Viresco Solutions

End-to-end sustainability

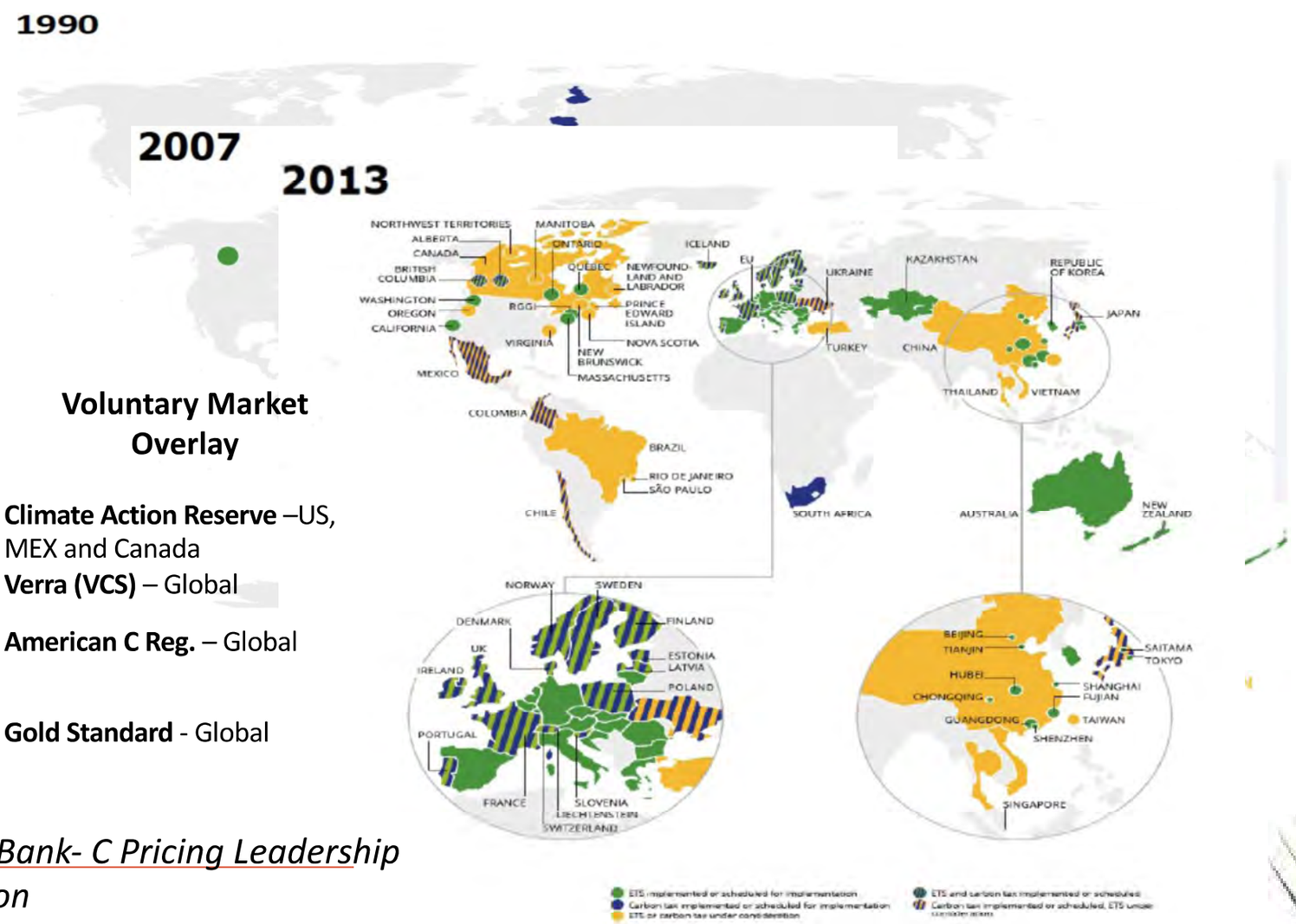
The Potential for the Agricultural Sector to Contribute to Net-Zero Goals

NACW April 28, 2021

Karen Haugen-Kozyra, MSc, PAg
President

Some of Our Clients / Partners

Looking Back Down the Road to Today



Voluntary Market Overlay

Climate Action Reserve –US, MEX and Canada
Verra (VCS) – Global

American C Reg. – Global

Gold Standard - Global

World Bank- C Pricing Leadership Coalition

Alberta - 14 Years of Carbon Pricing

- A series of Firsts:
  - Economy-wide Compliance C Pricing System w/Offsets
  - Based on ISO 14064 Standards
  - 21 offset protocols – 7 Agricultural, 9 Natural Climate Solutions
  - Over 294 Offset Projects Registered
  - Proving Ground for other Systems: AU, CA, Brazil, Korea, China, SK, ON, QUE
- Offsets at Scale from Ag:
  - Over 17 Million Active AB Soil Carbon Compliance Offsets
  - MRV Systems that scale; Assurance Systems that work for land-based sectors
  - First jurisdiction to demonstrate soil carbon at scale; need for aggregation

"What we have to learn to do, we learn by doing"

-Aristotle

Conservation Cropping Tonnes Up Until 2018

www.mapreach.ca/offsets

Offset Criteria/Rules

- Additional – beyond business as usual (establish valid and defensible baseline post system start date); surplus to regulations/received incentives)
- Real/Measurable– agreement on best available science and activity data – develop a Protocol. Must stand up to the Review Process; account for all 6 GHGs.
- Verifiable – carbon accounting, and tracking process must be clear, defensible, and have good QA/QC procedures; verified by qualified 3rd party.
- Permanent – must protect against carbon reversals; account and replace mechanisms; liability period of 100 years
- Clearly Owned – Crown Land vs Private Land; Land Lessee vs Land Owner; Technology provider vs Buyer
- Not Double Counted – Registered and serialized once
- Intensity-Based metrics – comparing apples to apples

Offset Criteria/Rules

- Leakage of emissions occurs when there is an increase of emissions outside a project boundary as a result of project activity inside the project boundary. Essentially, emissions are displaced from one area to another with no net decrease in emissions. The risk for leakage differs among project types. For example, leakage may be more of a concern for a forestry project than in a coalmine methane project because altering forestry practices in one area may affect land use in other areas and because timber is a global commodity.
- Material misstatement means that errors, omissions or an aggregation of both in the reported GHG reductions or assertion exceeds a +5% threshold.)
- Uncertainty: parameter associated with the result of quantification that characterizes the dispersion of the values that could be reasonably attributed to the quantified amount
- Verifiiable: process for evaluating a statement of historical data and information to determine if the statement is materially correct and conforms to criteria

American Carbon Registry (ACR)[150]

Administe	
Establishe	
Type	
Registere	
Credit na	
Credits is	
Credits re cancelled	

Gold Standard

Gold Sta

Administered by	
Established in	
Type	
Registered activities	
Credit name	
Credits issued ($MtCO_2e$)	
Credits retired or cancelled ($MtCO_2e$)	

Verified Carbon Standard (VCS)[161]

Geographic coverage	Global
Countries with projects	72
Administered by	
Established in	
Type	
Registered activi	
Credit name	
Credits issued (M	
Credits retired o cancelled (MtCO	

Climate Action Reserve[153]

CLIMATE ACTION RESERVE

Geographic coverage	USA, Canada and Mexico
Countries with projects	2
Price data for 2019	US$3/$tCO_2e$ (unweighted average)[154]
Carbon pricing initiatives accepting issued credits for compliance	CORSIA, Washington State CAR
Administered by	Climate Action Reserve
Established in	2001
Type	Independent
Registered activities	274
Credit name	Climate Reserve Tonnes (CRTs)
Credits issued ($MtCO_2e$)	69[155]
Credits retired or cancelled ($MtCO_2e$)	40
Sectoral coverage	5 sectors

- 2% Agriculture
- 25% Forestry
- 27% Industrial gases
- 0.1% Other land use
- 46% Waste

"World Bank. 2020. State and Trends of Carbon Pricing 2020. Washington, DC: World Bank. © World Bank. https://openknowledge.worldbank.org/handle/10986/33809 License: CC BY 3.0 IGO."

We Need Innovation and We Need Diversification – Private Sector and Public Cooperation

- Secretary Vilsack at Agri-Pulse Conference two weeks ago:

"When we talk about a carbon bank, many folks are taking a look at the existing carbon markets and asking themselves whether or not it will work for agriculture," Vilsack said. "I think it's important to point out that this carbon market is not designed and set up for farmers. There's a lot of paperwork involved – a lot of complexity involved. The actual payments are not necessarily significant – not enough anyways to compensate for the hassle that's connected with the carbon market." The proof, he said, is in the numbers. Out of about 134 million outstanding carbon credits, only about 2.5 million are agriculture-based. However a new carbon market is established, Vilsack said, "it has to be set up in a way that speaks to farmers' needs and is really designed for farmers and about farmers."

Platforms and Programs

ECOSYSTEM SERVICES MARKET CONSORTIUM – Founding Members and Partners

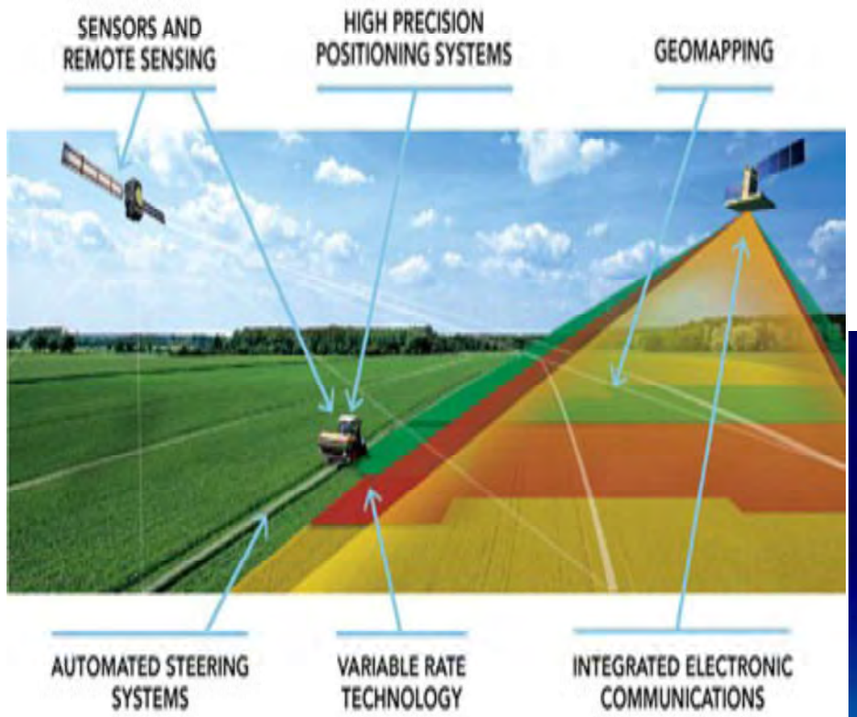
syngenta
TRUTERRA
Nutrien
YARA
BASF We create chemistry
indigo
CORTEVA agriscience
LOCUS
BAYER
FARMERS BUSINESS NETWORK

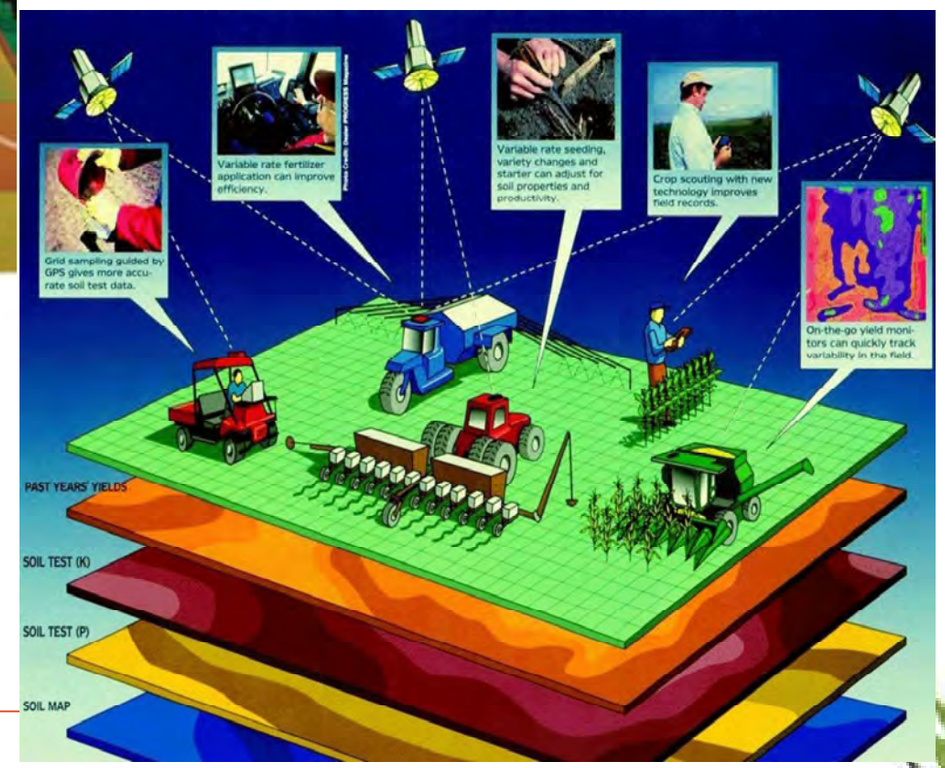
Nutrien Ag Solutions
SOIL HEALTH INSTITUTE
The Nature Conservancy
TRUTERRA
NOBLE RESEARCH INSTITUTE
CORTEVA agriscience
DANONE NORTH AMERICA
Nestlé
syngenta
Cargill
NFWF
General Mills

VENCE
SORGHUM CHECKOFF
Sustainable Northwest
Tyson
Field to Market
TRUST IN FOOD
FARMOBILE
NEWTRIENT
MissouriCorn
IL Corn
Seil
THE FERTILIZER INSTITUTE
ASA American Soybean Association
Low Carbon Prosperity Institute
National Farmers Union
SOIL HEALTH PARTNERSHIP
NCBA
Farm Foundation
ARVA
OpenTEAM
National Association of Conservation Districts
GROWMARK
CTIC
native energy
FARMERS BUSINESS NETWORK
MARS
almonds
PIVOT BIO
American Sugarbeet
WWF
American Farm Bureau Federation
ASU Arizona State University
National Association of Wheat Growers
MISSOURI SOYBEANS
THE MOONSHOT FACTORY
CAMPBELL
ANUVIA
Cornell Atkinson Center for Sustainability

SUSTAINABLE Environmental Consultants Powered by ECOPRACTICES
IOWA SOYBEAN Association
WALTON FAMILY FOUNDATION
Quantified Ventures
pepsi
Ingredion
Nutrien Ag Solutions
NORI

Digital Ag Technology Today

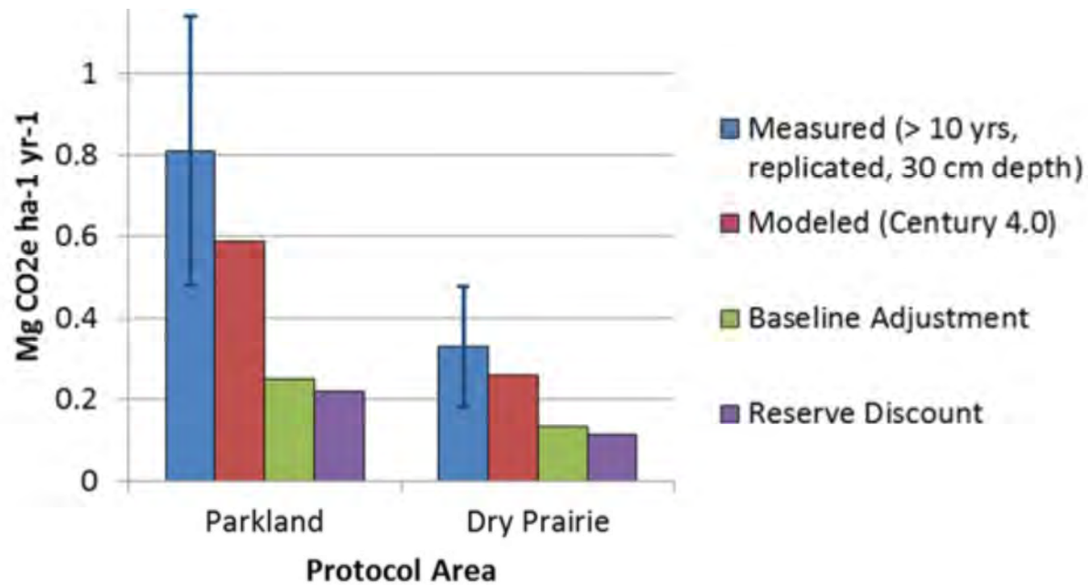




Innovation and Enabling Private Markets – The US Government can Leverage Private Sector Initiative Show the World

- Take on the 100 year+ Monitoring Role with USDA resources
- Leverage enhanced Conservation programming – provide a backstop to reversals with government portion of carbon (buffer reserve)
- Consider an Insurance Product to address permanence/reversals
- Assist with Verification costs by mobilizing USDA resources
- Support carbon markets with High Quality Soil Carbon datasets, alleviating cost burden (repeat 2011 Rapid Soil Carbon Assessment)
- Consider a storage fee for soil carbon for early adopters of climate smart practices or apply regional/proportional additionality (like Alberta)
- Capacity building with the private sector to help scale adoption of climate Smart Ag Practices
- Consider Early Stage Financing - government offtake agreements thru reverse auctions for suppliers, but with a contract of differences to enable flexibility for participation in carbon markets

Alberta's Innovation for Soil Carbon

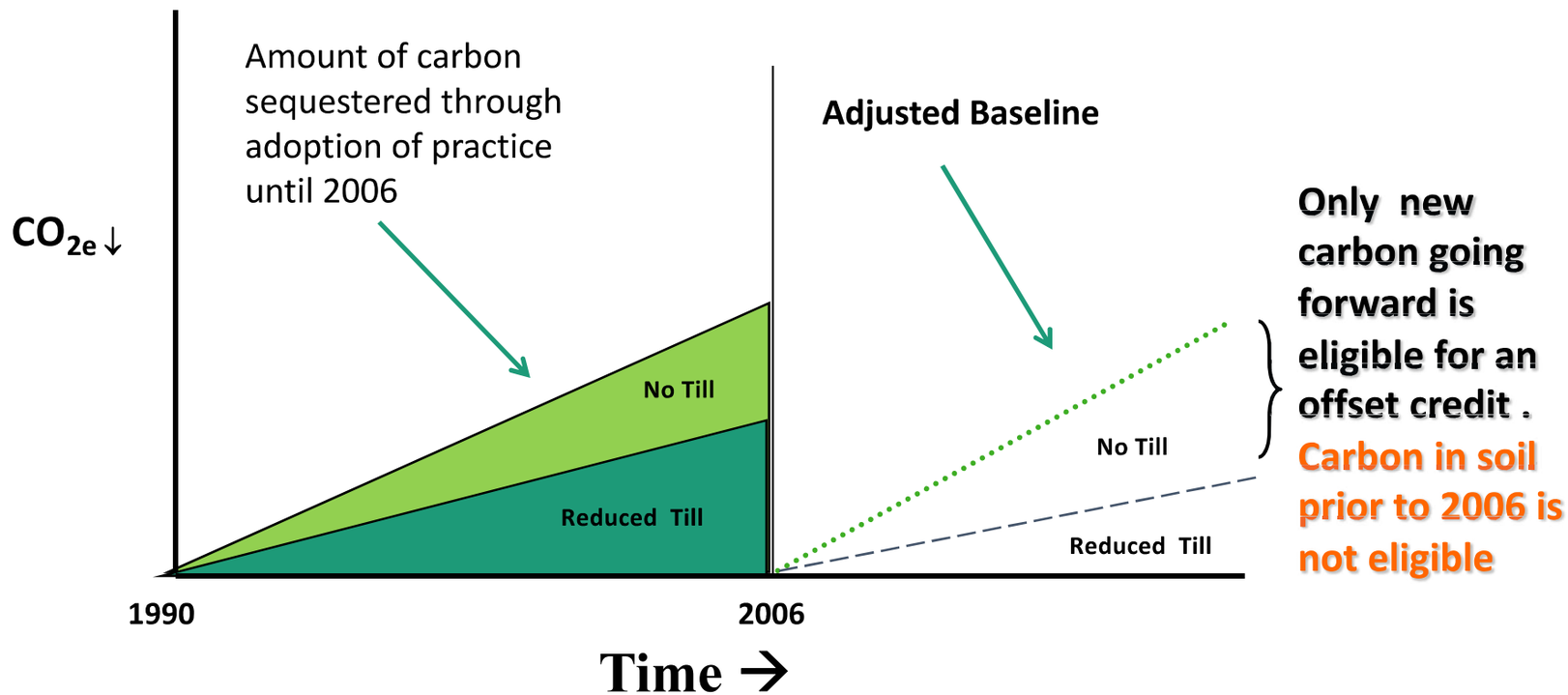


Conservative Science/Policy in the Protocol – 1 tonne credited for every 3 sequestered in soil: 1 Mt CO_2e/yr from 2002 to 2012

Science based on validation of Century model (Vander Bygaart et al 2008) and use of modeled results (McConkey et al. 2007) for Canada's National Inventory Report (Environment Canada, 2018)

Proportional Additionality

Policy Objectives – Maintain Sink to Date and Keep Growing the Sink



Applied approach developed by Soil Management Technical Working Group (Haak, 2006) including Agriculture and AgriFood Canada, Soil Conservation Council of Canada, Environment Canada, Provincial Ag reps, Producers, including review.

Proportional Additionality – Baseline Discount

- Takes existing practice change into account so early and late adopters can participate in offset credits
- Distributes only newly sequestered carbon among all adopters
- Discounts the value of science-based coefficients that are in the baseline condition to maintain the activity and not jeopardize the carbon sink built to date
- Expressed as % of land area practicing No Till (NT), Reduced Till (RT) and Full Till (FT)

Approach cited in Policy Statements issued by:
•Environment Canada (2009)
•Federal U.S. Bills (Waxman-Markey; Kerry-Boxer; 2009-2010)
•Western Climate Initiative Offsets Policy Paper (2012)

The Road Today and Ahead – Several Options for Ag to Engage

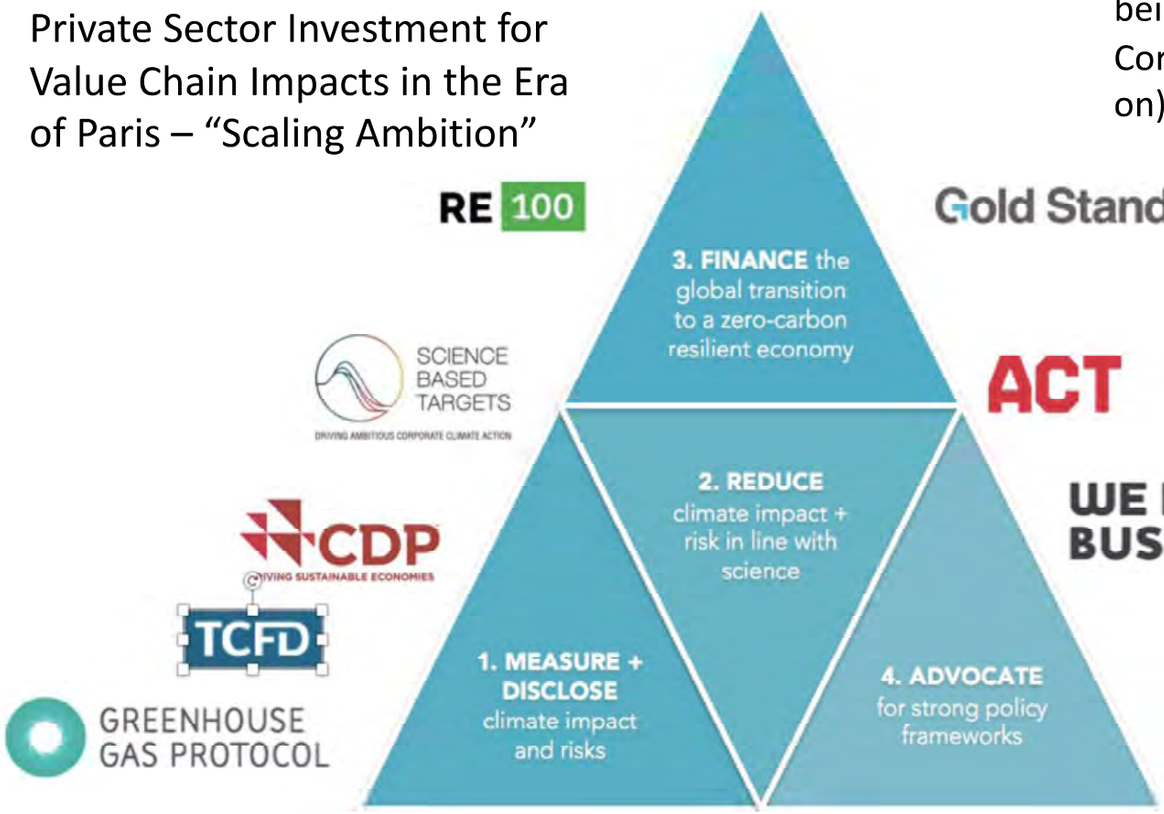
Compliance C Markets	Voluntary C Markets	Insetting/Scope 3 Actions
Created through regulations and laws at the National or Sub-National level (e.g Alberta, BC, Quebec, California, EU ETS) **Buyers:** Large emitters required to reduce emissions by law **Price:** $15 - $50 **Risks:** Policy uncertainty, invalidation	Usually managed through a third party registry (e.g Climate Action Reserve, Verra (VCS), Gold Standard, etc.; Clean Development Mechanism) **Buyers:** Any individual, business, non-profit, municipality, utility, etc. voluntarily reducing emissions **Price:** $1 - $45+ **Risks:** Finding buyers, price	An investment in an emission reducing intervention within a company's supply chain. The emission reduction (i.e. inset) can be claimed by the company that sponsored the activity. (Gold Standard Value Change Initiative, ICROA, Insetting)

Market Pull

The Corporate World - Scaling Ambition – Value Change Scope 3 Supply Chain Drivers

Alignment of Global Standard Setting Organizations leveraging Private Sector Investment for Value Chain Impacts in the Era of Paris – "Scaling Ambition"

Aggressive Value Chain Targets affecting Farms and Ranches being set by Food and Bev Corporates (with more coming on) ;



RE 100

SCIENCE BASED TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

CDP
DRIVING SUSTAINABLE ECONOMIES

TCFD

GREENHOUSE GAS PROTOCOL

Gold Standard

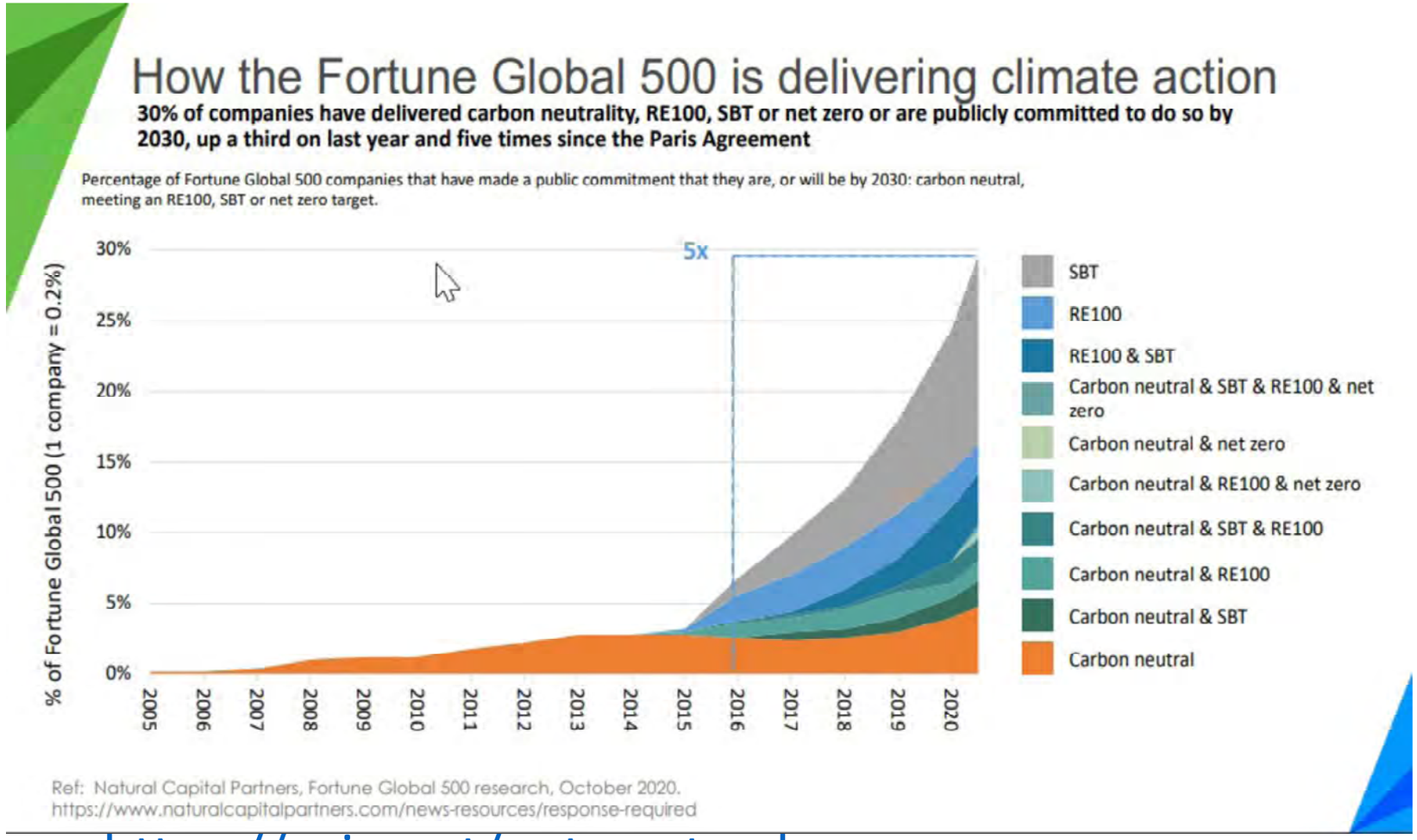
ACT

WE MEAN BUSINESS

Coca-Cola, McDonald's, Cargill, PEPSICO, MOLSON Coors, GENERAL MILLS, DANONE, Carlsberg, MARS, Kellogg's, Walmart, Nestlé, MAPLE LEAF

- Opportunity to scale investment to measurable Farm actions

Net Zero/Carbon Neutral Pledges: >1200 Corporations; >140 Countries; >50 cities



- https://eciu.net/netzerotracker

Scope 3 Insetting/Value Change Initiative

Value Change

Piloting unlocking credible Greenhouse Gas claims for Corporate Reporting in line with Science-based Targets

SUSTAINCERT User-centric impact assessment

Gold Standard

Unlocking the Potential

OPPORTUNITY IN ADDRESSING VALUE CHAIN EMISSIONS

An addressable market worth $311bn of investments

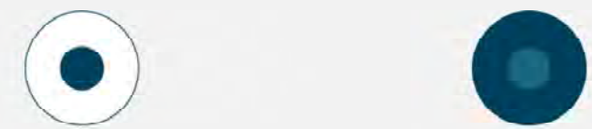
The 500 largest companies globally reported climate related risks and opportunities of respectively USD970bn and USD2.1trn most of which relate to value chain emissions.

- Opportunities are mostly driven by **potential new revenue** from the growing demand of low emissions products and **better competitive advantage** with shifting consumer preferences.

New demand for comprehensive, straightforward and reliable solutions to quantify and reduce value chain emissions is quickly emerging and represents $311bn worth of investments

The market opportunity to reduce value chain emissions is worth $311bn

Market Value



$311bn Cost to enable transition

vs.

$2,160bn Potential climate related business opportunities

Emission coverage	**14 GtCo2e**
Suppliers impacted	**>10m**
Companies actively managing their emissions	**955**

The Corporate World…

2021 onwards…. The Value Change Initiative

From Program to Initiative: Extending the purchased goods and services guidance to other sectors, scope 3 categories and beyond boundary claims; and supporting the development of scalable and comparable measurement, reporting and verification systems

Vision

To rapidly unlock the climate mitigation potential in global value chains by removing barriers to information and financial flows

Mission

Realizing the mitigation potential within value chains by enabling value chain actors to scale up collective efforts to reduce impacts, in line with global reporting frameworks such as the GHG-Protocol and Science Based Targets.

Programs Objectives

To co-create guidance, tools and implementation trajectories that allow companies to credibly quantify, verify and allocate and make claims about impacts realized in their value chains.

With more clarity on how to account and report on impacts achieved, barriers towards more ambitious targets are minimized and incentives for increased investments can be created.

A community of best practice

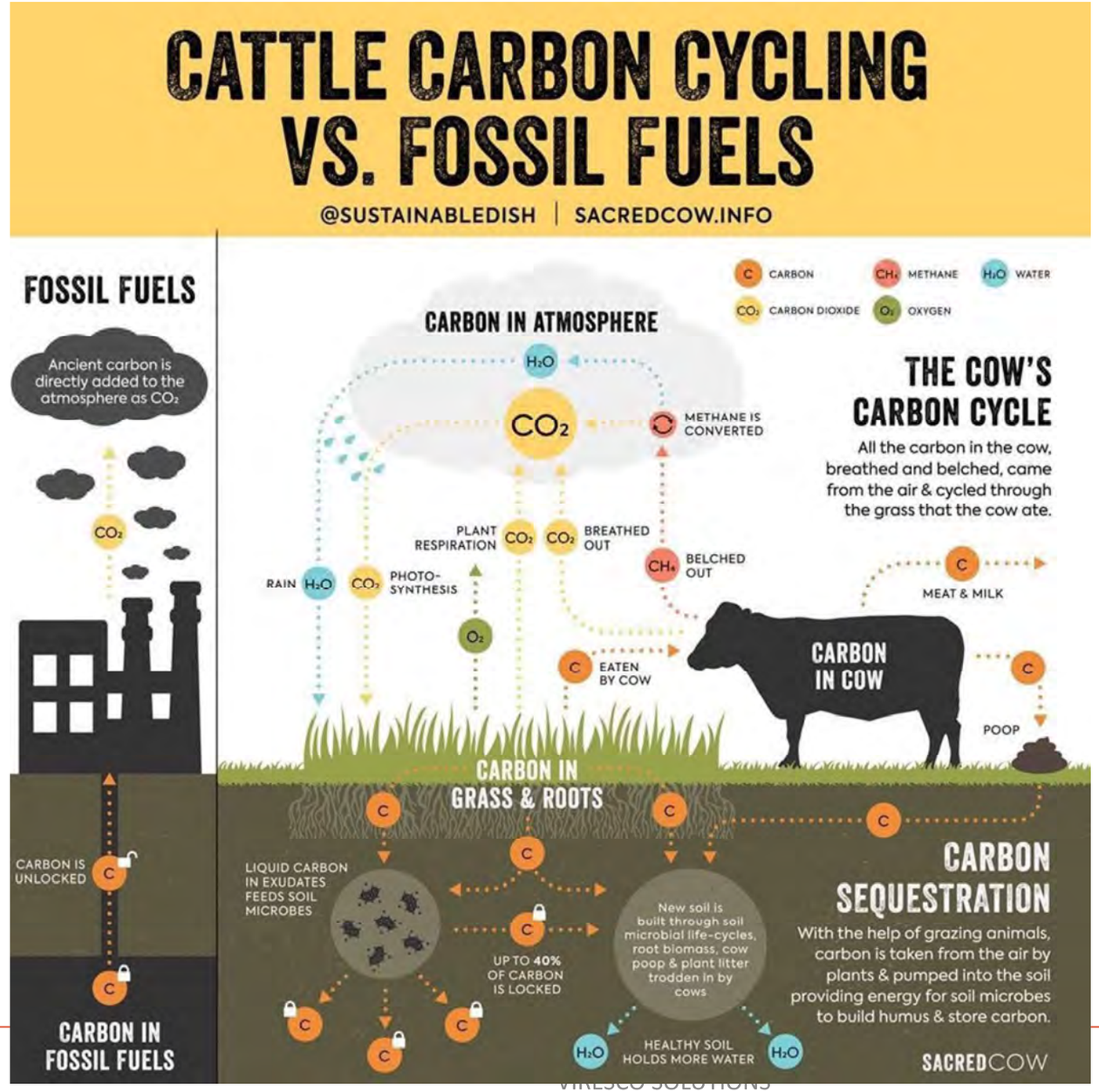
Sector-specific working groups and topic-specific labs ensure applicability, allow us to identify needs for new or additional guidance, and support the uptake of best-practice

Pilots provide case studies and use cases to confirm best-practice and will lay the foundation for scalable value change verification solutions, claims and systems

Scope 3 category
1. Purchased goods and services
2. Capital goods
3. Fuel- and energy-related activities (not included in scope 1 or scope 2)
4. Upstream transportation and distribution
5. Waste generated in operations
6. Business travel
7. Employee commuting
8. Upstream leased assets
9. Downstream transportation and distribution
10. Processing of sold products
11. Use of sold products
12. End-of-life treatment of sold products
13. Downstream leased assets
14. Franchises
15. Investments

But, the Science is not settled – needs R&D Investment

- Knowledge Gaps:
  - Impact of methane – accounting for the radiative forcing of a short-lived climate pollutant
  - https://www.youtube.com/watch?v=RW8BclS27aI&feature=youtu.be
  - Carbon stock changes under grasslands management
  - Impacts attributable to indirect land use change

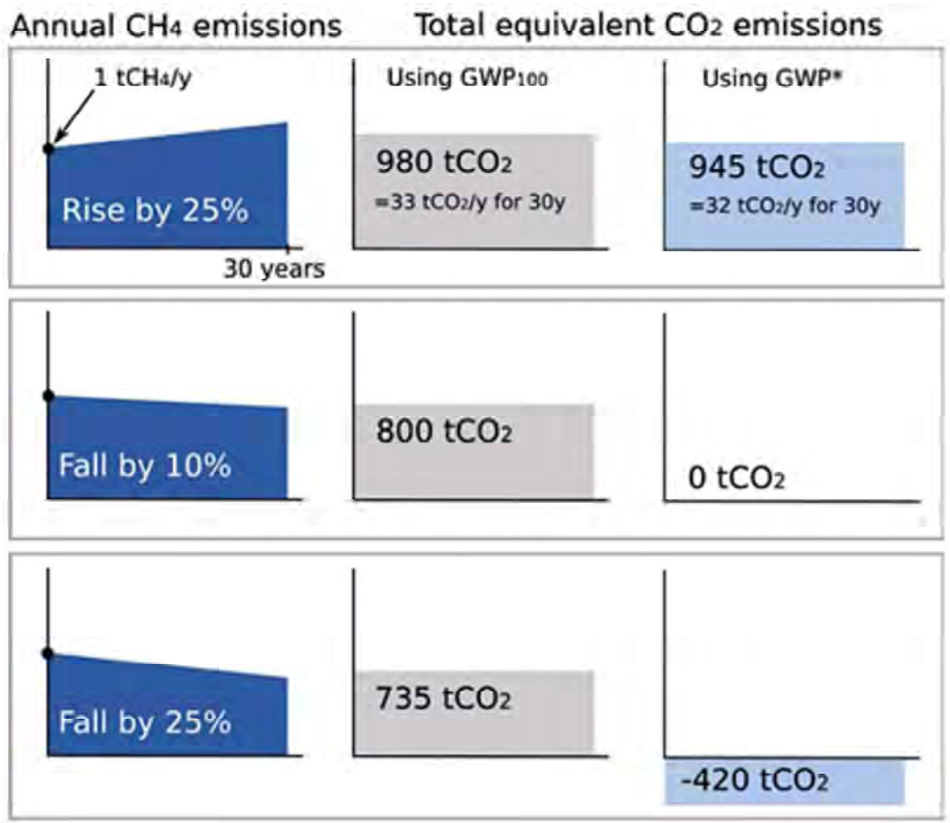


"We may be overestimating the impact of Methane"

-Frank Mitloehner, UC Davis

@GHGuru

GWP_{we} sensitive to overall GHG scenario



Source: *Allen et al., 2018., Climate metrics for ruminant livestock Oxford Martin School, University of Oxford*