

## Iowa Farm Bureau Carbon Credit Aggregation

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**IOWA FARM BUREAU  
CARBON CREDIT  
AGGREGATION PROGRAM**

FARMERS CAN REGISTER AND SELL CARBON CREDITS FROM AGRICULTURAL PRACTICES THROUGH THE IOWA FARM BUREAU CARBON CREDIT AGGREGATION PROGRAM

|          |   |          |
|----------|---|----------|
| SOIL     | <p><b>SOIL</b></p> <ul style="list-style-type: none"> <li>IMPROVES SOIL QUALITY AND TON</li> <li>CREDITS BASED ON CROPPING AND TILL TYPE AND BY HOW YOU STOP PRODUCTION IN SENSITIVE AREAS</li> <li>CREDITS PAID OFFERED FOR NEW CROPS PLANTED (AFTER JAN. 1 1990)</li> <li>LANDSHARE IMPROVEMENT PROJECTS ELIGIBLE</li> <li>ELIGIBILITY BY ZONE</li> </ul> | SOIL     |
| FORESTRY | <p><b>FORESTRY</b></p> <ul style="list-style-type: none"> <li>IMPROVES SOIL RESISTANT AND IMPROVES BIODIVERSITY</li> <li>CREDITS BASED ON NET CARBON SEQUESTERED DURING THE CONSTRUCTION PERIOD</li> <li>CONSTRUCTION OF NEW PLANTINGS (AFTER JAN. 1 1990) ON AFFORESTED LAND</li> <li>ALL AREAS OF THE U.S. ELIGIBLE</li> </ul>                            | FORESTRY |
| METHANE  | <p><b>METHANE</b></p> <ul style="list-style-type: none"> <li>ON-FARM METHANE DIGESTERS</li> <li>DRASTICALLY REDUCES METHANE EMISSIONS INTO THE ATMOSPHERE</li> <li>CREDITS OFFERED FOR DIGESTERS INSTALLED AFTER JAN. 1 1990</li> <li>ALL AREAS OF THE U.S. ELIGIBLE</li> </ul>   | METHANE  |

FOR INFORMATION ON THESE AND OTHER IOWA FARM BUREAU ENERGY PROGRAMS PLEASE CALL 515-225-5431 OR VISIT WWW.IOWAFARMBUREAU.COM/CARBON.

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## Topics to be Covered

- What is Carbon Sequestration?
- Background on the Chicago Climate Exchange
- Exchange Offsets
- Exchange Offset Sales Contracts

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**Greenhouse Gases**

- Carbon Dioxide (CO<sub>2</sub>)
- Methane (CH<sub>4</sub>)
- Nitrous Oxide (N<sub>2</sub>O)
- Sulfur Hexafluoride (SF<sub>6</sub>)
- Perfluorocarbons (PFCs)
- Hydrofluorocarbons (HFCs)

**The Greenhouse Effect**

**Estimated Sources of 2000 U.S. Greenhouse-Gas Emissions**

**Green GHG Emissions of 2000 in the United States 2000**

- 6.9 billion metric tons CO<sub>2</sub>e total
- 545 million metric tons from CH<sub>4</sub>
- ~40 million metric tons from manure management alone

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**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.

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**Carbon Credit Program**

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## The Chicago Climate Exchange

Phase 1: Pilot Project 2003 - 2006

Phase 2: Pilot Project 2006 - 2010

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## 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. CCX® is a self-regulatory, rules-based exchange designed and governed by CCX® Members.
- These members have 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, the last year of the first phase of the pilot program.

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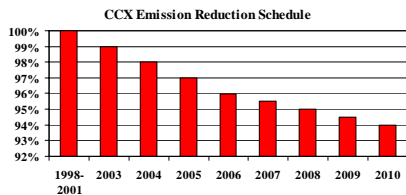
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## CCX Reduction Timetable

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



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## Meeting CCX Reductions

- Allowances (x% less than baseline)
- Own reductions
- Industry credits from excess reductions
- Offsets (no more than 50% of reduction requirement)
  - Industry
  - Agriculture
    - No-till
    - Rangeland Improvement
    - Ag Methane
  - Forestry

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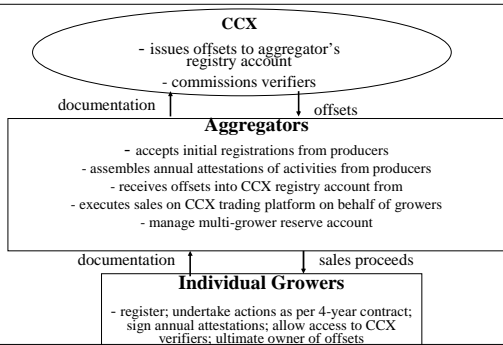
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## Mechanics of Ag Offset Aggregation in CCX®



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## Methane Offsets

- Ag manure digesters
- Landfill methane destruction
- Industrial biogas production
  - Fuel switching credits
    - Offset natural gas

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 **Methane Offsets - Ag Manure**

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

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 **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).

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 **Ex Ante Calculation of Baseline Methane**

- Appendix B: Ex Ante Calculations of Baseline Methane Emissions for U.S. Manure Digester Projects
  - 1. Characterize the average livestock populations included in the anaerobic digester project for the reporting period;
  - 2. Characterize the baseline manure management system for the project;
  - 3. For each livestock population category and baseline manure management system, multiply the number of animals by the appropriate emission factor for that state (from Tables B.2 and B.3), by the appropriate solids separation correction factor, by the proportion of manure from those animals used in the digester, by the number of days in the period (Equation 1);
  - 4. Sum the estimates for all population categories and baseline manure management systems (Equation 1);
  - 5. Multiply the total estimate of methane emission by the appropriate methane GWP for the reporting period (Equation 2).

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## Baseline Credit Rates - Iowa

| Liquid Slurry/Pit Storage (Metric Tons CO <sub>2</sub> 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 <sub>2</sub> e per head per year) |      |      |      |      |      |      |      |      |
|--|------|------|------|------|------|------|------|------|
| 4.42   | 1.97 | 1.98 | 1.92 | 0.24 | 0.38 | 0.63 | 0.84 | 0.88 |

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## Flow Meter Requirements

The following information regarding flow meter performance must be maintained and may be required by CCX to be included in Project Reports:

- Accuracy, precision per manufacturer;
- Proof of initial calibration;
- Capability to record flow every 15 minutes; and
- Means to correct for temperature and pressure.

Installed flow meters should be inspected, cleaned, and checked for accuracy using a portable instrument such as a pitot tube to measure the flow velocities along a transverse of the header pipe. The velocity measurements are then used to calculate a flow rate, which is typically accurate to within 2 percent in larger pipes (greater than 4 inch diameter). The inspection, cleaning, and flow verification should be done at least quarterly.

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## Recordkeeping

- Type of flow meter
- Date & location of installation
- Date & results of calibration
- Hours of control device shutdown (month)
- Biogas flow to control device
- Methane concentration
- Verification reports

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**FB** **Mechanics of Trading**

- CCX Registry
 
- CCX Trading Floor
 





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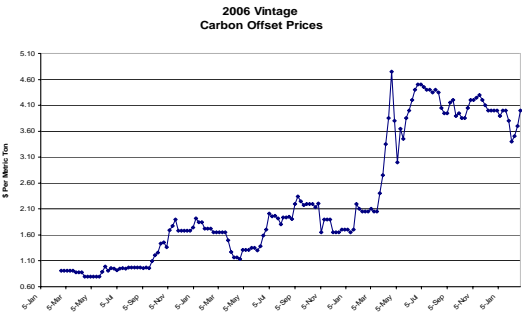
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**FB** **Carbon Offset Prices 2004 - 2006**

**2006 Vintage Carbon Offset Prices**



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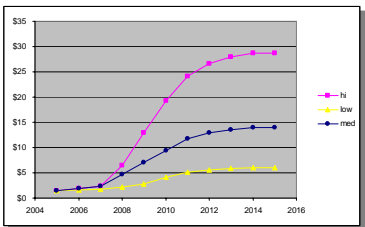
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**FB** **Price forecasts for US carbon credits**

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. 395, the Clean Power Act of 2003. Energy Information Administration, USDCE, BR/CA/AF 2004-05, May 2004; EIA/DOE 2005, Impact of Modified Recommendations of the National Commission on Energy Policy. Energy Information Administration, USDCE, BR/CA/AF 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.

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### Contact Information

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