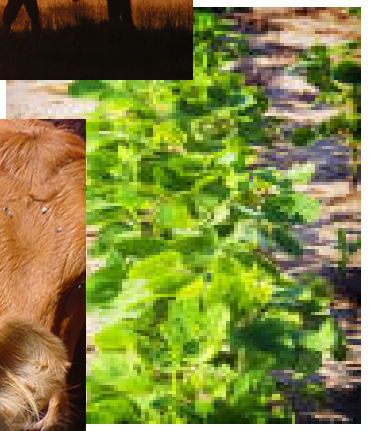
Carbon Cap-and-Trade: What's in it for Agriculture?

Rewarding Agriculture for GHG Mitigation



National Association of Conservation Districts
Washington, DC
July 21, 2008

Debbie Reed
DRD Associates

Carbon Cap-and-Trade: What's in it for U.S. Agriculture?

Premise:

WE do not have the luxury of excluding *agricultural emissions reductions offsets* from GHG cap-and-trade policies;

AND

AGRICULTURE should receive *full market value* for emissions reductions offsets (and considerable income generation opportunities exist).

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Carbon Cap-and-Trade: What's in it for Agriculture?

Overview:

- *Global Climate Change…and Agriculture*
- Climate Change Policies: Cap-and-Trade
- Congressional Activity on Climate Change
- Potential Role for Conservation Districts?

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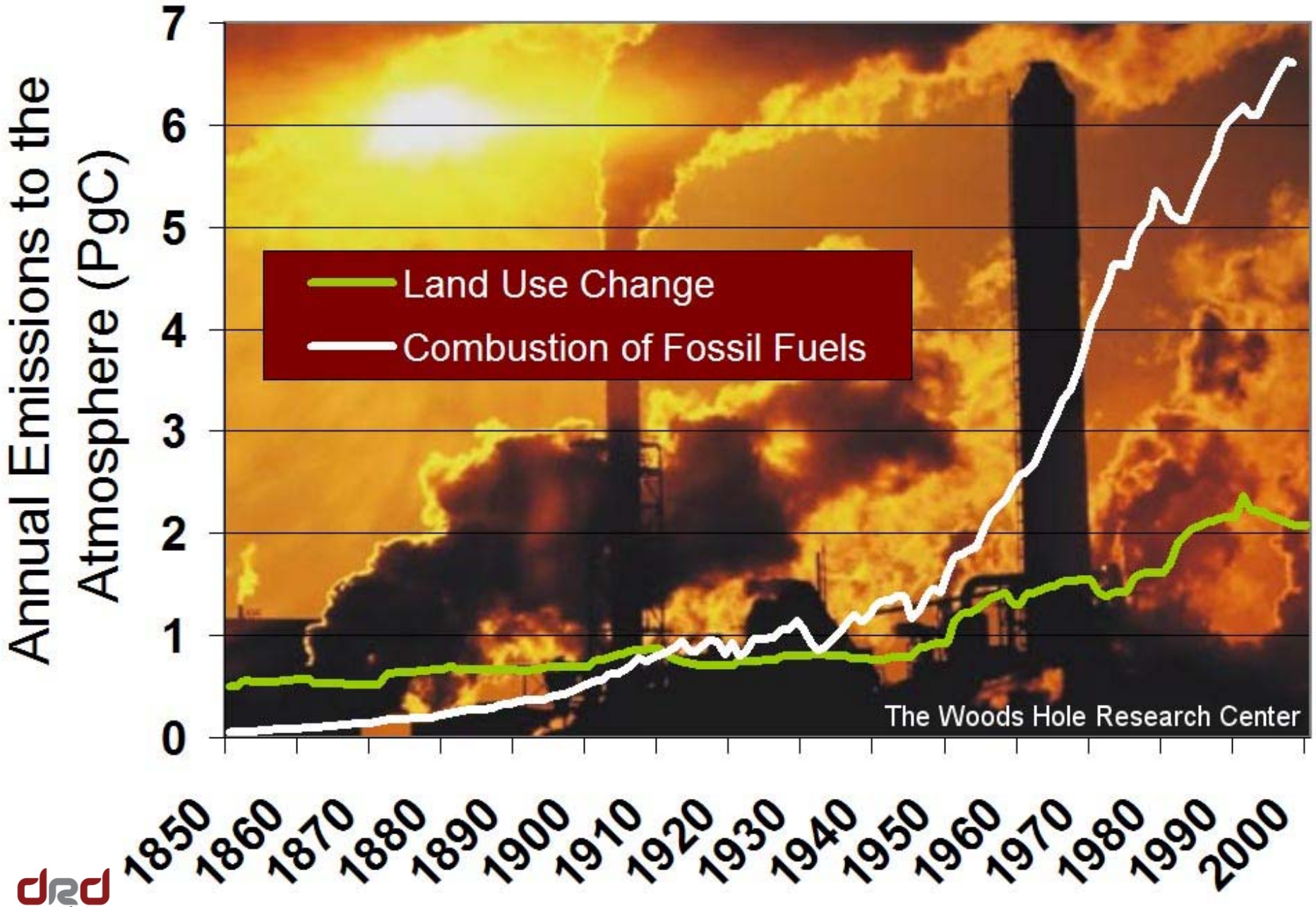
Annual Emissions to the Atmosphere (PgC)
7
6
5
4
3
2
1
0
Land Use Change
Combustion of Fossil Fuels
The Woods Hole Research Center
1850
1860
1870
1880
1890
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000

Global Climate Change
…and GHG Emissions, Reductions

If atmospheric CO_2 levels are to be stabilized at reasonable concentrations by 2050 (450-650 ppm CO_2), drastic reductions in emissions are required over the next 20-30 years.

--IPCC Special Report on Emissions Scenarios

During this critical 20-30 year period, all available emissions reductions measures must be utilized, and new energy technologies must be developed.

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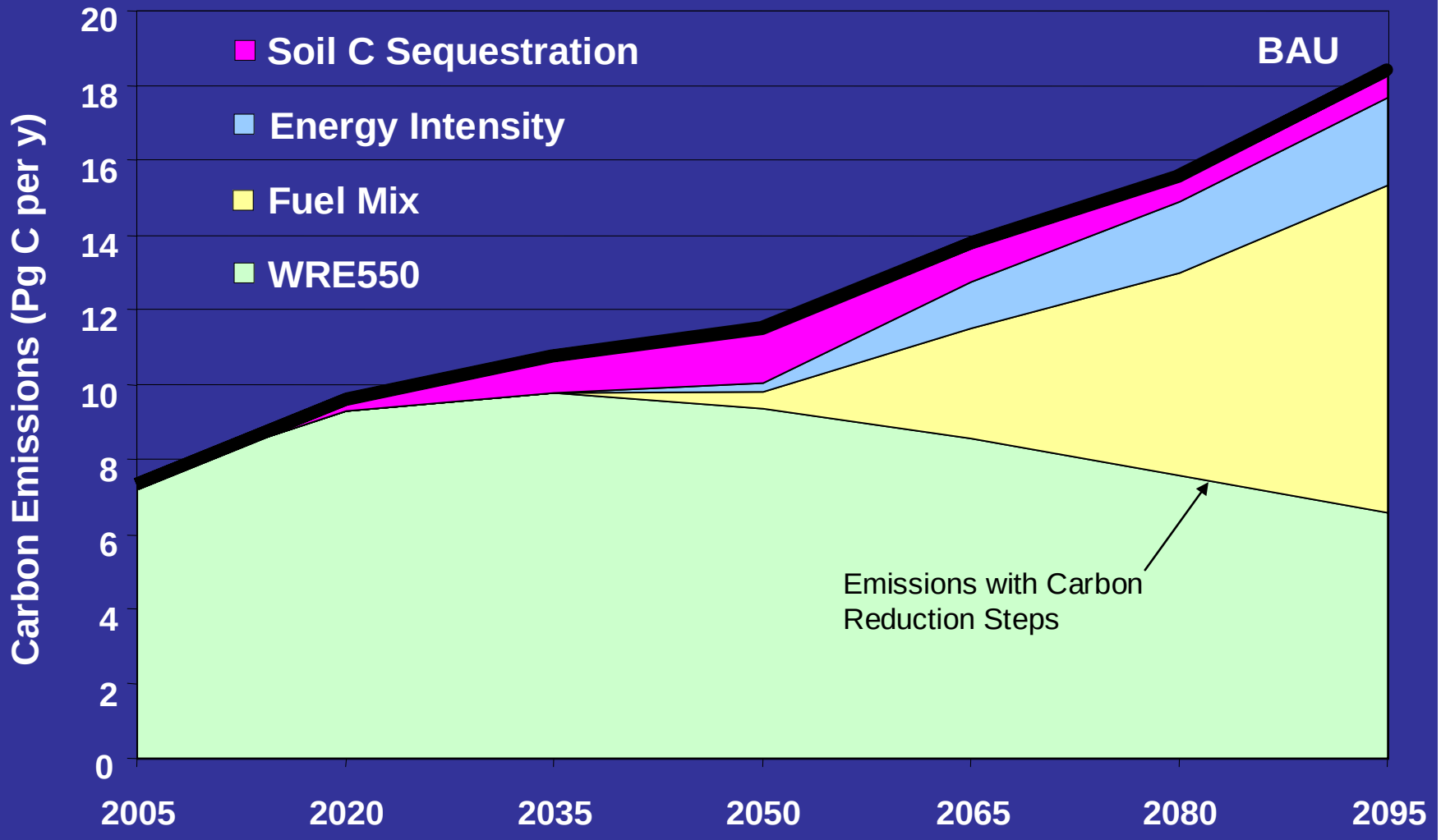
Carbon Emissions Reductions: WRE 550 with Soil Carbon Sequestration Credits



From: Rosenberg, N.J., R.C. Izaurralde, and E.L. Malone (eds.). 1999. Carbon Sequestration in Soils: Science, Monitoring and Beyond. Battelle Press, Columbus, OH. 201 pp.

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Global Climate Change …and Agriculture

- Agriculture is both a **source of GHG**, and a **sink (GHG reservoir)**
- As a source of GHG, agriculture contributes approximately **8% of US GHG emissions** – mostly from small, diffuse, non-point sources
- N_2O and CH_4 account for the largest share of agricultural emissions (CO_2 equivalent basis)

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Global Climate Change …and Agriculture

The Role of U.S. Agriculture in Climate Change Mitigation:

- **Reducing emissions** from agricultural sources of GHG, or displacing fossil fuels,

or

- **enhancing sinks** (forest and soil carbon sequestration)

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Global Climate Change… and Agriculture

Agricultural Sources of Nitrous Oxide (N_2O) emissions:

- Soils
- Fertilizers
- Land application of manure

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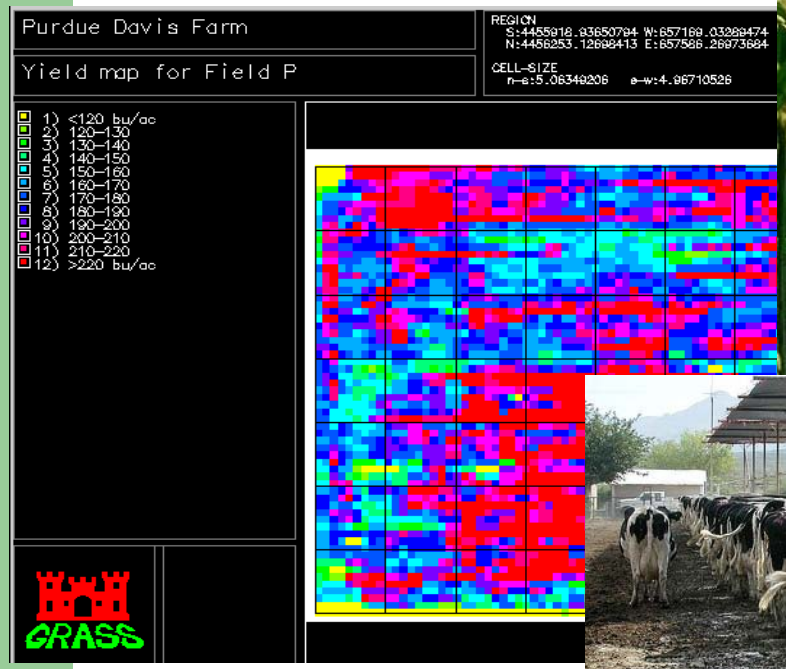
Global Climate Change… and Agriculture

Agricultural Sources of Methane (CH4):

- Livestock (enteric fermentation, manure)
- Soils
- Rice cultivation

Global Climate Change…
and Agriculture:
Mitigation Options for Agriculture



CH_4

N_2O

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Global Climate Change… and Agriculture

Mitigation Options for Agriculture

** Enhancing the soil carbon sink **

- *No-till, cover crops*
- *Crop rotations*
- *Buffer, filter strips*

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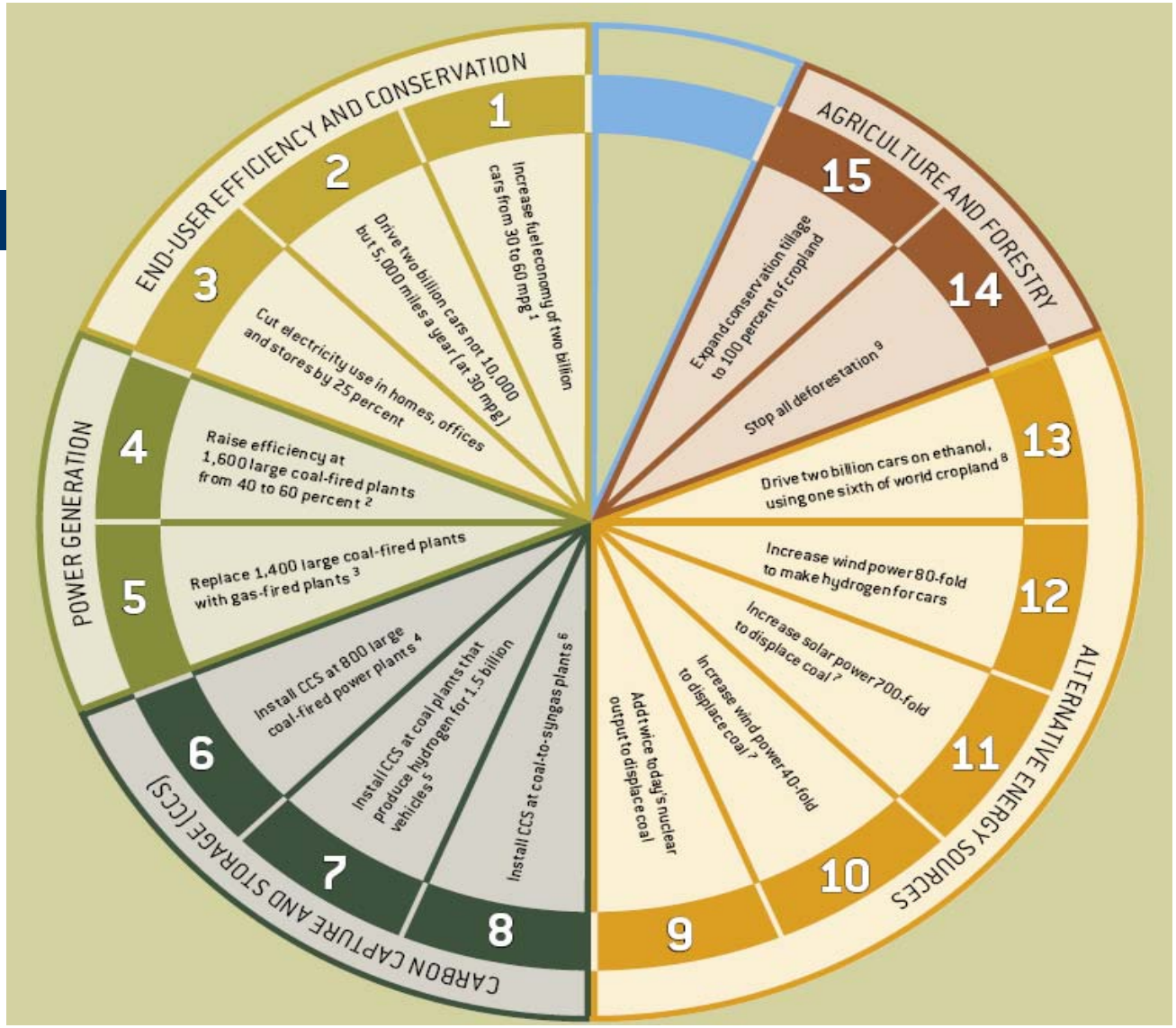
Emission Reduction "Wedges"



Source; Socolow and Pacala, *Scientific American*, September 2006, p.54

Potential CO_2 Reduction Options

	Rapidly Deployable	Not Rapidly Deployable
Minor Contributor <0.2 PgC/y	• **Biomass co-fire electric generation** • Cogeneration and Hydropower • Natural Gas Combined cycle • Niche options	• Photovoltaics • Ocean fertilization
Major Contributor >0.2 PgC/y	• **C sequestration in Agricultural soils** • Improved efficiency • Industrial Non-CO_2 gas abatement • **Ag non-CO_2 gas abatement (CH_4, N_2O)** • Reforestation	• **Biomass to hydrogen** • **Biomass to fuel** • Cessation of deforestation • Energy-efficient transport • Geologic storage • High efficiency coal technology • Large-scale solar • Next generation nuclear fission

Caldeira et al. 2004. A portfolio of carbon management options, p. 103-130, *In* C. B. Field and M. R. Raupach, eds. The Global Carbon Cycle. Island Press, Washington, DC.

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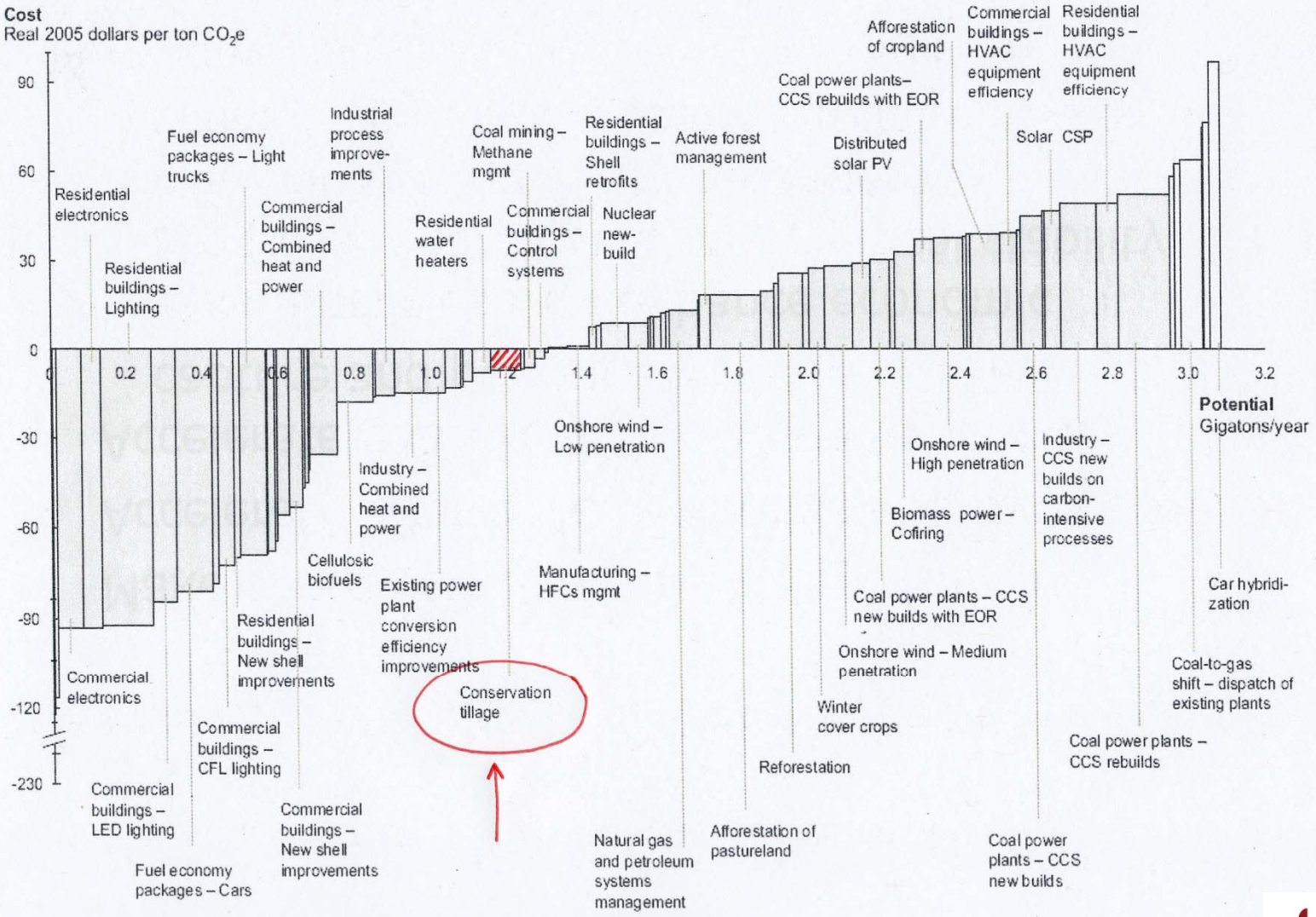
McKinsey Study Shows U.S. Can Get Large GHG Cuts at Low Costs



Source: McKinsey, "Reducing U.S. Greenhouse Gas Emissions," November, 2007

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Global Climate Change …and U.S. Agriculture

Q: What are the *potential contributions* of soil carbon sequestration to climate change mitigation in the U.S.?

- Technical
- Economic

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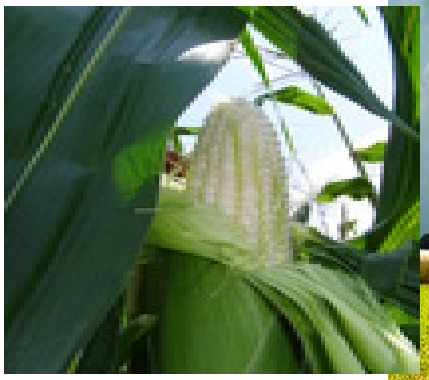
Global Climate Change… and Agriculture

Technical potential:

- Agricultural soil sinks have the potential to offset 10-15% of annual CO_2 emissions*
- N_20 and CH_4 offer additional potential reductions



***Economic potential:**

- Depends on policies, and CO_2 price

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Cap-and Trade: Addressing Global Climate Change

Economy-Wide, Cap-and-Trade

CAP = amount of GHG that can be emitted in a year

- Established by policy
- Reduced every year (theoretically)
- Applies to emitters ID'd by policy

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Cap-and-Trade: Addressing Global Climate Change

Economy-Wide Cap-and-Trade

Allowance = legal tender, represents 1 ton GHG ***emissions***

- Given/auctioned to capped entities
- Can be traded, sold on GHG market

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Cap-and-Trade: Addressing Global Climate Change

Economy-Wide, Cap-and-Trade

Offset = legal tender, represents 1 ton GHG ***reductions***

- Given to non-capped entities for proven, verified GHG reductions
- Can be traded, sold on GHG market
- Are a COST-CONTAINMENT measure

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Theory: Why are Agricultural Sinks Important for Cap-and-Trade?

Economy-Wide Cap-&-Trade:

A New Economy

- CBO estimates allowances from cap-and-trade worth $50 B - $300 B/year
- Over 20 years = $300 B - $6 Trillion

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Carbon Cap-and-Trade: What's in it for U.S. Agriculture?

Q: Why are Agricultural Sinks Important for Cap-and-Trade?

A: Offsets are a *cost-containment measure*, and, soil sinks have multiple ancillary benefits to society, and to agriculture: "charismatic carbon credits"

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Global Climate Change… and U.S. Agriculture

Q: How do **agricultural sinks** compare to other available GHG emissions reductions offsets? (i.e., what's the competition)?

A: They are:

- *Real, proven*
- *readily available*
- *Implement now*
- *low-cost*

- *NO ONE ELSE can make these claims!*

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A Role for Agricultural Sinks in Cap-and-Trade Programs?




In theory, in a cap-and-trade system, agricultural emissions reductions that are proven and verified will receive ***offsets credits*** that can be traded or sold in Carbon Markets…….*right*?

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Agricultural Sinks in International Cap-and-Trade Programs

- Kyoto Protocol: Articles 3.3 and 3.4
- EU ETS: no agricultural or forestry sink offsets allowed
- Canada ?
- EC INSEA: “Sink enhancement measures could not only turn out to be instrumental to attain climate mitigation goals, but could simultaneously become a major driver of how our natural environment is managed.”

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Overview of Congressional Activity, And Opportunities for Agriculture

- 110th Congress: 165 climate change bills, resolutions, amendments introduced by July, 2007*
- Some bills -- not all --would allow a role for agricultural sinks, and other agricultural emissions reductions
- 11 major bills in Senate, 10 in House, would/might provide some credit to agriculture for emissions reductions activities

*Pew Center on Global Climate Change, www.pewclimate.org

Overview of Congressional Activity, And Opportunities for Agriculture

- House Energy and Commerce Committee Chairman John Dingell white paper (10-07)
- "The agricultural sector's direct emissions generally should not be included in the cap-and-trade program because of difficulties monitoring emissions and the large number of sources each with low emissions."
- "This sector may present opportunities for emission reductions that would be measurable and might then provide offset or credit opportunities."

Overview of Congressional Activity, And Opportunities for Agriculture

Chairman Markey's bill:

- Very limited offsets
- Only ***one*** source agricultural offsets allowed: anaerobic methane digesters

Rep. Doggett's bill:

- Limits offsets to 4% of cap

Practice: Proposals for Agricultural Sinks in Cap-and-Trade Programs

S.2191 – The Lieberman-Warner Climate Security Act of 2008

- ***Offsets:*** entities can meet up to 15% of annual obligations with offset credits
  - Ag and forestry sinks qualify as offsets
- ***Allowances:*** 5% of annual allowance pool given to USDA Secretary to award for emissions reductions for ag, forestry

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Practice: Proposals for Agricultural Sinks in Cap-and-Trade Programs

EPA Modeling of S.2191 – The Lieberman-Warner Climate Security Act of 2008, shows:

- ***Offsets*** reduce the price of allowances 93% (i.e., allowance prices increase 93% w/o offsets)
- If ***domestic offsets*** are unlimited, allowance prices fall by 26%
- If ***offsets*** are unlimited, allowance prices fall by 71%
- ***Unlimited offsets*** ***will not hamper technological innovation because cap is low, and declining***

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Overview of Congressional Activity, And Opportunities for Agriculture

- Week of June 2, 2008: the Lieberman-Warner Climate Security Act of 2008 debated by full Senate

- Stabenow, et al Offsets Amendment supported by major ag groups: increased domestic offsets, gave programmatic authority to USDA (previously EPA), plus…

Overview of Congressional Activity, And Opportunities for Agriculture

2008 Farm Bill:

- Environmental Services Markets Program
- Consortium for Agricultural Soils Mitigation of Greenhouse Gases (CASMGS) reauthorized

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Potential Role for Conservation Districts in Carbon Markets?

Now:

- Weigh in about beneficial role of agricultural offsets (sinks in particular) in climate change mitigation solutions at all levels (national, sub-national)
- National Security: energy ***and*** food

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Potential Role for Conservation Districts in Carbon Markets?

Future:

- Consultants/Guidance in developing protocols, standards
- Project Developers
- Aggregators
- 3rd Party Verifiers

U.S Cap-and-Trade: What Role for Agriculture?.

(1) Agricultural emissions reductions are a low-cost, high-impact, readily available means of *near-term** GHG reductions

(2) However, it is not clear that they will be included in future policies to reduce GHG emissions – not for *credit*, anyway, and not always for *full credit*

(3) If not included, *from the start*, it is a huge missed opportunity: society and agriculture