



# Terra Verde



Emissions Credits Inc.

# ...today's carbon market?



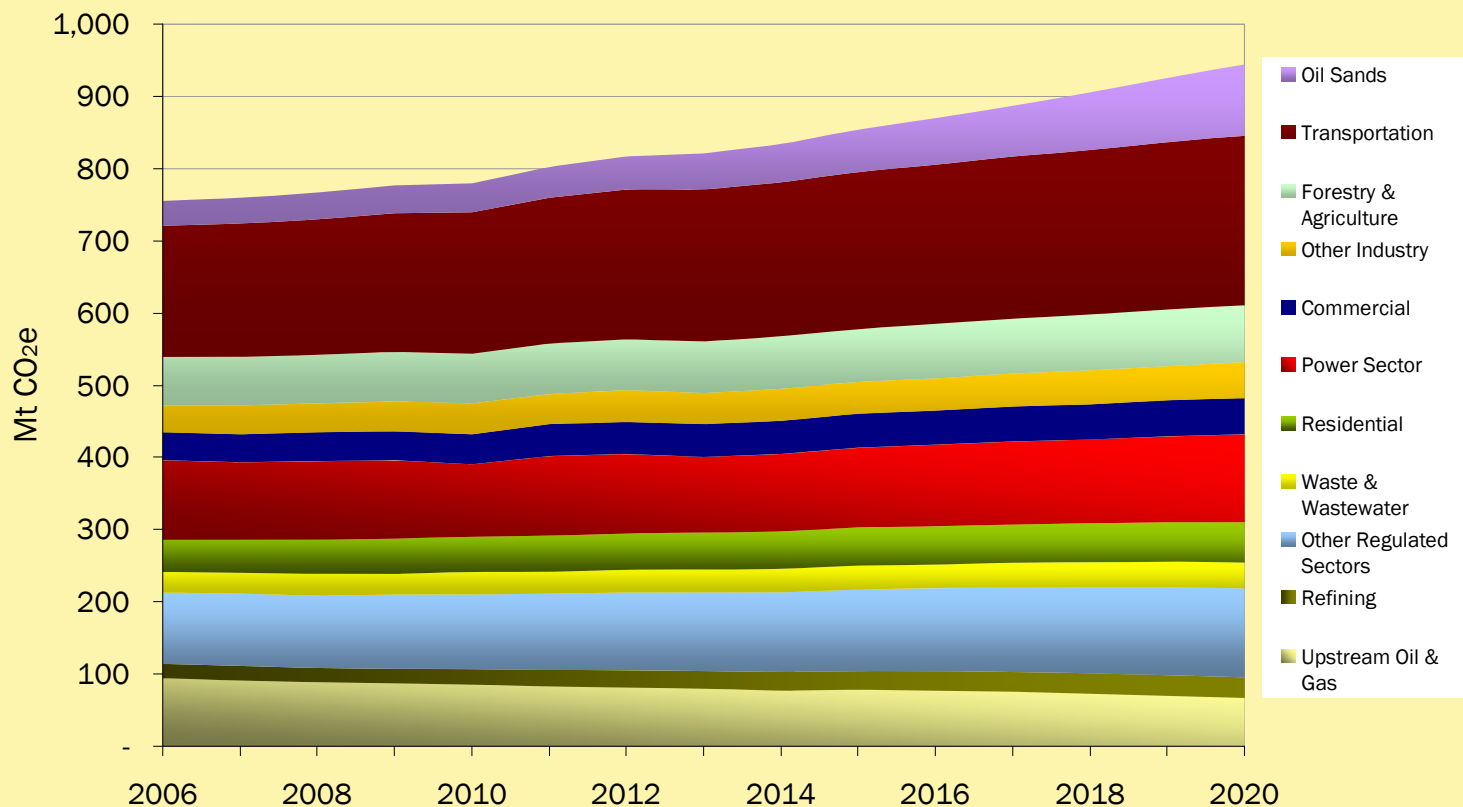


# Carbon Clips to Cover...

- Outline Federal and Provincial Regulations
- Aggregation Process and participating in the carbon offset markets
- Zero till agricultural protocol
- About Terra Verde Emissions Credits Inc.

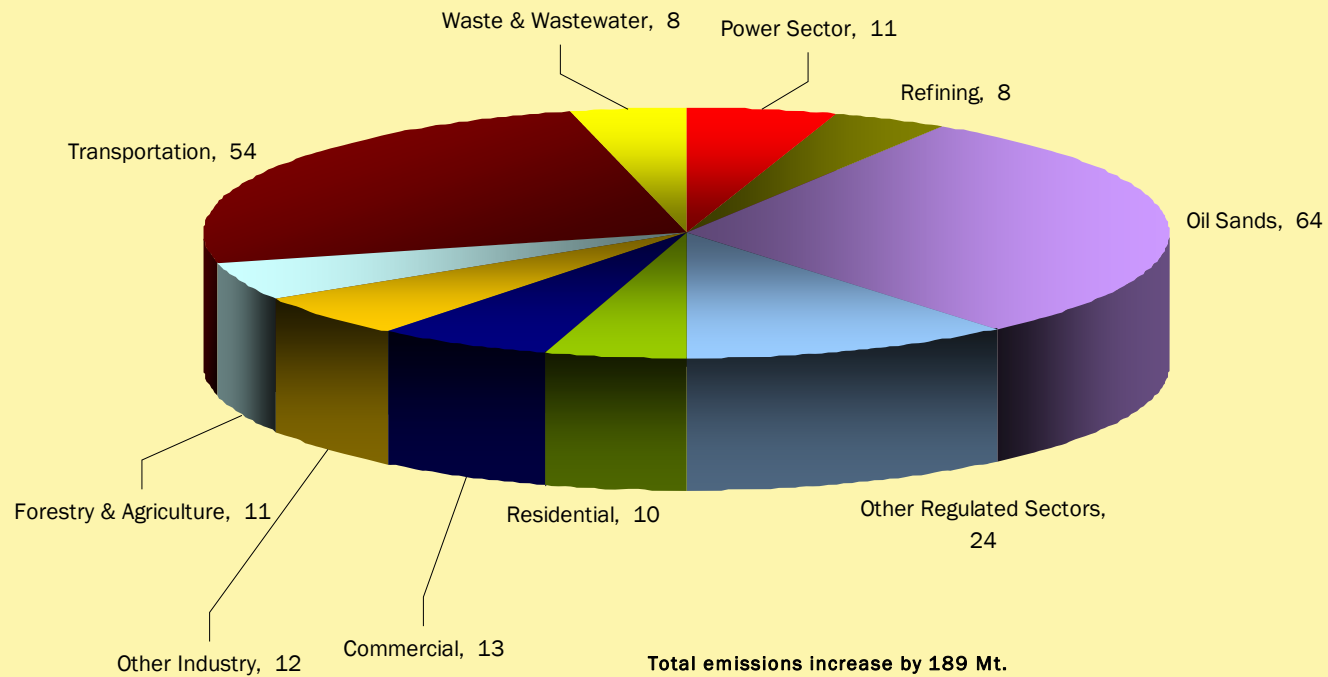
# Who are Canada's major emitters?

GHG Emissions by Sector - BAU



# Where are the emissions are coming from in the future?

Growth in Emissions - BAU - 2006-2020 (Mt)

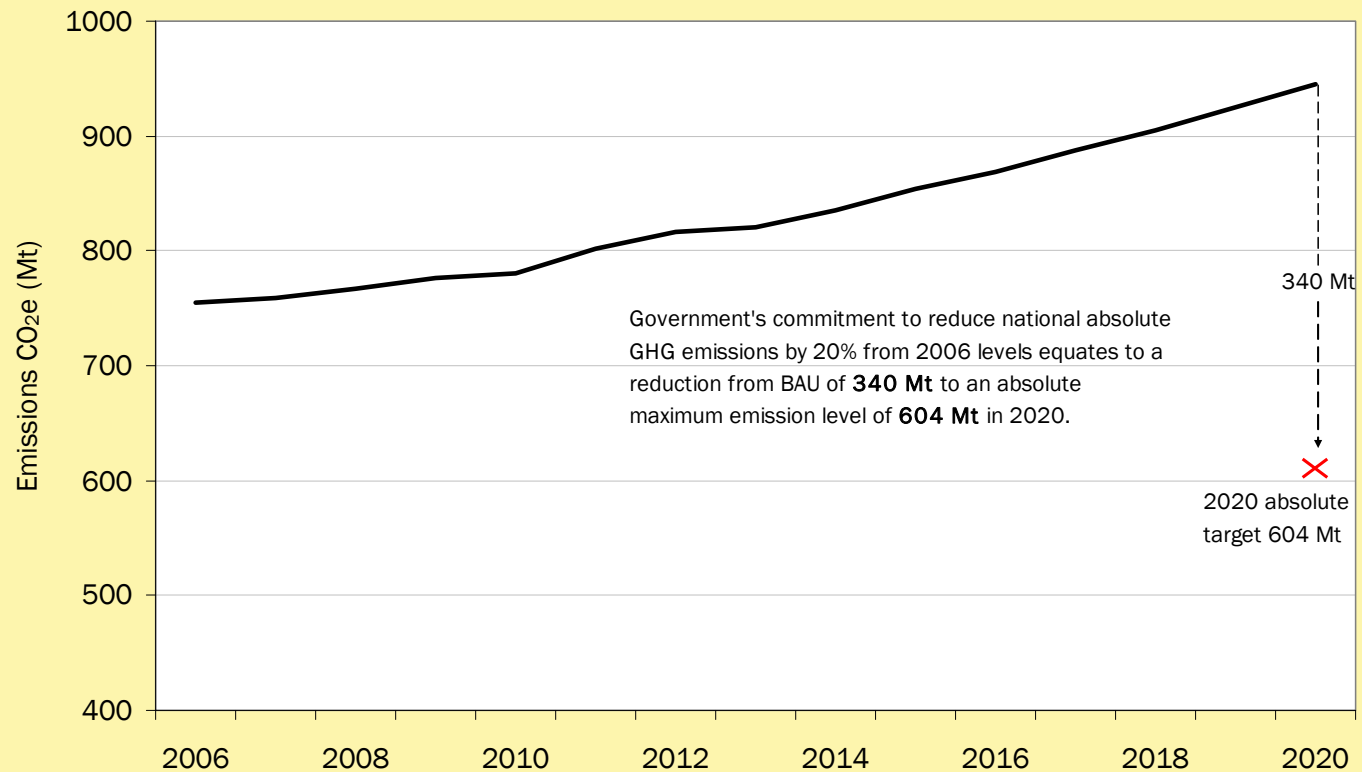


**Total emissions increase by 189 Mt.**

Note: Emissions from Upstream Oil & Gas decrease by 27 Mt over this period.

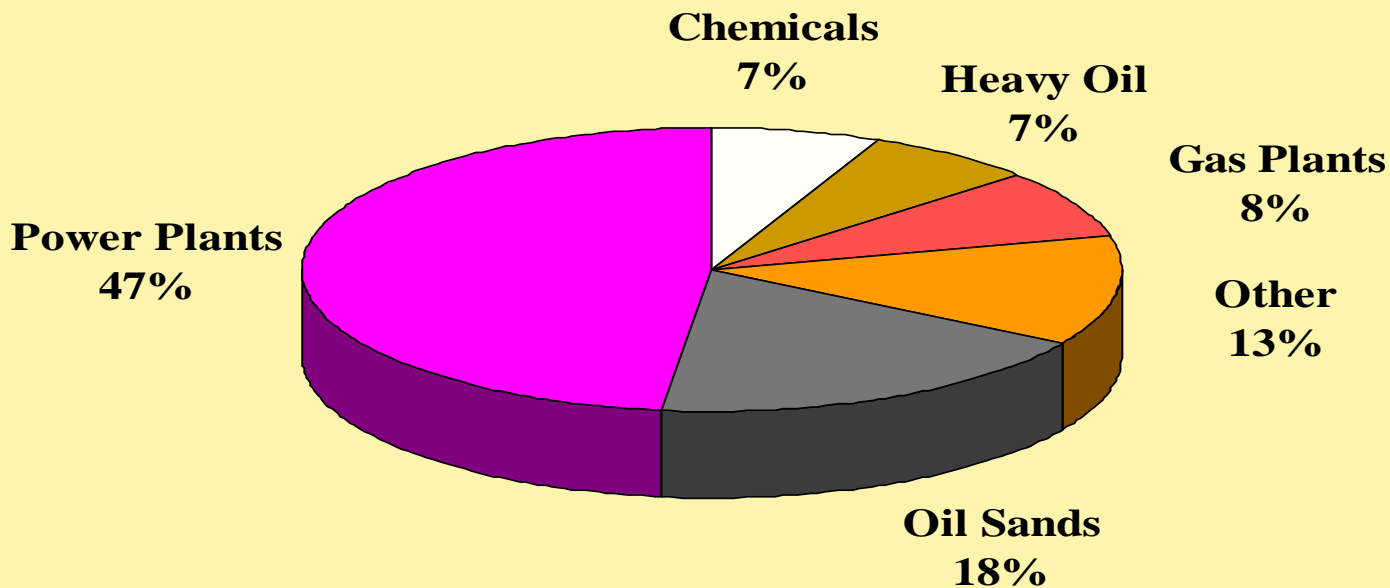
# Canada's emissions reduction target 2006 to 2020

BAU GHG Emissions



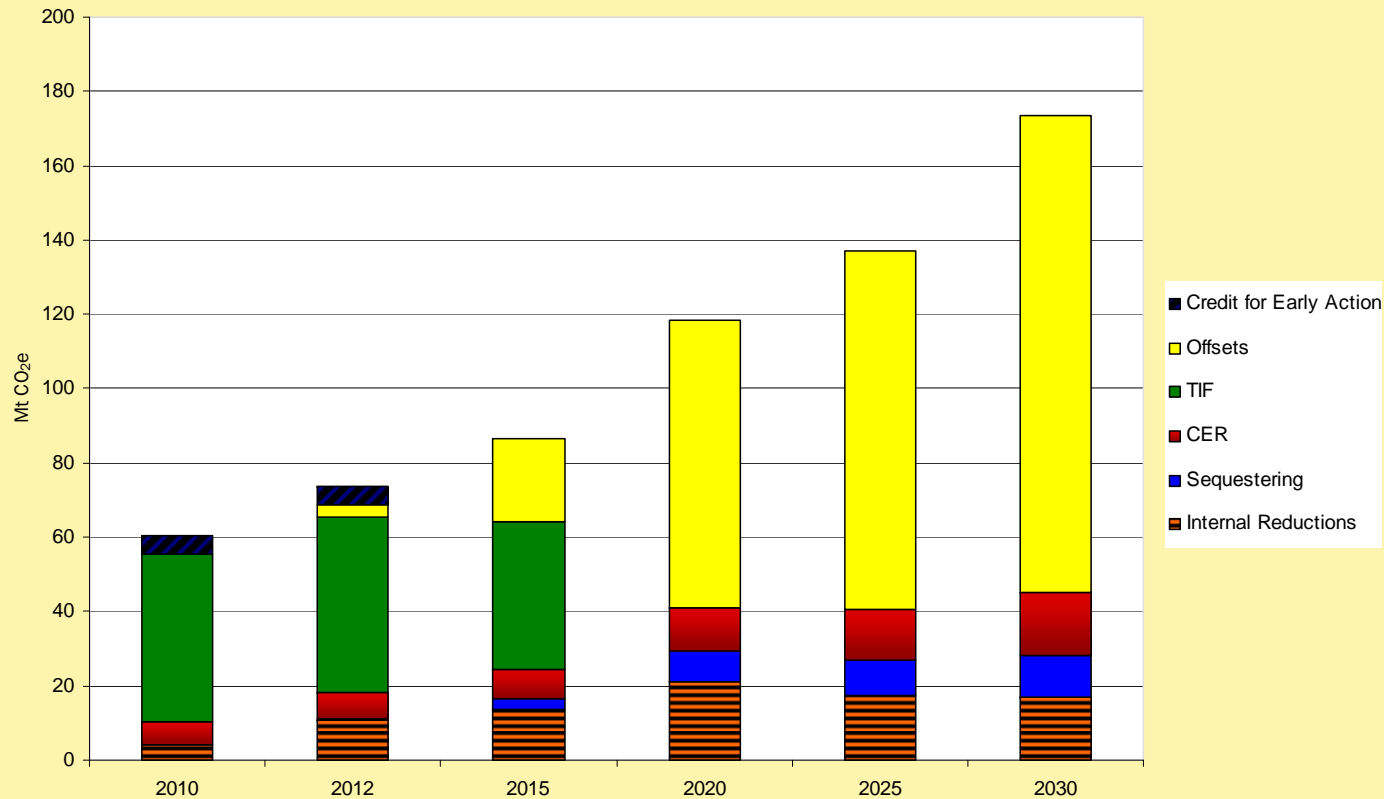
# Who are the major emitters in Alberta?

## Large Industrial Emitters Profile (*>100,000 tonnes CO<sub>2</sub>e/year*)



# How will industry meet its obligations in the future?

All Regulated Sectors - Regulatory Compliance



# Example - Federal and Alberta

	<b>Proposed Federal System</b>	<b>Alberta Offset Market</b>
<b>Emission Reductions</b>	18% per year/2% thereafter	12% per year
<b>Facilities Regulated</b>	50,000 tonnes CO2e/yr	100,000 tonnes CO2e/yr
<b>Junior Producers</b>	10,000 boe/day/company	No restrictions
<b>Technology Fund</b>	<ul style="list-style-type: none"> <li>•\$15/tonne 2010 rising to \$20/tonne in 2020</li> <li>•70% reductions in 2010 decreasing to 0% in 2018</li> </ul>	•\$15/tonne in 2007 and thereafter
<b>Total Share of Emissions Market</b>	60%	40%
<b>Baseline Period</b>	2006 Emissions Levels	2004-2006 Average Emissions
<b>Aggregation Years Available</b>	2008 forward	2002 forward
<b>Risk Acceptance of Offsets from Accepted Protocols</b>	None	Alberta Government



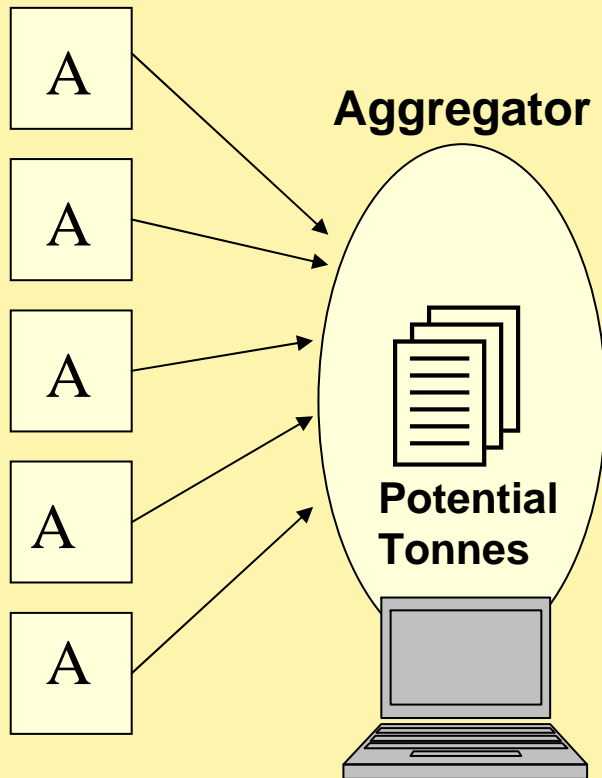
# What Makes an Ideal Offset Project?

## **Key project characteristics include:**

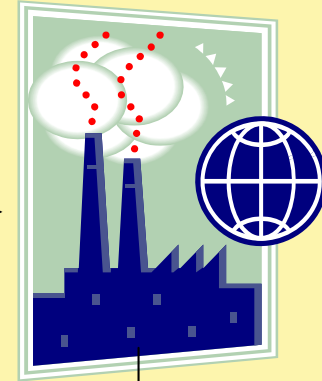
1. Application of technology creates real net emission reductions and/or CO<sub>2</sub> sequestration
2. Technology has multiple industry applications and is easily replicated
3. Ownership of offsets can be easily established
4. Data is available and easy to measure and collect
5. Technology is based on sound, currently acceptable science
6. Project quantification technology is relatively easy to establish
7. Project is financially self sufficient; is not reliant on emission reduction value economics

# The Credit Supply Chain

## Farms



## Buyer






# What to look for in a good purchase contract...

- Flexible period terms (1 - 5 years)
- Ability of producers to withdraw their application if not accepted within reasonable time frame
- Contract clearly defines ownership of offsets
- Reasonable payment terms upon sale of offsets
- Farmers need not commit all of their land or all prior or future years under the same contract
- Should not include a right of first refusal on future years
- Protocols and co-efficients to be used should be clearly outlined
- Commissions, verification costs and other costs should be clearly outlined; comparisons between contracts should be easy to make



# Marketing Alternatives

- Direct, bilateral agreements between buyer and supplier
  - Alberta Offset System (2007)
    - Regulated
  - Canadian Offset System (2010)
    - Regulated
- Large investment funds
  - banking offsets, willing to pay for supply
- Chicago Climate Exchange
  - Voluntary, futures purchases
- REGGI, WCI



# Offset Buyers

## NET GHG EMITTERS

- Primary energy emitters represent the largest, most familiar target market. These include oil sands projects, coal fire power plants, natural gas plants, upgraders and refiners and other energy related emitters
- Non-energy emitters include concrete plants, manufacturers, steel plants and other manufacturers
- Other emitters include the airline and transportation industry
- Primary initial market is the regulated industries/facilities
- Non-regulated emitters represent potential for a voluntary market and would be consumer driven (auto manufacturers, consumer product manufacturers, etc.); market potential could be larger than regulated market



# Market Price Discovery

## What is the best way to discover price?

- Most buyers arranging bi-lateral deals with aggregators/suppliers; no real price discovery
- Fewer large buyers/numerous sellers open market up for pure speculation with downward price pressure
- Creating liquidity, providing market information to sellers and competition among buyers best way to discover price
- Possible carbon exchange?
  - CCX, Alberta Carbon Exchange, NYMEX, Toronto, Montreal



# Emission Offset Projects

## EMISSION OFFSET PROVIDERS

- Projects either ‘remove’ or ‘reduce’ emissions from the atmosphere
- Companies and Producers (Farmers) that are not “net emitters” can, through the use of technology or better practices, produce performance offsets that can be traded in the market
- *Removal Projects* include agricultural sinks and forestry projects
- *Reduction Technology Projects* include bio fuel and alternative energy producers; oil industry technologies, recovery and flaring; GHG gas injection or incineration projects; non-ag composting, bio mass combustion, land fill and waste heat recovery
- *Agricultural Reduction* projects include methane gas reduction and incineration from poultry, pork, dairy and beef operations



# Offset Market

## Current Offset Prices (estimates)

- Alberta Technology Fund credits cost \$15.00 per tonne
- Large Utility Companies have entered into contracts for the purchase of Ag offsets ranging from \$4.00 - \$10.00/tonne, depending upon the source and quality of the credit, and the bargaining power of the credit seller
- Energy Companies are expected to pay prices somewhere in this range, or slightly higher in 2008
- Recent trade done at \$13/tonne
- Prices on US exchanges for voluntary credits have been as low as \$1.90 and was at \$5.50 in March 2008
- Cost of sequestration per tonne of CO<sub>2</sub> in the energy sector estimated between \$50 and \$100/tonne



# Alberta Offset System for Zero Till Projects

- Can sell credits back to 2002 and as far into the future as you are willing to contract
- Can contract 1 or more years, part or all of your acres, and part or all of tonnes per acre allowed through the AB government protocol
- Forage protocol coming
- No holdback/Government Underwrites Reversal Risk
- Verification costs need consideration
- Note: If you are given a deadline to sign up, it is one imposed by the Aggregator, not the Alberta Government

# Alberta Government Zero Till Protocol

Protocol Area	Soil Zones	Emissions Factor
Parkland	Black Soil Zone, Boreal Plains, Lake Manitoba Plain, Boreal Shield (AB, SK, MB, and NW ON), Montana Cordillera (AB)	0.16 metric tonnes / acre
Dry Prairie	Dark Brown Soil Zone, Brown Soil Zone	0.088 metric tonnes / acre

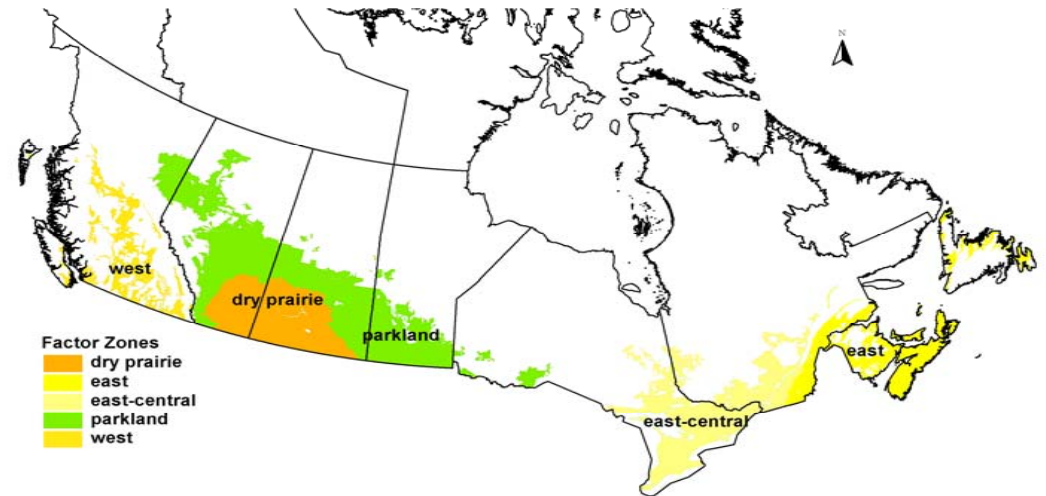


Figure A1. The boundary between Dry Prairie and Parkland is the Black-Dark Brown soil zone boundary. The numbers shown are for No Tillage. From McConkey 2006.



# Zero Till Protocol

**GHG removal offsets projects can be produced through zero till agricultural technologies (2006 Agriculture Canada figures):**

Province	Variable	Acres	% of Land Available	Approx. Tonnage Available/.122 tonnes/acre	Tonnage Avail. 2002-2007
AB	Seeded Land	18,726,144	100		
AB	Zero Till	8,950,836	47.8	1,092,001	6,552,006
SK	Seeded Land	32,984,104	100		
SK	Zero Till	19,955,382	60.5	2,434,557	14,607,734
MT	Seeded Land	9,613,927	100		
MT	Zero Till	2,050,735	21.3	250,190	1,501,140
<b>Total</b>				<b>3,776,748</b>	<b>22,660,880</b>



# Chicago Climate Exchange

- Voluntary market
- Have to commit to future credits for next five years to December 31<sup>st</sup>, 2011 → Includes forage acres opportunity
- 2008 price: \$5+ per tonne
- 20% of your revenue is placed in a Reserve Pool to cover risk of reversal/non-compliance
  - You get some or all of this back at the end of the pool period
- Exchange fees
- Verification Fees

# Example - Alberta vs Chicago

	<b>CCX</b>	<b>Alberta Offset Market</b>
<b>Carbon Credit Factor</b>	0.40 t / acre	0.16 t / acre
<b>Mandated Hold Back: Reserve Pool</b>	20%	0%
<b>Net Offsets</b>	0.32 t / acre per year	0.16 t / acre per year
<b>Price</b>	\$5.00 Cdn	\$10.00 Cdn
<b>Gross Value</b>	\$1.60 / ac	\$1.60 / ac
<b>Transaction Costs</b>	40 to 50% of gross value	20 to 50% of gross value
<b>Net Value to Farmer</b>	\$0.80 to \$1.28/ acre per yr	\$0.80 to \$1.28 / acre per yr
<b>Contract period</b>	5 years locked into future	From 2002 forward at choice of farmer
<b>Deadlines</b>	Typically Sept of each yr	No deadlines to sign up



# Terra Verde's Role in the Carbon Market

## 1. **AGGREGATOR**

- Co-ordinate aggregation of available offsets in the market place and their re-sale to net emitters and other purchasers

## 2. **OFFSET/PROJECT DEVELOPER**

- Assist potential carbon suppliers with the creation of accurate validation statements, project methodology documents, verification of data, proper data collection and technical expertise through our consultation network

## 3. **SERVICE PROVIDER**

- Provide current market information to producers and offset providers

## 4. **BROKER**

- Facilitate the sale of emission offsets between buyers and sellers and optimize price discovery between market participants



# Terra Verde's Consulting Team

**It is important to have access to industry leading consultants to assist in the development of carbon offset projects, provide verification, assist in gaining access to international markets and to provide updated information on the changing markets.**

- **Bennett Jones LLP**
  - *Gray Taylor, Head, Climate Change & Emissions Trading and Environmental Groups, Corporate Law Partner, Toronto*
- **PriceWaterhouseCoopers**
  - **Christine Schuh, P.Eng, Ph.D.**
  - *Director-Sustainable Business Solutions, PricewaterhouseCoopers, Calgary*
- **Meyers Norris Penny**
  - **Leading Agricultural Project Consultants and Agribusiness advisors**
- **ICFI Toronto**
  - **Erik Willis, Director, Canadian Operations**
  - **Leading international consulting firm in project developing and verification**

# Zero Till Agricultural Projects





# Current Projects

- **Zero-Till**

- Zero-Till practice ensures that the carbon sequestered in the soil by the growing of a crop does not get disturbed and re-released into the atmosphere
- Zero-Till allows for up to 2 passes with low disturbance openers (up to 33%) or one pass with a slightly higher disturbance opener (up to 46%), discretionary tillage of up to 10%

- **Forage Protocol in the development stage**

- **Additional Ag-related projects**

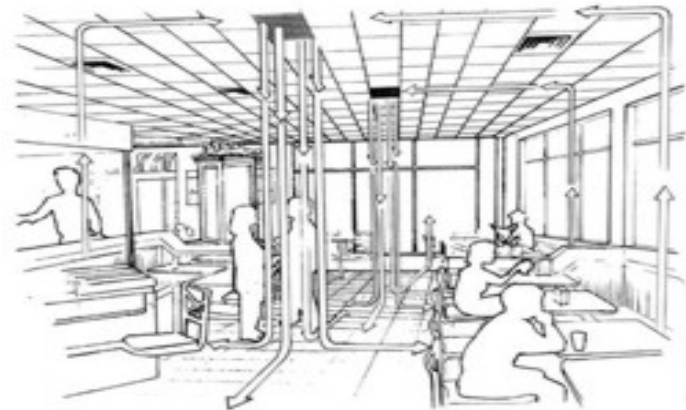
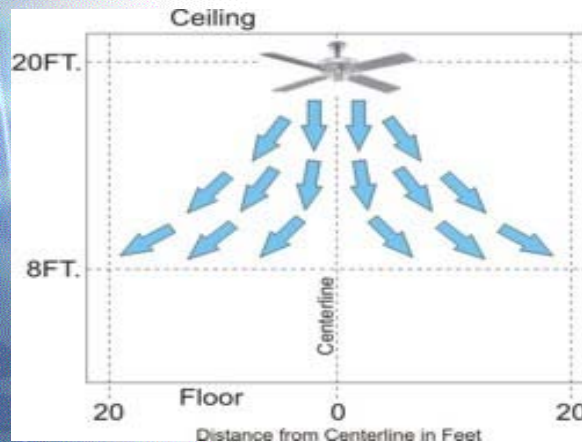
- Alberta Environment currently reviewing additional ag-related protocols that will enhance carbon offset development projects for farmers (methane capture, bio-fuel, waste management, on farm alternative energy production)

# Current Projects

## Vortex Air Circulation Project

### PRINCIPLE OF AIR MOVEMENT

- Traditional Paddle Fan:
- Vortex Air Sytem , Commercial Unit





# Current Projects

## Vortex Air Circulation Project

- Patented Fan Pattern Technology
- Evenly distributes warm and cool air circulation in a buildings
- Creates more efficient use of energy for heating and cooling
- Applications include hog barns, dairy barns, machine shops, and other large commercial and residential buildings

# Current CO2 Reduction Projects

## Incineration Project




**Efficient and  
Economic Waste  
Gas Incineration**

*Clean Air Technology  
serving Industry and  
Community*

***“Cleaning the Air”***






# Current CO2 Reduction Projects

## **Incineration Project**

- Reduces volumes of natural gas required to flare gas at regulated temperatures by 80%
- Efficiently incinerates methane to reduce GHG emissions (methane is 21 x more intense as a green house gas than CO2)
- Reduces CO2 emissions and distributes the particulates more efficiently than conventional flaring
- Applications include agricultural applications such as methane capture and incineration for hog barns and feed lots, waste disposal sites, as well as oil field and pipeline applications



# What does the carbon market mean to you?

- Spend appropriate time deciding who to have market your offsets
- As a seller of agricultural offsets, fertilizer and input decisions more important to your farm operation
- A small difference in price makes less difference than commissions and fees charged; pick your aggregator accordingly
- Keep in mind what your annual carbon sale means to your farm or business...

# Is it worth filling out the forms every year?



Sure, if it helps make the payments!!!





# How to Reach Us

**Anthony Weisshaar**

**President**

**[aweisshaar@terraemissions.com](mailto:aweisshaar@terraemissions.com)**

**or**

**[terraemissions.com](http://terraemissions.com)**

**or**

**1-866-949-1962**