

Mobilizing Conservation Finance

Catalyzing mitigation & sequestration in the forestry
& agricultural sectors through investment into offset
projects

Conservation finance has to reach a scale of \$400 billion a year to realize the carbon reduction needed to limit catastrophic climate change impacts. The forestry and agricultural sectors in the United States offer tremendous opportunity to mitigate carbon emissions but finance is needed to develop and construct projects. Traditional investors are reluctant to finance projects that depend upon emerging and nascent environmental markets. Public efforts must be made to mitigate the risks associated with emerging environmental markets and create a favorable investment environment.

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Executive Summary

The United States Department of Agriculture (USDA) and its Conservation Innovation Grant (CIG) program has fostered the development of the basic infrastructure that is needed to account for the greenhouse gas reductions of conservation projects and generate carbon offsets. Alone, however, this framework for the market is insufficient to catalyze the private investment into conservation agriculture and forestry projects. Policy creates and controls carbon markets—both supply (what projects qualify to generate credits) and demand (how many credits polluters need to purchase). Given the potential for this policy to change, carbon markets are perceived by financiers to be risky. In practice, this means lenders do not value potential revenues from carbon markets and require projects to be profitable in their absence. This means carbon markets do not currently change what projects get developed or built—and cannot properly incentivize the implementation of agricultural and forestry projects.

Financiers are needed to manage the risks associated with emerging carbon markets and make upfront investments based upon the revenues that those projects will generate from selling offsets. The USDA has an opportunity to incentivize private lenders and investors to do so by mitigating and managing the risks associated with nascent environmental markets by providing *demand enhancements* and *credit enhancements*.

Demand Enhancement: Creating demand beyond existing compliance and voluntary carbon markets to increase the certainty of investors that offsets generated by upfront investments will have real value.

- *Key recommendation:* Modify the [2012 CEQ Guidance on Federal Greenhouse Gas \(GHG\) Accounting and Reporting](#) to allow carbon offsets to be applied as an adjustment against a Federal agency's emissions. This will allow offsets to be used in part to meet the Executive Order 13693 requirement that Federal agencies reduce greenhouse gas emissions 40% below 2008 levels by 2025. The Climate Trust estimates this modification could grow the voluntary market for offsets by 15%.

Credit Enhancement: The proceeds from the sale of a climate bond are an ideal source of low-cost, patient capital finance greenhouse gas offset projects. Given uncertainty about the future of North American carbon markets, however, offset sales have been viewed as too risky to be the source of repayment for a bond.

- *Key recommendation:* Provide a credit enhancement to a climate bond whose proceeds are used to finance greenhouse gas offset projects. To do so, the USDA could issue bonds themselves, or guarantee the principal and interest repayment associated with third-party issued bonds. With the balance sheet of a large public entity standing behind the repayment of a bond, the risk to institutional investors purchasing bonds is significantly reduced. Through this credit enhancement, proceeds from the bond can give greenhouse gas impact opportunities access to low cost capital— with public entities assuming some of the risks associated with the investments. Meanwhile, institutional investors can continue to purchase a product they are very familiar with incorporating into their portfolios— government-backed bonds.

History: USDA development of carbon market infrastructure to date

Greenhouse gas accounting work from USDA and its Conservation Innovation Grant (CIG) program administered by USDA's Natural Resources Conservation Service (NRCS) has fostered the development and implementation of the basic infrastructure needed to account for the greenhouse gas reductions of conservation projects and the generation of carbon offsets. Many of the CIG awards have supported the development of the infrastructure that carbon markets depend upon. This has been a critical step in developing the sectors for the carbon market.

USDA Report Quantifying Greenhouse Gas Fluxes in Agriculture and Forestry: Methods for Entity-Scale Inventory (July 2014)

This report created a standard, science-based set of GHG estimation methods that allow entity-scale estimation of the GHG impacts of landowner management decisions. These methods support the development of entity-, farm-, or forest-scale GHG inventories that facilitate the participation of landowners in public and private environmental markets, registries, and reporting systems.

USDA Conservation Innovation Grant (2011)

The USDA NRCS invested \$7.47M in FY2011 for CIG projects to reduce greenhouse gas emissions and promote carbon sequestration, hereinafter referred to as the **USDA GHG CIG projects**.

The process of developing, planning and implementing the USDA GHG CIG projects played a key role in helping to create and develop agricultural offset market protocols and methodologies in voluntary markets and in the California Cap-and-Trade program. Important programmatic elements and constructs were tested and established for agricultural sector GHG market participation in the course of piloting the USDA GHG CIG projects, including:

- The use of cost-effective yet rigorous *biogeochemical process models* to measure GHG fluxes from agricultural practices, including development of how to account for structural uncertainty and data uncertainty within these models to ensure high confidence in model outputs;
- The concept of *aggregated projects*, such that individual landowners are aggregated by a project developer into a single larger project that meets all requirements of participation in offset markets but which reduces the burden and costs on individual landowners while retaining scientific rigor;
- *Project developers* interpreted complex market opportunities for landowners by devising user-friendly materials to engage landowners while assuming more complex functions and requirements in a manner that meets the stringency of the market and landowner alike; and
- GHG CIGS resulted in successful creation of emissions reductions from land use projects and the resulting sale of those credits within offset markets. These included tons sold from the *Avoided Conversion of Grasslands* projects to Chevy Automotive; and from the *Nutrient Management for Nitrous Oxide Reductions* project. Additionally, the *Rice Cultivation Offset Protocol* currently up for adoption by the California Air Resources Board (CARB) was adapted from a USDA GHG CIG.

Problem: Carbon credits are not financeable

The USDA's past investment into quantification research and carbon market methodologies that deliver the accounting infrastructure for the market is essential—and there is more basic research and development in this field that is needed to integrate new sectors into the carbon market. Alone, however, this framework for the market is insufficient to catalyze the private development of the conservation agriculture and forestry projects using the carbon market.

Carbon markets offer a unique opportunity through which producers can be paid for effecting these emission reductions. In this [North American Carbon Market Supply and Demand Assessment](#), The Climate Trust estimates that existing carbon markets in North America will demand \$2.89 billion of offsets from 2015 through 2025. However, policy creates and controls this market—both supply (what projects qualify to generate credits) and demand (how many credits polluters need to purchase). Given the potential for this policy to change, carbon markets are perceived by financiers to be risky. In practice, this means lenders do not value potential revenues from carbon markets and require projects to be profitable in their absence. This means these markets do not currently change what projects get developed or built. Given this perceived risk from lenders, carbon markets drive little "additionality" or new projects that depend upon offset sales. To mitigate catastrophic climate change, it is vital that new low carbon infrastructure be built. Without valuing the future cost of carbon emissions upfront, this will not occur.

A new investment thesis that carbon prices can be relied upon to make investments today must be developed and supported. The USDA recognized this when it announced, in February 2015, a new round of GHG, ecosystem, and innovative market financing CIGs with up to \$20M of awards available. Anticipated to begin in September 2015, these projects are devised to build upon the successes of the FY2011 GHG CIGs and to achieve scale and innovative project financing to overcome upfront financing costs associated with these offset credits. The solicitation writes, "Priority will be given to projects that help successful past CIG grants mature into replicable and scalable transactions...NRCS is seeking applications to stimulate the development of... investment products and demonstrations in areas such as pay-for success environmental improvement bonds [and] climate/green bonds."



Risks: Delivery & Market

Financiers are needed who are willing to manage the risks associated with emerging carbon markets and make upfront investments that support projects based upon the revenues that those projects will generate from selling offsets.

Typically upfront investment into projects in return for equity in the future sale of carbon credits is exposed to two fundamental risks:

1. Delivery Risk – Will projects be able to generate credits? The risk that due to project failure or an inability to meet the monitoring and procedures required to produce offsets, the projects either do not generate offsets or generate fewer offsets than anticipated. To mitigate this risk it is essential for investors to:

- a) Perform detailed due diligence on the quantification of projects.
- b) Conduct active project management.
- c) Create diverse portfolio of projects, and
- d) Ensure that the project(s) builds a robust buffer pool of credits that can be used to compensate for under-delivery.

2. Market Risk – Will the price for those credits be sufficient to repay the pre-purchase and generate returns? The risk that changes in policy will change carbon prices or the sectors that qualify to generate offsets. To mitigate this risk, investors need to:

- a) Conduct on-going policy tracking.
- b) Create a portfolio of projects in a variety of sectors.
- c) Sell credits to both the voluntary and compliance markets.

The Climate Trust currently occupies a unique position to manage and mitigate this type of market risk. The Climate Trust has \$22 million under management that must be spent to purchase and retire carbon credits to satisfy the Oregon Carbon Dioxide Standard, and can thus act as “buyer of last resort” to backstop investments. This small fund, however, is not nearly sufficient for the task at hand. To reach a scale that can truly realize the mitigation potential of the United States agriculture and forestry projects, significantly more capital is need than what can currently be supported by this unique source of funds that act as a buyer of last resort. The USDA could grow the potential scale of capital available by providing two types of enhancements discussed in detail below: demand enhancements and credit enhancements.

USDA Market Catalyst: Demand enhancement

The ability for carbon markets to incentivize project development to realize the carbon mitigation potential has been stifled by a limited market for the offsets generated by current and emerging offset project types. While forestry and livestock digesters can sell credits into California’s compliance market, nascent sectors like nutrient management and grassland conservation are forced to find buyers on the limited and difficult to predict voluntary market. Creating demand beyond existing compliance



and voluntary carbon markets would therefore send a strong signal to project developers of demand availability and give investors increased confidence that market risks have been mitigated.

Amending Council on Environmental Quality's Greenhouse Gas Offset Guidance

The Council on Environmental Quality (CEQ) could play an instrumental role in mitigating market risk by modifying their [2012 CEQ Guidance on Federal Greenhouse Gas \(GHG\) Accounting and Reporting](#) to allow carbon offsets to be applied as an adjustment against a Federal agency's emissions.

In October 2010, the CEQ released Guidance on Federal GHG Accounting and Reporting that established the government-wide requirements for measuring and reporting GHG emissions associated with Federal agency operations. This guidance was revised June 4, 2012. Section 4.0 considers Renewable Energy and Carbon Offsets. While Section 4.0.2 specifically allows Renewable Energy Credits (RECs) to be used to meet emissions reduction targets (by acquiring and retiring them), Section 4.4 on Carbon Offsets indicates that:

At this time carbon offsets are not allowed to be applied as an adjustment against a Federal agency's emissions for purposes of meeting their targets. However, agencies may voluntarily report production, purchase, or sale of offsets in their qualitative statement. The area of carbon offsets is broad, encompassing multiple organizations and validation/certification processes. More time and deliberate focus is necessary to understand how the market for carbon offsets and use of those offsets could be applied consistently across the Federal community. Future versions of the Guidance may address the broader category of carbon offsets in greater detail.

The time to address the broader category of offsets has come. Protocols, carbon standards, and registries were somewhat nascent at the original time of writing of the Guidance. In recent years, however, the Climate Action Reserve, American Carbon Registry, and Verified Carbon Standard have established respected protocols for qualifying and quantifying offsets from a large variety of projects. The California Air Resource Board (CARB) adopted four of the Climate Action Reserve protocols into its compliance offset system under AB32. A revised Guidance can now rely on the rigorous work of the existing registries who have approved protocols that have been developed based on scientific methodology and subjected to a high degree of scientific and peer review in their respective approval processes. High degrees of quality, transparency, tracking, and reporting are now the norm due to the efforts of these registries.

It is recommended that the CEQ consider revising the Guidance to allow carbon offsets to be used by any agency to meet emissions reduction targets, provided:

1. The credits are registered in any one of three voluntary North American registries (American Carbon Registry, Climate Action Reserve, and/or Verified Carbon Standard) or in any compliance program, such as the California's Air Resources Board mandatory compliance offset program or the Regional Greenhouse Gas Initiative; and
2. The credits are retired on one of these registries when they are used to meet the federal agency obligation.



3. There is a reasonable cap on the amount of emissions reductions that can be achieved via offsets. This ensures agencies prioritize onsite mitigation measures that avoid or minimize emissions. In California’s compliance market, for example, offsets can be used to satisfy up to 8% of the total number of pollution permits a regulated entity obtains.

Amending the Guidance would have positive and dramatic implications for meeting President Obama’s 2009 Executive Order (EO) 13514, Federal Leadership in Environmental, Energy, and Economic Performance. The order required Federal agencies and departments to lead in increasing sustainability and energy-efficiency across the Federal government, and to report and reduce GHG pollution to meet a number of energy, water, and waste reduction targets. In 2010, President Obama announced a Federal government-wide target of a 28% reduction against a 2008 baseline by 2020 in direct GHG emissions, and 13% reduction by 2020 in indirect GHG emissions. A new Executive Order 13693-- Planning for Federal Sustainability in the Next Decade—was signed by the President on March 19th 2015. EO 13693 revoked EO 13514 and called for a 40% reduction under 2008 levels by 2025.

Such emission reduction targets should include all strategies to allow effective attainment of such reduction goals. Amending the CEQ Guidance to allow for the use of a limited number of offsets would support the critical effort to mitigate greenhouse gas emissions and sequester carbon in the forestry and agricultural sectors in the United States. Moreover, it would send a critical signal to the carbon market that there is significant demand beyond just the California compliance offset market. The Council on Environmental Quality estimated that the initial EO 13514 would result in 101 million mtCO_{2e} reductions by 2020.¹ To meet this target, emissions would need to have been reduced by 16.8 million mtCO_{2e} per year through 2020. If only 8% of these reductions came from offsets, federal agencies could potentially demand 1.35 million offsets per year. This additional demand represents under that EO, by The Climate Trust’s calculations, a 15% growth over the current demand in the North American voluntary offset market.

On December 18, 2014, the CEQ released revised [draft Guidance](#) for public comment that describes how Federal departments and agencies should consider the effects of greenhouse gas emissions and climate change in their NEPA reviews. Section F. Mitigation suggests that alternatives can be considered for “their ability to reduce or mitigate GHG emissions.” This appears to indicate that offsets from the forestry, agricultural, and livestock sectors could be eligible in this regard.

Such an amendment to the Guidance, allowing for the limited use of offsets, would promote project development in currently nascent agricultural sectors that have high quality protocols for rigorously quantifying real climate benefits—but are yet to be applied at scale because the market for the resulting credits is uncertain. Amending the CEQ Guidance therefore leverages the significant labor to develop these voluntary protocols to increase carbon sequestration and mitigation and offer a host of additional benefits that include cleaner water, healthier crops, rural employment, and conservation of natural resources and species.

¹ Council on Environmental Quality. “[Guidance for Federal Greenhouse Gas Accounting and Inventories.](#)”



International Civil Aviation Organization (ICAO)

Another potential source of significant demand for offsets is International Civil Aviation Organization (ICAO). The ICAO assembly agreed to develop a range of approaches to reduce emissions in the aviation sector, and committed to a goal of carbon neutral growth from the civil aviation sector post-2020 – the first global sector to adopt GHG emissions reduction targets. The sector is looking into technology options, operational changes, alternative fuels, and market based measures (MBM), including the purchase of offsets from existing or future carbon markets. ICAO believes MBM will allow the sector to achieve their goal of carbon neutral growth post-2020 at a potentially lower cost and in a more flexible manner than mandating certain technologies and fuels. ICAO will soon release seven technical papers addressing the technical design elements they deem necessary in an offsets market, including:

- Governance and approval of systems for ICAO compliance;
- International accounting/linkages between UNFCCC and ICAO;
- Environmental Integrity/key eligibility criteria;
- Registry design and operation;
- Vintage Restrictions: Implications for ICAO;
- Role of Allowances vs Offsets; and
- Net atmospheric benefit and discounting.

ICAO is currently two to four years ahead of the UNFCCC (United Nations Framework Convention on Climate Change) process in terms of thinking through market design, so the outcomes of these efforts will quite likely inform future discussions at the UNFCCC level. The implications of these efforts clearly show global progress in and acceptance of carbon markets and offsets as a credible means of helping to achieve GHG emissions reductions. Demand volume from ICAO members will certainly support offset generation in the land-based sectors of the U.S.

USDA Market Catalyst: Credit enhancement

The proceeds from the sale of a climate bond are an ideal source of low-cost, patient capital to finance greenhouse gas offset development. The proceeds from the bond would finance projects by way of offering a pre-purchase of projected offset streams. After projects are implemented and offsets are issued and sold, revenue from the sale would be used to repay bond purchasers.

Given the perceived market and delivery risks, however, offset sales are viewed as too risky to be the source of repayment for a bond. To unlock this source of low-cost capital to catalyze the carbon market, a public entity such as the USDA could provide a credit enhancement to allow the issuance of a climate bond that is repaid through offset sales from forestry and agricultural projects in the United States. This section provides a brief overview of bonds and climate bonds and discusses how the USDA could structure a credit enhancement.

Climate Bonds Overview

Bonds have financed infrastructure initiatives over the past two centuries to meet environmental and social challenges. Sewers to address the blight of cholera in Europe and national energy grids to fuel the economic growth of the 20th century were built with bonds. To begin to solve the challenge of our generation, there is much value in supporting a climate bond whose proceeds are invested into projects that directly mitigate carbon emissions.

Bonds are long-term debt instruments that are repaid at pre-agreed upon rates and often guaranteed by governments. The greatest share of institutional funds is allocated to the global bond market. The value of these bonds as of the end of 2010 was \$95 trillion with 72% of those bonds being held by long-term investors such as pension funds, mutual funds, and insurance firms.² While conventional investors are waiting for policy signals, others are actively demonstrating their commitment by investing in bonds and other financial instruments that support low-carbon project development at scale. This has set the stage for a market for climate and green bonds, defined as fixed income, liquid asset-backed bonds that furnish capital to climate change mitigation projects that yield credible reductions in emissions, or strengthen adaptation measures. The green bond market is currently just 0.4% of the global bond market.

Bonds are ideally suited to fund the long-term environmental infrastructure, like anaerobic digesters, forestry, grassland conservation and nutrient management projects, needed to develop the low-carbon economy. Climate bonds typically mature in the five to ten year range, which matches the long period of time over which these credits are eligible to generate offsets. According to IFSL Research, climate bonds could be issued each year up to a level of \$0.5 trillion for the next 20 years and still not exhaust the demand of the global market. Market observers predict increased uptake in the climate bond arena. This Green Bond market is estimated to reach a value of \$100 billion in 2015-- up from \$36 billion in 2014.³

A 2014 conservation finance report by Credit Suisse and World Wildlife Fund finds that for conservation finance to be recognized as a mainstream asset class, early stage venture-type investments

² Environmental Finance. [Climate Bond Issuance Summary](#). April 2014.

³ HSBC and Climate Bond Initiative White Paper. [Bonds and Climate Change: State of the Market in 2014](#). July 2014.



in climate friendly projects could “unlock and establish profitable business models that rely on simple cash flow mechanism and measurable conservation benefits.”⁴ While there is an increasing demand for investable conservation programs and projects, clear investment characteristics (expected returns, associated risks, required ticket size, and tenure of the investment) have been lacking. Current flows to conservation finance have been in the range of \$52 billion and need to reach \$200 to \$300 billion per year to achieve the level of global biodiversity protection needed.

Credit enhancement to enable climate bonds to finance environmental credits

In order to unlock the proceeds of a climate bond to finance the upfront investments made by a Carbon Investment Management Organization, the market and delivery risks associated with carbon credit investments need to be mitigated. The potential for the delivery or price for credits to change makes the asset, at this stage, too risky for bond finance. To mobilize the low-cost, long-term capital associated with climate bonds to provide upfront value for offsets, the USDA could provide a credit enhancement to the issuance of the bond that would mitigate these risks.

To do so, the USDA could issue bonds and guarantee to repay the principal and interest to bond purchasers. With the balance sheet of a large public entity standing behind the repayment of a bond, the risk to institutional investors purchasing bonds is significantly reduced. Through this guarantee or credit enhancement, proceeds from the bond can give impact opportunities access to low cost capital— with the USDA assuming some of the risks associated with the investments. Meanwhile, institutional investors can continue to purchase a product they are very familiar with incorporating into their portfolios— government-backed bonds. An example includes loans issued through the Green Job-Green New York program for energy efficiency improvements, which were financed with a \$24.3M bond.⁵ The New York State Environmental Facilities Corporation (through its State Revolving Fund program under the Clean Water State Revolving Fund) guaranteed to repay the principal and interest associated with the bond, which was therefore given an AAA/Aaa rating.

Accessing the burgeoning appetite for climate bonds can provide cost effective, early stage financing. To do this at scale, the following is recommended:

- 1) **Issue a Green Bond.** USDA issues and guarantees a *Heartland Conservation Bond* according to the recognized Green Bond Principles (guidelines that recommend transparency and disclosure and promote integrity in the development of the Green Bond market).
- 2) **Investment in projects.** Bond proceeds are channeled as direct investments into forestry, anaerobic digestion, grassland conservation, nutrient management and rice projects to mitigate carbon emissions. All projects meet “additionality” through the reliance on established carbon offset protocols prevalent in the market.
- 3) **Repayment of bond purchasers:** The US Department of Agriculture repays the bond purchasers at the offered coupon rate (typically in the range of 1%-4%) amortized over the tenor of the bond (typically 10 years).

⁴ Credit Suisse, World Wildlife Fund, McKinsey& Company White Paper. [Conservation Finance: Moving beyond donor funding toward an investor-driven approach](#). January 2014.

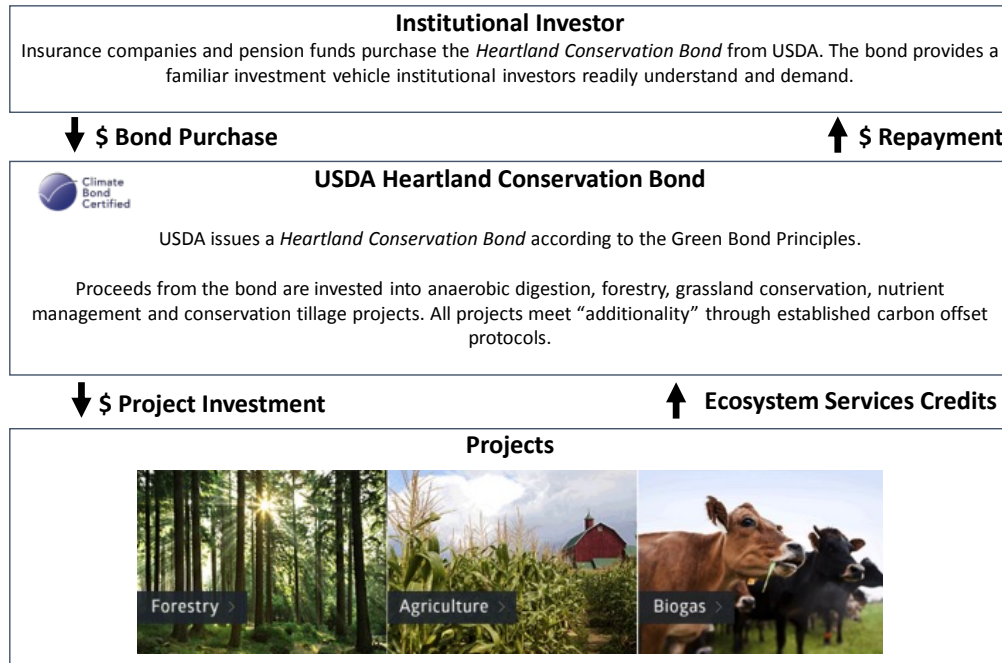
⁵ “[NYSERDA Announces Residential Energy Efficiency Financing Bonds through Green Jobs – Green New York](#).” August 13, 2013.



- 4) **Repayment support:** The sale of the carbon credits in both the regulated and voluntary markets (estimated \$2.89 billion market size by 2025) will support the repayment of the bond purchasers.

Heartland Conservation Bond

An opportunity for USDA to catalyze private capital and environmental markets.



Conclusion

Environmental markets have matured over the last 15 years. Respected protocols that ensure the integrity of greenhouse gas offsets have now been put into place for a large variety of agricultural and forestry projects in the United States. To bring these markets to scale, initial investors need the comfort of a guarantee and the markets need enhanced demand. The demand released from modifying the CEQ’s Guidance would send a vital signal to the project developer community that there is increased appetite for offsets and that the Federal government is willing to support the offset market while meeting its own compliance needs under the President’s Executive Order. The guarantee to repay bond investors provided by USDA would deliver investor comfort and enable the raising of capital, thereby demonstrating the success of investments that rely upon environmental markets. After demonstrating success, future projects can be financed without the need for public support, which is the ultimate goal.

Attracting private sector investment to help bridge the climate finance gap, and to sign up for debt instruments that finance projects dependent upon revenues from environmental markets is a viable solution. The Climate Trust believes this is the perfect moment for USDA to provide demand and credit enhancements to harness the emerging green bond market to finance carbon offset projects in order to preserve and conserve our Nation’s natural resources.

APPENDIX

Public-Private Carbon Market Case Studies

The following examples are included to exhibit the mechanism and powerful impact of governmental initiatives on supporting flows of conservation finance and the demand of environmental credits.

Climate Change and Emissions Management Corporation – Alberta, Canada

The CCEMC was established in 2009 as a key part of Alberta’s climate change strategy and movement toward a stronger and more diverse lower-carbon economy. CCEMC’s mission is to establish or participate in funding initiatives that reduce GHG emissions or improve the ability to adapt to climate change.

In April 2007, Alberta became the first jurisdiction in North America to pass climate change legislation requiring large emitters to reduce greenhouse gas (GHG) emissions. Alberta’s target is to reduce emissions by 200 megatons or 50% below business as usual, by 2050. In doing so, Alberta sought to stimulate growth in green jobs and promote an economic transition to a low carbon economy.

Alberta’s Specified Gas Emitters regulation identifies that companies that emit more than 100,000 metric tons of carbon dioxide equivalent per year must reduce emissions intensity by 12% below their 2004-2005 baseline intensity. Organizations that are unable to meet their targets have three compliance options:

1. Improve the energy efficiency of their internal operations;
2. Buy carbon credits from other Alberta-based organizations; or
3. Pay \$15 into the Climate Change and Emissions Management Fund (that funds CCEMC) for every ton they exceed the allocated limit.

The \$15/ton collected does not go into general revenues but rather funds the discovery, development and deployment of low carbon initiatives and technologies. Since June 2010, CCEMC has funded 89 projects with investments of \$234 million that have a total project value of \$1.6 billion.

CCEMC considers funding projects at all levels of the innovation chain, from early stages to commercialization. Attracting the project developer and entrepreneur (pull strategy) and advancing technology and deployment (push strategy) is equally important in CCEMC’s strategy.

The CCEMC model is a great example of regulation creating a funding mechanism to drive investment into greenhouse gas reducing projects that foster low carbon innovation from inception to commercialization.

Pacific Carbon Trust, B.C., Canada

In 2007, the then-Premier Gordon Campbell garnered the support of academics and environmental NGOs for the passage of a carbon tax. The business community also lent its weight to the effort, but under the condition that it be “revenue-neutral”- the government would collect no additional revenue from it.

In a dedicated effort to stimulate investment in innovative carbon mitigation initiatives outside of the revenue-neutral tax provision, the Pacific Carbon Trust (PCT) was established. (PCT) was an innovative hybrid policy instrument developed by the British Columbia government, which blended a market mechanism with public investment and regulation as part of the government’s commitment to mitigate greenhouse gas emissions. The model was designed to help establish a local carbon offset



market as part of a larger framework that regulates carbon neutrality in the public sector to reduce GHG emissions while influencing cultural norms and behavior.

PCT charged British Columbia public sector organizations (PSOs) by the ton for their annual GHG emissions, calculated for their carbon equivalency. The current rate was \$25/ton, and was charged over and above the provincial carbon tax on fossil fuels. The money PCT collects from PSOs helps fund a variety of carbon offset projects across B.C. that include energy efficiency, fuel switching and carbon sequestration projects. Pacific Carbon Trust managed to offset close to a million tons of GHGs in 2010, the first year of its mandate. As a result, BC became the first senior government in North America to become carbon neutral.

In addition to the \$25 million dollars in seed money PCT received from the provincial government, the fees received from public sector organizations (PSOs) who are required to purchase offsets from PCT for their annual operating emissions contribute to its ongoing operational expenses. The organization has also achieved some success in helping stimulate the local green economy and position B.C. as a green innovation hub and a source of low carbon systems expertise.

PCT's effort delivered some wins for the province. An estimated 2,836 jobs have been supported through investments in offset projects: 1,638 direct jobs, 779 indirect jobs and 419 induced jobs over the five-year period. The PricewaterhouseCoopers (PwC) report *Economic Analysis of British Columbia Carbon Offset Projects* shows that 31 carbon offset projects in BC will have stimulated approximately \$317 million in capital spending between 2008 and 2012. Pacific Carbon Trust calculates that, on average, for every dollar spent by Pacific Carbon Trust to purchase offsets, another \$8 is spent in the private sector providing an argument for effective leverage. As of June 29, 2012, the projects have generated approximately 4.7 million tons of reductions.

Note that Pacific Carbon Trust has closed its doors. The new Climate Investment Branch in the Ministry of Environment's Climate Action Secretariat has now assumed the operations of PCT.

Green Credit Reserve - California

While the design intent of the Green Credit Reserve (AB2390) was to support the California's low carbon fuel standard (LCFS) and the federal Renewable Fuel Standard's RIN credits, it is an instructive model for making the case of supporting environmental credit markets. The bill was defeated in June of 2014, but it made the case that predictable revenues from both the State's LCFS and the federal Renewable Fuel Standard's (RFS) RIN credits are essential to develop sufficient low carbon and renewable fuels to meet California's needs. The same argument can be made to nurture and support an offset market in general.

The Green Credit reserve was intended to spur the in-state development and production of low carbon fuels. It would have done so by providing long-term certainty required to finance the infrastructure to produce low carbon and renewable fuels. Currently, the future value of fuel credits is highly uncertain. The Reserve was designed as a necessary mechanism to provide certainty for the future value of fuel credits that will be produced by a low carbon fuel project.

Financing is one of the biggest barriers to low carbon and renewable fuel development in California, and indeed in stimulating low carbon project development in general. The Reserve was designed to remove this barrier by providing a long-term and guaranteed revenue stream for projects that produce low carbon fuels, much like a Power Purchase Agreement provides for electricity generation projects.



Although the purchase price may turn out to be lower than the actual market price, it would have still have been guaranteed at the project development phase, which will enable project developers to secure financing.

The Reserve would have entered into long-term contracts to purchase low carbon fuel standard (LCFS) and federal RIN credits from developers, which will provide the developers with financial certainty about the long-term value of the LCFS and RIN credits, but the reserve would not actually have bought the credits until the fuel was produced. Once the Reserve purchased the credits, it could have held them or resold them to parties obligated to purchase LCFS and RIN credits or others.

In the long run, the Reserve was likely to have generated revenue for the State as the value of LCFS and RIN credits increased over time. Note that the Reserve was not a grant program, which imposes an ongoing cost to the state with no offsetting financial return. Nor was the Reserve a loan program, which runs the risk of losses from failed loans. Instead the Reserve would have simply entered into contracts to purchase credits, which are generated only when a low-carbon fuel is actually produced, at a guaranteed price. If the fuel was not produced in accordance with the terms of the contract, the Reserve was not obligated to expend funds. If, as expected, the value of the credit when the fuel was produced exceeds the contracted credit value, the Reserve would have generated revenue, which could be used to replenish the Reserve.

Unlike loan loss reserves or loan guarantee programs, the Green Credit Reserve was designed to provide a guaranteed market and a purchase price at the outset of a project's development sufficient to provide a known revenue stream in order to secure financing

The Reserve model could be applied to carbon reductions in the agricultural and forestry sectors where the USDA would essentially offer offset demand capacity, once the CEQ Guidelines are modified, to meet compliance under the EO.

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