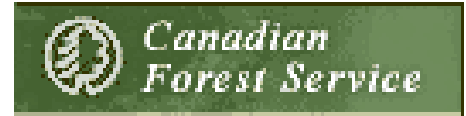




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***Feasibility Assessment of Afforestation for Carbon Sequestration (FAACS):***

## **Exploring Options for Aggregating and Selling Afforestation Carbon Credits from Small Landowners**

*Prepared for*

Canadian Forest Service, Pacific Forestry Centre,  
Federation of BC Woodlot Associations,  
and  
Canadian Landowners

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***DRAFT: Revised to December 17, 2003***

## Preface

This report and its associated appendices are two separate digital file documents and are provided under separate covers. The appendices provide important background information aimed at improving understanding of the complex interactions required between landowners, government, aggregators, and carbon buyers in afforestation projects. The appendices also provide a discussion of the obstacles and the economics of growing trees and getting the new carbon credit commodity to market.

***Please note: Throughout the report, you will see many references to the appendices. It is beneficial to have the appendices available when reading the report.***

The development of this report has been funded by the Canadian Forest Service. The report has been prepared for the Canadian Forest Service, the Federation of BC Woodlot Associations, and landowners across Canada.

BC landowners attending the Prince George 2003 carbon workshop had many more questions than there were answers available about the business side of afforestation carbon credits. Although lengthy, this report provides landowner readers with an easy to understand overview of the business as viewed today by carbon credit buyers and others.

It is important to recognize that this report is time-sensitive for the current period (fall 2003), and that afforestation program components and the carbon credit market will evolve with new domestic and international rules as we approach 2008-2012.

## Acknowledgements

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Thanking each of you,

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## 1.0 Executive Summary

In December 2002, Canada signed the Kyoto Protocol, agreeing to reduce greenhouse gas (GHG) emissions to specific targets during the first emission reduction compliance period (2008-2012). Canada has said that it will follow through with an emissions reduction program without ratification of the Kyoto Protocol by the international community.

In designing a system for offsetting greenhouse gas emissions, Canada is considering a forestry component including afforestation (tree-planting) of private landowners' marginal agriculture lands. Eligible afforestation projects will grow trees to sequester carbon and create offset credits that can be sold to large industrial greenhouse gas emitters (buyers) to offset their emissions. **It is important to note that an afforestation credit is a very expensive type of offset carbon credit to produce.**

By planting trees, each landowner could produce roughly 10 to 600 tonnes of carbon credits to sell annually. Carbon credit buyers demand that small landowners bundle their credits with those of other landowners in aggregations of 100,000 metric tonnes per saleable unit. **It is a major task and expense to aggregate a large volume of forestry credits from thousands of landowners in order to make one sale.**

The planting of 100,000 hectares of fast growing species (such as hybrid poplar) in 2005 could provide sufficient carbon volumes to measure, aggregate, and sell in the first compliance period (2008-2012). Tree-planting efforts commencing in 2005 of most native tree species will not sequester enough carbon for the first emission compliance period to bother measuring or aggregating, due to slow early growth rates of both trees and carbon. Post-2012, these native species will start to accelerate their tree growth and associated carbon growth, and will then be worth measuring, aggregating, and selling into the future. **If there is to be any market certainty for afforestation carbon credits, Canada must extend the emission compliance period past 2012.**

Internationally, and domestically, a true supply and demand market place has not yet been established for carbon credits. Past prices have been negotiated based on perceptions in the market place. The international 2003 price range for Kyoto pre-compliance credits bought in forward contracts was \$4.00 – 8.00 CDN per metric tonne CO<sub>2</sub>e, according to the recent report "*State and Trends of the Carbon Market 2003*."<sup>1</sup>

Ninety percent of the project credits sold were from transition or developing countries – primarily Latin American countries selling landfill methane gas reduction credits and other non-forestry types of credits. It is not apparent that there were forestry carbon credits sold within the price ranges above. Forestry credits are not in demand by buyers due to the issue of permanence. Currently, buyers will only consider purchasing forestry credits if prices are discounted approximately ten to fifty percent against non-forestry carbon credit market prices.

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<sup>1</sup> Franck Lecocq, Karan Capoor, PCFplus Research, World Bank ([www.prototypecarbonfund.org](http://www.prototypecarbonfund.org))

Because of fire, disease, insects, animals, weather, and deforestation activities, forests are not permanent. Buyers want guarantees that credits bought forward in options and contracts will indeed be delivered on schedule. Who should assume the liability risk for carbon credit delivery shortfalls? The issue of permanence with forestry credits is currently (December 2003) being discussed at the 'Conference of the Kyoto Parties' in Italy. Hopefully, international guidelines will be announced shortly that will help provide solutions to concerns with permanence.

**If forestry credits are not perceived as having the same quality and stability as other types of credits, landowners will face significant marketing and economic challenges.** Canada could develop domestic policies on permanence that could help landowners. **Government could provide bonding or financial guarantees against carbon delivery shortfalls due to natural disasters causing carbon losses.** This would reduce liability risks and costs to landowners, investors, and aggregators, and create more interest in projects on afforestation carbon sequestering.

The future market for carbon credits is unknown, and subject to the vagaries of world politics. Without Russia signing onto Kyoto, the international market is expected to remain soft for the near future. Canadian energy sector experts are predicting that market prices will not exceed \$15 CDN per tonne even if the Kyoto Protocol were to be implemented globally (excluding the United States). There will be more supply than demand for credits on a global scale. To date, the United States has declined to sign Kyoto, but if the US did sign, prices are expected to rise above \$15 CDN per tonne.

A few landowners are interested in planting small areas (1 – 4 hectares) with trees for environmental and aesthetic purposes, using their own money. **Currently, most landowners are not interested in planting large areas with their own money for various reasons.** These include

- High risks associated with regulatory and market uncertainty;
- Too many complexities regarding credits, aggregation, and credit accounting to fully understand;
- Poor to nil economic return on investment;
- Property and income tax disincentives; and
- Their close proximity to retirement age.

Costs for establishing a successful plantation range from \$800 to \$2600 per hectare. The economics for return on investment are both variable and specific to the parcel of land, tree species planted, productivity of the land, landowner's management techniques, tree survival rates, term till harvest, and prices for carbon credits and harvested log values. **The unknown future selling prices and the cost of time on a long-term investment (net present value or interest on loan) make investments in tree-planting difficult to justify.**

Landowners must be motivated to plant many trees and hectares. **Government needs to remove obstacles that impede motivation. As well, government will need to provide financial assistance in some form.**

For example, government could do one or all of the following:

- Pay for the majority of plantation establishment costs with no strings attached;
- Exchange plantation establishment financial assistance for ownership of the future carbon credits; or
- Provide landowners with financial loans repayable in carbon credits.

**Without hundreds of thousands of eligible hectares planted, cost-effective aggregation cannot be conducted.** Aggregation, in the larger context, includes communication with landowners, setting up landowner databases, annual or periodic sample measurements of tree and carbon growth, certifying compliance credits, aggregating credits, legal fees with contracts, potential insurance fees against carbon losses, brokerage fees, general administration, accounting of credits and dollars, and disbursement of payments to landowners.

These cumulative activity costs are estimated to range from \$2.50 - \$5.00 CDN per credit, or tonne. Once further domestic policies are formulated and the required activities are better known, associated aggregation costs could rise or fall. The aggregator will need to amortize infrastructure costs over many years to reduce costs. The estimated cost of \$2.50 - \$5.00 CDN is related to aggregating a minimum of 100,000 – 300,000 tonnes per year per aggregator. If market prices for forestry credits are less than \$5.00 CDN per tonne, then aggregation may not be worth conducting, and landowners will lose access to the marketplace. **The potential inability to access the market is a risk for the landowner or investor.**

**The short-term economic picture for afforestation and aggregation for carbon credits is poor.** Meanwhile, trees are long-term investments and if no trees are planted in the near future, there will be no eligible carbon available in the future, if carbon markets were to improve. As well, there may be future timber supply shortages in parts of Canada if more trees are not planted. In addition to sequestered carbon helping to mitigate climate change, tree-planting provides various other environmental, social, and economic benefits to landowners, communities, and to society as a whole. These other benefits far exceed those of sequestering carbon in most people's eyes, but are often difficult to measure in terms of return on investment. **Landowners need to be better informed of the other benefits to planting trees.**

Landowner organizations such as woodlot associations and provincial woodlot federations have experience in planting trees and have the trust of landowners. **Government could provide these organizations with financial support to promote and encourage tree-planting throughout Canada. As well, these organizations could assist with the delivery of government funded afforestation programs.**

Once enough tree plantations are established and the carbon market exceeds \$5.00 CDN, it is expected that various aggregators will come forward to offer aggregation services. In December 2003, a few parties showing preliminary interest in becoming aggregators were Natsource, AgCheck Canada Inc, Mikro-Tek Inc, Tree Canada Foundation, and the Canadian Federation of Woodlot Owners.

**Aggregators will be selected based on landowner's trust of the aggregator to look after their best interests, and the ability to conduct aggregation activities at a low price.** Landowner organizations such as provincial woodlot federations or agriculture federations meet this aggregator selection criterion for trust and representing landowner's interests, and may already be helping deliver afforestation programs. These landowner organizations operating at a provincial scale are good candidates to follow through with aggregating and selling their landowner members' carbon credits.

**For reducing aggregation costs, economy of scale is an important factor.** Therefore, a national body providing centralized administration may be needed. For example, the Canadian Federation of Woodlot Owners has shown preliminary interest in forming an affiliated, but independent, corporation to provide national, centralized administration. In theory, a further step to improve the economy of scale is for several national organizations such as the Canadian Federation of Woodlot Owners, the Federation of Agriculture, and the Canadian Cattlemen's Association to form a corporation for the purposes of aggregating both forestry and agriculture credits.

**There are other business factors that can influence who becomes an afforestation carbon credit aggregator.** For example, in the situation where lowest aggregating price becomes the primary selection criterion, then already established national or international aggregators may have competitive advantages. Aggregators of landfill methane gas credits and agriculture credits will become established several years in advance of large volumes of afforestation credits being available to aggregate. New start-up aggregators directly, or solely, associated with afforestation credits may not be able to provide aggregation services as competitively as those aggregators who are already established.

Due to marginal economics for landowners, it is expected that the price of aggregation services will be a key selection criterion used by landowners. **The competitive marketplace will likely be used to determine who becomes afforestation aggregators.**



## 2.0 Introduction

### 2.1 Report Purpose

The Federal government's program "Feasibility Assessment of Afforestation for Carbon Sequestration" (FAACS) is an early effort by Natural Resources Canada - Canadian Forest Service to identify the challenges and benefits involved in launching a large national afforestation program – to grow trees on land that does not currently support a carbon-rich vegetative cover. This could be marginal agricultural land or biologically good land that has been marginalized by lack of market access, crop failures, or lack of human resources. It would also include land denuded for other uses. This afforestation program will be primarily for the purposes of sequestering carbon in trees to produce domestic offset greenhouse gas (GHG) emission reduction credits. Sequestration of carbon through afforestation projects is one of the emission reduction strategies available in Canada to comply with the greenhouse gas reduction targets in the Kyoto Protocol.

Large industry greenhouse gas emitters have to reduce emissions or purchase carbon credits to offset their emissions and comply with Canada's emission reduction policies. Each large Canadian industrial company will have emission reduction targets to meet annually (2008-2012). Small private landowners have the ability and opportunity to plant trees, sequester carbon in the trees' wood, and sell these carbon credits to large industry emitters which will then use the credits to offset their emissions.

To reduce transaction costs with the purchase of carbon credits (metric tonnes of carbon dioxide equivalent – CO<sub>2</sub>e), large companies request a minimum purchase of 100,000 metric tonnes. Each private landowner may only have 10 to 600 tonnes of carbon credits to sell annually. In order for small landowners to sell their small volumes of credits, they must bundle them together with other landowners in aggregations of 100,000 metric tonnes. The challenge of aggregating a large volume of forestry credits for selling is not known to have been attempted in Canada before.

**The main purpose of this report is to explore the feasibility and options for successfully aggregating and selling afforestation carbon credits from small landowners. A secondary purpose is to discuss various aspects of afforestation and provide information to the Canadian Forest Service and landowners regarding the financial business side of sequestering and selling carbon.**

### 2.2 Notes

The following are important notes to ensure readers derive the full benefit from the report:

- “Small landowner” or “landowner” in this report refers to a private landowner, or family land ownership, with 2 to 2000 acres (or 1 to 800 hectares). Landowner does not refer to large industrial agriculture or forestry corporation's holdings.

- The Appendices for this report are provided in a separate document under separate cover that provides more detailed information on the landowners' (sellers') perspectives, the carbon credit buyers' perspectives, and economics. This background information is important for gaining a good understanding of the complexities and obstacles for both the seller and buyer in the sale and transfer of credits. There are many practical factors that can limit various aggregation options that would otherwise be theoretically available. This report identifies key motivational factors for sellers and buyers. Both buyers and sellers are businesses that are very concerned with managing risks associated with carbon credits. Aggregator types are identified and the pros and cons of various aggregation options are listed. As well, several parties that have shown preliminary interest in becoming an aggregator of carbon credits are listed and described.
- Different aggregation options could theoretically be driven by either government, landowners (sellers), brokerage firms, enterprising private investor(s), charitable society(s), trusts / foundations or a combination of these. The business structure of the aggregator could potentially be a cooperative, corporation, non-profit society, government agency, or Crown corporation. One aggregation model or aggregation organization is very unlikely to meet the needs of all private landowners due to various factors. There may be several very different aggregation models that best suit different geographic areas of Canada.

### **2.3 Introduction to Afforestation Carbon Credits**

The following describes the current situation in Canada. Implementation of new Canadian or international policies could change this situation.

*Afforestation:* Afforestation is the direct human-induced conversion of land that has not been forested for a period of at least 50 years, to forested land through planting, seeding, and / or human-induced promotion of natural seed sources.

*Reforestation:* Reforestation is the direct human-induced conversion of non-forested land to forested land through planting, seeding and / or the human-induced promotion of natural seed sources, on land that was forested but that has been converted to non-forested land. For the first emission reduction compliance period, reforestation activities will be limited to reforestation occurring on those lands that did not contain forest on 31 December 1989.

*Eligible Lands for Afforestation and Emission Reduction Compliance Credits:* The technical definitions of “afforestation” and “reforestation” apply to lands considered eligible. In other words, to be eligible, lands must not have been in forest on 31 December 1989. To be eligible, it is not a mandatory requirement for lands to be in non-forest for at least 50 years as per the Afforestation definition. Hereafter in the report, the word “afforestation” will be used to describe afforestation and reforestation combined.

It should be noted that private lands that are obligated for afforestation or reforestation activities under forest tenure licensing or other agreements, may be ineligible even

though bare of trees on 31 December 1989. For example, BC Woodlot Licence Schedule A lands would fall into this category.

*Deforestation:* Deforestation is the direct human-induced conversion of forested land to non-forested land.

*Starting Date for Afforestation / Reforestation:* Projects to plant trees on eligible land will not produce tradable carbon credits if they are started before the official start date determined by the government. The government can select any date after January 1, 1990. As of September 2003, the government of Canada had not set a start date.

*Carbon Accounting for Afforestation:* The carbon accounting theory is very simple. First, measure the amount of carbon on the site before planting trees. This will establish a baseline carbon contribution. After planting with trees, calculate the amount of carbon being sequestered by periodically measuring the carbon stored on the site in tree stems, limbs and foliage, stumps, root mass, and soil and litter on the forest floor. A mix of field measurements and average factors will probably be used. Subtract the baseline carbon. Convert the net gain in carbon to Carbon Dioxide equivalent (CO<sub>2</sub>e) using appropriate conversion factors and we have the carbon credits.

Carbon losses though time must also be accounted for. They may be due to natural disturbances like fire, insect attack, disease, wind, animal damage, ice storms, or to logging, clearing, or other management and stewardship failures. Risk management to make provision for possible carbon losses is not complicated, and requires selling only a percentage of the total, perhaps 70-80%. The rest can be kept in reserve (“carbon reserve”) as insurance against loss. Risk management strategies should be part of the land management plan.

*Leakage:* Leakage of carbon from the above calculation will be of two main types: a) Additional carbon could be released if landowners increase their clearing and deforestation activity on another parcel of land while leaving the carbon afforestation site untouched; and b) Greenhouse gas emissions (GHG) involved in establishing the plantations (fuel consumption for site preparation, fertilization, weed control, seedling production and delivery) could be considered as carbon emission activities in establishing a carbon forest.

*Permanence:* Lack of permanence is a problem in forestry. A lack of permanence can be caused by deforestation by fire, or by clearing for development. Wind, fire, ice storms, drought, animals, insects, and diseases are also risks to healthy growing forests. Risk management strategies will help to overcome these problems. Lack of permanence becomes less of a problem as we move up the size scale from a very small patch of trees covering 1 hectare, to a plantation of 100 ha, to a new forest at a landscape scale covering perhaps 100,000 ha or more. The same effect can be achieved by aggregating numerous plantations. If small landowners collectively aggregate their carbon credits and lands, then the overall risk to permanence is lessened, due to geographic diversity. For example, a forest health issue or fire could wipe out one small landowner's forest (10 hectares), without adversely affecting any other landowners' forests.

*Purchase and Sale of Carbon Credits:* Carbon credits will be sold by the owner to any customer who needs credits to meet emission reduction targets. In some instances, the purchase of carbon credits can be a cost-effective way to meet emission reduction targets. The price will be established by the market; however, Canadian GHG emitters will not have to pay more than a federal cap of \$15 CDN per metric tonne. Currently, afforestation carbon credits have a sales value in Canada only for the 2008 – 2012 period, although some buyers will want a purchase option or sales renewal option past 2012, to cover the likely event that Canada will continue to reduce emissions.

*Aggregation:* Some system of aggregation will be needed to bundle the credits from small private landowners to create marketable volumes (minimum of 100,000 metric tonnes of carbon dioxide equivalent) and reduce transaction costs. There may be opportunities to aggregate credits from agriculture and landfill methane in combination with those from forestry, to derive the minimum trade unit size.

Is a carbon credit a real product with enduring value on the market? Carbon credits are not like wood, which has a long-standing value in the marketplace. The carbon embodied in wood became a commodity due only to the negotiation and signature of the Kyoto Protocol. Carbon embodied in wood had no value before then, except perhaps when wood was used as a fuel. It is the carbon that is the main component of wood that combusts and produces heat.

Carbon in wood has value as a carbon credit only as long as the Climate Change Convention is legally in force or is honoured by Canada. Carbon credits are a compliance tool for the first measurement period 2008-2012. Their value will be increased if the Canadian government states that they will also be a compliance tool for the second, third and ongoing measurement periods. Carbon credits' value in the market is entirely dependent on the Canadian government staying in the Climate Change Convention or establishing a domestic GHG emissions reduction program based on the same general principles and reduction mechanisms.

The government of Canada could undertake to provide a significant part of the investment required to establish plantations under any afforestation program. This investment would serve to underwrite the risk to any investment made by private landowners or others interested in the development and use of carbon credits.

Landowners and forest managers must understand and accept the nature and foundation of the value of carbon credits in their decisions to invest in the production of carbon credits.

Landowners who invest in afforestation on marginal / sub-marginal agricultural lands may want to consider the value of a 'basket of benefits' that will result from their expenditures on plantation establishment. Some of these benefits will be more certain and tangible than others.

*Benefits of Growing Trees:* There are various benefits to growing trees including economic, social, and environmental benefits:

- *Economic:* Trees can provide income from forest products along with providing jobs in silviculture, timber harvesting, and manufacturing. For an agriculture community, adding another potential industry such as forestry adds diversity and stability. Carbon credits can also be sold to bring in annual revenues until trees mature.
- *Social:* Trees on the landscape are aesthetically pleasing. Continuity in managing trees can provide a continual wood supply that supports rural communities by stabilizing wood fibre supply and forest sector jobs.
- *Environmental:* Trees can establish wildlife habitat, increase biodiversity, moderate and filter water run-off, and protect waterways from flood erosion or temperature extremes. Trees can be used as windbreaks, controlling blowing snow and wind and protecting roadways, farmyards, and livestock. Trees help retain moisture in fields to increase crop yields and decrease soil erosion. Trees also sequester carbon that can offset greenhouse gas emissions and slow climate change.

### 3.0 Steps to Sequestering and Commercializing Carbon

An afforestation project for the purpose of sequestering carbon can be broken into four distinct, but interrelated, components or steps:

1. Tree plantation establishment;
2. Measurement and verification of carbon;
3. Aggregation of carbon credits; and
4. Sales of carbon credits.

The success of an afforestation sequestration project depends on success in each of the four components. The failure of a single component will result in failure of the project as a whole.

For example, an afforestation program that encourages only a few landowners to plant trees is unlikely to create sufficient carbon credits to make any aggregation option worthwhile, even with cost-effective measurement and a good sale price.

When looking at the total picture, from plantation establishment through to selling of the carbon credits, there may be related efficiencies that assist in identifying the most effective aggregation model.

For each of the four components, who must be involved, who is responsible, and who can best drive or deliver that component? There are four principal parties in sequestration projects:

- Landowner
- Government
- Aggregator
- Buyer

A collective effort has to be made by all these participants to make a successful sale. In reality, their real actions and energy for their role will be driven by market prices.

One must be cautious in making interpretations of “success” for the different participants’ roles in an afforestation project, from establishment to carbon sales. Success in the eyes of one party may not be seen as success by other parties. However, because most activities and roles evolve around the landowner, the landowner’s definition of success and perception of responsibilities are very important.

The roles and responsibilities listed below are theoretical. The responsibilities in particular can easily change with agreements made between parties.

### 3.1 Tree Plantation Establishment

The establishment of plantations will be driven by landowners, with potential government assistance. (There is also potential for an investor to lease the land or fund the plantation establishment, taking the role of a landowner in order to profit from the investment).

*Responsibilities:*

- *Landowners or Investor:* Will identify eligible, suitable lands, decide to contribute to a long-term project, develop an afforestation and management plan, and supervise the establishment of trees.
- *Government:* May fund the establishment activities if needed to motivate the landowner, and may fund extension services to provide technical advice / assistance.

### 3.2 Measurement and Verification of Carbon Credits

The net carbon sequestered (surplus to baseline) must be measured in some manner. For landowner success, measurement and verification of carbon credits must be very low in cost, particularly if the average landowner only plants approximately three hectares. Within an aggregation of numerous landowner's lands, it is expected that random samples will be drawn from the total landowner population and only a small percentage of all plantations will be physically measured on-site for tree growth and carbon content.

This measurement will be extrapolated to all plantations and payments will be made based on the sample's measurement. The larger the aggregation of hectares, the lower the measurement sample intensity per unit required to meet statistical confidence requirements, and the lower the cost per credit.

Instead of doing significant measuring, it should be possible to develop and use regional and species-specific carbon growth models that can predict average carbon sequestration rates. Field measurements by technical experts will be conducted periodically to calibrate the growth model for improved accuracy of predictions over time. Domestic and international carbon measurement standards are still being developed and must be considered when available.

There are other low-cost carbon measuring alternatives (some of which can be combined with random samples) that may include satellite imagery, or landowner self-measurements, whereby the landowner would take date-imprinted photographs including the same horizon landmarks of various plantation sections. Along with these photographs, other basic information such as average height, average diameter, and stems per hectare would be collected and mailed annually to an aggregator or buyer.

A self-measurement method is good from the landowner's perspective, but may not be acceptable to a carbon certifier, carbon buyer, or the international community. Afforestation credits may be combined and sold with other types of credits – meanwhile, it is somewhat an international market and for consistency, international measurement standards may have to prevail. Buyers will likely demand that the measurement and

verification be completed by an independent, qualified party so that measurement bias is minimized. Specialized technical contractors / consultants will probably conduct this measuring component. These contractors may be the aggregator party, or at arm's length from the aggregator.

Once measured, there is the question of "Who can certify the carbon credits as acceptable to aggregators, brokers, buyers, and government?" This issue has not been addressed. One option would be to have the requirement for a professional's signature and seal. This professional must be a member of a professional organization with both ethics and consequences for not being ethical. The professional would state that they have the expertise required to review, and that they have reviewed the measurement methodology, data collected, and resulting number of credits. They would then state that it is acceptable and accurate in their view.

A reality twist to the measurement, aggregation, and selling components is that carbon credit market prices may be low, and the landowner has established a plantation with government assistance. The landowner's primary purpose for planting is not carbon income. The landowner has not pre-sold their credits and does not find it worthwhile to have their carbon measured, aggregated, or sold. Meanwhile, the government assistance was for the purpose of sequestering carbon and counting this carbon toward national emission reductions. The government may now have to pay for the measurement if they want to account for the carbon credits, depending on funding agreement language.

*Responsibilities:*

- *Landowner or Investor:* Bear all the costs of getting an acceptable product (measured and verified carbon credits) to market.
- *Government:* Fund carbon measuring costs if the landowner does not want to personally sell their credits. Measurement and verification / certification will be driven by international or national standards set by government. Will also need to measure leakage.
- *Aggregators:* Ensure that aggregated credits are measured, certified and eligible for meeting compliance requirements. Aggregators will have to ensure that measurement contractors adopt cost-effective measurement sampling methods.

### **3.3 Aggregation of Carbon Credits**

The measuring and certification of credits can be carried out prior to and independent of aggregation, but is often considered within the larger context of aggregation. In the larger context, aggregation activities may include communicating with landowners, the measurement of carbon, certifying credits, aggregating credits, paying legal fees, providing financial guarantees against delivery shortfalls, paying brokerage fees, setting up and maintaining a data base of thousands of landowners, accounting of credits and dollars, and distributing payments to landowners. The aggregator may be ultimately responsible for all activities, but could coordinate the contracting out of these activities.

Aggregation must be done as cheaply as possible. Aggregation will include the responsibility of ensuring that measurement and verification meet standards, and that



credits are certified and can be used for emission reduction compliance. Landowners will look for an aggregator that they can trust to look after their interests, including providing fair payment. Landowners may want to participate in a cooperative or corporation to direct how aggregation takes place. However, landowners who personally plant only 1 to 5 hectares with a net annual carbon credit payment of less than \$500 are unlikely to put much volunteer time and effort toward directing a cooperative or corporation.

The aggregator must be trustworthy and have financial resources and reserves. The aggregator must also have good business sense, as well as the authority to market credits at opportune times without delays for approvals – carbon credits will be a commodity in an ever changing world market. The aggregator will be expected to reduce liabilities reverting to landowners, but for self-preservation may have to pass them back to the landowner. As well, the aggregator will need to be able to insure credit delivery if required by the seller. The aggregator and aggregating structure should be selected with a view to long-term sustainability / continuity.

The landowner might transfer ownership of any potential carbon credits to an investor who covers the plantation establishment costs. In this case, the responsibility for aggregating and marketing these credits now falls upon the investor.

The more hectares of plantations, the easier and cheaper it is to aggregate credits. The aggregator may sell the credits directly to a buyer, or may aggregate credits and sell them through a brokerage firm. An aggregator who aggregates other types of carbon credits (such as those derived from agriculture and landfill gas) combined with afforestation credits should be cost-efficient due to the additional credit volumes and centralized administration.

*Responsibilities:*

- *Landowner or Investor (credit owner):* Wanting to sell their credits; ultimately are responsible for getting them to market.
- *Anyone* can be an aggregator providing they have landowner trust and financial resources; and they can aggregate at a very low cost per credit.
- *Government:* By promoting an afforestation program for the purpose of sequestering carbon, government bears some responsibility to assist landowners in using and accounting credits towards achieving Canada's emission reduction targets. Government could exchange afforestation funding assistance for ownership of the carbon credits produced for a certain time period. The government may also control a national registry for all afforestation projects. With these linkages, there may be efficiencies for government's direct or indirect involvement with aggregation.

### 3.4 Selling of Carbon Credits

Landowners must be assured there is a market for afforestation carbon credits, and that there is an aggregation system to collect and deliver their small carbon volumes to the market place.

From the landowner's perspective, they would like someone to represent their interests in getting the best price possible in the market place, along with carrying the least risk. Landowners are likely to accept market price, but not discounted prices. Landowners' interests will be best served if the aggregator is not directly related to the buyers of carbon credits, and does not have any conflicts of interest. Landowners must also have trust that they will indeed be paid on a timely basis for their credits.

*Responsibilities:*

- *Landowner or Investor:* Initiates sale.
- *Government:* Must help create a market through policy.
- *Aggregator:* Must aggregate and sell to be paid for aggregation services.
- *Buyer:* Is the end consumer of the credits, motivated by government penalties.

### 3.5 Summary of Various Parties' Responsibilities

The following table provides a rough summary of which parties are responsible for each of the four components or steps. The purpose of this table is to review where efficiency linkages between components could occur, particularly for aggregation.

<i>Component/Step</i>	<i>Party Responsible</i>			
	<i>X = major responsible role</i>		<i>y=potential responsibility</i>	
	<b>Government</b>	<b>Landowner/Investor</b>	<b>Aggregator</b>	<b>Buyer</b>
<b>Establish Plantation</b>	X	X		
<b>Measure/Verify Carbon</b>	y	X	X	
<b>Aggregate credits for sale</b>	y	X	X	
<b>Sell credits</b>	y	X	X	X

**Table 1: Responsibilities for the components of the selling process**

There are direct linkages and continuity of activity phases between the landowner and the aggregator. As well, the landowner is the most motivated party to control and / or conduct aggregation activities.

## 4.0 Challenges for Implementing Afforestation and Aggregation

Afforestation for carbon sequestration purposes is new to Canadians and provides many challenges. Some of the challenges can be overcome through policy changes, others are more attitude and mindsets that may, or may not, change over time. (*Note:* See Appendix E5, “Summary Profile of the Average Landowner”) The most serious and current impediment is perceived to be low economic return for afforestation investments. See section 9.0 of this report for recommendations / suggestions for reducing these barriers and challenges.

*Economic Return on Investment:* Investments in new tree plantations potentially have two revenue streams to the landowner or investor. There is an annual revenue stream in carbon credits sales and the longer term, revenue from selling logs for forest products (15 – 100 year term). Because of the high up-front plantation establishment costs and the length of time to recover these costs including loan interest or time, there is little financial return to the landowner or investor. Meanwhile, there are many associated risks. (*Note:* See Appendix F, “Landowner Economics for Afforestation Projects,” for more details, discussion, and examples of economic scenarios.)

*Landowner Mindset:* The average landowner is near retirement age and unwilling to participate in afforestation projects unless they are very small in size (approx 3 hectares) and / or have low capital cost. (*Note:* For Landowner Perspectives, see Appendix E; also refer to Appendix I, “Current Obstacles to Afforestation & Aggregation Initiatives” for more details on landowner abilities and mindset.)

*Too Many Complexities Regarding Emission Reduction Credits, Trading, and Accounting:* There are numerous complexities surrounding Kyoto, emissions, offset credits, accounting, sequestration rates, markets, etc. that are beyond the understanding of the average layperson and landowner. If one cannot understand all the factors and risks of a program or business, then landowners will refuse to participate. (*Note:* For more details on “Complexities,” see Appendix I; also refer to Appendix H, “Summary of Landowner Selling Difficulties”.)

*Taxation Disincentives:* There are potentially negative provincial land classification property tax implications for landowners planting trees and landowner difficulty in deducting tree plantation costs against off-farm / off-woodlot earned income. (*Note:* For more details on tax disincentives, see Appendix I, “Current Obstacles to Afforestation and Aggregation Initiatives.”)

*Regulatory Uncertainty and Lack of Emission Reduction Policies:* Regulations, policies, and rules are still under development in the areas of land eligibility, leakage accounting for farmers, the need for registered land title covenants / easements, carbon measurement and validation standards, baseline carbon accounting, start date for afforestation projects, availability of financial assistance, and length of compliance period.

Other outstanding questions include a) ownership of carbon credits – the question whether carbon can be legally separated from the wood (physically impossible) and sold

separately – issue of two owners of the same wood – and ownership liability for permanence of the credits; and b) will landowners need to keep their carbon credits to offset total farm emissions with future regulatory changes? (*Note:* For more details on regulatory uncertainty, see Appendix I, “Current Obstacles to Afforestation and Aggregation Initiatives.”)

*Social Acceptance / Public Opinion:* There is public resistance to cloning (misinterpreted as genetic engineering) of hybrid poplar, planting of non-native tree species, and the use of herbicides; all which can help increase carbon sequestration rates in afforestation.

The Offset Credit System gives emitters an opportunity to increase their emissions, contrary to the purpose of Kyoto's purpose. (*Note:* For more details on “Social Acceptance / Public Opinion”, see Appendix I, “Current Obstacles to Afforestation and Aggregation Initiatives.”)

*Rural Canada's Opinion:* There are differences in opinion toward Kyoto between rural and urban communities across Canada. Urbanites may be pro Kyoto without concerns; whereas rural Canadians are not very pro Kyoto and have concerns that they will be paying for implementing Kyoto through increased fuel taxes. Rural Canada relies on gas and diesel fuel for their primary energy source for distance transportation needs and farmers are reliant upon cheap fuel to operate their farms economically. Furthermore, rural landowners are concerned that sometime in the future that increased government regulation regarding accounting for all farm GHG emissions will be implemented – reducing their freedom to manage. Freedom to manage is extremely important to landowners.

*Biological Time Frames:* Unless “compliance-eligible” trees are already growing, there will be very little carbon sequestered in new plantations for the first compliance measurement period (2008-2012). To review sequestration rates for different tree species, refer to Appendix C, “Sequestration Rates.” For more details on biological time frames, see Appendix I.

*GHG Emitters' / Buyers' Lack Interest in Canadian Afforestation Carbon Credits:* Currently (2003), large GHG emitters / carbon buyers lack interest in driving or supporting an afforestation program; meanwhile, they were intended to be the recipient of the carbon sequestered under the program. They may be waiting for Kyoto's international ratification before they turn their efforts to closely assessing their emission reduction options and afforestation.

Currently, GHG emitters do not see afforestation playing a primary role in meeting their emission reduction targets. With an offset credit system, the slowness of sequestering carbon from new plantations, the Canadian cap limit of \$15 per tonne being the maximum cost for Canadian emitters to purchase offset credits, and the worldwide supply of various types of cheap emission reduction credits available, the large GHG emitters are not motivated to assist domestic afforestation and / or aggregation.

Because of the non-permanence issues, emitters / buyers are not very interested in purchasing afforestation credits, particularly if these credits are not discounted in price.

As well, GHG emitters recognize that Canadian afforestation credits are probably the most expensive carbon credits to produce in the world, and they are not willing to pay a premium price to support this Canadian initiative. Emitters would prefer to invest in emission reduction activities that are directly related and beneficial long-term to their own core businesses. For example, geothermal carbon sequestration, clean coal technology, etc.

*Logistics:* Implementation of a national afforestation program is difficult due to the size, scope, and nature of the program. The preparations for increased landowner awareness, expanded nursery facilities, extension services, and financial investments required provide tremendous challenges and are not for the faint of heart for landowners, investors, or government.

*Market Uncertainty:* Before investing, prudent investors / landowners want a more established carbon market for forestry offset credits, with low volatility and low risk. GHG emitters appear to be focused on purchasing landfill gas offset credits, rather than forestry credits. Future market prices for hybrid poplar are not seen as lucrative. (*Note:* For more details on market uncertainty, see Appendix I, “Current Obstacles to Afforestation and Aggregation Initiatives.”)

*Administration and Third-Party Expenses:* There are many costs associated with activities such as project documentation, management plan development, carbon measurement and verification, lawyer fees, brokerage commissions, and perhaps insurance premiums.

*Selling - Aggregation Issues:* The aggregation of 100,000 metric tonnes of CO<sub>2</sub>e to enable one sale is a very difficult and expensive task. An inexpensive aggregation system has not been clearly identified. (*Note:* For more details on “Selling-Aggregation Issues,” see Appendix I; also refer to Appendix H, “Summary of Landowner Selling Difficulties”.)

The costs of measuring and aggregating landowner credits range between approximately \$2.50 - \$5.00 CDN per afforestation carbon credit. The selling price must be a minimum of approximately \$5.00 CDN per credit before measurement and aggregation activities are financially viable and the landowner can access the carbon market. Having limited access to the market is a serious risk to investors and lender institutions.

## 5.0 Key Success Factors

### 5.1 Motivational Factors for Landowners

The landowner is the key party for the success of growing trees and carbon.

Questionnaires were distributed by the Canadian Federation of Woodlot Owners to the various Canada-wide provincial woodlot owner related organizations: woodlot-owner associations, woodlot-owner marketing boards, etc. Thirteen questionnaires were completed and returned from six provinces, providing woodlot organizations' views. These woodlot organizations consist of landowners who are already managing trees. (For details, please see Appendix K (list of the woodlot questionnaire respondents) and Appendix J1 (questionnaire used).)

A carbon credit workshop was held in Prince George, BC in March 2003, at which landowner participants provided input. For a short summary of participant themes at this workshop, see Appendix E3, or visit [www.woodlot.bc.ca](http://www.woodlot.bc.ca) for a full workshop summary.

The Eastern Ontario Model Forest held three series of workshops called "Landowner Incentive Focus Sessions" in Ontario in November 2003. For a summary of landowners' input from these sessions, see Appendix E4.

For an in-depth view of what numerous landowners think about various topics related to afforestation, please refer to Appendix E1 (Canadian Landowner's Survey), and Appendix E2, (BC Agroforestry Producer's Survey).

It is important to note that landowner workshops and focus sessions in BC and Ontario found that landowners' concerns and perspectives were the same in both provinces. From input provided from various landowners and sources, the following landowner motivational factors were developed:

#### **Key factors that will motivate landowners to plant trees:**

- Awareness of the government's afforestation program.
- Better awareness of the economic, environmental, and social benefits of trees.
- Identification of personal and family long-term benefits of growing trees.
- Identification of the financial risks and rewards associated with growing trees.
- Anticipation for nil to low capital costs for planting trees (personal \$).
- Assurance of a simple and clear agreement between landowner and funding agency / investor.
- Agreement term of no longer than 15 years.
- Assurance of minimal to no strings attached within legal agreements.
- Direct participation in decision-making; i.e., tree species selection, etc.
- Assurance of minimal to no infringement on landowner rights or freedom to manage.
- Assurance of minimal and simple paperwork for the landowner.
- Assurance that extension services will be available for technical assistance / advice.
- Assurance of stability of government program(s) associated with the plantation.

- Assurance that growing trees will not raise property taxes.
- Assurance that expenses will be deductible from off-farm or off-woodlot income.

**Key factors that will motivate landowners' participation in assisting with aggregating and selling carbon:**

- Potential for income revenue (the higher the income potential, the higher the motivation factor).
- Trustful relations with all parties involved.
- A transparent carbon measurement and accounting system that are easily understood.
- A transparent, easily understood, user-friendly aggregation model.
- Simple paperwork and related procedures
- Simple and clear contractual language.
- Minimal to no infringement on landowner rights or freedom to manage.
- Nil to low cost for landowner to support aggregation model.
- Maximum (but fair) payment and timely pay-out of carbon credits sold.
- A low-cost, efficient, sustainable aggregation administration model.
- Preference for a landowner-related organization being the aggregator.
- Limited risk to the landowner-related organization acting as an aggregator.

## **5.2 Motivational Factors for Carbon Buyers**

GHG emitters / carbon buyers from the energy sector were interviewed for their strategies for meeting emission reduction targets, their past carbon purchases, their forecast of the future, their views on aggregating credits, and their suggestions for small landowners. (*Note: Please refer to Appendix J2, "Questionnaires Used – Interview Questions for Buyers of Carbon Credits."*)

Energy (electrical, oil and gas) companies interviewed included Transalta, Suncor Energy Inc, EnCana Corp, TransCanada Pipelines Ltd, GEMCo (Greenhouse Emissions Management Consortium), and the energy brokerage firm Natsource–Tulett Co. GEMCo itself represents the interests of more than fifty percent of Canadian GHG emissions. The perspectives given by each energy company were consistent with those of other companies interviewed. Company-specific information was collected in confidence. Buyers' common perspectives can be found in Appendix G, "Carbon Credit Buyer Perspectives".

From the various interviews, the following buyers' motivational factors were developed:

**Key motivational factors for buyers to purchase aggregated landowner carbon credits:**

- Low cost per credit purchase price and discounted price if there are risks involved.
- Low cost due-diligence, legal, and transaction costs per credit.
- Seller / aggregator / broker is credit-worthy, trusted, accountable, and reputable.
- Seller / aggregator's project manager has a good past performance management record.

- Purchases are able to provide sustainable, long-term carbon credit streams, with renewable options (forward sales with a minimum of 5 year terms).
- Large volumes of credits to minimize transaction costs (minimum volume of 100,000 tonnes CO<sub>2</sub>e per transaction).
- Have seller's / aggregator's / broker's financial guarantees for delivered volumes on a specified schedule.
- Low risk exposure to 'permanence' issue (diversified portfolio).
- Clear title to fully own carbon credits; not very interested in temporary or leased credits without significant discounting of price.
- Payment only on delivery of credits.
- Credits have been measured and verified by independent, qualified, third party or parties.
- Credits are certified for compliance and acceptable to government.



## 6.0 Exploring Options for Aggregating Credits

Until there is more certainty regarding carbon market prices, the offset system and other domestic and international rules, the business potential and financial viability of being a carbon aggregator is unclear. The passage of time and more clarity around carbon credits is expected to increase the number of parties interested in becoming carbon credit aggregators. The activity steps within aggregation are numerous, and often one aggregator does not have the expertise or relationships in place to fulfill all the activities. It is very difficult to compare one aggregator or option against another without knowing all the rules that will apply and without also looking at regional-specific requirements.

The following are potential sources of aggregators and the perceived pro's and con's of each.

### 6.1 Landowner Cooperatives or Corporations

Landowners want and need control over their business operations. They recognize that their business interests and return on investments are reduced when they give too much control to others, whether a broker, product buyer, or the government. This is one of the reasons there are various landowner-related associations and organizations across Canada representing landowners' interests in negotiations with product buyers and government. National landowner organizations include, but are not limited to, the Canadian Federation of Woodlot Owners, the Canadian Federation of Agriculture, and the Canadian Cattlemen's Association. All of these national organizations have provincial and regional associations that are directed by, and represent, landowners' interests.

With this study, a questionnaire was prepared and distributed to woodlot-related organizations across Canada by the Canadian Federation of Woodlot Owners (see Appendix J1). Thirteen questionnaires were returned, from the provinces of New Brunswick, Quebec, Ontario, Manitoba, Alberta, and British Columbia. These organizations and associations were unanimous in stating that their existing organization (or the formation of a new affiliated cooperative or corporation) would best suit their landowner members to assist regional aggregation of carbon credits. Some of these organizations have existing infrastructures used to aggregate and sell their members' logs (regional marketing boards).

Also, these regional organizations / associations could help promote and implement an afforestation program for their members. Many of these organizations have helped implement past government planting and silviculture activity programs with million-dollar annual budgets. Woodlot association-related members also have expertise in tree-planting and tending.

#### **Pro's**

- Existing organizations are already in place and often networked to provincial and national umbrella organizations, such as the Federation of Woodlot Associations .
- Landowners actively participate in the operation of their organizations.
- Landowners trust their own organizations to represent their interests.

- Organizational decision-making is highly accountable to members and community.
- Best potential for program / project continuity in linking afforestation establishment and aggregation.
- Members of woodlot-related associations have forestry expertise that could be used in their local regions to provide farmer-landowners with technical assistance.
- If organizations can provide provincial and national large-volume aggregation, they may be able to bypass brokers demanding commission fees and deal directly with buyers, thus realizing cost savings.

### Con's

- Many local and regional organizations lack the administrative capacity and infrastructure to take on large projects. For example, they may have no paid staff at district or regional levels.
- Most district and regional organizations lack the financial resources to undertake large projects without dramatically increasing membership fees. Even if membership fees were raised, this is unlikely to provide the substantial financial backing or creditworthiness required in carbon buyer contract purchase agreements.
- Some organizations will see carbon aggregation as consuming large amounts of their resources, while noting that it is not their organization's major mandate.
- Some organizations may not be in favour of the Offset Credit System or the Kyoto Protocol in general.
- If there are delivery shortfalls of contracted credits, there is potential for significant financial liability. *Example:*
  1. A landowner sells credits forward in a contract of 100,000 tonnes, for \$5 per tonne.
  2. Slow growth rates or a natural disaster reduce the carbon sequestered, causing a carbon delivery shortfall.
  3. Contract wording obligates the seller to buy 50,000 tonnes of replacement credits at market value. The market is now at \$10 per tonne, creating a financial liability to the seller of 50,000 times \$5 = \$250,000.

## 6.2 Brokerage Firms

Brokerage firms provide connection services between sellers and buyers, and help create the market. Brokers can work on behalf of either the buyer or seller. Brokerage firms can provide some limited guarantees between a buyer and seller in order to protect either party's interests. Carbon credit buyers from the oil and gas sector plan to use brokers for the majority of their purchases. They plan to use brokers to help locate sellers, diversify and manage their carbon credit portfolios, and provide transaction services. Buyers have also indicated a willingness to negotiate directly with sellers without a broker.

Brokerage houses currently have limited experience in trading carbon credits. Consequently only a few brokerages to date have specialized in trading carbon credits, and their trading commissions are in the area of 7 per cent. Once trading becomes more active and other brokerage firms enter into carbon trading, then commissions will likely decrease with large trade volume and / or negotiation. Brokerage firms will probably

only want to deal with verified / certified credits and are unlikely to want to be involved in the prior step of aggregation – dealing directly with numerous landowners.

**Pro's:**

- A brokerage firm may be able to bring together several aggregators / sellers who have less than 100,000 tonnes each, in order to create a 100,000 tonne sale. As well, to make large-volume sales and to diversify a buyer's portfolio, landfill and agriculture credits may be combined with forestry (afforestation) credits. The planned aggregation of landfill and agriculture credits combined with forestry may be the only method of selling afforestation forestry credits in the near future, when young tree plantations are not accumulating enough carbon to make a sale. For example, in 2008 there may be less than 50,000 tonnes produced across Canada.
- If a broker is working on behalf of the seller, they may be able to negotiate a better price than a landowner's aggregation association can.
- Brokers have existing relationships that can assist sales.
- Brokers have financial backing to underwrite guarantees.

**Con's**

- Aggregating and selling carbon credits at a profit to the seller will be a challenge. Brokerage commissions are another expense item that may not be necessary for all carbon sales.
- Brokerage firms assist with the selling of credits, not the steps in aggregation starting at the landowner level. Help is also needed at this lower level, and brokers would not be able to provide it.

### **6.3 Forest Companies**

The Canadian forest industry features sawmills, fibre board mills, chip board mills, veneer mills, and pulp and paper mills, all of which use mature, merchantable trees. To provide for continuous operations, the forest industry requires a timber supply that is stable in the long term. An afforestation program will help achieve this goal.

Under the current Kyoto Protocol, the forest industry will have emission reduction targets for their pulp mills, but not for sawmills or lower emission processing plants. There was consideration that forest landowners throughout Canada often already have business relationships with their local timber processing companies, and that there may be benefits to landowners working with their local forest companies to implement an afforestation program and to aggregate credits from private lands. The forest industry could add to their long-term timber supply and aggregate and purchase private land carbon credits to offset their pulp mill emissions.

Canadian Forest Products, West Fraser Timber, and Weyerhaeuser—three of the largest integrated forest companies in Canada—were contacted as to their level of interest in purchasing carbon credits from small landowners. All three companies responded that they did not expect to be purchasing any carbon credits, as they will be able to meet their emission reduction targets through technological advancements, conversion from natural gas energy systems to wood-waste / hog fuel energy systems, and / or credits from their

existing ownership or lease of private forestlands. Some companies also indicated that they might become sellers of credits.

The Alberta-Pacific (ALPAC) pulp mill in northeastern Alberta has a hybrid poplar farm program whereby they lease private land from farmers within a 200 km radius of the pulp mill to grow fibre. This helps meet their long-term fibre demands, and also reduces their future average log transportation costs. The lease agreement between ALPAC and the landowners gives ownership of any potential carbon credits to ALPAC. In this situation, ALPAC is aggregating the credits for its own use or sale into the marketplace.

Overall, forest companies do not appear to be interested in helping with the aggregation or purchase of landowner carbon credits.

**Pro's:**

- Helping implement afforestation programs provides forest companies with timber supply benefits.
- Forest companies have the technical expertise to help implement planting programs and to measure carbon growth in plantations.

**Con's:**

- At the current time, forest companies do not appear interested in stepping forward to become carbon credit aggregators or help with landowner afforestation.

## **6.4 Other Companies and Organizations - Solicit Interest**

When approaching a difficult task, it is often smart to engage others to identify innovative and cost-effective methodologies to complete the task. This is often done by advertising a "Request for Proposals" (RFP) and soliciting interested parties to outline their vision for innovative and cost-effective ways to conduct the task, along with a bid price. Normally, a contract is awarded to the proponent submitting the best proposal.

This RFP approach was recently taken (Fall 2003) by the United States Department of Agriculture, Natural Resources Conservation Service, Nebraska utilizing a federal grant to find a consultant to help aggregate and sell carbon credits from farmers practicing "no-till" in Kansas and Nebraska with grain and forage crops.

Specifics within their RFP included the following:

- "The purpose of the contract work is to implement and evaluate procedures and guidelines for delivering greenhouse gas emission reduction credits derived from agriculture land management activities to a private sector market."
- "Tasks: Firms that meet the selection criteria should submit a business plan to 1) enroll, 2) aggregate, 3) verify, and 4) deliver to a recognized market or exchange a minimum of 10,000 carbon sequestered-based greenhouse gas credits per year."
- "The business plan will propose procedures for:
  - a) contracting with individuals to implement land management practices;
  - b) verifying performance with application of land management practices;
  - c) measuring actual rates of carbon accumulation to reduce uncertainty;

- d) accumulating and bundling credits in sufficient amounts to minimize transaction costs; and
- e) transferring ownership of credits from sellers to buyers in a transparent market setting."

A similar solicitation in Canada using a Request for Proposals methodology will bring forward interested aggregators. Specific aggregation activities could be solicited for as well. Solicitation could be done on a regional, provincial, or national basis to identify aggregators with innovative and cost-effective aggregation methods. However, the minimum number of credits should exceed 100,000 tonnes to reduce costs per unit.

## 6.5 National Health Charitable Societies

A charitable health society was suggested as a potential carbon credit aggregator for landowners. This aggregator model would be best fulfilled by the involvement of one large, well recognized, and publicly-accepted charitable society. To accumulate sufficient credits to be viable, all 'donated' credits would be directed to one charitable organization, rather than several charities. The selected charitable organization should be large, with the ability to invest in an infrastructure that can administer aggregation and selling of donated carbon credits. Examples include the Cancer Society of Canada, the Heart and Stroke Foundation, etc.

The thought behind this was that each landowner with a small afforestation project of less than five hectares will probably receive a net annual payment (after administration costs) of less than \$ 400. Rather than taking a small monetary payment and paying income tax, landowners may wish to donate their carbon credits to a charitable society and receive a charitable donation tax receipt.

### **Pro's:**

- Most landowners may find that the monetary return for their hard work and investment in an afforestation project is very low. Landowners may feel more emotionally inclined to grow carbon credits for the Cancer Society, than to grow trees for the purpose of reducing climate change. In this scenario they can do both.
- There is potential for relationship marketing between afforestation and the cure for cancer that could be very beneficial to a national afforestation program.
- By receiving carbon credits for free and then selling them, a charitable society should be able to finance the aggregation, including measurement and verification and, in the end, retain a profit. This could potentially be a long-term funding source for their organization.
- This aggregation model option is self-funded and administered by an existing organization.

**Con's:**

- Health charities are not interested in supporting air pollution emissions detrimental to health. By participating in carbon offset credits, health charities can be perceived to be supporting air pollution. The Offset Credit System allows for continued and potentially increased air pollution / emissions.

The Cancer Society of Canada (one of the most highly recognized and highly regarded health charities in Canada) was contacted to determine their interest in potentially becoming an aggregator of carbon credits for small landowners. Their reply was that they did not accept funding from companies affiliated with the sale of tobacco.

Similarly, if the Cancer Society were to receive revenue from sales of carbon credits to large corporate polluters, the public could view this transaction relationship in a negative light. The Cancer Society foresees concerns about links between environmental polluters (GHG emitters) and cancer risk. By purchasing offset carbon credits, GHG emitters avoid the requirement to reduce their emissions. The Cancer Society does not want to be seen as enabling them to continue to pollute. They also stated a lesser issue—the lack of resources to take this type of project on. Also, they see the carbon credit business as fairly risky and are not prepared to invest in infrastructure to pursue it.

In summary, the Cancer Society would have serious reservations and they feel that most national health charities would have similar concerns to theirs.

## **6.6 Foundations (non-health)**

There are many large non-health charitable societies, foundations, and trust funds in Canada. Some of these organizations may be interested in becoming afforestation aggregators if they see environmental linkages and economic opportunity. The best example of a foundation that already has an afforestation mission is the Tree Canada Foundation. (Please see section 7.4, “Tree Canada Foundation” for details of their preliminary interest in becoming an aggregator.) The Pro's and Con's for most foundations will be similar in nature to those listed in section 7.4.

## **6.7 Federal Government**

There are many roles that government(s) could potentially play in being the aggregator or supporting aggregation.

### **6.7.1 Federal Government – Direct Involvement**

The federal government could form a Crown corporation to directly aggregate / purchase credits from landowners participating in an afforestation program. The government would aggregate and potentially sell the credits to buyers, bringing in revenue. This revenue could be used to continue assisting afforestation program implementation. There is potential for the Crown corporation to deliver the afforestation program, become the national registry for carbon credits, as well as being the aggregator.

The government, when entering into a funding assistance agreement with a landowner, could exchange their financial assistance for ownership of the carbon credits. It is suggested that the landowner have the option to retain ownership of carbon credits by providing more than fifty percent of the plantation establishment costs. If the government provides more than fifty percent of the plantation establishment funding, then the government acquires ownership of the credits for a stated time period. If carbon credit prices are worthwhile, then the government could contract out the measurement, verification, and aggregation of the credits that they own. The government could then sell these credits and provide some cost recovery. If carbon credit prices are low (less than \$5.00 CDN), it may not be worthwhile to measure, verify, aggregate, and sell.

**Pro's:**

- There may be efficiencies for one central national government agency to control all the data for small landowners. For example, there could be a registry of afforestation projects, aggregation, and sales of credits. (This is suggested only if no other aggregators expressed interest).
- For all government-funded afforestation projects, government would be aware of whether or not all private land sequestered carbon is being accounted for to meet Canada's obligations. For example, once a plantation is established, the landowner may not be motivated to ensure that carbon sequestered is accounted for, causing a potential waste of government funds, if the program's primary goal was to account for carbon sequestered to meet Canada's overall emission reduction targets. In this case, government would be accountable and the role of aggregation could fall upon government.

**Con's:**

- Government is not known for operating cost-efficient business operations (for example, consider the National Gun Registry program.)
- There is uncertainty whether a Crown corporation is sustainable. Landowners should have assurances that aggregation systems developed will remain long-term to enable long-term marketing of their carbon credits, providing they own them.

**Expand Existing Prairie Farm Rehabilitation Authority (PFRA)**

The Prairie Farm Rehabilitation Authority (PFRA), funded by the federal Ministry of Agriculture and Agri-Food, has been in existence for 100 years. The PFRA provides free tree seedlings to bona fide prairie farmers requesting them for shelterbelt establishment. The PFRA operates a shelterbelt nursery at Indian Head, Saskatchewan that has conducted hybrid poplar clone breeding research for regions of the prairies in Manitoba, Saskatchewan, Alberta, and northeastern BC. The PFRA also provides extension services to prairie farmers. The PFRA is a successful operation that could potentially be expanded to meet increased afforestation needs, including administering and/or funding aggregation of carbon credits.

**Pro's:**

- Proven success in current and past afforestation activities. Expand the PFRA model to increase assistance and service to all eligible prairie province landowners, not just bona fide farmers. Aggregation could be part of the responsibilities of PFRA.

**Con's:**

- Government agencies and programs are often suspended at political whims.

### **6.7.2 Federal Government – Indirect Involvement**

There are numerous ways that the federal government could indirectly assist aggregation. These may include the following:

1. Providing significant funding to develop an Afforestation Trust Fund that contracts a trustee to manage the trust. The Fund could provide up-front dollars to hire aggregating contractor(s) to aggregate credits, creating a revenue stream for the Fund. (See section 7.4 of this report for details on the Canada Tree Foundation's Venture Capital Fund concept.)
2. Provide bonding to reduce the liability issues between and seller and buyer related to permanence and delivery shortfalls. This would increase the number of potential parties interested in becoming aggregators, decrease discounting of afforestation carbon credit prices, and remove this liability risk from landowners, aggregators, buyers, banks, and investors.
3. Provide low interest, direct loans to landowners for afforestation. Payment or part payment could be in the form of carbon credits. Government becomes the aggregator in this scenario.
4. Once any aggregation option(s) is selected, then government could financially assist the start-up and aggregation infrastructure building via grants or loans, until carbon sales are made to recover start-up costs.



## 7.0 Parties Showing Preliminary Interest in Being an Aggregator

(*Note:* The parties listed in this section have reviewed and approved the write-ups associated with their company / organization for inclusion in this report.)

### 7.1 Natsource

One international brokerage firm that is becoming active in trading carbon credits, both domestically and internationally, is Natsource. Natsource provides the following services to the energy sector: brokerage services, strategic GHG planning services, and asset management for the GHG portfolios. (Websites: [www.natsource.com](http://www.natsource.com) and [www.gsci.ca/downloads/ggcap.pdf](http://www.gsci.ca/downloads/ggcap.pdf) )

Natsource has identified a business model for accumulating a pool of combined credits for the carbon credit buyers among their clients. This pool, termed a “Supply Aggregation Pool,” is planned to combine credits from the agriculture, forestry, and landfill sectors. The pool aims to provide a stable supply and delivery to the buyers as the volume of landfill credit supply declines over time, while the forestry credit supply increases. (The supply of agriculture credits should remain fairly steady over time.) This mix of sector credits will provide a steady supply stream for delivery in different vintage years.

The model calls for one aggregator or intermediary per sector (agriculture vs. forestry vs. landfill sectors) whereby the credits are collected on behalf of a cooperative or corporation that is jointly owned by the industry sectors. This mixture of carbon credits will create the pool. The cooperative or corporation will provide for centralized administration and disbursement payments to measurement and verification contractors, lawyers, brokers, landowners, etc.

Natsource is willing to provide part of the finances to start up and operate this company or cooperative, but would not have controlling interests. In return for their financial investment, Natsource would get first option on purchasing the credits from the pool on behalf of their clients / buyers. Natsource plans to manage the assets (carbon credit portfolios) on behalf of their clients and desires a steady supply from a credit pool: this is Natsource's primary interest in this model. Natsource, representing the buyers, would therefore have to be competitive in their purchase price for credits.

In developing this model, Natsource has made several key assumptions, including the following:

- a) That government will ensure there is continuing domestic value to forestry, agriculture, and landfill credits for the years 2006 – 2020. In other words, there must be longer term compliance / commitment periods; and
- b) It will be possible to aggregate a minimum of 3 million tonnes of credits annually, combining forestry, agriculture, and landfill gas credits.

#### **Pro's:**

- Potential for an industry partner to help with financing the aggregation component.

- Potential for one centralized administration for all three sectors, thereby minimizing administration and transaction costs per unit (anticipated to be \$2.50 – 3.50 per tonne).
- Potential for long-term sales agreements and sales of less than 100,000 forestry tonnes.
- Potential to reduce risk of non-permanence by diversifying and pooling with other sectors.
- Potential to reduce discounted prices to forestry with the non-permanence issue by mixing more permanent credits from landfills.
- Potential to stabilize annual payments to sellers in the short and long term.
- Having a motivated partner (Natsource) to help with start-up.

**Con's:**

- This model could fail if the government does not ensure that credits will hold value post-2012. Natsource has no interest in helping implement this model if the time frame for pooling and trading credits is not lengthened and guaranteed by government. As well, other forestry (afforestation) aggregation models will fail as well because the volume of sequestered carbon will remain low until plantations are older (in other words, after the year 2015).
- This model does not provide administrative efficiency if the total aggregation is less than 3 million tonnes annually.

## **7.2 AgCheck Canada Inc.**

AgCheck Canada Inc. is a for-profit corporation established in 2003 by the Atlantic Dairy and Forage Institute (ADFI), is a not-for-profit institute operated by New Brunswick dairy farmers. ADFI has proposed a National Agriculture Greenhouse Gas Management Institute (NAGMI) beginning in 2003. NAGMI will be a national not-for-profit applied research and development institution, and will be sustained by funding from AgCheck. It is hoped that NAGMI research results can be packaged for commercialization within a few years to supplement revenue sources.

The ADFI proposal for NAGMI has been made in conjunction with the following organizations: BioAtlantech / New Brunswick Department of Agriculture, Fisheries, and Aquaculture; Elanco Animal Health; and BIOCAP Canada Foundation. CanUS Agra Ventures Inc. is also a member of the proposal team, providing technical and management experience to both NAGMI and AgCheck.

AgCheck is in the business of developing and implementing Clean Development Mechanism (CDM) projects that create verifiable emission reduction credits. They will be active in Asia and Africa as well as Canada. In addition, AgCheck aggregates and sells agricultural GHG emission reduction credits and provides verification services for agriculture offset credits.

AgCheck has invited participation from equity investors from the oil and gas industry, parts of the agriculture industry, and other large corporations.

When contacted, AgCheck indicated an interest in becoming an afforestation (forestry) credit aggregator. AgCheck perceives that good farm management should include “carbon management practices and accounting over the whole farm,” including trees, and sees the synergies of working with farmers who have both agriculture and forestry credits to aggregate and sell.

**Pro's:**

- Potential synergies of one company aggregating both agriculture and forestry credits from the same landowners.
- Potential to be considered more “farm-friendly” to farm and ranch landowners compared to other aggregator types.
- Is partnered with Canadian research (BIOCAP).
- Will be partnered with a multitude of national and international corporations, farm associations, and governments that may provide leveraged financial assistance.

**Con's:**

- The company is newly established, still establishing its finances, and does not have a proven track record at the present time.

### **7.3 Mikro-Tek Inc.**

Mikro-Tek, established in 1990, is a Canadian biotechnology company that produces and distributes microbial cultures of specific mycorrhizal fungi that enhance the survival and growth of plants and trees. Mikro-Tek has an extensive collection of microbes from a range of geographic locations and site conditions. From this collection, appropriate microbes can be selected to ensure the best field performance for the targeted plant or tree species. The cultures to inoculate tree seedlings are mass-produced in a controlled environment using Mikro-Tek’s proprietary biotechnology production procedures.

Mikro-Tek's mycorrhizal inoculum is applied to tree seedlings in the nursery before field planting. Treated trees have been proven to demonstrate increased growth and carbon sequestration compared to non-treated trees. The additional sequestered carbon (surplus to the baseline) is considered incremental sequestered carbon and should be certifiable as carbon credits eligible for compliance with the Kyoto Protocol to offset greenhouse gas emissions.

Mikro-Tek has been working with companies and landowners in Chile who have planted over one thousand hectares in eucalyptus, radiata pine, and quillay trees. These are Clean Development Mechanism (CDM) projects under the Kyoto Protocol, and associated carbon credits are planned to be sold forward to Canadian GHG emitters, brokers, or investors to finance ongoing administration and mycorrhizal inoculation costs. Mikro-Tek also has inoculated over 25 million seedlings in Canadian reforestation projects and is interested in applying the technology in afforestation projects in order to enhance growth rates and increase carbon sequestration potential. The technology has been third party reviewed using Industry Canada’s, TEAM SMART process.

Mikro-Tek is aggregating and selling Chilean afforestation credits from fast-growing species to Canadian large industrial emitters to meet the 2008-2012 emission reduction compliance requirements. These fast-growing species will be harvested in approximately 20 years. The short time-frame means loss of carbon and non-permanence are significant concerns. To provide investors and buyers with assurance of the permanence of carbon sequestration and of a stable credit stream for the longer term (post-2012), Mikro-Tek has formed a carbon pool of aggregated sequestration projects. Mikro-Tek will also inoculate slower-growing Canadian conifer forestry species to add domestic credits to this carbon pool. This will enhance permanence and help meet post-2012 compliance periods. Canadian credits can also be used as carbon reserves to insure against delivery shortfalls, disease, fire, etc.

In summary, Mikro-Tek is in the business of biotechnology. The application of this technology provides for increased timber growth and carbon sequestration. For cash flow and deriving profit, Mikro-Tek manages a carbon pool for aggregating credits and selling them into the marketplace. They intend to include Canadian credits in this pool. Therefore, there is some potential for Mikro-Tek to become an aggregator for Canadian landowner credits or to work with landowner groups and nurseries in Canada to inoculate their seedlings.

#### **Pro's**

- Mikro-Tek is becoming experienced in afforestation, aggregation, and selling of forestry credits earlier than others in the world. They have plantations established and carbon credits being accumulated for sale in Chile (under CDM rules) and in Canada (domestic rules).
- Mikro-Tek is very motivated to be involved in the Canadian carbon marketplace and may have an interest in helping aggregate Canadian landowner credits to support their forestry carbon pool, or to combine Canadian landowner credits with Chilean certified emission reduction (CER) credits in order to make a volume carbon sale, or to sell inoculation to Canadian nurseries providing landowner seedlings. Any of these activities could potentially build a beneficial business relationship between landowners and Mikro-Tek.

#### **Con's**

- Mikro-Tek, like all others, is waiting for Canadian and international forestry guidelines on permanence and other forestry-related issues in order to better assess their business position and interest in being a Canadian aggregator.

[For further information on Mikro-Tek's carbon pool, or for information on the applications of the mycorrhizal inoculums for afforestation and/or agricultural projects, contact Mark Kean at 705-268-3536 or [mikrotek@onlink.net](mailto:mikrotek@onlink.net).]

## **7.4 Tree Canada Foundation**

Tree Canada Foundation (TCF) is a national, not-for-profit, charitable organization established in 1992. Their objectives include:

- Facilitating the planting and care of trees throughout urban and rural Canada;
- Educating Canadians about the benefits of planting and caring for trees;
- Assisting interested parties implement a wide range of self-sustaining tree-planting and educational initiatives; and
- Encouraging corporations, communities, and individuals to participate in the program.

One of TCF's goals is to help reduce the harmful effects of carbon dioxide emissions in support of climate change. All of these objectives align themselves with national public opinion and the federal government's desire to plant more trees and to sequester carbon. TCF has been providing leadership in Canada by planting trees with sponsor, alliance, and partnership support, while reducing government's direct role.

At the same time, TCF has leveraged funds from government, using its cost-sharing private partners. TCF has established a presence in every province, has strong corporate support, and a proven record in the establishment of trees (75 million trees planted over the past 11 years). Tree Canada Foundation's website is [www.tcf-fca.ca](http://www.tcf-fca.ca).

TCF is considering proposing a venture capital fund, focused on rural private land afforestation, which would be supported by government, the private sector, and an appeal for support from urban Canadians via annual donations. Currently, Canada's rural economy is suffering, government is becoming more fiscally responsible, and tree-planting is not seen as a lucrative investment. Where is funding for tree-planting going to come from? Calls for environmental sustainability are coming from affluent urban residents. Canada needs a recognized national charity from which to collect forest-directed donations from urban residents.

The intent is to build a sustainable, ongoing fund. This fund would stimulate afforestation activities through partnerships and alliances. At the same, TCF could aggregate and sell carbon credits from the trees they plant, providing revenue streams for the fund. Revenues generated could pay dividends to the participating landowners for ongoing forest management activities, and funds could also be used to support resources for local stewardship efforts.

**Pro's:**

- TCF is an existing, recognized organization. It would be creating a fund that shares goals and objectives with many landowners and governments.
- The proposed fund has the potential ability to gain financial and moral support from all sectors.
- The proposed fund has the potential for urban financial support via charitable donations; this would please rural Canadians. (There is an increasing split between urban and rural voter interests. Rural Canadians perceive the combined power of the urban voter and of government environmental regulations as eroding rural landowners' right to freely manage their lands.)
- The fund has the potential for sustainability and for continual promotion for planting trees.

**Con's:**

- It takes significant time, energy, and financial resources to build a sustainable venture fund. Government financial assistance at fund startup will be required.
- It will take significant partnering and infrastructure to implement afforestation and / or aggregation activities on a provincial and national scale.

## **7.5 Canadian Federation of Woodlot Owners' network**

The Canadian Federation of Woodlot Owners (CFWO) consists of nine member organizations representing nine provinces:

- Federation of BC Woodlot Associations (28 member associations);
- Woodlot Association of Alberta;
- Farm Woodlot Association of Saskatchewan;
- Woodlot Association of Manitoba;
- Ontario Woodlot Association (five regional chapters);
- Federation des Producteurs de Bois du Quebec (15 regional Marketing Boards);
- Nova Scotia Federation of Woodland Owners;
- Prince Edward Island Woodlot Stewards Co-op; and
- New Brunswick Federation of Woodlot Owners (seven regional Marketing Boards).

These provincial and regional organizations together (56 independent organizations) provide a fairly extensive existing national network of tens of thousands of landowners already knowledgeable about growing and tending trees. As well, these organizations and landowners are already proponents of planting trees. Although the 56 organizations are independent, they are linked together provincially, and then to a national umbrella body (the CFWO). (Newfoundland and Labrador is the only province without a woodlot-owner association.)

Based on questionnaire replies received from twelve individuals representing six provincial woodlot federations (New Brunswick, Quebec, Ontario, Manitoba, Alberta, and BC), the CFWO believes there is member interest in becoming active in carbon aggregation activities in some manner. A new independent cooperative or corporation affiliated to the CFWO could provide national, efficient, centralized administration for aggregation activities, if there is a strong business case for it.

Member organizations would have to participate in identifying and approving a workable model. Carbon credit market prices would need to be high and have low volatility to reduce risk before implementing a model. The new cooperative or corporation could contract out all the activities along with the risk and liabilities and just coordinate the activities in the best interests of landowners. The model could be developed and approved in principle, years ahead of implementation.

The model could include other national federations such as the Canadian Federation of Agriculture and / or the Canadian Cattlemen's Association. Combining agriculture and

forestry credits into a pool controlled by these landowner associations has merit. The resulting joint-venture corporation may be the best business structure and be more accountable and businesslike than a cooperative. A corporate structure provides flexibility for percentage ownership.

**Pro's**

- The existing woodlot organizations already promote and have experience in large-scale tree-planting programs on private land.
- There is an existing network of organizations from regional, to provincial, to the national level.
- The national, centralized administration should be cost-effective for aggregation.
- The organization would be directed by, and have a high trust level with landowners.
- There would be an increase in the memberships of local and regional associations.
- There is potential for this same network or new cooperative / corporation to help government deliver afforestation programs.

**Con's**

- It would take much time (one or two years) and energy to develop, review, and approve a workable national aggregation model.
- Financing the initial infrastructure needed to start aggregation activities may prove to be a challenge.
- Depending on the model developed and what activities the new cooperative or corporation planned to conduct, it could be a risky venture for a new organization.

## 8.0 Summary

### Afforestation Issues

The process of aggregating and selling landowner carbon credits faces many challenges. The first significant challenge is "Will there be sufficient landowner carbon credits to aggregate?" Approximately 100,000 hectares needs to be planted before private sector aggregation will start to become viable, particularly if the species planted are not fast growing clones (such as hybrid poplar). The area of idle, marginal agricultural private land in Canada is considered to be 7 – 11 million hectares, so there is sufficient land base.

The average rural landowner farmer is not likely to be investing in large, new-to-them, types of crops that are long term; have high capital establishment costs; and have market uncertainties, and / or risks, including penalties for shortfalls in crop delivery (carbon credit contract shortfalls). Aging landowners will probably be conservative and not willing to risk their retirement dollars or flexibility. However, landowners may be interested in small afforestation projects (1 – 6 hectares), particularly if government pays a high percentage of plantation establishment costs. (See section 9.1, "Recommendations to Assist Afforestation.")

Convincing landowners or investors to plant large areas for financial return will be difficult. Past and current economic analysis by government and industry has repeatedly shown that when using net present value over long-term Canadian forest investments, that financial returns are low to nil, primarily due to our cold climate and slow tree growth rates. Even when planting fast-growing species such as hybrid poplar and adding carbon credit revenue streams, returns are still low, unless carbon credit prices approach \$15 CDN per tonne CO<sub>2</sub>e and there are many other favourable factors.

These favourable factors include low land investment costs, low plantation establishment costs, no plantation mortality issues, excellent tree growth, good prices maintained for both carbon credits and logs, and low expectations for return on investment. Meanwhile, at the time of tree harvest there will be negative accounting for carbon losses. (See Appendix F2 for a discussion on financial viability of afforestation investments.)

Some landowners do not demand a return on forest investments. These landowners want to plant trees for environmental and social benefits, with economic benefits being a much lesser consideration. For example, these landowners have a strong desire to enhance wildlife habitat and aesthetics on portions of their land. When provided with technical assistance and encouragement, these people will plant small areas with trees (1 - 4 hectares) with their own money. With government funding, they will plant many more trees and hectares.

Government leadership promoting tree-planting benefits, along with significant financial assistance programs, will be needed to plant the number of hectares to sequester sufficient carbon to make aggregation worthwhile.

Afforestation is a different challenge from aggregation, but still a critical component. See section 9.1, "Recommendations to Assist Afforestation," for more ideas to increase participation by landowners.



## **Aggregation & Selling Issues**

Once there are enough established plantations and subsequent carbon credits to aggregate, there are various challenges facing the aggregation and selling of credits.

First, there must be a strong market for forestry credits. With most landowners desiring to plant less than 10 hectares, the number of landowners and the geographic area for aggregating large volumes is huge. This makes administration, measurement, verification, legal fees, brokerage fees, financial guarantees against delivery shortfall, accounting, communication, and payment distribution extremely expensive on a per credit basis.

To reduce these costs per credit, there needs to be some assurance that an aggregator will be in business many years, providing continuity to its clients and amortizing their costs to develop their business infrastructure, set up landowner databases, and so on. Total aggregation costs are estimated to be \$2.50 – 5.00 CDN per credit. Although there may be hundreds of thousands of hectares planted and sequestering carbon, these credits cannot be aggregated unless there is an adequate carbon credit selling price to warrant the aggregation expense.

To pay for aggregation and provide payments to landowners, market prices need to be at least \$5.00 CDN per credit before landowners / aggregators will be motivated to participate in aggregation and selling. For 2003, carbon buyers bought forward Kyoto Pre-Compliance contract options at \$4 - \$8 CDN for non-forestry credits. Forestry credits are currently being discounted in price and very thinly traded.

The amount of discount is thought to vary between ten and fifty percent due to the 'permanence' issue. The forestry permanence issue is currently (December 2003) being discussed at the Conference of the Kyoto Parties in Italy. International guidelines should be announced soon as to how forestry permanence issues should be dealt with. These guidelines may include standardized discounting, government-backed guarantees, use of carbon reserves on and off site, and so on.

Currently, buyers request discounted prices, carbon reserves, and/or financial guarantees against credit delivery shortfalls. It is difficult for aggregators to negotiate with buyers when a forestry credit is currently considered lower quality than a landfill methane gas capture credit. Buyers are focused on limiting their exposed risk and paying low prices. Due to Kyoto not yet being internationally ratified, demand and outlook for credits is soft and market prices are expected to remain low in the near future. With this business scenario, the current concept of required aggregation activities must change dramatically to reduce costs; otherwise, aggregation will not be financially viable.

Most potential aggregators do not have deep financial pockets to provide insurance or financial guarantees for carbon delivery shortfalls that buyers may require. Aggregators will have to contractually shift their liability back to the landowners. The issue of who will be liable for the 'permanence' risk is significant and will prevent many landowners and potential aggregators from participating. Many existing organizations, new organizations, and private businesses will not be well enough established to satisfy

buyers that they can meet the guarantees required with any carbon delivery shortfalls. This financial risk barrier will reduce the number of potential aggregators.

Government may be able to play a role in underwriting the risk of permanence by bonding aggregators. This could alleviate the highest risk factor that landowners, aggregators, and buyers face in conducting transactions. Forestry credits might then be considered 'quality' credits demanding full market price rather than being discounted. Maintaining unsold reserves of carbon is a less preferable option for underwriting landowner risk, because it discounts the volume of available credits, similar to discounting the selling price, and is not desired if there are other options. (For more details, please refer to section 9.2, "Recommendations to Assist Aggregation.")

### **Aggregator Types with Potential**

Preliminary research revealed that the following aggregator types may be motivated to become aggregators:

- *Landowner-controlled organizations such as the Canadian Federation of Woodlot Owners, whereby small regional associations are networked to provincial and national levels representing landowners' interests:* Several farmer and rancher associations / organizations, such as the Canadian Cattlemen's Association and the Canadian Federation of Agriculture, have similar regional, provincial, and national networks. Several of these landowner networks could potentially form one aggregator corporation in the interests of their landowner afforestation and agriculture carbon members.
- *Brokerage firms that want to engage in trading carbon credits and are motivated by large volume trades with associated commission fees:* These firms are more interested in the selling end of the aggregation spectrum of activities, rather than the front-end measurement and verification; however, potential profits may motivate them to contract other parties to provide the up-front services needed to measure and certify credits.
- *Private businesses that have the associated expertise to engage in aggregation:* Should the aggregation business opportunity come to light, entrepreneurial companies may come forward. Public solicitation may be required to identify the various companies that may be interested and qualified to become an aggregator.
- *Other companies already engaged in aggregating credits for different industry sectors or internationally:* For various reasons, these companies may have the desire to combine Canadian forestry credits with other types of credits. For example, they may want to increase the volume of credits to secure sales, or to decrease aggregation administration costs.
- *Foundations:* Those that see a business opportunity to either receive carbon credit donations, or aggregate and sell credits at a profit for their organization may become interested in being aggregators. An example is the Tree Canada Foundation.

- *The federal government:* The government could become the owner of the credits in exchange for assistance with plantation establishment funding. Government will need to aggregate their credits in some manner.

There is also potential for other aggregator types to come forward when they see enough economic opportunity to do so. Potential aggregators could include banks and insurance companies. Parties already showing preliminary interest in being aggregators are listed in section 7.0 of this report.

### **Conclusion**

There are many significant challenges, particularly economic issues, facing both afforestation and aggregation activities. Many of the non-economic issues can be successfully addressed, as described in section 9.0, “Recommendations.”

**The economic issues are significant and make both afforestation and aggregation for sequestering carbon not feasible in the near future, unless government funding and support are provided.**

When the economics become viable, there is potential for various sources of aggregators to come forward when they see a profitable opportunity. Landowners, through their affiliated landowner and sector organizations, will select the aggregator(s) whom they trust and who will look after landowners’ best interests and provide very low cost aggregation services.

It is expected that landowner organization networks may become involved in aggregation activities on behalf of their members. Their involvement will largely be subject to the market price of carbon credits and the number of their members with carbon credits to sell. This may include agriculture sector credits as well as forestry credits.

These landowner organizations are not likely to step forward as aggregators until carbon market prices are relatively high, and their members pass resolutions to their organization's executives to investigate collective marketing of members’ credits. Non-profit organizations’ responses to a member's significant resolution generally take one year to initiate and a second year to produce results. Consequently, these organizations and associated landowners could miss the peak of a carbon credit market, unless they start to become more aware of the carbon credit business and are prepared to act when the timing is right.

**Engaging landowners’ organizations in delivering afforestation programs will prompt early attention to the need to supply aggregation services to their members.**

## 9.0 Recommendations

### 9.1 Recommendations to Assist Afforestation

- Build trust between government and landowners. Landowners perceive that rural areas are being ignored and landowner rights are being eroded by federal and provincial governments.
- Share more information between provincial and federal forestry and agriculture departments to prevent competing messages to landowners regarding idle and marginal land crop options: for example, suggestions to plant grass versus trees.
- Provide transparent communications with landowner groups and provide awareness of all the economic, environmental, and social benefits of planting trees.
- Focus firstly on the multiple benefits of planting trees, and secondly on carbon sequestration.
- Promote options for integrating agriculture and forestry practices (agroforestry) to landowners. Various agriculture cropping strategies (sun, shade, alley, and riparian crop systems) can provide short-term cash flow while trees are maturing. This is an emerging industry that diversifies revenue streams and has numerous environmental benefits.
- Present the complexities of afforestation carbon credits in laypersons' terms.
- Provide certainty and stability around afforestation programs and carbon sequestration rules.
- Identify the early adopters for afforestation projects and encourage them.
- Minimize and simplify any paperwork for the landowner.
- Minimize the need for covenants or easements on private land or other infringements on landowners' rights and freedoms to manage their lands.
- Convince provincial and regional government agencies to reduce, rather than increase, property taxes on lands being planted with trees.
- Force changes to the Income Tax Act to allow tree plantation expenses to be deductible from off-farm and off-woodlot income without having to pass the test for "reasonable expectation of profit" that is being brought back into effect in 2005.
- Ensure that other "farm benefits" and "farm status" (provincial and federal) are not lost when converting agriculture land to forest land.
- Accept that landowners may not be interested in planting hybrid poplar or other fast-growing or non-native species. Landowners must be involved in selecting the species to be planted.
- Assist with plantation establishment costs. Assistance can take many forms, such as direct government funding and/or cost sharing; zero interest loans (payments in carbon credits); or guaranteed loans at the bank.
- Provide extension services, such as technical assistance and advice at the field level.
- Encourage on-the-ground activities by landowners or local, reputable contractors.
- Engage landowner organizations to deliver an afforestation program.

Past government tree-planting programs have been good, but have been sporadic and lacked continuity. Similar to investing in RRSPs, slow and steady investments in planting trees is the way to secure the future. Small, steady annual investments or

commitments to planting programs, similar to RRSP cost-averaging investing, are the answer to managing our forestry resources into the future. We need to continually encourage people to plant trees.

This could be accomplished at relatively low cost by the following government actions:

- Providing sustained annual funding to regional landowner organizations to contract forestry consultants, with the purpose of providing extension services to help landowners plan and implement planting projects. Annual funding can be tied to the past year's performance (number of trees planted by landowners within the region).
- Providing landowners with free seedlings (paying nursery costs).

This could be the base program providing a sustained and continual awareness to encourage tree-planting. Government can greatly increase the number of trees planted by providing additional direct government funding for plantation establishment activities when they can afford to do so.

Based on the ever-changing world and societal demands, afforestation carbon credits and timber supplies could both become very valuable in the future. If Canada starts planting trees now, there will be established plantations with increasing tree and carbon growth rates to supply future markets for both carbon and timber.

## 9.2 Recommendations to Assist Aggregation

### **The two important economic issues where government assistance is needed:**

1. Provide viable solutions in removing “permanence” risk liability from landowners, aggregators, and/or buyers. This will make both afforestation and aggregation more economically viable, and will also motivate landowners, aggregators, and buyers to participate. With a solution to this financial risk issue, forestry credits will not be discounted or ignored by buyers. Government underwriting or bonding to provide financial guarantees against permanence issues is one potential solution. This allows new organizations without deep financial pockets to be aggregators who buyers will transact with. Examples include new landowner aggregator cooperative(s) or corporation(s).
2. Provide sufficient incentive and motivation for hundreds of thousands of hectares to be planted (otherwise, aggregation is not viable and “offset emissions” accounting will not occur).

### **Other recommendations to consider:**

- Simplify measurement, verification, and aggregation methods to reduce costs.
- Ensure that the carbon measurement and accounting system are transparent, user-friendly, and easily understood by landowners.
- Simplify measurements that can be conducted by the landowner and then audited.
- Promote policies that are simple and lack associated regulatory red tape.
- Provide assurances that any afforestation program will have continuity, stability, and sustainability into the future. A short-term afforestation program (less than 15 – 20

years) will reduce the viability of the business of aggregation. Many of the up-front costs of aggregation (infrastructure) need to be amortized over many years. (At the same time, the market price of credits has more influence on business viability).

- Promote the combining of agriculture, forestry, and landfill gas credits for aggregator efficiency and reduced dependence on 100,000 tonnes of forestry credits to make one sale. This also improves cash flow for an aggregator and landowners.
- Promote large geographic aggregation areas to enable viable aggregator business operations.
- Ensure contractual language is simple and clear.
- Promote landowner agreements that have minimal to no infringement on landowner rights or freedom to manage.
- Promote low to nil up-front costs for landowners to participate.
- Promote fair payment and timely distribution of carbon sales to landowners.
- Consider soliciting all aggregator source types to choose low cost aggregator(s).
- Promote landowner organizations' involvement in aggregator activities.
- Promote flexibility. The best overall aggregation option may feature various aggregation activities performed by different parties.