TOWARD MAKING THE AMS CARBON NEUTRAL

Offsetting the Impacts of Flying to Conferences

BY THOMAS M. HAMILL

The AMS recently endorsed the National Academies statement on the global response to climate change. We officially recognize the high probability of global warming from anthropogenic greenhouse gas emissions and implicitly endorse their recommendation to "take prompt action to reduce the causes of climate change." The AMS could underline the organization's stance on reducing greenhouse-gas emissions by becoming "carbon neutral." This would involve conservation efforts as well as the purchase of carbon offsets. In effect, the AMS would tax itself for continuing to pollute while donating the receipts to organizations that will fund projects that achieve equal reductions in emissions. By committing to carbon neutrality, the AMS would lead by example and demonstrate that we take the consequences of global warming seriously.[1]

The AMS produces a carbon footprint through many activities, including its headquarters operations at 45 Beacon Stret, the publishing and dissemination of journal articles, and the conduct of conferences. This last and assumedly predominant impact shall be the primary topic here. For many of us, regularly flying to and from AMS conferences produces copious greenhouse gas emissions (of course, flying anywhere will have the same sort of impact). To quantify this, suppose you drive 12,000 miles this year (~ 19,312 km) in a car that averages 25 miles per gallon (~ 10.6 km/liter). In this way you would produce a greenhouse gas effect of approximately 4.45 metric tons (1000 kg/metric ton) of carbon dioxide (CO_2).[2] In comparison, one round-trip ticket from Denver to Washington, D.C., produces approximately the greenhouse-gas effect equivalent to 1.32 metric tons of CO_2.[3] Multiply this effect by the more than four thousand attendees annually to AMS conferences and the magnitude of our annual contribution from air travel becomes clear.[4] As atmospheric scientists, it should discomfort us that even as we strive to reduce our personal emissions, our work travel can reduce the impact of these efforts.

WHY WE SHOULD CONSERVE AND OFFSET. Aside from doing nothing, the AMS could conceivably select from among many possible ways of addressing the organizational contribution to greenhouse gas emissions. For example, the AMS could invest in adaptive capacity, helping those affected by global warming to deal with consequences such as warmer temperatures and rising sea levels. While adaptation is very likely to happen eventually, it is difficult to anticipate what countries and organizations will be most worthy of help decades or centuries hence. Adaptation also does not change the underlying problem, and not every affected organism can adapt; for example, building seawalls to protect

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[1] In embracing carbon neutrality, the AMS should also indicate in a policy statement that the Society believes that national and international agreements are still preferable for achieving comprehensive greenhouse gas emissions. Embracing carbon neutrality should not provide a disincentive for embracing more sweeping change.

[2] This was calculated from the Environmental Protection Agency Web site: www.epa.gov/climatechange/emissions/ind_calculator.html. This assumed that 19.4 pounds of CO_2 are emitted per gallon of gasoline, and the radiative effect is calculated by multiplying the resulting total by 1.0526 to account for the effects of other tailpipe emissions.

[3] There are many calculators of airline greenhouse gas emissions available over the Web. The number cited above was calculated using the "Atmosfair" Web site (www.atmosfair.de/index.php?id=5&L=3). A detailed description of the method for calculating emissions is available at www.atmosfair.de/index.php?id=27&L=3.

[4] AMS meetings drew 4,700 people in 2005 and 4,200 people in 2006.

an urban coastline will not reverse the decline of the polar bear population due to shrinking sea ice.

Alternatively, the AMS might embrace "geoengineering," investing in ways of changing our planet so that the anticipated warming is reduced or eliminated. Many examples of geoengineering have been proposed in the last few decades, such as increasing the Earth's albedo through the injection of sulfate aerosol precursors into the stratosphere. This would increase the planetary albedo at modest expense, resulting in less solar radiation reaching the surface (Crutzen 2006, Wigley 2006). However, there are practical reasons why geoengineering investment is not a wise short-term course of action for the AMS. Scientifically, most of the geoengineering strategies have not been adequately tested, so possible unanticipated affects and negative feedbacks are not well understood. Further, geoengineering strategies have global impact, with inevitable winners and losers, and hence such strategies cannot be utilized without international agreement.

Mitigating our carbon footprint through conservation and offsetting the rest are much more realistic near-term strategies for the AMS. A first step would be to conserve energy. Regarding AMS conference activities, some of the scientific exchange that we now do through on-site participation could be done remotely. For those who do not require the in-person interaction a conference provides, the AMS could facilitate remote participation. To encourage this, perhaps a discounted conference attendance fee would be possible for those participating remotely (perhaps the AMS could then rent smaller, less expensive venues, so over time this option might be revenue-neutral). Presentations could be broadcast "live" over the internet. Questions could be e-mailed to the session chair, and perhaps a two-way audio link could be established so that questions could be asked remotely. With technology changing so rapidly, it's not difficult to imagine that a robust videoconference capability could also be established in short order. Perhaps this remote-attendance capability will also broaden the number of people who participate.

If we cannot conserve, then surely we can offset. A wide range of nonprofit and for-profit organizations provide carbon offsets. The price of an offset varies from several dollars to several tens of dollars per metric ton of CO_2 (Table 1). Prices vary primarily due to the expense and documented efficacy of a particular type of offset; generally the less expensive offsets like planting trees are more controversial regarding whether they will actually produce the long-term greenhouse gas reduction claimed. To guarantee effectiveness, the AMS offsets should meet stringent criteria (Kolmuss and Bowell 2006). "Additionality" must be verified, meaning that the emissions reduction would not be accomplished in the absence of the AMS funding. Further, AMS offsets should not shift

Table 1. A partial list of carbon offset providers, the cost of the carbon offset they provide, and the types of projects the funds are used for. Taken in August 2007 from www.ecobusinesslinks.com/carbon_offset_wind_credits_carbon_reduction.htm.

Carbon Offset Provider	Price (US$ per Metric ton CO_2)	Project Types
AtmosClear Climate Club	$3.56–$25.00	Methane capture from landfill
Carbonfund.org	$4.30–$5.50	Renewables, efficiency, reforestation
e-BlueHorizons	$5.00	Renewables, reforestation
DriveNeutral.org	$6.93 and up	Efficiency
DrivingGreen	$8.00	Renewables
Terrapass	$8.26–$11.00	Renewables, efficiency
Native Energy	$13.20	Renewables
The CarbonNeutral Company	$14.00–$18.00	Renewables, efficiency, reforestation, methane
Cleaner Climate	$15.00–$18.00	Renewables, efficiency
Sustainable Travel International	$15.25	Renewables
Climate Friendly	$16.00–$19.00	Renewables
Uncook the Planet	$19.45	Efficiency
Bonneville Environmental Foundation	$29.00	Renewables
Myclimate	$33.00–$99.00	Renewables
Global Cool	$39.48	Renewables, efficiency

emissions elsewhere, and protections must be in place to avoid "double counting." For example, AMS-sponsored offsets that fund a wind-farm development in a particular state should not be counted as part of a state's legislatively mandated greenhouse gas reductions. And last, the AMS should indicate that its own carbon neutrality is not to be interpreted as a statement that efforts by individual organizations are an adequate substitute for a more wide-ranging policy.

How much would offsetting increase your conference fee? As a back-of-the envelope calculation, let us assume that the average conference participant flies 1,000 miles (~ 1,613 km) each way. This would produce the greenhouse-gas impact of ~ 0.88 metric tons of CO_2.[5] Assuming a representative offset cost of $15.00 per metric ton, the carbon offset cost for the conference trip would be $13.20. The conference fee would be increased by this amount, with the collected funds directed to a reputable carbon offset organization.

OBJECTIONS TO OFFSETTING AT THE AMS. Many objections may be raised to the idea of a mandatory AMS tax for offsetting the impact of attending a conference. Let us consider some of these objections.

First, aviation is currently estimated to be a relatively small fraction of the overall planetary contribution greenhouse gas impact. The Intergovernmental Panel on Climate Change (IPCC) estimated the aviation contribution to be 2% of the total CO_2, though the overall impact may be magnified by ozone and water vapor emissions (IPCC 1999). If this is much smaller in aggregate than other greenhouse gas sources, why should the AMS focus on this? The answer is that while aviation is likely to be a small component of the global problem, for those of us who fly frequently and for the AMS as an organization, it is our predominant source of emissions.

Another objection may be that a uniform carbon offset tax upon each conference participant is unfair, since conference participants come from both near and far, and some drive. However, AMS conference locations change from year to year and a large percentage of us are repeat attendees, so if we overpay one year, we are likely to underpay the next. Over time, the costs should average out to be relatively fair.

Must offsetting our AMS-related air travel be mandatory? Unfortunately, voluntary CO_2 reduction has yet to work at the national and international scale. Also, were it voluntary, the carbon offset would have to come out of each attendee's pocket. If built into the conference fee, then the organization that commonly pays for your conference attendance would automatically be paying that offset. A skeptic might argue that the AMS is substituting its own value judgment for that of the conference participant and the organization funding the travel, and that money instead could stay with the organization sending the scientist, thereby providing more funds for research. While this is a valid point, there is another way of looking at it: an offset is simply part of the cost of doing business with a certifiably responsible organization like the AMS. Conference attendees are provided with attractive venues, effective organization, and archives of presentation materials. In the future, the raised fee would include offsets, this insurance policy that the positive benefit from attending the conference isn't negated by a greenhouse gas impact.

CONCLUSION. For many of us frequent-flying AMS members, airline travel produces our biggest personal greenhouse gas impact. The most obvious remedy is difficult: we need to cut back on our airline travel. Perhaps we can combine work and recreational travel, or perhaps we can attend some less-important conferences remotely. Failing that, we should offset our carbon impact, taxing ourselves and investing the proceeds in projects such as renewable energy. Consequently, I urge the AMS to invest in a remote-conference infrastructure and to build the modest cost of carbon offsetting into conference fees. This action is consistent with our endorsement of the National Academies' recommendation for prompt action on climate change. Our leadership on this issue will lend credibility to the scientific guidance we offer our government.

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[5] Again calculated using the previously cited Atmosfair calculator, for a round trip between Denver, Colorado and San Jose, California, which is approximately 1,000 miles each way.

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FOR FURTHER READING

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