



The Basics of Carbon Credits

AgraGate Climate Credits Corporation
&
Kansas Farm Bureau



Topics to be Covered

- AgraGate Climate Credits Corp.
- What are Carbon Credits?
- Background of the Chicago Climate Exchange (CCX)
- Exchange Offsets (XO's)
- Offset Contract

AgraGate Objective

Enable businesses, farmers, ranchers, and land owners to capitalize on financial opportunities available in the environmental credits markets

AgraGate Climate Credits Corporation

- New Entity for carbon credit aggregation owned by Iowa Farm Bureau Federation
- Launched in July 2007
- First licensed aggregator on the Chicago Climate Exchange (2003)
- Four Aggregation Specialists – Build a nation-wide network of contract facilitators
- 3.4 Million Carbon Credits enrolled
- 1.6 million acres enrolled in 25 states
- Nearly 620,000 Rangeland acres

AgraGate Role

- Provide farmers, ranchers, and land owners with information on opportunities available for earning marketable environmental credits
- Provide farmers, ranchers, and land owners with a reliable means to market their environmental credits

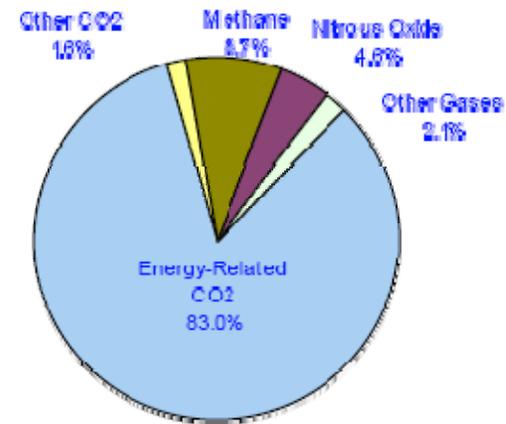
What is Kansas Farm Bureau's Role?

- Contract Facilitator
 - Provide information and education to Kansas producers
 - Sign-up Kansas producers
 - Answer questions on program and contracts
 - Work with AgraGate to enroll credits

Greenhouse Gases

- Carbon Dioxide (CO₂)
- Methane (CH₄)
- Nitrous Oxide (N₂O)
- Sulfur Hexafluoride (SF₆)
- Perfluorocarbons (PFCs)
- Hydrofluorocarbons (HFCs)

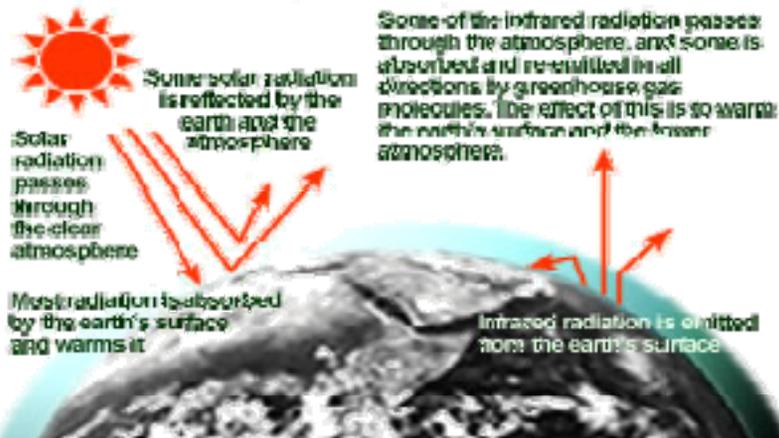
Predominant Sources of 2003 U.S. Greenhouse Gas Emissions



Source: EIA, Emissions of GHG gases in the United States 2003

- 6.9 billion metric tons CO₂e total
- 545 million metric tons from CH₄
- ~40 million metric tons from manure management alone

The Greenhouse Effect



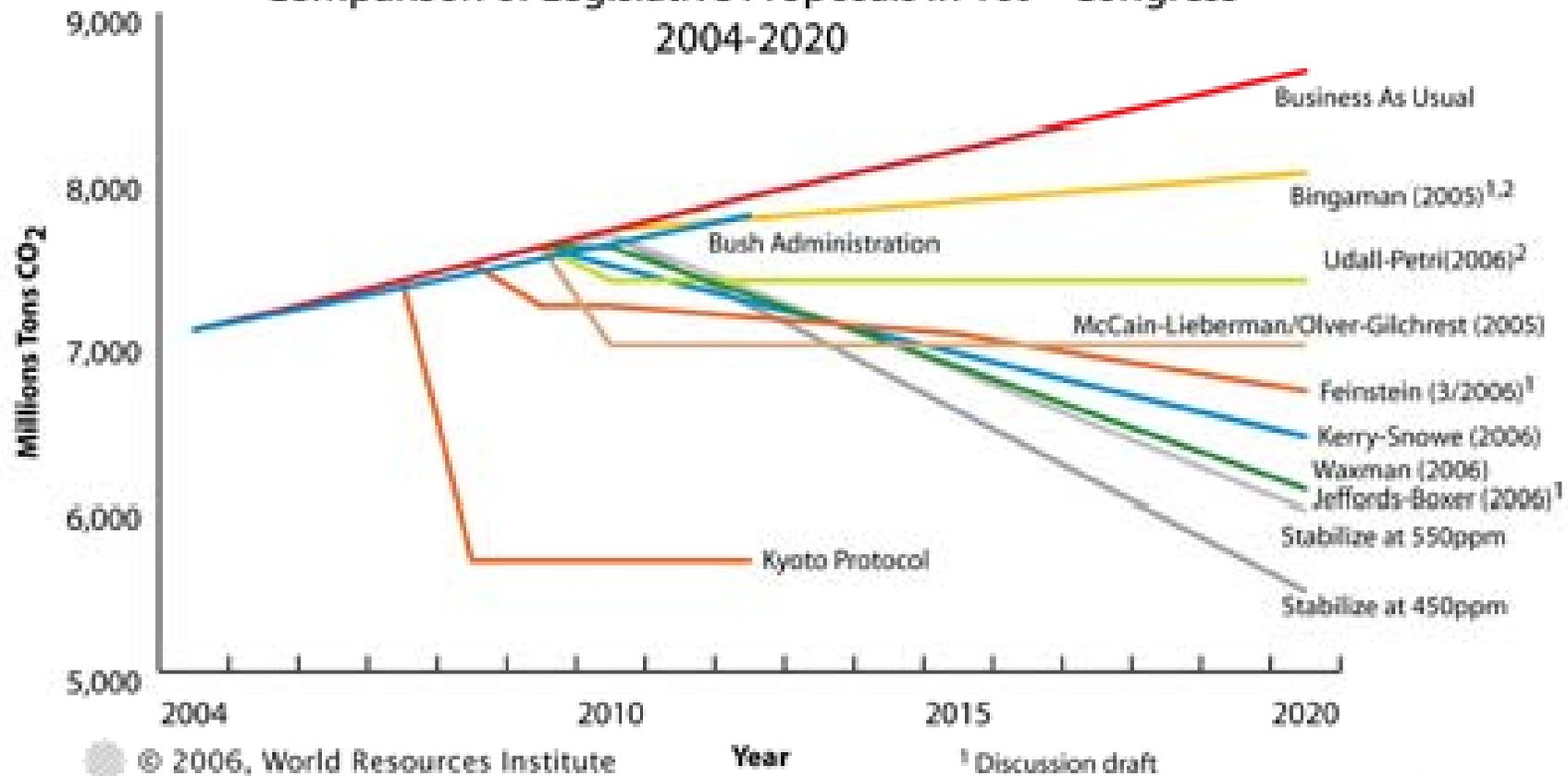
Greenhouse Effect

- The temperature-regulating gases, called “greenhouse gases” or GHGs, form a blanket around the earth that traps some heat from the sun within the earth’s atmosphere, keeping the planet warm and habitable.
- The “greenhouse effect” refers to the temperature regulation effect that certain atmospheric gases have on the earth.

Global Warming Legislation

- The 109th U.S. Congress
 - no less than seven proposals
 - Use of market-based, cap-and-trade mechanisms.
- Specified emission caps
 - Different formulas, such as a return to 2000 levels (Warner-Lieberman) or 1.5% reductions per year (Kerry-Snowe).
 - Different time frames; some run only through 2020, while others run through 2050, usually with reductions that increase in later years.
- Bush administration policy--an [emissions intensity target](#)
- "business as usual" scenario
- Estimated U.S. emissions reduction paths that would be needed to stabilize global atmospheric greenhouse gas concentrations at 450 or 550ppm (parts per million) CO2 equivalent.

Comparison of Legislative Proposals in 109th Congress 2004-2020



¹ Discussion draft
² Projections do not include emissions that may exceed the cap due to a price "safety valve."

What are carbon credits?

Carbon credits encompass two ideas:

- (1) Prevention/reduction of carbon emissions produced by human activities from reaching the atmosphere by capturing and diverting them to secure storage.
- (2) Removal of carbon from the atmosphere by various means and securely storing it. (i.e.. carbon sequestration)

**Therefore, as a landowner, you will earn carbon credits for implementing CCX approved sequestration methods.

One carbon credit is equivalent to one metric ton of CO₂.

An XSO or Exchange Soil Offset credit rates/acre/year

- **0.2 - 0.6** - Continuous no-till or strip-till practices.
- **0.4 - 1.0** - New grass planting after Jan. 1, 1999.
- **0.12 – 0.52** – Rangeland LRR regions

What are carbon credits?

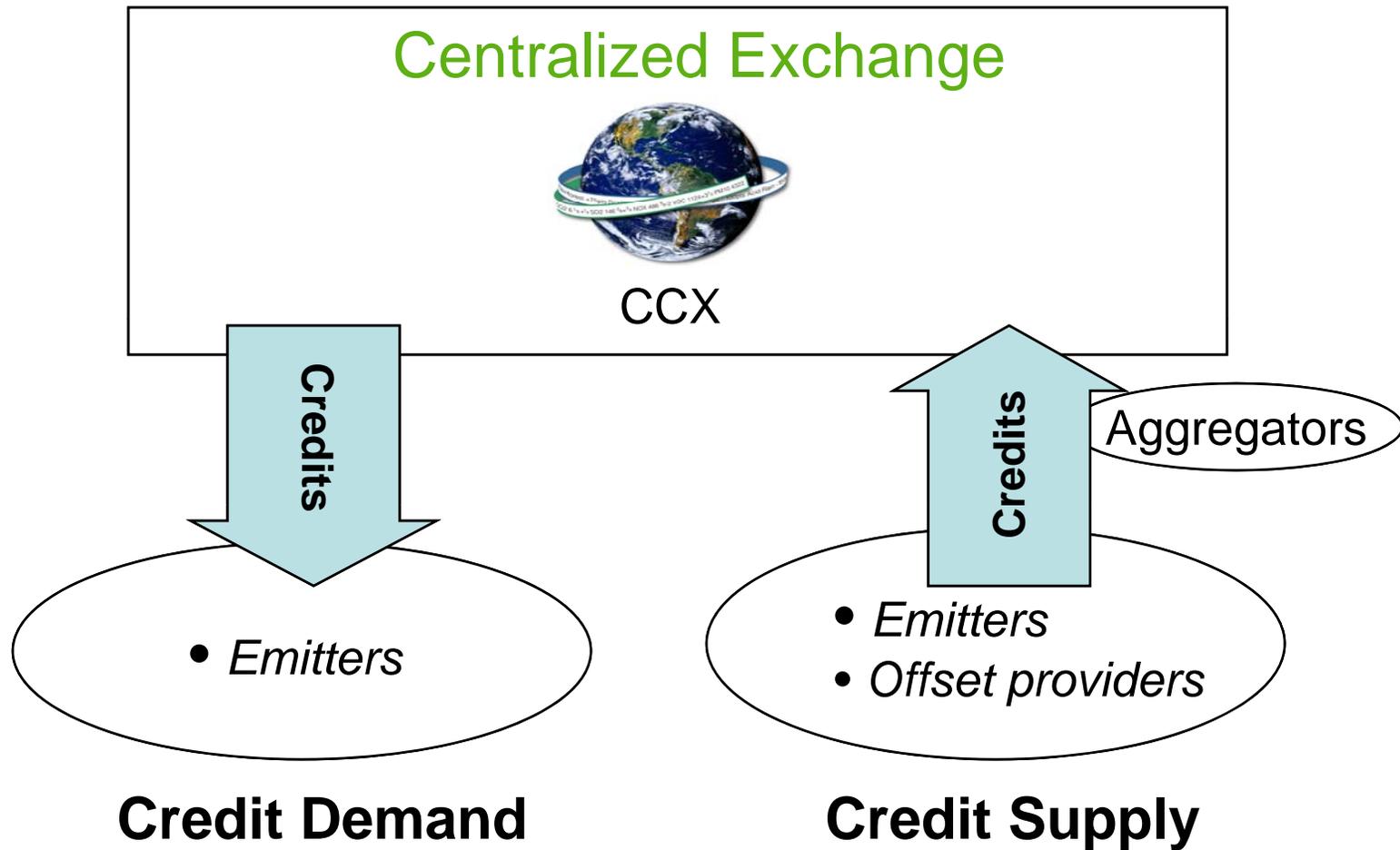
- **Equivalent to one metric ton CO₂ – Example...**
An XSO or Soil CC in Kansas = **0.2, 0.4, 0.6** cc/acre/year for continuous no-till and strip-till.
1.0 cc/acre/year for new grass seedings after January 1, 1999.
- **Carbon credits encompass two ideas:**
 - (1) Prevention/reduction of carbon emissions produced by human activities from reaching the atmosphere by capturing and diverting them to secure storage.
 - (2) Removal of carbon from the atmosphere by various means and securely storing it.

Carbon Sequestration

Carbon sequestration can be defined as the capture and secure storage of carbon that would otherwise be emitted to or remain in the atmosphere.



The Carbon Credit Market



The Chicago Climate Exchange®

- The Chicago Climate Exchange® (CCX®) is a greenhouse gas (GHG) emission reduction and trading pilot program for emission sources and offset projects in the United States and for offset projects undertaken in Brazil and other countries. CCX® is a self-regulatory, rules-based exchange designed and governed by CCX® Members.
- These members made a voluntary, legally binding commitment to reduce their emissions of greenhouse gases by four percent below the average of their 1998-2001 baseline by 2006 and a six percent reduction by 2010.

CCX Founding Members

American Electric Power

Ford Motor Company

Baxter

DuPont

Waste Management Inc.

Equity Office Properties

International Paper

Manitoba Hydro

MeadWestvaco

Motorola

STMicroelectronics

Stora Enso

Temple-Inland

City of Chicago

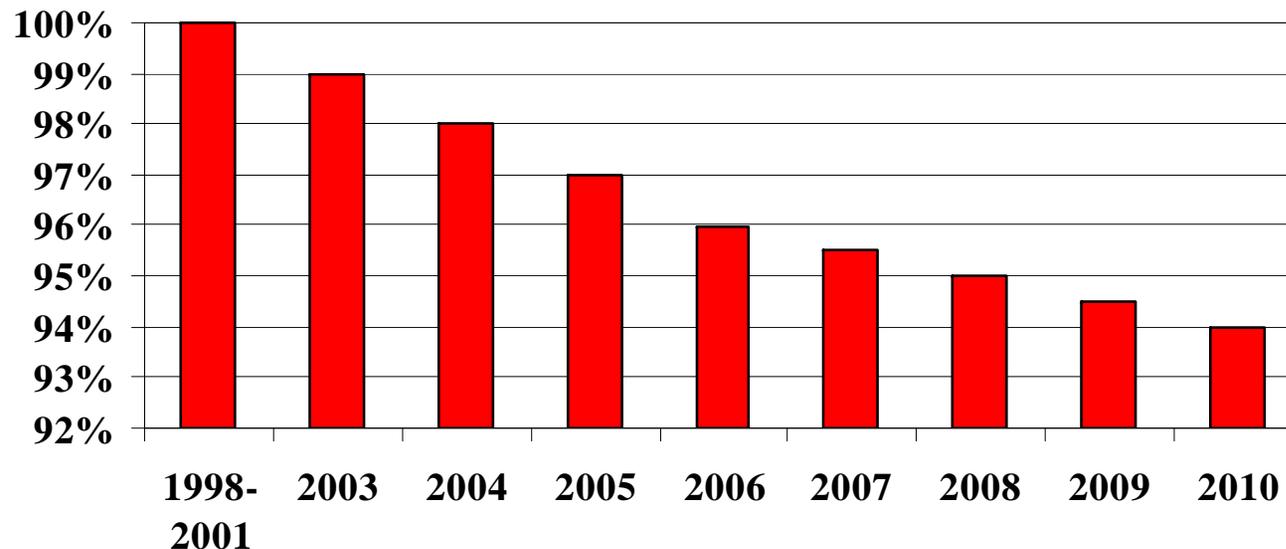
CCX Members

- Over 380 members
- Around 100 emitter members including:
 - Agrium
 - Alliant Energy
 - American Electric Power
 - Bayer Corporation
 - Cargill
 - Dow Corning
 - Eastman Kodak
 - IBM
 - Intel
 - Monsanto
 - MGM
 - Smithfield Foods
 - Safeway
 - Sony
- Also including seven municipalities and seven universities

CCX Reduction Timetable

- 2003-2006: Reduce emissions to 1%, 2%, 3%, 4% below 1998-2001 baseline
- 2006 – 2010: Reduce emissions to 6% below 98-01 baseline

CCX Emission Reduction Schedule



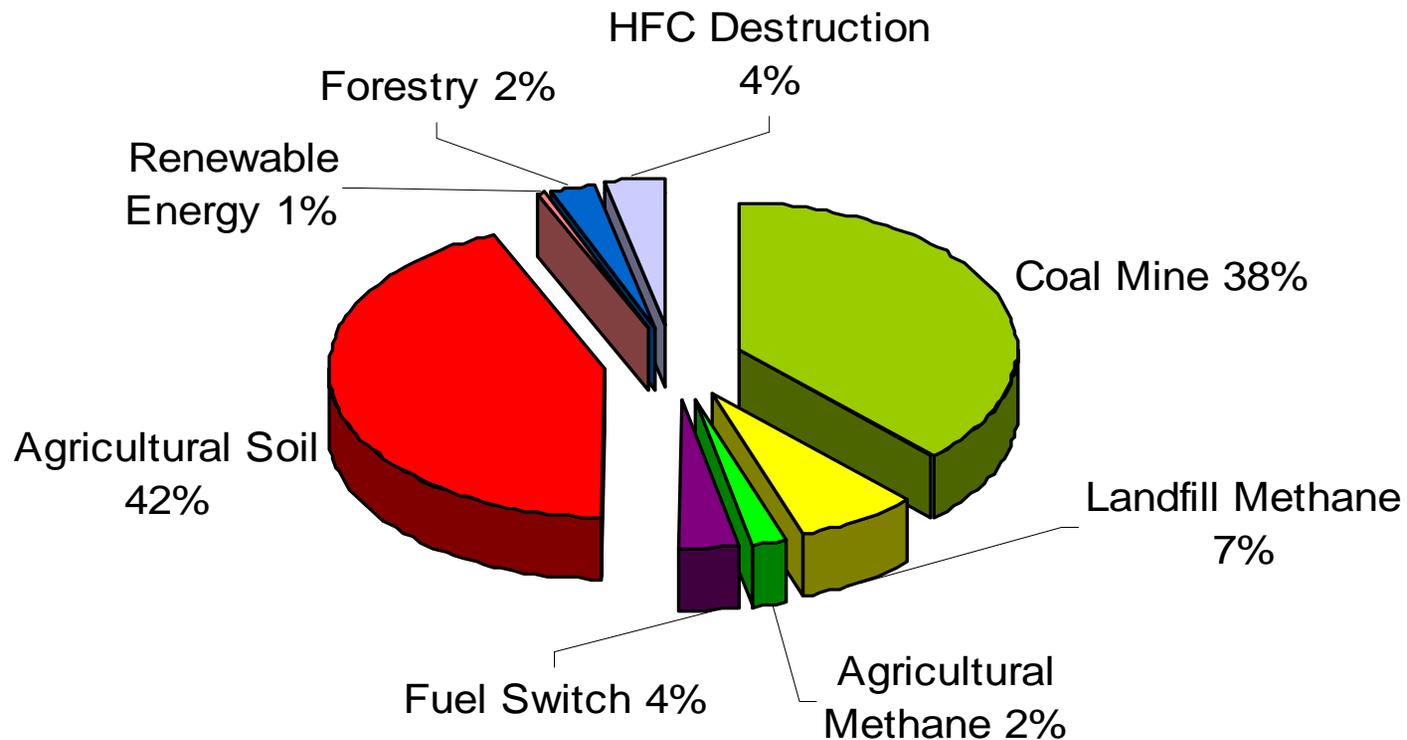
Meeting CCX Reductions

- Allowances (x% less than baseline)
- Own reductions
- Industry credits from excess reductions
- Offsets (no more than 50% of reduction requirement)

- Soil Offsets
 - No-till
 - New Grass
 - Rangeland
- Forestry
 - New Plantings
 - Enhanced Working Forest
- Ag Methane
- Industrial Fuel Switching
- Biofuels
- Landfill Methane

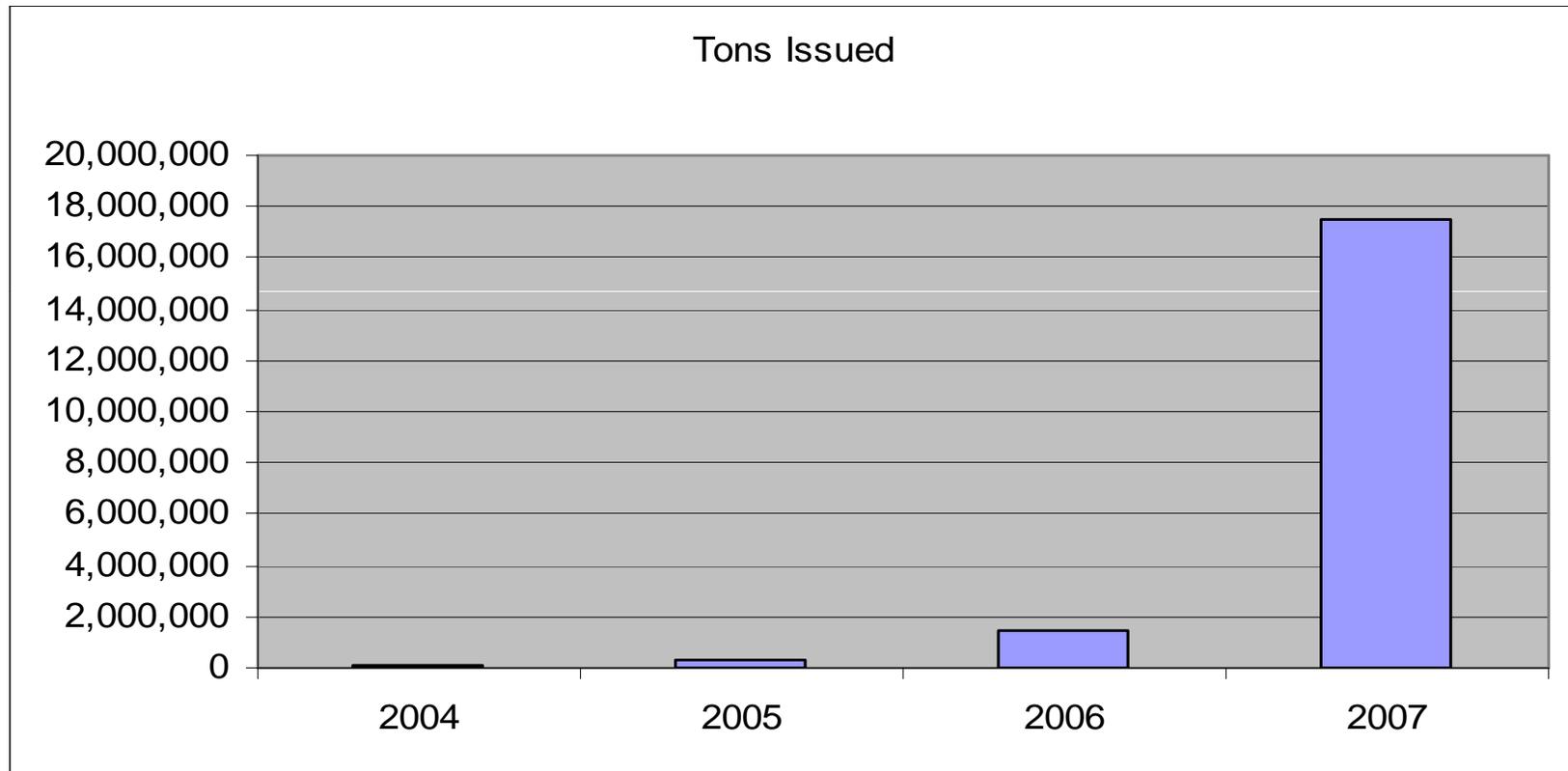
CCX Offset Portfolio by Type

(Projects registered through September 2007)

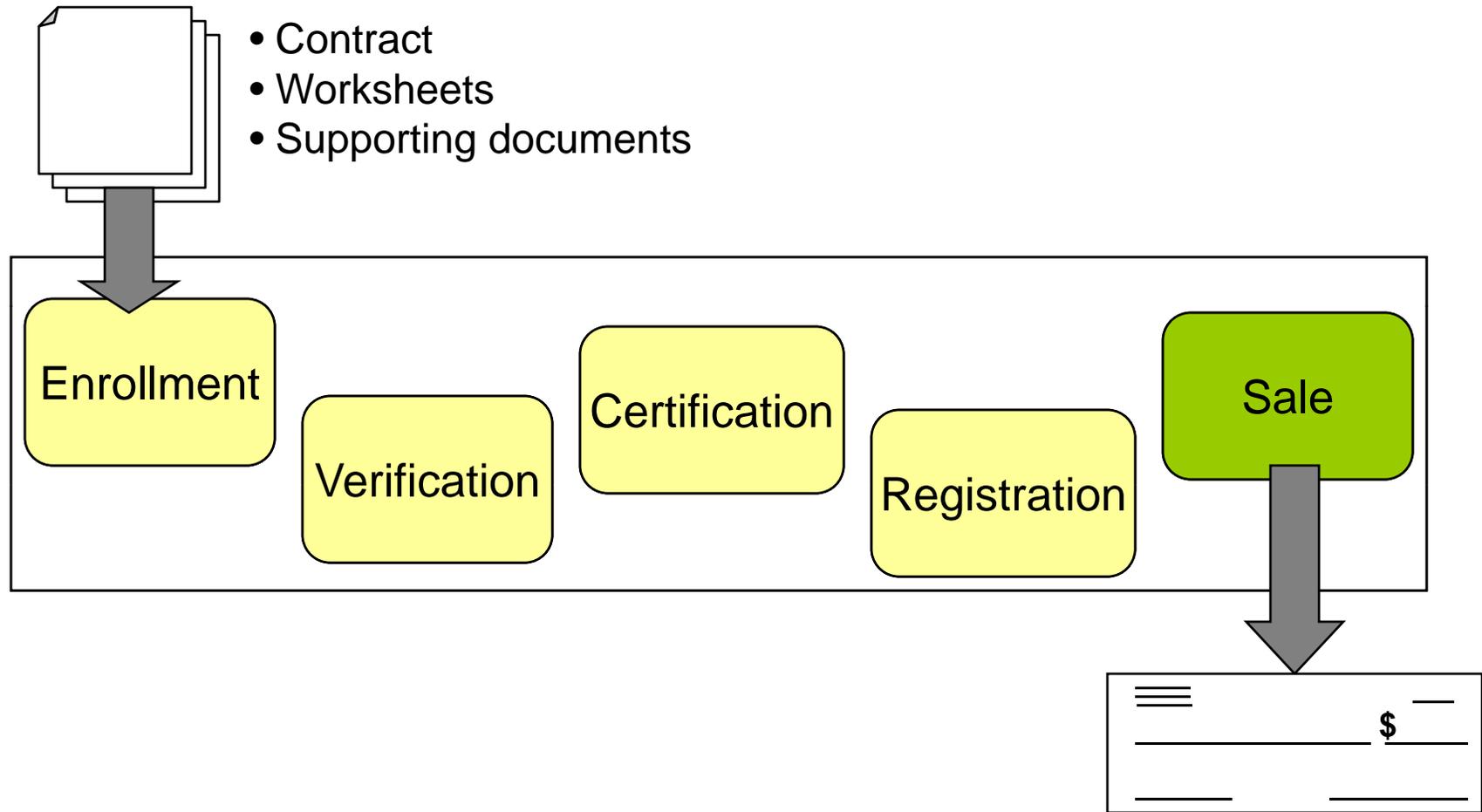


CCX Offsets Issued by Year

(Offsets registered or in process; through September 2007)

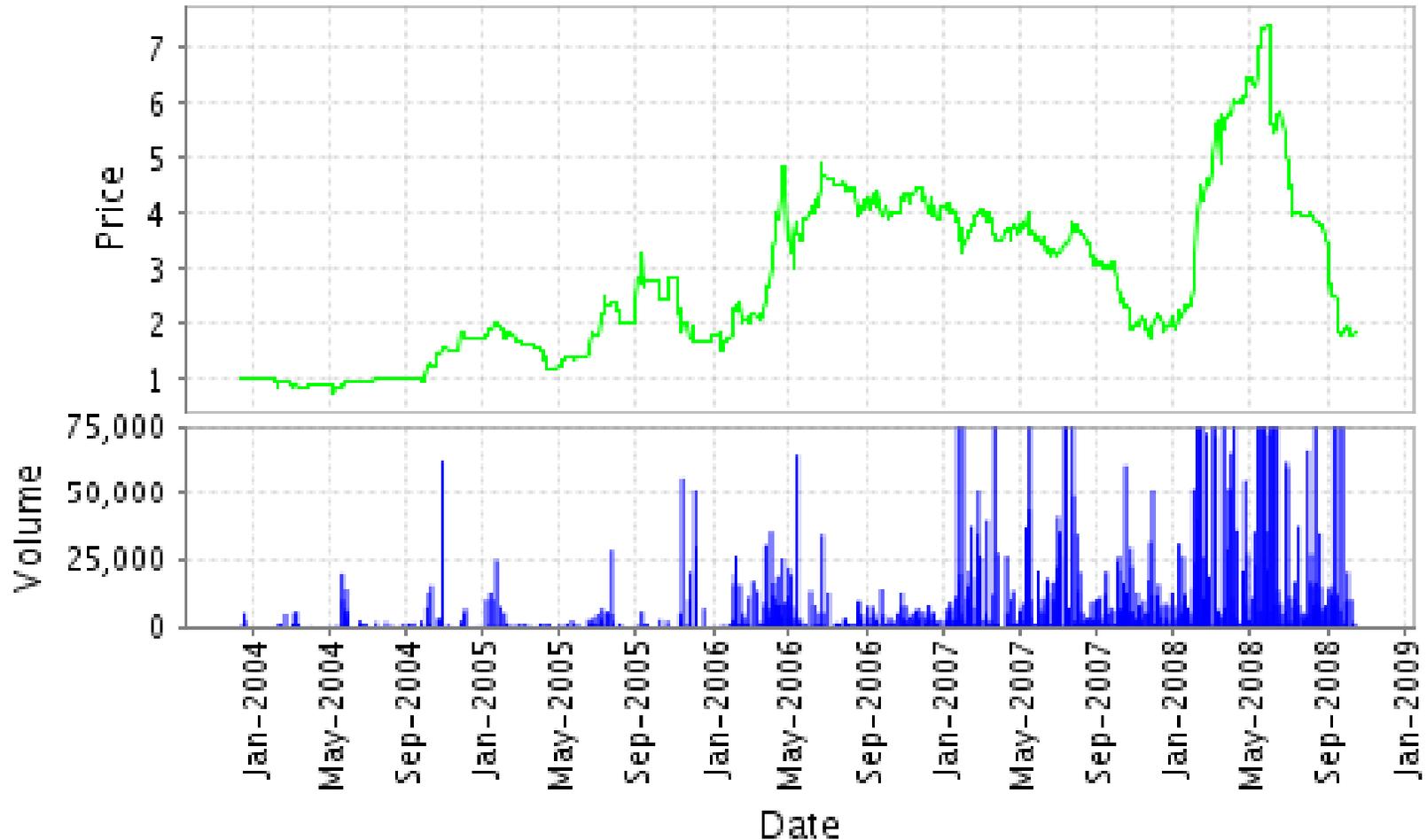


The Carbon Credit Market Process

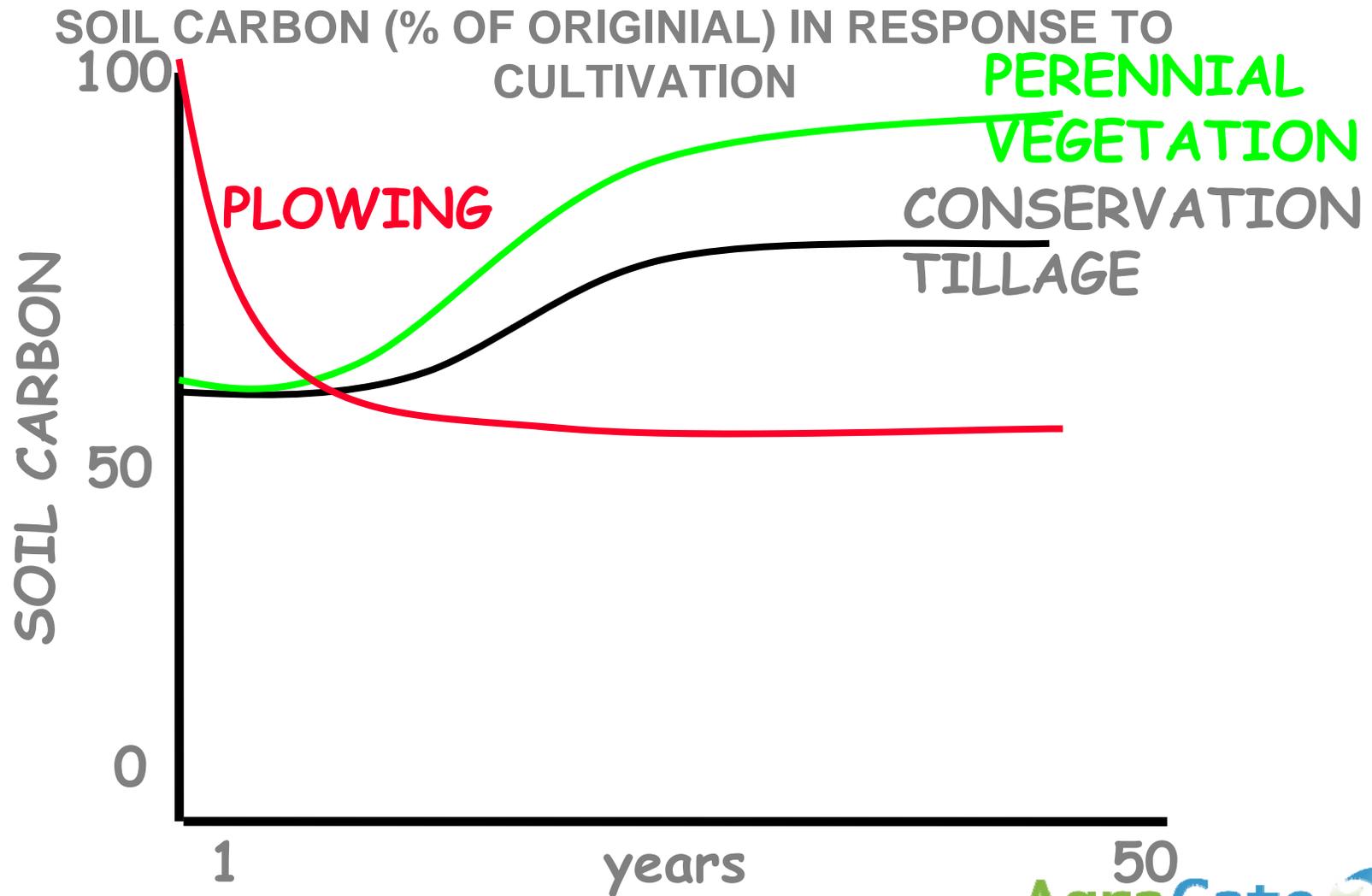


Carbon Offset Prices, 2003-Current

CCX Carbon Financial Instrument (CFI) Contracts Daily Report



Soil Carbon Dynamics in Response to Tillage



Soil Carbon Sequestration

- Carbon sequestration rates, with a change from conventional tillage to no-till, can be expected to peak in 5-10 yr with SOC reaching a new equilibrium in 15-20 yr.

Details of Eligible CCX Offsets

Soil Offsets – 5 or 6 year contract
2007 or 2008 – 2012

No-till & Strip-till Crop Production &
New Grass Plantings After January 1, 1999

XSO Eligible Land

No-till/Strip-till -- *Rewarding the early adopters of NT and ST.*

- Must be farmed with no-till or strip till practices.
- Crop land can be in hay, but if changed to row-crop, must be done in compliant manner. Alfalfa is eligible.
- Continuous cotton or soybeans are eligible only if there is a cover crop.
- Exchange Soil Offsets will be earned at a rate of 0.2 -0.6 metric tons of CO₂/acre/year in eligible areas.
- Fallowed acres are not eligible in NT/ST zone A,B,D,E,F OR G.

New Grass Plantings that were recently converted from cropland after January 1, 1999.

- Such grass cover must be maintained through 2010 on the acres specified upon project registration.
- Exchange Soil Offsets will be earned at a rate of 0.4 -1.0 metric tons of CO₂/acre/year.

Cropland (No-till or Strip-till)

No-till/Strip-till -- Must be farmed with no-till or strip till practices based on the 2002 NRCS handbook.

- Qualifying land with annual crops can be seeded to grassland (hay or pasture) midway through a contract as long as the conversion to grassland is completed in a compliant manner (no-till or strip-till). After the land is converted, the carbon credit rate will change to the “new grass” rate (0.4 or 1.0).
- Continuous cotton or soybeans are eligible only with a cover crop.
- Alfalfa acres qualify at the no-till rate.
- Exchange Soil Offsets will be earned at a rate of 0.2 - 0.6 metric tons of CO₂/acre/year in qualifying states.
- Enrolled acres may be planted in soybeans no more 50 percent of the enrolled years.
- Fallowed acres (> 12 months) are not eligible in most zones.

Tillage Equipment

- **Cannot use full-width implement**
 - Moldboard plow
 - Chisel plow
 - Field cultivator
 - Tandem disk
 - Offset disk
 - Ridge-till planter
 - Row crop cultivator
 - Aerway
- **Okay to use**
 - No-till/strip-till planter
 - No-till drill
 - Rolling harrow (Phoenix or Phillips)
 - Stock chopper
 - Tools with wide knives
 - Subsoiler/Ripper
 - Anhydrous applicator
 - Manure knife applicator

General Guidelines

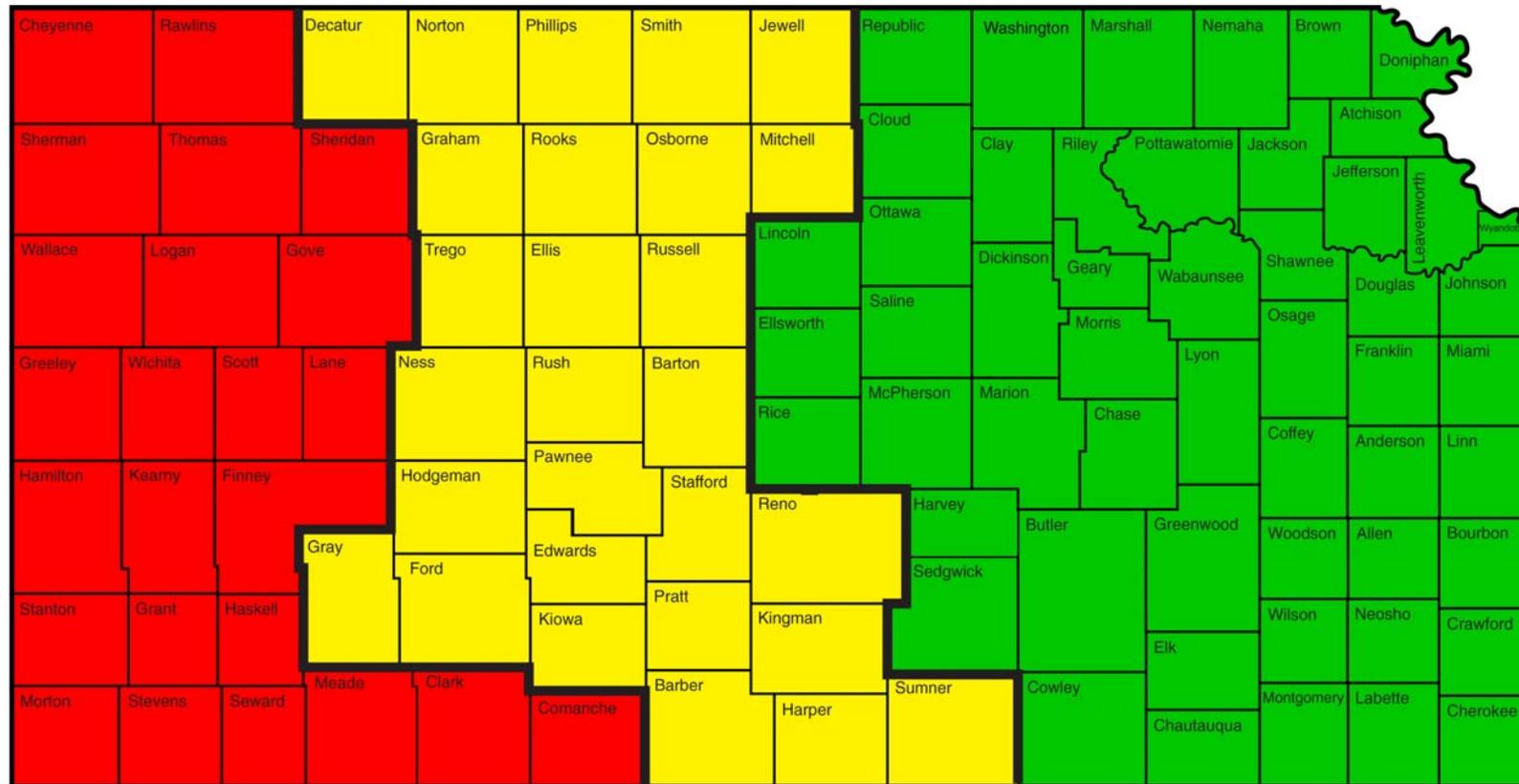
- General Guideline: After the implement has been through the field, there must still be a substantial amount of surface residue present and the soil disturbance must not be full width. If use of the implement would require that a leveling or smoothing activity follow, it would probably result in too much soil disturbance. (2/3rds rule)
- No credits earned during year if residue is removed (i.e. baling corn stocks, chopping silage, burned, etc.) unless a cover crop is planted after the removal.
- 3% variance factor for fixing washouts, ruts, tiling, etc.

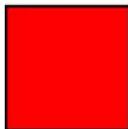
New Grassland Plantings

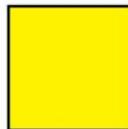
Definition – Land converted from cropland to grass (cool or warm season grasses) after January 1, 1999.

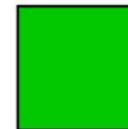
- Eligible land – CRP, CREP, pasture, hay ground, etc.
- To receive the new grass credit rate, such grass cover must be maintained through 2012 on the acres specified upon project registration. If land is converted from grass to cropland midway through a contract, the conversion to cropland must be done in a compliant manner (no-till or strip-till).
- Exchange Soil Offsets will be earned at a rate of 0.4 - 1.0 metric tons of CO₂/acre/year.
- Prescribed burnings and/or **light** disking is allowed on qualifying CRP acres and/or Managed Rangeland. This is considered a management practice and allowed under our carbon credit contract.
- Mowing, baling or grazing cattle is allowed on new grass.
- Carbon contract can extend back to 2003 with an approved CRP or CREP Contract.

No-till, Strip-till offsets

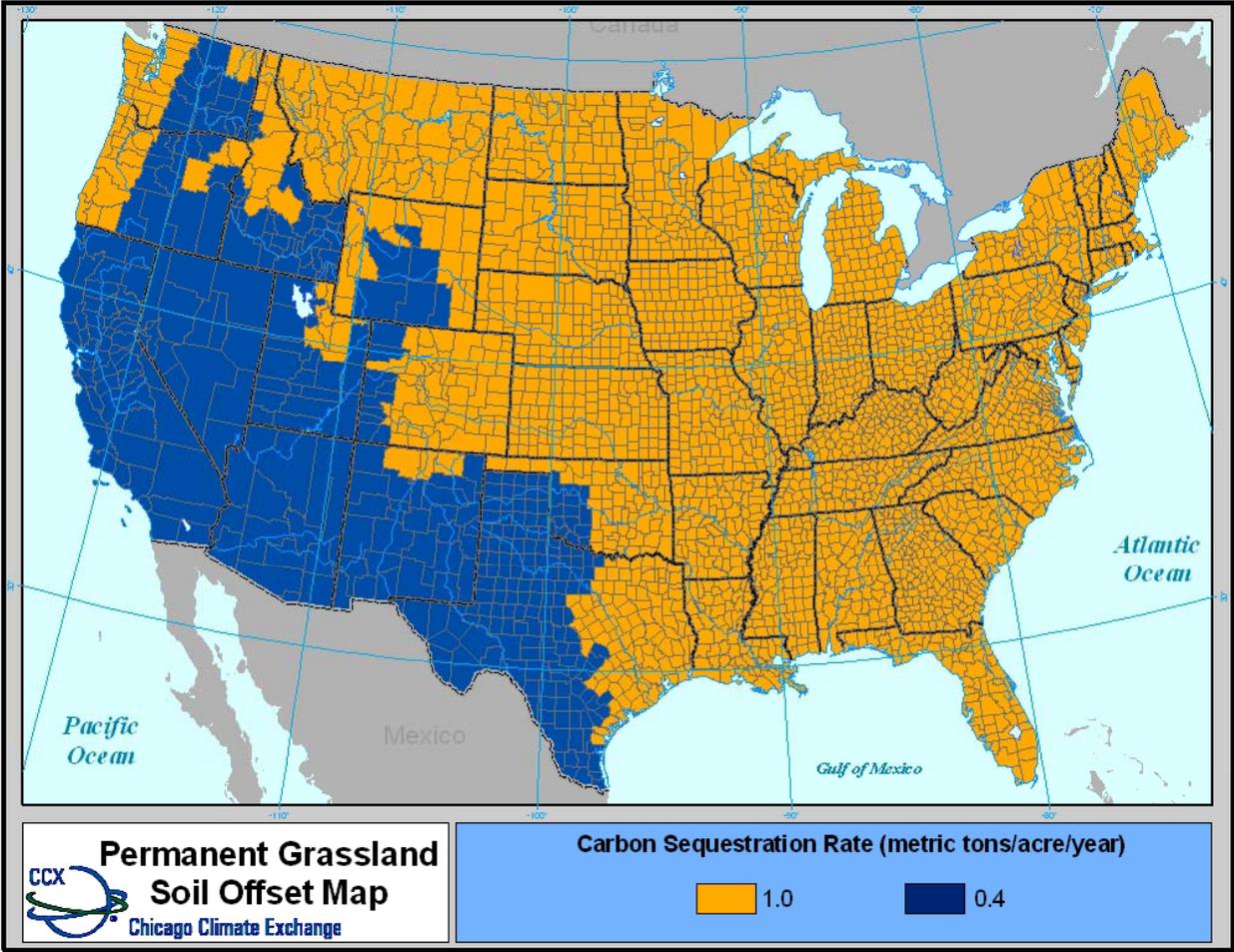


 Conservation tillage
(dryland – 0.2 metric tons
CO₂ per acre; irrigation –
0.6 metric tons CO₂ per acre)

 Conservation tillage
(dryland – 0.4 metric tons
CO₂ per acre; irrigation –
0.6 metric tons CO₂ per acre)

 Conservation tillage
(0.6 metric tons CO₂
per acre)

New Grass Plantings



Exchange Soil Offsets (XSOs)

- Commitment to 5 or 6 years of conservation tillage 2008 – 2012 w/ option on 2007
- New Grass acres can extend back to 2003 with an approved CRP Contract.
- Annual certification of compliance
- Credits transferred to aggregator on Jan 1
- 20% reserve held until end of pilot project
- Transfer price will be the price as determined by sale through CCX less a 10% service fee.

Documentation For CCX® Ag sector offsets

- Enrollment form information
- Legal description of acreage, practice(s) employed
- FSA maps and crop report (CCC-578)
- Lessees: reasonable expectation that acres are under control through 2012.
 - ***Failure to keep land in compliance throughout the contract period voids all credits on the non-compliant land.***
- Submit annual signed attestation to aggregator
- Acknowledge that CCX verifiers will be given access to fields and CCX documents
- Eventually credits can be banked from year-to-year

Definition of Conservation Tillage

- For CCX purposes these practices are as defined in the 2002 Natural Resources Conservation Service National Handbook of Conservation Practices.
- No-till/Strip-till - Managing the amount, orientation, and distribution of crop and other plant residue on the surface year-round while growing crops in narrow slots or tilled or residue-free strips in soil previously untilled by full width inversion implements.

How do I calculate carbon credits?

*Example - 250 acres of no-till in NT zone “A”

1. First calculate how many metric tons of carbon will be sequestered each year:

$$250 \text{ acres} \times 0.6 \text{ mT/acre/year} = 150 \text{ carbon credits (cc)}$$

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2. Then calculate how much of that will go directly into the reserve pool:

$$150 \text{ cc} - 20\% = 30 \text{ cc} - \text{reserve pool} = 120 \text{ cc to sell each year}$$

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3. Multiply this number by the future price of carbon credits:

$$120 \text{ cc} \times \$4.00 \text{ (based on avg. CCX rate)} = \$480.00/\text{yr}$$

How do I calculate carbon credits?

*Example - 250 acres of no-till in NT zone “A”

4. This is your gross annual income, before CCX and aggregator charges are applied. Proceed to subtract these charges:

$$\$480.00 - 10\% \text{ aggregator fee } (48.00) = \$432.00/\text{yr}$$

$$\$432.00 - (150 \text{ cc} \times \$0.20/\text{cc} \text{ CCX trading fee})$$

$$\$30.00 = \underline{\$402.00/\text{yr}}$$

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5. This is your net annual income. Multiply this number times six (for 2007, 2008, 2009, 2010, 2011, 2012) to calculate your income over the next six years: $\underline{\$402.00/\text{yr}} \times 6 \text{ years} = \$2,412.00$

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6. Then in 2013, you get to add in your reserve pool credits:

$$30 \text{ reserve pool cc} \times 6 \text{ years} = 180 \text{ cc}$$

$$180 \text{ cc} \times \text{current market price (\$4.00)} = \text{\$720.00}$$

$$\text{\$720.00} - 72.00 (10\%) - 36 \text{ (CCX fee)} = \text{\$612.00}$$

$$\text{\underline{\underline{\$2,412.00}}}$$
 + $\text{\underline{\underline{\$612.00}}} = \text{\underline{\underline{\$3,024.00}}}$

7. Total Income for the life of the contract ... $\text{\$3,024.00} / \text{\$12.10/acre}$

How do I calculate carbon credits?

*Example - 250 acres of no-till in NT zone “A”

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 $250 \text{ acres} \times 0.6 \text{ mT/acre/year} = 150 \text{ carbon credits (cc)}$
2. Then calculate how much of that will go directly into the reserve pool:
 $150 \text{ cc} - 20\% = 30 \text{ cc} - \text{reserve pool} = 120 \text{ cc to sell each year}$
3. Multiply this number by the future price of carbon credits:
 $120 \text{ cc} \times \$4.00 \text{ (based on avg. CCX rate)} = \$480.00/\text{yr}$
4. This is your gross annual income, before CCX and aggregator charges are applied.
Proceed to subtract these charges:
 $\$480.00 - 10\% \text{ aggregator fee (48.00)} = \$432.00/\text{yr}$
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6. Then in 2013, you get to add in your reserve pool credits
 $30 \text{ reserve pool cc} \times 6 \text{ years} = 180 \text{ cc}$
 $180 \text{ cc} \times \text{current market price } (\$4.00) = \$720.00 - 72.00 - 36 = \612.00
 $\underline{\$2,412.00} + 612.00 = \underline{\$3,024.00}$

7. Total Income for the life of the contract ... **\$3,024.00 or \$12.10/acre**



Details of Eligible CCX Offset

Rangeland

Rangeland Project Eligibility

- Land meets CCX definition of Rangeland
- Rangeland is in a CCX-approved area
- Project involves rangeland management practices that include use of *all* of the following tools:
 - Light or Moderate Stocking rates;
 - Sustainable Livestock Distribution
 - Drought mitigation

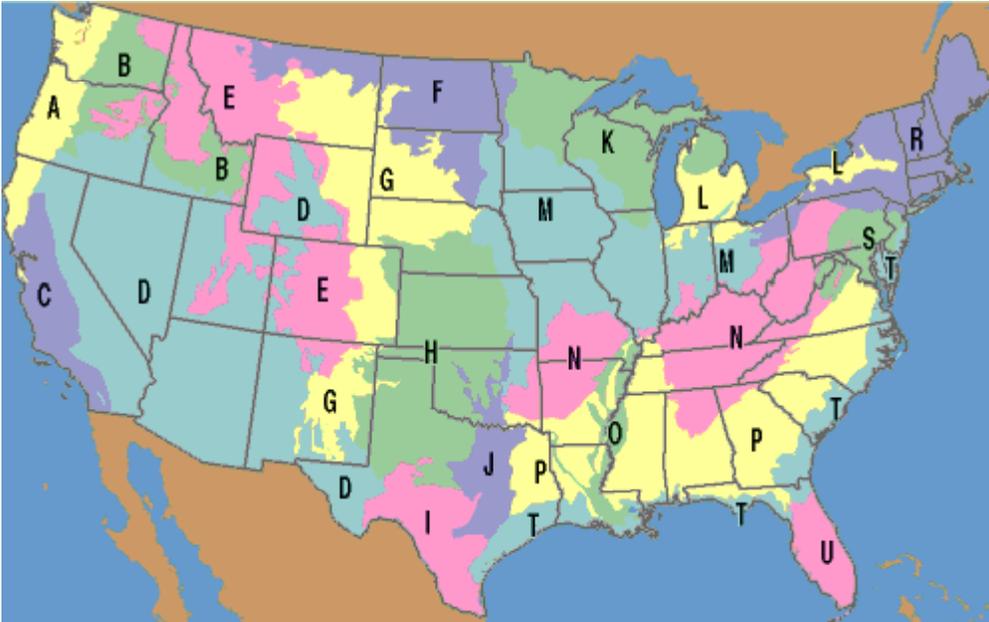
Rangeland Protocol

- The Natural Resources Conservation Service (NRCS) Field Office Technical Guides publish guidelines for managing the controlled harvest of vegetation with grazing animals.
- Stocking rates and livestock distribution criteria are defined according to County and State in the NRCS “Prescribed Grazing Specification” code.
- Range burning results in zero credits for that year if it is not part of the grazing management plan.

Rangeland Offsets



Land Resource Regions



Rangeland Credit Rates

(Metric Tons CO2 Per Acre Per Year)

Rangeland Area	Non-Degraded	Degraded
Northwestern Wheat and Range Region (B)	0.12	0.20
California Subtropical Fruit, Truck, and Specialty Crop Region (C)	0.16	0.16
Rocky Mountain Range and Forest Region (E)	0.12	0.28
Northern Great Plains Spring Wheat Region (F)	0.12	0.24
Western Great Plains Range and Irrigated Region (G)	0.27	0.40
Central Great Plains Winter Wheat and Range Region (H)	0.20	0.52

Eligible rangeland project crediting rates are based on appropriate below-ground carbon sequestration rates according to Land Resource Region, as well as status of the land (degraded or non-degraded) prior to inception of project



Details of Eligible CCX Offset

Forestry Offsets

(New Tree Plantings after January 1, 1990)

Forestry Offsets -Two eligible projects

1. New tree plantings -- Planting and/or natural regeneration on private lands after Jan 1, 1990 on land not forested on December 31, 1989.

Thinning of a tree stand is **not** allowed.

- Credits based on net annual increase in carbon stocks (CO₂ equivalents) during 2003-2010.
- Must provide proof of ownership and legal description of land.
- Statement of Intent or 15 year CRP contract.
- 250 tree/acre minimum.
- Riparian buffer strips, shelter belts, etc.
- **Desk Review** - All land enrolled by the selected applicant or forest offset provider are subject to an annual desk audit. Landowners that are unable to provide sufficient documentation will be ineligible.

2. Managed Forestry Contract

- Sustainably Managed Forests** -- Must provide evidence of sustainable forest management of all their managed forest land.
- Must have a forest management plan and must be member of the Sustainable Forestry Initiative or American Tree Farm System.
 - Provide a description of forest management activity and quantification model used.
 - Stand thinning **is** allowed.
 - Carbon credits are based the net change in carbon stocks (expressed in metric tons of carbon dioxide) during each of the years 2003 through 2010.
 - The net change in carbon stocks is defined by the equation:
Net change in Carbon Stocks = (increases in Carbon Stocks due to growth) minus (the quantity by which Carbon Stocks decreased due to harvest, pest, fire and adverse weather events).

Forestry Offsets

- Eligible Projects
 - Planting and/or natural regeneration on private lands after Jan 1, 1990 on land not forested on Dec 31, 1989.
 - Credits based on net annual increase in carbon stocks (CO2 equivalents) during 2003-2010.
 - Small forestation projects – less than 2,000 metric tons CO2 per year - desktop audit only.
- Long-term commitment
 - Statement of Intent or 15 year CRP contract

Items to be submitted with Application

1. Forestry Offset Contract (XFO contract)
2. Forestry Offset Enrollment Worksheet
3. FSA, Forest Service or NRCS maps of enrolled areas
4. Copies of supporting documents (i.e. Planting records, CRP contracts, Forestry management plan, etc.
5. Supporting documents for direct measurement calculations (if applicable)
6. Supporting documents for urban/suburban and riparian buffer plantings (if applicable)



Details of Eligible CCX Offset

Ag Methane Offsets

Methane Offsets

- Ag Methane destruction projects that were put into place after Jan 1, 1999.
 - Dairy
 - Swine
- Eligibility
 - Liquid slurry storage
 - Pit storage below animals (> 1 month)
 - Uncovered anaerobic lagoons



Credit Calculation

- Baseline Calculation -- The lower of:
 - (a) Actual monitored amount of methane captured and destroyed by the project activity (using existing CCX monitoring protocols but with full GWP for methane). The default methane combustion efficiency for flared biogas from anaerobic digesters is 90%. Higher efficiencies may be used if supported by manufacturer's specifications or other acceptable data. The default methane combustion efficiency for biogas utilized by electricity gensets is 100%.
 - (b) The methane emission calculated ex ante based on the amount of the animal manure that would decay anaerobically in the absence of the project activity, using the most recent country-specific IPCC tier 2 approach (for a description of the proposed calculation methods for projects in the U.S., see Appendix B).

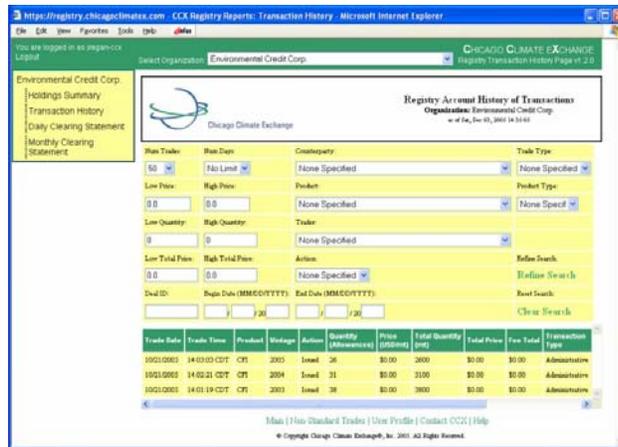
Baseline Credit Rates - Iowa

Liquid Slurry/Pit Storage (Metric Tons CO ₂ e per head per year)								
Dairy Cow	Dairy Heifer	Feedlot Steer	Feedlot Heifers	Market Swine <60	Market Swine 60 – 120	Market Swine 120-180	Market Swine > 180	Breeding Swine
1.56	0.70	0.70	0.68	0.09	0.13	0.22	0.30	0.31
Anaerobic Lagoon (Metric Tons CO ₂ e per head per year)								
4.42	1.97	1.98	1.92	0.24	0.38	0.63	0.84	0.88

* 18.25 carbon credits are collected for every metric ton of Methane captured and destroyed.

Mechanics of Trading

- CCX Registry

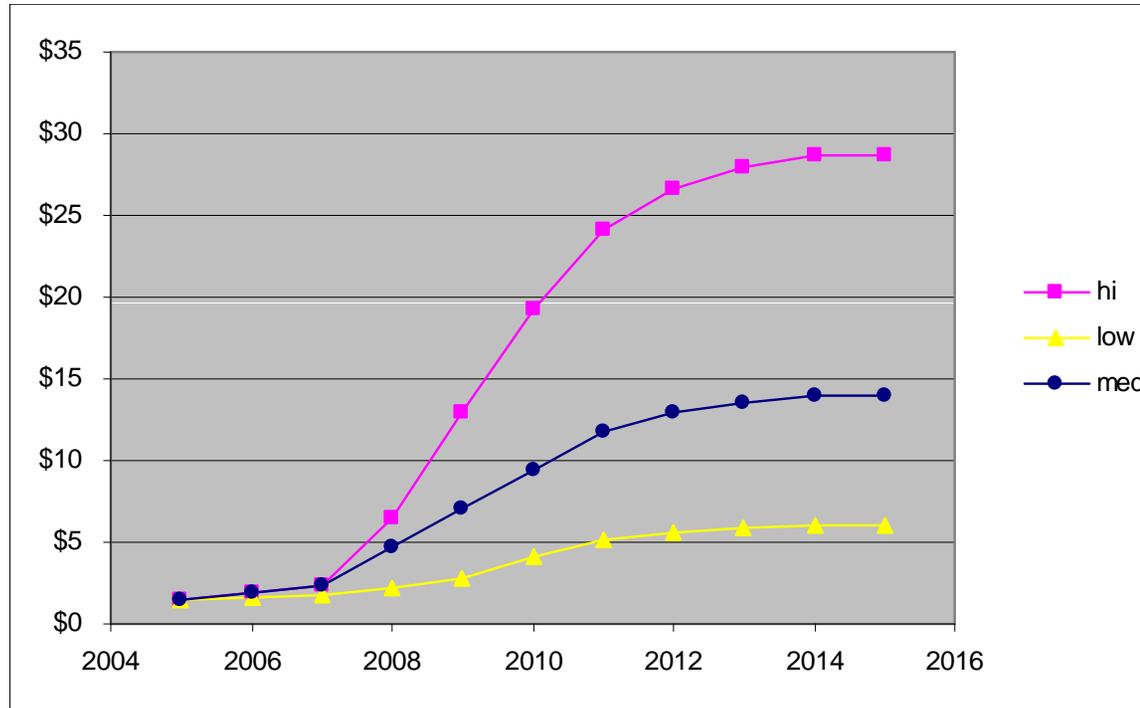


- CCX Trading Floor



Price forecasts for US carbon credits

Figure 1. Projected price curves for US carbon credits (\$US per metric ton).



Sources: Carbon Finance, August 2004; EIA/DOE 2004. Analysis of S. 1844, the Clear Skies Act of 2003; S. 843, the Clean Air Planning Act of 2003; and S. 366, the Clean Power Act of 2003. Energy Information Administration, USDOE, SR/OIAF/2004-05, May 2004; EIA/DOE 2005. Impacts of Modeled Recommendations of the National Commission on Energy Policy. Energy Information Administration, USDOE, SR/OIAF/2005-02, April 2005; AEP 2004. An assessment of AEP's actions to mitigate the economic impacts of emissions policies. American Electric Power, August 31 2004

QUESTIONS???

Steve Swaffar

Director of Natural Resources

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