

ESA 08

Sydney 1-5 December 2008



Carbon Neutral Status of ESA 2008

This year ESA will be running its annual conference on a fully carbon-neutral basis. This means that the Society is attempting to offset all greenhouse gas emissions generated through activities associated with the conference. There are considerable uncertainties and many questions arising when ESA becomes involved in such a venture. The discussion below has three main aims:

1. To inform ESA members about the specific options and issues that must be confronted in planning to offset greenhouse gas emissions;
2. To inform ESA members about the rationale behind the choices made specifically for ESA 2008; and
3. To stimulate informed debate as a basis for developing the Society's future approaches and contributions to global climate change issues.

Why should ESA invest in climate change mitigation?

Upward trends in greenhouse gases, global average temperatures and sea levels, and a decline in snow cover are 'virtually certain' and it is 'virtually certain' that these trends are a result of human activities (virtually certain means >99% probability, IPCC 2007). There is a growing body of research on the ecological consequences of these changes, including significant contributions by ESA members. Much of this work points to major consequences for biodiversity. Many ESA members have expressed a desire to conduct the Society's business in an ecologically sustainable manner. Our Council is currently drafting an ESA Environmental Commitment Policy and is exploring the possibility of the Society becoming 'climate neutral' in the near future (McMillan 2007). In 2007, for the first time, a voluntary carbon offset for air travel was offered to registrants of the Annual ESA Conference. For ESA 2008, the Local Organising Committee has decided to go one better by planning for a fully carbon neutral conference. This will be one of the first events of its kind in Australia and one of the first carbon-neutral scientific conferences in the world. The advantages for ESA are:

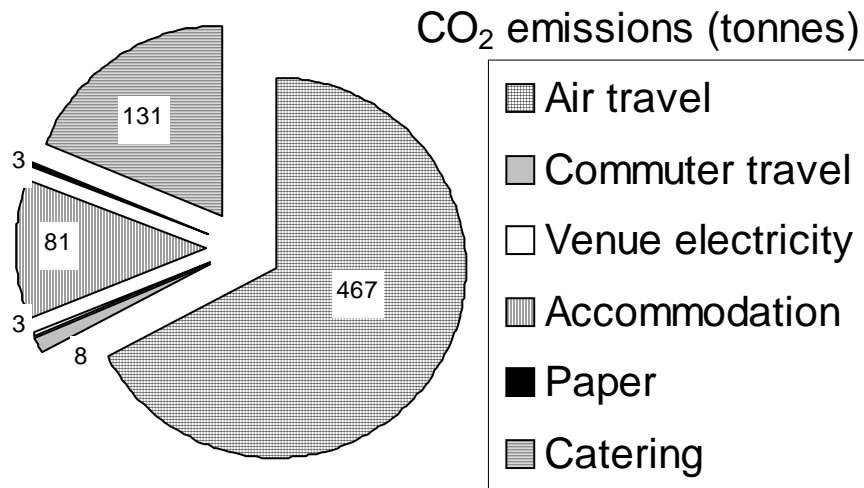
- Demonstrated leadership and innovation, putting environmental science into action
- A practical case study to show the planning and costs involved in carbon-neutral operations
- Promotion of climate change ecology as a national research priority
- Flow-on effects by influencing the way other societies, businesses and government institutions conduct their activities
- Improved education, promotion and sponsorship opportunities.

Voluntary vs Mandatory Carbon Offsets

A number of conferences offer voluntary carbon offsets. Recent examples include ESA 2007 and the Society for Conservation Biology's Annual conference in Port Elizabeth 2007. Many airlines also now offer voluntary offsets for air travel, and a growing number of businesses, government agencies and non-government organisations are beginning to offset some of their CO₂ emissions, including WWF, the Victorian EPA, BHP and Splendour in the Grass events. If carbon offsets are mandatory, anyone who registers for the conference automatically signs up to be part of a carbon-neutral event. There are several reasons why we decided to trial mandatory offsets for ESA 2008. Firstly, it allows comprehensive budgeting of CO₂ emissions as a step towards planning comprehensive offsets. Secondly, it gives ESA direct influence over how CO₂ emissions are offset. Thirdly, it allows ESA to guarantee fully carbon-neutral status to potential sponsors of the conference and others. Conferences with voluntary offset schemes typically only cover air travel (not other sources of emissions) and have variable uptake among participants. For ESA 2007, 22% of total registrants (34% of those from interstate or overseas) signed up to offset CO₂ emissions from their air travel. If ESA 2008 continued with voluntary carbon offsets, it would show commitment by keeping up with the trends set by recent event organisers. By opting for mandatory offsets, ESA 2008 will lead the way towards complete carbon neutrality and demonstrate the sort of innovation that is needed to achieve real progress in climate change mitigation.

How much CO₂ does an ESA conference generate?

We estimated that the conference would generate about 700 tonnes of CO₂ emissions [see pie chart]. About two-thirds of this comes from air travel, although some other sources are appreciable, particularly catering (about 19%) and electricity consumed by accommodation (about 12%). The cost of offsetting these emissions was \$17,500. The Local Organising Committee (LOC) engaged a provider of carbon credits to help calculate a comprehensive carbon budget for the conference. The selection of the provider (Carbon Friendly) was based on recent investigations by the ESA Council (McMillan 2007). Like any financial or environmental planning, the carbon budget was based on a number of assumptions. These are summarised in the Appendix below. We made conservative but realistic assumptions to ensure a high level of certainty about the carbon-neutral status of the conference.



How do we offset our carbon emissions?

There are a wide range of options for offsetting, each with its own limitations. We cannot provide a comprehensive review of these options here, but merely identify some of the salient considerations. There are two main alternatives: one is to use offset funds to sequester greenhouse gases already in the atmosphere; the other is to reduce emissions that would otherwise be released into the atmosphere as a consequence of conference activities. The principal option for carbon sequestration is tree planting which, as well as removing CO₂ from the atmosphere, can generate ecological outcomes by restoring native vegetation and associated habitats. Critics of this approach point to risks of successfully establishing trees in the face of droughts or fires, uncertainties in the long-term security of sequestered carbon in the face of necessary future management commitments, inevitable changes in land use and tenure, future environmental change and uncertainties in realising the expected biodiversity benefits. Options for emissions reduction are based on development of renewable energy sources as alternatives to fossil fuels, including biofuels, wind and solar power generation. Accelerating the development of renewable energy sources is designed to be a preventative measure because it provides energy for activities without adding greenhouse gases to the atmosphere. Critics of this approach argue that it might simply be adding to total energy production, rather than replacing fossil fuels, although an increase in renewable energy capacity seems unlikely to increase or maintain dependence on fossil fuels. As well, construction of renewable energy facilities may have local environmental impacts and implications for alternative uses of the land. Use of biofuels has raised concerns because it generates increased demand for production of short-rotation crops or palm oil. In some cases this has increased rates of land conversion (resulting in accelerated habitat loss) and diverted productive land or crops produced in developing countries that would otherwise service less profitable local markets for food. For these reasons, it is important that ESA makes a proactive decision about where its carbon credits come from.

How does purchase of carbon credits actually reduce emissions?

New energy production facilities are continually being initiated and constructed. The opportunity to earn a return from carbon credits makes it more economically attractive to build renewable energy facilities than it would otherwise be. Renewable energy certificates can only be sold when construction of a facility is complete and operational. Without this source of returns, many such projects would not otherwise proceed. The energy that they produce meets at least some of the demand that would otherwise be met

by construction of new fossil fuel energy facilities. In other words, carbon credits are market-based mechanisms for increasing the proportion of renewable energy and reducing the proportion of fossil-fuel energy supplied to the grid. Total energy demand may still increase, and more CO₂ emissions may rise as a consequence, but at a slower rate than they would without carbon offsets.

What standards and accountabilities do our carbon credits comply with?

Any investment decision carries risks and uncertainties about whether expenditure will actually achieve its intended purpose. The credits purchased for ESA 2008 are premium quality renewable energy certificates accredited under the Voluntary Carbon Standard, and compliant with the Gold Standard, as well as the Australian Government GreenPower scheme and the Kyoto Protocol Clean Development Mechanism. These accreditations carry a number of checks and balances intended to bring greater certainty that purchase of carbon credits will actually reduce atmospheric emissions by funding sustainable energy projects. They allow particular sustainable energy projects to be identified as the recipients of the funds, and these can be independently audited. Carbon credits cannot be sold from these projects until they are commissioned actually producing energy. This reduces the risk of funding projects that never come to fruition. The carbon credit provider, Climate Friendly, was selected by ESA Council (McMillan 2007) because it performed well in an international review of carbon offset companies and their emissions calculators (Kollmuss & Bowell 2006,). Climate Friendly was one of two providers assigned an ‘excellent’ rating for calculator accuracy and one of four recommended providers out of the 13 reviewed (Kollmuss & Bowell 2006). Carbon Friendly screens projects from which its credits are purchased against eight criteria (see text box below). The carbon credits database maintained by Climate Friendly is independently audited annually by Price Waterhouse Coopers. In addition, an international registry is under development for the Voluntary Carbon Standard, which will parallel the one recently established for the Gold Standard. When this becomes active in the near future, it will also be audited annually by Price Waterhouse Coopers. While none of these checks and balances can guarantee unconditionally that greenhouse gas emissions will be reduced by the amount estimated, they provide some assurance of positive outcomes and reduce the risks that the money will not achieve carbon-neutrality for the conference.

Eight criteria for selection of renewable energy projects as sources of carbon credits (Climate Friendly):

1. **Address the root cause of climate change** – projects must effect rapid transition to a sustainable energy future and replace fossil fuels.
2. **Permanent** – renewable energy projects must permanently reduce greenhouse gas emissions.
3. **Additional** – projects must be over and above ‘business as usual’, i.e. they would not go ahead without outside investment through carbon credits.
4. **Verifiable** – projects must be verified by independent, third party experts and auditors.
5. **Project/community based** – projects must not be allowance-based, such as those that are part of complying with national emissions reduction legislation.
6. **Contribute to sustainable development** – projects must have broader environmental and social benefits beyond climate change.
7. **Synchronous** – abatement from renewable energy projects must be closely matched to ‘real-time’ when emissions occur.

8. **Exclusive** – carbon credits from renewable energy projects must not be double counted.

Where will the money from the conference go?

On this occasion, we opted to offset emissions by purchasing carbon credits generated by the Jaisalmer wind farm, located in Rajasthan (India) near the Yamuna River, between the Vindhyha mountains and the Himalayas. The 60 MW project comprises seventy-five 800KW Enercon-engineered wind turbines. This wind farm is capable of generating 115,632 MW.h of energy, offsetting 101,000 tonnes of greenhouse gases per annum that would otherwise be emitted by burning fossil fuels. ESA's purchase of credits from the Jaisalmer wind project helps ensure its ongoing viability and reduces the need for new polluting coal-fired power sources. Our support will also generate social and environmental benefits for local communities in Rajasthan. The credits are exclusive (cannot be re-sold to other parties) and are over and above 'business as usual' operations.

Why are our carbon credits coming from overseas?

After considering at some length options to source a portion of carbon credits from Australian GreenPower projects, the LOC decided to source carbon credits for ESA 2008 from overseas. There are several reasons why we opted for overseas credits on this occasion. Firstly, there is currently a shortage of Gold Standard carbon credits within Australia. The available Gold Standard credits are heavily committed to long-term clients. GreenPower credits were potentially available, but these are usually purchased to offset electricity, and they were considerably more expensive ($\times 2.5$) than Voluntary Carbon Standard credits. As more renewable energy projects are initiated in Australia, more credits will be available to meet the growing demand. Secondly, the world's fastest growing economies, and hence the fastest growing greenhouse gas emissions, are in Asia. While the past and current growth in greenhouse gas concentrations has largely emanated from Europe and North America, future growth in emissions will be driven largely from Asia. Any global solution to climate change must therefore deal with energy production in Asia, particularly India and China. Investment from developed nations in Asian carbon credits will help to meet a greater proportion of Asia's demand for new energy from sustainable sources. Thirdly, local communities in developing countries benefit socially, economically and environmentally from support of such projects, which potentially reduce poverty and the need for aid.

From here on?

How should ESA deal with the climate change impacts of its activities in the future? Should offsetting be mandatory or voluntary? Should we purchase credits to fund projects that sequester carbon or those that reduce CO₂ emissions? Should credits be sourced only from Australia or from overseas as well? There are many uncertainties in climate change mitigation and no clear answers. The choices made by the LOC aim to address the root cause of climate change in a permanent, synchronous and verifiable manner by assisting the transition to sustainable energy sources. Our decisions may not have been optimal and not everyone will agree with them. By planning a carbon-neutral conference for ESA 2008, we are engaging in adaptive management of the Society's affairs. There are several ways that you can contribute:

Firstly, be part of ESA's first carbon-neutral conference. There will be a symposium on climate change ecology and we will dedicate a slot to an open discussion of carbon-offset planning. Secondly, a discussion area will be established on the ESA website as a venue for ideas and debate on the subject. Thirdly, contribute to development of ESA's Environmental Commitment/Policy by channelling ideas through your Regional Councillor, proposing and developing policy options and providing input on draft policies as they are produced. Fourthly, use your connections to get other organisations (workplaces, professional associations, community groups) to think about how they can carry out their business more sustainably. We hope this initiative informs opinion, provokes thought, stimulates debate and generates innovative ideas for the future.

David Keith
On behalf of the Local Organising Committee
ESA 2008

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Appendix – assumptions and details for carbon budget calculations

- The expected number of delegates and their origin of travel based on records of previous conferences, adapting them to a Sydney venue, assuming a total attendance of 600 delegates.

- Air travel emissions were based on per-capita aircraft fuel consumption with an uplift factor of 2.7 to allow for radiative forcing (conversion of nitrous oxides to ozone, contrails (aircraft vapour trails), cirrus cloud effects, etc.), based on the best estimate in Penner *et al.* (1999) and Sausen *et al.* (2005).
- Commuter travel was based on daily trips by car for 200 people (estimated average distance 10 km), daily trips by train for 100 people (estimated average distance 10 km) and daily trips by bus for 100 people (estimated average distance 8 km). Car fuel efficiency was assumed to be 0.1 l.km⁻¹. A total coach travel distance of 730 km was assumed to cover conference field trips.
- Energy consumption for conference catering was estimated based on 9200 meals valued at \$80.33 per capita, applying emission factor per \$ for 'eat-out' meal based on research by the Centre for Integrated Sustainability Analysis at the University of Sydney.
- Energy consumption at the venue was estimated from floor space and hours of operation (36 266 hr.m²), assuming 4.1 x10⁻⁵ MW.hr⁻¹.m⁻² using a full fuel cycle emission factor for NSW based on National Account Factors published by the Department of Climate Change (2008).
- Energy consumption for conference accommodation was based on 2400 room nights for standard-type hotels, assuming delegates staying in university college-style accommodation will compensate those staying in business-style hotels. The emission factor for NSW based on National Account Factors published by the Department of Climate Change (2008).
- Energy consumption for paper production and printing assumed 133,000 A4 pages and includes emissions from manufacture, transport and waste stream. Emission factors were based on data from Australian Industry and the Australian Greenhouse Office.