



# Understanding Carbon Credit Opportunities in Northeast Minnesota

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# Outline of presentation

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- n What is carbon storage and carbon sequestration?
- n What are carbon credits?
- n What's happening in the carbon markets?
- n What kind of credits are available for native seed production?



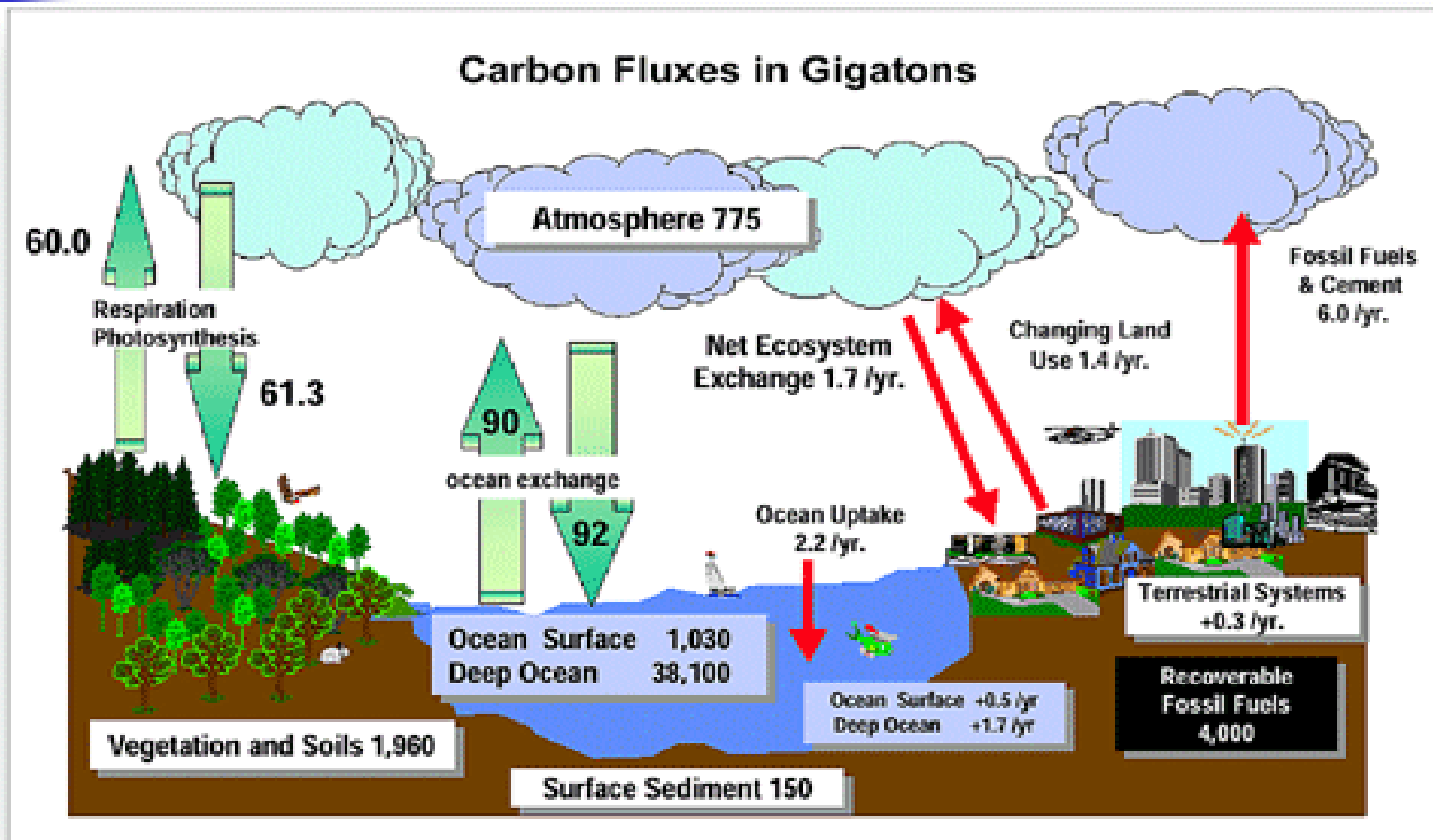
# Carbon Storage

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- n Carbon is continuously cycled between land and sea, in inorganic and organic form.
- n The atmosphere, in addition to comprising a major carbon reservoir, plays a critical role as a medium for rapid global exchange of CO<sub>2</sub> and other bioactive elements.

Source: Iowa Farm Bureau, 2006

# Global Carbon Cycle





# Carbon Sequestration

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- n Carbon sequestration can be defined as the capture and secure storage of carbon that would otherwise be emitted to or remain in the atmosphere.
- n Growing plants sequester carbon from the atmosphere and release it when they decompose unless converted

Source: Iowa Farm Bureau, 2006



# Trees and Forests as “Sinks”

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- n While growing trees absorb CO<sub>2</sub> and release oxygen
- n Carbon sequestered and stored in trees
  - n Trees roughly 20% carbon by weight
- n Faster growing trees will sequester a greater amount of carbon in a given time
- n New plantings provide a “net gain” in carbon sequestered
- n Managed forests maintain a carbon “stock”

# Alternative land use/land management practices



**Grassland  
/CRP**



**Wetland  
Restoration**



**Afforestation:  
Pine**



**Cover crop  
Adoption**



**Agroforestry:  
Poplar**



# What are Carbon Credits?

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Carbon credits encompass two ideas:

- n Prevention/reduction of carbon emissions produced by human activities from reaching the atmosphere by capturing and diverting them to secure storage.
- n Removal of carbon from the atmosphere by various means and securely storing it.



# What's happening in the market?

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- n Chicago Climate Exchange, (Voluntary)
- n European Climate Exchange (Kyoto)
- n Iowa Farm Bureau carbon credit trading
- n State programs – California
- n North East Regional GHG Initiative
- n Conservation oriented non-profits



# Aggregators

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- n CCX requires credits be sold in increments of at least 12,500 mT, approx. 2,500 acres
- n Landowners need to work with an aggregator.
- n An aggregator works to combine your credits with other rural landowners in order to create a large enough bundle to sell to the CCX.



# Aggregators (Cont.)

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- n Aggregators charge a fee of between 8-10% of your gross carbon credit payments in order to sustain their business.
- n Possible Aggregators
  - n The Delta Institute (as part of the Illinois Climate Initiative)
  - n National Farmer's Union
  - n Forecon EcoMarket Solutions
  - n The Iowa Farm Bureau





# Why are Companies Buying Credits?

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- n Voluntary market right now.
- n CO<sub>2</sub> regulation may come in the future.
- n Companies and EPA are tracking CO<sub>2</sub> emissions.
- n Credits may be more expensive in the future.

# Price Forecasts for Credits

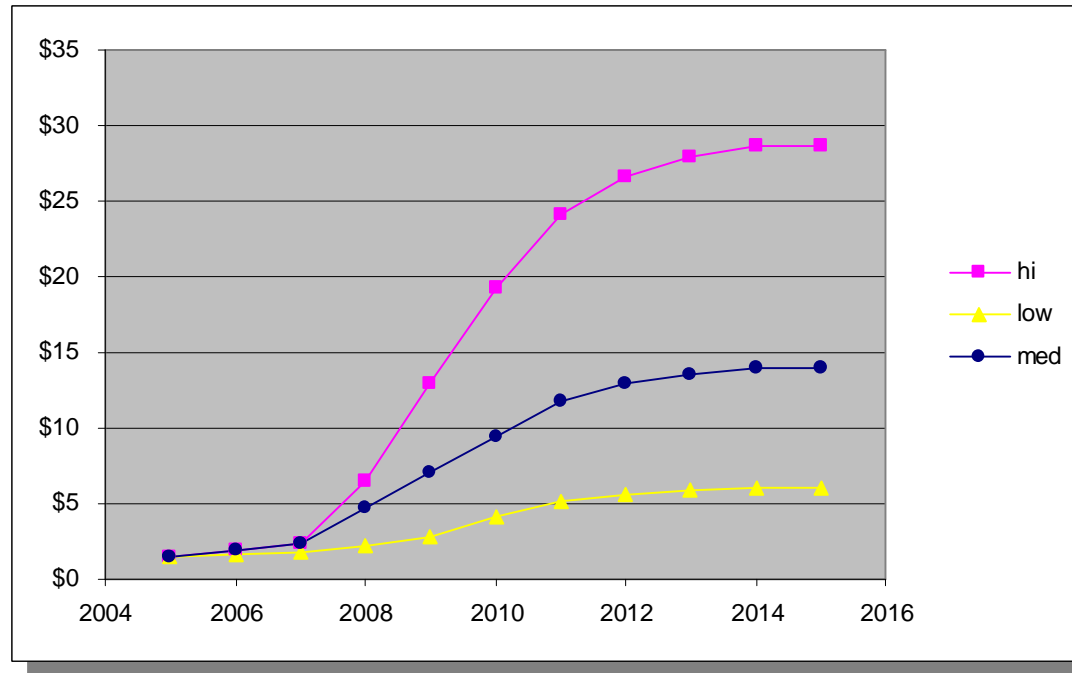
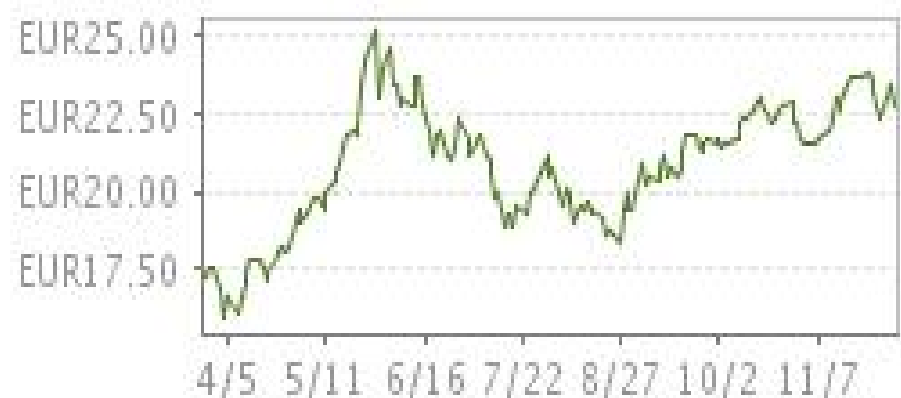
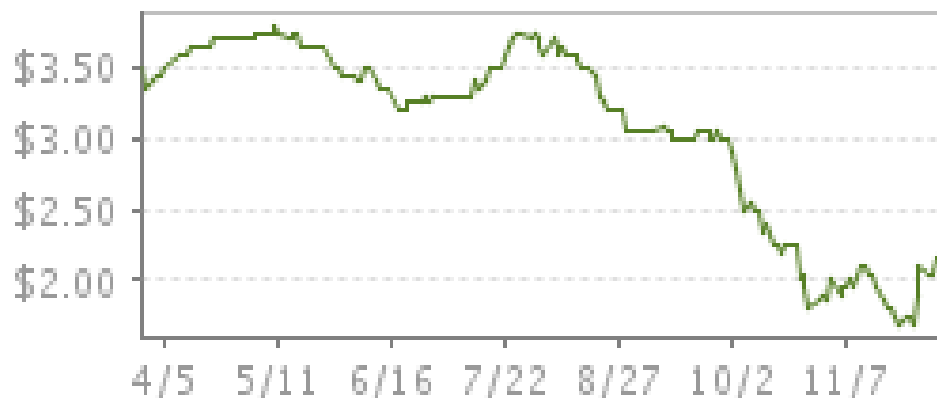


Figure 1. Projected price curves for US carbon credits (\$US per metric ton).

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

# Current Market Status

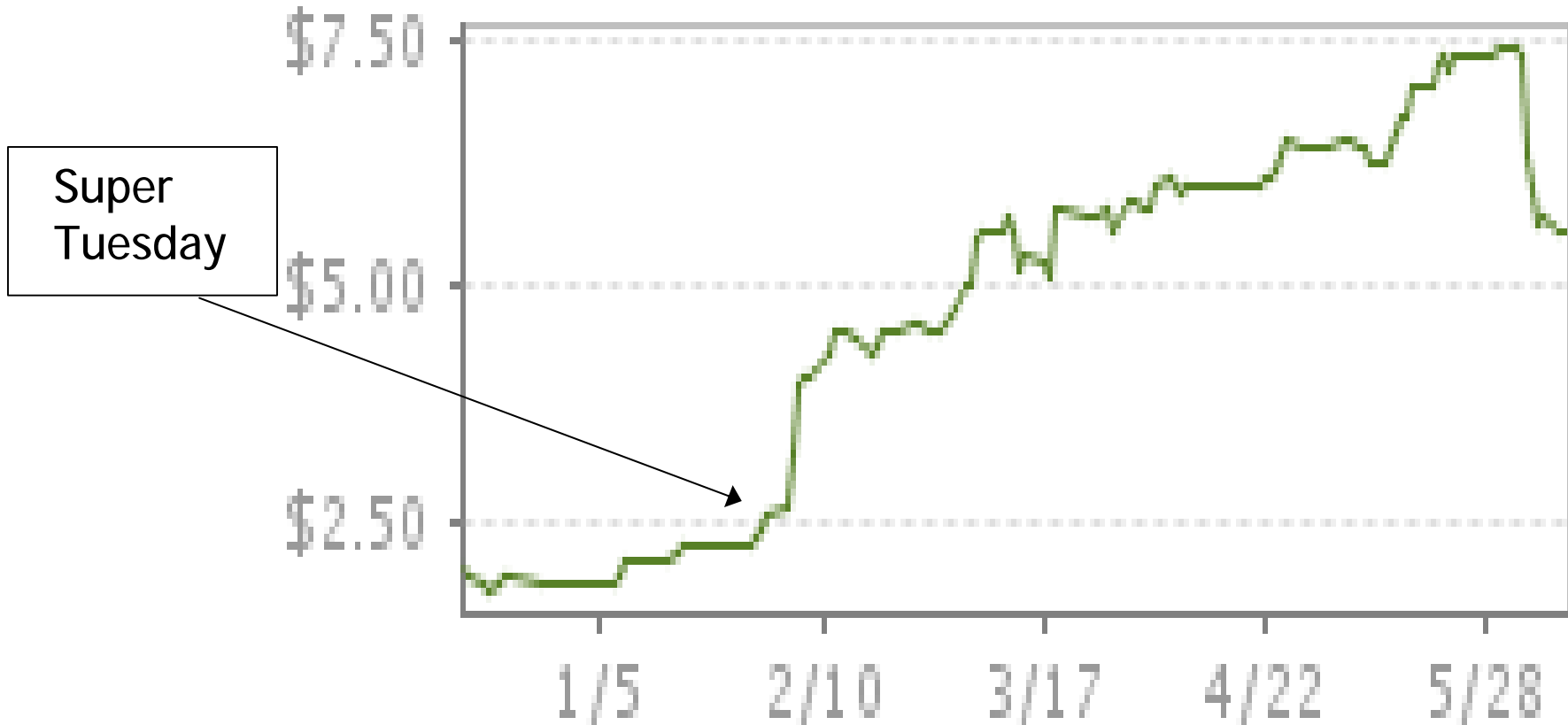
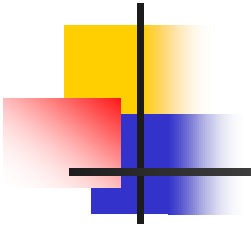
- n Typical price per mT of CO<sub>2</sub> sequestered for 2006: \$3.50 – \$5.00 in the US.
- n Currently at \$2.15/mT (December 7, 2007)
- n In Europe, where the market is mandatory, prices have ranged between \$25.00-\$40.00



# Chicago Climate Exchange

(\$5.75/mt CO<sub>2</sub> – Mar. 19, 2008)

(\$7.40/mt CO<sub>2</sub> – June 2, 2008)



# Example (Aspen-Birch in MN)

Northern Lake States	Years					
Species	1-5	6-10	11-15	16-20	21-25	26-30
Aspen-birch (t/acre/yr)	1.59	1.40	0.98	1.53	1.86	2.04
x 5 years	7.96	7.01	4.92	7.66	9.31	10.22
x \$5.70/ton (rounded)	\$45	\$40	\$28	\$44	\$53	\$58
x 40 acres	\$1,815	\$1,598	\$1,121	\$1,745	\$2,122	\$2,330
CCX Total income/acre	\$268 - Total income (40 acres) \$10,731					
ECX Total income/acre	\$1,616 - Total income (40 acres) \$64,648					

Carbon price Mar. 25, 08 Chicago Climate Exchange (6.30) = \$ 5.70  
 (June 5, 08) European Climate Exchange (43.57)= \$34.34

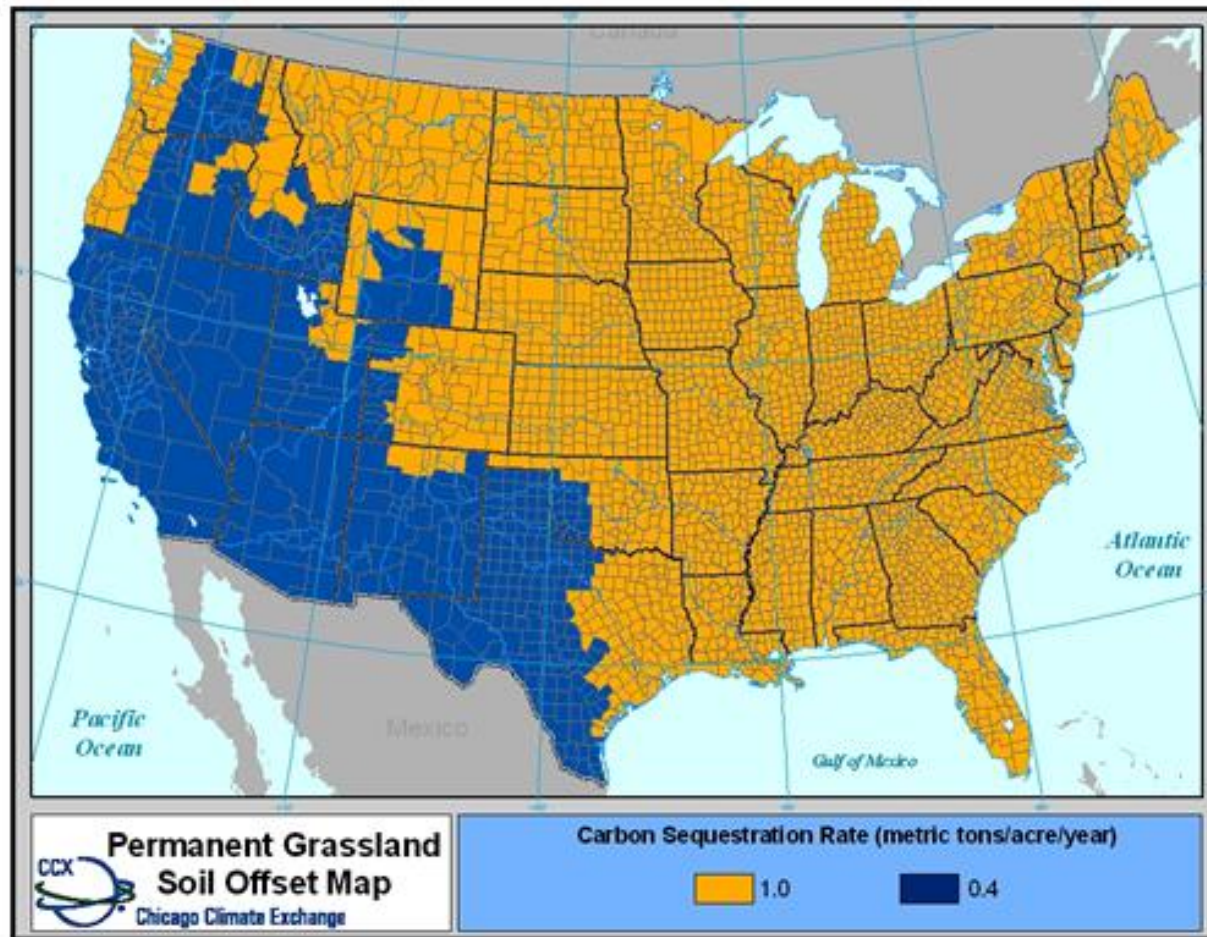


# Permanent Grass Planting

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- n Min. four year contractual commitment
- n 1.0 m. tons CO<sub>2</sub> per acre per year.
- n Projects must be enrolled through a CCX-registered Offset Aggregator.
- n Subject to independent verification.

# Permanent Grassland Soil Offsets



# Example (Permanent Grassland in MN)

Permanent Grassland	Years			
	1	2	3	4
Sequestered (t/acre/yr)	1.0	1.0	1.0	1.0
x \$5.70/ton (rounded)	\$5.70	\$5.70	\$5.70	\$5.70
x 40 acres	\$228.00	\$228.00	\$228.00	\$228.00
CCX Total income/acre	\$22.80 - Total income (40 acres) \$820.80*			

ECX Total income/acre	\$137 - Total income (40 acres) \$4,945*
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Carbon price Mar. 25, 08 Chicago Climate Exchange = \$ 5.70  
 (June 5, 08) European Climate Exchange (43.57) = \$34.34

\* 10% deducted for aggregator

# Opportunities

- n Minnesota's certified forests
- n Credits for working lands
  - n Carbon sequestration
  - n Avoided emissions
  - n Conversion
- n Rewarding stewardship/maintaining carbon stores
- n Conversion to solid wood products





# Renewable Energy Offset Projects

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- n Project proposer must have clear ownership rights to the envir. attributes
- n Not being used to meet obligations established by state or local mandates
  - n Renewable portfolio standards
  - n Green energy sales
- n 0.4 metric tons per megawatt hour

# Co-Benefits of Carbon Sequestering Land Practices

- n Biomass Production
  - n Fossil Fuel Substitute
- n Water Quality
  - n Riparian Buffers
  - n Reduced Erosion/Runoff
- n Increased and Improved Habitat





# Current Issues with Sequestration and Storage

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- n Uncertain Science
  - n Reliability of Sequestration Rates
    - n Conservation Tillage
    - n Changes in CCX Rates
  - n Methodology Behind Calculations
- n Capacity to “solve” our problems is small
  - n One part of a larger solution
- n Permanence
- n Voluntary Nature of the Markets



# What's Happening in Minnesota?

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- n Mid-West Governor's Association Greenhouse Gas Accord
  - n Cap & Trade Agreement between 6 States
- n Minnesota Terrestrial Carbon Sequestration Project
  - n State Policy and Program Review
  - n Recommendations for improving state's ability to sequester carbon
- n Minnesota Climate Change Advisory Group
  - n Recommendations for reducing emissions



## Current developments:

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- n Payments for sustainable management
- n Credit rates for long lived products
- n Move to on-site verification as opposed to tables (practice based)
- n New rate tables
- n Development of Cap and Trade program in Minnesota



# Summary

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- n Emerging market for Carbon Credits –  
Some risk associated
- n Tendency seems to be towards some  
kind of regulation
- n Opportunities for Forests and Grasslands
- n Opportunities for renewable  
energy/increased forest productivity



# Questions?

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<http://www.cinram.umn.edu>

MN Terrestrial Carbon Project:

<http://wrc.umn.edu/outreach/carbon/>

Thank you!