CTCN
CLIMATE TECHNOLOGY CENTRE & NETWORK
UNFCCC Technology Mechanism

Agricultural Carbon Markets – Building the Biological Bridge

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UN environment
UNIDO

The Climate Technology Centre and Network

Organisation

- Operational arm of the UNFCCC Technology Mechanism
- Consortium of organizations from all regions + Network

Mission and scope

- Mission to stimulate technology cooperation and enhance the development and deployment of technologies in developing countries
- Technologies include any equipment, technique, knowledge and skill needed for reducing greenhouse gas emissions and for adapting to climate change effects

Core services

- Technical assistance to developing countries
- Knowledge platform on climate technologies
- Capacity building and support to collaboration and partnerships

CTCN Technical Assistance

Country-driven

- Any organization from developing countries can express need
- Request endorsed and submitted by the NDE

Fast and easy access to assistance

- User-friendly access: 4-pages submission, in all UN languages
- Appraisal of request within 1-2 weeks and response design within 2-12 weeks

CTCN selects and contracts relevant experts

- Assistance provided through Consortium and Network (value up to 250,000 US$)
- Collaboration with financial organizations to trigger funding

Support to remove barriers to technology transfer (financial, technical, institutional)

- ✓ Identification of needs and prioritization of technology, depending on country context
- ✓ Technical recommendation for design and implementation of technology
- ✓ Feasibility analysis of deploying specific technologies
- ✓ Support to scale up use and identify funding for specific technologies
- ✓ Support legal and policy frameworks

Networking and Collaboration

Join our network! Easy and free of cost.

Access commercial opportunities: respond to competitive bidding for delivery of CTCN technical assistance services

Create connection: network with national decision makers and other network members to expand your partnership opportunities and learn about emerging areas of practice

Increase visibility: broaden your organization or company's global reach, including within UNFCCC framework

Exchange knowledge: keep updated on the latest information and share via the CTCN's online technology portal

Examples of collaboration

- Co-host climate related events
- Twinning arrangements with research institutions
- Engage in new technology projects

How to use the webinar platform

To listen to the webinar (select audio mode):

1. Listen through your computer: Please select the “mic and speakers” radio button on the right hand audio pane display
2. Listen by telephone: Please select the "telephone” option in the right-hand display, and a phone number and PIN will display.

To ask a question

Select the “questions” pane on your screen and type in your questions, at any time during the presentation

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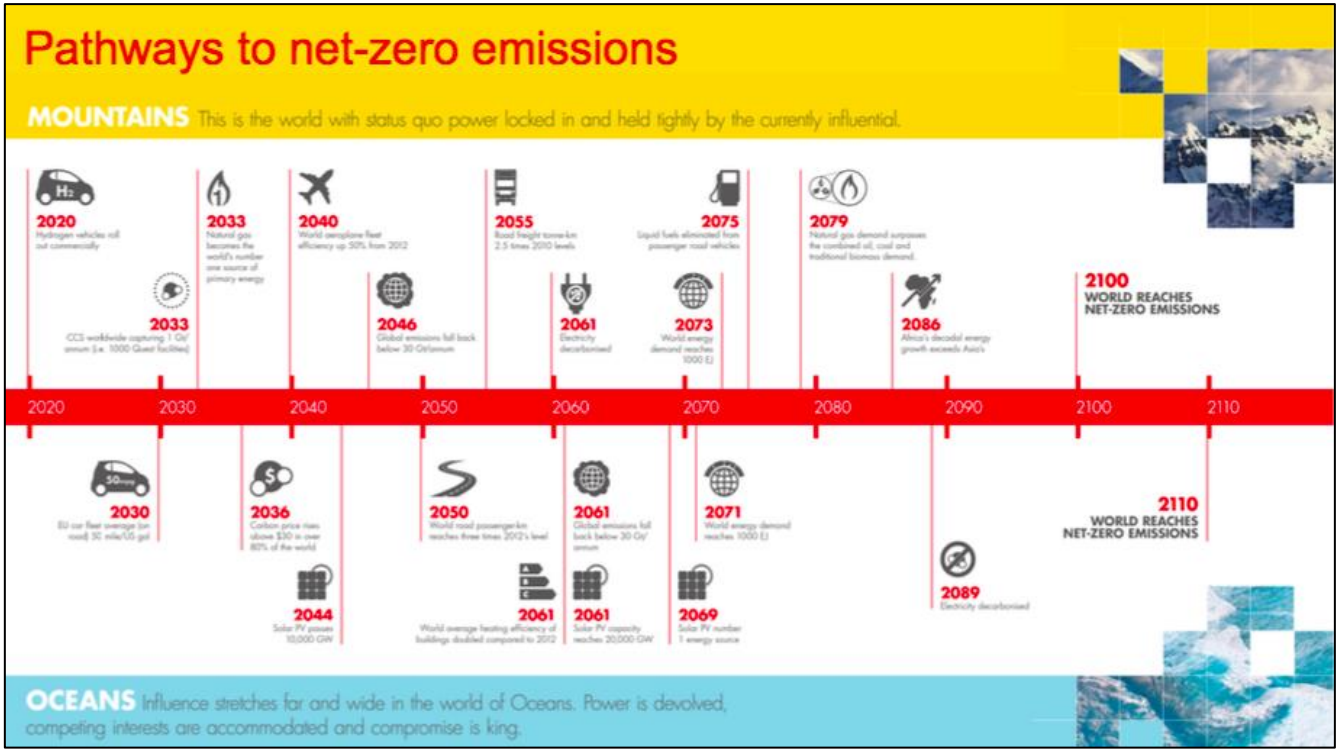
Contact the GoToWebinars Help Desk: 888.259.3826

The presentations will be made available after the webinar

Building the Biological Bridge

- The Problem – The Gap
- Sequestration vs. Emission Reductions
- Potential of the Biological Bridge and International Context
- Co-Benefits and SDGs
- Current and Future Opportunities
- Lessons Learned
- Examples – Alberta and Beyond

Shell Pathways to Net Zero – Fossil Fuels Firmly in the Mix by mid-Century



Source: David Hone, Shell Climate Advisor, https://blogs.shell.com/2016/09/27/timeline/

Problem: The Gap

Figure 1. Impact of Known and Anticipated Domestic Pledges

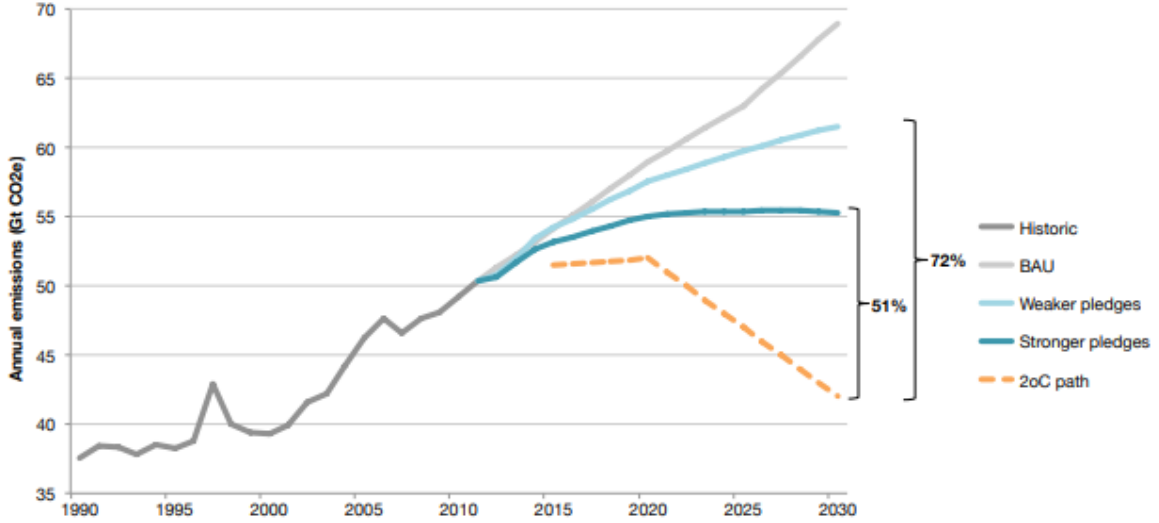
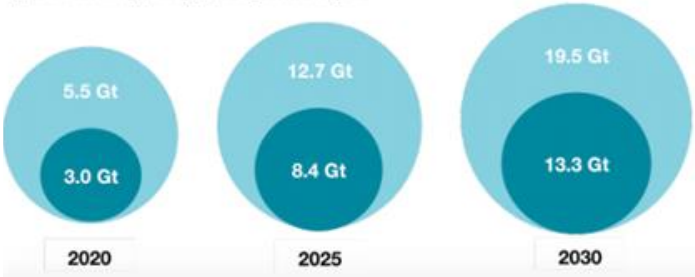


Figure 2: The mitigation gap is expected to grow



Source: http://www.climateadvisers.com/mindthegap/

Sequestration vs. Reductions

Biological land-based practices address GHG emissions in two ways:

1. Sequestration and storage

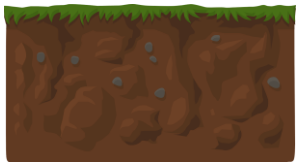
2. Emission Reductions

Climate Smart Agriculture

Carbon Sequestration and Storage

Soil Carbon

Grassland/Rangeland Management



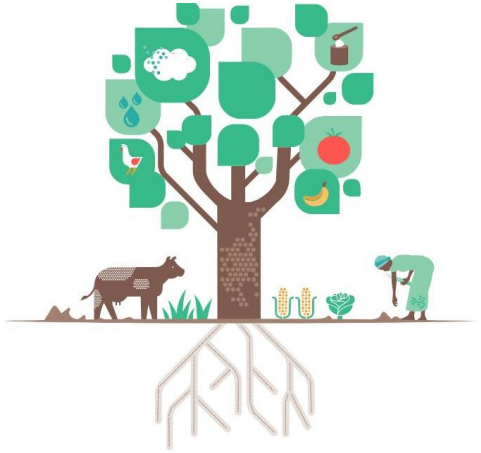
Biochar

Reduced/No Till

Ecosystem Conservation and Restoration

Afforestation/Reforestation

Biomass



Agroforestry

Case Study - Conservation Cropping in Alberta

- Generates saleable credits for **reduced/no-till practices** that sequester and maintain stores of soil carbon.
- Allows minimal disturbance of soil for seeding and field-specific management issues.
- Accounts for **23%** of all carbon offsets generated in Alberta's carbon market.

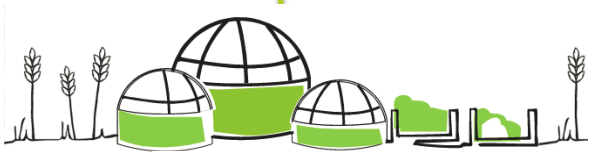
Protocol: https://open.alberta.ca/publications/9780778596288

GHG Emission Reductions

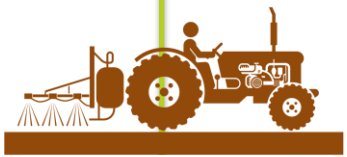
Biological Systems

Livestock Efficiency

Composting/ Aerobic Digestion

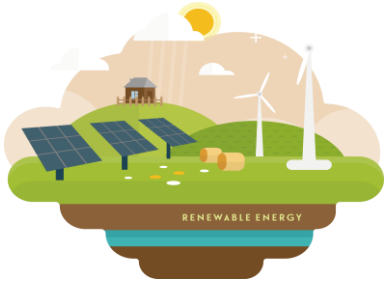


Anaerobic Digestion



Fertiliser and Fuel

Energy



Renewable Energy

Energy Efficiency

Case Study – Fertiliser Management

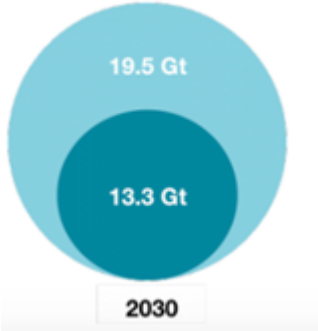
- NERP (Nitrous Oxide Emission Reduction Protocol) is a climate smart agricultural protocol recognized by the UN and various national and private-sector strategies.
- Generates carbon offsets for:
  - 4R Beneficial Management Practices – Right Rate, Time, Place, Source
    - Manage applied N in more comprehensive way to reduce N_2O emissions
  - Fuel Use – reduced passes
- Gives 3 options for implementation: Basic, Moderate, Advanced
- Projects are now being developed in Alberta
- Global expansion

Protocol: https://open.alberta.ca/publications/9781460125502

Significant Potential

"… combination of forestry and agriculture potentials from IPCC AR4 … for the AFOLU sector are estimated to be **~3 to ~7.2 Gt CO2eq/yr in 2030** at **20 and 100 USD/t CO2eq,** respectively."

IPCC (2013) Working Group III – Chapter 11: AFOLU
Available: http://www.ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_chapter11.pdf



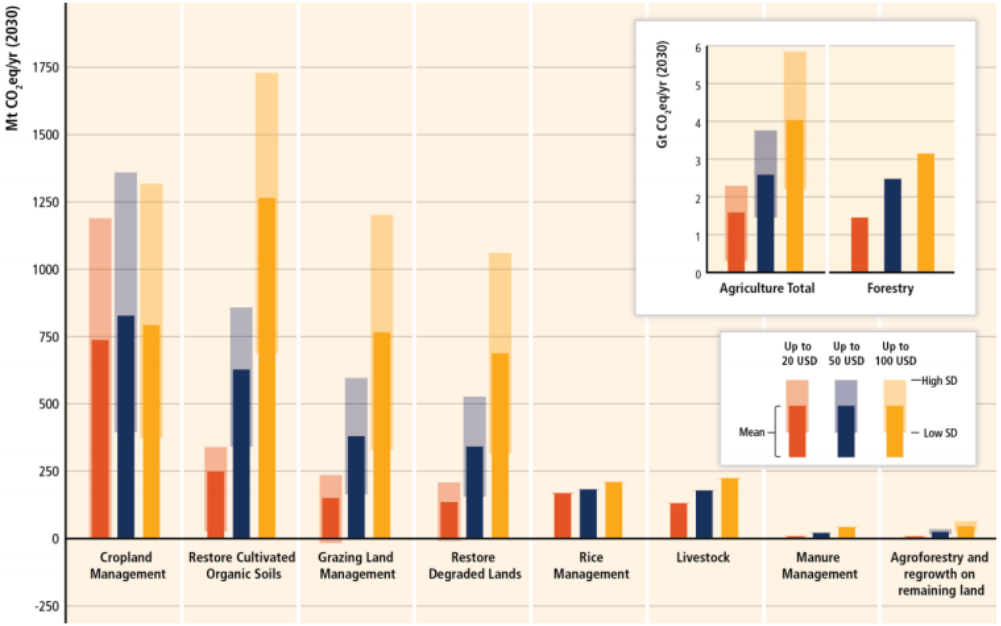
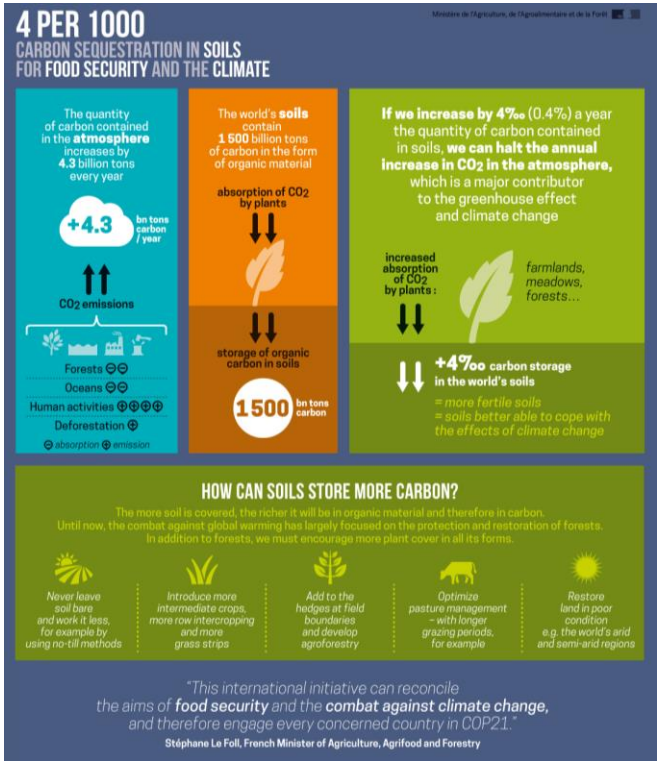


Figure 11.13. Mitigation potential for the AFOLU sector, plotted using data from IPCC AR4 (Nabuurs et al., 2007; Smith, et al., 2007). Transparent ranges show the range of estimates (+/- 1 standard deviation) for agricultural options for which estimates are available.

International Context: 4/1000 Initiative

- 4/1000 Initiative - Soils for Food Security and Climate:
  - International voluntary initiative
  - Aim to increase soil carbon by 0.4% per year to offset anthropogenic CO_2.
  - Collaborative scientific research
  - Collaborative training and implementation



Website: https://www.4p1000.org/

International Context: Koronivia Joint Work on Agriculture

Links UNFCCC's technical and implementation bodies for a joint approach to agricultural issues.

Three key issues:

1. Sustain growing human populations
2. Deal with impacts of a changing climate
3. Reduce GHG emissions from the sector

CCAFS 5 ways forward:

1. Support implementation
2. Knowledge sharing
3. Technology transfer
4. Capacity building
5. Mobilisation of finance

Co-Benefits

Direct

Increased food security and adaptation

Soil fertility and reduced erosion

} Improved yield

Cost Reduction/Marketable?

Biodiversity – pests, disease, pollination

Water Quality and Quantity

Air Quality

} Monetizable Benefits?

International Context: Sustainable Development Goals

Climate-smart agriculture also works towards SDGs:

Food security and sustainable agriculture

Land, water and air quality, food quality

Bioenergy

GHG emission reductions, carbon sequestration, adaptation/resilience

Enhanced biodiversity, conservation and restoration, and food security

Enhanced biodiversity, conservation and restoration, sustainable land use.

Global Carbon Market - Methodologies

- **Clean Development Mechanism (applicable in CDM countries)**
- **The Gold Standard**
- **Verified Carbon Standard**
- **American Carbon Registry**

- Soil Carbon - generic
- Enteric Methane
- Peatland Conservation
- Grassland Conservation and Management
- Grazing Management
- Dairy management
- Reduced Tillage
- Fertiliser Use – 4Rs, crop rotation, N-efficient seed
- Water management in rice
- Waste management – crop waste, manure, bedding, wastewater
- Biofuels
- Biomass heat/electricity
- Energy Efficiency

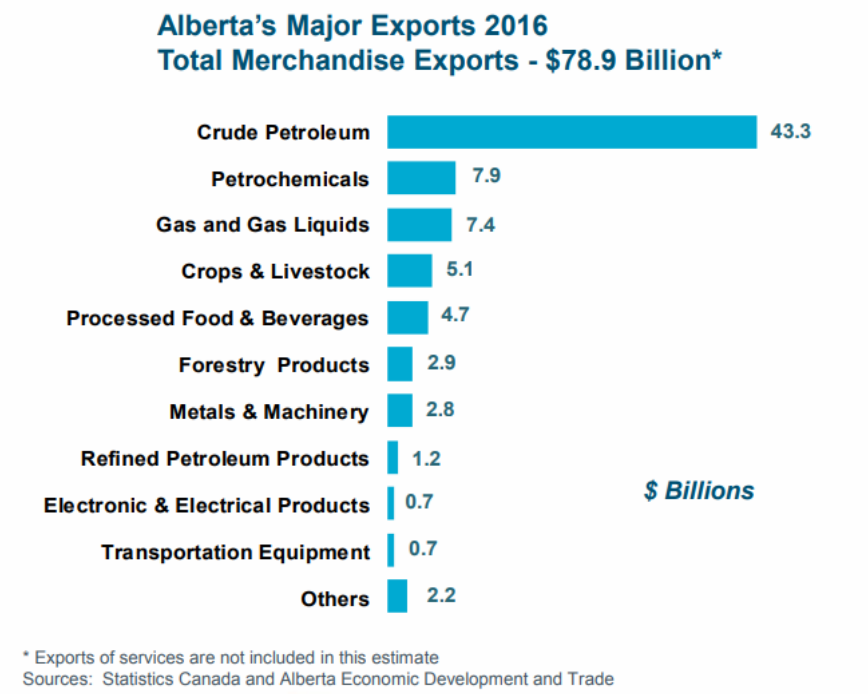
Global Carbon Markets

Current prices: US$5-20 per tonne CO_2e

Expected prices rises:

- Carbon Offset and Reduction Scheme for International Aviation (CORSIA)
- Increasing consumer/corporate demand

Alberta Experience & Learnings



Alberta's Agricultural Methodologies

Over 20 Million tCO_2e reduced!

- Aerobic Composting
- Agricultural Nitrous Oxide Emission Reductions (4R's)
- Anaerobic Decomposition of Agricultural Materials
- Biofuel Production and Usage
- Conservation Cropping
- Emission Reductions from Dairy Cattle (Recently adapted into Kenya)
- Energy Efficiency Projects
- Reduced Age at Harvest of Beef Cattle
- Reducing Greenhouse Gas Emissions from Fed Cattle
- Selection for Low Residual Feed Intake Markers in Beef Cattle

See: http://aep.alberta.ca/climate-change/guidelines-legislation/specified-gas-emitters-regulation/offset-credit-system-protocols.aspx

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Project Examples – Alberta and Beyond

Fed Cattle Protocol – World's First Beef Carbon Credits

Fed Cattle Protocol

- Quantifies enteric and manure reductions associated with practices that increase feed use efficiency (e.g. beta-agonists, genetic improvements, feed changes, etc.)

There are **2** projects listed in the Emissions Offset Registry.

Title: Reducing GHG Emissions from Fed Cattle Aggregation Project Pool 2
Project Identifier: 1720-5703

Start	2016-01-01	
End	2019-12-31	
Country	Canada	**Estimated Annual Emission Reductions**
Quantification Protocol	Reducing Greenhouse Gas Emissions from Fed Cattle	
Estimated Lifetime Emission Reductions	200,000 t CO_2e	

Title: Reducing GHG Emissions from Fed Cattle Aggregation Project Pool 3
Project Identifier: 2877-2127

Start	2016-01-01	
End	2019-12-31	
Country	Canada	**Estimated Annual Emission Reductions**
Quantification Protocol	Reducing Greenhouse Gas Emissions from Fed Cattle	
Estimated Lifetime Emission Reductions	400,000 t CO_2e	

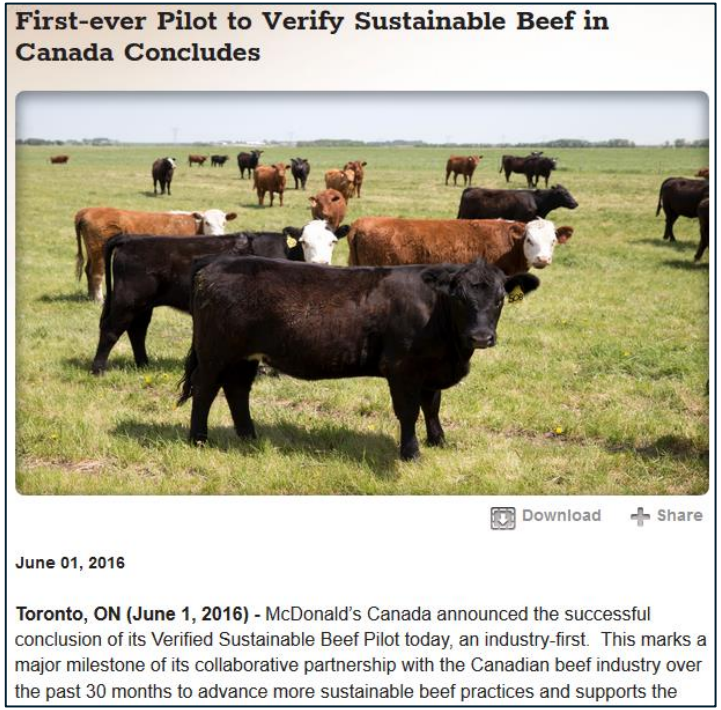
McDonald's Sustainable Beef Pilot

McDonald's committed to purchasing a portion of its beef from sustainable sources by 2016

Pilot developed regionally specific indicators that aligned with GRSB principles and criteria

- 1 to 5 performance scale
- 3rd party verification

182 operations verified, 8,967 head tracked through verified operations, 65 million pounds of beef sourced



First-ever Pilot to Verify Sustainable Beef in Canada Concludes

Download Share

June 01, 2016

Toronto, ON (June 1, 2016) - McDonald's Canada announced the successful conclusion of its Verified Sustainable Beef Pilot today, an industry-first. This marks a major milestone of its collaborative partnership with the Canadian beef industry over the past 30 months to advance more sustainable beef practices and supports the

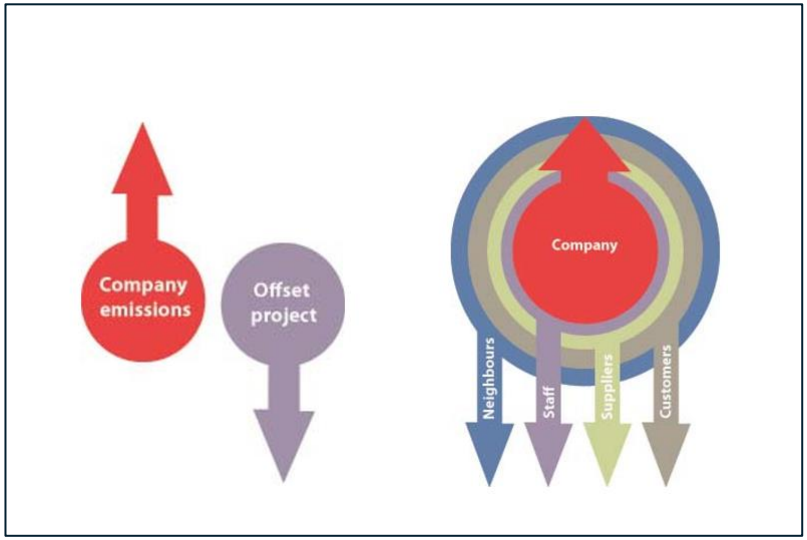
Carbon Accounting and Insetting Framework

Purpose: To create a framework for carbon insetting that integrates recent advancements in precision agriculture and satellite imagery (Piloting for following practices: cover crops, reduced tillage, advanced nutrient management)

Funders: NRCS Conservation Innovation Grant and Monsanto

Partners: Monsanto, US National Corn Growers Association, Soil Health Partnership, EFC Systems, Applied Geosolutions, DNDC-ART, Climate Smart Group, CropGrowers

More Information/Discussion Documents:
https://climatesmartgroup.com/initiatives/

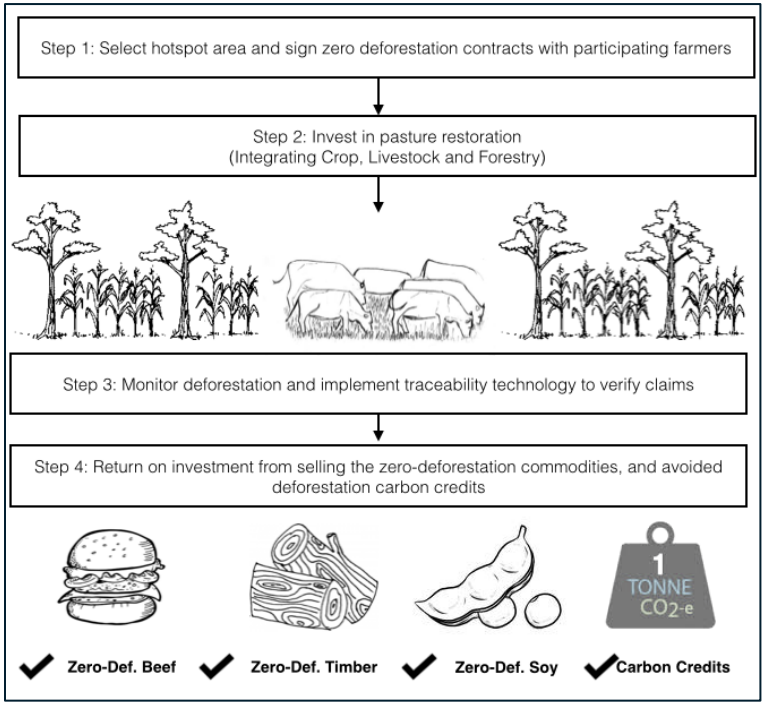


Source: Tipper et al. (2009). “Is ‘Insetting’ the New ‘Offsetting’?”

Campo Sustentavel – Pilot Program in Tocantins, Brazil

Objectives:

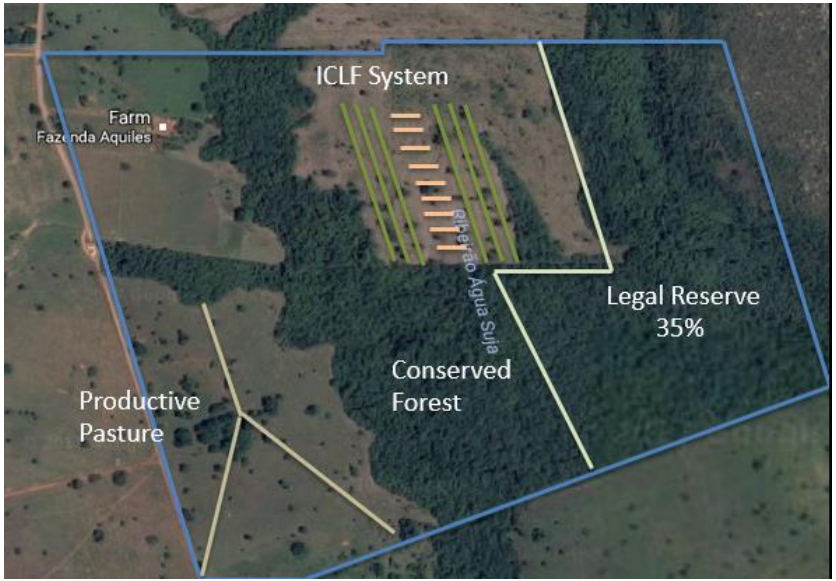
- Pilot sustainable landscape management to deliver certified deforestation-free commodities (beef, soy, etc)
- Intensify agricultural production through Integrating Crop, Livestock, Forestry (ICLF) systems on degraded lands near high-carbon-high biodiversity areas
- Reduce the pressure for conversion of native vegetation to agriculture



Campo Sustentavel – Pilot Program in Tocantins, Brazil

Current State

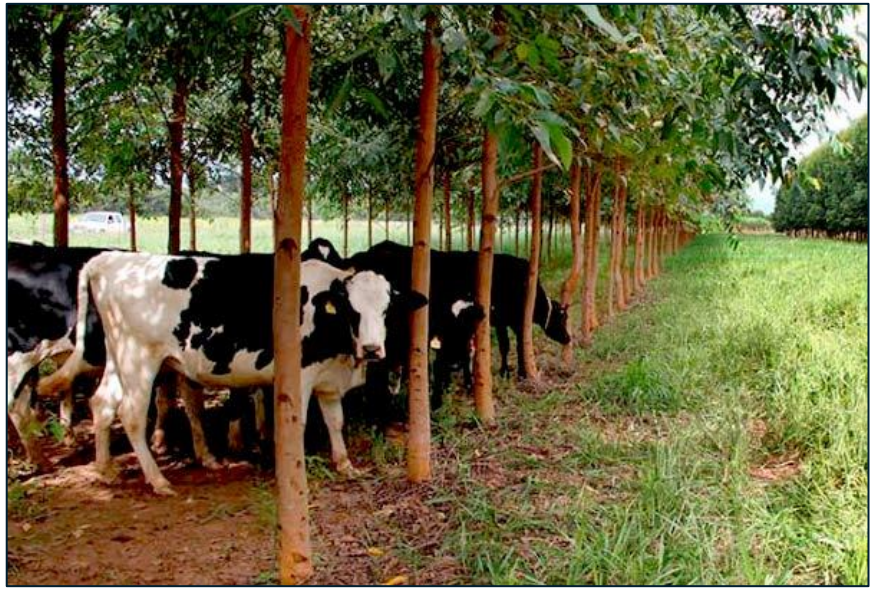
Desired State



Campo Sustentavel – Pilot Program in Tocantins, Brazil

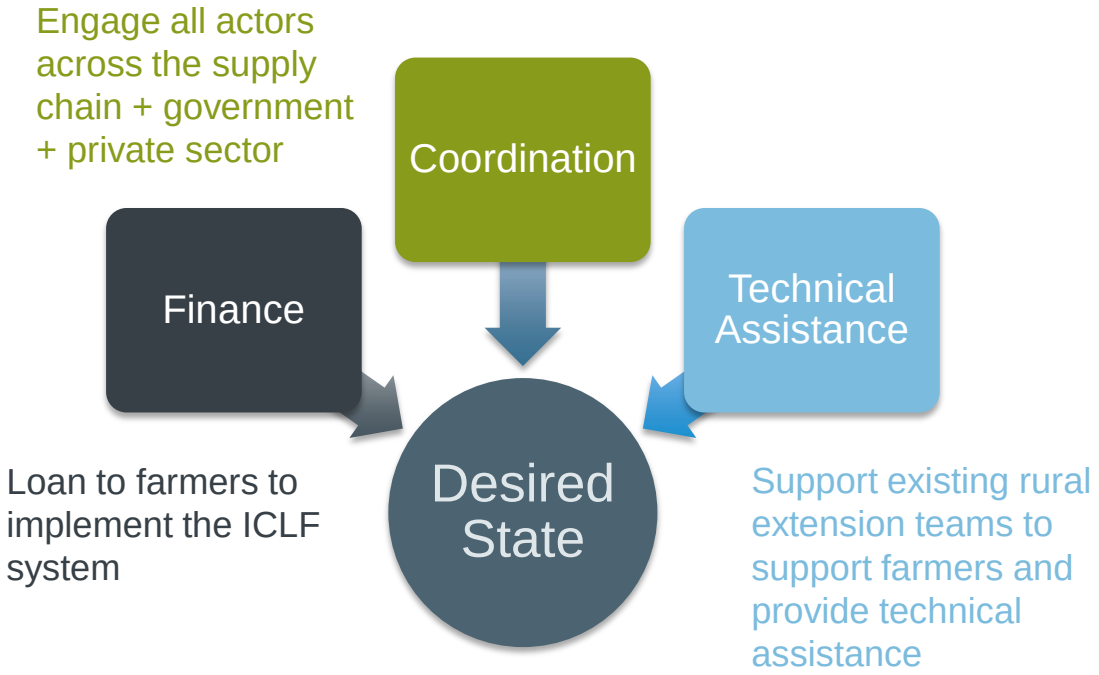
Emission Reduction Activities

- Avoided deforestation
- Forest restoration
- Pasture/soil restoration



Campo Sustentavel – Pilot Program in Tocantins, Brazil

How the project intends to get to the Desired State



Campo Sustentavel – Pilot Program in Tocantins, Brazil

Grower Benefits: technical assistance, seeds and inputs, increased productivity, farm management plans for crop diversification and climate change adaptation, preferential agreements to sell sustainable commodities and carbon payments

Outcomes: jurisdictional carbon credits, zero-net deforestation commodities, smallholder resilience and water/biodiversity benefits

Monitoring and Verification: Satellite Data, Social and Environmental Safeguards

Ghana – Sustainable Intensification

- **Problem:**
  - Reoccurring droughts have forced Fulani herdsmen South in search of water and grazing lands.
  - Encroachment on traditional cropping lands causing land degradation, destruction of food crops, pollution of water and ultimately conflict

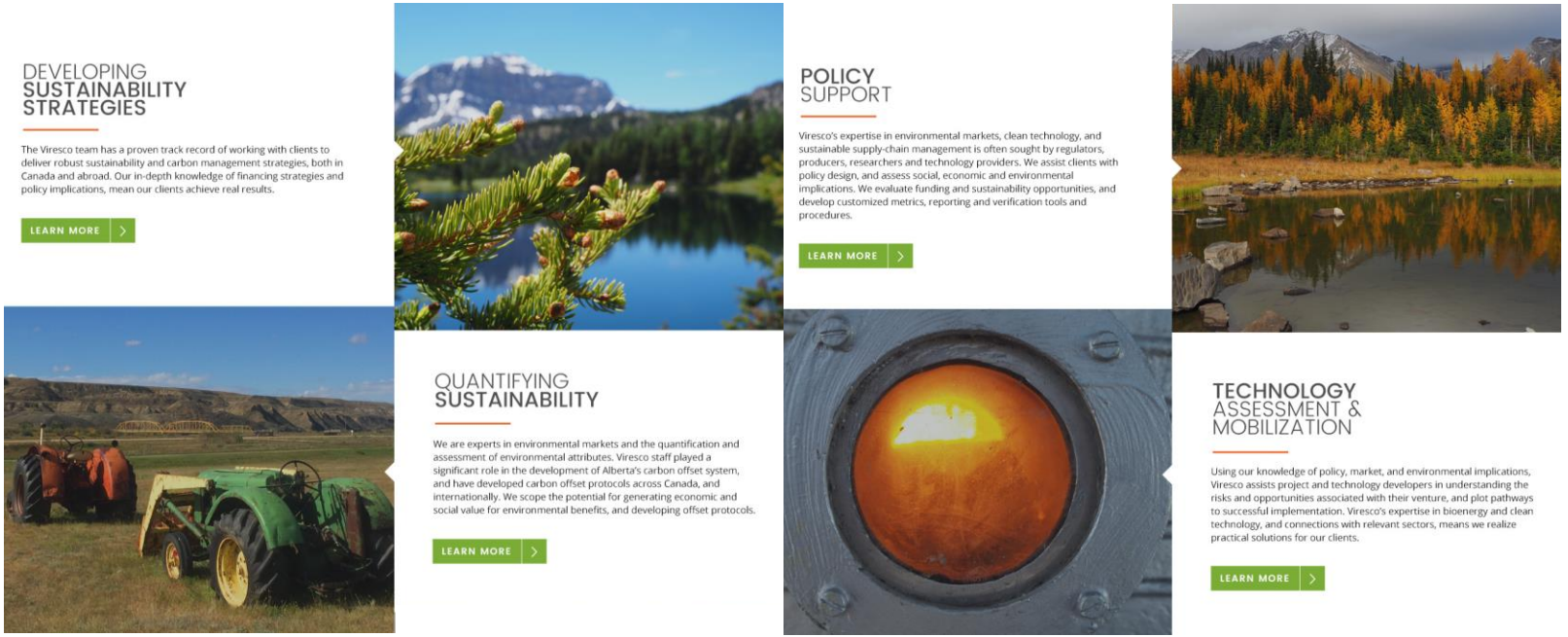
- **Intervention:** Climate Smart Agricultural practices (e.g. 4R's, improved grazing management, improved feed efficiency, etc.) that sustainably intensify production

- **Theory of Change:** Sustainable intensification can alleviate environmental pressure and consequent conflict over resources, while also improving livelihoods, mitigating climate change and improving resilience

Closing Thoughts

Change is hard – when you ask a farmer to make changes, you are asking them to change the way they do business. To achieve success we must deliver tangible benefits to farmers for protecting the environment

About Viresco Solutions



Website: https://www.virescosolutions.com/

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UNFCCC Technology Mechanism

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Udenrigsministeriet DANIDA

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環境省 Ministry of the Environment

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Economic Affairs SECO

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on the basis of a decision by the German Bundestag

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Ministero dell'Ambiente e della Tutela del Territorio e del Mare

Ministry for Foreign Affairs of Finland

Comhshaol, Pobal agus Rialtas Áitiúil
Environment, Community and Local Government

Spanish Cooperation

Government Offices of Sweden
Ministry of the Environment and Energy

Thank you

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