

# Background

- Food, fibre & biofuel feedstock production accounts for 10% to 30% of global GHG discharges. In Canada, ag sector GHGs are 20% larger than total electricity sector GHGs.
- No nation has more to win--or lose--than Canada, if we do not get this right.
- Does the sector want regulation or a market measure?

Figure ES-2 Breakdown of Canada's Emissions by Intergovernmental Panel on Climate Change Sector (2019)

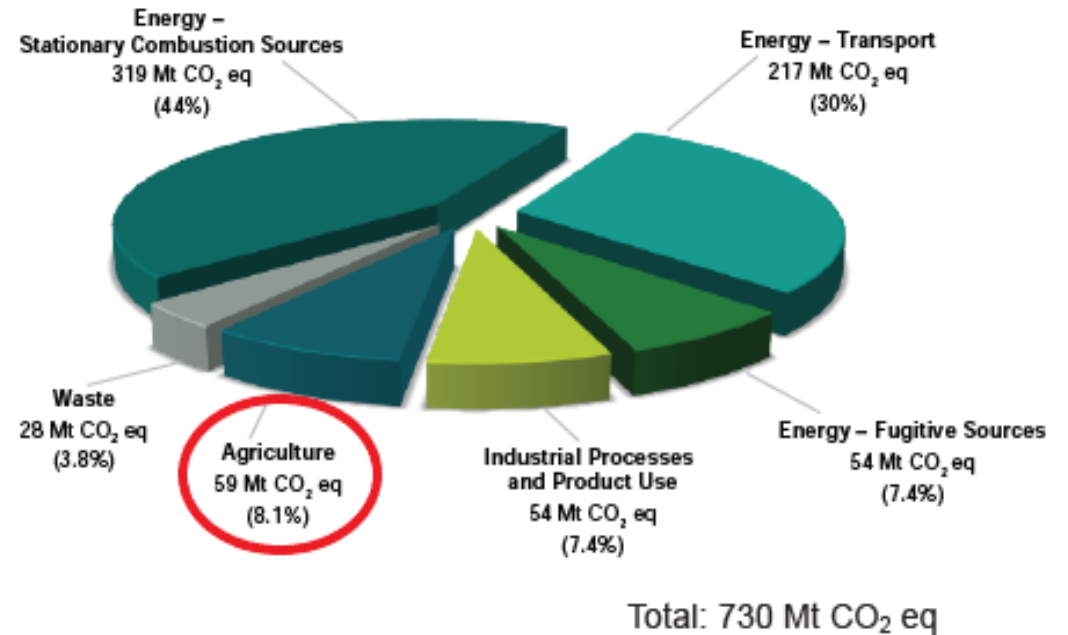


Table ES-1 Trends in GHG Emissions and Economic Indicators, Selected Years

Year	2005	2014	2015	2016	2017	2018	2019
<b>Total GHG (Mt)</b>	<b>739</b>	<b>723</b>	<b>723</b>	<b>707</b>	<b>716</b>	<b>728</b>	<b>730</b>
Change since 2005 (%)	NA	-2.2%	-2.1%	-4.3%	-3.1%	-1.4%	-1.1%
<b>GDP* (Billion 2012\$)</b>	<b>1 654</b>	<b>1 926</b>	<b>1 938</b>	<b>1 953</b>	<b>2 022</b>	<b>2 078</b>	<b>2 115</b>
Change since 2005 (%)	NA	16%	17%	18%	22%	26%	28%
<b>GHG Intensity (Mt/\$B GDP)</b>	<b>0.45</b>	<b>0.38</b>	<b>0.37</b>	<b>0.36</b>	<b>0.35</b>	<b>0.35</b>	<b>0.35</b>
Change since 2005 (%)		-16%	-16%	-19%	-21%	-22%	-23%

# Canada Ranks #2

*...when it comes to theoretical potential to draw heat trapping gases out of the atmosphere and store captured C in soils and root systems*



Source: FAO GSOC map

# “Registry”, “Market” and “Market-Maker” are Different

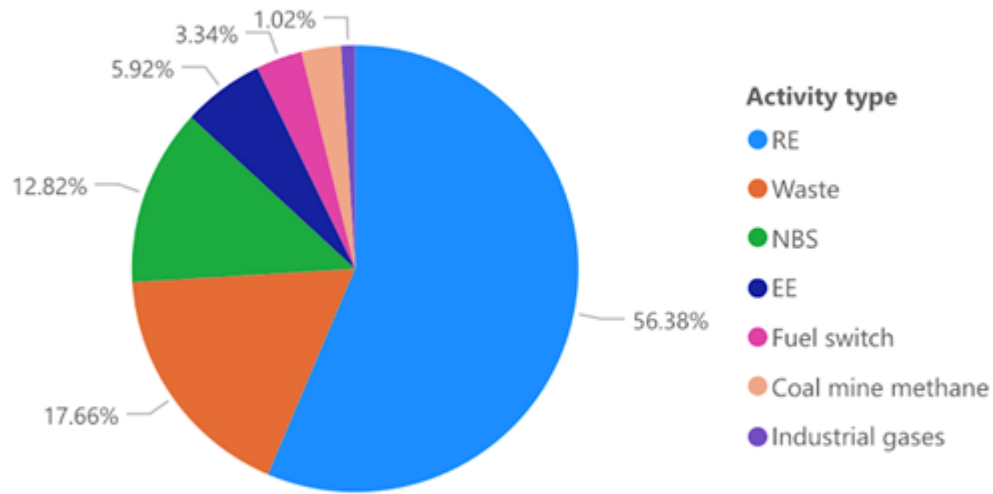
- A **Registry**—e.g. Gold Standard, Verra, CAR, Nori, Alberta Carbon, California Air Resources Board Offset Program—establishes GHG/net C sequestration accounting, reporting & verification standard, as well as a method for determining if/when reported change in GHG emissions/C stocks shall be deemed incremental and, therefore, creditable. The Registry publishes a list of “projects” that meet their standard, and discloses all credits issued to the “Project Owner” and used or “retired” pursuant to their unique standard. The Registry does not track or report credit sales, credit leases or swaps, or facilitate true credit price disclosure.
- A **Market**—e.g. EEC, Chicago Climate Exchange (now defunct), Nori—establishes a platform to support credit trading, typically including mechanisms designed to facilitate true and timely price disclosure. At this time, the Market administrator may approve the listing and sale of credits that are issued by 3<sup>rd</sup>-party controlled registries, or coincidentally act as a registry and a market.
- A **Market-Maker**—e.g. IndigoAg, the US Commodity Credit Corporation (potentially)—buys and resells credits. A Market-Maker could also act as broker for farmer/rancher landowners, or as a Project Owner.

# Verra Registry Performance Summary

Carbon standard:  LDC - Not LDC:

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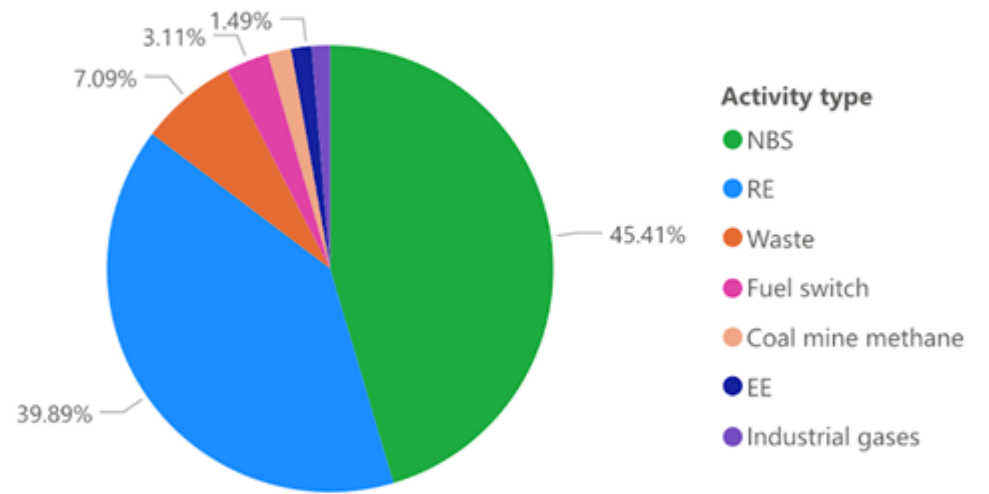
Registered projects by activity type



1857

Registered projects

Credits issued by activity type



853M

Credits issued

# Established “Soil C Markets”, To Date

as of 2022/01/31	Gold Standard	Verra	CAR	Nori
# of approved ag sector-relevant protocols	1 in process	5	2	1
# of credits issued to farmers/ranchers/grasslands preservation orgs for SOC sequestration, to date	0	0	0	84k
# of credits recorded as retired or “used” to date	0	0	0	76k
average reported payment to Project Owner, per issued credit (US\$, nominal)				US\$15/TCO2e
average time lag between first payment to registry operator and Project Owner receipt of first marketable credit	4–5 years	6–11 years	3-4 years	60-150 days
average cost incurred by Project Owner between initial application for project listing and receipt of first marketable credit	US\$60k-\$80k	US\$30k - \$50k	>US\$50k - \$80k	US\$0

# Established Registries' Performance, So Far

Verra Registry Activity Summary	All Projects, All Sectors	Agriculture & Forestry	Agriculture		
				% total	% A&F
# of Active pproved Protocols/Methodologies	?	30	5		16.7%
# of Projects that have applied for Registration	2,340	207	16	0.7%	7.7%
# of Project that are Currently Registered	1,857	?	2	0.1%	
Estimated Credit Potential, all Applicants	1,487,664,854	1,149,767,121	7,931,039	0.5%	0.7%
Credits Issued, as of 2022/02/15	870,362,111	?	0	0.0%	
Credits Held Back in Buffer Account, as of 2022/02/15	59,732,198	59,732,198	?		



# Qs Farmers & Ranchers Should Ask Before Jumping In

- How much is this going to cost me?
- What do I get out of this, beyond the promise of “carbon credit” revenues?
- Do I own my Project and/or any credits or other benefits that might attach to it?
- Am I giving away my private farm operating data and what can the Aggregator, Registry operator or Market Administrator do with my data?
- How fast and frequently will credits be issued to my project?
- Who sets the prices my credits sell for?
- If a Buyer pays US\$20/TCO<sub>2</sub>e for my credits, how much do I receive out of the amount paid, how fast?
- Do I have to keep reporting farm operating data after the Aggregator or credit Buyers stop paying for credits? If so, for how long?
- Am I contractually bound to specific soil treatment, cropping and/or livestock management practices, or not?
- Does a lien attach to my property? If so, for how long?

# Every Credit does *NOT* = Net -1TCO2e

For one sample mid-west prairie farm...

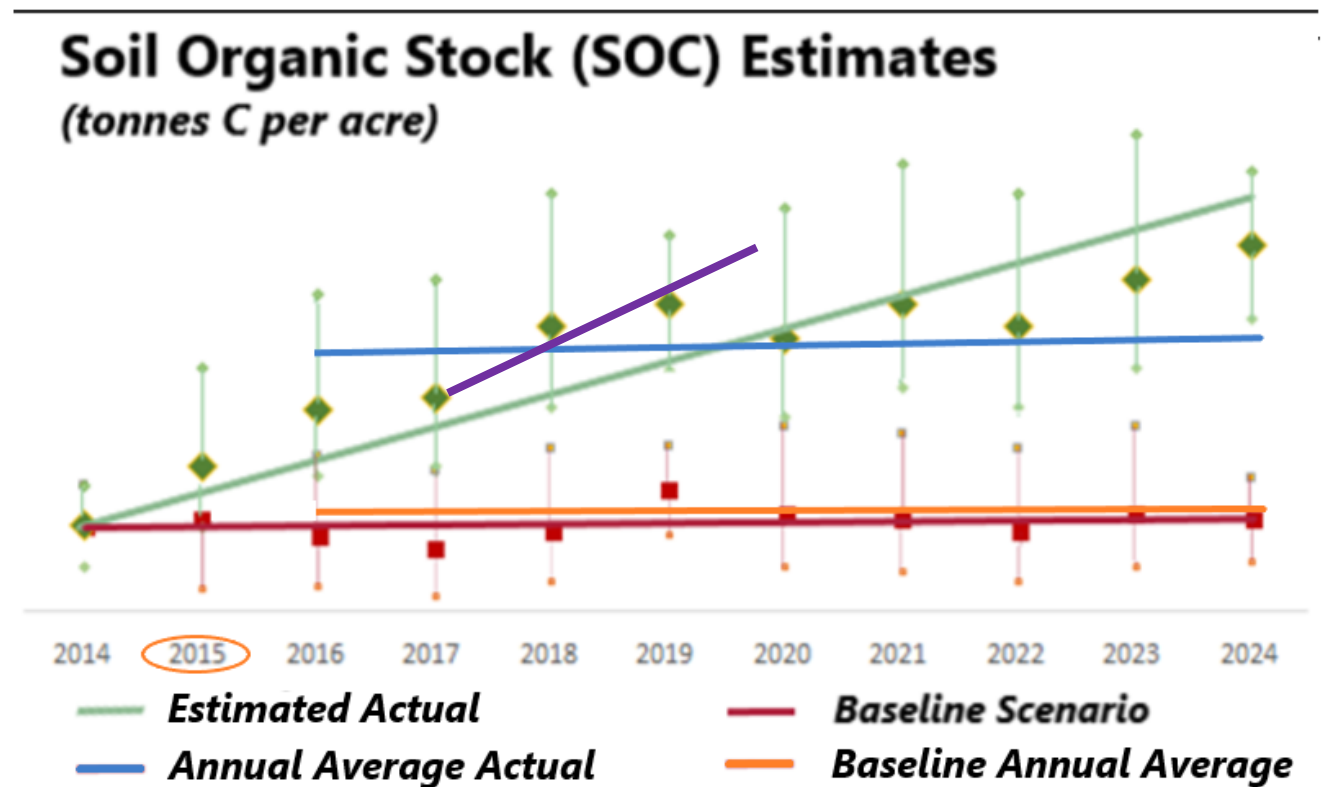
- CAR registry requires Project Owner to commit to 100 years of data reporting, verification and C stock retention (compared to 10 years for Nori).
- CAR credit issuance is “vested” over 100 years (2 different vesting options).

	year	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Conditional Future Credits Receivable	
Registered project acres		511	511	511	511	511	511	511	511	511	511	511	511	511	511	511		
Actual incremental SOC stock gains per acre, for year		0.80	0.50	0.12	0.45	0.85	0.92	0.79	0.83	1.01	0.55	0.84	(0.24)	0.92	1.10	0.85		
<b>Maximum marketable credits issued by registry/market administrator</b>																		
<b>Climate Action Registry - TYA Method (no buffer account set aside)</b>							<b>2</b>	<b>7</b>	<b>11</b>	<b>15</b>	<b>20</b>	<b>25</b>	<b>28</b>	<b>32</b>	<b>31</b>	<b>35</b>	<b>4,322</b>	
<b>Climate Action Registry - TTA Method (before risk/buffer deduction)</b>							<b>71</b>	<b>130</b>	<b>136</b>	<b>113</b>	<b>114</b>	<b>134</b>	<b>70</b>	<b>103</b>	<b>(28)</b>	<b>103</b>	<b>3,580</b>	
<b>Nori Market Method</b>							<b>699</b>	<b>724</b>	<b>582</b>	<b>644</b>	<b>654</b>	<b>313</b>	<b>347</b>	<b>417</b>	<b>417</b>	<b>453</b>		



# Why Deriving SOC Stock Trend Estimates from Point-in-Time Soil Samples Doesn't Work

- If initial credit quantification reflects the difference between sample test results for 2017-2019, too many credits will be issued.
- Subsequent verification events will suggest C losses which did not actually occur.
- Soil sample collection and characterization has to be affordable enough to cost-effectively generate useful field-scale trends, faster.



# **We Can Be the First to Get It Right**

*...But that can only happen if Canadian farmers and ranchers actively and directly engage in “climate-smart” agriculture and food policy design and development...*

# Soil Carbon Estimates & Uncertainty

*(IPCC Tier 1)*

Table A2-2 Uncertainty Assessment Level and Trend					
	IPCC Source Category	Gas	Base Year Emissions	2019 Year Emissions	Combined Uncertainty
			kt CO <sub>2</sub> eq	kt CO <sub>2</sub> eq	%
4.A.1	LULUCF – Forest Land Remaining Forest Land	CO <sub>2</sub>	(201 589)	(133 575)	38.00
4.A.1	LULUCF – Forest Land Remaining Forest Land	CH <sub>4</sub>	439	375	110.00
4.A.1	LULUCF – Forest Land Remaining Forest Land	N <sub>2</sub> O	222	228	110.00
4.A.2	LULUCF – Land Converted to Forest Land	CO <sub>2</sub>	(1 069)	(302)	110.00
4.B	LULUCF – Cropland	CO <sub>2</sub>	(1 798)	(9 224)	23.00
4.B	LULUCF – Cropland	N <sub>2</sub> O	14	13	40.00
4.C	LULUCF – Grassland	CH <sub>4</sub>	0	1	64.00
4.C	LULUCF – Grassland	N <sub>2</sub> O	0	0	69.00

*...uncertainties associated with forest C stock estimates are larger than those associated with agricultural soils*

The 2019 national emission estimate, including LULUCF emissions and removals, of 740 Mt CO<sub>2</sub> eq, lies within an uncertainty range of 675 Mt CO<sub>2</sub> eq to 806 Mt CO<sub>2</sub> eq (±9%) (Table A2-2). The top five contributors influencing the national uncertainty when LULUCF is included were:

1. LULUCF – Forest Land Remaining Forest Land, CO<sub>2</sub>
2. LULUCF – Harvested Wood Products (HWP), CO<sub>2</sub>
3. Waste – Solid Waste Disposal – Managed Waste Disposal Sites, CH<sub>4</sub>
4. Agriculture – Direct Agriculture Soils, N<sub>2</sub>O
5. Waste – Solid Waste Disposal – Unmanaged Waste Disposal Sites – Wood Waste Landfills, CH<sub>4</sub>

Source: MECCC, NIR 2021, Part 2