

# Evaluating and Improving Carbon Offsetting Programs

## Key Findings

- For entities facing emission reduction targets that might otherwise be tough to meet at manageable costs, offsets provide an opportunity to moderate cost impacts. At the same time, offset programs can offer social, environmental, and technology transfer benefits to regions that host offset projects.
- The world's largest offset program to date, the Clean Development Mechanism (CDM), for instance, was explicitly intended to foster sustainable development and technology transfer to developing countries. Other offset programs launched in developed countries, whether for the voluntary market or regional mandatory cap-and-trade programs, often prioritize projects in nearby communities and enterprises. The success of these programs in achieving local or sustainability benefits has been mixed.
- Because many of the offset programs do not focus on additional sustainability benefits, several add-on standards have been developed that can be used in conjunction with other mandatory or voluntary programs.
- An in-depth road test of several offset standard protocols shows that the amount of offsets credited to a given project can vary by a factor of 2 or greater. Protocols are the foundation of an offset program. They define the eligibility requirements and the quantification procedures for calculating the quantity of offsets generated by each offset project.
- Carbon credits are increasingly used to offset air travel and yet our research shows that offset calculators for aviation vary greatly in their results, depending on how non-CO<sub>2</sub> climate emissions are treated.
- There is continuing debate on how non-CO<sub>2</sub> climate effects from aviation should be included in greenhouse gas air travel calculators. SEI shows that underlying this debate are not primarily scientific gaps but differing policy choices that have to be made in order to estimate aviation's other climate effects.

## The carbon offsetting landscape

Offset markets are rapidly expanding and maturing. SEI's CORE programme, the *Carbon Offset Research Education Initiative*, offers one of the few comprehensive comparisons of international, national and sub-national offset programs and standards.

Current climate science suggests that global greenhouse gas emissions must decline by as much as 80 per cent by 2050 to avoid unacceptably high risks. To achieve this goal, we must dramatically transform how we produce and use energy, manage land, and value the climate in our economic system. Such a transition will require far-reaching local, national and international climate policies, with support and participation by businesses and communities.

Carbon or greenhouse gas offsets have long been promoted as an important element of a comprehensive climate policy approach. By virtue of enabling emission reductions to occur where costs may be lower, offset projects and programs can



reduce the overall cost of achieving a given emission goal, a finding supported by many economic analyses. As a result for a similar overall cost, climate policies and targets can be more ambitious than they might otherwise be. As well as this, offsets have the potential to deliver sustainability co-benefits, to spur technology development and transfer, and to develop human and institutional capacity for reducing emissions in sectors and locations not included in a cap and trade or a mandatory government policy.

### Risks connected to offset programs

As experience with offset markets grows, however, several policy challenges have become apparent.

- **Additionality** - Offsets may come from projects that would have happened anyway – projects that are ‘non-additional’.
- **Permanence** - Offset projects may turn out not to be permanent – e.g. forestry projects that fall prey to fire, insects, logging, or clearing for agriculture.
- **Leakage** - Offset projects can lead to increased emissions somewhere else (‘leakage’).
- **Quantification and Verification** - Emissions reductions may be incorrectly estimated on a systematic basis.

Some “error” — non-additional projects, leakage, impermanence — is to be expected, and can be compensated for in offset program design through features such as conservative baselines, leakage factors, or buffer pools, to name a few. However, if such errors are predominant, and the compensating features inadequate, the integrity of an offset market will be undermined.

Depending on how offsets are used, they can delay investment and innovation in lower-emitting technologies in key sources and sectors of the economy (e.g. those covered by a cap and trade). They may provide desirable near-term cost advantages, but at the risk of “locking-in” higher emissions infrastructures and higher costs in the longer term. Where the cost of implementing offset projects is significantly lower than the market price of offsets, as is the case for many non-carbon dioxide (CO<sub>2</sub>) projects such as HFC incineration<sup>1</sup>, offsets may provide a useful transition mechanism. Ultimately, however, other policies such as direct incentives or regulation could achieve deeper reductions more rapidly and at lower cost.

### Policymakers’ challenge

The challenge for policymakers is clear: to design offset programs and policies that can maximize their potential benefits while minimizing their potential risks. Given the number and complexity of offset issues and interactions, this challenge is considerable. At the same time, well designed offset programs may be one way out of the conundrum of needing to achieve steep global emission reductions while at the same time supporting development in less affluent regions. The climate

<sup>1</sup> HFC-23 is a byproduct of HCFC-22 manufacturing. HCFC-22 is used as coolants in air conditioning units and refrigerators. Their use was encouraged as an alternative to ozone-depleting chlorofluorocarbons. Despite their “ozone-friendly” properties, HFCs have a high global warming potential.

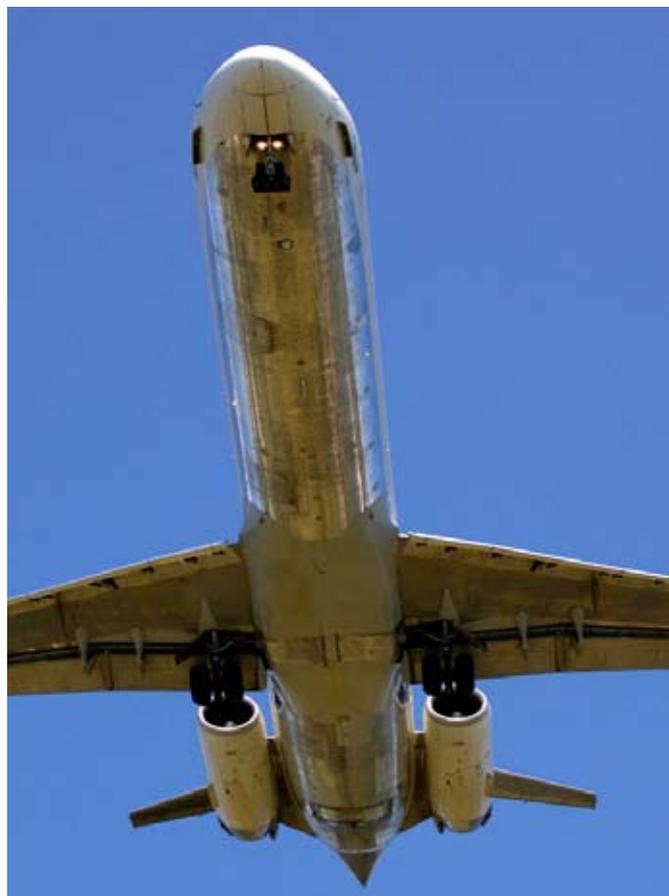


Photo: © James Wang

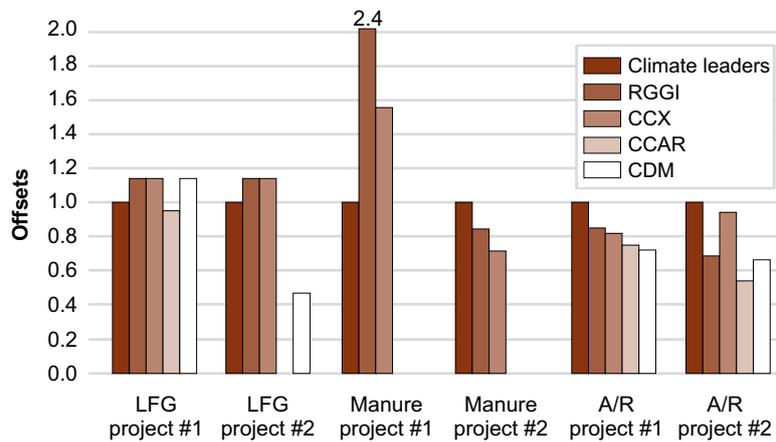
imperative calls for steep domestic reductions in wealthier nations, as well as significant financial flows to support the low-carbon transition in nations lacking capacity and historical responsibility to reduce emissions.

The landscape of domestic and international project-based emission reduction or “offset” programs is evolving rapidly. While the global economic slump dampened activity in 2008, the global value of primary offset transactions has grown to USD 7.2 billion in 2008, representing over 10 fold growth from 2004 levels. Offset markets are likely to grow substantially over the coming years.

### New US cap and trade legislation

In June 2009, for the first time ever, a US congressional body (House of Representatives) approved cap-and-trade legislation. This bill, American Climate and Energy Security Act (ACESA), calls for a massive expansion of offset market activity. It establishes emission targets of 17 per cent below 2005 levels in 2020, and 83 per cent below 2005 by 2050, with offsets as the most prominent mechanism for containing costs of compliance. The bill allows for the use of up to 2 billion tons in domestic and international offsets for compliance each year. Were the full 2 billion tons of offsets to be used, which is unlikely to happen in the near future, it would require a four-fold increase in the global volume of offset created annually as compared with current levels.

The fate of US cap-and-trade legislation (now in debate at the US Senate), the outcome of the international climate negotiations in Copenhagen in late 2009, and the timing of a global economic recovery, are the major factors that will drive offset markets in the years to come.



**Figure 1: Offsets credited for sample projects, relative to estimates using the climate leaders protocol<sup>2</sup> (Climate Leaders value = 1)**

<sup>2</sup> In figure 1, no credits are indicated in cases where sample projects were either ineligible or increased emissions under the protocol applied.

### Analysing offset programs

Voluntary market offset programs and existing regional offset programs could prove influential in the design of a federal US offset market, as well as in the reform of the Clean Development Mechanism and Joint Implementation. SEI carried out a systematic and comprehensive review of existing offset programs in 2008, *A Review of Offset Programs: Trading Systems, Funds, Protocols, Standards and Retailers*, which was updated in 2009.

The goal of these reviews is to provide an up to-date analysis and synthesis of the most influential offset programs and activities, to reflect on lessons learned, and thus to inform participants and designers of current and future offset programs.

To provide further guidance to policy makers, SEI also engages in more in-depth analysis of offset project protocols. Protocols are the foundation of an offset program. They define the eligibility requirements and the quantification procedures for calculating the quantity of offsets generated by each offset project. By assuring quality standards for offsets, protocols are central to the credibility of offset markets.

In 2009, SEI prepared a report comparing offset protocols of four different programs: **Road-testing of Selected Offset Protocols and Standards; A Comparison of Offset Protocols: Landfills, Manure, and Afforestation/Reforestation**. The report examines protocols of three offset types: landfill methane, manure digesters, and afforestation projects. It compares the U.S. EPA Climate Leaders' protocols for these project types with four other offset programs: the Clean Development Mechanism (CDM), Regional Greenhouse Gas Initiative (RGGI), Climate Action Reserve (CAR), and Chicago Climate Exchange (CCX).

SEI road tested these protocols for two sample projects for each of three project types to reveal differences in amounts of offsets counted under the different protocols. These differences in offset counts arise from differences in accounting boundary definitions, baseline setting methods, measurement rules, emission factors, and discounts.

As illustrated in Figure 1 for the sample projects, the amount of offsets credited by various protocols can vary rather dramatically. Overall, the quantitative road test results underscore the importance of improving and standardizing protocols so that at least across offset programs, and for a given project type, "a ton is a ton". Currently, as the road test illustrates, this is not quite the case.

The report reveals a number of other differences among protocols – in additionality and regulatory surplus requirements, monitoring methods, and other elements – that are salient to the further refinement of project protocols. With respect to general protocol elements, we find, for instance, that eligible project start dates can be important tools to encourage swift early action and to limit non-additional projects. These are projects that were implemented prior to the influence of carbon markets, in other words, they were implemented for other reasons than for the carbon credits they can sell. Such projects should therefore not be eligible as offset projects.

Carbon Offset Research & Education (CORE) is an initiative of the Stockholm Environment Institute (SEI). CORE's mission is to foster offset programs and policies that maximize their potential benefits, while minimizing their potential risks. CORE maintains an extensive website that includes information on an analysis of over 30 offset programs and standards:

[www.co2offsetresearch.org](http://www.co2offsetresearch.org)

The 2008 study, *A Review of Offset Programs: Trading Systems, Funds, Protocols, Standards and Retailers* by Anja Kollmuss, Michael Lazarus, Carrie Lee and Clifford Polycarp is available for download for the CORE website. An update will be published as a book by Earthscan Ltd. in late 2009 under the title: *Handbook of Carbon Offset Programs*.



Photo: © Ian Wilson

## Recommendations

### Improved protocols

SEI's research shows that in order to assure offset quality and to make functionality of offset credits from different programs possible, project protocols have to be improved and standardized so that across offset programs emission reduction credits are calculated consistently and conservatively, scaled up as alternatives to traditional biomass burning.

### Sharing of best practice

Greater sharing of information and lessons learned from existing programs is needed, as new offset programs at regional, national, and international levels are being established or revised.

### Not all project types are equally 'offset friendly'

Some project types are better suited to be included in offset programs than others. For example, difficulties in measuring the carbon benefits or in defining a project baseline, make the validation and verification of offset credits some project types especially difficult. For those, other policy measures might be more appropriate. Also, in some sectors, emissions reductions can be achieved more efficiently and cheaper by implementing other policies such as straight forward regulation (for example for HFC emissions). In these sectors, offset programs should only be implemented as transitional measures until regulation has been passed.

### Offsets a transitional tool

In order to maximize the benefits of offset policy and to minimize their risks, offset programs may best serve as transitional instruments to encourage the speedier uptake of low-carbon practices as well as managing near-term costs of mitigation.

#### Published by:

Stockholm Environment Institute  
11 Curtis Avenue  
Somerville, MA 02144-1224  
USA  
+1 617 627 3786



[www.sei.se](http://www.sei.se)

#### Author:

Anja Kollmuss  
[anja@sei-us.org](mailto:anja@sei-us.org)

#### Further Information:

Robert Watt  
[robert.watt@sei.se](mailto:robert.watt@sei.se)  
+46 709 675808