ISSUE BRIEF

Role of Offsets in Global and Domestic Climate Policy

U.S. Global Leadership: An Initiative of the Center for Climate and Electricity Policy

Raymond J. Kopp

RESOURCES FOR THE FUTURE

May 2010
Issue Brief 10-11

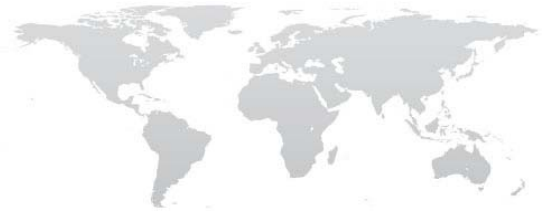
Resources for the Future

The Center or Climate and Electricity Policy at Resources for the Future provides a framework for policymakers and stakeholders to better understand and address one of the most complex environmental issues of our time: climate change. The center has three core objectives: to develop domestic policies that are politically and economically viable, to articulate new architectures for a global climate policy regime, and to conduct advanced research focused on the future needs of policymakers.

U.S. Global Leadership is one of the Center's initiatives. Its objective is to engage with policymakers to develop integrated U.S. foreign climate policy options and to conduct in-depth research on specific foreign policy issues to support development of these options.

The Center for Climate and Electricity Policy is funded by contributions from foundations, governments, corporations, and individuals. Current supporters include: the Doris Duke Charitable Foundation, Smith Richardson Foundation, David and Lucille Packard Foundation, Simons Foundation, Foundation for Strategic Environmental Research (MISTRA), G. Unger Vetlesen Foundation, Alcoa Foundation, ALLETE, Inc., Altria, American Honda Motor Company, Inc., CF Industries, Inc., Consolidated Edison Company of New York, Constellation Energy, Duke Energy, Edison Electric Institute, ExxonMobil Corporation, PG&E Corporation, the Salt River Project and Tokyo Electric Power Company. For more information, contact Ray Kopp, senior fellow and director Center for Climate and Electricity Policy at kopp@rff.org.

RESOURCES FOR THE FUTURE



Role of Offsets in Global and Domestic Climate Policy[1]

Raymond J. Kopp[2]

Introduction

Greenhouse gas (GHG) offsets are a mechanism by which mitigation policy can achieve emissions reductions where they are least expensive—a characteristic Manne and Richels (1997) term "'where' flexibility"[3]—in much the same manner as emissions trading. Offsets incentivize cost-effective reductions from sources that generally have no obligations to reduce emissions and thereby can increase the economic efficiency of GHG mitigation policy at the national, regional, and global scale. Whether they will indeed play this important role has a great deal to do with the nature of the mitigation policy design.

This paper has two objectives. First, it provides definitions and a taxonomy that will be helpful in sorting through the complex offset landscape. With this taxonomy in mind, the paper then considers the role offsets could play given likely states of the world with respect to mitigation policy.

[1] Prepared for "Modeling the Economics of Greenhouse Gas Mitigation," National Research Council, the National Academies, Washington, DC, April 16, 2010. Comments by workshop participants are gratefully acknowledged.
[2] Senior Fellow and Director, Center for Climate and Electricity Policy, Resources for the Future.
[3] "When we assume that reductions take place wherever it is cheapest to do so (regardless of geographic location) we refer to this as 'interregional' or 'where' flexibility" (Manne and Richels 1997, 255).

Definitions and Taxonomy

Perhaps the first time the term "offsets" was used in a context relevant to GHG mitigation policy was in the U.S. Clean Air Act.[4] Under the act, an expansion of a polluting activity in a nonattainment area[5] could be accommodated if the added pollution at the new or expanded source was offset by reductions in emissions at another source within the nonattainment area.

Since the early introduction of the term in the Clean Air Act more than 40 years ago, a loose and confusing terminology has developed in which "offsets" has been used to label very different concepts. One can argue this lack of precision has not only caused a great deal of confusion around the concept, but also has led to a negative perception of offsets as tools of GHG regulatory policy among policymakers, at least in the United States.[6]

Generally speaking, a GHG offset refers to a ton of greenhouse gas[7] that that has *not* been emitted due to resources applied and some purposeful action taken. An important feature of the resources and the action is that that they are "additional" to normal business-as-usual (BAU) behavior.[8]

……

[4] "In order to reduce the cost of compliance with air pollution reduction requirements, several Flexible mechanisms were introduced in the United States in the late 1970's. Referred to generally as emissions trading, they included emissions offsets, plant-specific 'bubbles,' and emission reduction credits. The offset mechanism was introduced to permit economic growth in areas that were not meeting air quality goals. For example, a new source could locate (or an existing source could expand) in a nonattainment area by reducing emissions at another source (usually by more than the increment of new emissions). In this way, the economy could grow and the environment could improve" (McLean 1999).

[5] A nonattainment area is a location that is in violation of National Ambient Air Quality Standards under the Clean Air Act.

[6] In the fall of 2008 and over the course of two months, Resources for the Future staff interviewed more than 30 congressional staffers—Republicans and Democrats, from committee and personal offices, and in both the House and the Senate—to determine their views on the role of international offsets in general and forest carbon in particular. With respect to offsets generally, "most respondents said that international forest carbon was frequently perceived only or primarily as a form of offset. A significant coalition of members opposes offsets of any kind as reducing the impetus for domestic emissions reductions." The perception of international offsets is based on "negative perceptions about the Clean Development Mechanism (CDM) in particular, as well as more general perceptions that international offsets are not managed well, do not produce real reductions, and are inappropriate because developing countries need to 'do their own part on climate change'." See Leonard et al. forthcoming 2010.

[7] Usually denominated as a ton of carbon dioxide equivalent (CO_2e).

[8] Additionality plays an important role in the generation of an offset. For example, suppose a new office building is being constructed, and the plans call for water heating via natural gas as the least-cost option. Combustion of the natural gas will cause GHG emissions. Suppose someone comes to the building owner and agrees to pay the added cost of rooftop solar panels to heat the water in lieu of natural gas. Use of the solar panels will eliminate the GHG emissions, but importantly, if this individual did not compensate the building owner of the added cost of the solar panels, the owner would use natural gas, and emissions would take place. Thus, the purposeful action—providing the additional resources to the building owner to install rooftop solar—was additional. Because the solar installation would not have occurred under business as usual, the GHGs that were not emitted due to the solar panels are "additional" and could be valid offset credits.

Perhaps the most important distinction to draw with respect to offsets concerns the motivation that gives rise to the offset—that is, the motivation that causes resources to be devoted to an action to reduce GHGs. The motivations arise from an economic return that can be earned by selling the offset (reflecting a ton of reduced emissions) to a buyer. There generally are two classes of buyers: those who do not have any legal obligation to reduce emissions and choose to buy offsets for other reasons, and those who do have legal obligations and can meet those obligations by purchasing offsets.

The greatest popular press attention has focused on the first class of offsets that reside in what might be termed the "voluntary market." Examples of these voluntary offsets are sold by companies like Terrapass.[9] An individual who is concerned about his or her GHG emissions due to personal behavior—for example, air and auto travel—can purchase offsets equal to the emissions the individual seeks to offset. The same is true for private business. Firms that have no legal commitments to reduce GHGs may still undertake projects to reduce their own emissions or purchase offsets from entities like Terrapass or on commercial exchanges like the Chicago Climate Exchange.[10]

The volume of voluntary offsets has been growing over time, and a small industry of offset developers and third-party verifiers has been established to support this growth. However, it is unlikely that motivations for voluntary investments in such offsets, either by private individuals or corporations, will ever be so large as to require the modeling community to incorporate them in analysis of mitigation efforts. Therefore, the paper does not consider them further.

Compliance entities are those with a legal obligation to reduce their GHG emissions. Should a cap-and-trade system for GHGs be deployed in countries like the United States,[11] the market for compliance offsets can be quite large if obligations can be met with these purchased offsets. Countries are compliance entities with respect to the Kyoto Protocol, private businesses are compliance entities in the European Union Emission Trading Scheme (EU-ETS)[12] and within the United States under provisions of H.R. 2454,[13] and proposals exist for individual carbon trading, where the compliance obligations rest with individuals (Roberts and Thumim 2006).

The obligations of entities can vary. Countries under the Kyoto Protocol must keep their emissions under their Kyoto limits or purchase either Certified Emission Reductions Units

……

[9] http://www.terrapass.com/ (accessed April 2010).

[10] http://www.chicagoclimatex.com/ (accessed April 2010).

[11] EIA (2009) suggests that 1.2 billion tons of domestic and international offsets would be traded in the U.S. market in 2020.

[12] See http://ec.europa.eu/environment/climat/emission/index_en.htm (accessed April 2010).

[13] American Clean Energy and Security Act of 2009, passed by the U.S. House of Representatives in the 111th Congress, http://www.govtrack.us/congress/bill.xpd?bill=h111-2454 (accessed April 2010).

(CERUs,[14] in the form of Clean Development Mechanism (CDM) credits) or Emission Reduction Units (ERUs,[15] quantified emissions-limitation and -reduction commitments from other Annex 1 Kyoto parties). Private firms under domestic cap-and-trade programs like the EU-ETS and H.R. 2454 must hold allowances in amounts equal to their emissions. Or, they may buy domestic and international offset credits[16] or purchase international emissions allowances.[17] Volumes of CERUs, ERUs, U.S. GHG market allowances, EU-ETS allowances, other international emissions allowances, and domestic and international offsets credits can be expected to be large and therefore important to modeling efforts.

From the perspective of the compliance entity, any legally recognized instrument that satisfies its compliance obligation can be viewed as an offset—that is, as a ton of reductions that can be purchased rather than physically reduced by the entity. However, as a general matter, analysts sort these legal instruments into two groups—uncapped tons and capped tons—and generally refer to the first group as offsets and the second group as allowances.

UNCAPPED TONS

Uncapped tons are "additional" emissions reductions from sources that do not have a compliance obligation. If an uncapped ton is purchased by a compliance entity, the emissions within the source category to which the entity belongs will rise above the cap. Examples drawn from H.R. 2454 include domestic offsets,[18] international sector-based credits,[19] Kyoto CERUs and other credits issued by an international body,[20] and international credits for reducing deforestation and forest degradation in developing countries (REDD).[21] Examples drawn from the current Kyoto Protocol under the United Nations Framework Convention on Climate Change (UNFCCC) and negotiations under the UNFCCC for beyond 2010 include CDM credits[22] and sectoral crediting.[23]

CAPPED TONS

Capped tons originate from sources that have compliance obligations. Examples include H.R. 2454 allowances, Regional Greenhouse Gas Initiative (RGGI) allowances,[24] EU-ETS allowances, Kyoto

[14] Article 12 of the Kyoto Protocol to the United Nations Framework Convention on Climate Change, http://unfccc.int/kyoto_protocol/mechanisms/clean_development_mechanism/items/2718.php (accessed April 2010).
[15] Article 3 of the Kyoto Protocol to the United Nations Framework Convention on Climate Change, http://unfccc.int/resource/docs/convkp/kpeng.pdf (accessed April 2010).
[16] H.R. 2454, Part D.
[17] H.R. 2454, Part C, Section 728.
[18] H.R. 2454, Section 732.
[19] H.R. 2454, Section 743(c).
[20] H.R. 2454, Section 743(d).
[21] H.R. 2454, Section 743(e).
[22] Article 12 of the Kyoto Protocol.
[23] UNFCCC 2009a, section 73(e).
[24] See http://www.rggi.org/home (accessed April 2010).

ERUs, and any allowances from a sovereign cap-and-trade program (sectoral or economy-wide) that has binding domestic limits. For capped tons purchased by a compliance entity where the ton reduced originated from within the entity's source category, emissions within that source category will not rise. For capped tons purchased by a compliance entity where the ton reduced originated from outside the entity's source category, emissions within the entity's source category will rise, but emissions aggregated across the two categories will not rise. An example would be an EU-ETS allowance purchased by an entity with a H.R. 2454 obligation.

OFFSETS GENERALLY

We tend to think of offsets as mechanisms within the context of a cap-and-trade regulatory approach, but as the reference in the introduction to the Clean Air Act points out, regulatory programs amenable to offsets can be very broad. Setting aside voluntary actions, offsets have value if an emitting entity has a legally binding obligation with respect to its emissions. These obligations could be in the form of standard cap-and-trade regulation, emissions taxes, fixed emissions limits, and performance standards. An offset is a mechanism by which a regulatory obligation can be discharged. Equivalence formulas can be established that would define the relationship between an offset ton and any of the above four forms of obligation.

Offsets and Some Difficult Modeling Issues

Numerous issues concerning offsets can be important for modelers, and while these issues are beyond the scope of this paper, they are worth identifying. As mentioned previously, the issue of additionality is important. What GHG mitigation actions would *not* have been taken by sources in a BAU world (absent any compliance obligation) and therefore would qualify as a valid offset? Unless regulators have detailed the projects or actions that they deem additional, the modeler can do little to make this determination.

Project-level offsets like those of the CDM and those proposed in H.R. 2454 can have non-trivial transactions costs that must be added to the marginal cost of emissions control. These transactions costs are often a function of each unique regulatory environment and are not directly observable. When data on transactions costs are available to the modeler, those data are likely specific to a regulatory environment and not easily generalizable broadly throughout the model.

International offsets pose particular problems when modelers have information about the marginal cost of control for particular classes of offsets but little or no reliable information about country-level investment environments that have a direct bearing on the country's ability to generate offsets. This is particularly true in the case of REDD offsets, where the biology and economics of specific countries suggest the availability of large quantities of offsets at very low cost but where the governance and readiness of the country suggest the opposite. Generally

speaking, modelers rarely have access to governance and readiness data, and when they do, they lack parameters that map such country data to investment performance.

Sectoral offsets are a new class of offsets under consideration by UNFCCC negotiations and already are embedded in U.S. legislative proposals.[25] Sectoral offsets hold out the promise of offsets on a large scale and at lower transactions costs than project-level offsets like the CDM. However, from a modeler's perspective, issues arise. To properly model the supply of sectoral offsets from any particular country, a modeler needs a BAU emissions path for the sector, a marginal–cost of control function for the sector, and a baseline emissions path (lying somewhere below the BAU path) against which actual emissions will be measured and thereby the generation of offsets calculated. Data necessary to develop the first two are hard but possible to obtain. However, the baseline will often be the result of a political negotiation, and the results of that negotiation could be quite county specific.[26]

Sectoral offsets can also pose some difficult double-counting problems. Countries could put forth low carbon–growth paths complete with registries of nationally appropriate mitigation actions (NAMAs) and at the same time negotiate bilateral offset programs with specific countries like the United States.[27] Since the NAMAs are official government statements regarding the future mitigation actions of developing countries, modelers could use the NAMA registries to develop emissions paths for these countries. However, they must then track down any bilateral or multilateral offset deals and net them out.

Offsets in a Post-Copenhagen World and the Value of Flexible Mechanisms

Flexible mechanisms, particularly offsets, based on project-level crediting can be greatly improved with a movement to sectoral-based approaches that lowers transactions costs and considers additionality. Perhaps more important, a move to offset credits that are generated for reductions below negotiated baselines, rather than BAU emissions paths as embodied in most CDM-like

……

[25] See UNFCCC 2009a, H.R. 2454.

[26] For example, in H.R. 2454 the baseline-setting process is part of a bilateral negotiation between an offset-supplying country and the Unites States.

[27] The concept of nationally appropriate mitigation actions (NAMAs) originated in the final action of COP13, the "Bali Roadmap." Section 1(b)(ii) of the text refers to mitigation actions by developed and developing countries calling for "Enhanced national/international action on mitigation of climate change, including, inter alia, consideration of: … (ii) Nationally appropriate mitigation actions by developing country Parties in the context of sustainable development, supported and enabled by technology, financing and capacity-building, in a measurable, reportable and verifiable manner" (UNFCCC 2007). Section 5 of the "Copenhagen Accord," the product of COP15, contains the agreement that "Non-Annex I Parties to the Convention will implement mitigation actions, including those to be submitted to the secretariat by non-Annex I Parties in the format given in Appendix II by 31 January 2010, for compilation in an INF document, consistent with Article 4.1 and Article 4.7 and in the context of sustainable development" (UNFCCC 2009b) These mitigation actions referenced in the accord are the NAMAs of the Bali Roadmap. The posting of the NAMAs in Appendix II of the accord and the further compilation is considered the registry of NAMAs.

project-level crediting, requires more aggressive developing-country participation and therefore greater global GHG reductions. However, the ultimate usefulness of enhanced offsets depends on the state of the world. That is, the usefulness of offsets (and therefore the size of the offset market and dollars flowing from developed to developing countries) depends on the nature of domestic and international climate policy. In some scenarios, offsets will be useful, in others, useless.

Consider two states of the world:

> World 1—Kyoto II, emanating from the UNFCCC Kyoto track (Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol), is a top-down Kyoto regime of legally binding international emissions-limitation commitments, common but differentiated responsibilities with respect to non–Annex 1 parties, and developed-country commitments that are consistent with aggressive climate goals—for example, halting global warming at 2°C.
>
> World 2—Bottom-Up Carbon Markets, possibly emanating from the UNFCCC non-Kyoto track (Ad Hoc Working Group on Long-Term Cooperative Action), or the Major Economies Forum, is characterized by broad and deep GHG cap-and-trade programs in the major emitting Annex 1 economies[28] that encourage large-scale use of international offsets. With this group of countries, the largest potential market for international offsets would be the United States.

In both worlds, offsets play a very important and useful role in their capacity to add "where" flexibility, but as we deviate from these two scenarios, the usefulness of offsets declines. As a result, it is important to examine the likelihood that either of these states emerges.

The Likelihood of World 1—Kyoto II

I believe it is reasonable to argue that the post-Copenhagen world is decidedly not Kyoto II. The shape of a future international accord will not be a remake of the top-down Kyoto–Berlin Mandate world (UNFCCC 1995).

Legally binding international emissions-limitation commitments have been replaced with NAMAs, and no forces are pushing the process back to embrace the Berlin Mandate. Abandonment of the Berlin Mandate means the heart of a post-Copenhagen international accord no longer involves binding international emissions-limitation commitments, the burden sharing that implies, and therefore the need for considerable "where" flexibility. As a consequence, pressure to reform and use enhanced and scaled-up flexible mechanisms like sectoral offsets has diminished.

[28] Australia, the European Union, Japan, New Zealand, Russia, and the United States.

In the post-Copenhagen world, there is at best a weak interpretation of Article 4 of the Kyoto Protocol (common but differentiated responsibilities), and non–Annex 1 rapidly industrializing nations are expected to take domestic actions to reduce their emissions (Annex 1 nations will presumably do more). A reinterpretation of Article 4 places more burden on the rapidly developing emitter nations (the ones with the greatest potential to offer up sectoral offsets) to establish and finance their own domestic mitigation actions. Thus, flexible mechanisms taking the form of offsets are no longer seen as the primary policy by which non–Annex 1 countries will act to reduce their domestic emissions.

Current Annex 1 commitments offered up post-Copenhagen are likely inconsistent with a goal of halting global warming at 2°C (certainly when combined with the non–Annex 1 offerings) and likely are more in line with 4°C, meaning less aggressive domestic action than anticipated in a Kyoto-II world. The implicit rejection of the 2°C goal (implicit in the actions pledged in the wake of Copenhagen) further diminishes the developed world's political need to seek low-cost international tons through offset mechanisms as a means of cost control.

The Likelihood of World 2—Bottom-Up Carbon Markets

Absent the Berlin Mandate and the Kyoto structure of binding international emissions-limitation commitments, there is no longer a need at the sovereign level to meet international commitments with domestic reductions or to utilize the flexible mechanisms. However, to the extent that domestic regulatory policy has been developed in such as manner as to devolve legal responsibility for emissions reductions to the private sector (for example, through a cap-and-trade system) and regulatory approaches admit the private-sector use of flexible mechanisms, especially offsets, the usefulness of such mechanisms remains.

With the passage of H.R. 2454 this past June and the prospect of a very large U.S. cap-and-trade program that admits international offsets, the political and economic value of enhanced and scaled-up flexible mechanisms was quite high. Indeed, these mechanisms were to provide the offsets necessary to contain compliance cost within politically acceptable limits, while at the same time providing a source of U.S. funds to aid developing countries.

Unfortunately, within the U.S. Senate, the prospects for comprehensive GHG policy generally, and an economy-wide cap-and-trade approach in particular, are not good at the present time. If the United States chooses another regulatory approach—for example, regulation under the Clean Air Act or a strict standards approach appended to an energy bill like S. 1462[29]—the demand for offsets and flexible mechanisms by the United States could likely be zero. Moreover, without a

[29] *American Clean Energy Leadership Act of 2009*, sponsored by Senator Jeff Bingaman (D-NM) in the 111th Congress, http://www.govtrack.us/congress/bill.xpd?bill=s111-1462 (accessed April 2010).

U.S. GHG market, it is unlikely that the EU-ETS combined with other country programs would be of sufficient size to drive a large-scale sectoral offset program.

Offsets in a World without Kyoto Commitments or Large-Scale Carbon Markets

Offsets do provide "where" flexibility and therefore enhance the economic efficiency of global mitigation policies. However, as noted above, the future of the two major institutional features that make offsets viable—a Kyoto-like global regime and large-scale GHG markets—are in doubt. If the regime for global cooperation on climate change follows a bottom-up pledge-and-review model and large-scale GHG markets fail to develop, are there alternative domestic policy structures that would support offsets?

GOVERNMENT FUNDING

Governments can of course continue to purchase offsets to support their domestic GHG policies. However, given the stressed budgets of the many Annex 1 countries, how long will that practice continue after the forcing function of the Kyoto Protocol expires?

The developed countries, including the United States, pledged in Copenhagen to amass $100 billion annually by 2020 to support mitigation and adaption activities in developing countries, and these funds could be used to finance offsets. However, in the case of the United States, the bulk of these funds were to originate from private-entity purchases of international offsets, not from the U.S. Treasury. If a cap-and-trade program does not develop in the United States, it is highly unlikely Congress will authorize the use of tax money to fund large-scale purchases of offsets.

SMALLER-SCALE CARBON MARKETS

There is good reason to believe the EU-ETS will continue as a cornerstone of EU mitigation policy. Whether the member states will open the market to wider acceptance of offsets remains to be seen. The European Union has shown little enthusiasm for admitting REDD credits, in part for fear these offsets would substantially drive down the allowance price thereby diminishing the economic incentives to control domestic EU emissions. It seems unlikely this policy will be reversed (especially if the there is no U.S. market) and even more unlikely the European Union would accept sectoral credits from countries like China and India.

Absent a U.S. federal GHG market, states seem prepared to move ahead. The RGGI market already exists, and planning continues for the much larger California market as well as the market that might develop from the Western Climate Initiative, an organization of western U.S. states and Canadian provinces. Similarly, GHG markets in Australia, New Zealand, and even Japan are being developed or discussed. Offsets could become integral components of these markets, but given the size of the markets and some limits on the use of offsets, they are not likely to accommodate large volumes.

TAX OFFSETS

While seemingly not as popular as cap-and-trade systems, GHG taxes (usually carbon dioxide taxes) are still discussed as viable GHG policies. President Obama has created by executive order the National Commission on Fiscal Responsibility and Reform to examine the huge federal deficit and make recommendations for tax reform to address the deficit. A slim chance remains that GHG control policy could be recast as deficit-reduction policy in which revenues from carbon tax are used to reduce the deficit. Legislation enacting such a tax could contain provisions whereby tax liability could be reduced through international offsets.

TRADABLE RENEWABLE ENERGY CREDITS

Developed and developing countries have shown a great deal of interest in renewable energy and policies to enhance their commercialization and deployment abound. Thirty-eight U.S. states have some form of mandatory or voluntary renewable energy standard,[30] and the chances are quite high that a federal standard will soon be adopted. Renewable energy standards are finding their way into the developing world as well. India recently announced a proposed renewable energy standard of 15 percent by 2020 (Wheeler and Shome 2010). Trading renewable credits is already popular in the United States, and such trading could be expanded internationally to support more aggressive developing-country mitigation goals.

The Future Economic Value of Project and Sectoral Offsets

CDM is a flexible mechanism under the Kyoto protocol. CDM credits have economic value since they can be used to meet compliance obligations for countries that are signatories to the Kyoto Protocol. Moreover, countries that have adopted or are considering cap-and-trade programs to regulate domestic emissions may admit CERs into the domestic systems as uncapped offset credits (for example, in the EU-ETS and provisions of H.R. 2454).

With the expiration of the Kyoto Protocol in 2012 and prospects for a successor slim, the value of existing CERs going forward will depend to a great extent on the EU-ETS and other domestic markets that may come into being. It is important to recognize that individual domestic markets may impose particular restrictions on the character of CDM credits they admit into their markets. Such restrictions are already in place in the EU-ETS and emerging policies in New Zealand, Australia, and Canada (Aasrud et al. 2009). Thus, to maintain the value of CERs, reformers of the CDM who are operating within the structure of the UNFCCC must be cognizant of the various domestic carbon market demands and not focus exclusively on the CDM as a component of a successor to Kyoto.

[30] See http://apps1.eere.energy.gov/states/maps/renewable_portfolio_states.cfm (accessed April 2010).

In addition, the project-level character of the CDM and the BAU baseline may cause developed countries to further restrict their acceptance of CERs to the poorest of developing countries and require the more advanced countries like China and India to move toward sector-wide crediting with aggressive below-BAU baselines. This evolution in the global regime for climate cooperation and trends in the development of domestic mitigation policies does not suggest a bull market for CDM credits going forward.

In the absence of a Kyoto successor, the value of sectoral offset credits and the magnitude of the supply will depend in large part on the multiplicity and vagaries of domestic policies within individual offset–demanding countries. For example, one crucial feature of a sectoral crediting system is the baseline. While a BAU baseline may enjoy the support of many developing countries within the UNFCCC that are potential credit suppliers, it may not be acceptable to countries that are credit demanders. In the case of the Unites States, H.R. 2454 already has expressed a preference for bilateral negotiations over decidedly non-BAU baselines between the United States and supplying countries. Aggressive, non-BAU baselines limit the supply and raise the price of offsets.

Moreover, the bilateral negotiation model contained in H.R. 2454 means that each offset-supplying country could be treated differently by the large offset demanding countries. Some suppliers may be granted lenient baselines, others aggressive baselines, and perhaps some countries excluded entirely.

If large-scale domestic GHG markets are established and are hospitable to offsets (particularly international offsets), mechanism to "share" the economic rent associated with offsets will likely be deployed. These mechanisms could include government aggregators serving as monopsonistic buyers of international offsets who would in turn sell the offsets in the domestic market, with the intent of using monopsonistic power to shift some of the economic rent from the offset supplier to the demander (Purvis et al. 2009). The economic results of this government intervention in the international offset market are to lower the offset sales price and reduce the profit to be earned by offset suppliers.

Conclusions

The future is highly uncertain for all offsets, including those from domestic and international sources, as well as existing CDM credits and proposed REDD and sectoral credits. The uncertainty emanates from unsettled domestic policy—primarily in the United States—and as-yet poorly shaped international policies that are developing for coordinated action on GHG mitigation.

If future international policy takes the form of bottom-up pledge and review, rather than an extension of the Kyoto architecture, then the usefulness and economic value of offsets generally

depends on the breadth and depth of regional GHG markets (logically tied to cap-and-trade programs). While it is true that offsets could exist and have value absent formal markets, they would likely play a very small role in domestic and international climate policy.

References

Aasrud, A., R. Baron, B. Buchner, and K. McCall. 2009. *Sectoral Market Mechanisms—Issues for Negotiation and Domestic Implementation*. OECD/IEA, COM/ENV/EPOC/IEA/SLT(2009)5. http://www.oecd.org/dataoecd/3/28/44001884.pdf (accessed April 2010).

EIA (Energy Information Administration). 2009. *Energy Market and Economic Impacts of H.R. 2454. The American Clean Energy and Security Act of 2009*. SR/OIAF/2009-05. Washington, DC: EIA, U.S. Department of Energy.

Leonard, L., R. Kopp, and N. Purvis. Forthcoming 2010. International Forest Carbon in the U.S. Congress: A Survey of Key Congressional Staff. In *Deforestation and Climate Change: Reducing Carbon Emissions from Deforestation and Forest Degradation*, edited by V. Bosetti and R. Lubowski. Cheltenham, UK: Edward Elgar.

Manne, A., and R. Richels. 1997. On Stabilizing CO_2 Concentrations—Cost-Effective Emission Reduction Strategies. *Environmental Modeling and Assessment* 2(4): 251–65.

McLean, B. J. 1999. Emissions Trading: U.S. Experience Implementing Multi-State Cap and Trade Programs. *Journal of Business Administration and Policy Analysis* 27–29: 659–679.

Purvis, N., R. Kopp, and A. Stevenson. 2009. Managing Climate-Related International Forest Programs: A Proposal to Create the International Forest Conservation Corporation. Issue brief 09-07. Washington, DC: Resources for the Future.

Roberts, S., and J. Thumim. 2006. *A Rough Guide to Individual Carbon Trading: The ideas, the Issues and the Next Steps*. Report to Defra Centre for Sustainable Energy. London, UK: Defra. http://www.carbonequity.info/PDFs/defranov06.pdf (accessed April 2010).

UNFCCC (United Nations Framework Convention on Climate Change). 1995. *Report of the Conference of the Parties on Its First Session, Held at Berlin from 28 March to 7 April 1995*. FCCC/CP/1995/7/Add.1. Berlin, Germany: UNFCCC. http://unfccc.int/resource/docs/cop1/07a01.pdf (accessed April 2010).

UNFCCC. 2007. *Bali Action Plan*. Decision 1/CP.13. Bali, Indonesia: UNFCCC.

UNFCCC. 2009a. Ad Hoc Working Group on Long-Term Cooperative Action, UNCCC, negotiating next, Bonn 1-12, 2009.

UNFCCC. 2009b. *Copenhagen Accord*. Draft decision -/CP.15. Proposal by the President. Copenhagen, Denmark: UNFCCC.

Wheeler, D., and S. Shome. 2010. Less Smoke, More Mirrors: Where India Really Stands on Solar Power and Other Renewables. Working paper 205. Washington, DC: Center for Global Development.