Center for American Progress

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March 2008

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Introduction and Summary

Members of Congress this year can take an important step toward a U.S. cap-and-trade marketplace in greenhouse gas emission allowances. Legislation proposed by Sen. Joseph Lieberman (I-CT) and Sen. John Warner (R-VA) would establish a national cap on carbon emissions and then auction emission allowances to industries, which in turn could trade those allowances or use them to cover their emissions. An often overlooked but nonetheless controversial component of this proposed cap-and-trade system in the Lieberman-Warner bill is a provision that will allow emitters to meet their emissions targets, in part, by obtaining carbon "offset" credits from reductions in emissions that are not covered by cap-and-trade restrictions, including emissions from forestry and agricultural sources and from unregulated energy uses.

Making sure Congress crafts these carbon offset credits wisely as part of a mandatory cap-and-trade system is a difficult but important challenge. The reason: Carbon offsets have earned a bad name in many quarters, particularly here in the United States where the appetite for companies and individuals to demonstrate "carbon neutrality" by offsetting their carbon emissions in the absence of a cap-and-trade system has spawned an unregulated, voluntary offset market that many consider to be unreliable at best, and rife with fraud, at worst.[1]

Even in the international arena, where "offsets" earned in the developing world are subject to regulation under the Kyoto Protocol, there are concerns that some offsets credited as new reductions under the Protocol's Clean Development Mechanism would have occurred anyway. Critics also complain that polluting industries are obtaining offset credits on the cheap, enabling them to avoid making more expensive—but needed—investments in reducing their own emissions.[2]

Proponents of carbon offsets, however, argue that bona-fide carbon reductions obtained through well-designed offset projects have important benefits, including incentivizing investment flow and market interest in steps to reduce carbon emissions in ways that might otherwise go unaddressed and, in the process, lowering the overall costs of meeting carbon reduction mandates.[3] Both sides of the offset debate make persuasive arguments, but with Congress and the states now designing mandatory cap-and-trade programs, policy choices must be made.

The threshold question—as explored in a Carbon Offsets Workshop I hosted at Stanford University's Woods Institute for the Environment—is whether a U.S.-based cap-and-trade program should bother with "offsets" at all. The answer is a qualified yes.

Offsets make sense in a cap-and-trade world because they provide a financial incentive for reducing greenhouse gas emissions that otherwise are beyond the reach of the cap-and-trade system. As such, they are a sensible component of a comprehensive legislative effort to control all greenhouse gas emissions.

Indeed, offsets should be viewed as one of several types of financial incentives that target emissions not covered under a mandatory carbon cap. Other financing mechanisms, such as tax credits, rebates, and grants, may be more appropriate ways to encourage reductions in some types of un-capped emissions sources. That's why climate change legislation should include *both* a mandatory system for reducing emissions—via the "cap" part of cap-and-trade—and a suite of incentives—including offsets—that seek to reduce emissions from sources that are not restricted under the cap.

The Lieberman-Warner bill, S. 2191, takes a step in the right direction by including an offset program as part of its cap-and-trade system. The thrust of this program is to enable companies subject to emission caps to meet their obligations in part through emission reductions achieved by segments of the economy outside the cap-and-trade system. Lieberman-Warner would establish a program to quantify, certify, and verify emissions reductions from qualifying projects.

Lieberman-Warner's carbon offsets program includes a number of sensible features. The legislation, for example, would only allow a company regulated under the carbon cap program to meet up to 15 percent of its allowance submission requirements through carbon compliance offsets. This limit would ensure that lower-cost offsets would not swamp the market and displace investments needed in the emissions profiles of regulated industries. Lieberman-Warner also would enable companies to meet up to 15 percent of their compliance obligations with allowances from a foreign greenhouse gas trading market approved by the Environmental Protection Agency. These allowances could include offsets accepted for compliance purposes in an approved foreign trading market.

By taking a few additional steps, however, Lieberman-Warner can nest its offsets program in a more comprehensive policy framework that includes a menu of incentives to reduce greenhouse gas emissions that otherwise are beyond the scope of the cap-and-trade program. The incentives program would pick up where the mandatory cap-and-trade program leaves off—filling gaps under the carbon cap and tailoring different types of incentives to different types of emissions reduction opportunities. Here are the three key principles for this program.

Measures to Include Carbon Offset Credits Where There Are Gaps Under a Cap-and-Trade System

Under any mandatory cap-and-trade program that is "economy-wide" in its coverage there will still be a significant number of greenhouse gas sources emitting significant quantities of carbon dioxide and other greenhouse gases that are not limited by a mandatory cap—at least in the initial years of a mandatory cap-and-trade program. Cases in point: Emissions from disaggregated, smaller industrial sources that burn their own fuel, the collection of methane from landfills

or old coal mines or emissions from agricultural and forestry practices

In addition, because any cap-and-trade program would initially focus on mostly "upstream" polluters, such as power plants, additional opportunities for emissions reductions by "downstream" users in the chain of energy use are largely unaddressed. Examples include: energy-saving building retrofits and the purchase of fuel-efficient car or truck fleets. These downstream carbon offset opportunities are touched only indirectly—and sometimes not at all—by a cap-and-trade system, yet can yield real and cumulatively significant reductions of greenhouse gas emissions.

Encourage New Carbon Reduction Opportunities through a Climate Change Incentive Program

To provide a more comprehensive approach for reducing all significant emissions of greenhouse gases, Congress should enact an incentive system that encourages reductions from otherwise unregulated greenhouse gas emissions sources alongside a mandatory cap-and-trade program.

An offset program along the lines of the Lieberman-Warner approach should form Tier I of the Climate Change Incentive Program, with carbon offsets renamed "compliance credits" to more accurately describe validated emissions reductions used to meet mandated emissions levels. Nomenclature matters here. Once this system is in place we should retire the ambiguous and misleading term "offsets" because it has been used so loosely as to have virtually no meaning.[4]

Because these compliance credits would be acquired and used by companies operating under a cap-and-trade system to meet their allowance requirements, these new credits will be in demand, and the carbon market will set their price. Building on some of the features included in the Lieberman–Warner offsets program, this new Compliance Credit Program should advance the twin goals of environmental integrity and compatibility with the mandatory cap-and-trade system by:

- Awarding compliance credits only for projects that meet stringent, measurement, verification, and permanence requirements via the application of rigorous methodologies and protocols that EPA approves for this purpose
- Restricting companies' use of compliance credits to no more than 15 percent of their allowance submissions
- Periodically revisiting the qualification of project types for compliance credits in light of the evolution of "business as usual" practices, new regulatory requirements, and other developments.

Tier I compliance credits would also be made available for purchase in the so called voluntary offset market, which currently serves individuals and businesses who are not required to reduce emissions under a carbon cap but who nonetheless want to invest in projects that will reduce greenhouse gas emissions. Because Tier I compliance credits will be certified by EPA to provide real and verifiable emission reductions, these individuals and businesses will, for the first time, have an opportunity to purchase and retire top-grade compliance credits to account for their greenhouse gas emissions.

Additional incentives should be included in the Compliance Change Incentive Program's Tier II, Targeted Carbon Reduction Program. This Tier II program would include program- or project-based activities that reduce emissions that may not satisfy the stringent tests required to earn Tier I compliance credits. These activities would earn other financial rewards, including tax credits, rebates, grants, or other financial incentives.

A wide array of such rewards is now provided under a variety of federal laws and would be expanded under greenhouse gas reduction proposals such as Lieberman-Warner. Broad-based grant programs that encourage carbon-enhancing forestry or agriculture practices, for example, could be included in Tier II, with some practices in those sectors also likely qualifying for compliance credits under Tier I. Other Tier II activities might include program initiatives to encourage more efficient energy use via the use of existing or new subsidies or tax rebates.

Once Tier II programs develop a track record, some of them may qualify to move up into Tier I, where they can generate marketable compliance credits. In this way, Tier II may serve as an "incubator" of projects and programs that ultimately may qualify for compliance credit status under Tier I.

Under the Tier II Targeted Carbon Reduction Program, EPA would be charged with estimating emissions reductions that are generated from federally-supported financial incentive programs, and with maintaining a web-accessible inventory and database of the federal programs and their estimated emissions reductions. States and local governments would be encouraged to contribute data from their programs to this inventory and database. As emissions reductions outside the cap are documented under this program, reductions required under the cap may be recalibrated to account for reductions achieved under the Targeted Carbon Reduction Program.

In contrast, when Tier I compliance credits are used by companies regulated under the carbon cap, they would be counted under the existing cap—not as additional reductions outside the cap. EPA would issue periodic reports to Congress regarding the relative cost-effectiveness of initiatives that are part of the Targeted Carbon Reduction Program, based on an evaluation of the estimated per-ton cost for emissions reductions achieved through the financial investments made under each initiative.

By melding together these two complementary types of financial incentives—Tier I compliance credits and Tier II carbon reduction programs—into a Climate Change Incentive Program, many emissions sources that would otherwise be ignored under a mandatory cap-and-trade system will receive special attention and be incentivized to reduce their emissions. In addition to this benefit, the Climate Change Incentive Program also will more comprehensively identify and measure carbon emissions from unregulated sources and evaluate the relative cost-effectiveness of the financial incentives included in this new carbon offset program.

This rich data set will provide important information about the nature and scope of emissions that are otherwise beyond the reach of the cap-and-trade program. It will also inform policymakers about which types of incentives provide the

most bang for the buck. Over time, these data may provide the basis for expanding the cap to include some of these currently unregulated emissions sources.

By adopting these measures, the Climate Change Incentive Program will also avoid the "winner- takes-all" situation in which investments in reducing emissions from unregulated sources either qualify for valuable financial incentives through an "offsets" program or are left out in the cold. Where there is no alternative financial incentive mechanism to support good projects that cannot satisfy all of a compliance credit's requirements, the pressure builds to weaken the standards for offsets. The two-tiered structure reduces those pressures while, at the same time, enables policymakers to more systematically review and augment financial incentives that seek to reduce emissions from unregulated sources.

Building Toward an International Carbon Market

Because all greenhouse gas emissions and any greenhouse gas reductions affect the entire planet, regardless where they occur, Congress should require EPA to explore whether and, if so, how the Climate Change Incentive Program might interact with offset programs established under the Kyoto Protocol. The Lieberman-Warner approach of allowing EPA to review proposed carbon allowances and offset credits that are generated overseas and are routed through nations that have caps under the Kyoto Protocol deserves careful consideration.

Carbon allowances, for example, which have been produced by companies in the European Union and which have secured greater-than-required emissions reductions under the E.U. cap should be considered highly credible. EPA's review needs to be meaningful, however, given potential differences between the U.S.-based Compliance Credit Program and Kyoto's Clean Development Mechanism and Joint Implementation program (a carbon-reduction cousin of CDM which generates offset credits in Russia and Eastern Europe). In particular, there are serious concerns that some CDM-qualifying projects are not "additional," meaning they would have occurred without regard to the CDM program and, as a result, they should not be credited as reductions under the cap.

The type of financial incentives included in the Tier II Targeted Carbon Reduction Program should also be actively explored in international settings, where program financial support may be effective, at least at the outset, in reducing overall emissions from some types of emission sources such as, for example, tropical deforestation. Likewise, Lieberman-Warner's diversion of some allocations in order to help finance international efforts to reduce tropical deforestation is appropriate, and should be accompanied by a concerted effort to formulate an approach to avoid deforestation in tropical countries including, in particular, some type of "crediting"-type mechanism to preserve tropical rainforests, as called for in Section 3805 of Lieberman-Warner.

Creativity and discipline will be needed in this regard, however, because it may be difficult to demonstrate that project-based investments to avoid tropical deforestation actually generate net emissions reductions. The serious measurement and "leakage" challenges, for example, of making sure deforestation

activities don't simply move to another area of the country, must be closely policed. The Lieberman-Warner bill's focus on the importance of establishing country-wide baselines against which to test progress in reducing tropical deforestation is an appropriate response to this real-life concern.

All of these steps to craft an effective carbon compliance program will be examined in detail in the following pages of this paper. Congress boasts a unique opportunity to include carbon offsets in any forthcoming carbon cap-and-trade legislation, and then create a new set of carbon compliance offsets to further reduce greenhouse gases alongside the cost of reducing those gases as the United States shifts to a low-carbon economy. The steps outlined below detail how new compliance credits and other financial incentives that target unregulated emissions sources can help us get there.

A Two-Tiered Approach to Carbon Offsets

Compliance credits and carbon reduction programs together would expand the range of tools to reduce greenhouse gases under a Climate Change Incentives Program

Tier I: the Compliance Credit Program

The first tier of the Climate Change Incentives Program would establish a market-based incentive program to invest in high-quality emissions reductions projects from otherwise non-regulated sources of greenhouse gases pollution. Reductions that meet stringent requirements—including additionality, measurement, verification, and permanence requirements—would count as compliance credits that could be bought and sold in the carbon market and used like carbon allowances under a mandatory cap-and-trade system to satisfy companies' emissions reductions requirements.

Because companies required to operate under a mandatory carbon cap-and-trade system could use these compliance credits to demonstrate compliance with emissions reduction requirements, the credits would have a market value that provides a strong financial incentive for investment in projects that generate such credits. Compliance credits will function as carbon offsets, but because they include these special features, they should not be tagged with the ambiguous moniker "offsets." Instead, they should be called compliance credits, a more accurate and descriptive term.

Tier II: Targeted Carbon Reduction Program

Currently, a number of federal and state programs provide financial incentives that have the intent, or the effect, of reducing carbon emissions from unregulated sources. Many more are under active consideration at all levels of government. Tier II of the Climate Change Incentive Program would direct the Environmental Protection Agency to identify and catalogue all existing carbon reduction financial incentive programs at the federal level and refer collectively to these initiatives as part of the Targeted Carbon Reduction Program that reduces carbon emissions. Tier II programs would include a wide variety of initiatives, many of which are programmatic in nature, such as tax incentives for the purchase of high-mileage automobiles, direct financial assistance for home-based energy efficiency projects, and tax credits for installing solar panels.

Under the Targeted Carbon Reduction Program, EPA would be charged with estimating emissions reductions that are generated from federally supported financial incentive programs and maintaining a web-accessible inventory and database of the federal programs and their estimated emissions reductions. States and local governments would be encouraged to contribute data from their programs to this inventory and database. Some Tier II programs may qualify, over time, for Tier I Compliance Credits. Thus, Tier II may help to "incubate," and provide a track record for, projects or programs that ultimately qualify for Tier I compliance credits.

EPA would issue periodic reports to Congress regarding the relative cost-effectiveness of initiatives that are part of the Targeted Carbon Reduction Program, based on an evaluation of the estimated per-ton cost for emissions reductions achieved through the financial investments made under each initiative.

Crafting a Workable Carbon Offset Program in the United States

Many well-intentioned Americans today are purchasing carbon "offsets" to counterbalance emissions of global warming gases that their airplane travel, commutes, or home energy use are causing.[5] Eager offset providers promise that they will take these purchasers' money, invest it in projects that will affirmatively reduce greenhouse gas emissions, and thereby compensate for, or "offset," emissions that individuals or businesses otherwise cannot control.

Retailers of airline tickets and other products make it easy by offering "offsets" or "carbon credits" with the click of a mouse. And with the help of the Internet, the voluntary market for carbon offsets is taking off across the United States as many individuals and businesses look to do their part to reduce the emissions that pose an increasing threat to our climate.[6]

Unfortunately, despite such good intentions, a barrage of critical news reports raises serious questions about the integrity of carbon offsets that are being sold in the unregulated U.S. market.[7] It turns out that some offset dollars are being collected for some projects that already have been financed independently, arguably doing no additional environmental good. And even where offset dollars appear to be invested wisely, consumers have no way to check whether projects are actually producing the promised reductions in greenhouse gas emissions.

In addition, the voluntary market is awash in competing protocols and standards for "offsets," but none are required. Confusion reigns.[8] Some providers are committing to follow specific protocols or standards, and many do, but offset buyers have limited ability to check whether such promises are being kept.[9]

Perhaps confusion and even abuse should be expected in a new, unregulated market where the product is an intangible promise to reduce emissions of an invisible air pollutant. But there are troubling signs that even when a concerted effort is made to develop and apply detailed rules for carbon offsets and to give them regulatory significance—as under the Kyoto Protocol's Clean Development Mechanism—some of the projects may be questionable.[10] This is particularly so when political pressure is brought to bear to generate lower-cost offsets, and when equally strong pressures push regulators to conclude, without strong evidence, that wind, hydro, or other projects would not have moved forward in the absence of a carbon offset program.[11]

Given these concerns, it is no surprise that some are arguing that credits from carbon offset projects should not be part of a U.S. mandatory cap-and-trade program. These

critics question whether any regulatory system will be able to vouch for the integrity of carbon offset projects. Others note that offsets distract from job No. 1—driving innovation in high-greenhouse gas emitting sectors and reducing emissions from sources that are covered under the cap-and-trade program. [12]

These are important and timely questions as Congress and several states turn their attention to the issue.[13] The threshold question is whether a U.S.-based cap-and-trade program should follow the lead of other cap-and-trade programs by expanding the scope of the carbon market and allowing verified reductions in emissions from sources that are not covered by the cap to generate compliance credits that regulated entities can purchase and utilize to meet their restricted emissions budgets under the cap—as under Kyoto's CDM mechanism.

After responding with a qualified "yes" to this initial design question, a tougher question follows: How can the United States create an offset program that has environmental and financial integrity, that generates measurable and verifiable carbon emissions reductions, and that does not undermine the principal goals of our overall climate policy? We turn now to answer these questions with the facts, figures, and logic to support this qualified "yes."

Include High Quality Offsets in a U.S. Cap-and-Trade Program

There are compelling theoretical reasons why a carbon offset program should be included as part of a mandatory cap-and-trade program. First, and most importantly, even the most expansive cap-and-trade system inevitably will leave a large number of greenhouse gas-emitting sources outside of the cap, where they will be unregulated and unaddressed. Forestry and agriculture, for example, are both major emissions sources, but none of the current cap-and-trade plans propose to cap and regulate emissions from those sectors.[14] Likewise, many smaller, disaggregated or unconventional (non-industrial) sources will not be regulated, such as landfill-generated gases, even though, cumulatively, they are significant contributors to climate change. [15]

An offset program that targets these unregulated sources of greenhouse gases, and which provides incentives to reduce such emissions, certainly would promote a public policy good if it would generate real reductions that otherwise would not occur because the sources fall outside the cap-and-trade program. Conceptualized this way, an offset program takes up where the "cap" leaves off. Its touchstone is emissions reductions from unregulated sources.

Along the way, it will produce a better understanding of emissions from such sources, helping policymakers and scientists construct a more complete picture of total emissions, and the practical opportunities and costs of emissions reductions. It will also doubtlessly prompt additional policies or programs to further reduce carbon emissions in additional sectors. This information could also be used by EPA to identify, evaluate, and identify additional categories of emissions sources that should eventually be transitioned to regulation under the cap-and-trade program.

In sum, a well-designed carbon offset program would provide verifiable emission reductions—in the form of compliance credits—under the cap. At the same time, an offset program could snag addi-

tional emissions reductions *outside* the cap from sources that otherwise may go unaddressed by establishing a second tier of incentivized emissions reductions. This type of comprehensive offset program also would provide more information about the nature and scope of unregulated emissions, setting the stage for their potential inclusion as sources whose emissions are constrained under the cap.

Finally, a strictly regulated offset program would provide entities and individuals who are interested in reducing their carbon footprints with a new, highly-credible means to do so, specifically, by purchasing and retiring compliance credits and thereby making them unavailable for use by companies operating under the cap. Together, these prospects provide a strong rationale for moving forward with an offset program as part of a mandatory cap-and-trade scheme.

Guarding Against Excess

Many proponents point to three justifications for a carbon offset program, each of which has strong political appeal backed by powerful constituencies. But these rationales carry with them as much danger as promise. Indeed, if the success of an offset program is measured solely against these goals, the pressure to expand the program beyond its credible limits may become irresistible. The three overly-attractive justifications for an offsets program include cost reduction; co-benefits in the forestry and agriculture sectors; and the opening up of new carbon markets.

Cost Reduction. It is a truism that some offsets will come at a lower price than reductions gained from regulated sectors, thereby reducing the overall cost of reducing carbon emissions.[16] And given political and business concerns about the high cost of carbon constraints, the prospect of offset-generated cost savings provides an attractive balm for nervous policymakers and regulated industries. Modelers, using opaque assumptions that assume the unlimited availability of credible low cost offsets, have provided reinforcement, producing charts that show offsets as dramatically lowering compliance costs.[17]

Land Use Co-Benefits. Others argue strongly in favor of offsets because they are attracted by the co-benefits that may accrue from keeping carbon in trees and on farms, protecting wildlife habitat and water supplies, promoting sustainable land management practices—and potentially finding an environmentally-based source of cash to replace outright subsidies to farmers. This is an attractive prospect indeed for all advocates of responsible stewardship of both pristine and working landscapes.

Extension of the Carbon Market. Still others, including entrepreneurs, property owners, brokers and investment bankers, point out that an offset program's extension of the market into unregulated sources of emissions will unleash the full power of the market, with money hunting down carbon emission or sequestration opportunities wherever they may lurk. These proponents argue that the marketplace can and should take over, harvesting profits from sequestering carbon in fields and fauna, recycling operations, furniture manufacturing, and everything in between, and providing an additional carbon price boost for virtually any type of renewable energy or energy efficiency project imaginable.

The extremely appealing prospects of lower costs, environmental co-benefits, and market-driven innovation represent

benefits that will flow from a well-designed offset program. But none of these worthy aims should provide the measure of, or primary justification for, an offset program. If lower costs, environmental co-benefits, or expansion of carbon markets are used as the measure of success, then there will be inexorable pressure on regulators to loosen offset standards and award compliance credits to projects that are on the margin.

The cracks that are beginning to show in the Kyoto Protocol's CDM program illustrate the danger of relying on an offset program that serves too many potentially competing constituencies. For instance, some critics in Europe question whether the strong appetite for CDM projects isn't prompting regulators to look the other way in China when they treat new wind and solar projects there as driven by modest CDM payments—even though they appear to track the government of China's strong push toward energy diversification.

Instead, the touchstone for success of an offset program must be more simple and direct: measurable, verifiable reductions that would not occur in the absence of the program—the so-called "additionality" test—which provide additional options for regulated entities to meet their compliance obligations in an efficient and cost-effective way.

Adopting a "Climate Incentives" Program and Broadening Emissions Reductions

In addition to putting the primary focus of a carbon offset program on a showing of measurable, verifiable, and additional reductions under a cap, Congress should adopt other design features that will improve the operation of an offset program and allow for emission reductions to occur outside of the cap as well as under the cap. For instance, Congress should move beyond an approach that focuses primarily on reducing emissions through one of two mechanisms: reducing emissions from sources that are regulated under the cap; or reducing emissions from unregulated sources through offset projects that generate compliance credits.

This is too narrow a way to look at efforts to reduce carbon emissions. While one side of the ledger properly focuses on emissions reductions that are mandated by the cap, the other side of the ledger should not be limited to offset projects that generate compliance credits. Instead, any new carbon offset program should focus more broadly on a range of incentives that can help encourage reductions from otherwise unregulated emissions sources.

Offset projects that generate compliance credits should be nested in a continuum of projects and programs that reflect a range of emissions reductions strategies, with some projects meeting the toughest test and earning compliance credits, while others earn other types of valuable financial incentives. This approach would diminish the "all or nothing" pressure that regulators otherwise face to approve offset projects and award compliance credits for projects that will reduce emissions, but which may come up short in terms of measuring or verifying the precise quantum of reductions achieved—definitively demonstrating that the projects would not have gone forward in the absence of the carbon market.[18]

The new design would contrast *mandated reductions* that apply to sources that are covered by the cap, and a *climate incentives*

program which would use a variety of mechanisms—including but not limited to compliance credits—to encourage investments in emissions reduction projects or activities of all types in unregulated sectors. Under this approach, some types of projects or programs in unregulated sectors would earn compliance credits if they can make the strict showings required by regulatory agencies.

These credits would be included in Tier I of our proposed Compliance Credits Program. As noted above, once this system is in place we should retire the ambiguous and misleading term "offsets" because it has been used so loosely as to have virtually no meaning. Compliance credits is a more accurate and descriptive term.

Other carbon offset efforts that engage in programmatic activities that reduce emissions, or special projects that reduce emissions but may not satisfy the stringent tests required to earn compliance credits, would earn other financial rewards, including tax credits, rebates, grants, or other financial incentives. These actions would be considered under our Tier II Targeted Carbon Reductions Program.

By adopting a broader, multi-tiered "climate incentives" approach instead of a one-note "offsets" program, Congress can tailor financial incentives to the specific projects involved. The capture of gas from landfills, feedlots, or abandoned coal mines, for example, may be amenable to project-based solutions, where each project can be evaluated in accordance with established and broadly-accepted criteria. Because clear ground rules are available—or can be developed—for these types of "Tier I" projects, it may be appropriate to incentivize these project-based investments by awarding credits that can be traded on the carbon market and used by companies for compliance purposes under a mandatory carbon cap.

Rather than assuming that all projects should generate compliance credits, however, a broader-based climate incentives program would acknowledge that some unregulated sources pose special challenges in terms of precisely measuring and verifying emissions reductions and/or demonstrating additionality and permanence. Such "Tier II" projects nonetheless may have clear carbon reduction benefits, and be deserving of financial incentives.

Adopting a new, incentives-based architecture whose goal is to incentivize otherwise unregulated reductions of emissions also opens the door to constructing a broader array of programmatic incentives in a Tier II program that moves beyond the project level and focuses on behavioral or technology changes that will reduce carbon emissions. Examples include energy-saving activities of all types in unregulated sectors, such as programs that:

- Retrofit buildings with energy-saving materials or smart appliances
- Introduce distributed solar energy to communities, such as solar panels on roofs
- Reduce the need to utilize energy-intensive virgin materials

Some of these types of reduction programs may qualify for Tier I compliance credits; many more can be incentivized through tax breaks, rebates, or other Tier II tools.

Many tax breaks and other financial benefits already are in place for a variety of climate-friendly behaviors, but they are scattered under a variety of statutes

and programs.[19] They should be acknowledged, tracked and, as appropriate, expanded to cover a range of individual and collective activities that hold the promise of producing meaningful reductions in greenhouse gas emissions. The EPA also should be required to analyze the relative cost-effectiveness of initiatives that are part of the Targeted Carbon Reduction Program, and to periodically report to Congress regarding the estimated per-ton cost for emissions reductions achieved through the financial investments made under each initiative.

Forestry and Agricultural Projects and Programs

Some of the most significant sources of emissions that are not regulated under a cap are in the forestry and agricultural sectors, where deforestation and certain types of farming and livestock-related practices generate significant carbon emissions.[20] Many of these emissions can be reduced by maintaining and protecting forests and rangelands, and by adopting low-till agriculture and installing methane collection systems for livestock. In addition, some net carbon benefits may be gained, at least on a temporary basis, by planting trees and more carefully managing land use practices.[21] The transitional benefits provided by forestry and agricultural practices should not be dismissed due to their lack of permanence. Most observers agree that new emissions reductions that can be implemented over the next few decades are among the most important; they may help us get through a transition period while the overall economy retools to a lower-carbon model.[22]

Unfortunately, forestry and ag projects can present daunting additionality, measurement, and verification challenges when it comes to identifying carbon reductions that are associated with specific practices.[23] Yet there is also no doubt that steps can be taken to cause real reductions in emissions from these sectors.[24] Forestry and ag projects also are attractive because they may produce relatively lower-cost emissions reduction opportunities, they come with significant co-benefits (maintaining habitat for wildlife and other ecoservices), and they attract private funds to sectors that traditionally suffer from underinvestment.

The conflict between these two sets of realities has put forestry and agriculture in the carbon offsets hot seat. Opponents are concerned that if offsets are credited in these sectors, despite additionality, measurement, and verification concerns, the integrity of the cap-and-trade system will be compromised. Proponents argue, in return, that these major sources of emissions must somehow be addressed as part of any comprehensive climate change legislative initiative, and offsets provide a logical vehicle to do so. And now that the Kyoto Protocol signatory countries have put the issue of containing tropical deforestation on the table as a key issue that needs to be addressed when considering how to revamp the Protocol for the post-2012 period, proponents have a new basis for demanding that deforestation issues receive serious attention.[25]

The two-tiered Climate Change Incentives Program recommended in this paper provides a flexible tool that can address these special challenges associated with emissions from the unregulated forestry and ag sectors. Where new forestry and ag practices that reduce carbon emissions can be shown to be non-additional—

where they are being implemented due to the operation of the carbon market, and not due to other factors—and where measurement and verification issues can be addressed through improved measurement techniques and, potentially, through a discounting mechanism that will provide an assured core of provable reductions—then some projects may qualify for compliance credits.

Other forestry and ag initiatives may be excellent candidates for the Tier II Targeted Carbon Reduction Program, where financial incentives such as grant or subsidy programs or reduced tax burdens can be used to promote or reinforce carbon-reducing practices that already may be taking hold in some quarters, such as no-till agricultural techniques.

Emissions associated with deforestation in tropical nations, which constitute a surprisingly large percentage of global carbon emissions (estimated to be approximately 20 percent of total emissions), and which were highlighted in the recent international talks in Bali, present additional challenges, particularly with regard to so called "leakage" issues. Leakage happens when reducing deforestation in some locations simply triggers deforestation activities in other locations.

Once again, however, a flexible incentives-based approach, such as the Climate Change Incentives Program, could help address this pressing issue. Tier II programmatic-type support could be provided at the outset, for example, to help establish countrywide baselines and develop institutional capacity and state-of-the-art measurement techniques. The Lieberman-Warner bill adopts this type of approach by allocating some allowances to international forest protection (*see* Section III, Subtitle H of S. 2191.) Steps such as these could lay the groundwork for a sound compliance credits program that would generate additional, market-based incentives to avoid destructive deforestation in the future.

Other innovative techniques also might be employed to encourage private investment in these efforts. One way could be to link the level of the carbon cap on companies to deforestation trend lines, which would encourage companies to invest in these types of carbon offset programs to avoid tightening caps if progress is not made in avoiding tropical deforestation.

Other Design Issues for a Workable Carbon Offset Program

Deciding to move forward with a climate incentives program that has, as one component, an opportunity to earn compliance credits, answers a fundamental design issue, but many others remain. It is beyond the scope of this article to fully analyze these second-order design issues, but some initial observations are in order. A quick examination of the "who" and "how" of regulating compliance credits is clearly the most important remaining issue.

The Who and How of Regulating Compliance Credits

Simply put, a broad-based climate incentives program will not work effectively unless a lead agency is empowered to develop and implement the rules needed to clearly explain how incentives can be earned for reducing emissions from unregulated sources. As recognized in Lieberman-Warner, EPA is the regulatory agency that is in the best position to play this key role.

EPA is the appropriate agency to identify the types of projects that meet the stringent tests for earning compliance credits and to establish sector-specific standardized protocols and methodologies that should be used for measurement and verification purposes, working in concert with other expert agencies, as appropriate (such as, for example, the U.S. Department of Agriculture for agriculture and forestry projects).[26] In doing so, EPA should draw on the body of standard-setting work that a large number of organizations, ranging from the Kyoto Protocol's CDM Executive Board, which reviews and approves all proposed CDM projects from its offices in Geneva, and leading non-governmental organizations that have already undertaken efforts in this arena.

EPA also should establish additionality and permanence tests for compliance credit projects and for projects and programs that earn other types of financial incentives. In that regard, it is important to note that because of the dynamic rate of change in energy-related sectors and the likely effects of a cap-and-trade system on the U.S. electricity sector, questions about the "additionality" of various types of emissions reduction projects should be revisited periodically (for new projects) and tested against legal requirements, industry norms, and economics.

Congress should establish an expert advisory board to undertake such additionality reviews, and to analyze and approve methodologies for measurement and verification. EPA should develop written guidance to create a "common law" that parties can rely on in developing projects for which marketable credits will be awarded by EPA.

Finally, compliance mechanisms must be developed to ensure both initial and ongoing adherence to applicable standards. Primary enforcement responsibility should lie with EPA, supplemented by the potential use of third-party verifiers paid for from program application fees but hired by EPA, and citizen suit enforcement. The current Lieberman-Warner bill includes many of the elements of this suite of regulatory tools that are needed to ensure the integrity of Compliance Credits. These provisions can, and should, be tightened up as the bill moves to the floor of the Senate.[27]

Additional Features of a U.S.-based Climate Incentives Program

Competing policy concerns have prompted some policymakers to suggest that Congress should adopt an offset program that limits the compliance credits that can be earned from projects outside the cap—due to concerns about the integrity of such offset credits and concerns that the presumed availability of cheaper offsets may reduce investments in long-term changes that should be made in the emissions profiles of regulated sectors. Other policymakers are at the same time pushing Congress to allow companies operating under a mandatory carbon cap to meet some portion of their compliance obligation through the use of credits that are earned from non-U.S.-based offset programs such as Kyoto's CDM program, as a way of promoting links with global efforts to reduce emissions.

Lieberman-Warner adopts this approach. It allows 15 percent of allowance budgets to be satisfied by allowances and offsets that are earned outside the United States and that are utilized in countries that are operating under the Kyoto Protocol's "cap," such as the European Union and Japan. The bill also opens the door to potential future crediting of avoided tropical deforestation in the U.S. cap-and-trade program.

Several features of the Compliance Credits Program recommended in this paper should diminish the concern that marginal projects will receive compliance credits under this program, thereby undermining the integrity of the cap-and-trade program and removing pressure on regulated entities to make major investments in new technologies and practices to reduce their emissions profiles. In particular, the Compliance Credits Program would only award compliance credits to projects that meet strict standards that EPA administers in a tough, transparent, and consistent fashion.

The Compliance Credits Program would also focus on demonstrated emissions reductions—and not just cost containment—as the appropriate measure of success for the program. The program would nest compliance credits within a broader suite of available financial incentives, thereby taking the pressure off regulators to award compliance credits to marginal projects.

Taken together, these design features should diminish—if not eliminate entirely—the concern that compliance credits will swamp the cap-and-trade program. Nonetheless, in light of the challenges in establishing a credible Compliance Credits Program, and the ongoing concerns regarding the effect of these compliance credits on investment decisions by regulated industries under the cap, it is prudent to limit the use of compliance credits by regulated entities

to no more than 15 percent of their required emissions reductions at the outset of the program, as required by Lieberman-Warner. It would be appropriate to revisit this limitation once the program is underway and its impacts can be more fully assessed.

Congress should also adopt the Lieberman-Warner approach to a potential relationship between a Climate Change Incentive Program with carbon offset programs established already under the Kyoto Protocol's Clean Development Mechanism and Joint Implementation program by requiring EPA to explore potential linkages and allow the use of credits from those CDM and JI investments that pass EPA muster. When reviewing applications for the use of such foreign-based carbon credits under the U.S. cap-and-trade program, EPA should undertake a meaningful review to take into account differences in approach between the U.S.-based Compliance Credit Program and the CDM and JI programs. This is particularly important with regard to concerns about the "additionality" of some CDM-approved projects, as noted on page 6.

Finally, the type of financial incentives included in the Tier II Targeted Carbon Reduction Program also should be actively explored in international settings, where programmatic financial support such as that included in Lieberman-Warner via the dedication of some allocations to international forestry efforts may be effective, at least at the outset, in reducing overall emissions from the serious threat posed by rampant tropical deforestation. As hinted in Lieberman-Warner, market-based opportunities to reduce tropical deforestation also need to be actively explored.

Voluntary Markets—What Becomes of Them?

There has been a remarkable surge of activity in the voluntary carbon marketplace in recent months.[28] Some of these transactions have been fueled by individuals and businesses who are seeking to buy "retail" carbon credits to reduce their carbon footprints for moral, ethical, and/or reputational reasons. The voluntary markets also are attracting sophisticated investors who are developing new carbon market products and/or are investing in emerging types of carbon reduction projects or initiatives.[29] In addition, much of the activity in the voluntary markets is due to "pre-compliance" investments by companies who are anticipating carbon constraints and are seeking to hedge their carbon risks. All of these players are engaging in the purchase and sale of carbon "offsets" on a rather chaotic, over-the-counter basis—based on promised reductions that are made with little or no regulatory oversight.

Because the voluntary market has been the source of much of the concern regarding the integrity of carbon offsets, and given the effort that will be devoted to constructing a credible climate incentives program under new cap-and-trade legislation, the question arises whether a U.S. cap-and-trade system should seek to supplant entirely the voluntary market, impose additional regulatory requirements on the voluntary market to protect investors from fraudulent practices, or simply allow the voluntary market to co-exist alongside the new cap-and-trade and climate incentives program.

Many observers believe that a voluntary market should and will continue to thrive in the shadow of carbon regulation, par-

ticularly if the recently released Voluntary Carbon Standard[30] and other broad-based, well-respected voluntary standards gain market acceptance. The Voluntary Carbon Standard is the latest effort that a number of non-governmental organizations, investors, and other interested parties have made to identify minimum standards for offsets sold in the voluntary market. These observers note that the voluntary carbon market has continued to grow in Great Britain despite its coexistence with the mandatory Kyoto Protocol program.

Based on discussions held under the auspices of Stanford University's Carbon Offsets Project, a solid case can be made in favor of allowing the voluntary carbon credit market to continue to flourish with minimal governmental involvement. Proponents make a convincing argument that a voluntary market can play a number of roles that are not inconsistent with a regulated offset market, such as promoting investments in projects that reduce emissions from sources that are not yet regulated or in projects that do not yet (or which may never) qualify for compliance credits.

An exception should be made, however, for the "retail" voluntary market, through which individuals and small businesses are purchasing carbon offsets to reduce their carbon footprints. By definition, buyers in the retail market tend to be small players who typically do not have the resources, sophistication, or capability to ensure that their purchases are reducing emissions in the amounts claimed by vendors. And many observers are concerned that the unregulated retail voluntary market is damaging the credibility of the overall effort to reduce carbon emissions, given the absence of clear standards against which claimed reductions are measured and the near-total lack of accountability in the retail market.

Adoption of a cap-and-trade and climate incentives program could heighten these already serious concerns, given the regulatory and financial importance that would attach to qualifying emissions reductions under the new system. If an unchecked and fundamentally suspect voluntary retail market continues to operate in this context, credibility questions will continue to be raised, potentially affecting confidence in the integrity of the cap-and-trade and climate incentives programs.

Congress should address this situation by requiring the Federal Trade Commission to more vigorously police the voluntary offset market and ensure that claims made by offset providers are accurate.[31] In addition, Congress should provide opportunities for "retail" purchasers to purchase and retire compliance credits that are generated under the climate incentives program, thereby providing an additional option for committed citizens and businesses to more confidentially compensate for their carbon emissions.[32]

Conclusion

Congress has an important opportunity to develop a carbon reduction incentive program that generates meaningful reductions in greenhouse gas emissions from sources unregulated under a mandatory cap-and-trade program and transforms today's highly suspect, voluntary offset market into an important part of a comprehensive cap-and-trade system. The Lieberman-Warner bill takes an important step in that direction, but Congress needs to build on that start.

Congress should enact a program that is targeted only on emissions sources that are not regulated under a cap. The program should include a suite of incentives, with the top level (Tier I) being reserved for compliance credits that satisfy a high showing of additionality, measurement, verification, and permanence through the application of rigorous methodologies and protocols that EPA approves for this purpose.

In addition, the program should adopt a Tier II program with other financial incentives that will reward emissions reduction efforts that may not satisfy the difficult showings needed to obtain compliance credits, but which nonetheless will trigger meaningful reductions in overall emissions. It also should not squelch the voluntary markets while, at the same time, providing new protections for retail purchasers of carbon offsets.

Carbon reductions crafted under the types of incentive programs recommended in this paper would ensure that a full range of tools to reduce greenhouse gas emissions are on the table for use under a U.S. cap-and-trade system. What's more, by transforming the ill-defined and often-abused "offset" concept into a suite of incentives—including, but not limited to, compliance credits—Congress can address emissions sources that otherwise would be ignored under the cap-and-trade program and thereby enact more far-reaching and comprehensive climate change legislation.

In short, Congress can build a solid foundation upon which the emerging carbon markets can thrive—both here in the United States and, ultimately, globally. Congress should swiftly act to expand and sharpen the "offset" title in the Lieberman-Warner legislation by adopting the multi-tiered incentive structure advocated in this paper, converting offsets from a near-slanderous term into a logical and effective part of Congress' comprehensive effort to address all significant sources of greenhouse gas emissions.

Endnotes

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2 David Victor and Danny Cullenward, "Making Carbon Markets Work," *Scientific American* (Dec. 2007), p. 75-76.

3 See, for example, Natsource LLC, "Realizing the Benefits of Greenhouse Gas Offsets: Design Options to Stimulate Project Development and Ensure Environmental Integrity" (January 2007)(for the National Commission on Energy Policy); Robert Stavins, "A Sensible Way to Cut CO2 Emissions," The Environmental Forum (November/December 2007), p. 18.

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5 Claudia Deutsch, "Attention Shoppers: Carbon Offsets in Aisle 6," *New York Times*, Mar. 7, 2007.

6 See generally B. DeLollis, "Can You be Green by Buying Offsets?" *USA Today*, March 2, 2007; Dan Mitchell, "How Clean Is Your Carbon Credit?" *New York Times*, May 5, 2007; Andrew Revkin, "Buying Carbon Neutral," *New York Times*, April 29, 2007; Cindy Loose, "Guilty About Flying? Just Click," *Washington Post*, June 10, 2007.

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8 Mark Trexler and Laura Kosloff, "Selling Carbon Neutrality," *Environmental Forum* (March/April 2006), at p. 34.

9 "A Consumer's Guide to Retail Carbon Offset Providers," *Clean Air-Cool Planet*, 2006.

10 Michael Wara, "Is the Global Carbon Market Working?" *Nature*, Feb. 8, 2007, p. 595; Sebastian Mallaby, "Carbon Policy that Works," *Washington Post*, July 23, 2007.

11 Michael Wara, forthcoming article, 2008.

12 Letter from Frances Beinecke (President, Natural Resources Defense Council) to Reps. Dingell and Boucher (March 19, 2007), p. 29-30, available at http://docs.nrdc.org/globalwarming/glo_07031901A.pdf. The author criticizes offsets due to additionality concerns and their potential to divert investments in transformative technologies.

13 The points discussed herein apply with equal force to implementation of cap-and-trade systems at the federal level or at the state level. For short-hand purposes, however, federal legislation is presumed to provide the vehicle for the offsets program.

14 See generally Pew Center on Global Climate Change, "Agricultural & Forestlands: U.S. Policy Strategies" (July 2007), available at http://pewclimate.org/global-warming-in-depth/all_reports/ag_forestlands.

15 See, for example., Annotated Table of Contents, *The Lieberman-Warner America's Climate Security Act of 2007*, p. 2 (identifying the covered sectors of the economy of electric power, transportation and industry as accounting for approximately 80 percent of GHG emissions, according to the Inventory of U.S. Greenhouse Gas Emissions and Sinks); Market Advisory Committee of the California Air Resources Board, "Recommendations for Designing a Greenhouse Gas Cap-and-Trade System for California" (June 30, 2007), p. 28 (noting that 17 percent of GHG emissions sources are excluded from recommended cap for California); House Committee on Energy and Commerce staff report, "Climate Change Legislation Design White Paper: Scope of a Cap-and-Trade Program (October 2007), p. 20 (noting that agriculture alone is responsible for 8 percent of U.S. emissions).

16 L. Abboud, "Banks See Green in Carbon Projects," *Wall Street Journal*, Dec. 18, 2007, p. C1.

17 See, for example, EPA Office of Atmospheric Programs, "EPA Analysis of the *Climate Stewardship and Innovation Act of 2007*" S. 280 in 100 Cong. (July 16, 2007) (identifies potential compliance cost savings projections based on alternative offset availability scenarios).

18 "Additionality" is a critical requirement for the integrity of offsets. A project that is being counted as an offset must be a project that is "additional" to the status quo—that is, it would not have occurred without the impetus of the financial reward associated with earning a compliance credit. Unfortunately, testing for additionality is a complex exercise that must be approached from an analytical perspective. See generally Mark Trexler, Derik Broekhoff, and Laura Kosloff, "A Statistically-Driven Approach to Offset-Based GHG Additionality Determinations: What Can We Learn?" *Sustainable Development Law and Policy* (Winter 2006), p. 30.

19 By way of example, the tax code includes production tax credits for wind, solar, and other types of renewable energy sources. *See* 26 U.S.C. Section 45. Likewise, the Energy Policy and Conservation Act of 2005 includes a number of incentive programs (see, for example, 42 U.S.C. Sections 15821 and 15853 which describe a rebate program for purchase of energy efficient appliances or installation of renewable energy systems in homes, respectively).

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21 See generally Zach Willey and Bill Chameides, eds., *Harnessing Farms and Forests in the Low-Carbon Economy: How to Create, Measure, and Verify Greenhouse Gas Offsets* (Duke University Press, 2007).

22 See generally EPA, *Greenhouse Gas Mitigation Potential In U.S. Forestry And Agriculture* (November 2005)(EPA 430-R-05-006), available at http://www.Epa.Gov/Sequestration/Pdf/Greenhousegas2005.Pdf

23 "Upset About Offsets," *The Economist*, August 5, 2006.

24 See, for example, Zach Willey and Bill Chameides, *Harnessing Farms and Forests in the Low-Carbon Economy.*

25 Tom Wright, "New Tool May Help in Fight to Curb CO2," *Wall Street Journal*, January 3, 2008 (discussing the Bali focus on tropic deforestation).

26 Joseph Kruger and C. Egenhofer, "Confidence Through Compliance in Emissions Trading Markets," *Sustainable Development Law & Policy* (Winter 2006), p. 4-5 (discussing EPA experience in administering cap and trade programs).

27 By way of example, the definitions of key terms such as "additionality" can be strengthened, and the mechanisms by which EPA and other agencies (and experts) should evaluate and validate protocols and methodologies can be sharpened. It is expected that some of these issues will be addressed in connection with the mark-up of the legislation in committee.

28 See generally The World Bank, "State and Trends of the Carbon Market 2007" (May 2007).

29 See generally Testimony of Derik Broekhoff before the House Select Committee on Energy Independence and Global Warming, "Voluntary Carbon Offsets—Getting What You Pay For" (July 18, 2007); Testimony of Joseph Romm before the House Select Committee on Energy Independence and Global Warming (July 18, 2007); "Special Report: Voluntary Market," *Point Carbon*, (December 2007).

30 Voluntary Carbon Standard, available at www.v-c-s.org.

31 Michael Wara, "How sustainable is my company? Commercial speech, carbon neutrality, and offset quantification," *Trends* (July/August 2007)(describing FTC jurisdiction over deceptive acts and practices affecting commerce).

32 Michael Vandenbergh and A. Steinemann, "The Carbon-Neutral Individual," 82 N.Y.U.L. Rev. (forthcoming 2008)(discussing the role that individuals play in producing carbon emissions and the importance of providing opportunities for individuals to address their carbon footprints, including via information disclosure).

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Acknowledgements

Mr. Hayes is grateful for the support of Stanford's Woods Institute for the Environment and its co-directors, Buzz Thompson and Jeff Koseff, for their support for this project. Mr. Hayes also thanks the experts who participated in the Carbon Offsets Project dialogue at Stanford in October, 2007. Following the Stanford-sponsored workshop, Duke's Nicholas School convened a work group, led by Tim Profeta and Lydia Olander, which has provided a forum in which some of the concepts included in this paper have been discussed. Finally, thanks to Kit Batten and Bob Sussman of the Center for American Progress, who provided helpful comments on this paper, and to Susannah Foster and Meryl Raymar, who provided some of the early research that underpins the paper. The recommendations included in this paper are Mr. Hayes' alone; they do not purport to represent a consensus from the Stanford dialogue group, or the positions of WWF, PPI, or Latham & Watkins.

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