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Greenhouse Gas Markets and Agriculture

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Presentation Objectives

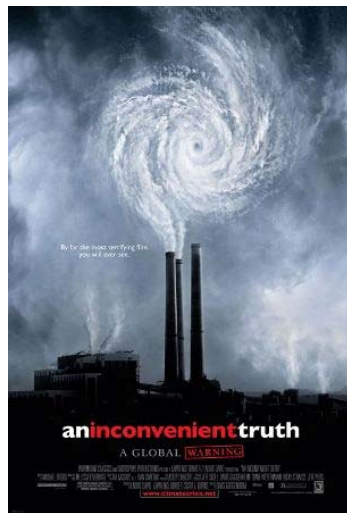
- Present a brief overview of the climate change history
- Present the current status of climate change policy
- Begin the presentations on greenhouse gas policy and agriculture.

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Kyoto Protocol

- Kyoto Protocol to reduce Greenhouse Gas (GHG) emissions was adopted December 1997.
 - Industrialized countries were to reduce emissions.
 - Developing countries were not expected to reduce emissions except via the Clean Development Mechanism.
 - Supported by the Clinton/Gore administration.
 - Never brought before the U.S. Senate because it was expected to fail ratification.

Global Warming in Popular Culture



- Inconvenient Truth Film
 - Al Gore's slide show on global warming
 - Academy Award winner in 2006
 - Raised international awareness
 - Brought the issue to the public arena
 - Has become a staple of high school curriculum

Livestock's Long Shadow

- Published by the UN Food and Agriculture Organisation in 2006.
- Oft quoted as saying 18% of all GHG emissions come from meat consumption.
- Authors admit, in 2010, that their methodology was inconsistent.

livestock's long shadow
environmental issues and options



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Massachusetts v US EPA

- Supreme Court ruled in 2007 that “Under the clear terms of the Clean Air Act, EPA can avoid taking action only if it determines that greenhouse gases do not contribute to climate change...”
- December 2009 the EPA published the final rule indicating they found that GHGs contributed to climate change and had adverse health effects.

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The EPA Regulatory Actions

- Proposed that those emitting over 100,000 tons of CO₂ equivalents after July 2011 be required to obtain a permit to do so.
 - Estimated that no crop and livestock operations will need a permit
- Already requiring emission reporting for those emitting over 25,000 tons of CO₂ equivalents.
 - Estimated that 107 livestock operations will need to report.
 - Congress forbid the EPA to spend money to enforce this in agriculture

Regulatory Options

- Best Management Practice requirements – e.g. command and control
- Cap and Trade
- Tax on emissions

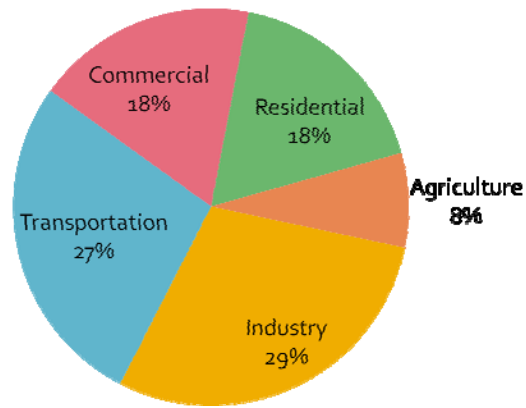
The Legislative Situation

- Unless Congress acts, the EPA will regulate GHG as it sees fit.
- Current Congressional action to create a cap-and-trade system for GHG emissions
 - Waxman-Market bill passed the U.S. House of Representatives
 - Kerry-Lieberman proposal is a comprehensive cap-and-trade bill
 - Kerry currently is proposing an emissions cap on utilities only

Questions for Agriculture

- Greenhouse gas limitations have the
 - Potential to profit agriculture
 - Potential to regulate agriculture
- Which is the greatest potential and how will it impact agriculture?
- Is agriculture a source of offsets or a source of emissions?

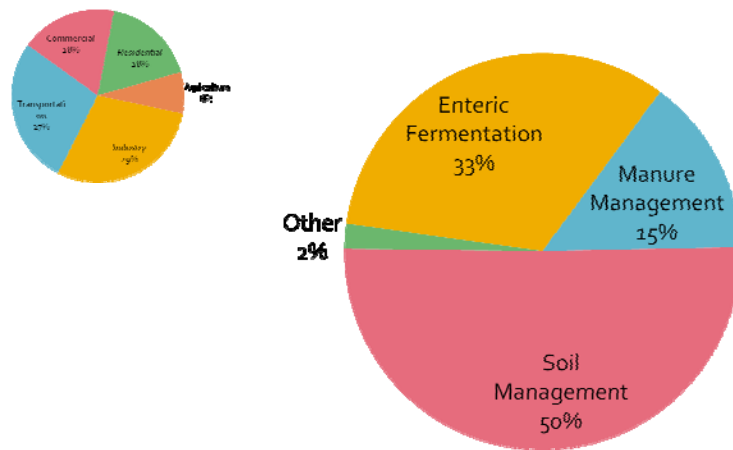
US Sources of Greenhouse Gases, 2008



Source: EPA. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2008*



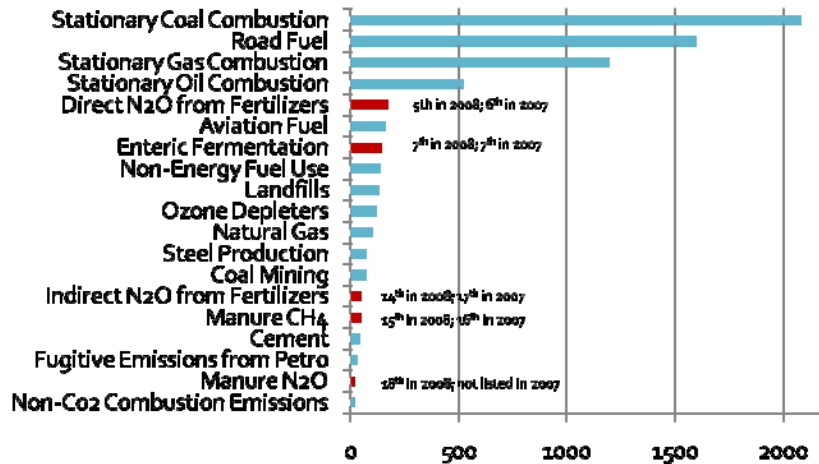
Agricultural Sources of Greenhouse Gases, 2008



Source: EPA. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2008*



EPA Key Categories of GHG Emissions, 2008



Source: EPA. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007*



World Challenge to Agriculture

- To reduce GHG emissions in absolute numbers:
 - Reduce the quantity produced
 - Improve efficiency to keep below a target emission
- The problem is that all estimates of demand for agricultural products are increasing.
 - Reducing quantity produced is not an option
 - Must both improve efficiency **and** increase production



Cap-and-Trade Major Players

- The Government
- Entities Subject To Emission Caps
- Entities Able To Provide Emission Offsets
- Other Interested Parties
- The Market

Current GHG Markets

- Chicago Climate Exchange (CCX) – voluntary market for greenhouse gas trading.
- European Union Emissions Trading System (EU ETS) and Climate Exchange (ECX) - EU wide mandatory GHG cap-and-trade.
- Regional Greenhouse Gas Initiative (RGGI) – eastern states electric power generation cap on emissions.

Government

- Determines according to policy objectives:
 - Who is subject to a cap
 - Who can provide offsets
 - What the caps are and when they are to be reached
 - Market Rules
- The Chicago Climate Exchange currently determines these – as a market rather than as a regulator.

Capped Entities

- Determined by government according to some type of benefit cost analysis
 - Point sources of emissions
 - Sufficient size to regulate
- Capping upstream emissions is simplest but does not permit as much policy discretion.



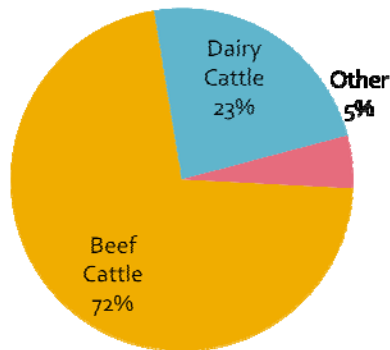
Capped Sources in the Market

	EU ETS	RGGI	CCX
Electric Power Generation	Yes	Yes	Voluntary
Energy Intensive Manufacturing	Yes	No	Voluntary
Indirect GHG emitters (e.g. businesses with negligible GHG emissions)	No	No	Voluntary

Key categories are likely sources for emissions cap

- Direct fertilizers
 - Non-point source pollution difficult to cap.
 - Cap the upstream source – either ammonia producer or natural gas supplier.
- Enteric fermentation
 - Cap would be difficult to implement.
 - Tax would be easier to implement.
- Manure Management
 - Most easily subject to cap.
 - Only farm level emission subject to EPA mandatory emissions reporting rule

Enteric Fermentation Emissions, 2008



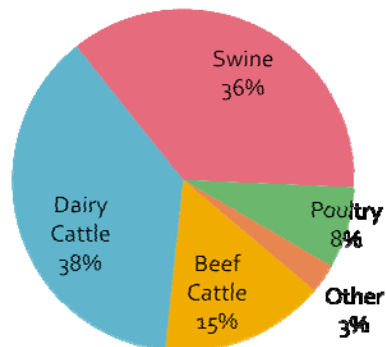
- Enteric fermentation
 - Cap would be difficult to implement.
 - Tax would be easier to implement.

Source: EPA. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2008*



Manure Emissions, 2008

- Manure Management
 - Methane and nitrous oxide emissions from manure storage structure are “point source”
 - Only farm level emission subject to EPA mandatory emissions reporting rule



Source: EPA. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2008*



Offset Providers

- Determined by government according to policy considerations
 - Power generation without GHG emissions
 - Methane Destruction – emitters too small to regulate who voluntarily reduce GHG emissions in order to participate in the market
 - Carbon sequestration
 - International projects to help developing countries reduce emissions

Offset Providers Allowed in the Market

	EU ETS	RGGI	CCX
Landfills	No	Yes	Yes
Manure Storage	No	Yes	Yes
Developing country projects	Yes	No	No
Soil Sequestration	No	No	Yes

Waxman-Markey American Clean Energy and Security Act of 2009
(Sec 732 (e)) "An offset credit does not constitute a property right."

The Market

- Determined by government according to policy considerations
- Permitted trading region:
 - Regional?
 - National?
 - International?
- Initial allocation of allowances greatly affects market performance

Principles for Greenhouse Gas Legislation

1. The agriculture sector must not be subject to an emissions cap.
2. Any cap-and-trade legislation must fully recognize the wide range of carbon mitigation or sequestration benefits that agriculture can provide.
3. Legislation must be structured so that it makes economic sense for agriculture.
4. USDA should promulgate the rules and administer an agricultural offsets program (as opposed to EPA).

Principles for Greenhouse Gas Legislation (con't)

5. The use of domestic offsets must not be artificially limited.
6. Carbon sequestration and greenhouse gas mitigation rates must be based on sound science.
7. Any cap-and-trade legislation must provide an initial list of project types that are eligible agricultural offsets.
8. Legislation should recognize early actors.
9. Legislation should not prohibit stackable credits or participation in multiple programs when multiple benefits are achieved for the same practice.

Principles for Greenhouse Gas Legislations Agricultural Signees (March 2009)

- American Farmland Trust
- American Soybean Association
- National Association of Wheat Growers
- National Cattlemen's Beef Association
- National Corn Growers Association
- National Farmers Union
- National Milk Producers Federation
- National Pork Producers Council
- others

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