Additionality in Agricultural Offset Protocols

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White Paper Goals: This White Paper is provided to initiate a discussion at C-AGG concerning additionality. A draft of the paper will be presented to C-AGG (Coalition on Agricultural Greenhouse Gases) for discussion at 02 & 03 November, 2011 meeting in Washington, DC. This is designed to be a living document to be discussed at the C-AGG sessions and to be revised by the C-AGG community on Collaborase, a web-based consultation platform.

Timeline: The first draft will be presented in Washington, DC meeting for discussion. After the C-AGG meeting, the C-AGG community (and others) will be invited to register for commenting and to continue discussion on Collaborase.

Collaborase: Comments/Issues/Concerns are welcome and can be provided by going to the URL (which will be provided after the initial discussion at the November meeting in Washington DC):

TABLE OF CONTENTS

1 Summary of Agriculture-Tuned Additionality

Established approaches to additionality focus on the connection of offset activity to motivations attributed to opportunities afforded by carbon markets. Further, the designers or interpreters of these established approaches provide support for adapting the determination process to meet specific circumstances, and even to provide simplified criteria through such adaptation.

The options described in this White Paper are intended to be true to established principles of additionality, but seek to adapt these principles to the particular circumstances of agricultural protocols and projects. Thus, the options identified by the White Paper reflect the view that aggregators or project developers are the agents of change who respond to market interventions, that technical agriculture experts and practitioners need to be included in designing tests to assess how agents of change overcome barriers to catalyze practice change and outcomes at meaningful scales, and that operationalizing these tests in the multi-faceted context of agriculture likely is best achieved through standardized approaches. These options can be summarized as follows:

- Approaches to additionality for agriculture should be based on whether protocols, as delivered by project developers with the infrastructure they build or integrate, serve as a catalyst to drive innovation needed to overcome barriers to adoption of practice change and successful outcomes.
- Additionality determinations for the agricultural sector should be accomplished by teams of experts, including meaningful participation by farmers and technical agricultural experts.
- Additionality tests for the agricultural sector should be standardized (embedded in protocols, rather than assessed on a project-by-project basis), including 'positive lists', standardized barriers tests, and performance benchmarks, etc.

2 Background

Climate change mitigation opportunities and outcomes, and incentives to promote or enhance adoption of these opportunities by the agricultural sector are a central focus of C-AGG. A C-AGG discussion of additionality, which is a key issue in offset protocol development, is particularly relevant now. The recent funding of greenhouse gas (GHG) offset pilot projects by the US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Conservation Innovation Grants (CIG) program has renewed attention to the challenge of identifying eligible agricultural participants to participate in offset protocols, and to related challenges, such as framing the message to engage eligible participants from the sector. It is hoped that this discussion may help to accelerate inclusion of agriculture offsets in GHG programs, by identifying barriers to participation – including those linked to additionality and how it is applied – as well as related barriers of infrastructure, risk and reward, and scale.

Innovative farmers have been adopting practices to advance sustainable intensification of agriculture for some years, often motivated by anticipated opportunities in carbon (and other environmental) markets. Delays in the adoption of regulatory or mandatory climate change policies internationally and nationally, and attendant delays in the inclusion of agriculture in voluntary and non-U.S. carbon markets, has created perverse influences on the adoption of GHG mitigation practices within the sector, and complicated the issue of additionality as applied to offset protocol development.

C-AGG seeks to "advance the development and adoption of science-based policies, methodologies, protocols, and projects for GHG emissions reductions and carbon sequestration within the agricultural sector." Inherent in these goals is an acknowledgment that careful attention is needed to adapt GHG accounting practices and offset policies, which were developed for applications not necessarily as challenging as biologically-based agro-ecosystems, to capture the potential for agricultural systems to

contribute to global climate change mitigation goals. A clear challenge to the scientific imperative to incentivize agricultural GHG mitigation at scale, is the fact that agricultural practitioners require technological, institutional, and financial assistance to cover the risks that can accompany changes in current practices. C-AGG seeks to articulate how agriculture-tuned additionality principles can contribute to wide-scale adoption of scientifically sound, outcome-based agricultural mitigation protocols to reduce atmospheric GHG.

3 Introduction

The discussion of additionality is central to the development of agricultural GHG reduction quantification protocols, and is crucial to effective engagement of potential participants in agricultural offsets projects. The premise of this White Paper is that additionality policy can be implemented to incentivize GHG reduction activity in agriculture with environmental integrity and at substantive scale.

The purpose of this discussion is not to argue that principles of additionality should be compromised for development of agricultural protocols or projects. Rather, the intent is (1) to point out the range of thinking and approaches concerning additionality principles, (2) to describe how the complexity of agricultural protocols and projects challenges the application of these principles, and requires adaptation for appropriate utilization within the agricultural sector, and (3) to articulate an adaptation of additionality principles with respect to agriculture protocols and projects. The objective is to build a rationale that the principle of additionality, as is well-argued in some of the referenced papers, is perhaps not best met by applying "typical" additionality approaches to the agricultural sector. And, the context of this objective is a shared outcome — agricultural mitigation of GHG at a scale that matters. In short, the goal is to seek to tune accepted principles of additionality for use in agriculture.

How is agriculture unique or different from other sectors? First, agriculture is different from the industrial or point-source or facility-based activity types for which additionality principles were developed and traditionally applied. Unlike these project types and sectors, agriculture activity is biological, highly dispersed and heterogeneous, and systems-based. Agriculture is exceptionally multi-faceted, meaning that agricultural solutions inherently involve multiple issues/multiple actions/multiple risks/multiple benefits. Thus, the nature of agriculture activity complicates the application of established additionality principles.

The acknowledgement of the special circumstance of agriculture is embedded in the preamble to the Kyoto Protocol:

> The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, **to ensure that food production is not threatened** and to enable economic development to proceed in a sustainable manner[1].

The Food and Agriculture Organizations' (FAO) definition of 'climate-smart' agriculture captures the multifaceted character of agriculture and recognizes that its GHG-related significance is embedded in a context with economic, environmental, and social dimensions:

[1] (http://unfccc.int/essential_background/convention/background/items/1353.php)

> Climate-smart agriculture sustainably increases productivity, resilience (adaptation), reduces/removes greenhouse gases (mitigation), and enhances achievement of national food security and development goals[2].

One way to articulate the need to tune principles of additionality in biological, dispersed, systems-based, and complex agricultural protocols and projects is as a 'challenge of confusion by co-effects'. That is, the multi-faceted character and context of agriculture activity makes it difficult to separate primary effects from co-effects – including the many beneficial co-effects -- and to identify how carbon market factors are motivating change to practices and outcomes effective for GHG mitigation. Speaking to offsets in general, the CORE (Carbon Offset Research and Education) website states:

> ... the carbon offset mechanism was originally conceived as a means to provide not only climate benefits but also co-benefits. As the word 'Development' in the Clean Development Mechanism indicates, ... , the original intention was that a CDM project would not only have carbon benefits but also development benefits.

And,

> there is often a trade-off between maximizing emission reductions and increasing sustainability benefits. Projects that work on the grass-roots level and involve local populations are often small-scale and require much continuous support, capacity-building and follow-up.[3]

Yet, in the particular case of agriculture offsets in North America (which also "are often small-scale and require much continuous support, capacity-building and follow-up"), the successful creation of co-benefits is sometimes understood as a threat to the additionality status of protocols and projects. The discussion in this white paper to tune established principles of additionality for agriculture involves, in part, proposing options to sort out the additionality for protocols and projects in this context of co-effects.

4 Overview of Additionality

At this initial stage of discussion, this White Paper has compiled some key materials concerning determination of additionality. The attempt here is to provide a sense of the breadth of interpretations of the established principles of additionality, and to cite support for the options proposed in the White Paper for tuning of these established principles for effective application to agricultural protocols and projects.

[Please note that, in this early draft of the White Paper, much of the material has been pasted directly from articles and websites. As this White Paper is further developed and revised by the C-AGG community, further editing will ensure that rules of proper citation are followed.]

4.1 Background

4.1.1 What is Additionality? – A Three-part series by Michael Gillenwater

Michael Gillenwater produced a series of discussion papers in February 2011 that provide a literature review and historical discussion concerning additionality. The overall aim of the papers is to *"more precisely define the terms 'additionality and 'baseline' in the context of environmental policy and propose a framework for applying these concepts within policies"*.

[2] (http://www.fao.org/climatechange/climatesmart/en/)
[3] (http://www.co2offsetresearch.org/consumer/cobenefits.html)

In the first paper, ***Part 1: A long standing problem***, Gillenwater addresses additionality and associated challenges in its application and provides a historical background and literature review. In this paper, Gillenwater argues that within GHG emission offset programs, the language used to discuss and define additionality and baseline is imprecise, varied and internally inconsistent. And, Gillenwater defines additionality and baseline as follows:

> Additionality occurs in cases in which a policy intervention actually causes an activity to take place and is determined by assessing whether a project activity is distinct from its baseline.
>
> A baseline is a prediction of amount of good or harm produced from the expected future behaviour of the entities proposing, and affected by, a proposed activity in the absence of one or more policy interventions, holding all other factors constant.

The second paper, ***Part 2: A framework for a more precise definition and standardized approaches***, presents a series of fundamental questions with respect to additionality and baselines that are critical to resolving offset policy design issues. This paper also explains why these definitions are contingent on the specification of a policy intervention and *"provides a conceptual framework for the development of standardized approaches that are founded on scientifically credible investigations."*

In Part 2, Gillenwater explores conceptual frameworks for discussing and defining additionality that can provide a generalized theoretical foundation for realistic offset policy implementation. However he notes that this approach requires upfront design and research investments unlike project-specific approaches which require little investment to set up but are costly for operators. Yet if offset programs are to achieve scale and greater cost-effectiveness, such investments in standardized approaches by program administrators are needed. "In the long-term, the success of offsets as a policy mechanism will likely depend upon a shift from this judicial approach to one that is akin to a regulatory standard setting that is based on causal inference investigations, evidence and carefully elicited expert judgement".

In this paper, Gillenwater points out one of the flaws many other authors have identified with respect to the Clean Development Mechanism (CDM). Historically, GHG offset programs, such as CDM, focus on assessing the intentions of each individual actor submitting a proposal. CDM determines additionality on a largely case-by-case basis, referred to as a project-specific approach. However, this approach has a high cost burden for project developers, investors and verifiers, and it is questionable as to whether it is scalable as the offset markets grow. In response, several authors have urged moving towards more objective metrics and the use of standardized approaches (Kartha and Lazarus 2002; Schneider 2007; OQI 2008; OQI 2009a; Hayashi, Müller et al. 2010). Gillenwater thus builds on these other authors to argue that adaptation is needed to improve the way additionality is addressed within CDM.

The third paper, ***Part 3: Implications for stacking and unbundling***, presents and analyzes specific options for how to apply the concept of additionality to activities that can potentially stack offset credits and suggests a practical way forward for policy makers.

4.1.2 The Concept of Additionality under the UNFCCC and the Kyoto Protocol: Implications for Environmental Integrity and Equity - by Charlotte Streck

Despite many attempts to define additionality, the concept continues to be poorly understood and its application contested. However, the desire to retain environmental integrity of GHG emission reductions has led to extensive elaboration of the application of additionality under the Kyoto Protocol's CDM. In this paper (in press) Streck argues that additionality should be established through clearly defined and objective requirements which will lead to more predictable outcomes than the current CDM additionality test and will strengthen the overall legitimacy of the mechanism.

According to the CDM Rule Book, "...a CDM project activity is additional, if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity (3/CMP.1, Annex, paragraph 43)." Although the UNFCCC and the Kyoto Protocol use additionality in different contexts, neither defines the term. The UNFCCC requires additionality of financial support for developing countries while the Kyoto Protocol adds the demand of additionality for the eligibility to offset emissions that fall under the target of developed countries. However, according to Streck, in both cases the requirement is hard to operationalize and thus CDM needs to establish clear criteria for additionality. This would not only address the insecurities that are associated with additionality testing but would also safeguard the environmental integrity of offsets. Moreover, the predictability would remove investment risk and channel more funds into emission reducing activities, thus providing a win-win for development and the global climate. To operationalize such clear criteria, Streck highlights the simplified approach used in the American Clean Energy and Security Act (ACESA) as follows:

– Are not required by or undertaken to comply with any law, including any regulation or consent order;
– were (generally) not commenced prior to January 1, 2009;
– are not receiving support of particular subsidies; and
– exceed the activity GHG baseline.

4.1.3 A Statistically-Driven Approach to Offset-Based GHG Additionality Determinations: What Can We Learn? - by: Mark Trexler, Derik Broekhoff and Laura Kosloff

At the root of all additionality tests is the search for the answer to the same questions: would a project have occurred regardless of the existence of drivers created by the trading system, or not? According to Trexler *et al.* (2006), in practice it has proven difficult for stakeholders to agree on what type of additionality test to apply due to the inherent pros and cons of each. Instead, Trexler *et al.* state that there is no one correct additionality test, in part because people disagree about how well different tests perform with respect to the underlying objective of the tests, i.e. judging whether the project would have happened in the absence of an offset crediting mechanism. "In the face of significant changes in market supply or demand, static additionality tests cannot effectively balance the policy objectives of acceptably small magnitudes of phantom reductions and the cost-effectiveness of the overall credit pool". However, Trexler *et al.* point to 'adaptable additionality' as the key to a successful GHG market instead of regimented approaches to additionality testing. Additionality can be operationalized if one recognizes and accepts that no test will ever be perfect, and then adapts the process accordingly.

4.1.4 Ensuring Offset Quality: Integrating High Quality GHG Offsets Into North American Cap-and-Trade Policy - The Offset Quality Initiative

The Offset Quality Initiative (OQI) addresses additionality in this 2006 paper from the perspective of maintaining offset quality. In it, OQI "support the development of cost-effective, robust, and flexible additionality assessment tools that provide a standardized, transparent and rigorous framework for the eligibility of offset projects". OQI recommends using a hybrid approach, which combines elements of both project-specific and standardized methodologies to balance the strengths and weaknesses of each. The advantages or disadvantages of this approach depend on the balance struck between the two assessment methods. Regulation should strive to integrate the transparency and consistency of standardized approaches, while capitalizing on the flexibility and adaptability of project-specific approaches. This hybrid approach potentially can strike the best balance between transparency and standardization, and may allow regulatory regimes to build on the existing groundwork that has been completed at all levels in this regards.

4.1.5 Multi-Project, Standardized Baselines and Beyond: Explaining a Key Issus in the Reform of the Clean Development Mechanism - The International Emissions Trading Association

The International Emissions Trading Association (IETA) stresses in this paper the need for a 'multi-project, standardized baseline'; where standardization refers to the adoption of generally accepted uniform procedures which enable objective comparison or judgment to simplify and add more predictability to decision making. For instance, in the CDM there can be standardized methods for:

- The establishment of additionality;
- The determination of baseline emissions of the project or program (i.e. the crediting baseline), and;
- The determination of actual project or program emissions after the project has been implemented in order to be able to request credit issuance.

Standardization provides numerous benefits to the CDM along a number of parameters, including:

- *Regional and Sectoral Distribution*: Lowering the high transaction of determining baselines, establishing additionality and determining emission reductions is fundamental to incentivizing the flow of investment dollars underrepresented in host countries;
- *Extensive Cost Reduction*: By reducing the cost of proving additionality, the use of benchmarks or positive lists directly affects the commercial viability of projects;
- *Greater Predictability*: For projects with relatively high profits, such as large projects in countries with good investment environment, the question of eligibility is less of a deterrent for investors;
- *Increased Simplicity and Accessibility*: Objectively establishing additionality and determining crediting baselines and project emissions through the use of standardized procedures and data sets will simplify the project developments so the CDM can be clearer and more accessible to potential stakeholders; and
- *Continuous GHG Improvements*: Including CDM projects into the benchmark calculation is not appropriate for all technologies, but in cases where it is, it will incentivize continuous GHG efficiency improvements.

However the IETA also states concerns and shortcomings of a standardized baseline approach, including: ensuring that standardized methods for additionality and crediting baseline determination do not lead to over-crediting; addressing the concern of conservativeness may rule out truly additional projects from eligibility; and the political difficulty of agreeing on positive lists.

4.1.6 Financing mitigation in smallholder agricultural systems: Issues and Opportunities – by Tanja Havemann , Climate Change Agriculture and Food Security (CCAFS)

Smallholder farmers are sensitive to agricultural risks due to lack of income, price volatility and changes to regulatory frameworks – for both agricultural products and carbon credits. And, many farmers rely on traditional coping methods to manage financial risk, including social networks, informal loans, contract farming and sharing liability amongst a group. Moreover, "risks could be exacerbated if the benefit associated with mitigation is only provided to the smallholder after credits are issued and if the smallholder has to bear upfront costs associated with developing a carbon credit project". However, according to Havemann, risk within a project should be transferred to the entity best able to control it, i.e., the project developer.

However, Havemannn emphasizes that correctly designed carbon finance could reduce some of the challenges that smallholders are facing by "providing revenue diversification tied to sustainable practices and by encouraging aggregation which could increase the accessibility of services and

products." Havemann states that the forms of carbon finance that target improvement of long-term productivity in tandem with increased mitigation are the most appropriate for smallholders. But it is necessary to design carbon finance to help bridge the financial gap until the project becomes economical. Although existing carbon finance approaches are exacerbated by existing agricultural finance barriers, "fit-for-purpose carbon finance for mitigation could help to overcome some existing barriers faced by smallholders. In designing fit-for-purpose carbon finance, emphasis must be on overcoming these fundamental, traditional barriers faced by smallholders and to financing sustainable agriculture in general, rather than on generating discrete units of mitigation." The concept of 'fit for purpose' emphasizes the notion that policy principles, such as additionality, must be adapted to be appropriate for agriculture.

4.1.7 Synthesis of Additionality Literature

Presuppositions concerning additionality thus range from definitions using objective criteria through to acknowledgement of the politicized nature of additionality, and with strong opinions in between. Some authors promote the adaptation of the process to operationalize the testing for additionality under specific circumstances, and others focus on really simplifying the process to a straightforward set of criteria. A consistent theme, however, is the ideal that additional activities are those initiated in response to the opportunity afforded by the carbon market, but that this ideal needs to be adapted for specific circumstances. This White Paper will describe elements of an approach to tune this core element for determination of additionality in agricultural protocols and projects.

4.2 GHG Program Criteria

4.2.1 Western Climate Initiative – Offset System Essential Elements Final Recommendations Paper

WCI defines a GHG offset as additional if the offset provided by the project activity would not have occurred in the absence of the offset program. "Because awarded offset compliance units allow a regulated entity to emit more than it otherwise would have been able to, the underlying offset project only provides a true emissions reduction benefit if the project would not have occurred absent the offset program – i.e., it is 'additional' to activities that would have otherwise occurred in the absence of the offset program."

WCI also uses proportional additionality as the channel to develop performance standards for sequestration projects in agriculture and forestry. "Proportional additionality models sector activity in aggregate across the WCI jurisdiction or region – the level of project activity that would occur absent the offset programs of WCI jurisdiction (i.e. baseline activity) and the level of aggregate project activity that is induced in response to the WCI offset program". Thus the portion of a projects emissions reductions or sequestration over the baseline is considered additional. Ultimately as practices become common, projects will be given a smaller portion of offset credit for these actions.

4.2.2 Pacific Carbon Trust – Guide to Determining Project Additionality

The Pacific Carbon Trust (PCT) uses the identification of barriers to project implementation in order to prove additionality. The PCT Emission Offset Standard defines additionality in terms of the baseline emissions against which a project's emission reduction are estimated, i.e., "...the baseline scenario will result in a conservative estimate of the GHG reduction to be achieved by the project considering...existing or proposed regulatory requirements, provincial or federal incentives...including tax incentives or grants...the financial implications of...action referred to in the baseline…any other factor...to justify the claim that the baseline scenario is likely to occur if the project is not carried out".

The PCT states that a project is additional if there is at least one barrier to the project that "must, partially, or entirely be overcome by the incentive of having the GHG emissions reduction recognized as an offset". PCT classify the potential barriers as investment, technological, social and other, but recognizes that these barriers are not necessarily additive because some of the factors that produce one barrier may be correlated to another barrier.

4.2.3 Climate Action Reserve – Options for Determining the 'Additionality' of Agriculture Projects

The Climate Action Reserve (CAR) is committed to using standardized methods for determining additionality, so that projects are evaluated according to verifiable criteria rather than subjective methods that try to access a project's individual circumstances. The additionality tests that CAR uses generally have 2 components: a Legal Requirement Test and a Performance Standard Test.

Legal Requirement Test: ensures that eligible projects would not have occurred anyway in order to comply with federal, state or local regulations, or other legally binding mandates.

Performance Standard Test: intended to screen out potentially non-additional projects. In developing performance standards, the Reserve considers financial, economic, social and technological drivers.

Although the Reserve follows the same approach for testing the additionality of agriculture projects as it does other project types the specifics of additionality tests differ for agriculture due to its complexity. In areas within agriculture where data is readily available, it is not always easy to identify conditions under which a particular practice should be considered additional. However CAR has 3 solutions to this problem:

1. Conservatively limit project eligibility: This solution avoids a significant risk of crediting non-additional projects, but also means the protocols are missing a significant opportunity to incentivize additional reductions.
2. Conduct additional research and data analysis: In some cases, it is possible to identify distinguishing features that would allow a protocol to differentiate between business as usual projects and those that would be additional. However, identifying such features may not always be possible, and the additional analysis required can be time consuming.
3. Rely on aggregation and discounting: Discount the amount of credit received by each project according to the general level of common practice. However, this approach only works with full participation by a particular sector.

4.2.4 Verified Carbon Standard - Proposal for Inclusion of Standardized Methods & Voluntary Carbon Standard 2007.1

Under the Verified Carbon Standard (VCS) all projects must meet the additionality requirements set out in the methodology that the project uses. VCS defines standardized methods as "*methodological approaches that standardize the determination of additionality and/or the crediting baseline for a given class of project activity, with the objective of streamlining the development and assessment process for individual projects.*"

VCS has defined 2 standardized methods:

1. Performance Methods: establish performance benchmark metrics for determining additionality and/or crediting the baseline. Projects that meet or exceed a pre-determined level of the metric may be deemed as additional and a pre-determined level of the metric may serve as the crediting baseline.
2. Activity Methods: pre-determine additionality for given classes of project activities using a positive list. Projects that then implement activities on the positive list are deemed additional

and therefore do not need to otherwise demonstrate additionality. One of three options is used to qualify the project activity for a positive list: activity penetration, financial viability or revenue streams.

In addition to using a VCS approved methodology, the project must also demonstrate that the project is additional using one of the following tests:

Test 1 - The Project Test:

- Regulatory Surplus - "The project shall not be mandated by any enforced law, statue or other regulatory framework"
- Implementation Barriers - "The project shall face one (or more) distinct barrier(s) compared with barriers faced by alternative projects" (Investment, Technological and/or Institutional)
- Common Practice - "Project type shall not be common practice in a sector/region, compared with projects that have received no carbon finance, and if it is common practice, the project proponents shall identify barriers faced compared with existing projects".

Test 2 - Performance Test:

- Regulatory Surplus - *(see above)*
- Performance Standard - "Emissions generated per unit output shall be below the level that has been approved by the VCS Program for the product, service or industry, as the level defined to ensure that the project is not business-as-usual".

Test 3 - Technology Test:

- Regulatory Surplus - (see above)
- Technology Additionality - "The project and its location are contained in the list of project types and applicable areas approved as being additional by the VCS program. These project types are defined as those in which all projects would be deemed additional using the Additionality Test 1 and will be determined on a case by case basis".

5 Additionality in Agricultural Projects and Protocols

A number of GHG programs and government initiatives have made agricultural protocols a key element of their offsets systems.

5.1 General Guidance from GHG Programs which have incorporated agricultural offset protocols or projects

A number of GHG programs have approved agricultural protocols and projects as a major element of their GHG reduction strategy.

5.1.1 Alberta Offsets System

The Alberta Offset System defines additionality as “the ability to quantify emissions reductions that are beyond business as usual activities and regulatory requirements”. According to the Alberta requirements, projects need to demonstrate they meet the protocol conditions and that they result from actions taken on or after January 1, 2002. Activities that are already covered under the Specified Gas Emitters Regulations or any other federal and/or provincial regulatory obligations are NOT eligible to generate offsets under the Alberta offset system. All offsets must occur in the province of Alberta and project proponents must clearly establish ownership of the GHG emission reductions achieved in the proposed project. Lastly, the quantification or reductions achieved by the project must be based on actual measurement and monitoring, except where indicated in the protocol.

Some details of the additionality approach of the Alberta Offsets System are of particular relevance to agricultural protocols. First, the Tillage System Management Protocol (under revision to become the Conservation Cropping Protocol) does not require farm-specific baselines, although most of the other agricultural protocols require three years of farm-specific data to determine the baseline. Second, the Tillage protocol uses proportional additionality to discount sequestration coefficients in proportion to the adoption rate of prescribed practices to generate offsets only from 'go-forward carbon'. Finally, Alberta Environment uses 40% as the upper limit of adoption rate of a practice to qualify as additional.

5.1.2 American Carbon Registry

To establish that a project is additional in the American Carbon Registry (ACR), "a project developer must demonstrate that the presence of carbon markets and potential revenue from the sales of emissions reductions were deciding factors for project implementation." This proof of additionality is applied in the ACR Standard v2.1 October 2010 as:

ACR requires every project:

- Either to exceed an approved performance standard, as defined in the applicable methodology, and a regulatory additionality test;
- Or to pass a three-prong test of additionality as described below.

Only one of the above approaches is required.

General requirements for all projects include a start date of January 1, 2002 or later (excluding forestry projects).

The three-prong additionality test requires a project to be surplus to regulatory requirements and to be innovative (i.e. not widely adopted). If the first two tests are passed, the project is submitted to a barriers test including technological, institutional, and financial elements. If the project is surplus to regulation, and innovative, and has at least one of the identified barriers, it is deemed additional.

Alternatively, the project can be determined to be additional if it meets a performance standard as follows:

In lieu of the three-prong test for demonstrating project-level additionality, ACR also recognizes the "performance standard" approach in which additionality is demonstrated by showing that a proposed project activity is (1) surplus to regulations, and (2) exceeds a performance standard as defined in an approved methodology. Project Proponents must first establish regulatory additionality per the requirements in section A.1 of this (ACR's) chapter. Second, under the performance standard approach projects are required to achieve a level of performance that, with respect to emission reductions or removals, or technologies or practices, is significantly better than average compared with similar recently undertaken practices or activities in a relevant geographic area. The performance threshold may be:

- Practice-based: developed by evaluating the adoption rates or penetration levels of a particular practice within a relevant industry, sector or subsector; if these levels are sufficiently low that it is determined the project activity is not common practice, then the project activity is considered additional.
- Technology standard: installation of a particular GHG-reducing technology may be determined to be sufficiently uncommon that simply installing the technology is considered additional.
- Emissions rate or benchmark (e.g., tonnes of CO_2e emission per unit of output): with examination of sufficient data to assign an emission rate that characterizes the industry,

sector, subsector, or typical land management regime, the net GHG emissions/removals associated with the project activity, in excess of this benchmark, may be considered additional and credited.

5.1.3 Australian Carbon Farming Initiative

The Australian Carbon Farming Initiative seeks to promote sustainability and resilience in the agricultural and forestry sectors by creating carbon credit for genuine carbon abatement activities. The initiative has proposed to test additionality in two ways; on a case-by-case basis by reference to a yet-to-be-developed baseline; and by reference to a list under which activities would be deemed to be additional without further assessment. This would include activities which achieve abatement and clearly do not result in material increases in agricultural productivity or business profitability. Activities that could be included on this list could include not-for harvest, carbon sink forests, on-farm tree planting or capture and flaring of methane from livestock manure or landfill facilities. This appears to be based on the assumption that if a project increases productivity then it would have been undertaken in any event.

5.1.4 US Department of Agriculture

The US Department of Agriculture (USDA) does not constitute a GHG program. But, because the Office of Climate Change and the Office of Environmental Markets are active, and because USDA is supporting market development by refining quantification methods and by funding pilot projects, USDA is included as a GHG program for discussion purposes in this White Paper.

As yet, USDA has not announced formal policies for determining additionality of agricultural protocols and projects. Thus, for purposes of this paper and the discussion, the approach prescribed in failed cap and trade legislation, and in some USDA activities and publications are cited, since they may offer clues to the direction of any future policy approaches.

The most recent versions of cap and trade legislation considered by the U.S. Congress (the American Clean Energy and Security Act of 2009, and the Clean Energy Jobs and American Power Act) each contained a type of positive list of project activities eligible for agricultural offsets. The Stabenow-Baucus Amendment also contained a list of agricultural offsets for consideration. One version of this list follows:

‘‘(G) agricultural, grassland, and rangeland sequestration and management practices, including—

- ‘‘(i) altered tillage practices, including avoided abandonment of such practices;
- ‘‘(ii) winter cover cropping, continuous cropping, and other means to increase biomass returned to soil in lieu of planting followed by fallowing;
- ‘‘(iii) reduction of nitrogen fertilizer use or increase in nitrogen use efficiency;
- ‘‘(iv) reduction in the frequency and duration of flooding of rice paddies;
- ‘‘(v) reduction in carbon emissions from organic soils;
- ‘‘(vi) reduction in greenhouse gas emissions from manure and effluent;
- ‘‘(vii) reduction in greenhouse gas emissions due to changes in animal management practices, including dietary modifications;
- ‘‘(viii) planting and cultivation of permanent tree crops;
- ‘‘(ix) greenhouse gas emission reductions from improvements and upgrades to mobile or stationary equipment (including engines);
- ‘‘(x) practices to reduce and eliminate soil tillage;
- ‘‘(xi) reductions in greenhouse gas emissions through restoration of wetlands, forestland, and grassland; and

- ‘‘(xii) sequestration of greenhouse gases through management of tree crops;

The Senate version further stated (Section 734):

> ‘‘(a) METHODOLOGIES.—As part of the regulations promulgated under section 732(a), the President shall establish, for each type of offset project listed as eligible under section 733, the following:
>
> ‘‘(1) ADDITIONALITY.—A standardized methodology for determining the additionality of greenhouse gas emission reductions or avoidance, or greenhouse gas sequestration, achieved by an offset project of that type. Such methodology shall ensure, at a minimum, that any greenhouse gas emission reduction or avoidance, or any greenhouse gas sequestration, is considered additional only to the extent that it results from activities that —
>
> ‘‘(A) are not required by or undertaken to comply with any law, including any regulation or consent order;
>
> ‘‘(B) were not commenced prior to January 1, 2009, except in the case of —
>
> - ‘‘(i) offset project activities that commenced after January 1, 2001, and were registered as of the date of enactment of this title under an offset program with respect to which the President has made an affirmative determination under section 740(a)(2); or
> - ‘‘(ii) activities that are readily reversible, with respect to which the President may set an alternative earlier date under this subparagraph that is not earlier than January 1, 2001, where the President determines that setting such an alternative date may produce an environmental benefit by removing an incentive to cease and then reinitiate activities that began prior to January 1, 2009;
>
> ‘‘(C) are not receiving support under section 323 of division A, or section 207 of division B, of the Clean Energy Jobs and American Power Act; and
>
> ‘‘(D) exceed the activity baseline established under paragraph (2).
>
> ‘‘(2) ACTIVITY BASELINES.—A standardized methodology for establishing activity baselines for offset projects of that type. The President shall set activity baselines to reflect a conservative estimate of business-as-usual performance or practices for the relevant type of activity such that the baseline provides an adequate margin of safety to ensure the environmental integrity of offsets calculated in reference to such baseline.”

While these legislative options cannot be assumed to be fully aligned with current and future USDA policy, for the purposes of this discussion it is reasonable to predict that USDA will consider a positive list approach as part of a future policy for agricultural and forestry offsets.

With respect to stacking of ecosystem payments, The Office of Environmental Markets is engaged in pilot projects which combine GHG reductions and water quality credits. Further, a report from USDA (LaRocco and Deal 2011) states:

> “...services payments can promote the integration of multiple ecological values, the concepts of bundling and stacking ecosystem providing a more holistic view of natural systems and greater ecological benefits than a single-program or market approach.”

And,

> “Payments focused on ecosystem services potentially provide promising opportunities for landowners, particularly if landowners can access or stack multiple sources of revenue. If correctly implemented, bundling or stacking policies could promote landscape-scale conservation and help move financial incentives toward a more holistic approach of protecting ecosystems.”

Based on these documents, it seems reasonable to predict that USDA may seek to allow stacking of ecosystem payments.

If USDA were to choose to allow stacking of ecosystem payments, some analysis of such policy has already been outlined. For example, Dooley and Olander (2011) conclude:

> "Although current policy is largely silent with regard to stacking, the potential risks are known and can be addressed by clarifying policies for double counting, by carefully considering nonpoint source impacts in stacked trades until coverage of nonpoint sources is more complete, and by applying additionality tests where required. Where bilateral trades are the norm, acceptable metrics are needed to track ecosystem services impacts and offsets in order to avoid net environmental loss. Stacking can provide many benefits to the environment and to landowners, but good policy will be required to prevent possible negative outcomes."

This initial analysis appears to support the conclusion that stacking of ecosystems payments can be accommodated without compromising additionality of agricultural protocols and projects.

5.2 Tuning Additionality Determinations for Agriculture

The concept of agriculture-tuned additionality stresses the importance of conformance to the principle of additionality, but also emphasizes the fact that agriculture is different from other sectors. Because agriculture is heterogeneous and carried out in a multitude of dispersed enterprises, it does not lend itself to regulatory approaches to GHG mitigation. At the same time, because agricultural activity is so widespread, because mitigation and adaption are so closely interconnected, and because food security is a fundamental issue of social equity, effective policies to incentivize voluntary mitigation of agricultural GHGs is of crucial concern for policymakers.

5.2.1 Additionality Based on Expert Assessment

An approach common to GHG programs is to internally decide how to address additionality. In most cases, these programs request information from subject-matter experts regarding state of science, common practice, and quantification of GHGs associated with practice change. However, the types of information requested and received, the weight given to different elements of information, and the policy framework within which the weighted information is considered vary by program. Also, program personnel are typically experts in GHG accounting and policy, and so are essential members of the team of experts needed to assess additionality. But, these program experts are not necessarily experts in the biogeochemical processes which govern GHG emissions from agricultural systems, or in the management practices which can be used to mitigate these emissions. Further, the program experts may have little exposure to the barriers to practice change on modern farms. For these reasons, it is important for agricultural experts, technicians, and practitioners to play a more substantive role in the development of additionality tests and determinations for agricultural protocols and projects.

The development of protocols for N_2O reduction through nutrient management within the agricultural sector can provide illustrations to the need to involve agricultural experts in determining additionality.

Experts, technicians and practitioners in agricultural science understand that nitrogen management cannot be addressed as stand-alone practices. Because nutrients work in concert (and a single nutrient can create limitations for others, for instance), practices for nitrogen management should be implemented as part of a comprehensive plan to manage all nutrients. Science-based nitrogen management, which is economically and technically feasible, integrates a suite of beneficial management practices (BMPs). For instance, the 4R-conformant (Right Source, Right Rate, Right Time, and Right Place) plan helps to provide balanced crop nutrition to enhance yields and to maintain quality

of soil and water. Further, such plans needs to be designed and implemented under the guidance of individuals (i.e. farmers or farmers with professional advisors) who have the expertise to determine which suite of BMPs is appropriate for cropping systems in a specific region. The BMPs selected are important, but the key to N_2O mitigation, and to nitrogen use efficiency, is the development of farm-specific and crop-specific strategies. For agriculture experts, key questions concerning additionality of nutrient management are:

- how does current practice of nutrient management compare to the comprehensive BMP, 4R, or nutrient management plan needed to minimize N_2O emissions? And/or
- what proportion of cropland is managed according to BMP, 4R-conformant, or nutrient management plans?

If such questions are asked, evidence consistently supports that few farmers are fulfilling such comprehensive requirements for nutrient management. For example, Ribaudo *et al* (2011) conclude that more than 70% of corn grown in the Midwest is not applied in accordance with correct rate, correct timing, and correct method.

In contrast, some GHG programs have tended to focus on individual activities or practices with potential N_2O mitigation efficacy. These activities or practices can contribute to nutrient management, but in isolation do not constitute nutrient management. So, GHG program efforts to determine additionality commonly ask questions which do not fully address nutrient management, such as:

- what proportion of cropland receives a nitrogen fertilizer rate based on economic return, rather than according to a regional target yield? or
- what is the benchmark application rate of nitrogen fertilizer? or
- how commonly do farmers use cover crops or nitrification inhibitors or controlled-release forms of nitrogen fertilizer ?

Asking these questions does not consistently result in evidence to support additionality. That is, the majority of farmers implement one or more individual practices related to increasing nitrogen use efficiency. For example, Ribaudo *et al* (2011) conclude that about 68% of crops met the criterion for proper rate of nitrogen addition.

The questions asked clearly influence the resulting programmatic decisions concerning additionality. Thus, the inclusion of agricultural experts, technicians and practitioners in framing the determination of additionality can increase the likelihood that agricultural protocols and projects can be shown to comply with additionality tests.

Further, and for the same reasons, agricultural experts, technicians and practitioners should be involved as well in assessments of the barriers that prevent the adoption of comprehensive nutrient management plans. With the aid of agricultural experts, technicians, and practitioners, it is much more likely that barriers tests can be designed to appropriately assess the additionality of agricultural protocols and projects.

5.2.2 Additionality Based on Support of Practice Change

As alluded above, an important element of determining additionality is to apply barriers tests. Some GHG programs are increasing emphasis on such tests, as indicated by the detailed instructions in the revised standards VCS is developing for the application of these tests. Although such tests are instructive, they can be difficult to apply and/or to interpret. Particularly in agriculture, where the complexity of the systems to be managed is matched by the multiplicity of factors influencing the decisions of the farmers managing them, it can be exceedingly difficult to determine what barriers exist to prevent farmers from adopting specified practices. For agricultural protocols and projects, it may be

useful to test for the barriers preventing implementation of GHG mitigation practices in concert with consideration of the supportive infrastructure needed to effect adoption of these practices.

Trexler *et al.* (2006) define offsets as follows:

> "Emissions trading systems are premised on capping overall emissions from a certain set of sources at an absolute level. An "offset credit" allows emissions from these capped sources to increase with the understanding that this increase is "offset" by a reduction from a source whose emissions are not capped, leaving net emissions unchanged."

Thus, an offset protocol or project assures environmental integrity of the capped sector by ensuring the activity undertaken in the non-capped sector results in actual reductions. Compared to non-agricultural or point-source GHG reduction protocols and projects, it is difficult in agricultural protocols and projects to effect management changes in a "one-size-fits-all" approach in a manner that ensures the success of mitigation in the non-capped sector at a meaningful scale. Expert-based technical support (such as extension-based experts) would greatly enhance the transfer and potential adoption of these protocols and projects. In terms of standard principles of additionality, when asking whether or not an agricultural protocol or project is additional, a key test or criteria may be to identify the level of supportive infrastructure or technical support needed to overcome barriers identified through additionality tests.

By specifying the means of implementing the changes in practices and outcomes necessary for meaningful GHG mitigation in agriculture (the non-capped sector addressed in this white paper, we can effectively address one of the greatest challenges for the sector. This difficulty for agriculture protocols and projects relative to non-agricultural or point-source activity can be illustrated by comparing N_2O reduction from a nitric acid production facility with N_2O reduction from management of nutrients on agricultural land. In application of N_2O reduction activity at a nitric acid facility, existing facility personnel, who already work in a highly regulated situation, will have training in engineering and instrumentation through longstanding infrastructure to support operation of industrial facilities. So, achieving the protocol-prescribed activity (installing the catalyst and calibrating/monitoring the emissions monitoring system) is a relatively straight-forward extension of their existing duties and expertise. To achieve N_2O mitigation on cropland, however, farmers and their advisors will need to adopt an innovative nutrient management strategy as described above. The proper support infrastructure is needed to help farmers and their advisors to implement correctly the generic beneficial management practices (BMPs), but also to provide guidance as they combine these into a farm-specific plan. As conventional support from USDA-NRCS extension is eroding, new kinds of support from other sources of infrastructure are needed. Such infrastructure is only beginning to emerge, and accessing this emerging infrastructure is not habitual for farmers. The lack of, or limited access to, such infrastructure can indeed constitute a barrier to adoption. And, agricultural protocols, and the projects which implement them, may meet a criterion of additionality if they demonstrate they provide infrastructure to overcome this barrier and to effect practice change.

5.2.3 Additionality Based on Project Developers as the "Agents of Change"

Almost universally, definition of additionality includes a requirement for practice change to be adopted in response to the opportunity to sell offsets. That is, there is a requirement for the 'agent of change' to be motivated by the intervention of the carbon market. An issue from the perspective of ensuring additionality of agriculture protocols and projects is identifying who is the agent of change.

If farmers are considered the agent of change, it may be difficult to demonstrate that practice change has resulted in response to the carbon market. Particularly in the U.S., it has been demonstrated that it is generally difficult to engage farmers in discussions of GHG mitigation and carbon trading, regardless of

potential incentives. That is, farmers are not likely to respond to GHG-related interventions unless they are in the form of regulations (or pseudo-regulation such as value chain or supply chain restrictions). Anecdotally, at least, this has been reported by representatives of the CIG GHG grants who have identified producer recruitment and engagements as an early challenge. Second, the potential financial benefits of offsets on a per-acre or per-farm entity scale is relatively minor compared to the large input and investment costs required to operate a farm, on an annual basis. Additionally, the few dollars per acre potentially available from participation in offset projects are insignificant relative to land prices (Figure 1) and crop budgets (Figure 2). So the financial incentives related to currently available offset prices are not enough to create demand and change within the sector.

Figure 1: AgriNews Online — 29 September 2011

> According to a report released recently by the U.S. Department of Agriculture, the price of Illinois farmland averaged $5,800 per acre in 2011, an increase of 18 percent over the 2010 level of $4,900.
>
> "The 2011 increase continues a string of large increases that began in 2004," said University of Illinois agricultural economist and farm management specialist Gary Schnitkey. "Since 2004, Illinois farmland prices have increased by 222 percent. Or, another way of putting it, farmland is 2.2 times higher in 2011 than in 2004.
>
> "The last seven-year period in which land prices increased an equivalent amount was from 1975 through 1981. During this period, Illinois farmland increased from $846 per acre in 1975 to $2,188 per acre in 1981, resulting in farmland prices being 2.6 times higher in 1981 than in 1975."

Figure 2. Crop budget published by University of Illinois. The displayed budget does not include costs related to power (fuel, equipment, depreciation, etc.), overhead (hired labour, buildings, insurance, etc.), and land (rental, purchase, interest, etc.).

FARM BUSINESS MANAGEMENT

Crop Budgets
Northern Illinois
University of Illinois
Grain Farm Returns and Costs

2011 Crop Budgets, Northern Illinois

	Corn-after-Soybeans	Corn-after-Corn	Soybeans-after-Corn	Soybeans-after-Two Years-Corn	Wheat
Yield per acre	188	178	53	55	75
Price per bu	$5.50	$5.50	$13.40	$13.40	$6.50
LDP per bu	0.00	0.00	0.00	0.00	0.00
Crop revenue	$1,034	$979	$710	$737	$488
ACRE and LDP revenue	0	0	0	0	0
Other gov't payments	23	23	23	23	23
Crop insurance proceeds	0	0	0	0	0
Gross revenue	**$1,057**	**$1,002**	**$733**	**$760**	**$511**
Fertilizers	$145	$155	$52	$52	$106
Pesticides	45	51	28	28	13
Seed	100	100	55	55	42
Drying	17	16	2	2	1
Storage	6	6	2	2	1
Crop insurance	19	19	13	13	5
Total direct costs	**$332**	**$347**	**$152**	**$152**	**$168**

The sample budget above for Illinois cropping systems illustrates how payments for offsets (perhaps $2 per acre for N_2O reduction offsets?) would be 'lost' in the overall context of a general farm budget. Further, stacking of payments such as from EQIP management contracts (average payment of $8.88 in 2008 for nutrient management) (Ribaudo *et al.* 2011) on top of offsets still are not likely sufficient to attract farmers' participation.

If developers (or aggregators) of agricultural offsets projects are considered the agent of change, however, change clearly can be motivated by the prospect of revenues from the carbon market. And, aggregators, and the technical experts and professional farm advisors they engage, can be key providers of supportive infrastructure to farms participating in agriculture protocol projects (as we will see in more detail in the Case Study section below). Further, because of the small number of offsets expected per farm, it is unlikely agricultural projects could be accomplished without the aggregation services of project developers. When applied to the motivations and contributions of developers, agriculture protocols and projects meet the accepted principles of additionality.

5.2.4 Additionality Based on a Standardized Approach

The use of standardized approaches to determine additionality is common in GHG programs, and market participants (such as IETA) often promote the efficacy of standardized approaches. With the current effort to integrate standardized approaches into the VCS standard, and with the continued emphasis by CAR on performance standards, there seems to be growing momentum for such approaches. Indeed, it may be that standardized approaches soon may emerge as a 'best' practice for determination of additionality.

The use of standardized approaches for determination of additionality resonates with the effort to tune to agriculture the interpretation of established principles of additionality. As described in this White Paper, project-specific determinations of additionality for agricultural projects are likely to remain as resource-intensive approaches that are difficult to "prove". As shown by the analysis in this White

Paper, the use of standardized approaches, such as positive lists (based on assessments of barriers or level of adoption) or performance benchmarks are preferable for the agricultural sector.

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