

LINKING MARKETS FOR GHG REDUCTIONS: CAN IT BE DONE?

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SUMMARY

Companies worldwide have begun to participate in variety of markets – both voluntary and mandatory – involving the purchase and trade of greenhouse gas (GHG) emission reductions. These markets afford companies the opportunity to offset their own emissions and attain a particular net emissions goal, including “carbon neutrality.” Because these markets are arising in different contexts, however, they are characterized by a diversity of standards and uncertainties about their compatibility. As different climate change programs around the world create markets for GHG reductions, there is a growing push for common standards and harmonization. This paper surveys existing and developing GHG reduction standards, discusses the prospects for their harmonization, and highlights some areas where “common ground” may be found for programs and markets to link together. A key conclusion is that fully unified standards for tradable GHG reductions are probably not realistic, but that linkages between markets are still possible where certain basic criteria are met and sufficient transparency exists.

1 THE CHALLENGE OF STANDARDIZING “CARBON OFFSETS”

Tradable GHG reductions are often purchased to offset or “neutralize” a company’s carbon dioxide emissions, and are therefore commonly referred to as “carbon offsets.” Carbon offsets are a unique commodity. In essence, they are a claim or property right to a specific, verified reduction in GHG emissions. Carbon offsets originate from projects or activities (i.e., “offset projects”) explicitly designed to reduce GHG emissions. In purchasing and retiring an offset, a company in effect makes the claim that it has foregone reducing its own emissions, but is instead paying someone else to achieve the same net result.

Carbon offsets are intangible, and so their integrity depends on assurances about how well they meet certain defining criteria. It is commonly agreed that a carbon offset commodity must represent GHG emission reductions that are:¹

- **Real** – Quantified GHG reductions should represent actual emission reductions and not artifacts of (incomplete) accounting
- **Surplus** – GHG reductions should be a response to the buyer’s promise to purchase them, not reductions that would have happened anyway under “business as usual” (i.e., they should be “additional”).
- **Verifiable** – GHG reductions should result from projects whose performance can be readily monitored and verified
- **Permanent** – GHG reductions (or removals, in the case of sequestration) should be permanent, and/or be backed by guarantees if they are reversed, i.e., re-emitted to the atmosphere.
- **Enforceable** – GHG reductions should be backed by contracts or legal instruments that define their creation, provide for transparency, and ensure exclusive ownership

The challenge, of course, is elaborating these basic criteria into an actual standard that ensures a uniform commodity. What constitutes a sufficient level of assurance that offset reductions are real, surplus, verifiable, permanent, and enforceable? What requirements can provide confidence that a ton of GHG reductions from one project is the same as a ton from another?

In fact, three related sets of “standards” are necessary to fully define a carbon offset commodity:

1. **Procedural and technical standards.** These are standards related to the validation, monitoring, and verification of offset projects, as well as the certification and crediting of GHG reductions. Procedural and technical standards ensure that offsets are *verifiable*.
2. **Contractual standards.** These are standards for the establishment and transfer of property rights related to GHG reductions, and for information disclosure. They can include terms for payment and delivery, allocation of risk, and compensation where GHG removals or reductions are reversed or not realized. Contractual standards are necessary to avoid double-issuance and double-counting of GHG reductions, and ensure that offsets are *enforceable*.
3. **Accounting standards.** These are standards related to the actual quantification of GHG reductions. Accounting standards specify methods for defining quantification boundaries, estimating baseline emissions, and correcting for unintended changes in emissions (i.e., “leakage”). Accounting standards also encompass methods for demonstrating that a project would not have happened anyway (i.e., “additionality”). Finally, they may specify methods for treating non-permanent GHG removals on equal footing with permanent GHG reductions. Accounting standards are a first-order requirement for ensuring that “a ton is a ton” and ensure that offsets are *real, surplus, and permanent*.

In addition to defining these various standards, many carbon offset programs will impose **eligibility criteria** for offset projects intended to ensure that they are compatible with goals beyond simply reducing GHG emissions. Eligibility criteria may exclude certain types of projects based on secondary environmental or social concerns (e.g., nuclear waste, or community displacement caused by hydro reservoirs), or they may ensure that projects contribute to additional social, economic, and environmental objectives (e.g., “sustainable development”). While these criteria are ancillary to defining a GHG reduction, they nevertheless help to define or brand a particular carbon offset commodity, and are therefore germane to carbon offset “standards” and the linking of different markets.

2 A SURVEY OF EXISTING STANDARDS AND PROGRAMS

As far as prospects for linking are concerned, it is important to understand how and to what extent different standards address procedural and technical requirements, contractual requirements, accounting requirements, and eligibility criteria. Worldwide, there are a number of existing programs and standards for carbon offsets, and several that are under development. Each arose in a different context, and there is a corresponding diversity in their requirements. Some “standards,” for example, address only one or two elements of a full carbon offset commodity standard, e.g., accounting and verification. Others address every element, but with varying degrees specificity. The following overview of key similarities and differences among programs and standards is derived from a survey commissioned by the World Economic Forum and conducted in 2006 by the World Resources Institute (see Appendix A for a list of programs surveyed).ⁱⁱ

2.1 Procedural and Technical Requirements

Nearly every established carbon offset program requires or strongly recommends some form of offset project verification.ⁱⁱⁱ In almost all cases, verification must be conducted by third parties, separate from project developers or program administrators. Nearly all the programs require using verifiers from a pre-approved list, and have established separate criteria for approving and accrediting verifiers; details on accreditation criteria, however, may differ.

Verification generally requires assessing whether a project is being implemented correctly and ensuring that monitoring is being conducted according to pre-established plans. Verification is usually used to certify the results of monitoring activities and in most cases (though not all) is required for GHG reductions to be officially recognized. The biggest variation between – and within – programs occurs with respect to the required frequency of verification. Required frequency is usually determined by the type of project activity involved. The New South Wales Greenhouse Gas Abatement Scheme, for example,

determines verification (audit) frequency on a project-by-project basis, regardless of type. Some programs (e.g., the Clean Development Mechanism) recommend annual verification, and in some cases verification must be conducted at least annually (e.g., the Climate Trust).

Programs tend to differ in the specific documentation requirements. Generally, project developers are required to document their project applications to the program, as well as the results of ongoing monitoring and verification activities. No two programs have adopted precisely the same documentation forms, however. Several standards and programs do not have standardized forms, but rather specify what types of information must be provided and allow project developers to choose an appropriate format.

All carbon offset programs and standards require some form of project monitoring. Programs differ greatly, however, in their specific requirements. Some programs set out general requirements for monitoring that must be elaborated for specific projects (e.g. according to methodologies proposed by project developers). Others spell out monitoring requirements in detail for predetermined types of project activities. As may be expected, monitoring requirements tend to parallel accounting and quantification requirements.

Around half of current carbon offset standards and programs require public reporting, or public disclosure of information. Public reporting provisions tend to be linked to the design and objectives of each program, and programs that do not require public reporting may do so on confidentiality grounds.

2.2 Contractual Requirements

For many carbon offset programs, key elements of contractual standards are left to market participants to decide. Buyers and sellers may negotiate terms for offset purchases and establish property rights to GHG reductions through individual contracts. Several organizations, such as the World Bank and the International Emissions Trading Association, have independently developed standardized “emission reduction purchase agreements” to be used with Clean Development Mechanism (CDM) projects and in other contexts.^{iv}

Most carbon offset programs, however, explicitly require legal proof that GHG reductions are not counted and sold more than once. In most cases, this involves requiring an established legal claim to the GHG reductions (the form of which may or may not be specified by the program), and/or requiring that the GHG reductions not be used or claimed under any other program. There are also various context- or program-specific provisions. For example, GHG reductions assigned to Kyoto Protocol “Joint Implementation” projects must be subtracted from their host country’s emissions quota; the California Climate Action Registry requires that removals “must occur at sources or sinks not included in the target or cap for which [they are] used.”).

2.3 Accounting Requirements

Some of the most significant differences between carbon offset programs involve accounting methods. One major difference is between “bottom up” programs, which offer general accounting guidelines that must be elaborated over time for a range of different project types, and “top down” programs, which specify detailed accounting rules upfront for a limited set of project types. Most programs to date, including the CDM, have taken a bottom-up approach. This allows recognition for a wide array of possible offset projects, but can lead to uncertainties for project developers and significant transaction costs. Several recent and proposed programs are following a top-down approach. These programs include the New South Wales Greenhouse Gas Abatement Scheme, Chicago Climate Exchange, proposed Canadian Domestic Offset System, the U.S. Regional Greenhouse Gas Initiative, and the U.S. EPA Climate Leaders program.

Another major division is between programs that adopt “project-specific” or “performance standard” methods for estimating an offset project’s baseline emissions. Bottom-up programs have tended to rely on project-specific approaches, where baseline emissions are determined on a case-by-case basis. Some top-down programs, on the other hand, have begun to establish “performance standards,” where baseline emissions are determined using a standardized emission factor or an assumed technology. Some bottom-up programs (including the CDM) will allow performance standard baselines in theory, but have yet to approve performance standard methodologies.

A similar diversity is seen in methods prescribed for determining additionality. The majority of programs explicitly require some sort of additionality demonstration, but specific requirements for this demonstration vary widely. Programs that do not explicitly test for additionality often incorporate it in their eligibility rules or baseline determination procedures, but again with varying specifics.

2.4 Eligibility Conditions

Not surprisingly, different programs have adopted eligibility requirements tailored to their specific circumstances and objectives. Restrictions on project types generally reflect whether a program’s approach to GHG reduction accounting is “top down” or “bottom up.” Top-down programs generally limit eligible project types to pre-approved sectors. Bottom-up programs tend to have fewer restrictions on project types, but impose conditions on offset projects related to political, social, or environmental concerns. For example, projects may be restricted to those that involve domestic investment (the proposed Canadian Offset System) or contribute to sustainable development (the CDM).

3 ACCOUNTING STANDARDS – AN ACHILLES HEEL FOR LINKING?

From the standpoint of harmonizing carbon offsets and linking together programs, accounting standards are a critical consideration. Different methods for quantifying GHG reductions from the same types of offset projects may lead to essentially different offset commodities – a “ton” from one program may not truly be the same as a “ton” from another. Where programs are linked, the more “generous” methods are likely to be favored. An important question, therefore, is whether carbon offset accounting methods can be truly standardized.

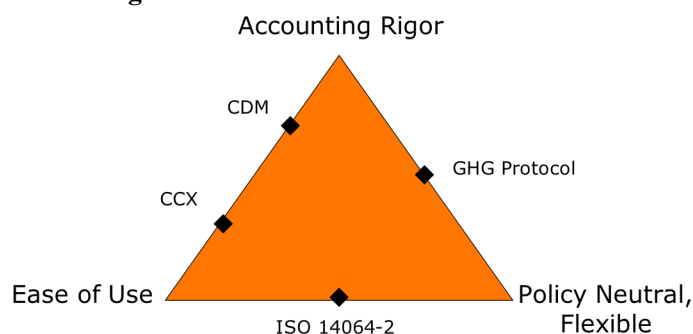
At least two major international efforts have attempted to create general GHG project accounting and quantification standards: the World Resources Institute / World Business Council for Sustainable Development (WRI/WBCSD) GHG Protocol Initiative, and the International Organization for Standardization (ISO) 14064 process. The GHG Protocol Initiative published its *GHG Protocol for Project Accounting* (Project Protocol) in December 2005. The ISO released its “14064 Part 2” standard for project-based GHG reduction quantification in March 2006.

The WRI/WBCSD Project Protocol is the result of a four-year multi-stakeholder effort to provide a standard set of accounting concepts and definitions for GHG reduction projects. It contains detailed procedures for defining a GHG reduction project, estimating its baseline emissions, and accounting for “leakage.” It also provides basic requirements for GHG project monitoring and reporting. The ISO 14064 Part 2 standard, also the product of a multi-stakeholder process, provides a succinct set of basic, verifiable requirements that must be met to fully account for project-based GHG reductions. While the Project Protocol and ISO 14064-2 standard differ somewhat in their terminology and requirements, they are essentially complementary. The ISO 14064-2 standard describes “what” to do, while the Project Protocol explains “how” to do it.

The development of both these “standards” offers some important insights into the difficulties of truly harmonizing project-based GHG accounting. Both standards are intended to be policy- and program-neutral, so that they can be used in a variety of contexts (and potentially serve as a common basis for transparency among GHG programs). When the Project Protocol was initiated, it was also intended to be

both rigorous and practical. It became apparent as it was being developed, however, that fulfilling all three of these goals – policy-neutrality, rigor, and ease of use – would be difficult to achieve. The final Protocol was designed for policy-neutrality and general accounting rigor, but the detail of its procedures and expertise required for their use make it challenging for typical project developers. Figure 1 illustrates the tradeoffs involved.

Figure 1. Accounting Standard “Tradeoffs”



The ISO 14064-2 standard, by contrast, takes a different approach by providing a relatively simple set of basic accounting requirements. These requirements are comprehensive and easy to follow, but they leave many of the details of baseline determination, for example, to elaboration by the standard’s users.

Finally, both ISO 14064-2 and the Project Protocol, because they are policy-neutral, afford a significant amount of flexibility. The Project Protocol, for example, allows users to choose between a “project-specific” or “performance standard” baseline determination. Neither the Project Protocol nor ISO14064-2 requires any explicit test for additionality. The result is that both “standards” can be used to achieve different quantified results for the same types of projects. Eliminating this potential for discrepancies requires making policy decisions. Policy decisions involve, for example, what type of baseline procedures to use, what tests to use for additionality, and the extent and rigor of “leakage” accounting.^v They generally involve balancing programmatic goals such as environmental integrity, administrative burdens, and transaction costs imposed on project developers. In establishing their own standards, carbon offset programs will decide these issues in different ways according to their goals and objectives. Figure 1 indicates roughly how the CDM and Chicago Climate Exchange, for example, have decided these issues to achieve different balances between “rigor” and “ease of use.”^{vi}

The fact that different programs will decide accounting standards in different ways according to their policy objectives ultimately raises questions about the prospects for linking carbon offset markets. If a ton of GHG reductions in one program is not the same as a ton from another, on what basis can programs work together and integrate the different markets they create?

4 CONCLUSIONS AND PROSPECTS FOR THE FUTURE

The creation of carbon offset standards will play an important role in efforts to link and unify global GHG emissions markets. As this paper makes clear, standards for carbon offsets have several dimensions and full harmonization of these dimensions would be quite challenging given the diversity of different offset programs and their objectives. The question is whether there are areas where further harmony can be achieved, and whether linkages are possible even where differences among standards persist.

As GHG markets grow, for example, it is likely that contractual standards will evolve towards a harmonized set of requirements. The first step in linking different programs should be the creation of

standard trading contracts and common registries that assign unique identifiers to traded GHG reductions. In principle, this can be done before reconciling differences among procedural and accounting standards, and several efforts are already underway in this area.

There is currently a fair amount of diversity in standards for validation, verification, and certification related to carbon offsets. Differences often arise for the same kinds of policy considerations that influence decisions about accounting standards (e.g., balancing rigor vs. transaction costs). Nevertheless, the prospects for harmonizing these “procedural” standards, or key aspects of them, are good. A general standard for the accreditation of independent verifiers, for example, is currently under development by the ISO and should be available in the first half of 2007. While there will always be variations in the technical monitoring requirements for different projects under different programs (related, in many cases, to differences in accounting standards), it should nevertheless be possible to specify common checklists of information and procedures, such as those established under the ISO 14064, Part 3 standard.

Harmonized accounting standards for carbon offsets will always be more difficult, for the reasons mentioned in the previous section. Different programs will adopt different accounting methods and criteria (including additionality criteria) depending on their goals and objectives. The absence of harmonized accounting standards, however, need not be an absolute barrier to linking. Carbon offset programs that are differentiated geographically, for example, could allow linking where separate methods are used for different regions. Even where there is geographic overlap, different programs could link where they have confidence that differences in accounting outcomes will be immaterial.

Differences in project eligibility conditions, of course, present another potential roadblock. For linking to occur, programs will ultimately have to decide whether verification requirements, accounting methods, and eligibility criteria are sufficiently alike and rigorous. This will above all require transparency, and a common framework and terminology that programs can use to evaluate each other. The pieces of this framework are coming together under the GHG Protocol Initiative, the ISO, and other voluntary and regulatory initiatives. With further collaboration, prospects for a truly global, interlinked market for GHG reductions may yet be realized.

APPENDIX A: SURVEYED CARBON OFFSET PROGRAMS AND STANDARDS (WORLD ECONOMIC FORUM 2006)

Generic GHG Project Accounting Protocols / Standards	
<i>WRI/WBCSD GHG Protocol for Project Accounting ("Project Protocol")</i>	Published by the World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD), December 2005.
<i>ISO 14064, Part 2</i>	Organization for International Standardization (ISO) <i>Final Draft International Standard for Greenhouse Gases, Part 2: Specification with Guidance at the Project Level for Quantification, Monitoring and Reporting of Greenhouse Gas Emission Reductions or Removal Enhancements.</i>
GHG Emission Reduction Trading Schemes	
<i>Canada's Offset System for Greenhouse Gases("Canadian Program")</i>	This program is not yet enacted; survey information is from the "Technical Background Document" published by Environment Canada, Summer 2005.
<i>The Chicago Climate Exchange (CCX)</i>	The CCX is a voluntary emissions trading program under which participants agree to legally binding commitments on GHG emissions; it credits project-based GHG reductions in certain sectors.
<i>Clean Development Mechanism (CDM)</i>	This Kyoto Protocol mechanism recognizes and credits GHG reductions from projects in developing countries.
<i>Joint Implementation (JI)</i>	This Kyoto Protocol mechanism recognizes and credits GHG reductions from developed countries (starting in 2008).
<i>The New South Wales Greenhouse Gas Abatement Scheme (GGAS)</i>	A legally binding program in Australia where GHG commitments are met primarily using credited reductions from GHG projects in several categories.
<i>The Regional Greenhouse Gas Initiative (RGGI)</i>	A proposed GHG trading scheme among nine states in the Northeast and Mid-Atlantic United States. This program is still under development; information for the survey was derived from the RGGI Draft Model Rule, published March 23, 2006.
Registries and Carbon Offset Initiatives	
<i>The California Climate Action Registry (CCAR)</i>	A voluntary GHG registry for companies and organizations. Currently, GHG project provisions are specified only for forest carbon sequestration projects.
<i>Climate Leaders</i>	This voluntary corporate GHG reporting program, sponsored by the United States Environmental Protection Agency, is still contemplating provisions for GHG projects; information for the survey was obtained from preliminary presentations and discussions with program staff.
<i>The Climate Neutral Network (CNN)</i>	CNN certifies businesses that offset the climate impacts of their products, services, or operations using portfolios of GHG projects meeting CNN accounting criteria. It is the longest-lived initiative of this type.
<i>The Climate Trust</i>	The Climate Trust is a non-profit organization that purchases carbon offsets on behalf of new power plants built in Oregon (required by statute to offset a portion of their CO ₂ emissions) and other buyers.

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ⁱ The concept of emission offsets originated under the “New Source Review” program established by the United States Clean Air Act of 1977. Under this program, offsets are required to be “real, creditable, quantifiable, permanent, and federally enforceable.” These basic criteria have been modified and adopted in general form under a variety of other offset programs, including programs for carbon offsets. The “surplus” criterion is generally added to distinguish offset reductions from reductions that would occur for other reasons. The criteria cited in this paper are the most frequently cited and are, for example, enshrined in the Memorandum of Understanding establishing the Regional Greenhouse Gas Initiative in the northeastern United States. See, for example, Liepa, I., 2002. *Greenhouse Gas Offsets: An Introduction to Core Elements of an Offset Rule*. Climate Change Central, Alberta, Canada.

ⁱⁱ Broekhoff, D., 2006 (unpublished). *A Comparative Survey of GHG Project Standards And Programs*. World Economic Forum, Geneva.

ⁱⁱⁱ A good overview of the validation, monitoring, and verification requirements of different carbon offset programs can be found in Dornau, R. and B. Reynolds, 2006. “Around the World with a Verifier,” in *Greenhouse Gas Market Report 2006: Financing Response to Climate Change: Moving to Action*. International Emissions Trading Association, Geneva.

^{iv} See, for example, the IETA *Emission Reduction Purchase Agreement Version 3* available at <http://www.ieta.org/ieta/www/pages/download.php?docID=1793>.

^v The WRI/WBCSD Project Protocol contains a chapter discussing these various “policy aspects” of GHG accounting.

^{vi} In this context, less rigor does not necessarily translate to reduced integrity. The CCX, for example, uses more streamlined accounting rules for GHG reductions than the CDM, but compensates for any reduced accuracy by using conservative assumptions and emission factors.