Primer:

Carbon Credit Markets in Alberta, Canada and North America - Where are we at?

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Introduction

Global trade in carbon is a growing business. According to the World Bank, international carbon sales quadrupled in 2006 to over $25B USD[1]. In North America, a patchwork quilt of voluntary and regulated carbon markets is emerging, causing a lot of confusion for buyers and sellers as to 'what counts' in these developing markets. Several companies in Alberta, called aggregators, are aggressively pursuing contracts with farmers and ranchers to secure carbon credits for sale into these markets. This Primer is designed to clarify the state of markets in Alberta, Canada and abroad.

The National Scene

In Canada, there's been a lot of signalling but limited concrete action towards establishing a country-wide **compliance-based** carbon market (also known as Carbon Offset market). Without clearly established rules that (a) set targets for companies to reduce their GHG emissions – establishing a demand for carbon; and (b) set standards for the supply side (i.e. what counts and how many tonnes of carbon can be reduced from an activity), most sales tend to be speculative and occur at the margins. With federal politics being what they are, we can't be sure when a national Offset System will be in place.

Carbon Offset *– A reduction in GHG emissions from a PROJECT that features a new management practice, technology and/or control system, often referred to as 'carbon credits'*

Offset System *– Provides a framework to allow a market for the supply and demand of project-based carbon offsets to be created, bought and sold.*

The Provincial Scene

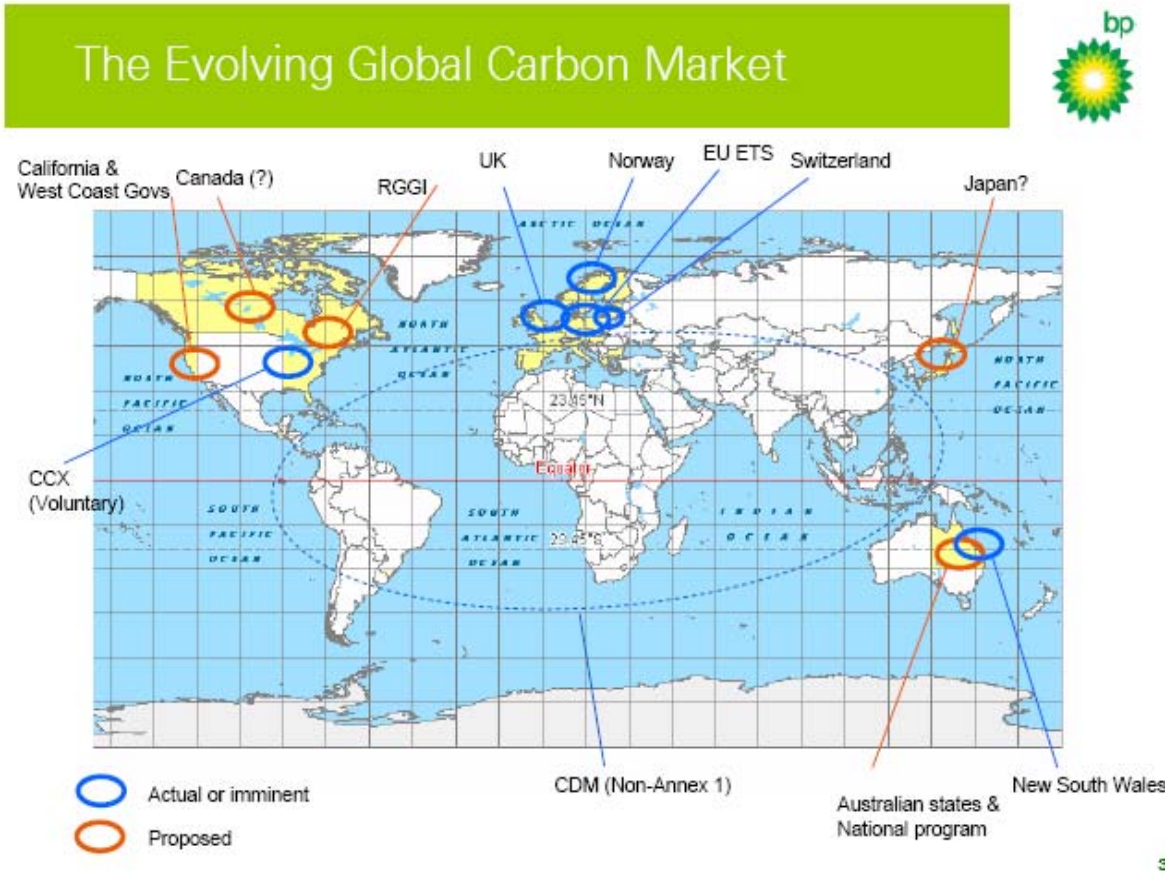
At the Provincial level – at least 5 provinces have signalled their intentions to move forward with regulatory frameworks for Greenhouse Gases. In the lead is the province of Alberta, with Greenhouse Gas regulations set to be in place by July 1, 2007. Alberta rules will allow regulated companies to purchase offsets ***created only in Alberta*** to meet their targets, enabling a *compliance-based* carbon offset market in this province. The intent is to keep investment in Carbon Offset projects within the province, creating more benefits for Albertans from improved stewardship of our resources. More on the Alberta Carbon market later.

[1] these represent sales that can be tracked through regulated markets in Europe and internationally - many trades occur outside these markets and are not captured in these numbers.

The North American Situation

In the US, a similar situation is arising. There are a number of smaller, regional markets developing, without any clear national system to knit them together. One of these markets is a **voluntary-based market** (Chicago Climate Exchange or CCX) which has a set of rules that are flexible to encourage participation by a wide variety of projects. Aggregators for the CCX are active in the prairie provinces and given the different set of rules required by this voluntary market – confusion reigns. Figure 1 shows the state of Carbon markets in North America and the world.

Figure 1. Status of the Global Carbon Market.[2]



A 'Head's Up for Buyers and Sellers in Alberta

Just like in any other market, buyers and sellers need to have a bit of 'market intelligence' to understand what the market will support, and whether it's worthwhile to engage in market activity at this time. And, since these markets tend to be created and defined around an intangible environmental commodity – something relatively recent in North America – confidence in the 'currency or commodity' along with transparency and price discovery are underdeveloped.

[2] Courtesy of British Petroleum, North American Carbon Market conference, Point Carbon, January 17-19, 2007; Washington, DC. RGGI – Regional Greenhouse Gas Initiative; CDM – Clean Development Mechanism, the Kyoto rules that facilitate the International Carbon Market; EU ETS – European Emissions Trading System. Note – the EU ETS does not allow carbon offset credits – only government-issued allowances.

Making business decisions as to which market, when and the extent of engagement can be exceedingly difficult. Producers must weigh the risk of participating in these initiatives now, where opportunities exist, versus waiting to see how opportunities unfold in the very near future.

Compliance Vs. Voluntary-Based Markets

Rules and requirements differ depending on whether a market is **compliance-based** (GHG regulated) or **voluntary,** (usually involving a group of firms who take on voluntary commitments to reduce GHGs). In a regulatory context, the government typically provides some structure to the market – setting the targets (demand) and providing standards to ensure offset credits meet compliance quality (they're real, measurable and quantifiable and incremental(supply)). In this context, the regulated companies want to be sure what they are buying will meet their compliance obligations set out by governments. And, if a country has signed on to Kyoto, governments need to consider how these domestic compliance credits will mesh with our international obligations for Greenhouse Gas reduction[3].

Table 1. Common Characteristics of Voluntary and Compliance-Based Markets

Characteristic	**Voluntary-Based**	**Compliance-Based**
Demand	Set by interested trading firms for a variety of reasons: • Corporate Social Responsibility • Public relations • Learning about markets • Carbon Neutral objectives	Set by Government regulations through compliance targets
Price	Relatively lower due to voluntary demand, thin markets and confidence of the market	Relatively higher; demand is mandatory; High Standards/confidence in Credits
Rules for Credit Supply	Decided by trading firms; science review/scrutiny may be limited	Overseen by government to fit compliance criteria for regulations; strong, consensus science base to ensure integrity of the system.
Transaction costs	Tend to be lower; emphasis on learning.	Higher; Can be minimized by supply standards and government policy
Aggregation	Still needed to minimize risk and reduce transaction costs	Still needed to minimize risk and reduce transaction costs
Verification	May be 3rd party;	Essential to have 3rd party audits
Practice Change	May or may not be required	Essential to have baseline and practice change to satisfy additionality criteria
System Integrity	Emphasis on learning; getting started; more flexible in rules	Emphasis on compliance; considers international rules/targets
Liability	Addressed through bilateral contracts	Rules in place; government policies will dictate how reversible carbon (soil and forestry sinks) need to be managed

[3] Canada ratified the Kyoto Accord in December 2002, legally committing the country to reduce its GHG emissions to 6% below 1990 levels by 2012.

At least 5 markets currently exist or are under development in North America, and the Chicago Climate Exchange is the only market at this stage that will accept outside credits:

- **California Climate Change Action Registry** - has very recently signed legislation that requires the reduction of GHG emissions by law; Offset market being formed – supply standards being developed. Now includes over 10 Western and Mid Western States.
- **Performance-Based Electricity Standards** - Seattle (voluntary) and Oregon (compliance-based).
- **Regional Greenhouse Gas Initiative (RGGI)** – a compliance-based market involving a coalition of 10-US Northeast and mid-Atlantic states to tackle and reduce CO_2-emissions created in the region. Still under development.
- **Chicago Climate Exchange** - a voluntary emissions trading floor where companies who are seeking to learn about the market and/or reduce their long-term risk in a carbon constrained future, can get a head start on emissions reductions.
- **Alberta Carbon Offset market –** the first province to bring in Regulations in Canada; the rules for the market are:
    - Projects must start after January 1, 2002 (credits can be claimed back to 2002 onwards);
    - Reductions must be real, demonstrable, quantifiable (using accepted science), and verified by a qualified third party;
    - Reductions must have clearly established ownership (e.g. do they belong to the seller or the firm that provided the new technology?);
    - From an action not otherwise required by law
    - From an action undertaken in Alberta
    - Reductions can only be counted once for compliance purposes;

The Alberta Carbon Market –Compliance-Based

It's important to know from the outset that any project-based carbon offset market, whether voluntary or compliance-based, involves a number of steps to deliver saleable offsets to market:

1. ***Demonstrate*** best available science has been used to quantify the tonnes of GHGs reduced by a practice change or new technology (fits the 'real' and quantifiable rules for the market);
2. ***Ensure*** the project is eligible under the particular market - guidance or market standards are typically issued by the government or program administrator;
3. ***Implement*** the project by changing practices or installing the technology; data and information management are key for reporting activity and enabling verification;
4. ***Verify*** GHG reductions achieved by the project – usually requires hiring third party auditors to give buyers confidence in the stated reductions;

Challenges for Ag-Sector Carbon Offset Projects*

1. *GHG management is a developing science in Agriculture.*
2. *Small offset packages created per farm unit – buyers want large volumes;*
3. *Potentially high GHG project verification costs;*
4. *Individual farm risk may negate value;*
5. *Need for aggregating smaller projects into market- ready commercial offsets packages.*

** see Appendix A for more info on Ag projects*

5. ***Certify*** amount of carbon offsets in the form of a credit (or compliance unit) - in a compliance-based market the government typically needs to be involved to provide assurance to the buyers;
6. ***Deliver*** GHG offset credits for sale on the carbon market.

These steps, in the context of the above rules in the Alberta Regulations, leave a number of questions in the minds of buyers and sellers:

- How will I know what activities or technologies count when thinking about a contract for carbon credits?
- How do I know how many tonnes of emission reductions (or in the case of soil sinks – removals) can be created these changes in practice or technology?
- Where do I find the 'best available science' for quantifying these offsets?
- If I was reduced tilling before 2002, or have trees on my farm already, will I have anything to sell?
- How long do I have to maintain the practice or technology in order to gain credit?
- Where do I find these qualified third party auditors and how much do they cost? How often will they come to my farm to check out what I'm doing?
- What kinds of records and data do I have to keep and in what format?
- What happens if I have to till to control weeds, or what happens if my woodlot burns down, and I'm under contract?
- Will I require a legal easement on my property if I enter into contract?
- What's the current price for a tonne of carbon?
- Where do I go to find out more information?

To answer some or most of these questions the Alberta Government and Climate Change Central will be launching ***Carbon Solutions*** – an information and market support program that will provide the necessary infrastructure and market tools to facilitate carbon market offset projects in Alberta. ***Carbon Solutions*** aims to reduce transaction costs and minimize risk for project-based offsets in Alberta.

By July 1 2007, ***Carbon Solutions*** will have available market guidance materials on how to get started, as well as other necessary information on things like baseline practices, crediting periods and project registries. Plus, to give buyers and sellers confidence in the market, over 13 market standards that quantify the amount of credits eligible for sale in Alberta will be available on Climate Change Central's website (www.climatechangecentral.com).

For the agriculture sector, these standards cover activities cross a wide range of activities and sub-sectors:

- Pork operations
- Beef operations
- Composting
- Soil Management

- Biofuels
- Biogas (anaerobic digestion)
- Biomass combustion
- Energy efficiency
- Waste heat recovery
- As well as others for other sector's activities as well.

They have been developed with the best available science for Canadian conditions and been reviewed by experts in each field. Further, they are based on International Standards and are designed to be compatible with an eventual National market and other compliance-based market requirements, enabling even greater opportunities for Alberta buyers and sellers in the future.

When considering how to get involved in the Alberta Carbon Market, and have assurance that what you're being told is appropriate, waiting a couple more months, for greater transparency and certainty in carbon as a commodity in Alberta, is advised.

The Chicago Climate Exchange -Voluntary-Based.

The CCX is North America's first voluntary, rules-based GHG emission registry, reduction and trading system. In this context, rules-based means that its registered companies have agreed to take on targets and achieve them by either taking action internally to reduce emissions or purchase offsets on the trading platform. The CCX is positioned as a pilot initiative to provide its member companies with experience in carbon markets. Although the CCX is a voluntary system, the offsets are backed by contracts – a legally binding aspect that puts a degree of rigour to the system. To some policy makers, the fact that the CCX is in the business of both defining the rules to create its own credits and offering a trading platform for its member companies, is seen as a conflict of interest if it migrates to a regulatory or compliance-based market sometime in the future.

Because it's a voluntary market, the rules don't need to reflect the requirements of regulated initiatives. This gives the CCX much more flexibility in how it designs its credit creation side. The value of the carbon reflects the voluntary nature of the market – the price has fluctuated between $3 to $4 USD/ton.

To support the market, they have reportedly defined standardized guidelines for several project types (although these are not readily available through the CCX – transparency is key to provide confidence in the credits) – select agriculture and forestry projects and others such as renewable energy and fuel switching. These include:

CCX Forest Carbon Emissions Offsets
CCX Agricultural Soil Carbon Offsets
CCX Agricultural Methane Emissions Offsets
CCX Landfill Methane Emission Offsets
CCX Renewable Energy Emission Offsets

Tradable Offsets can be registered and traded on CCX by both Offset Providers and Offset Aggregators. Both of these entities have to be accepted by the CCX administration. An Offset Provider is an owner of an offset project(s), registered and sold on its own behalf. An Offset Aggregator serves as the administrative representative of multiple offset generating projects on behalf of the owners. Members include corporations, utilities, universities, NGOs, cities and several States. All projects have to be verified by a third party auditing agency, approved by the CCX. Offset projects involving less than 10,000 tonnes of carbon dioxide equivalents must be sold through an aggregator (due to the transaction costs and complexity of management).

The CCX is developing a subsidiary platform in Canada called the Montreal Climate Exchange. The MCX has recently issued a statement that it will **delay becoming active until Canada is clear about the rules for the compliance-based market.** Through this statement, the MCX is effectively acknowledging that it would not want to bring in a voluntary approach into Canada, where regulated market requirements could be in conflict with some of the more flexible rules governing voluntary projects.

Overall, the framework the CCX is using to deliver offsets to their trading platform is similar to most of the requirements of project-based systems.

<u>CCX Market Activity In Canada</u>

A couple of years back, a company out of Regina called 'C-Green' became the first registered aggregator for the CCX. C-Green was very active in aggregating projects in Saskatchewan for the first crediting period of the CCX (2003-2006), reportedly contracting over 5.1 million acres in Saskatchewan. They are now advertising for contracts in all 3 Prairie Provinces for the 2006-2010 CCX crediting period. Since then other companies have applied to aggregate Canadian projects for the CCX market.

<u>Considerations when Contracting to the CCX Market:</u>

- **Past Crediting Period** – for the 2003-2006 time period, the tonnes were retroactively based, required no practice change and the years involved were definitely 'out of play' for any system in Canada. Virtually no risk was involved for contracting. This period is now closed to new contracts.
- **Current Crediting Period** – for 2006-2010, this involves future actions and carries more risk. Penalties for breaking the contract will need to be assessed against potential value received.. Producers who sign up will be excluded from selling credits for the same activities into the Alberta market (contract stipulates a producer can't enter into any other agreements once CCX signs the deal).
- **Farm gate value of CCX deals** – current trading price of offsets on the CCX is low (approximately $3 to 4 US per tonne), due to the voluntary nature of the market. By all reports, given the coefficients being used in the CCX projects, and accounting for secondary marketers involved in the deal, producers are reportedly expected to receive between $0.50 to $1.00 per acre/year or $3/tonne of CO_2e over the contracting period (for soil sink

projects). These estimates are dependent on the selling price of Carbon in the CCX market.

- **Canadian Buyers are sceptical** – companies who expect to be regulated in Canada, and understand the policy around project-based offsets are wary of CCX credits because of the more lenient requirements.
- **Lack of Transparency** – on several occasions, Canadian policy-makers have requested to see the standardized guidelines for project-based credit generation used by the CCX. The CCX administration has not provided these materials to date. This lack of transparency has given rise to scepticism by other developing compliance-based markets and acceptance of CCX credits in their systems.

Reasons Why These Considerations are Important:

- With the kinds of carbon markets Canada/Alberta is considering, the value of the offsets will likely be higher; Alberta rules will allow regulated companies to pay $15/tonne of carbon into a Fund and receive regulatory relief. This effectively becomes the ceiling price in the Alberta market.
- Producers who sign on for the second crediting period (2006-2010) may be forfeiting the opportunity for a higher rate of return here in Alberta.
- In addition, the federal government has stated in its Notice of Intent to Regulate, that credit for early action may be considered - this opens up more opportunity for producers in Canada.

Summary

Carbon markets are continuing to develop in Canada and North America. Alberta will have the first compliance-based market in North America by July 1, 2007. This market will be supported by standards that define the supply of potential offsets in Alberta – a key factor in reducing risk and providing certainty in the marketplace.

Deciding to engage in contracts for existing markets like the CCX is an individual choice by a producer, according to the level of risk they're prepared to take. The CCX requirements are likely less rigorous than potential requirements under a compliance-based market, particularly for countries like Canada, who have signed onto international agreements. Saskatchewan producers who engaged in the 2003-2006 crediting period had little to lose since contracts were based on retroactive actions. Contracting for the second CCX crediting period will need to be weighed against the obligations in the 2006-2010 contract, delivery on payment of the first round of contracts and whether producer's expect the Carbon Market in Alberta to bring higher benefits. Producers are advised to wait until July when more information will be available - making informed business decisions is the best place to start.

Appendix A - Supplementary Information

In the early years, several large companies on the emitter side were active in trying to shape the market and show governments that carbon credits/offsets can be one of the ways they could use to meet future commitments on greenhouse gases. This led to some trades in agriculture early on (1998 in Iowa by a group of energy companies known as GEMCo). Most companies are still very engaged in this area, as are their shareholders, and our experience tells us that several are looking for opportunities to continue to help shape policies on offset development.

Examples of agricultural GHG reduction projects might include increasing soil organic carbon by reduced tillage, residue management or decreasing summerfallow, increasing feed conversion efficiency on a pork or cattle farm, changing the time of year that manure is applied to cropland and generating bioenergy through an anaerobic digester.

The agricultural sector has the potential to deliver modest-sized packages of carbon offsets to market, which means that they will typically need to be ***grouped or 'aggregated'***. This creates particular challenges in capitalizing on the sale of carbon offsets, due to the relatively small packages of offsets that can be created by each farming operation. Buyers are typically looking for packages in the 100,000 tonne range, whereas an individual farm may only generate 1000 to 2000 tonnes of carbon offsets[4]. The transaction costs on most individual farms would make it uneconomical to try to participate in the market. Further, transaction costs in compliance-based markets can be higher due to the more rigorous requirements of the system.

Inherently, the land-based aspects of agricultural projects, along with the need for many farms to be aggregated, create risk and complexity challenges that need to be managed. This is in comparison to some of the larger offsets packages that can be created by larger single source industrial projects. And, carbon sink projects, which involve increasing soil organic carbon (through a process known as carbon sequestration) have additional risks/liabilities that must be managed due to the impermanent nature of the sequestered carbon – changing management can release the stored carbon and strategies to guard against this must be part of the rules to ensure integrity of the system.

In addition, GHG science is developing in agriculture and many measurement techniques are commercially unavailable – on-farm measurement of the net balance of all 3 gases is not feasible today[5], so scientific uncertainty can introduce additional risks to the equation. Quantification Protocols or performance bared standards that translate today's science into defining the amount of credits from a change in farming practices, are absolutely necessary to

[4] A carbon offset credit being 1 tonne of carbon dioxide equivalent.

[5] The three greenhouse gases need to be quantified from any given practice change are carbon dioxide (CO_2), nitrous oxide (N_20) and methane (CH_4); measurement tools are still in the research phase. For simplifying the marketing of the credits, and we're comparing apples to apples and not apples to oranges, the 3 gases are standardized to the equivalent global warming impact of carbon dioxide.

facilitate agricultural projects, particularly in a compliance-based market. These protocols or standards provide scientific certainty and lower transaction costs of bringing offset packages to the market. Alberta has taken a leadership role to work with Canadian and US researchers in developing offset protocols based on sound science and measurement and will be held at Climate Change Central in Alberta, www.climatechangecentral.com[6]. These will provide buyers and sellers in the Alberta and eventual Canadian market that the credits meet compliance rules.

[6] Protocols are equations and coefficients farmers can use to quantify the number of credits available from a change in practice. Protocols under development include: Beef Feeding, Pork Production, Anaerobic Digesters, Soil Management, Aerobic Composting, Biofuels, Energy Efficiency, Biomass combustion and afforestation (planting trees on agricultural land).