
# "Carbon Pricing: Impacts and Opportunities"

Island Agrology Workshop

August 20, 2019

# Overview

1. About Us
2. Introduction / The Biological Bridge
3. Potential Opportunities
4. Potential Impacts

# About Us

- Environmental consulting firm working in agriculture, bioenergy and agri-food sectors
- Assist clients in navigating the complex and evolving world of sustainability
- Experts in developing science-based metrics and solutions to enhance social license and public trust
- Vision: “Mainstream Sustainability”

# Viresco Solutions

## DEVELOPING SUSTAINABILITY STRATEGIES

The Viresco team has a proven track record of working with clients to deliver robust sustainability and carbon management strategies, both in Canada and abroad. Our in-depth knowledge of financing strategies and policy implications, mean our clients achieve real results.

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## POLICY SUPPORT

Viresco's expertise in environmental markets, clean technology, and sustainable supply-chain management is often sought by regulators, producers, researchers and technology providers. We assist clients with policy design, and assess social, economic and environmental implications. We evaluate funding and sustainability opportunities, and develop customized metrics, reporting and verification tools and procedures.

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## QUANTIFYING SUSTAINABILITY

We are experts in environmental markets and the quantification and assessment of environmental attributes. Viresco staff played a significant role in the development of Alberta's carbon offset system, and have developed carbon offset protocols across Canada, and internationally. We scope the potential for generating economic and social value for environmental benefits, and developing offset protocols.

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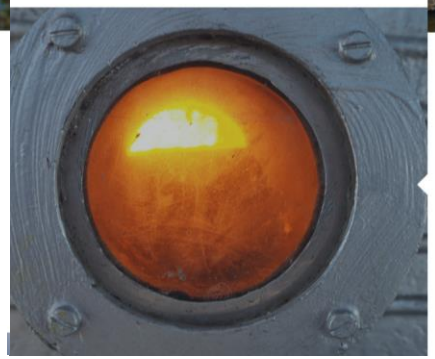

## TECHNOLOGY ASSESSMENT & MOBILIZATION

Using our knowledge of policy, market, and environmental implications, Viresco assists project and technology developers in understanding the risks and opportunities associated with their venture, and plot pathways to successful implementation. Viresco's expertise in bioenergy and clean technology, and connections with relevant sectors, means we realize practical solutions for our clients.

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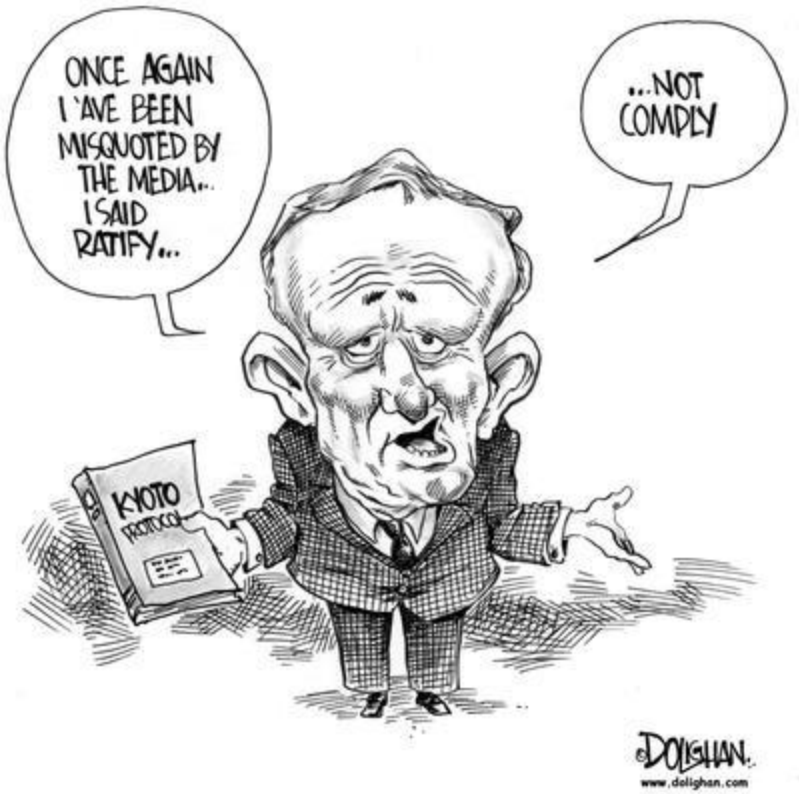
# INTRODUCTION

# Kyoto Protocol

- Adopted in 1997, went into force 2005
- Based on principle of common but differentiated responsibilities – developed vs. developing countries
- Goal: Stabilize GHG's in the atmosphere at a level that "would prevent dangerous anthropogenic (human) interference with the climate system"
  - Set binding commitments for Annex I Parties (Developed countries)
  - To meet targets Annex I countries could:
    - Reduce domestic emissions; or
    - Utilize mechanisms such as joint implementation, the Clean Development Mechanism and emissions trading

# Kyoto Protocol: Key Issues



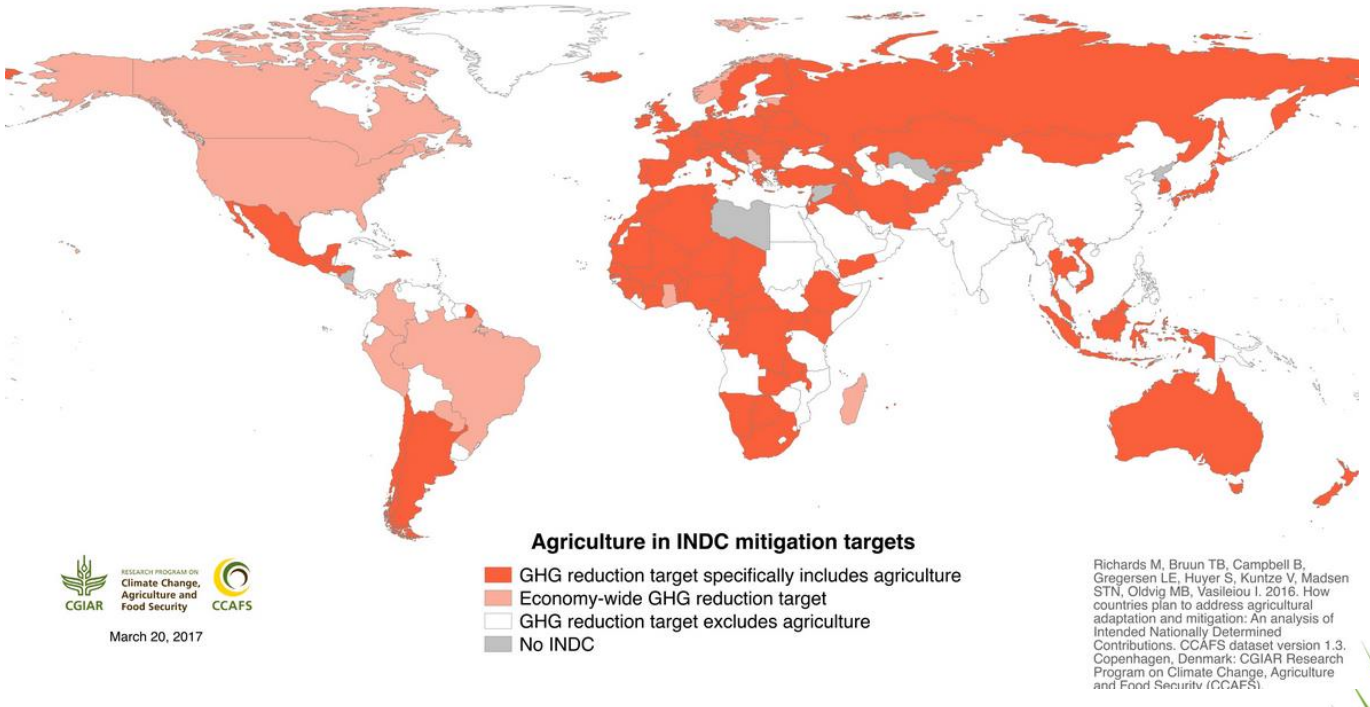

- China and Russia not Annex I
- Most of investment going to BRIC countries
- US and Canada dropped out
- Others were also slow to act
- Main success: EU ETS

# Paris Agreement


- Goals:
  - Agreed to limit global temp rises to "well below 2$^{O}$C
- Entered into force November 4, 2016
  - Ratified by 196 Nations
  - Notable exceptions: US and Russia
- Requires all parties to pledge their targets through nationally determined contributions (NDCs)
- Article 6 deals with carbon credits – now called Internationally Transferred Mitigation Outcomes (ITMOs)
  - Details of how NDC's will work with ITMOs are still being finalized

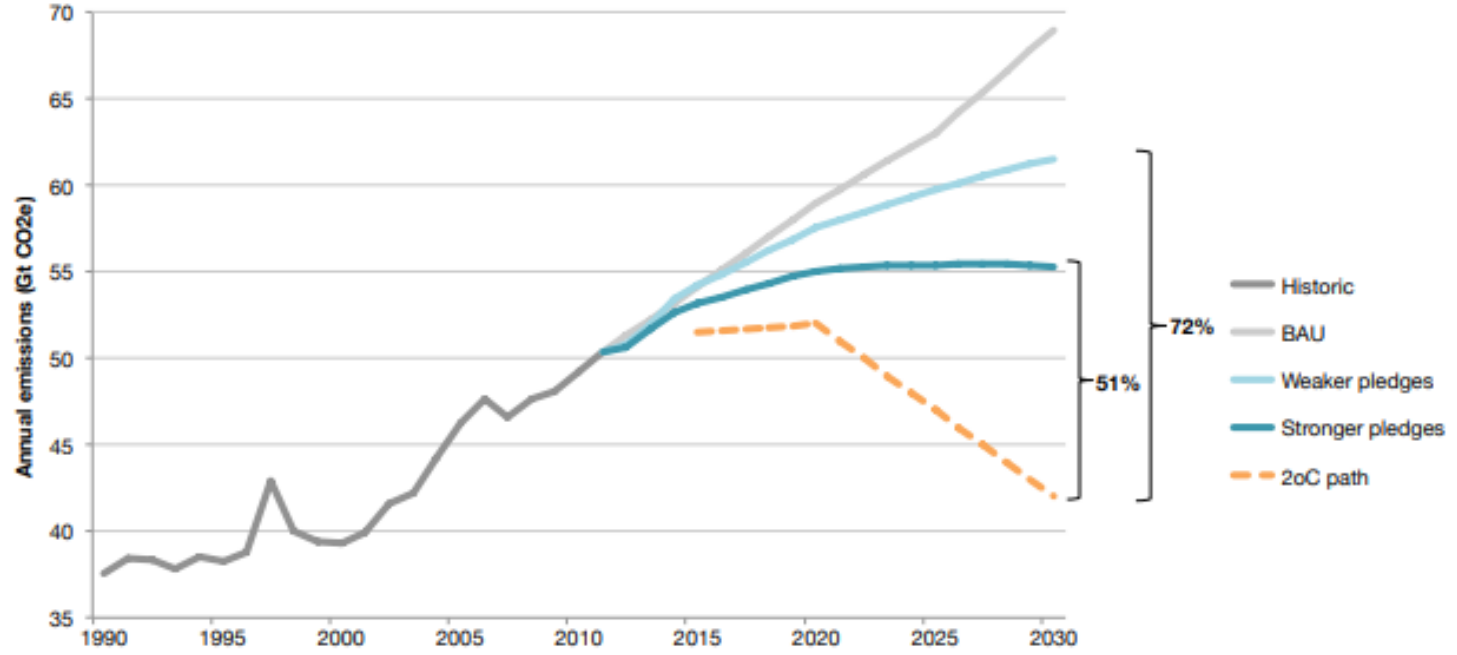
# Importance of Agriculture in INDCs

- Agriculture is a vital source of livelihoods, income and food security
- Interventions can deliver adaptation and mitigation benefits as well as economic, social and environmental co-benefits
- Agriculture and land use, land-use change and forestry prominent in INDCs



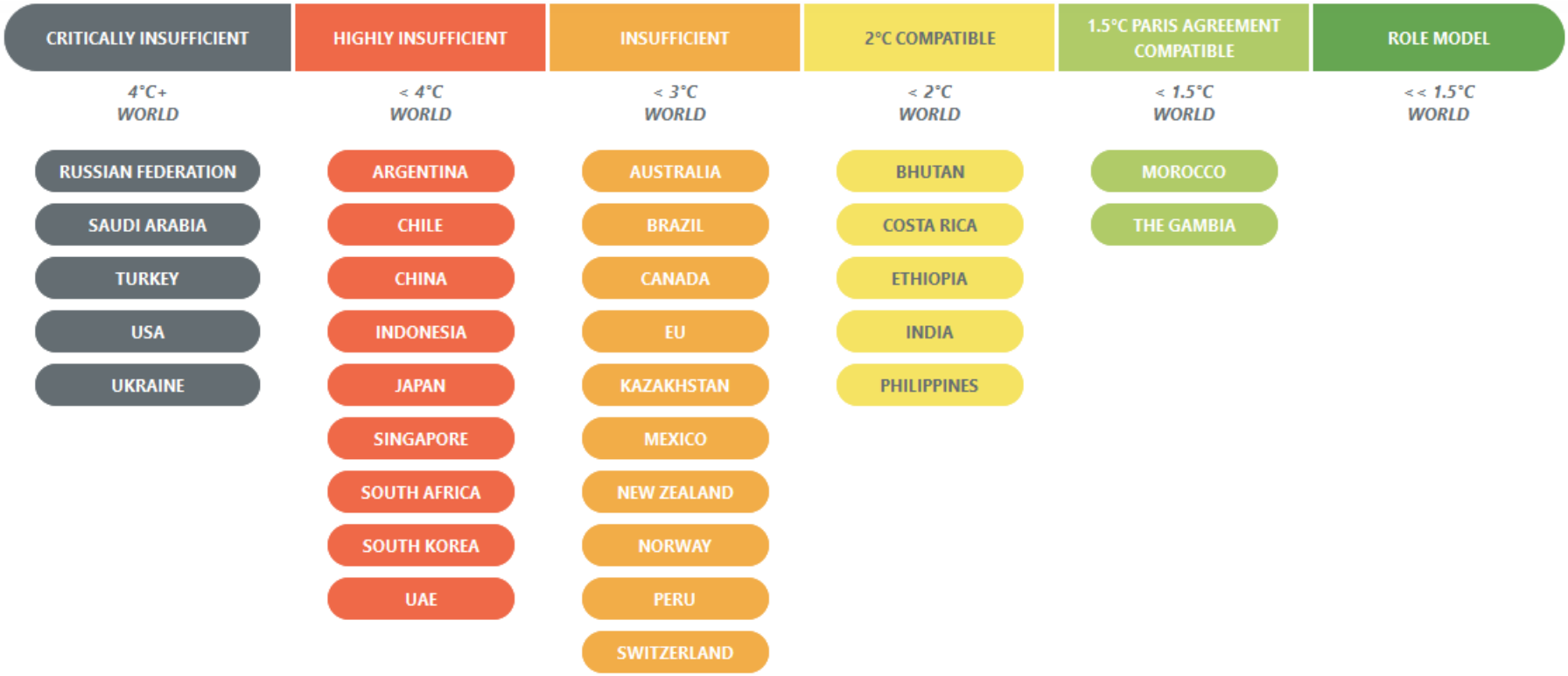
# Problem: The Gap

**Figure 1. Impact of Known and Anticipated Domestic Pledges**

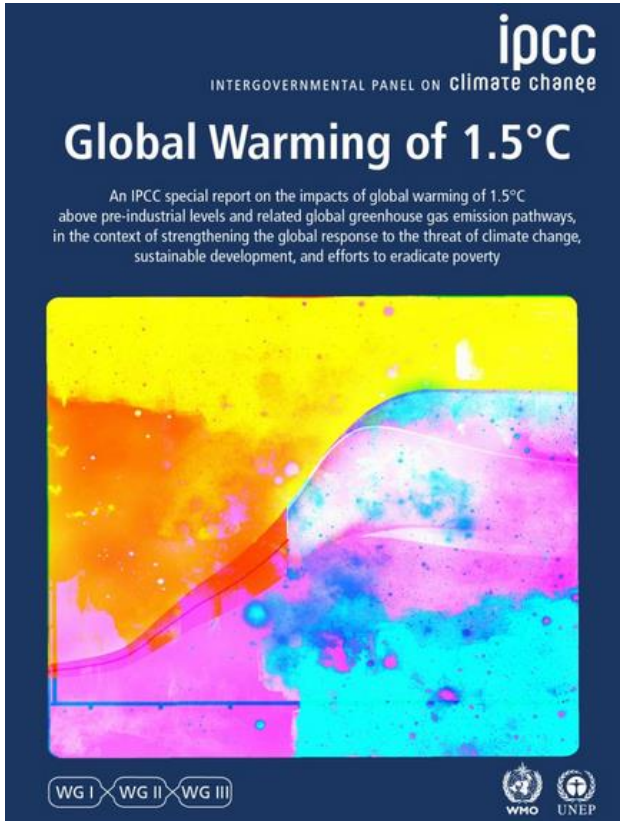



Source: http://www.climateadvisers.com/mindthegap/

# Climate Action Tracker Ratings

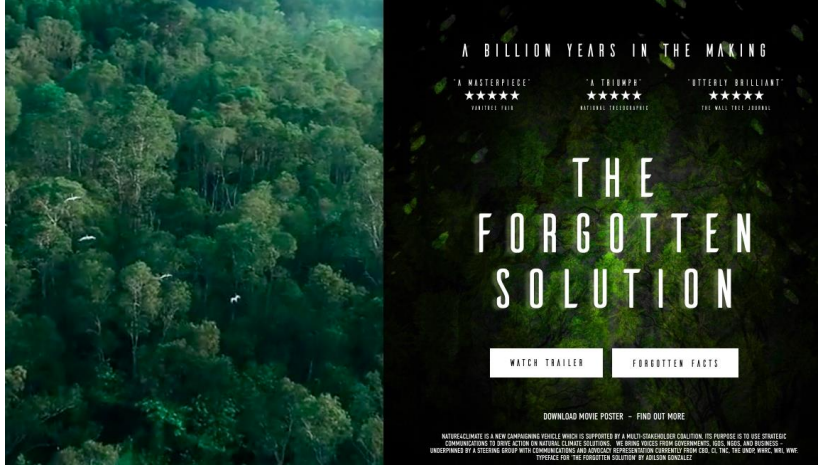


# And Then…




| | 1.5°C Modelled Pathway | 2.0°C Modelled Pathway |
|---|---|---|
| 2030 Target | 45% below 2010 | 25% below 2010 |
| Net Zero | ≈2050 | ≈2070 |

(Source: IPCC, Headline Statements from the Summary for Policymakers)




# Possible Solution - the 'Biological Bridge' or Nature Based Solutions

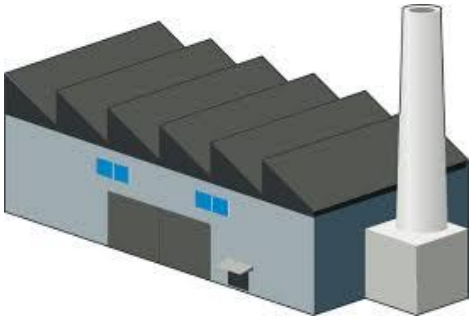
- AFOLU sector responsible for approx. **25% of global anthropogenic GHG emissions** (Smith et al., 2014)
- **Concept:** Switch AFOLU sector from problem to solution, while also transitioning energy
  - **Protection:** Avoided conversion (forests, grassland, wetlands, etc.)
  - **Improved Management:** Fertilizer (4R Nutrient Stewardship), livestock (feed use efficiency, manure management), cropping (no-till, cover crops), forest management
  - **Restoration:** Reforestation, grasslands, wetlands
- **NCS Potential:** 30+ % of solution in next 10-15 years (Griscom et al., 2017)

# CARBON PRICING – POTENTIAL OPPORTUNITIES

# Carbon Offset Markets

Carbon credits are transferred

Carbon is sequestered through re-forestation activities



Emitter purchases carbon credits for compliance or corporate social responsibility purposes

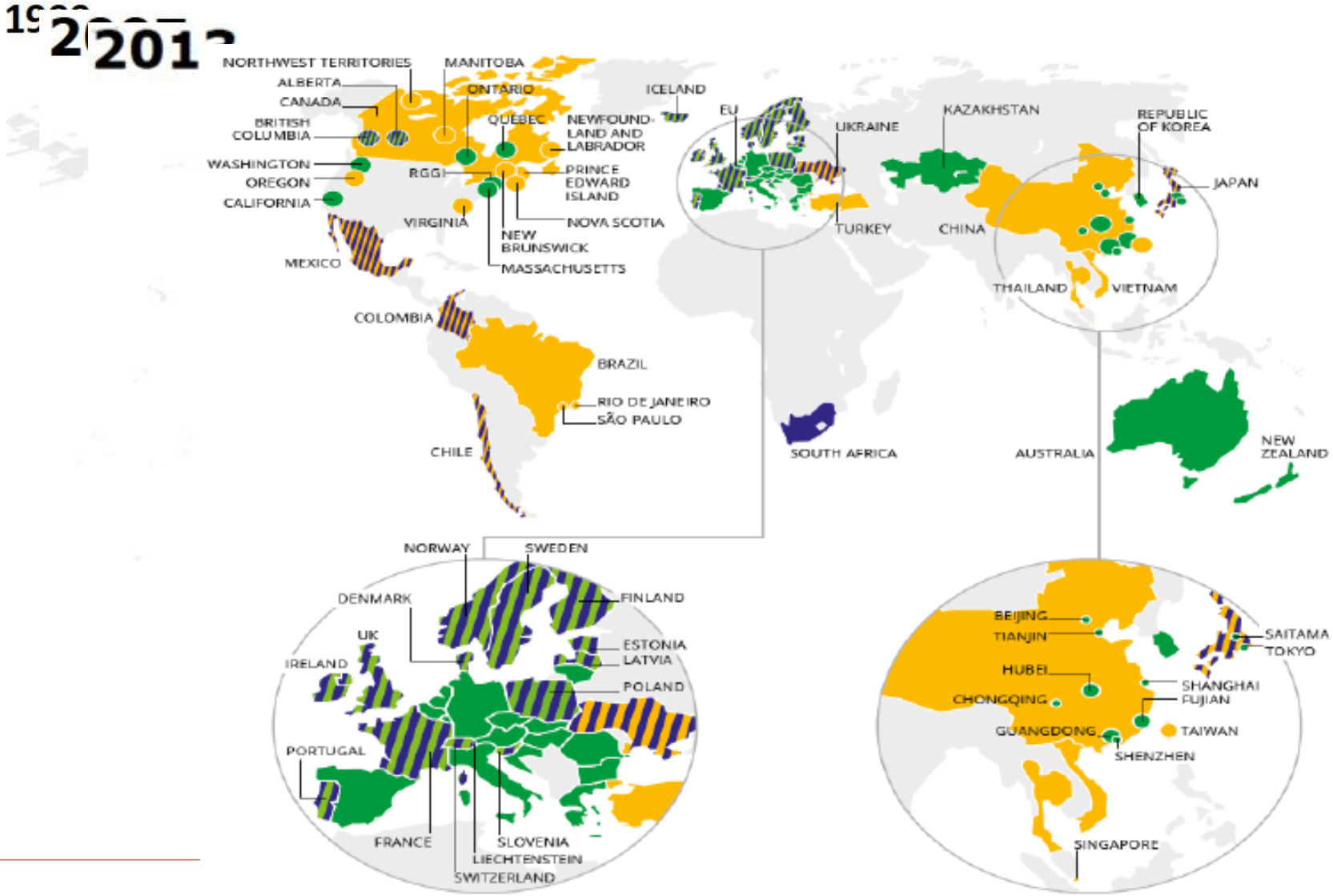
Payment is made for the carbon

# Different Carbon Pricing Structures

| Compliance Markets | Voluntary Markets | Insetting/Supply Chains |
|---|---|---|
| Created through regulations and laws at the National or Sub-National level (e.g Alberta, BC, Quebec, California)<br><br>**Buyers:** Large emitters required to reduce emissions by law<br><br>**Price:** $15 - $50<br><br>**Risks:** Policy uncertainty, invalidation | Usually managed through a third party registry (e.g Climate Action Reserve, Verra (VCS), Gold Standard, etc.)<br><br>**Buyers:** Any individual, business, non-profit, municipality, utility, etc. voluntarily reducing emissions<br><br>**Price:** $1 - $45+<br><br>**Risks:** Finding buyers, price uncertainty | An investment in an emission reducing activity within a company's supply chain.<br><br>The emission reduction (i.e. inset) can be claimed by the company that sponsored the activity.<br><br>(Gold Standard, Carbon Accounting and Insetting Framework)<br><br>  |

**Market Pull**

# Global Compliance Carbon Pricing



ICAO CORSIA

- CORSIA: Carbon Offsetting and Reduction Scheme for International Aviation
- Aim: carbon neutral growth from 2021 – 2035, relative to 2020 baseline
- If companies exceed average baseline emissions can purchase carbon offsets to achieve compliance

# Alberta's Agricultural Protocols

**Over 20 Million $tCO_2e$ reduced and over $200 million cash injection!**

- 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

# Pan-Canadian Framework on Clean Growth and Climate Change

- National plan for achieving emission reducing targets
- Includes a tax as well as a market mechanism
- Output-Based Pricing System or Federal GHG Offset System (intended to build fungibility between provinces)
  - For activities not covered by carbon pollution pricing
- Price starts at $20/tonne in 2019 and rises to $50/tonne in 2022

# Case Study– Fertilizer Management

- The 4R Nutrient Stewardship™ Platform is a Canadian Innovation and has been incorporated into a Carbon Offset Protocol called NERP
- The NERP Generates carbon offsets for:
  - 4R Beneficial Management Practices – Right Rate, Time, Place, Source (4R Nutrient Stewardship™)
    - 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's Compliance-Based Offset System; Pan-Canadian NERP Strategy
- Global expansion
- Protocol: https://open.alberta.ca/publications/9781460125502

# Case Study – Beef Carbon

- Fed Cattle Protocol – first beef carbon in the world
- Quantifies enteric and manure reductions associated with practices that increase feed use efficiency (e.g. beta-agonists, genetic improvements, feed changes, etc.)
- Clean Cow project - DSM has developed a (feed) solution that reduces enteric methane emissions from cattle/cows by at least 30%.

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 $CO_2e$ | |

# Additional Protocols Under Development

- **Avoided Conversion of Grasslands**
  - Soil carbon storage and sequestration from maintenance of grasslands and non-conversion to cropland
- **Avoided Conversion of Peatlands**
  - Maintenance of carbon stored in boreal peatlands via replacement of mined peat fibre with digested dairy manure.
- **Grasslands Management**
  - Rangeland BMPs for improved soil sequestration
  - Measurement based rather than practice based

# Market Drivers – Supply Chains

SCIENCE BASED TARGETS

DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

Collaboration between:

WORLD RESOURCES INSTITUTE

CDP
DRIVING SUSTAINABLE ECONOMIES

WWF

United Nations Global Compact

WE MEAN BUSINESS

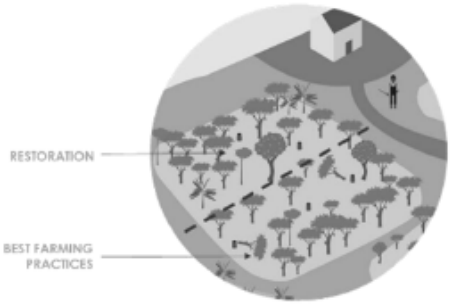
- Encourages emission reduction targets in line with level of decarbonization required to keep global temp. increases below 2°C vs pre-Industrial levels
- AgriFood Corporations with SBTs

Walmart
MARS
Carlsberg
General Mills
Cargill
Molson Coors
Nestlé
McDonald's
DANONE
Kellogg's
Coca-Cola
PEPSICO

# Supply Chain Insetting 2018 –Enabling Investment

**Credible accounting of emissions reduced by your interventions in your supply chain**

Example - Corporate implements a series of restoration projects, maximising soil sequestration




- Part 1 - How to account for intervention (boundary, scope, baseline, MRV etc)
- Part 2 - How to include intervention emissions in corporate report
- Part 3 - How to communicate about the intervention and its relationship with carbon credits

Developed by:

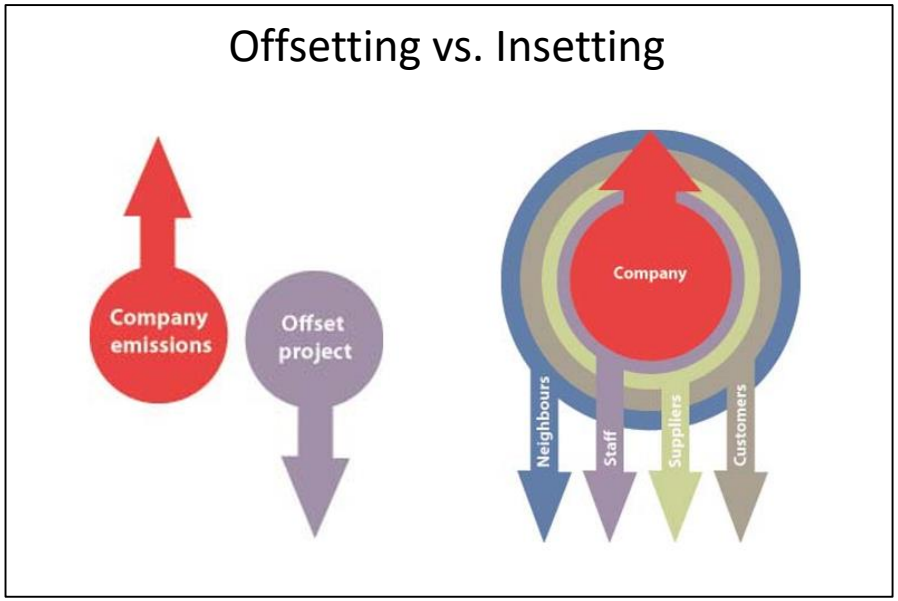
Gold Standard · Climate-KIC · Livelihoods Funds · World Resources Institute · CDP · MARS · Danone · Science Based Targets · WWF

**First Corporate Working Group (Oct 2018)** - Mars, Danone, General Mills, Cargill, Barry Callebaut, Ben&Jerry's, McDonald's, Chanel and L'Oreal

# “Plethora of Pop-Up Voluntary NCS Initiatives”

# Carbon Accounting and Insetting Project

- **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)
- **Partners:**
  - Bayer
  - US National Corn Growers
  - Soil Health Partnership
  - AgSolver
  - Applied Geosolutions
  - DNDC-ART
  - Climate Smart Group
  - CropGrowers
- **Funders:** USDA CIG/Bayer




Source: Tipper et al. (2009). "Is 'Insetting' the New 'Offsetting'?"

# CARBON PRICING – CHALLENGES

# Ag Challenges – Risk, Cost and Scale

- Agricultural projects are not metered - risk/cost
- Reliance on Modeling and Estimates – good, but risk
- Each farm has small emission reductions and are diffuse on the landscape – cost (needs aggregation)
- Soil sequestration is not permanent – risk (100 years+?)
- Revenue stream is small – scale/cost
- Activities can shift – risk (leakage)
- Additionality can be difficult to meet (requires further barriers analysis w/experts)

# Thank You!

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