistic and attractive long-term alternatives.

Lifestyle and business operational changes should be incentivised to encourage more passenger and freight traffic to use existing ground transport systems and to provide a business justification for upgrading ground transportation.

Other measures to reduce demand include the introduction of a flat-rate greenhouse charge on all domestic flights as suggested by The Australia Institute and a kerosene tax as advocated by Climate Action Network Europe. We note that the British Government has introduced a small tax on domestic flights in a bid to curb demand.²⁶ ANEDO submits that the Australian Government should conduct a qualitative assessment of realistic demand management options and implement them as the primary means of reducing aviation emissions. An emissions trading scheme will also assist in regulating demand, as airfares will rise due to a price placed being placed on carbon. Emissions trading will be discussed in further detail in **Part 5**.

4. Mitigation measures

In addition to demand management policies, mitigation measures such as the development of alternative fuels and improved operating procedures, are essential. In particular, the aviation industry must invest immediately in research into new technologies to adequately combat aviation greenhouse emissions. The Federal Government should assist with such initiatives as they will provide long-term solutions. The Federal Government should provide appropriate funding and support to accommodate such initiatives.

We note that greenhouse reduction initiatives are currently being undertaken by AirServices Australia, which is a government-owned corporation that was created to provide safe and environmentally sound air traffic control management and related airside services to the aviation industry.²⁷ ANEDO supports its current programs, which include pre-departure tactical management, continuous descent approaches, long-range air traffic management and flexible tracks. All of these

²⁵ *Sydney Morning Herald*, 9 February 2007, "Have green baggage, will travel".

²⁶ Andrew Macintosh & Christian Downie, (2008), *Aviation and Greenhouse Gas Emissions in the ACT – Research Paper No 50*, The Australia Institute.

²⁷ See <http://www.airservicesaustralia.com/> for more information.

initiatives may significantly reduce fuel consumption. Further opportunities for Australia are provided through the newly formed APEC Aviation Emissions Taskforce, of which Australia is a member. Its objects include expanding the uptake of new navigational technology; lifting investment in aircraft and engine research; and exploring the feasibility of alternative fuels. ANEDO is supportive of these goals and we anticipate that Australia will participate openly in the Taskforce and make available appropriate funding in future budget allocations to support technological innovations, demand management and alternative fuel research.

Alternative fuels

As mentioned above, alternative fuel sources should still be explored, even though their broad-scale implementation is unlikely in the short term. Fossil fuels, as non-renewable resources, are not realistic long-term options for aviation, from both an environmental and resource availability perspective, so alternatives must inevitably be found. In this vein, ANEDO supports the development of alternative low emitting or carbon free fuels, subject to several qualifications. We submit that any alternative fuel used must be ecologically sustainable. That is, the development and harvesting of the fuel must not have any deleterious environmental impacts on biodiversity, watercourses, etc. Secondly, in the case of biofuels, the fuel crop must not compete with existing food production, especially in developing countries.

Air New Zealand is conducting promising research into the use of a toxic weed called *Jatropha* as a fuel source. Air New Zealand is officially testing the weed fuel in one of its Boeing 747-400s, by blending it with jet fuel. The airline has set a target of using a million barrels of *jatropha* a year by 2013, which would constitute 10% of its current use. The fuel is 30% cheaper than current jet fuel prices.²⁸ Similarly, KLM has reported its intention to begin testing airplanes that run on algae-based fuels. KLM hopes to have 7% of their fleet running on algae fuel by 2010 with the eventual goal of running their entire fleet on the fuel.²⁹ The use of algae-based fuels would satisfy the sustainability criteria we mentioned above as they do not require agricultural land to grow the algae, they do not compete with food crops, and the entire biomass produced from algae can be used in end products.³⁰ Alternative fuel trials, such as biodiesel tested by Virgin on a flight from London to Amsterdam and synfuel tests by Air New Zealand and the US Airforce, need to be assessed against sustainability criteria for fuel sources. ANEDO supports such initiatives, provided they are comprehensively assessed against long term sustainability criteria.

Furthermore, significant research is underway in Europe into the use of fuel-cell powered aircraft. For example, the EU has provided funding to the Environmentally Friendly Inter-City Aircraft project. The aim of the project is to develop and validate the use of fuel-cell power technology as the propulsion system

²⁸ *Daily Telegraph*, 5 June 2008, "Air NZ ready to fly on weed".

²⁹ Environmental News Network, 5 June 2008, "Flying high on algae - KLM tests algae-based kerosene for airplane fuel".

³⁰ See www.greenfuelonline.com

for light and small commuter aircraft.³¹ Research has progressed well with the head of the project proclaiming:

“Hydrogen and fuel-cell power technologies have now reached the point where they can be exploited to initiate a new era of propulsion systems...”

Similarly, the Boeing Company are also designing a light aircraft that will be powered by a 20kW fuel-cell and lithium-ion battery pack. They expect to commence flight testing sometime in 2008.³²

The initiatives described above are promising. ANEDO urges Australia to fund and encourage such initiatives by funding research and pilot projects into alternative low-emitting or carbon-free fuels.

Fuel efficiency

Fuel efficiency is increasingly viewed as a potential solution to aviation emissions. It is believed that advances in the efficiency of jet engines will lead to reduced greenhouse gas emissions in a similar way that more efficient car engines produce less pollution.³³

Fuel efficiency in aircraft engines has seemingly progressed significantly since the 1960s. The IPCC finds that fuel efficiency has increased by 70% in the last 40 years, leading to the consumption of less fuel.³⁴ However, CAN Europe finds that this obscures the true picture. When the last 50 years are considered, it is apparent that current aircraft operate at similar levels of efficiency as aircraft in the 1950s, which were much more fuel efficient than the aircraft of the 1960s. Thus, the aviation industry has made almost no improvement in fuel efficiency in the last 50 years.³⁵ Despite this, we believe that research into fuel efficiency measures should continue as part of the suite of measures responding to aviation emissions. Indeed, the International Air Transport Association says that by 2020 fuel efficiency within the aviation industry will improve by 25 per cent over current levels.³⁶ This would be a welcome development.

However, although fuel efficiency constitutes an important abatement response, fuel efficiency improvements should be treated with caution. Improvements in fuel efficiency may sometimes have unintended consequences. For example, the IPCC points out that improved fuel efficiency, through the use of bypass engine technology, may actually lead to drastically increased levels of nitrous oxides

³¹ European Research, 27 June 2007, “Aeronautics – fuel-cell powered aircraft take to the skies”.

³² *Ibid.*

³³ National Aeronautic and Space Administration Centre, *Safeguarding our atmosphere*. Found at: <http://www.nasa.gov/centers/glenn/about/fs10grc.html>

³⁴ Intergovernmental Panel on Climate Change (1999), *Special Report on Aviation and the Global Atmosphere*. Found at: <http://www.grida.no/Climate/ipcc/aviation/index.htm>

³⁵ Climate Action Network Europe, (2006) “Clearing the Air – The myth and reality of aviation and climate change”

³⁶ *Sydney Morning Herald*, 9 February 2007, “Have green baggage, will travel”.

(which are greenhouse gases) even though carbon dioxide emissions are reduced.³⁷ In response to this, several projects are underway in the US to develop more fuel-efficient engines with fewer nitrous oxide emissions.³⁸ In light of the above, ANEDO advises that a precautionary approach should be adopted to fuel efficiency innovations. Fuel efficiency measures should be a secondary focus of action and must be subject to strict scrutiny to determine their overall climate impact, not just the extent to which they reduce carbon dioxide emissions.

5. Emissions trading schemes

Inclusion of aviation

ANEDO believes that aviation must be included in the upcoming Australian Emissions Trading Scheme. As noted, aviation emissions contribute a sizeable amount to Australia's greenhouse gas emissions and these are projected to increase significantly by 2050 as demand and population increases. The Garnaut Discussion paper proposes the inclusion of transport (which presumably includes civil aviation) in the ETS. We strongly support this recommendation. We note that aviation is being included in the second phase of the EU Emissions Trading scheme which runs from 2013 to 2020.³⁹

ANEDO submits that ETS should encapsulate all international aviation emissions that originate from Australia. The Australia Institute recommends that the quantification and regulation of international emissions could be done in collaboration with the International Civil Aviation Organisation (ICAO), which is an agent of the United Nations.⁴⁰ ICAO has published a draft guidance on the use of emissions trading to assist developed countries to meet their Kyoto commitments, so it would be prudent to require ICAO to oversee international emissions.⁴¹

It is important to note that emissions trading should not be treated as a complete solution to greenhouse gas emissions associated with aviation. Additional measures will be needed. For example, emission taxes, kerosene taxes and emission standards for new aircraft and engines could be used to complement an emissions trading scheme.⁴² ANEDO supports these suggestions.

Investment risks

³⁷ Intergovernmental Panel on Climate Change (1999), *Special Report on Aviation and the Global Atmosphere*. Found at: <http://www.grida.no/Climate/ipcc/aviation/index.htm>

³⁸ National Aeronautic and Space Administration Centre, *Safeguarding our atmosphere*. Found at: <http://www.nasa.gov/centers/glenn/about/fs10grc.html>

³⁹ See <http://ec.europa.eu/environment/climat/emission.htm> for more information.

⁴⁰ Andrew Macintosh & Christian Downie, (2008), *Aviation and Greenhouse Gas Emissions in the ACT – Research Paper No 50*, The Australia Institute at 19.

⁴¹ See www.icao.int.

⁴² Andrew Macintosh & Christian Downie, (2008), *Aviation and Greenhouse Gas Emissions in the ACT – Research Paper No 50*, The Australia Institute.

The Australia Institute has also identified a risk of unsustainable investments being made in the industry prior to its formalised inclusion in an emissions trading scheme. This could lead to significant financial and social impacts, as assets would be stranded if tight caps were introduced.⁴³ The Australia Institute believes that this risk could be addressed through the introduction of a flat-rate greenhouse charge on all domestic flights and that all new airport developments be subject to formalised environmental assessment procedures that take into account the greenhouse gas implications of airport expansions. Indeed, the Environmental Defender's Office in the Australian Capital Territory has called for a comprehensive environmental assessment of the plans to expand Canberra International Airport in terms of its greenhouse impacts. ANEDO submits that another way to address these risks is to provide clear signals to the aviation industry that aviation *will* be included in the ETS in 2010, and that as a result, emissions will have to be tightened in future. Once this occurs, then any investment decisions will occur within this context, thus ameliorating the risk of asset stranding and job losses.

Compensation

ANEDO does not support the granting of compensation to the aviation industry (in the form of free permits) on the basis that the industry is subject to global competition. The argument in favour of compensation is that by Australia establishing an ETS in the absence of global action, industries that are subject to global competition will suffer. ANEDO does not find this argument compelling. The Climate Action Network Europe has established that EU competition would not suffer from the introduction of strict policy measures, such as an ETS, despite being subject to competition from airlines outside the EU.⁴⁴ Similarly, NASA believes that reducing aircraft emissions is key to the US aviation industry remaining competitive in the global market. That is, rather than being placed at a competitive disadvantage, the reduction of aviation emissions through an emissions trading scheme could actually be *beneficial* in terms of market performance.⁴⁵

For further information, please contact robert.ghanem@edo.org.au.

⁴³ *Ibid* at 2.

⁴⁴ Climate Action Network Europe, (2006) "Clearing the Air – The myth and reality of aviation and climate change"

⁴⁵ National Aeronautic and Space Administration Centre, *Safeguarding our atmosphere*. Found at: <http://www.nasa.gov/centers/glenn/about/fs10grc.html>