Chicago Climate Exchange

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Chicago Climate Exchange

- Overview
- Members
- Transactions
- Project Protocol Review
  - Forestry Carbon Sequestration
- Overall Critiques

Chicago Climate Exchange

- Overview
  - Chicago Climate Exchange (CCX)
  - Founded by Dr. Richard Sandor in 2003

www.bsad.uvm.edu/Careers/Students/events05.htm Accessed November 27, 2009

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- Greenhouse Gases and Global warming:
  - Greenhouse gases released into the atmosphere build up in the atmosphere. These gases trap some of the sun's heat in the atmosphere, which causes an increase in the Earth's temperature.
  - Overarching goal of CCX: reduce these gases through cap and trade system

Chicago Climate Exchange: Overview

- Cap and Trade System
  - Legally binding commitment to reduce emissions or purchase credits
  - Cap
    - Set reduction goals for 2006 or 2010
  - Trade
    - Carbon Financial Instruments (CFI)
      - Equivalents 100 metric tons of CO2
    - Trades almost half of voluntary carbon transaction in the world
      - http://reducecarbon.wordpress.com/v-chicago-climate-exchange-ccx/ Accessed November 28, 2009.

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- Two phases:
  - Phase I
    - 2003 through 2006
    - Reduce emissions 4% from baseline by 2006
  - Phase II
    - 2006 through 2010
    - Reduce emissions 6% from baseline by 2010.

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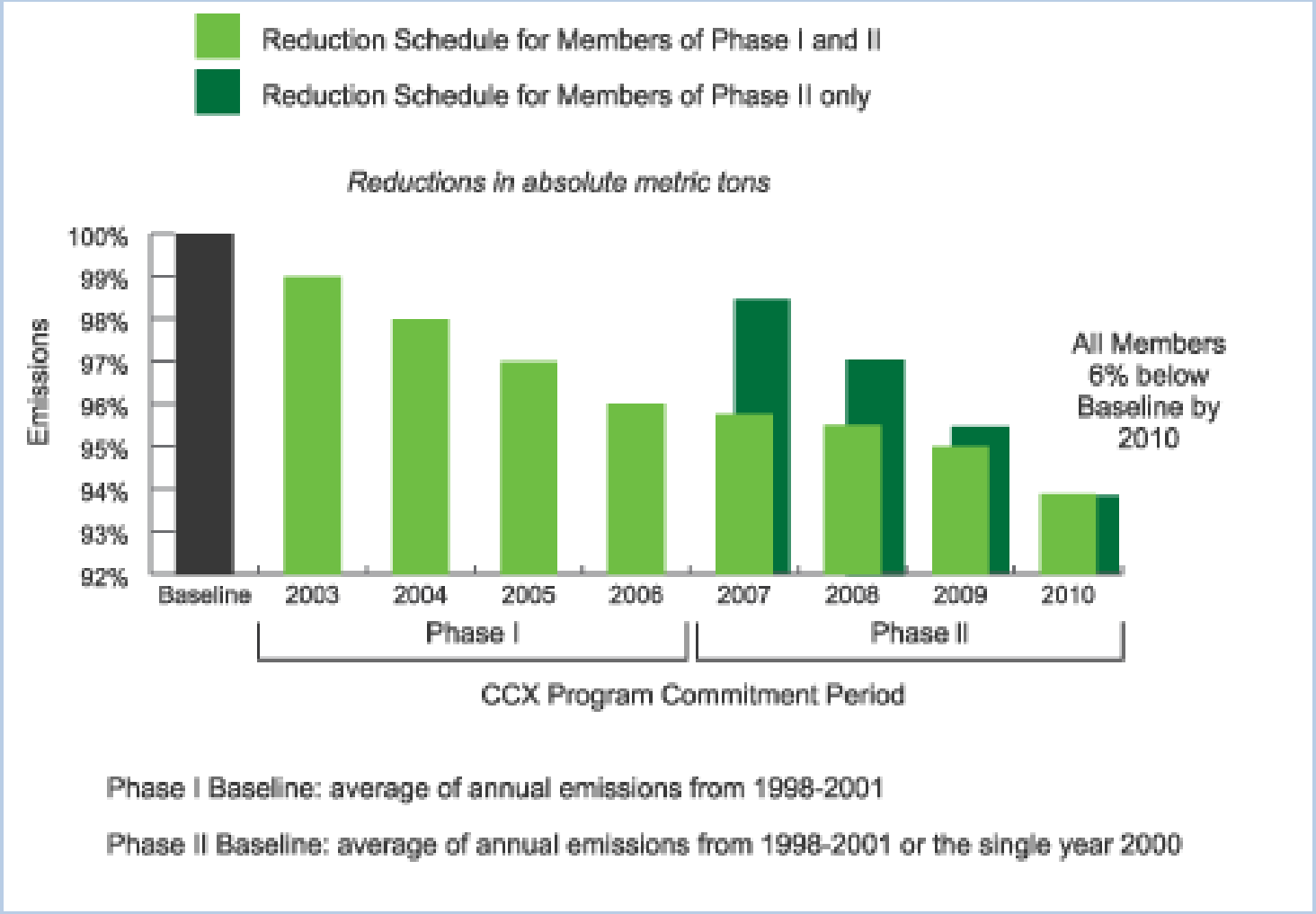

http://www.theccx.com/content.jsf?id=72

Chicago Climate Exchange: Overview

- Trade:
  - 6 Greenhouse Gases
    - Carbon Dioxide
    - Methane
    - Nitrous Oxide
    - Sulfur Hexafluoride
    - Perfluorocarbons
    - Hydrofluorocarbons

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- **Members**
- *CCX Members represent*
  - 17% of the Dow Industrials
  - 22% of the largest coal burning electric utilities
  - 11% of the Fortune 100

http://chicagoclimatex.com/images/content/File/Trading_CFIs.pdf Accessed November 28,

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Membership Fees

Annual Emissions	Enrollment Fee	First Year of Annual Dues	Subsequent Years of Annual Dues
> 1 million mts	$15,000	$50,000	$40,000
500,000 - 1 million mts	$10,000	$30,000	$25,000
250,000 - 500,000 mts	$10,000	$25,000	$20,000

Note: Annual Fee is a fixed fee that includes FINRA emissions data verification. Registry Participant annual fees will be applied retroactively to CCX membership if Registry Participant becomes a CCX member. Surplus emissions reductions verified through CCX membership may only be sold through the CCX trading platform by CCX Members or Liquidity Providers. Registry Participants do not have trading privileges. Companies may become Registry Participants for any or all years from 2005 through 2010, subject to extension. Earlier years would be subject to further discussion and may be subject to additional fees.

http://www.chicagoclimatex.com/membership/pdf/CCXRegistryPartMembership10.1.09.pdf
Accessed November 27, 2009

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- **Membership Categories**
  - Members
    - Registry Participant Members
    - Associate Members
  - Offset Providers
  - Offset Aggregators
  - Liquidity Providers
  - Exchange Participants

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- **Members**
  - Entities that release greenhouse gas emissions.
  - Members commit to the CCX Emission Reduction Schedule and are subject to annual emissions verification by FINRA.
  - Agreement regarding indirect emissions (e.g., energy consumption) is elective.

http://www.theccx.com/content.jsf?id=65 Accessed November 27, 2009

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- **Direct emissions** – emissions from on-site combustion of fossil fuels, such as natural gas to power industrial operations and gasoline to operate vehicle fleets

- **Indirect emissions** – emissions result from energy purchases, such as electricity, and their corresponding emissions.

http://chicagoclimatex.com/content.jsf?id=74 Accessed November 28, 2009

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- Entity Submits Baseline Emissions Average
  - Report Reviewed by FINRA
  - FINRA makes an Emissions Report
- CCX Emission Reduction Schedule created

http://www.chicagoclimatex.com/compliance/pdf/article_Audit_in_Climate_Change_Commitments.pdf

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- **Registry Participant Members**
  - Entities that release greenhouse gases
  - Obtain a CCX Registry account of their emissions and submit to data authentication.
  - Standardized independent third-party emissions authentication by FINRA on a yearly basis or a multi-yearly basis
  - Must own facilities that are direct sources of emissions.

http://www.theccx.com/content.jsf?id=65 Accessed November 27, 2009

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- **Associate Members**
  - Entities that release of small amounts of greenhouse gases (e.g., small businesses or establishments)
  - Associate Members must disclose and offset all of emissions arising from energy purchases and business travel from enrollment through 2010 and emissions are authenticated by FINRA

http://www.theccx.com/content.jsf?id=65 Accessed November 27, 2009

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- **Offset Providers**
  - Entities performing eligible offset projects that sequester, destroy, or reduce greenhouse gas emissions.
  - Offset Providers register and put offsets for sale on the Exchange.
  - Accounted for 10% of Reductions in Emissions from 2003 through 2006
    - CCX Rules Allow 50% of Reductions to Come from Offsets

http://www.theccx.com/content.jsf?id=65 Accessed November 27, 2009

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- **Offset Aggregator**
  - Agent for a group of offset-producing projects.
  - Projects producing less than 10,000 metric tons of CO_2 equivalent per year must be registered and sold through offset aggregators.

http://www.theccx.com/content.jsf?id=65 Accessed November 27, 2009

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- **Liquidity Provider**
  - Entities or individuals who trade on the Exchange without a commitment to a CCX Emission Reduction Schedule (e.g., market makers and proprietary trading groups).

http://www.theccx.com/content.jsf?id=65 Accessed November 27, 2009

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- **Exchange Participants**
  - Entities or individuals who purchase Carbon Financial Instrument® (CFI®) contracts and retire them to offset emissions associated with special events or other specified activities

http://www.theccx.com/content.jsf?id=65 Accessed November 27, 2009

Chicago Climate Exchange

- Transactions:
  - Methods
    - Online trading system for CCX members to submit bids and offers anonymously
    - Electronic bilateral agreements among members
    - Pre-negotiated block trades and cash transactions
      - Must be reported to CCX

http://chicagoclimatex.com/content.jsf?id=483 Accessed November 28, 2009

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- Registry Members can trade “allowances”
- Offset Providers can sell “offsets”
- All in form of CFI Contracts

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- CFI Contract:
  - One CFI contract is equal to 100 metric tons of CO_2e.
  - Vintage Contracts can be used at any time
    - Contracts from previous years
  - Limits on price
    - Minimum price = $5 per contract
    - 20% up or down from previous day

http://chicagoclimatex.com/content.jsf?id=483 Accessed November 28, 2009

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Greenhouse Gas Emission Factors For Direct Emission Sources

Stationary Emission Sources

Table 1 provides greenhouse gas (GHG) emission factors for combustion of common fossil fuels at stationary (non-transport) sources.

Table 1 Stationary Emission Sources

Fuel Type	Metric Tons CO_2 per Gigajoule	Metric Tons CO_2 per mmBTU	Metric Tons CO_2 per Cubic Meter	Metric Tons CO_2 per 1000 Cubic Feet	Metric Tons CO_2 per Liter	Metric Tons CO_2 per Gallon	Metric Tons CO_2 per Metric Ton Fuel	Metric Tons CO_2 per Short Ton Fuel
Natural Gas	0.050	0.053	0.002	0.055	-	-	-	-
Propane	0.060	0.063	-	-	0.002	0.006	-	-
LPG	0.060	0.063	-	-	0.002	0.006	-	-
Kerosene	0.069	0.072	-	-	0.003	0.010	-	-
Distillate Fuel (#1, #2, #4 heating oil & Diesel)	0.069	0.073	-	-	0.003	0.010	-	-
Residual Fuel (#5 and #6 heating oil)	0.075	0.079	-	-	0.003	0.012	-	-
Anthracite	0.098	0.103	-	-	-	-	1.930	1.750
Bituminous Coal	0.088	0.093	-	-	-	-	2.470	2.240
Sub-Bituminous Coal	0.091	0.096	-	-	-	-	1.860	1.690
Lignite	0.093	0.098	-	-	-	-	1.400	1.270
Peat	0.101	0.106	-	-	-	-	-	-
Petroleum Coke	0.097	0.102	-	-	0.004	0.015	3.380	3.070

Source: *World Resources Institute GHG Calculation Tools for Stationary Emission Sources available at: http://www.ghgprotocol.org/templates/GHG5/layout.asp?type=p&MenuId=OTAx prior to October 2006*
Note: *Emissions based on high heating values where applicable*

http://www.theccx.com/docs/misc/GHG_Emission_Factors.pdf Accessed November 27, 2009

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Mobile Emission Sources

Table 2 provides GHG emission factors for the combustion of common fossil fuels at mobile sources involving road and air transport.

Table 2 Mobile Emission Sources

Fuel Type	Metric Tons CO_2 per Liter	Metric Tons CO_2 per Gallon	Metric Tons CO_2 per Cubic Meter	Metric Tons CO_2 per Therm
Gasoline	0.0024	0.0092	-	-
Diesel	0.0027	0.0104	-	-
Jet Fuel	-	0.0100	-	-
Aviation Gasoline	0.0024	0.0090	-	-
LPG	0.0016	0.0060	-	-
CNG	-	-	0.0022	0.0054

Source: World Resources Institute GHG Calculation Tools for Stationary Emission Sources available at:
http://www.ghgprotocol.org/templates/GHG5/layout.asp?type=p&MenuId=OTAx

http://www.theccx.com/docs/misc/GHG_Emission_Factors.pdf Accessed November 27, 2009

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Greenhouse Gas Emission Factors for Electricity Purchases (Indirect Emissions)

Phase I Electricity Purchase Conversion Factors

During Phase I program years (2003-2006), the conversion factors outlined in the table below will apply. These conversion factors represent the respective average national emissions rates for electricity production during the Phase I CCX Baseline Period (1998-2001).

Table 3 Phase I Purchased Electricity Emission Factors

Location of Facilities	Metric Tons CO_2 per Purchased Megawatt Hour
United States	0.61
Canada	0.20
Mexico	0.59

Phase II Electricity Purchase Conversion Factors

During Phase II Members operating within a single region as defined by the National American Electric Reliability Council (NERC), CCX will use the applicable regional conversion factor in determining the CFIs to be allocated based on a Member's annual objective for electricity purchases and the annual CFI requirement for the Committee approved electricity purchases. **See Table 4 and Figure 1 for Phase II regional purchased electricity emission factors.**

For Members operating in multiple NERC regions, CCX will use the applicable national conversion factor in determining the annual CFIs to be allocated based on a Member's annual objective for electricity purchases and the annual CFI requirement for the Committee approved electricity purchases.

Please view Advisory 2007-01 at http://www.chicagoclimateexchange.com/info/advisories/2007/2007-01.pdf for additional details.

http://www.theccx.com/docs/misc/GHG_Emission_Factors.pdf Accessed November 27, 2009

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Table 4 Phase II Purchased Electricity Emission Factors		
NERC Region	NERG sub-regions in the region	Metric Tons CO_2 per purchased Megawatt Hour
ASCC	All Alaska	0.49
ECAR	ECMI, ECOV	0.82
ARCOT	ERCT	0.64
FRCC	FRCC	0.63
HICC	All Hawaii	0.78
MAAC	MAAC	0.50
MAIN	MANN, MANS	0.68
MAPP	MAPP	0.83
NPCC	NYLI, NYCW, NEWE, NYUP	0.51
SERC	SRMV, SRSO, SRTV, SRVC	0.62
SPP	SPNO, SPSO	0.89
WECC	CALI, NWGB, NWPN, ROCK, WSSW	0.51

http://www.theccx.com/docs/misc/GHG_Emission_Factors.pdf Accessed November 27, 2009

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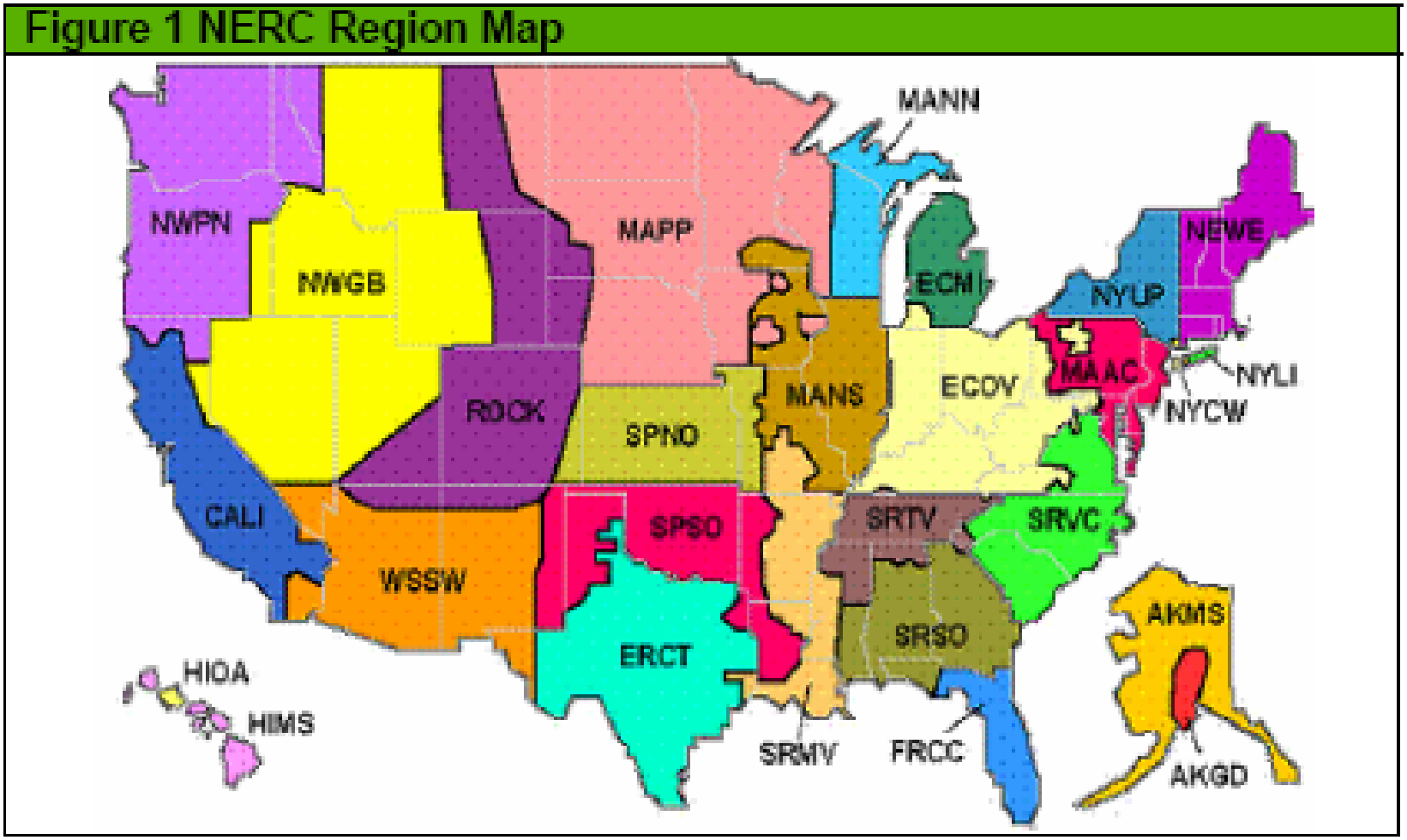

http://www.theccx.com/docs/misc/GHG_Emission_Factors.pdf Accessed November 27, 2009

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- CCX Offset Project Protocols

Forestry Carbon Sequestration	Agricultural Methane Collection and Combustion
Agricultural Best Management Practices – Continuous Conservation Tillage and Conversion to Grassland Soil Carbon Sequestration	Agricultural Best Management Practices – Sustainably Managed Rangeland Soil Carbon Sequestration
Avoided Emissions from Organic Waste Disposal	Landfill Methane Collection and Combustion
Ozone Depleting Substances Destruction	Coal Mine Methane Collection and Combustion
Renewable Energy Systems	Small Scale Renewable Biogas

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- Forestry Carbon Sequestration
  - Afforestation
    - A land-use change followed by the establishment of forest on land that has been in a non-forest use for ten (10) years or longer prior to the afforestation.
  - Reforestation
    - Reestablishing a forest on land where forest cover has been lost, usually through a severe disturbance that is not the result of intentional management activity or gross negligence, and where the desired forest is not regenerating naturally

http://www.chicagoclimatex.com/docs/offsets/CCX_Forestry_Sequestration_Protocol_Final.pdf
Accessed November 28, 2009

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- CCX Forestry Committee
  - Reviews Standards
  - Must approve all projects in this area
  - Contains Academics, Industry Leaders, and others

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- Analysis of Offset Protocol for Forestry Carbon Sequestration
  - Additionality
  - Leakage
  - Permanence
  - Location
  - Verification
  - Transparency

http://reducecarbon.wordpress.com/v-chicago-climate-exchange-ccx/ Accessed November 28, 2009;http://www.chicagoclimatex.com/docs/offsets/CCX_Forestry_Sequestration_Protocol_Final.pdf Accessed November 28, 2009.

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- Additionality Standards
  - Regulatory:
    - Must be a voluntary act, not covered by a current law or regulatory regime
  - Common Practice:
    - Must go beyond the “technologies or practices that have penetrated the market”.
    - Here, must plant trees after January 1, 2003 and must be a place where trees had not existed for 10 years.

http://www.chicagoclimatex.com/docs/offsets/CCX_Forestry_Sequestration_Protocol_Final.pdf Accessed November 28, 2009.

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- Additionality Standards Critique
  - Vague articulation of standards
  - Should consider whether there are other motivations for changing behavior and whether behavior was occurring before entity involvement in CCX.

http://reducecarbon.wordpress.com/v-chicago-climate-exchange-ccx/ Accessed November 28, 2009

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- Leakage Standard
  - No “leakage” anticipated
  - No analysis required

http://www.chicagoclimatex.com/docs/offsets/CCX_Forestry_Sequestration_Protocol_Final.pdf
Accessed November 28, 2009.

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- Leakage Standard Critique
  - Standards do not consider possibility that an entity could purchase additional land and deforest and undo all of the carbon reduction accomplished by the offset.

http://reducecarbon.wordpress.com/v-chicago-climate-exchange-ccx/ Accessed November 28, 2009

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- Permanence Standards
  - Must place 20% of carbon stocks in CCX account in case of natural disaster which undermines the carbon sequestration (e.g., forest fire). Stocks returned to entity near end of commitment period (Phase I – 2006; Phase II – 2010).
  - Commit to maintaining the land as a forest for 15 years
  - Submit non-binding letter of intent to maintain forest beyond 2010.

http://www.chicagoclimatex.com/docs/offsets/CCX_Forestry_Sequestration_Protocol_Final.pdf
Accessed November 28, 2009.

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- Permanence Standards Critique
  - Not difficult to plant trees, obtain carbon credits, then discard the project
  - Letter of intent is expressly non-binding, so seemingly ineffective

http://reducecarbon.wordpress.com/v-chicago-climate-exchange-ccx/ Accessed November 28, 2009

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- Location Standards
  - Projects located in U.S.
  - Projects located in non Annex I countries (per Kyoto classifications)

http://www.chicagoclimatex.com/docs/offsets/CCX_Forestry_Sequestration_Protocol_Final.pdf Accessed November 28, 2009.

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- Verification Standards
  - In-field verification done by CCX-approved third-party verifier
    - Beginning and End of CCX commitment
    - Some intermittent depending on size
  - "Desk audit" required when no in-field verification done
  - Verifier must affirm that project meets "materiality thresholds"
  - Remote sensing standards included

http://www.chicagoclimatex.com/docs/offsets/CCX_Forestry_Sequestration_Protocol_Final.pdf Accessed November 28, 2009.

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- Verification Critique
  - Lots of verifiers
  - Inconsistent application of rules?

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- Transparency Standards and Critique
  - Blank submission documents and protocols available online
  - Submitted/Accepted documents not available for public inspection or verification

http://reducecarbon.wordpress.com/v-chicago-climate-exchange-ccx/ Accessed November 28, 2009

Chicago Climate Exchange

- Overall Critiques
  - Reduction of emissions levels are too small compared to Kyoto Protocol emission reduction goals (but unratified)

    - J. Goodell, “Capital Pollution Solution?” New York Times Magazine (July 30, 2006). http://www.nytimes.com/2006/07/30/magazine/30carbon.html?pagewanted=2 Accessed November 28, 2009

Chicago Climate Exchange

- Overall Critiques
  - Allows for emissions to go up if the size of company goes up because measures intensity of carbon emissions, not outright emissions
    - Abrahm Lustgarten, CCX's New Competition, Fortune, September 1, 2006.

Chicago Climate Exchange

- Overall Critiques
  - CCX claims credit for carbon reductions that may not be attributable to the Exchange

    - J. Goodell, “Capital Pollution Solution?” New York Times Magazine (July 30, 2006). http://www.nytimes.com/2006/07/30/magazine/30carbon.html?pagewanted=2 Accessed November 28, 2009

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- Overall Critiques
  - States and Cities should not join CCX
    - Goals too modest
    - Rules too loose
    - Might frustrate other attempts to legislate
      - National Resources Defense Council: http://www.hawaiienergypolicy.hawaii.edu/PDF/Appendix_I.pdf Accessed November 28, 2009

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Experiment that governments can learn from or the future of carbon regulation?

Only time will tell…

Thank you!