

# Carbon Offsets

## An Overview for Scientific Societies

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### Executive summary

Carbon offsets are mechanisms allowing individuals and organizations to “offset” activities (such as air travel) that emit carbon dioxide (CO<sub>2</sub>) and other greenhouse gases by funding mitigating activities (such as landfill methane capture) elsewhere. For scientific societies, where air travel to conferences plays a central role, carbon offsets offer an immediate response to the issue of climate change while the organization formulates longer-term, more comprehensive plans to reduce its carbon footprint.

The world of carbon offsets—what kinds of offsets are available, what organizations offer them, how they are vetted and evaluated, which ones are considered good, how much they should cost, etc.—is rather complex, and there are arguments both in favor of and against purchasing them. This report is an attempt to summarize what we have learned about this world while developing recommendations for [SIGPLAN](#), the Special Interest Group on Programming Languages of the [Association for Computing Machinery](#), as part of a [larger effort](#) to evaluate potential ways for SIGPLAN to respond to the issue of climate change. We conclude that, on the whole, purchasing carbon offsets is a good short-term strategy for mitigating the climate effects of conferences.

There are four basic criteria that are commonly used to evaluate carbon offsets (*additionality*, *permanence*, *absence of leakage*, and *verification*) and several *standards* (such as the *Verified Carbon Standard*, the *Gold Standard*, and the *Clean Development Mechanism*) that are used by *vendors* (such as *atmosfair* and *Cool Effect*) to certify that particular carbon-offset *projects* satisfy these criteria to an acceptable degree. Types of offsetting projects range from renewable energy development and energy efficiency improvements to reducing carbon emissions from industrial and agricultural processes, biosequestration (e.g., planting trees), and deploying technologies for carbon capture and storage. The Stockholm Environmental Institute (SEI) found that the types of projects most likely to deliver reliable greenhouse gas reduction while furthering (or at least not damaging) the United Nations [Sustainable Development Goals](#) (SDGs) were methane capture projects such as wastewater treatment, manure management, and landfill gas capture. Offsets also vary widely in cost (from less than \$1 USD to more than \$50 USD), depending on project type, vendor, certifying standard, geographical region, and other factors. A typical cost for rigorously certified offsets from a reputable vendor seems to be

around \$9–\$15 USD per ton of CO<sub>2</sub>e (“CO<sub>2</sub>-equivalent,” the standard unit of measure for greenhouse gases), but an exact number is frustratingly difficult to pin down.

There are still differences of opinion about whether carbon offsets are a good idea at all. In particular, critics point out that the convenience and inexpensiveness of offsets may lead organizations to delay challenging conversations about how to actually reduce their emissions. Proponents, on the other hand, point to the fact that offsetting can reduce emissions significantly in the short-term while more permanent solutions are being developed; moreover, they may help develop a mindset of paying attention to emissions. On balance, we agree with the proponents.

With this in mind, we offer some specific recommendations. We recommend supporting projects that use the Gold Standard, the most demanding of the three common standards. We currently recommend purchasing offsets from either Cool Effect or atmosfair. Cool Effect offers a range of project types including some that seem to have a very high likelihood of reliable carbon reduction; works with a number of established organizations in science, technology, and the environment; and claims to donate an impressive 90.13% of funds collected to the sponsored projects. However, Cool Effect’s Web site is unfortunately U.S.-centric and doesn’t accommodate currencies or addresses from other countries. Atmosfair also works with project types with a high likelihood of reliable carbon reduction, has received consistently good reviews, and is notable for exclusively sponsoring Gold Standard-certified or Gold Standard certification-pending projects. Its website works well with purchasers from multiple countries; however, its offsets are quite expensive compared to Cool Effect and other high-quality vendors.

*Your comments on this report are greatly appreciated! The text is available as a [live Google Doc](#), where you can add comments and suggestions directly.*

# What are Carbon Offsets?

Carbon offsets are a “credit for negating or diminishing the impact of emitting a ton of carbon dioxide by paying someone else to absorb or avoid the release of a ton of CO<sub>2</sub> elsewhere.” (<http://www.co2offsetresearch.org/consumer/Glossary.html#A>) Simply living means that your individual effect on the planet is carbon-positive (because animals such as humans emit CO<sub>2</sub>, if nothing else); however, by paying for the reduction of carbon emissions elsewhere, one’s net effect can theoretically be carbon-neutral or even carbon-negative.

For example, you might purchase a carbon offset that funds a project that supplies [more-efficient cookstoves](#) in a developing nation. More efficient cookstoves mean decreased carbon emissions from wood or charcoal burning.

## Criteria for Quality Carbon Offsets

Environmental experts have identified a number of criteria to look for in a carbon offset. Some of the most common criteria are Additionality, Permanence, absence of Leakage, and Verification.

**Additionality** refers to whether the carbon emissions reduction or mitigation would have happened without the offset. If, for instance, the carbon offset project pays a factory owner to install new, less-carbon-emitting equipment, but the factory owner had planned to install the equipment anyway (either because the equipment would pay for itself or because regulation compelled the owner to do so), the carbon offsets would not be additional.

**Permanence** refers to whether the carbon emissions reduction or mitigation continues for the stated life span. A simple example of this might be regarding a project to plant trees, forecasting that the trees will remove carbon from the atmosphere over a certain number of years. The project must guarantee that the trees will remain in place over the life of the project, instead of being cut down prematurely.

Absence of **Leakage** refers to whether the carbon emissions reduced or mitigated do not occur somewhere else. For instance, if a forest is prevented from being cut down, perhaps a logging company will just cut down a different forest, resulting in no net carbon decrease.

**Verification** refers to whether all of the above can be independently established by a credible authority.

## Standards

Various organizations verify the quality of carbon offsets that are sold, under standards/guidelines that they publish.

The most commonly-used standard (by carbon offsets sold under that standard) is the Verified Carbon Standard (VCS), followed by the Gold Standard and the Clean Development Mechanism (CDM). Other common standards are the Climate Action Reserve and American Carbon Registry. ([Unlocking Potential: State of the Voluntary Carbon Markets 2017](#), 15.)

**VCS** is a standard founded in part by the International Emissions Trading Association, a consortium whose members include major energy and chemical companies, banks, and law firms. Unlike the Gold Standard or CDM, VCS has no requirement that its carbon offset project have additional social benefits, allowing for a wider range of projects.

The **Gold Standard**, founded by organizations that include the World Wildlife Fund, differentiates itself by requiring that carbon offset projects also meet various “sustainable development” goals—beyond offsetting emissions, also contributing to the economic and social welfare and development of the people where the project is taking place. It claims that “[t]he difference we make is to ensure that each dollar of funding goes further.” The Gold Standard’s sustainability requirements are more stringent than those of VCS or CDM. Perhaps as a result, the Gold Standard focuses on a narrower range of projects, including renewable energy, energy efficiency, waste management, and land use and forests.

**CDM** is a UN standard established under the Kyoto Protocol, and is to some extent the baseline standard against which other standards are compared. CDM allows for a wide range of projects, although not as wide as VCS (for one, CDM projects are exclusively in developing nations), and has sustainability requirements more stringent than VCS but less stringent than the Gold Standard. CDM has been criticized for backing projects that fail additionality requirements. ([How additional is the Clean Development Mechanism?](#), 152).

## Vendors

Voluntary carbon offsets are sold by a number of providers. Some of the notable vendors of carbon offsets found our research are briefly mentioned here:

- **[atmosfair](#)** is a German nonprofit. It focuses on mitigating the effects of air travel on climate change. Its projects are exclusively Gold Standard approved or pending approval.
- **[Cool Effect](#)** is a U.S. nonprofit and a relatively new player in carbon offsets. Its partners and clients include Audubon, March for Science, Salesforce, and SXSW. [Cool Effect touts](#) its transparency, close involvement in project selection, and ability to send 90.13% of funds from carbon offset purchases to its projects.
- **[Go Climate Neutral Now!](#)** is a platform run by the United Nations Framework Convention on Climate Change that allows individuals to purchase carbon offsets from UN CDM projects.

- [NativeEnergy](#) is a U.S.-based registered B corporation. Its high-profile partners and clients include Ben & Jerry's, National Geographic, National Resources Defense Council (NRDC), and The Sierra Club.
- [TerraPass](#) describes itself as a "[mission-driven business](#)," and is a subsidiary of JustEnergy, a Canadian-based, publicly traded energy company. It offers carbon offsets exclusively for U.S.-based projects.

## Types of Carbon Offset Projects

Carbon offset projects seek to avoid or absorb a specified amount of carbon emissions while selling credits for the resulting carbon reduction. Sometimes these are developed in close partnership with carbon offset vendors; other times the vendor has a more distant relationship. Projects are typically verified under a third-party standard.

The Carbon Offset Research and Education (CORE) Initiative [outlines six main types of carbon offset projects](#):

- Renewable Energy - developing renewable energy production, such as solar, wind, hydro, or biomass power.
- Energy Efficiency - encouraging energy efficiency. Examples include distributing more efficient light bulbs or more efficient cooking stoves.
- Industrial Gases - capturing and/or destroying greenhouse gases produced in industrial processes, particularly those that have dramatically more warming effect compared to carbon dioxide, such as nitrous oxide (N<sub>2</sub>O) or HFC-23.
- Methane Capture - Methane's effect on climate change is between 21 and 72 times more severe than that of carbon dioxide. Thus capturing it and converting it to carbon dioxide can have a big impact on global warming. These projects capture the methane released from activities such as landfills, coal mining, wastewater treatment, etc., and either burn it off or use it as fuel.
- Biosequestration - broadly speaking, keeping carbon in plants by not killing them, or growing plants to absorb carbon. Projects include tree planting and avoiding deforestation.
- Carbon Capture and Storage - Capturing carbon from emissions sources and storing in geological formations.

(This set of categories is neither universally agreed upon nor exhaustive.)

The Stockholm Environmental Institute examined different types of offset projects and rated them on (1) confidence of environmental integrity (their likelihood of delivering the promised carbon offset) and (2) confidence in delivering additional sustainable development goals.

SEI [found](#) that projects most likely to deliver both were methane capture projects such as

- wastewater treatment
- manure management
- landfill gas capture

but not coal mining methane capture.

Projects that had only medium environmental integrity confidence but that were still likely to bring sustainable development benefits included

- household energy efficiency projects like cookstoves and lighting improvements
- small renewable energy projects
- municipal projects in solid waste management
- energy efficiency of public or commercial buildings, HVAC, or street lighting.

## Cost

Pricing of carbon offsets can vary wildly, for reasons that are far from transparent. While, theoretically, carbon offsets could function as commodities, with every metric ton of CO<sub>2</sub>e being fungible independent of price, a few commentators have compared the voluntary purchase of carbon offsets to buying real estate, in that “even if two houses have an identical size and make, there are an infinite number of factors that might affect the selling price.” ([Unlocking Potential: State of the Voluntary Carbon Markets 2017](#), 8). Some of these factors might include project type, location of project, which standard verified the project, etc.

Ecosystem Marketplace’s report on voluntary carbon markets found that the average price of carbon offsets in 2016 was \$3 USD/ton, although prices paid ranged from little as < \$0.5/ton to as much as > \$50/ton. (See [Unlocking Potential: State of the Voluntary Carbon Markets 2017](#), 8). The average price of offsets sold under the Gold Standard was \$4.6/ton. Offsets sold under CDM averaged \$1.6/ton, while those sold under VCS averaged \$2.3/ton when not additionally covered by the Climate, Community and Biodiversity Standards (CCB Standards); those sold under VCS + CCB averaged \$3.9/ton.

On the other hand, the vast majority of the vendors we examined sell offsets to individuals at between \$9 USD and \$15 USD per ton. Notable exceptions include on the low end Go Climate Neutral Now!, which as of January 2018 sold offsets at prices between \$.38/ton and \$8.50/ton, and on the high end atmosfair, which sold offsets at 23 EUR / ton (around \$28 USD / ton).

We don’t fully understand why the vendors we’ve come across sell carbon offsets for \$9 to \$15/ton while the average price for voluntary carbon markets overall is merely \$3/ton. Some possible explanations and data points:

- Some portion of the cost can reasonably be assumed to be vendor overhead or profit.
- Some portion of the cost could be attributed to the types of projects being selected. We looked at vendors that were relatively well-known or had good reputations. These vendors are more likely to pick projects that are reliable, credible, uncontroversial, third-party verified, and have additional social benefits. These characteristics might all carry a premium relative to the average price of carbon.

- Many carbon offsets sold on the voluntary market are purchased in bulk, which may drive down the price (either because of purchasers' being more sensitive to price or economies of scale / bulk discounting) relative to the prices for individuals that we found on vendors' websites.
- California's [current cost for carbon](#) (Nov 29, 2017) is \$15.17 / ton for industry. While this is a compliance market, quite separate from the voluntary carbon offset market, this may be a reasonable upper bound for offsets purchased in voluntary markets. [Carbon Offset Research and Education \(CORE\) notes](#) that the price for carbon is often lower in voluntary markets than in compliance markets, since demand is lower in voluntary markets.
- The *social cost of carbon*, meant to fully capture the damage done by emitting carbon into the atmosphere, is estimated at approximately [\\$40/ton](#) by the U.S. Government Interagency Working Group on Social Cost of Carbon. Theoretically, policies that spend up to \$40/ton to avoid or offset carbon emissions would still be "worth it." (Note that the social cost of carbon is [calculated to increase over time](#).)

The opacity of pricing remains concerning. It would be a good idea to do further research on this topic, including getting price and cost breakdowns directly from vendors.

## What Are the Main Concerns with Carbon Offsets?

Concerns with carbon offsets can be broken down into several categories:

1. Concerns with the quality of the offsets—that they are fraudulent or in some way don't deliver the promised reduction in emissions
2. Concerns that carbon offsets don't do enough or make things worse—that they avoid or even hinder more substantive personal or policy choices necessary to reduce emissions. For instance, purchasers might avoid taking steps to reduce their own emissions by buying their way out, in the process propping up older, fossil-fuel-based infrastructure. In a worst-case scenario, carbon offsets arguably could result in more carbon emissions, as purchasers over-emit more due to having purchased offsets (a "rebound" effect).
3. Concerns with fairness—that they are a means to shift emissions reductions from the developed world to the developing world, or that in some cases (some fraudulent, but not necessarily so), they end up paying polluters.
4. Concerns with unanticipated side effects—that carbon offsets might perversely incentivize behavior that increases carbon emissions (such as building a nitrous-emitting plant, then selling off carbon offsets to capture the nitrous before it's released into the air); that carbon offset projects might have unintended environmental or economic effects or might be simply be unconcerned with such effects; or that carbon offset policies could be used to justify (and fund) land grabs or similarly exploitative actions
5. Concerns with potential moral hazards—the "buying indulgences" issue (this is related to #2). Specifically, that carbon offsets are a way to avoid the "sinful" behavior of emitting carbon while paying others to avoid emissions for you, and that this avoids taking real

responsibility for one's own emissions. Proponents of this argument might characterize this as inherently wrong, or harmful for the planet long-term.

## Why Purchase Carbon Offsets?

Properly chosen, carbon offsets should reduce an organization or individual's carbon footprint, enabling them to limit their contribution to climate change and global warming. Issues of quality, fairness, and unanticipated side effects should be able to be limited (if not wholly eliminated) by carefully choosing projects and vendors.

Carbon offset projects can also have additional positive social benefits, such as promoting a transition to renewable fuel sources, improving economic development or health, or promoting the advancement of women. For instance, projects approved by the Gold Standard [must meet](#) at least two SDGs, in addition to addressing climate change (SDG #13). These additional social benefits can mitigate the fairness concern that the developed world is paying off the developing world to reduce emissions instead of doing so itself; in a best-case scenario, developed world funding helps poorer countries leapfrog to a renewable energy infrastructure and carbon neutral economy.

Purchasing carbon offsets can create a form of a voluntary carbon tax, creating a way for a individual or organization to recognize to some extent the social cost of carbon, and thus disincentivizing carbon-emitting behavior. For organizations, this can also be a way to start to plan for a more-regulated future, where we might anticipate there *is* a carbon tax or similar cost for carbon emissions.

There is some risk of a “rebound” effect—that given the chance to purchase carbon offsets, an individual or organization might increase carbon-emitting behavior. Research on this is mixed. [Some researchers have found](#) that, given a chance to purchase “green energy” for household use, participants did not increase their energy use, while in a similar study another researcher [found evidence of a rebound effect](#) of 1%–3% of increased electricity use.

In either instance, concern about a rebound effect with respect to carbon emissions could be mitigated by simply measuring overall carbon emissions before offsets and ensuring that these stay fixed or are reduced. To the extent that purchasing carbon offsets can encourage greater awareness and measuring of carbon-emitting behavior, they could serve as a gateway to an overall carbon strategy that leads to changes in that behavior.

While carbon offset purchases are sometimes criticized as “buying indulgences,” this analogy falls apart under scrutiny:

- “Buying indulgences” implies an act that is itself inherently bad. But the act of emitting carbon isn't inherently bad; if all carbon emissions could somehow be offset, there would be no climate change and no reason to assign a moral value to emitting carbon. (In fact,



before the industrial age, carbon emissions of animals were offset by carbon sequestration by plants.)

- In addition, if carbon offsets become popular, the price of offsets should go up as cheaper or more desirable projects become more scarce. Carbon offsets should then become expensive, and deeper emissions cuts should become more economically desirable. Or, renewable energy technology or other technology advances should make it cheaper to continue offsetting—in which case emissions reductions continue not to be a better option. Arguably, if we can continue to offset carbon emissions, then we all should continue to do so—if it actually works, then we are in fact mitigating the effects of climate change.
- Again, this argument could be mitigated by pairing carbon offsets with an overall emissions-reduction strategy.

## Conclusions

Ultimately we agree with the UN and environmental organizations and NGOs such as [NRDC](#) and [The Nature Conservancy](#), who conclude that, when used as part of an overall emissions reduction strategy and when carefully chosen, carbon offsets are a useful tool for reducing the carbon impact of individual and group activities. Moreover, carbon offsets can be applied quickly, reducing the net carbon footprint of human activities almost immediately as large, slow-moving organizations like the ACM gradually change course.

We recommend projects that use the Gold Standard rather than CDM or VCS alone, as these standards have fewer safeguards, and we are skeptical of bio-sequestration (forest) projects, because of the difficulties with ensuring additionality, permanence, and no leakage.

Therefore at this time **we favor purchasing carbon offsets from Cool Effect or atmosfair.**

We like **Cool Effect** for a number of reasons:

- Cool Effect's carbon offset projects seem carefully chosen. In particular, the developing world biogas and cookstove projects, all of which meet Gold Standard certification, provide significant social benefits in addition to carbon offsetting and are of project types that are likely to deliver the promised offset while also providing social benefits.
- Cool Effect claims that an impressive (and remarkably precise) 90.13% of funds raised for carbon offsets goes directly to the funded projects. At the same time, prices for Cool Effect offsets were among the cheaper of the vendors we examined, at \$6.04 to \$13.18/ton, depending on project.
- Cool Effect can boast a number of high-profile clients, including Salesforce and March for Science.
- Cool Effect operates as a U.S. non-profit/charitable organization, not as a commercial endeavor.

- Cool Effect has an impressive level of transparency regarding its projects, important given the asymmetrical information possessed by sellers vs. buyers in the voluntary carbon offset market. Cool Effect posts copious project reports and details for each project it sponsors. We appreciated also that Cool Effect posts a summary of each project that mentions project challenges as well as benefits.

We also had some concerns with Cool Effect:

- Cool Effect's Web site is disappointingly U.S.-centric, without means for purchasers with non-U.S. addresses or using currencies other than U.S. dollars to purchase offsets.
- Cool Effect's projects are not exclusively verified by the Gold Standard, and include bio-sequestration (forest) and wind projects, for which the promised carbon offset can be difficult to accurately verify/quantify.

We recommend purchasing carbon offsets in Cool Effect's projects in [biogas](#) and cookstoves ([Honduras](#), [Malawi](#), [Peru](#), [Uganda](#)) in the developing world, all of which are certified by the Gold Standard. **We do not recommend its U.S.-based projects, due to their limited additional social benefits, or its projects in forest conversation or wind turbines, due to verification/quantification concerns with biosequestration and wind projects.** Also, Cool Effect's U.S.-based and forest projects are not certified by the Gold Standard.

We also recommend **atmosfair** for a number of reasons:

- atmosfair's carbon offset projects meet high standards. All atmosfair projects are CDM-approved and are *also* either Gold Standard approved or pending approval. While atmosfair includes some project types for which verification/quantification is often uncertain, such as wind power or biomass projects, many of its projects are of types that are more easily verified and deliver social benefits, such as biogas/manure management, cookstoves,
- atmosfair avoids tree-planting projects, for which meeting additionality, permanence, and no leakage requirements are hard to ensure.
- atmosfair's website is friendly to non-US purchasers, unlike Cool Effect, accommodating addresses from a large range of countries (although only taking payment in euros).
- atmosfair's project description pages were transparent and detailed, with links to detailed, official documentation.
- atmosfair's website provides a lot of useful information about its carbon policies and its stance on carbon-offset-related issues. The information seemed relatively straightforward, clear, and fact- and evidence-based, without much attempt to cover uncomfortable facts with marketing.
- atmosfair is a German nonprofit organization.
- atmosfair is highly regarded in multiple comparisons of carbon offset vendors. While we were unable to find any published comparisons of carbon offset vendors within the last 8 years, atmosfair is top-ranked or nearly top-ranked in studies in [2009](#) (tied for second place), [2007](#) (recommended), and [2006](#) (top-tier).

We also had some concerns with atmosfair:

- atmosfair's carbon offsets are significantly more expensive than those of other vendors -- at \$28/ton, more than twice the cost of Cool Effect's, and well outside the typical range we saw of \$9/ton to \$15/ton. We've attempted to contact atmosfair to get an explanation of their pricing. Their responses so far have not been terribly illuminating.
- While atmosfair's projects are all Gold Standard-approved and a significant portion are of types that often deliver promised carbon offsets (cookstoves, biogas), a number are of types for which verification/quantification is often uncertain, such as wind power or biomass projects.
- A [2007 Tufts Climate Initiative study](#) (note that this is not terribly current) found that atmosfair directs about 80% of its offset sales toward carbon offset projects. This was about average for nonprofits, but a few organizations can claim a higher percentage. (Cool Effect, for example, claims [over 90%](#).)

Ultimately, carbon offsets are not a guarantee of reduced emissions. In many ways, they're more like an investment, with some degree of calculated risk. The surer way to reduce one's carbon footprint is to reduce emissions at the outset. Even so, we believe that carbon offsets can be a reasonable way to take immediate action in the short-term, as each scientific society develops a longer-term, more comprehensive strategy.

## Appendix A: Further reading

We recommend the following articles and reports for more information.

- General-interest articles
  - ["Aviation: The Dirty, Not-So-Little Secret of Internet Governance"](#) (2017)
  - ["Carbon Offsetting: Buyers' Guide 1.0"](#) (2017)
  - ["Offsetting Green Guilt"](#) (2009)
  - ["Should You Buy Carbon Offsets?"](#) (2016)
- In-depth reports
  - ["Overview of Carbon Offset Programs: Similarities and Differences"](#) (2015)
  - ["Supply and sustainability of carbon offsets and alternative fuels for international aviation"](#) (2016)
  - ["Purchasing Carbon Offsets: A Guide for Canadian Consumers, Businesses, and Organizations"](#) (2009)
  - ["Unlocking Potential: State of the Voluntary Carbon Markets 2017"](#) (2017)

## Appendix B: Who Purchases Carbon Offsets?

We've investigated carbon offset purchases by other non-profit organizations, including universities and professional organizations. Some examples of other organizations that have purchased carbon offsets or recommended purchase to their constituents:

## Scientific Organizations

- American Astronomical Society (AAS). AAS [collected carbon offset donations](#) of behalf of its members for its 2017 annual meeting, and continues to offer carbon offset donations at registration for future meetings.
- American Meteorological Society (AMS). AMS [recommends](#) attendees either take personal steps to reduce carbon emissions to offset the carbon cost of traveling to its events, or purchase carbon offsets.
- Ecological Society of America (ESA). ESA [donated over \\$22,000](#) to a forestry program for “environmental offsets” to “offset the environmental costs of travel” to the society’s 2017 annual meeting.
- Society for Conservation Biology (SCB). To offset emissions associated with SCB’s July 2017 meeting, SCB funded specific carbon offset projects, for which 80% of the money came from members and 20% from SCB itself. ([Sustainability Report](#), 19)

## Other Professional Organizations

- American Association of Law Libraries (AALL). Encouraged members to [purchase carbon offsets](#) to offset travel to their July 2017 conference.
- RIMS (Risk Management Society). Encouraged members to [purchase carbon offsets](#) to offset their emissions from their 2017 conference.
- Society for Music Theory (SMT). Encourages members to [purchase carbon offsets](#) to offset their travel to SMT meetings.
- Unitarian Universalist Association (UUA). In 2015, moved from making carbon offsets an optional purchase for attendees to their annual General Assembly to [including it as part of the registration fee, offsetting 100%](#) of emissions.

## Universities

- Duke University. [Duke Carbon Offsets Initiative](#).
- University of California, Los Angeles. [Sustainable Transportation Plan](#), 25.
- University of Colorado. [Carbon Offsets and RECs](#).
- University of Maryland. [Carbon Neutral Air Travel Initiative](#).



