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Overview of Offsets Types in Agriculture and Forestry and Key Policy Issues

**EPRI GHG Emissions Offset Policy
Dialogue Workshop 4**
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Forestry-based GHG Offsets

- Afforestation
- Reforestation
- Forest management
- Forest products
- Reducing Emissions from Deforestation and Degradation (REDD)
 - Potentially large scale, particularly in the tropics
 - Focus of future EPRI workshop



Agriculture-based Offset Types

- Agricultural soil sequestration
 - Reduced tillage
 - No till
- Agricultural soil management
 - Reduced N₂O in crop production
- Grassland carbon sequestration
- Livestock manure management (i.e., methane digesters)



Row crop ecosystems, such as this corn crop in the United States, contribute about 50% of anthropogenic N₂O emissions.

Eligible Offset Project Categories under Proposed Federal and Region Cap-and-Trade Legislation

	RGGI	WCI	Lieberman-Warner	Dingell-Boucher
Agriculture and Forestry				
Agricultural Soil Sequestration		✓	✓	Maybe
Afforestation	✓	✓	✓	✓
Reforestation		✓	✓	✓
Agricultural Soil Management		✓	✓	Maybe
Land Use Change				Maybe
Forest Management		✓	✓	Maybe
Forest products		✓		
Manure Management	✓	✓	✓	✓
Avoided Deforestation		✓	Maybe via international offsets	Maybe



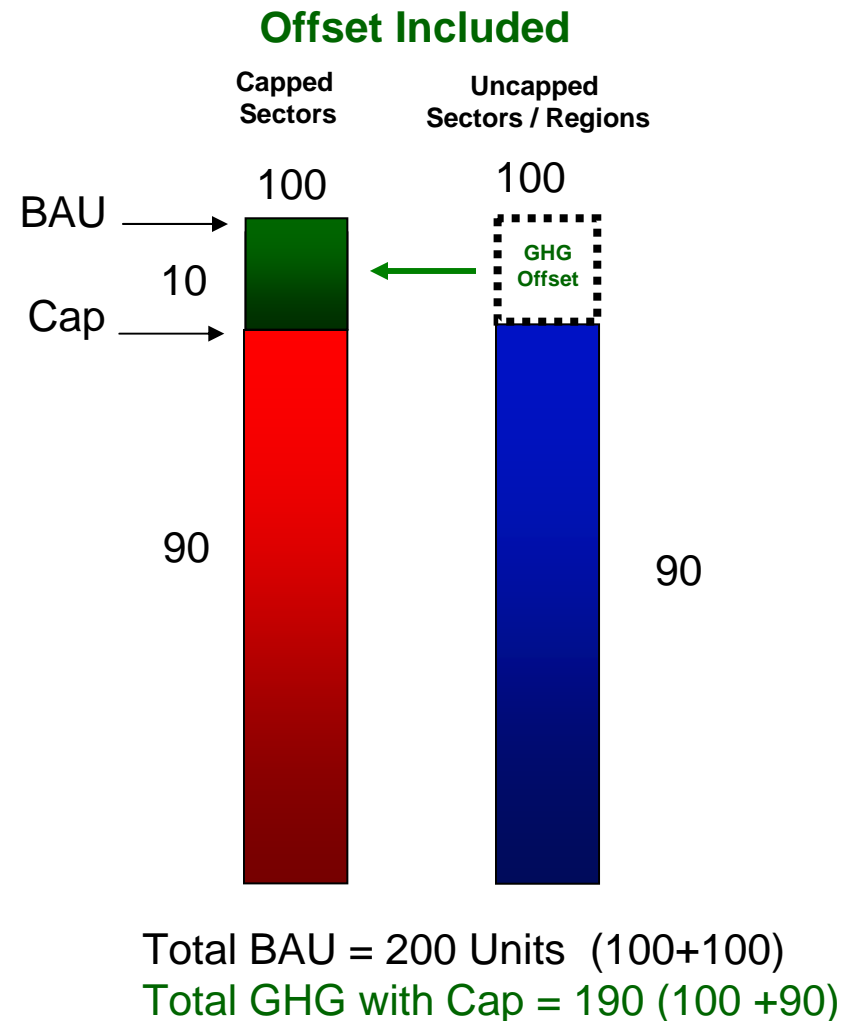
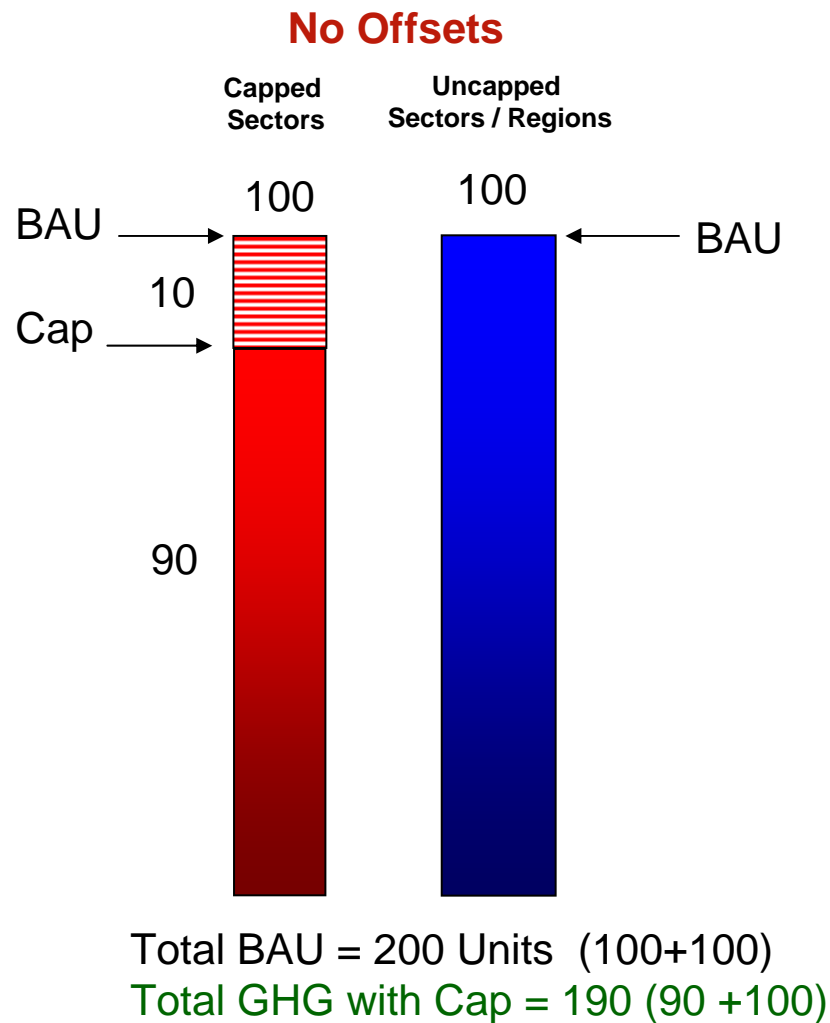
Key Questions – Potential U.S. Offset Supply

- What is the competitive economic potential to achieve GHG emissions offsets in the U.S. agriculture and forestry sectors?
 - Offset types?
 - Potential quantities?
 - Regional distribution?
 - Potential abatement costs?

Key Offset Concerns Related to Agriculture and Forestry-based GHG Offsets

- *Project Baselines* – A project “baseline” is the schedule of GHG emissions related to a project that would be expected to occur in the absence of the project (aka “Business-as-Usual” (BAU) emissions)
- *Additionality* – A GHG abatement project is considered “additional” if it would not have occurred without the added incentives provided by the carbon market.
- ***Leakage*** – Refers to increased GHG emissions outside of a GHG abatement project boundary that are directly or indirectly caused by the project.
- ***Permanence*** – Refers to the potential to reverse GHG emissions reductions achieved by an abatement project.

GHG Offsets Can Substitute Emissions Reductions in Uncapped Sectors & Regions for “Internal” Reductions



Emissions “Leakage”

- **Leakage** refers to increased GHG emissions outside of a GHG abatement project’s boundary that are directly or indirectly caused by the project.
 - Leakage has been a contentious issue in the design of RGGI and CA climate policies
 - CA experimented with adoption of a “load-serving entity” approach rather than the more traditional “source-based” approach to reduce leakage.
- Examples:
 - Forest preservation may be offset by timber harvesting elsewhere
 - Reduced crop yields resulting from conservation tillage practices potentially could be offset by increased conversion of farmland elsewhere to make up for lost yields.

Key Questions – Leakage

- How can potential project leakage be quantified?
- How can leakage be addressed?
 - Reduce issuance of offsets for projects based on quantification of expected leakage
 - Address leakage directly as part of project design
 - Focus activity where land use being displaced is declining
 - Other approaches ?
- How do existing offset programs handle leakage?
 - CDM
 - CCAR
 - NSW-GGAS

Permanence

- **Permanence** refers to the potential to reverse GHG emissions reductions
 - Unintentional (e.g., fire, disease...)
 - Intentional (e.g., timber harvests)
- Particularly problematic for terrestrial sequestration projects
 - Sequestered forest carbon may be re-emitted due to timber harvesting, forest fire & disease.
 - Sequestered soil carbon may be re-emitted when farmers revert from no-till to standard tillage
- In contrast, some types of GHG abatement activities are **permanent because they avoid or destroy** GHG emissions
 - CH₄ destruction projects (LFG, digesters, CMM)
 - N₂O reductions in agricultural crop production



Source: Courtesy of Sam Sandburg,
USDA Forest Service

Important “Facets” of Permanence

- The actual physical storage of CO₂ over long periods of time
- Developing regulatory or other approaches to ensure that sequestered carbon remains stored permanently
- Developing approaches to handle the registration and cancellation of offsets that may be impermanent in an offset program’s official accounting registry

How Can Permanence Risk be Addressed?

- Risk-based discounting of offsets
- Liability approaches (buyer / seller / negotiated)
- Insurance requirements / maintenance fees
- Regulatory differentiation (e.g., tCERs and ICERs)
- Market price differentiation
- Creation of “buffer reserves”
- Other approaches?
- How have existing and proposed offset programs attempted to handle permanence?

Potential Permanence and Leakage Risks for Agriculture and Forestry Offset Project Categories

Agriculture and Forestry Offset Types	Permanence Risk	Leakage Risk
Agricultural Soil Sequestration	Yes	Yes
Afforestation	Yes	Yes
Reforestation	Yes	Yes
Agricultural Soil Management	No	No
Land Use Change	Yes	Yes
Forest Management	Yes	Yes





Thank You

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