



Sustainability Means Markets Must Matter

BIOLOGICAL CARBON CANADA'S RESPONSE TO AGRICULTURE AND
AGRI-FOOD CANADA: A SUSTAINABLE AGRICULTURAL INDUSTRY FOR
CANADA

Biological Carbon Canada | March 29, 2023

Executive Summary

The sustainability of the primary sector of Canada's agricultural industry is foremost an economic one.

Like other Canadian industries, earnings (profit) pay for environmental and social commitments. The environmental costs (pay to pollute) are a part of doing business for some industries. Primary agriculture requires significant new earnings to invest in environmental and social issues in this paper.

Earnings are now at risk when examining abatement costs for greenhouse gas emissions reductions and other social commitments. There is potential to add to farm earnings from a regulated market in Canada. However, the Canadian voluntary market potential cannot cover the expected abatement costs.

The current documentation of a sustainability plan for primary agriculture is short on policy tools, long on issues that could warrant spending public money on, but short on the structural changes needed to cement transition.



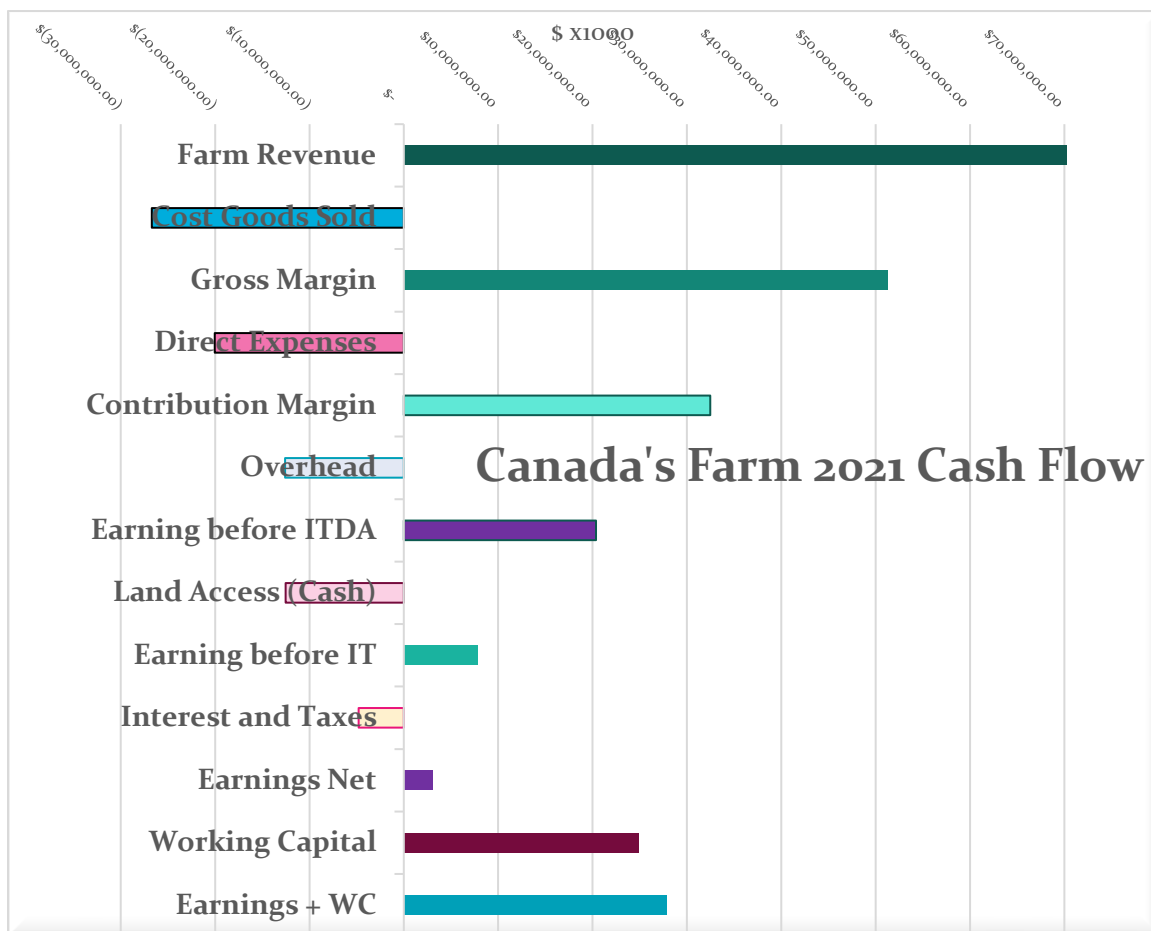
Farm Cash Matters

Figure 1 shows Canada's farms' 2021 cash flow health.

It shows earnings (EBITDA) of approximately \$20 billion. Earnings pay for land and capital access costs and taxes. After paying for management costs, net earnings of \$3 billion are left.

Working capital is also measured. Working capital is the potential revenue from stored inventory (no breeding herd) and payment of current liabilities over the next year.

Figure 1 – The State of Cashflow for Canada’s Farms for 2021.



EARNINGS EQUALS SUSTAINABILITY

The first question in building sustainability is the ability of economic performance, earnings, profitability, and cash flow.

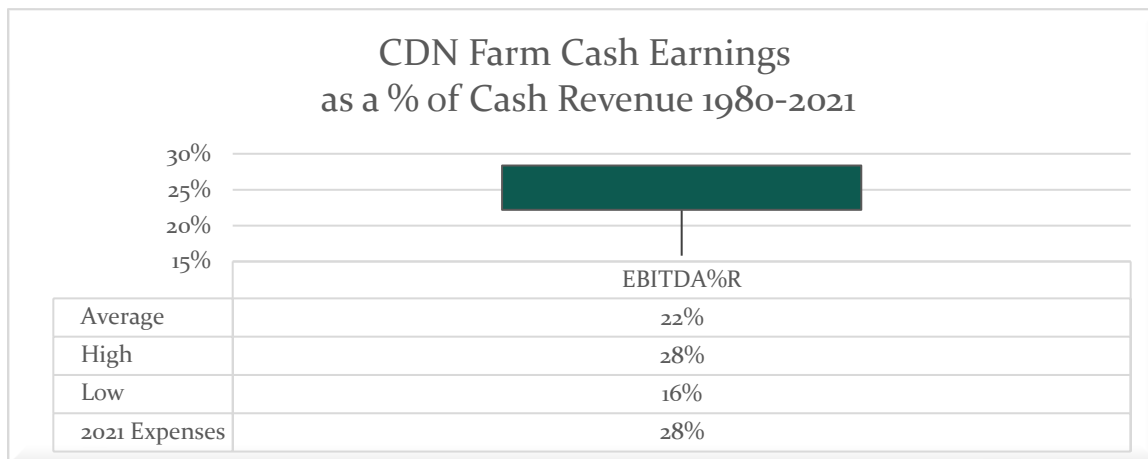
Canada has set their emission baseline at 2005 levels. As a result, primary agriculture will need to voluntarily remove 34.6 million tonnes of greenhouse gas emissions (combined with sustained soil sequestration) to reach the 2005 target. This can be accomplished by 2050.



The Council of Canadian Academies estimated the farm abatement cost is approximately (averaged out) \$100 per tonne. The abatement cost is removing (and sequestering) one tonne of CO₂e. At this price, the payment and costs on the agricultural industry is approximately \$3.46 billion, \$1.7B in 2021¹. This does not include the levy costs on natural gas and propane or the Ministry's estimate of up to an additional 0.5% inflation on farm costs due to the carbon levy embedded in supply purchases.

The abatement spending is slightly larger than the current farm cash net earnings available. This is important because earnings as a percentage of revenue is consistent.

Figure 2 – Earnings as a % of Revenue

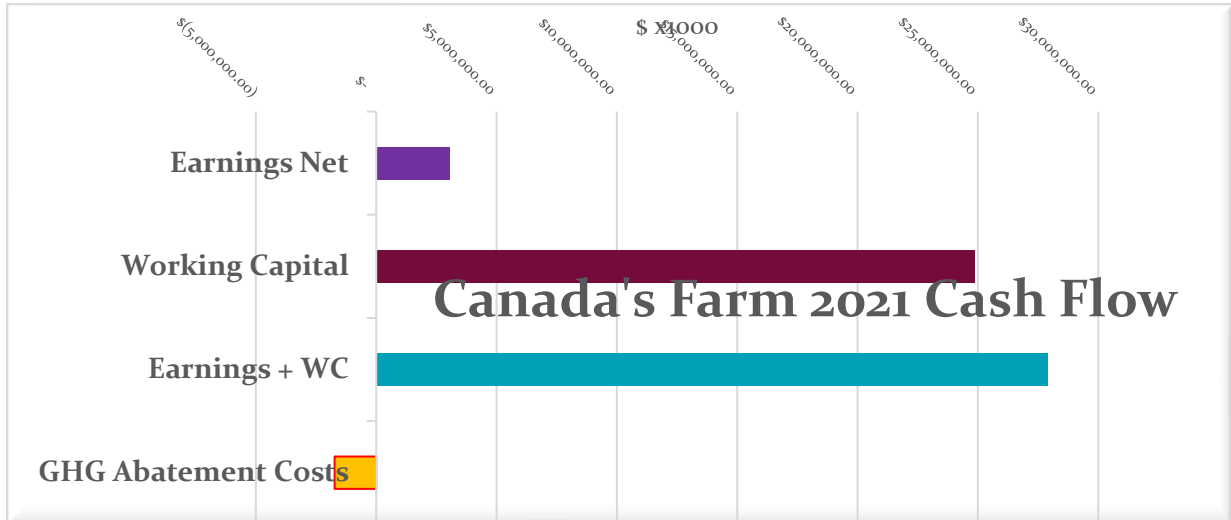


The working capital is net of the inventory available for sale at year-end, less the current liabilities on the farm. The current liabilities are the outstanding payments due over the next 365 days, and it requires the sale of the stored inventory to pay for this cash outflow.

¹ NPV out to 2050, discount 6.65%, 0.5% inflation on abatement costs

This means the abatement costs for the reductions the Government of Canada proposes will need to be paid for from the inventory (working capital) to keep the current net earnings.

Figure 3 – Adding (\$1.7 billion) to the farm cash flow to fund on-farm GHG reductions.



Implications – There is insufficient cash flow to pay for the abatement costs. This is just for greenhouse gas reduction targets. This estimated amount does not include abatement costs to reverse soil degradation and other biodiversity reductions.

Why Do Markets Matter?

Without a carbon market in Canada, all abatement costs are paid from working capital. The farms' net earnings are not sufficient.

Emission technologies were evaluated in the recent publication by the Expert Panel on Canada's Carbon Sink Potential (Council of Canadian Academies). All have protocol potential.



The first table shows the maximum potential when the technology is a regulated protocol with escalating carbon levy, with the NPV calculated to 2050. The second is a voluntary protocol holding the value at \$20/tonne CAD.

Table 1 – NPV Potential Regulatory Market

Practice	CO2e Mt/year	Opportunity	Potential Tonnes/year	Net Present Value of Potential Revenue (@25%)
Cover Crops	9.78	0.4	3,912,000.00	\$ 1,752,670,720.81
Legume	2.6	0.5	1,300,000.00	\$ 582,431,476.75
No-Till	0.9	0.8	720,000.00	\$ 322,577,433.28
BioChar	6.9	0.2	1,380,000.00	\$ 618,273,413.78
4R	6.3	0.6	3,780,000.00	\$ 1,693,531,524.71
Alley Cropping	3.9	0.2	780,000.00	\$ 349,458,886.05
Silvopasture	2.8	0.2	560,000.00	\$ 250,893,559.22
Shelterbelts	0.2	0.5	100,000.00	\$ 44,802,421.29
Avoid Grassland Conversion	8.4	0.2	1,680,000.00	\$ 752,680,677.65
Grasslands Restore	0.55	0.2	110,000.00	\$ 49,282,663.42
Grass Management	0.22	0.2	44,000.00	\$ 19,713,065.37
Totals	42.55		14,366,000.00	\$ 6,436,315,842.31

Table 2 – NPV Potential Voluntary Protocol

Practice	CO2e Mt/year	Opportunity	Potential Tonnes/year	Net Present Value of Potential Revenue (@25%)
Cover Crops	9.78	0.4	3,912,000.00	\$ 312,203,309.15
Legume	2.6	0.5	1,300,000.00	\$ 103,748,543.43
No-Till	0.9	0.8	720,000.00	\$ 57,460,731.75
BioChar	6.9	0.2	1,380,000.00	\$ 110,133,069.18
4R	6.3	0.6	3,780,000.00	\$ 301,668,841.66
Alley Cropping	3.9	0.2	780,000.00	\$ 62,249,126.06
Silvopasture	2.8	0.2	560,000.00	\$ 44,691,680.25
Shelterbelts	0.2	0.5	100,000.00	\$ 7,980,657.19
Avoid Grassland Conversion	8.4	0.2	1,680,000.00	\$ 134,075,040.74
Grasslands Restore	0.55	0.2	110,000.00	\$ 8,778,722.91
Grass Management	0.22	0.2	44,000.00	\$ 3,511,489.16
Totals	42.55		14,366,000.00	\$ 1,146,501,211.47

Figure 4 – Net Earnings Changes Regulated

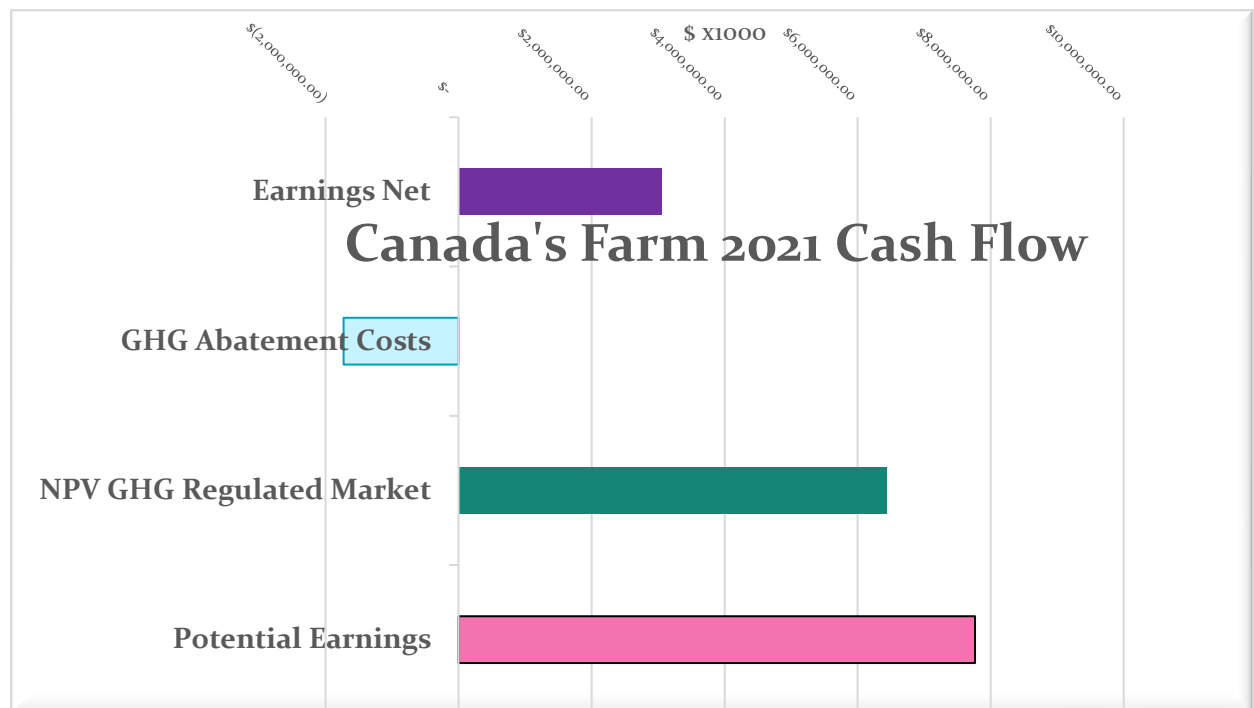
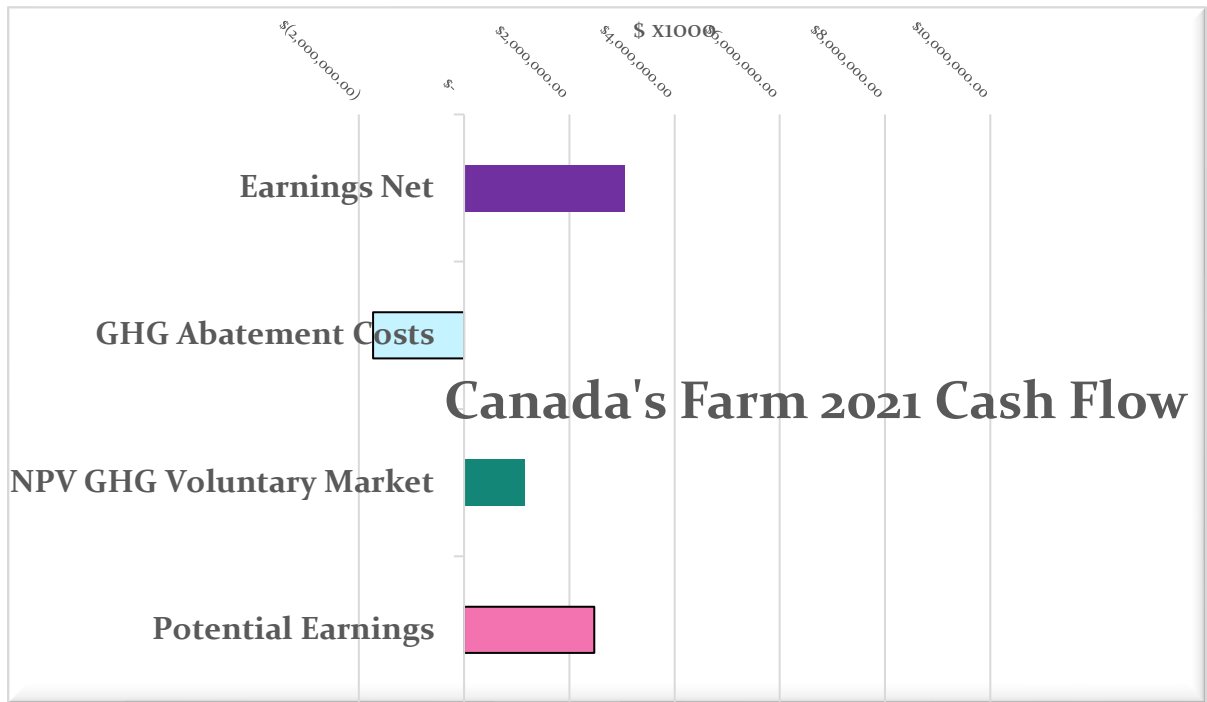


Figure 5 – Net Earnings Changes Voluntary



A regulated market can potentially add \$4.7 billion to the farms’ net earnings. However, the voluntary market would reduce net earnings by \$582 million (unless supply/demand raises the estimated price). This \$582 million would need to be covered by the working capital.

Non-market Implications

Without the regulation infrastructure, the opportunity factor will require a deduction, and the risk factor for the NPV will require a minimum of a 10 point increase (30%).

As the complexion of the full carbon market expands, with the lack of market infrastructure, the risk premium is expected to rise. This means the value of a cash flow in today’s dollar value will decrease.



AAFC Asked - How can a Sustainable Agriculture Strategy for Canada support an environmentally, socially, and economically sustainable agriculture sector?

The strategy has the order backward. The farm must first be economically sustainable. This means Canada's farms can pay bills, invest in technology, and build non-farm retirement savings.

The strategy does not address what the agricultural sector will be accountable for protecting. Instead, the discussion document discusses land conversion, soil loss, and habitat degradation. Unlike other businesses and industries, this discussion document lacks policy signals on accountability issues.

The plan looks like a spending plan with little or no accountabilities.

Lastly, the social issues of food and rural development previously announced by the Government are beyond the scope. The vast majority of today's primary agriculture sells commodities that are not ready to eat. However, for some farm businesses, there are many steps from when the farm commodity leaves the farm gate, is processed, and shows up on a store shelf, and is ready to be consumed as food.

Extra care in this plan should address the delivery of public goods by those agricultural businesses in supply management.

POLLUTER PAY PRINCIPLES

A recent paper by the Arrell Food Institute at the University of Guelph placed the cost of soil erosion from Canada's farms at \$3.2 billion annually. They concluded the loss of yield and erosion abatement costs to remediate are part of this charge.

If they are correct on this one issue, Canada's farm earnings are improvable.

A recent paper² discussed a 0.5% increase in food prices in North America due to land erosion. At \$8000 per adult per year³, Canada's families will spend \$245.8 billion on food.

That 0.5% attributable increase in food budgets from soil erosion can be valued at \$1.23 billion.

² Martina Sartori, George Philippidis, Emanuele Ferrari, Pasquale Borrelli, Emanuele Lugato, Luca Montanarella, Panos Panagos, *A linkage between the biophysical and the economic: Assessing the global market impacts of soil erosion*, Land Use Policy, Volume 86, 2019

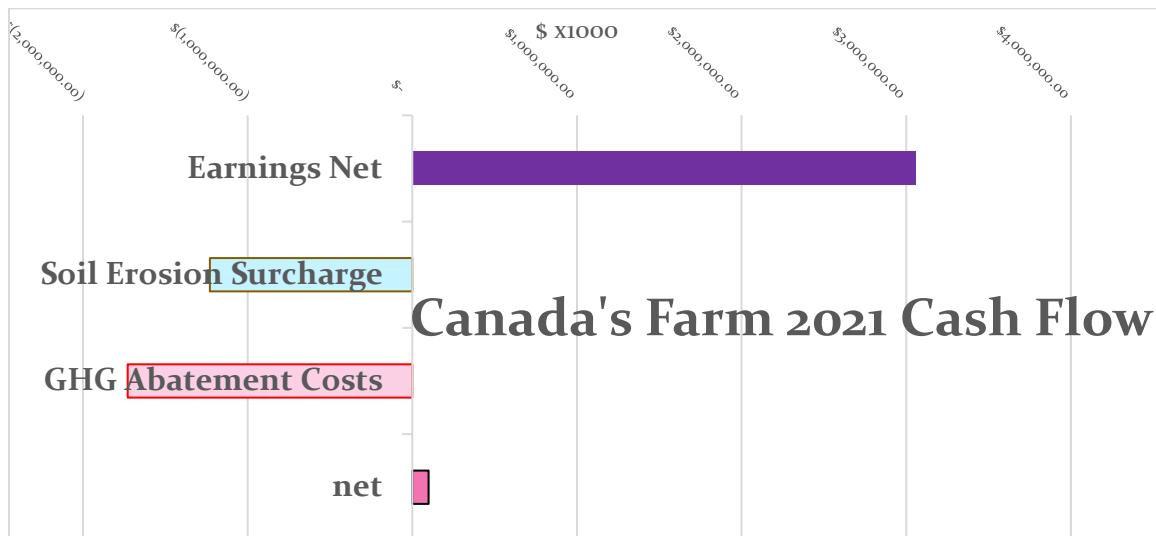
³ Statistics Canada



The principles of polluter pay would lead to a discussion of a \$1.23 billion surcharge to recoup the damage inflicted on household budgets.

By adding the greenhouse gas abatement costs, net farm earnings drops to just \$98 million.

Figure 6 – Change of Earnings with Erosion Surcharge



Be clear! This is not a call to levy a surcharge on the primary agriculture sector.

This is to point out that other sectors of Canada’s economy are subject to the polluter pay principles. We can agree any additional levy would severely restrict the ag sector’s earnings.

But, there is an actual cost to soil erosion. The net earnings across Canada’s farms may be missing an additional \$3.2 billion when farm management choices lead directly to soil degradation and erosion.

There is also a social cost. Today’s Canadian families are willing to absorb into their food budget the erosion inflation cost.



Picture - Grassed water drainage



AAFC Asked - Given the pace of change needed, in which areas could regulatory approaches or changes to existing ones be used to accelerate environment and climate action?

There needs to be an all-of-government approach.

THE MARKETPLACE

We have continued to express the need for a sustainable marketplace. Canada needs carbon marketplace rules.

We have examples. Canada has reasonable rules for the trade of grains across most of Canada. Canada has a reasonable set of rules for creating, selling, and brokering derivatives. Canada also has a complex set of rules for supply management and approved monopolies.

Canada does not have transaction rules for carbon emissions and other environmental services trading.

No marketplace rules raise risks placed directly on the makers' and sellers' shoulders. We can see this today on the basis of regulated offsets. They trade as a discount under the levy price.

In the past year, issues of certificates being real are dogging this unregulated over-the-counter marketplace. Examples include:

- 2023Feb – A London-based brokerage lost its appeal and must pay compensation in an EU carbon trading fraud case.⁴
- 2023Feb – A BC seaweed company, Synergraze Inc, is reported by Trans Mountain that their offsets may be in question with the factory being rejected for a permit. ⁵
- 2023Jan – The Guardian reported 90% of the rainforest credits are likely phantom.⁶
- 2022Aug – A Taiwan company and its owners, were convicted of fraud in a carbon credit trading scam.⁷

⁴ <https://carbon-pulse.com/191476/>

⁵ <https://www.nationalobserver.com/2023/02/23/news/fight-save-climate-carbon-credits-cow-burps>

⁶ <https://www.theguardian.com/environment/2023/jan/18/revealed-forest-carbon-offsets-biggest-provider-worthless-verra-aoe>

⁷ <https://carboncredits.com/carbon-credit-scam-checklist-avoid-scammers/>



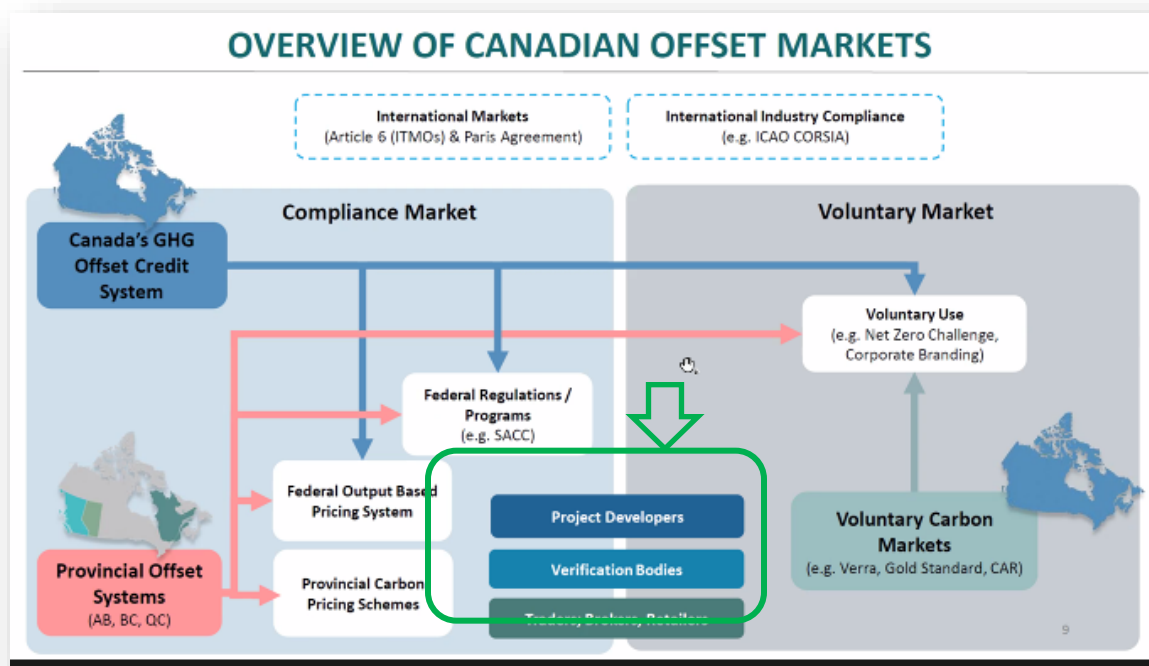
Canada has a standard (a protocol) for creating a regulated greenhouse gas offset or credit. At the end of the transaction chain, the Minister (Canada and Alberta) decides to accept (or not) the certificate for compliance.

What is missing is the market rules between making an offset and submitting an offset for compliance.

Unlike other commodities, carbon markets don't have market rules on who can be aggregators and brokers, payments are not protected, and contracts are not defined. Even in the regulatory environment, this lack of market rules exist.

Once the agricultural industry engages the non-protocol markets, standardization of a carbon product is also lost.

Figure 7 – Visual of the Market, Source ECCC



The issues and targets for market rules are identified within the green square above.

WHY IS THIS CRITICAL NOW?

Canada needs to keep pace with our largest market, the USA.

In the giant spending bill passed in December of 2022 by Congress, the USDA received \$4 million over four years to execute a *Growing Climate Solutions Act*.

What is key is the American voluntary carbon market now has a ‘regulator’. Borrowing⁸ from the National Law Review, the USDA will be:

The *Growing Climate Solutions Act* (the “Act”) is the first congressional effort to help farmers, ranchers, and private forest landowners to participate in voluntary carbon offset markets.

- *To assist these groups, the Secretary of Agriculture must publish a list of widely accepted industry protocols to support the calculation and verification of GHG reductions used to generate meaningful and marketable credits.*
- *USDA also may establish a voluntary program to expand access to information, technical assistance, and direct services related to developing and marketing carbon credits.*
- *A list of voluntarily registered “covered entities,” administered by USDA, would be deployed to improve access to information and increase transparency, consistency, and service reliability across U.S. carbon markets.*
- *The Act creates an Advisory Council, broadly representative of the agricultural and private forest sectors, to administer the program and conduct periodic assessments of the credit markets.*

What are the implications? The carbon market south of the border will scale faster than Canada.

Recommendation – The language of the Canada Grains Act can be modified and introduced in new legislation to create a Carbon Commission and carry out the duties and responsibilities similar to the Canadian Grain Commission.

⁸ <https://www.natlawreview.com/article/congress-passes-and-funds-support-nature-based-greenhouse-gas-reductions>



Other Regulatory Tools

TAX POLICY

Notwithstanding one-time and short-term program grants can kickstart change, more extended-term tax and policy changes have been shown to support structural change.

The Government of Canada should examine changes to tax policy to support adoption.

Below is a table outlining examples of tax policy changes that would provide longer-term shifts in business practices.

Table 3 – Tax Policy Shifts Examples

Sweeten the Pot	Put Salt in the Feed
<p>Refundable Tax Credits (RTC) for investments made in:</p> <ul style="list-style-type: none"> • Permanent grassing of waterways and buffer zones around wetlands. • Fertility and soil carbon monitoring • Investments made by Agrologists in continuing professional development. • Investments in protocol development. • Planting and maintaining shelterbelts. • Installation of backup generation equipment. • Purchase of agrology services. 	<p>Lower CCA pool rates for equipment assisting soil degradation and GHG emissions.</p> <ul style="list-style-type: none"> • Examples <ol style="list-style-type: none"> 1. Fertilizer broadcast applicators. 2. Tillage equipment with disturbance over 50%. <p>Delaying capital gains exemption qualification when rangeland is converted to annual cropping by five years.</p> <p>Broadcasters are encouraged to amend their code of conduct when buying agricultural advertising.</p>
<p>Increase the capital gains exemption ceiling to match the current value of farm assets.</p>	<p>Lower the capital gains exemption on lands converted to urban development within five years.</p>



Picture - High Disturbance Tillage

OPEN THE DOOR

Alberta has an open door for the industry to submit a protocol for approval. The same Government has set the standard for making a protocol. This supports and allows for private investment in protocols.

Alberta's NERP⁹ is a good example of taking 4R principles in fertilizer management and building a protocol from them.

The Government of Canada currently has no door.

Recommendation – The Government of Canada creates a door for private submissions of protocols.

Recommendation – The Government of Canada sets a standard for protocol design.

OTHER POLICY TOOLS

The discussion paper outlines examples of desired practices.

Below is a table suggesting policy changes to support those practices.

⁹ Nitrous Oxide Emission Reduction Protocol

Table 4 – Practice Change

Practice	Policy Instrument
Permanent Cover	Replicate the USDA’s Conservation Reserve Program. An annual program payment for the restoration and conservation of perennial grassland.
AAFC Seed Licensing	Amend seed licensing to include climate and drought adaptation characteristics.
Federal and Provincial Agricultural Ministry Agreements.	<p>Add forage and native range production insurance. Deliver the same suite of insurance programs already provided to growers of annual crops.</p> <p>Disqualify acres for five years for crop insurance eligibility when those acres are converted from the native range. This also includes converted perennial grass buffers around wetlands.</p>
Food Fraud	Amend legislation to mirror the US Government’s approaches to food fraud.
Financial Services	Mirror the latest USDA announcement. Modify Farm Credit Canada’s mandate to be the premium choice and source for long-term agricultural credit and working capital.

Conclusion

The sustainability of primary agriculture is first an economic one. The rest will follow.



Picture - Highly Species Diverse Landscape

For More Information

Biological Carbon Canada can be reached at biologicalcarboncanada@gmail.com or through www.biologicalcarbon.ca .