

Stanford SOCIAL INNOVATION REVIEW

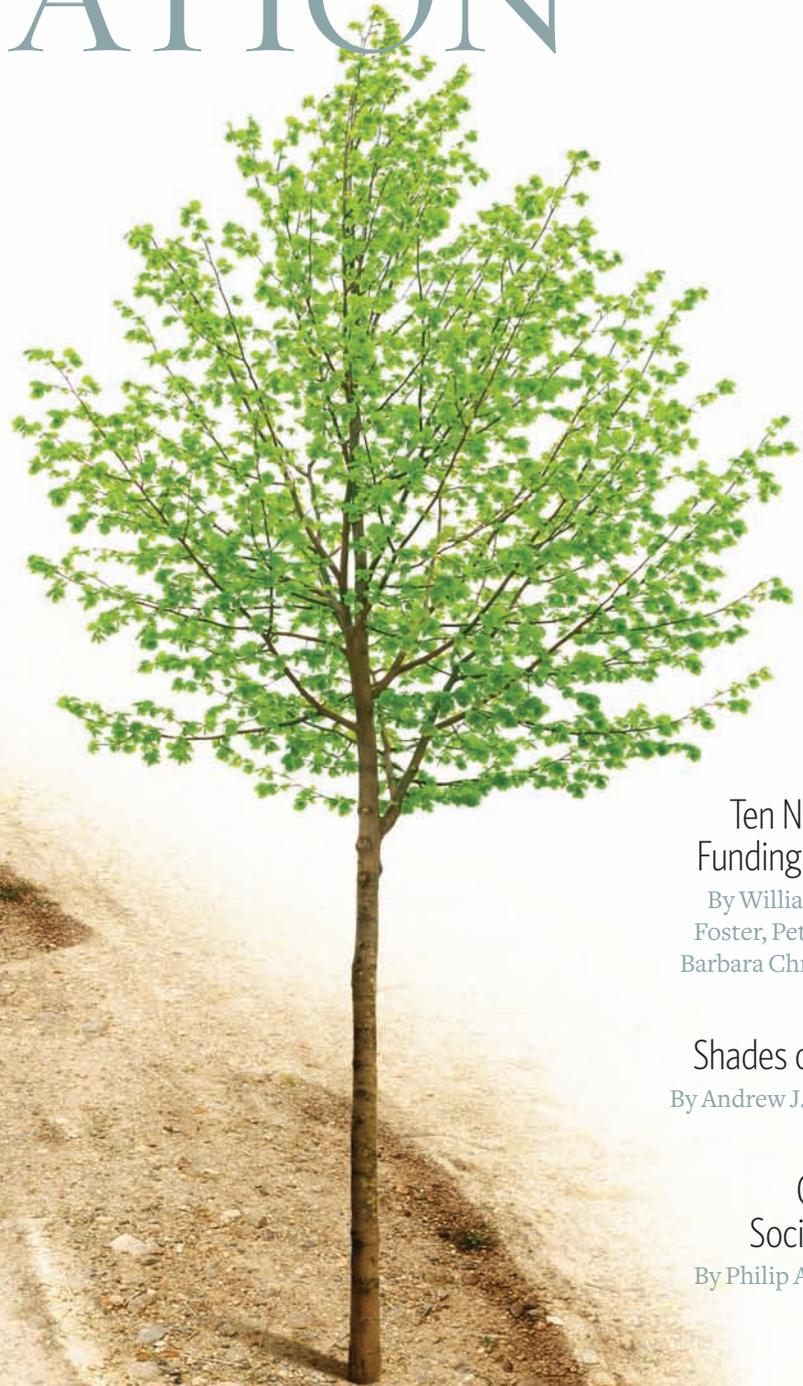
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Offsetting Green Guilt

Do voluntary carbon offsets help counteract greenhouse gases, or are they just a way for guilt-ridden consumers to buy their way out of bad feelings?

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Offsetting Green Guilt

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Voluntary carbon offsets allow people to invest in projects that allegedly counteract their greenhouse gas emissions. But can voluntary offsets help slow global warming? Or are offsets simply a way for guilt-ridden consumers to buy their way out of bad feelings? Here's what an economist has to say.

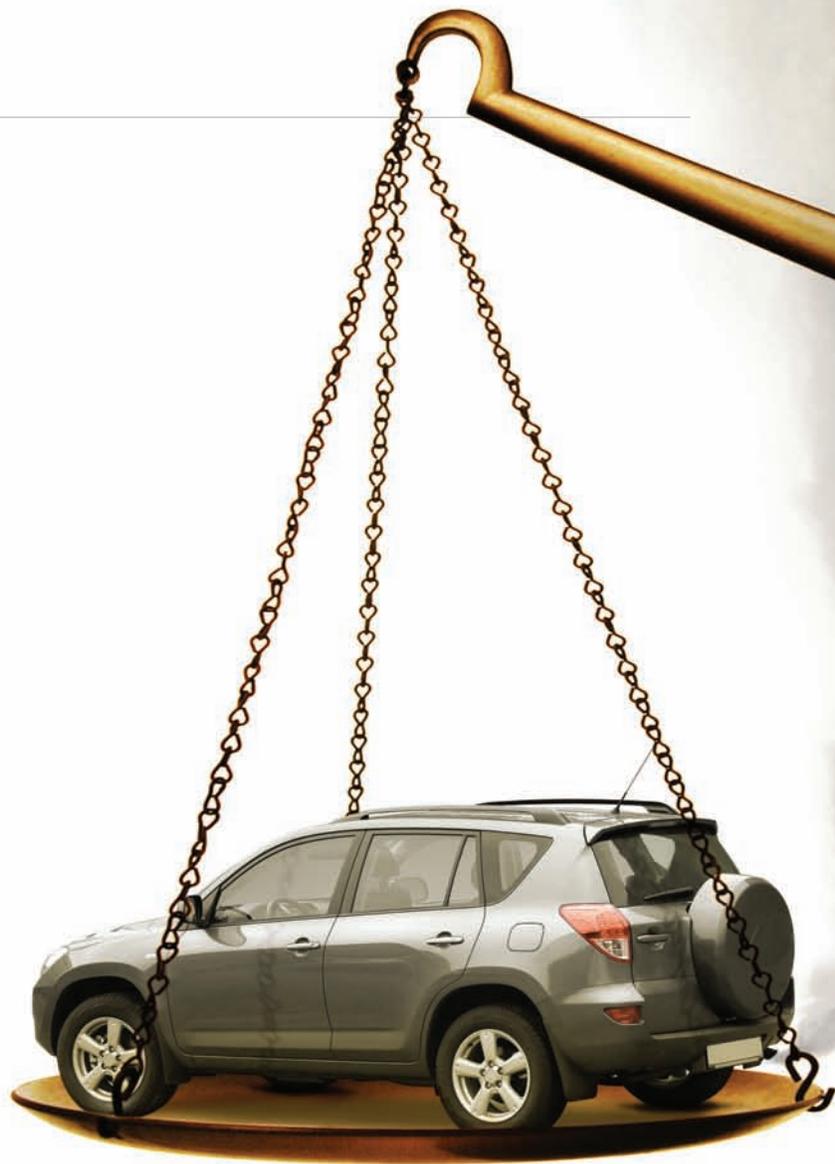
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fter purchasing airline tickets through Travelocity a few months ago, I received this offer from Arlington, Va.-based Conservation Fund: “Effectively offset the negative environmental impact of your entire trip. Go without guilt—Go Zero!” For an additional \$3.42, I learned, I could neutralize the carbon dioxide (CO₂) my one-day trip would emit by planting trees that would absorb the CO₂ out of the atmosphere. The organization also noted that my offset purchase would not only fight climate change, but also restore wildlife habitat, improve air and water quality, enhance outdoor recreation areas, and leave a lasting legacy for future generations.

Such appeals to eco-guilt are increasingly common, and indeed crop up at many rites of passage. For births, London-based Carbon Clear offsets the greenhouse gases that diapers produce. EcoEvents, a Brighton, U.K.-based company, negates the greenhouse gases that weddings generate. And the Natural Burial Company, of Leicester, U.K., and Portland, Ore., allows the bereaved to send out the deceased with carbon-neutral funerals.

The voluntary carbon offset market gives consumers a way to pay for their sins of emissions. Yet many observers worry that, by allowing people to buy their way out of eco-guilt, the offset market may actually lead people to emit even more greenhouse gases, perhaps by encouraging them to take another flight, buy a bigger car, or build a larger house. In other words, they argue, consumers will purchase carbon offsets and keep polluting, just as Christians in the Middle Ages bought indulgences and kept transgressing.

Should people who care about the environment buy carbon offsets? Or might offsets really do more harm than good? These questions are, for me, both personal and professional. My academic research combines insights from economics and psychology to understand why people make





environmentally related choices and to determine whether these choices have their intended effects.

My aim in this article is to share some insights, many from the academic literature, that are useful for understanding voluntary carbon offsets and for evaluating whether the offset market is likely to help the environment. To be clear, I am focusing on voluntary offsets and not offsets that are part of national or international climate change policies, such as cap-and-trade legislation. I show that the voluntary carbon offset market exists and has been growing for psychological and sociological reasons.

But an economic perspective reveals that the potential benefits of voluntary offsets will go only so far. We cannot—and should not—rely on the offset market to reverse climate change. Yet there are still good reasons to buy offsets, as guilt alleviation is not necessarily a bad thing and the offset market may promote greater environmental awareness. To maximize this new and growing market's environmental benefits, however, it needs greater scrutiny and standardization.

HOW VOLUNTARY OFFSETS WORK

Voluntary carbon offsets allow consumers to pay someone else to reduce their own greenhouse gas emissions by investing in renewable energy, energy efficiency, forest protection, and other projects that either reduce emissions or sequester planet-warming CO₂. In principle, these offset projects reduce the overall amount of greenhouse gases in the atmosphere. Later I will discuss legitimate concerns about whether firms that sell carbon offsets always deliver on their claims. But for the time being, let's assume that they do and focus on the consumer side of the market.

For example, I may want to offset the emissions of driving my 2001 Subaru Outback. According to one provider, San Francisco-based TerraPass Inc., my driving emits 11,000 pounds of CO₂ a year. For \$65.45, I can negate my car's emissions through projects that promote cleaner power and farm energy.

If I'm feeling more ambitious, South Burlington, Vt.-based NativeEnergy Inc. will offset my entire carbon footprint, which the company's calculator estimates to be 36,000 pounds per year. Lucky for me, that's smaller than the whopping 50,000 pounds that the average American generates. Neutralizing my emissions would cost \$252—which the organization accepts in 12 monthly installments—and the money would go toward energy-efficiency programs and the use of biomass to generate electricity. Overall, the price of offsets is surprisingly variable, with the majority falling between \$10 and \$20 per ton of CO₂. (See "The Market for Carbon Offsets at a Glance" on page 29 for more price information.)

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The market for voluntary carbon offsets has expanded rapidly in recent years, along with the public's awareness and concern about climate change. Former Vice President Al Gore's documentary, *An Inconvenient Truth*, not only earned him the Nobel Peace Prize, but also had a measurable effect on the offset market, shows my graduate student Grant Jacobsen in a new study. He finds that during the two months immediately following the film's release, offset purchases grew 50 percent.

Now, according to Carbon Catalog, the largest online directory of carbon offset providers, 97 companies are in the market—an increase of more than 200 percent since 2002. The majority of providers are in Europe and North America, but they invest in 328 projects around the world. (See graphs at the top of page 29 for a snapshot of the carbon offset market.) Reforestation projects are the most common, followed by renewable energy initiatives. Other popular categories of projects promote energy efficiency and the use of less polluting fuels and materials. In total, the voluntary carbon offset market accounted for expenditures of \$330.8 million in 2007—up more than 300 percent from the previous year.¹

Despite the impressive growth of the voluntary offset market, its current effects are not even drops in the bucket of what is necessary for meaningful climate-change mitigation. In 2007, voluntary offsets reduced the amount of CO₂ in the atmosphere by 65 million tons. Yet the three largest U.S. power plants—among a total of 8,000—emitted roughly the same amount of CO₂. Meanwhile, global emissions in 2007 exceeded 40 billion tons, and they are increasing at an alarming and accelerating rate.

WHY THEY AREN'T ENOUGH

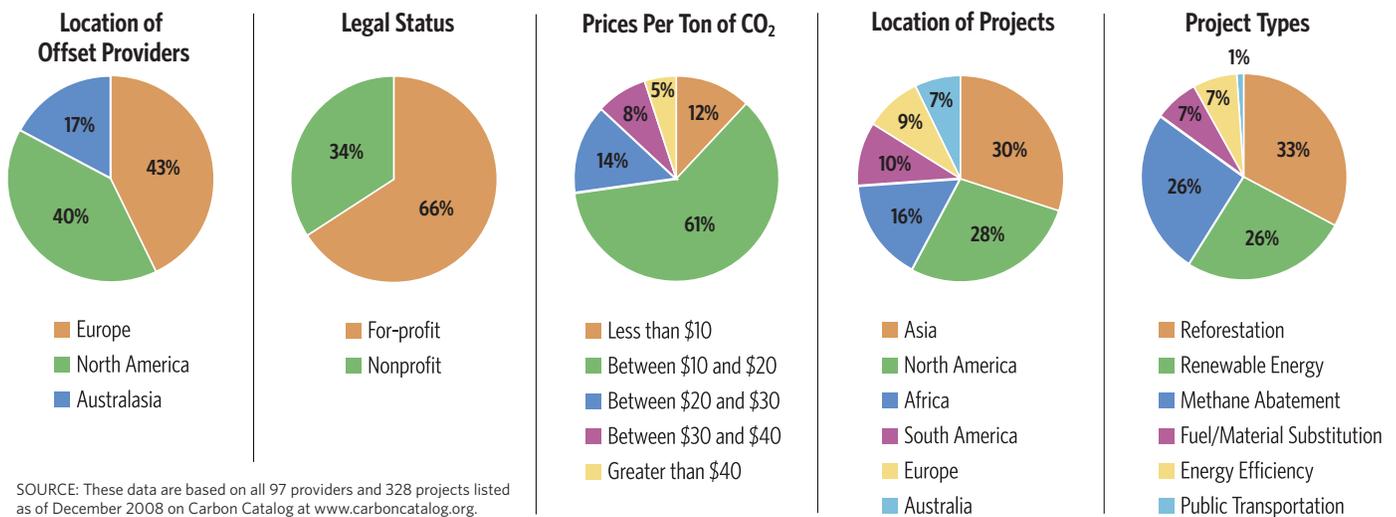
Although people are investing large and growing amounts of time and money in the voluntary carbon offset market, the scale of their efforts is entirely incommensurate with the problem of climate change. From an economics perspective, this is not surprising, because voluntary offsets function like charitable contributions to a public good. And a fundamental finding in economics is that voluntary contributions never provide enough public goods.

Public goods have two defining characteristics: non-excludability and non-rivalry. Non-excludability means that no one can prevent an individual from enjoying the good once it is offered. Non-rivalry means that one person's use of the good does not diminish other people's ability to enjoy it. Reducing CO₂ emissions is a public good because, once provided, everyone can enjoy the benefits without adversely affecting anyone else's ability to do the same.

But this situation means that private people and institutions fall prey to the free rider problem. If people can enjoy the benefits of the good without providing it themselves, they have little incentive to contribute to the good. The free rider problem is even greater when each contribution to the good has only a trivial impact, as in the case of individual reductions of greenhouse gas emissions. People might reasonably ask

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The Market for Carbon Offsets at a Glance



themselves, “Why should I pay more to offset my emissions if it isn’t even going to make a difference?” The result of this reasoning is a so-called “market failure,” as everyone would be better off with more of the public good, if only enough people could avoid the free rider problem. To overcome the market failures, governments often intervene by levying taxes and using the revenue to provide public goods, such as roadway maintenance and national defense.

Despite the free rider problem, private individuals and firms often provide more public goods than traditional economic theory predicts. Charitable giving in the United States, for instance, reached \$295 billion in 2006, at which time 26.7 percent of American adults also volunteered for some organization, spending a total of 12.9 billion hours, reports the National Philanthropic Trust. To help explain this behavior, economists have developed the notion of *impure public goods*, which are products or services that combine both public and private benefits. Through impure public goods, people gain additional private benefits by providing public benefits.

Recognizing the power of impure public goods, many nonprofit organizations—think Girl Scouts of the USA and National Public Radio—finance their publicly beneficial activities by selling private goods, such as cookies, theater tickets, and magazine subscriptions. Likewise, consumers can donate to charitable causes while purchasing the private goods they like through corporate programs such as Bono’s (Product) RED campaign and 1% for the Planet, both of which register companies that donate a portion of their profits to charitable organizations. Government agencies are also taking advantage of impure public goods. The city of Palo Alto, Calif., for instance, encourages residents to participate in a voluntary green electricity program by offering them discount coupons at dozens of local businesses, including dentists, hair salons, and gyms.

Charitable acts also yield less tangible, but nevertheless powerful psychological and social benefits. When donating money or volunteering, people often experience a “warm glow” of good feeling, approval from their peers, and a reputational boost from being wealthy enough to donate. Fundraisers recognize the importance of these benefits and often seek to capitalize on them through public

auctions, naming rights, and published lists of donors.

The same strategies are clearly at play in the market for voluntary carbon offsets. The reputational benefits are most obvious. People who buy offsets for their cars often receive a window decal to make others aware of their carbon neutrality. And when companies or institutions purchase offsets, they typically advertise having done so.

POLLUTION PENANCE

As with other charitable contributions, purchasing voluntary carbon offsets can generate the warm glow of doing good, as well as social approbation. But it also alleviates guilt. As I described earlier, many offset providers seek simultaneously to instill guilt and to offer a way out of it.

Yet economic theory has less to say about what happens when guilt alleviation is the private benefit of an impure public good. This means that voluntary carbon offsets pose new and challenging questions for economists to study—namely, could voluntary carbon offsets, like indulgences of yore, actually increase people’s gas-guzzling, energy-consuming ways?²

Let’s start with the observation that people who care about the environment—that is, people who are likely to purchase carbon offsets—are likely to pollute less. They seem to drive less, take fewer flights, turn off the lights more readily, and use less heating and cooling in their homes. And indeed, in our recent study of residential electricity consumption in Traverse City, Mich., we find that households identified as conservationists (because of their membership in an environmental organization) use 10 percent less electricity than did comparison households.³

But what happens when environmentally minded people purchase carbon offsets? Let’s consider two possibilities. The first is that they do not change their pollution-generating behaviors, which means that their offsets truly reduce their greenhouse gas emissions.

The other possibility is that they change their behaviors in ways that generate more emissions—a rebound effect. Because purchasing offsets is easier than continuing to restrain consumption, even conservationists may use offsets to justify more travel, a bigger car,

or (as Al Gore has demonstrated) a larger house. If these changes more than offset the offset, they increase a person's emissions.

Stanford University social psychologists Benoît Monin and Dale Miller have discovered such rebound effects in their research on prejudice.⁴ The researchers find that when people are given the chance to demonstrate their egalitarianism, they are more likely to discriminate against a minority member. In one experiment, for example, people who are allowed to publicly short-list a woman or an African-American person for a job are later more likely to hire a white man than are people who didn't first create the short list. Another experiment showed that people who are given the opportunity to refute blatantly sexist statements later favor a man for a job more than do people who didn't get to advertise their nonsexist credentials. Likewise, people who prove their environmental credentials by purchasing voluntary carbon offsets may later feel justified to act in less environmentally friendly ways.

Paying to alleviate guilt did lead to worse behavior in one well-known study of parents of children in day care.⁵ Uri Gneezy of the University of California, San Diego, and Aldo Rustichini of the University of Minnesota experimented with charging parents a fee when they were late picking up their children. The surprising result was that the number of late pickups increased—more than doubling. The ability to pay a late fee—essentially an offset—alleviated guilt and justified tardiness.

The Web site www.cheatneutral.com is already satirizing the possibility that carbon offset purchasers are merely appeasing their own guilty consciences. Its pitch: "When you cheat on your partner you add to the heartbreak, pain, and jealousy in the atmosphere. Cheatneutral offsets your cheating by funding someone else to be faithful and NOT cheat. This neutralizes the pain and unhappy emotion and leaves you with a clear conscience."

Unfortunately, few researchers directly study how the purchase of carbon offsets affects consumers' actions. Some of my own research, however, is beginning to get at this question. Returning to those conservationists in Traverse City, we were able to compare electricity consumption before and after participants had the opportunity to purchase carbon offsets through voluntary participation in a green electricity program. Participating households agreed to pay more to support wind energy that offset their household's emissions from electricity use. Comparing these households to those on a waiting list to join the program—and therefore not yet offsetting—we found that participating households did not increase their electricity consumption. In this case, the offset had the intended effect of decreasing net emissions.

In sum, voluntary carbon offsets not only allow environmentally minded people to alleviate their guilt, but also seem to decrease their net emissions. Although existing economic theory can help us understand offsets as impure public goods, further research that draws on both economics and psychology is necessary to understand important features of the market. Voluntary offsets on their own are not going to save the planet from climate change. But the market is providing new and substantial opportunities for both academic study and business innovation. People are spending real money on carbon offsets, and with demand expected to grow, we can expect an expansion in the supply of offset providers.

MAKING OFFSETS WORK

I have so far focused on the consumer side of the market and said little about the suppliers of carbon offsets. But offset projects themselves have been a source of substantial criticism and controversy. Problems arise because consumers cannot see what they are buying and whether a project actually reduces atmospheric CO₂. Third parties that set standards and certify offset projects will play an increasingly important role in maintaining the offset market's integrity and in giving it the best shot at having real environmental benefits.

The market for voluntary carbon offsets is plagued by asymmetric information, which arises when one party in a transaction has more or better information than another party. Offset providers know a lot about the projects in which they invest, but offset buyers know only what the provider tells them. Because potential buyers have no way of verifying that the providers are investing their money, or that their investments are actually reducing emissions, they may be discouraged from purchasing offsets. They may also buy from unscrupulous providers.

Many other industries deal with asymmetric information through third parties. In general, third parties set standards, audit firms, and verify whether firms are delivering on the quantity and quality of their claims. Examples of third party-certified industries within the environmental sector include organic agriculture (U.S. Department of Agriculture), green electricity (Green-e), green buildings (U.S. Green Building Council's LEED program), energy efficient appliances (U.S. Department of Energy and the U.S. Environmental Protection Agency's Energy Star program), sustainable forestry (Forest Stewardship Council), and management (ISO 14000). Third parties may be nongovernmental organizations, industry associations, or governmental agencies.

The market for voluntary carbon offsets also needs third parties to set standards and provide certification—and both are emerging. According to a report by Ecosystem Marketplace and New Carbon Finance, third-party standards are considered the most significant trend in the voluntary offset market in 2007.⁶ The report identifies 13 different standards and describes the scope of each. The most popular standard is the Voluntary Carbon Standard (VCS), which was created through a collaboration of the Climate Group, the International Emissions Trading Association, the World Economic Forum, and, more recently, the World Business Council for Sustainable Development. Among the VCS's objectives are to standardize and provide transparency and credibility to the voluntary offset market, and to enhance business, consumer and government confidence in voluntary offsets.

Other widespread standards are those established by the Clean Development Mechanism (CDM) and the Gold Standard. The CDM criteria regulate the way that developed countries can accrue carbon credits to comply with the Kyoto Protocol, as well as certify emission reductions that are sold on the voluntary market. The Gold Standard is an independent organization that promotes long-term emission reductions that are compatible with sustainable development. The Gold Standard establishes criteria above and beyond the CDM, making sure that no offsets are sold multiple times and that offsets are backed by real emission reductions.

Although existing standards and certifiers differ in many ways, they all address concerns about additionality and permanence. Ensuring additionality means showing that a carbon offset would not have occurred in the absence of a voluntary contribution. Offsets may not be additional because of double-counting of offset sales, existing regulations that required the emission reductions anyway, and intentional increases in baseline emissions for the purpose of later offsetting them. Establishing additionality has been the biggest challenge for the offset market.

Concerns about the permanence of carbon offsets arise mostly about forestry-based projects. Trees absorb CO₂ as they grow and hold on to it as long as they remain standing. But cutting, burning, and future land uses are difficult to predict. If, for example, you buy an offset that works through the prevention of deforestation, it may have no benefit next year if the forest burns and trees are not replanted. Such concerns about permanence are significant enough that the Gold Standard does not even certify forestry-based projects.

Nevertheless, forestry-based offsets are the most common type of offset sold on the voluntary market, and proponents of them stress their many additional benefits, such as the protection of wildlife habitat and the provision of recreational opportunities. At this point, efforts are ongoing to establish generally accepted forestry-based standards and best practices. One useful idea is to discount the price of forest-based offsets in order to reflect the uncertainty.⁷

Amidst the information asymmetry and surge in competing and confusing claims, the U.S. Federal Trade Commission (FTC) has also taken an interest in voluntary carbon offsets. Specifically, the FTC has begun investigating whether the market poses problems for consumer protection. As a first step, the FTC convened a workshop in January 2008 to identify issues in the voluntary offset market so that it could review the Guides for the Use of Environmental Marketing Claims. It remains to be seen whether these guides established by the FTC will serve as a complement or substitute for those established among nongovernmental certifiers.

In the meantime, consumers interested in purchasing offsets should check out the Carbon Catalog at www.carboncatalog.org. The Web site maintains a comprehensive listing of projects and providers, along with an array of additional information including the company's location, its status as for-profit or nonprofit, the specific projects it works with, its offset price per ton of CO₂, and whether it satisfies various criteria for transparency and project quality. The site also includes detailed information about each project, along with links to further information.

SHOULD YOU OFFSET?

Climate change is now widely recognized as one of the most pressing problems affecting people all over the planet. As governments on all levels—national, regional, and local—wrestle with ways to address the problem, some people have begun taking matters into their own

hands. These people care about minimizing their own contribution to the buildup of greenhouse gases, and they are the driving force behind the emerging market for voluntary carbon offsets.

Although the voluntary carbon offset market has grown substantially in recent years and is expected to keep expanding, it will not make real progress on solving the problem of climate change. The purchase of voluntary offsets functions much like the provision of public goods, and so the incentive for free riding is simply too strong. But free riding is overcome to some extent because people who purchase offsets obtain private benefits—most notably guilt alleviation.

Even if the voluntary carbon offset market will not save the world from climate change, it is providing real opportunities for eco-entrepreneurship. For example, people looking for capital to invest in renewable energy projects will find willing investors in the voluntary offset market.

Meanwhile, the demand for offsets is present and growing. Offset companies are making real money. And third parties are starting to keep sellers honest and buyers interested.

One of the largest criticisms of the voluntary carbon offset market is that purchasing offsets will, at best, justify business as usual behavior and, at worst, actually increase emissions of CO₂. Although there is little research about the effects of purchasing offsets on behavior, the existing evidence suggests that people do not indulge in carbon emissions as a result of purchasing offsets. After all, the type of person who is willing to buy a carbon offset in the first place is likely to be quite green. I don't see too many Hummers on the road with window decals touting that the owner purchased carbon offsets.

My own view is that purchasing carbon offsets is better than nothing, assuming that you are careful about where you buy them. Yet when considering ways to reduce your own carbon footprint, you should compare offsetting to the more certain alternative of directly reducing your own emissions. As offset provider Carbonfund.org states, your motto should be, "Reduce what you can, offset what you can't." ■

Third parties that set standards and certify offset projects will play an increasingly important role in maintaining the offset market's integrity and in giving it the best shot at having real environmental benefits.

Notes

- 1 Katherine Hamilton, Milo Sjardin, Thomas Marcello, and Gordon Xu, *Foraging a Frontier: State of the Voluntary Carbon Markets 2008*, report by Ecosystem Marketplace and New Carbon Finance, 2008.
- 2 For some initial attempts to model the theory of carbon offsets, see the following papers: Joshua Gans, "Carbon Offset Provision with Guilt-Ridden Consumers," 2008 (working paper available at www.mbs.edu/home/jgans); and Matthew Kotchen, "Voluntary Provision of Public Goods for Bads: A Theory of Environmental Offsets," *Economic Journal* (in press).
- 3 Matthew Kotchen and Michael Moore, "Conservation: From Voluntary Restraint to a Voluntary Price Premium," *Environmental & Resource Economics*, 40, 2008: 195-215.
- 4 Benoît Monin and Dale Miller, "Moral Credentials and the Expression of Prejudice," *Journal of Personality and Social Psychology*, 81, 2001: 33-34.
- 5 Uri Gneezy and Aldo Rustichini, "A Fine Is a Price," *Journal of Legal Studies*, 29, 2000.
- 6 See Note 2.
- 7 Man-Keun Kim, Bruce McCarl, and Brian Murray, "Permanence Discounting for Land-Based Carbon Sequestration," *Ecological Economics*, 64, 2008: 763-769.