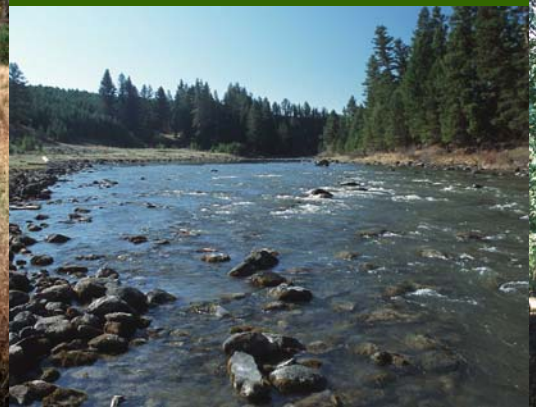
Greenhouse Gas Offsets
Opportunities for Agriculture and Forestry



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Options for Environmental Regulation

- Traditional Command and Control
  - Regulatory agency sets standards
    - Specific technologies (scrubbers)
    - Performance (tons, tons/unit output)

- Cap and Trade
  - Regulatory agency sets overall objective (total allowable emissions)
    - Allocates or auctions emission allowances
    - Firms must obtain allowances in order to emit a pollutant
      - Firms can receive allowances, purchase allowances, or reduce emissions

- Cap and Trade with Offsets
    - Unregulated firms can receive credits for reducing emissions
    - Regulated firms can purchase offset credits to meet regulatory requirements ("offsetting emissions")

Why is there interest in Cap-and-Trade?

Concept: Regulators set overall limits on emissions (or environmental performance). Firms must have allowances to emit the pollutant. Allowances can be bought, sold, or transferred

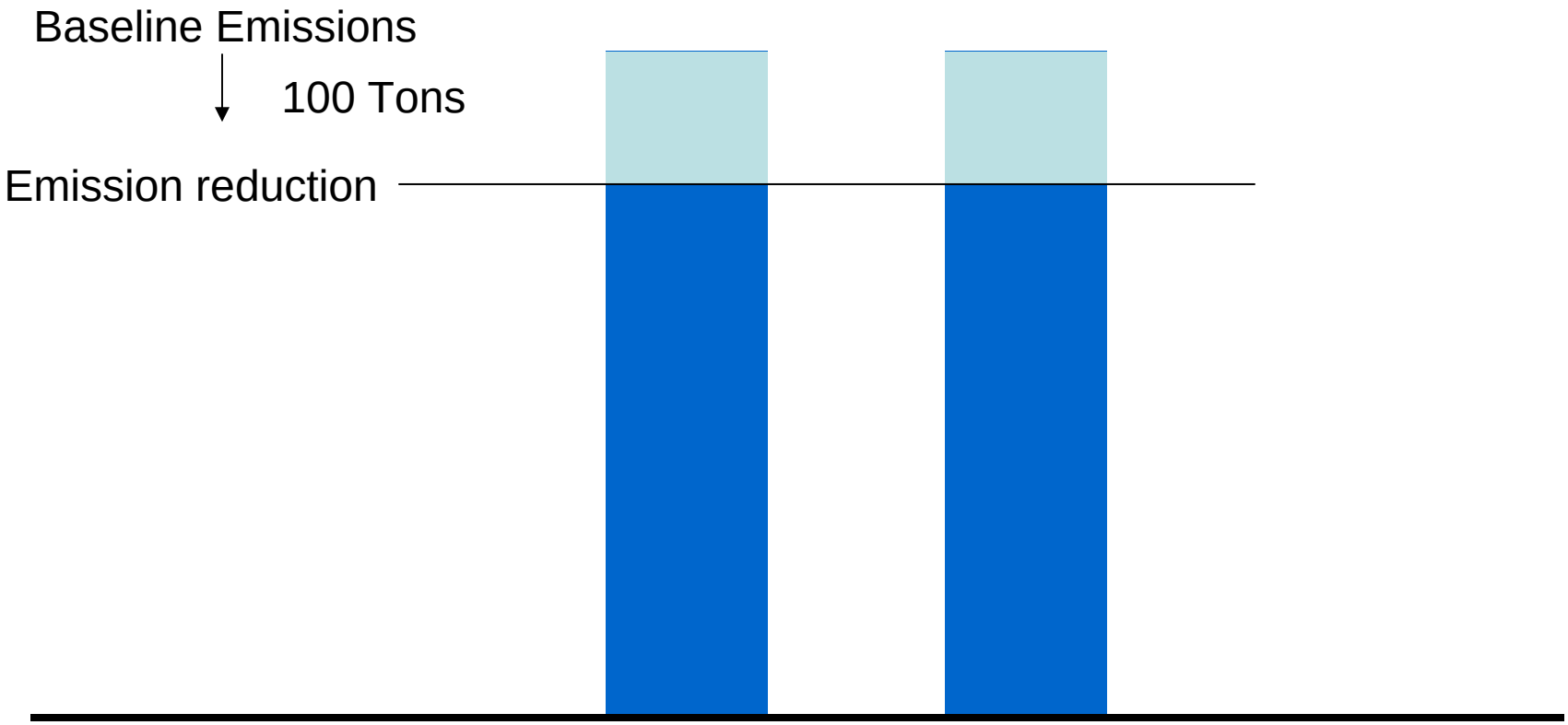
Attributes:

- Establishes clear property rights for pollutants
- Taps market forces to efficiently allocate resources to reduce pollution
- Provides incentives to innovate
- Equates costs of environmental control across all polluters

Concerns:

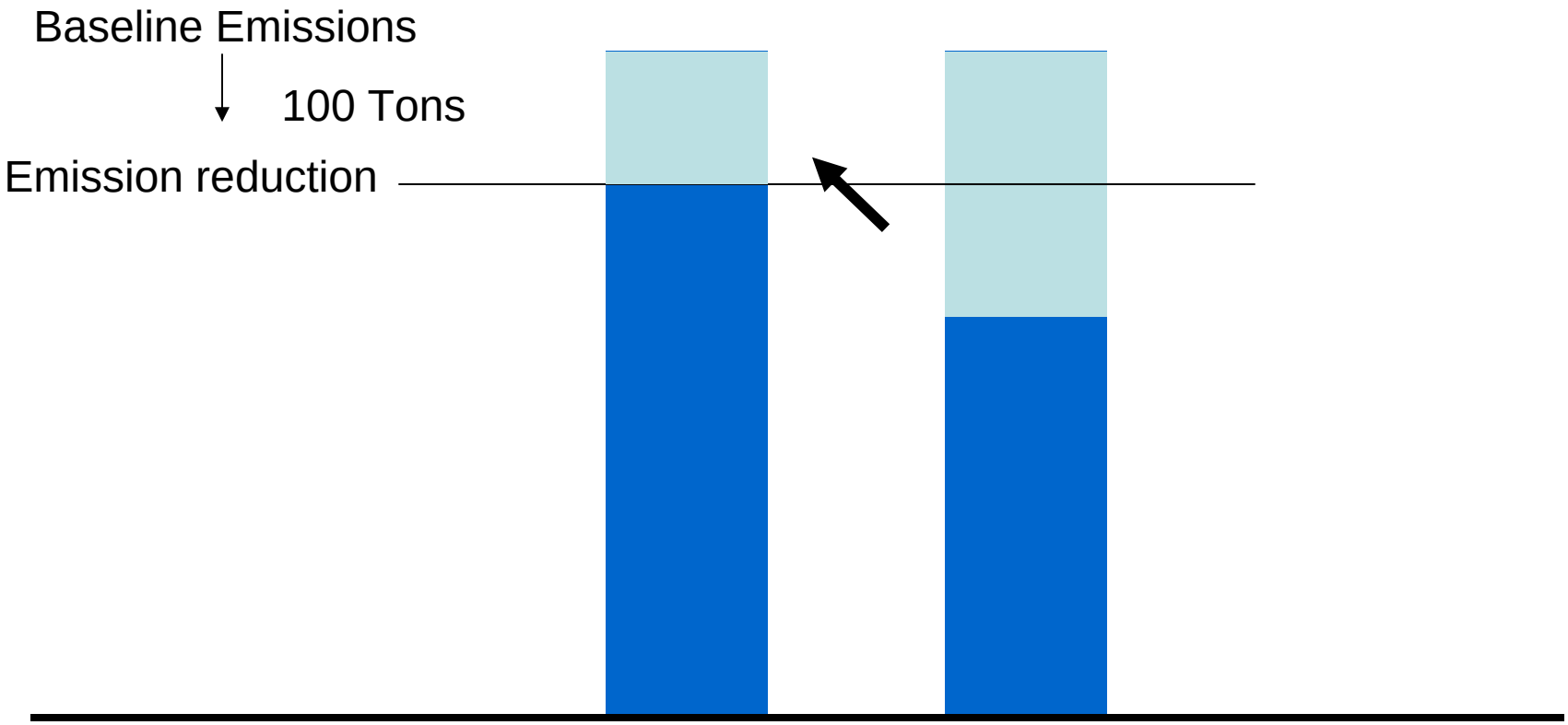
- Makes it difficult to address localized environmental damage
- Could concentrate pollution in lower income areas
- Distribution of allowances creates new assets – and transfers of wealth

Traditional Command and Control Regulation



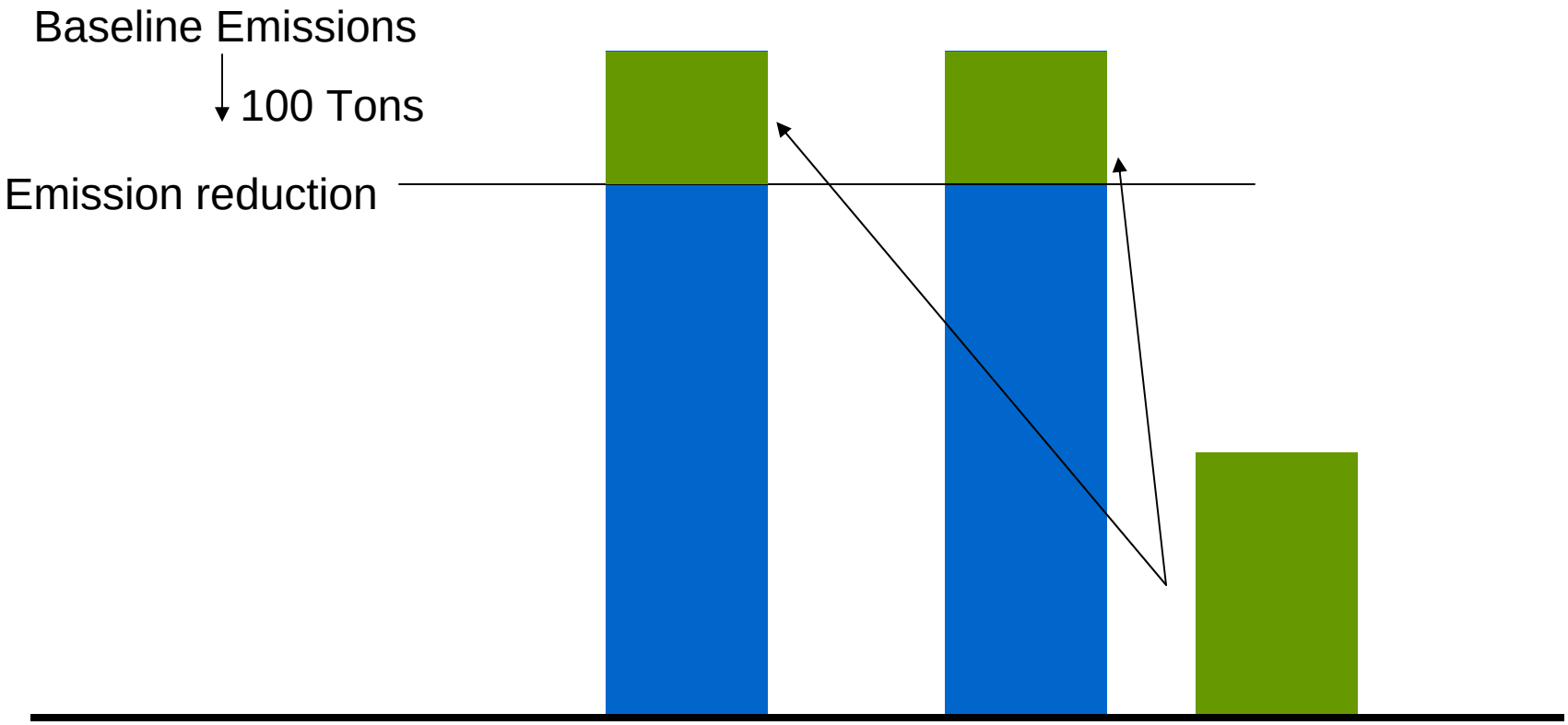
	Firm A	Firm B		
Cost of abatement	$100.00/ton	$50.00/ton		
Total cost of abatement	$10,000.00	$5,000.00	=	$15,000.00

Cap and Trade Regulation



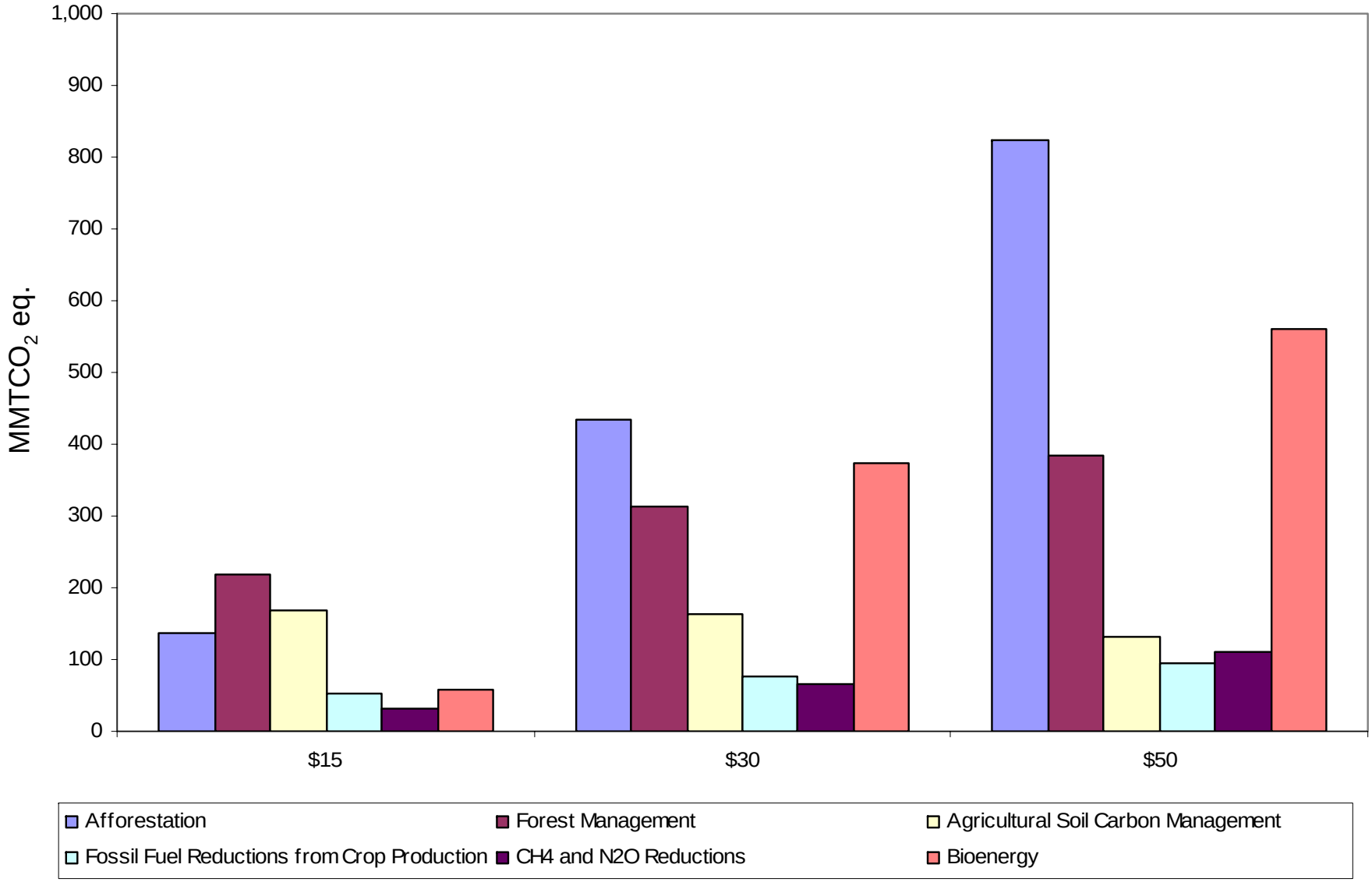
	Firm A	Firm B	
Cost of abatement	$50.00/ton	$50.00/ton	
Total cost of abatement	$5,000.00 ←	$5,000.00	= $10,000.00

Cap and Trade Regulation With Offsets



	Firm A	Firm B	Farmer	
Cost of abatement	$25.00/ton	$25.00/ton	$25.00/ton	
Total cost of abatement	$2,500.00	$2,500.00	$5,000.00	= $ 5,000.00

Recent EPA Analysis indicates significant opportunities for GHG reductions in the Agriculture and Forest Sectors



Concerns with Offsets

Offsets are produced by entities that are not regulated:

- Would the action have happened anyway? (Additionality)
- Will other firms/entities fill gaps if the action results in a drop in production? (Leakage)
- What are we measuring benefits against? (Baselines/benchmarks)

Carbon sequestration is unique:

- Will the carbon that is sequestered and stored be kept out of the atmosphere? (Permanence)

Most agriculture and forestry sources and sinks are not well defined "point" sources:

- Can we truly assess the benefits? (Measurement uncertainties)

Offsets Market “Lingo”

- Issue 1: Additionality – Would the action happen anyway?
  - Potential solutions:
    - Limit entry (categorical exclusions)
      - Exclude forests and agriculture (EU)
      - Exclude deforestation (CDM)
      - Exclude forest management (several US registries)
    - Document justification,
      - Reporting requirements (CCAR)
      - Barrier tests
    - Discount credits,
      - Proportional additionality
    - Accept it (adjust national goals)

Offsets Market “Lingo”

Issue 2: Leakage – Will the emissions move elsewhere?

Internal Leakage: Swapping fields within an operation.

– Potential solution:

- Require entity-wide reporting.

Market Leakage: Others respond to reduction in supply of goods.

– Potential solutions:

- Discount credits,
- Exclude activities,
- Reporting requirements -- document that changes did not occur elsewhere,
- Accept it (adjust national goals)

Offsets Market “Lingo”

Issue 3: Baselines –What are we measuring benefits against?

Options:

Historic

- Base year/period carbon stocks;
- Base year/period carbon fluxes;
- The actions of others (comparison lands)

Expectations

- Projections of business-as-usual;
- Projections of expected improvements;
- Projections of expected average business practice.

Technology standards/cutoffs

Offsets Market “Lingo”

Issue 4: Permanence -- Will the carbon stay out of the atmosphere?

- Potential solutions:
  - Assign liability, continuous reporting,
  - temporary credits, renting credits,
  - Discounting

- Verifying the existence of carbon stocks is easier over time
  - Cumulative aggregation of carbon is easier to detect than year-to-year fluctuations

Offsets Market “Lingo”

Issue 5: Uncertainty –What if our estimates are wrong?

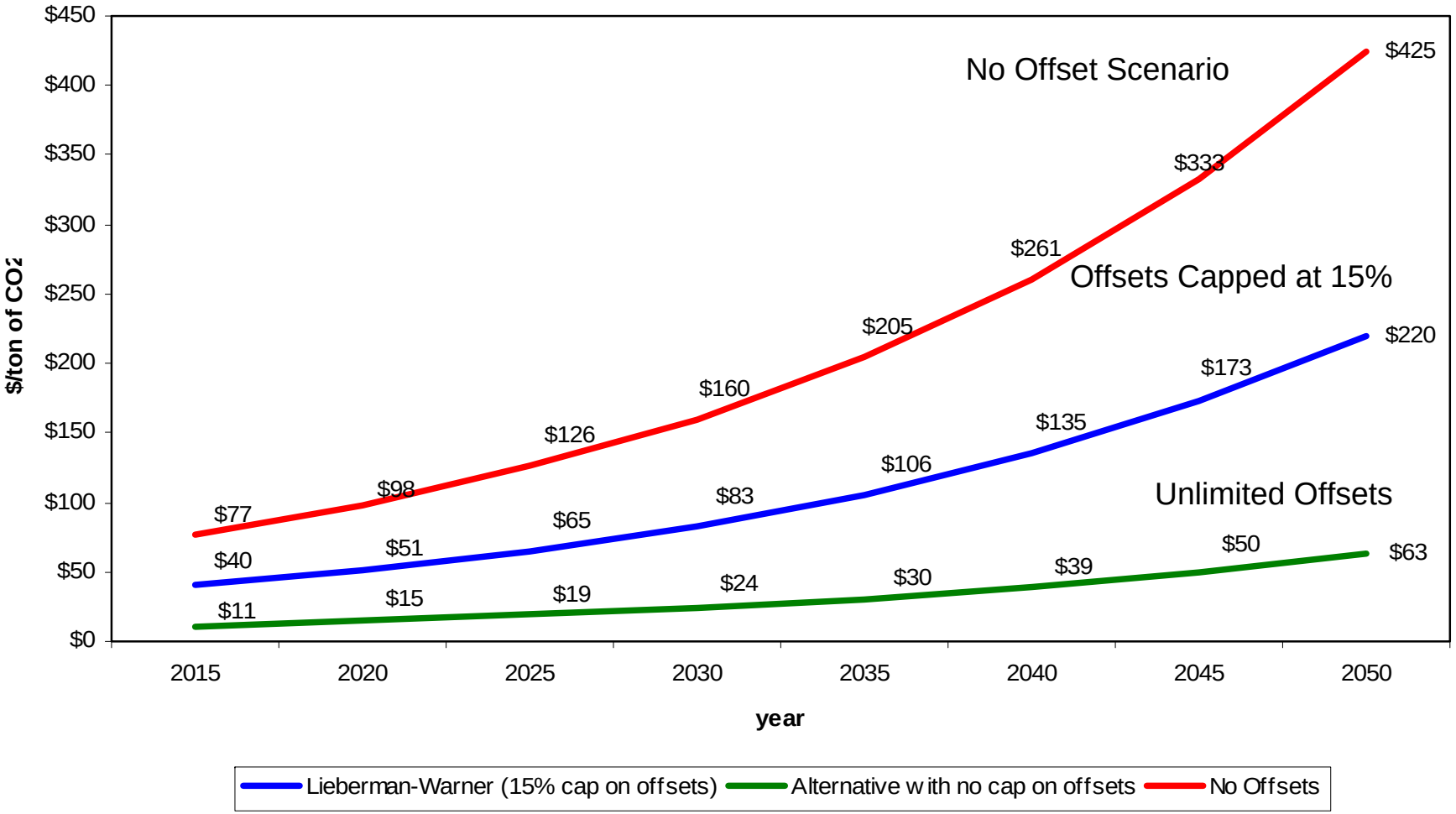
- Potential solutions:
  - Exclude categories or pools;
  - Discount credits using an uncertainty factor,
    - One-tailed tests
  - Accept it (recognize that uncertainty does not imply bias – laws of large numbers apply)

How does Lieberman-Warner Bill S. 2191 address Offsets?

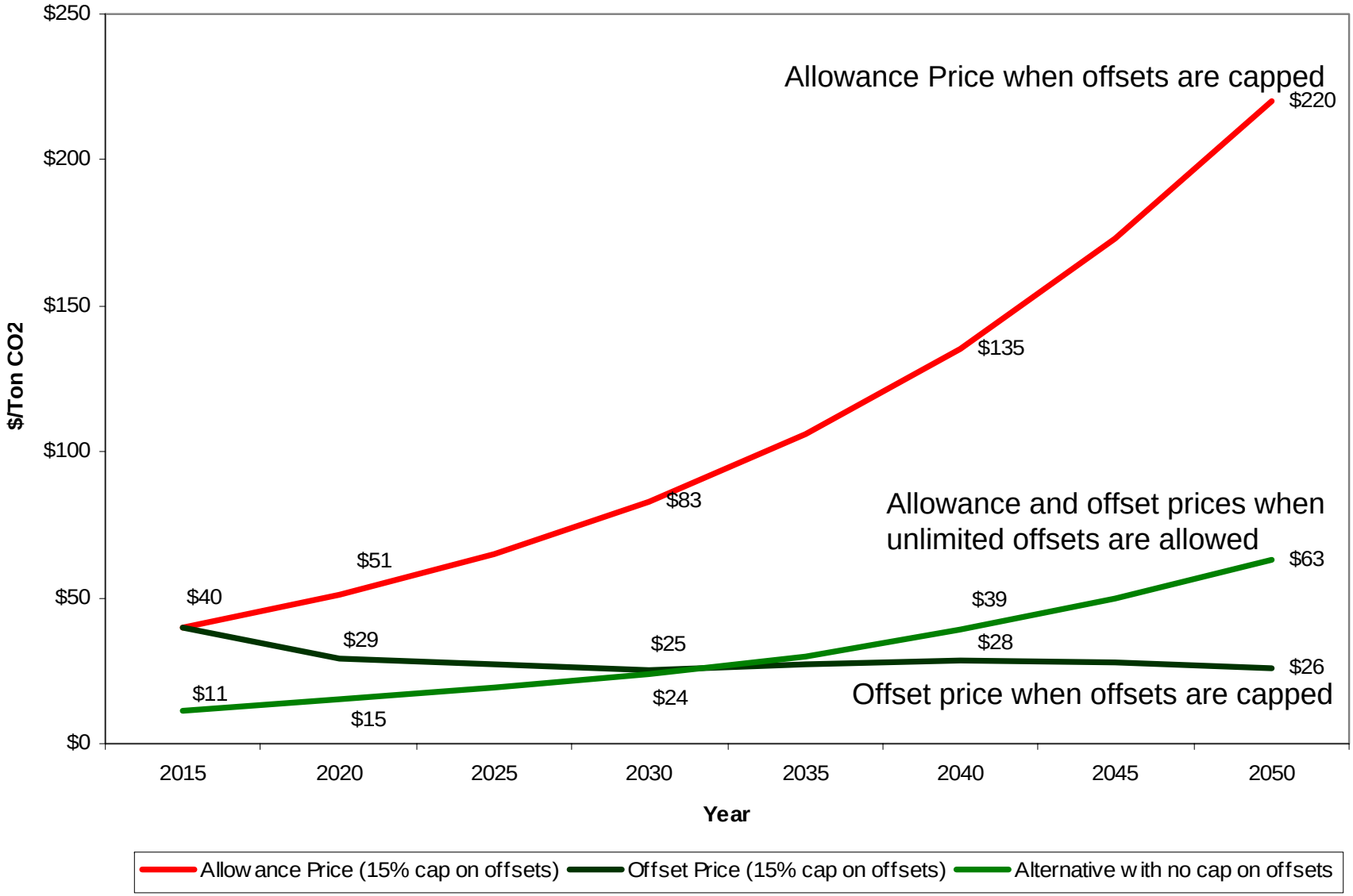
Lieberman-Warner

- caps the use of offsets at 15%
- requires EPA to discount the value of offsets to account for:
  - Leakage
  - Additionality
  - Uncertainties
- Requires the use of projections to establish baselines

Allowing Offsets Lowers Overall Costs of Abatement Under Lieberman-Warner Cap-and-Trade Legislation



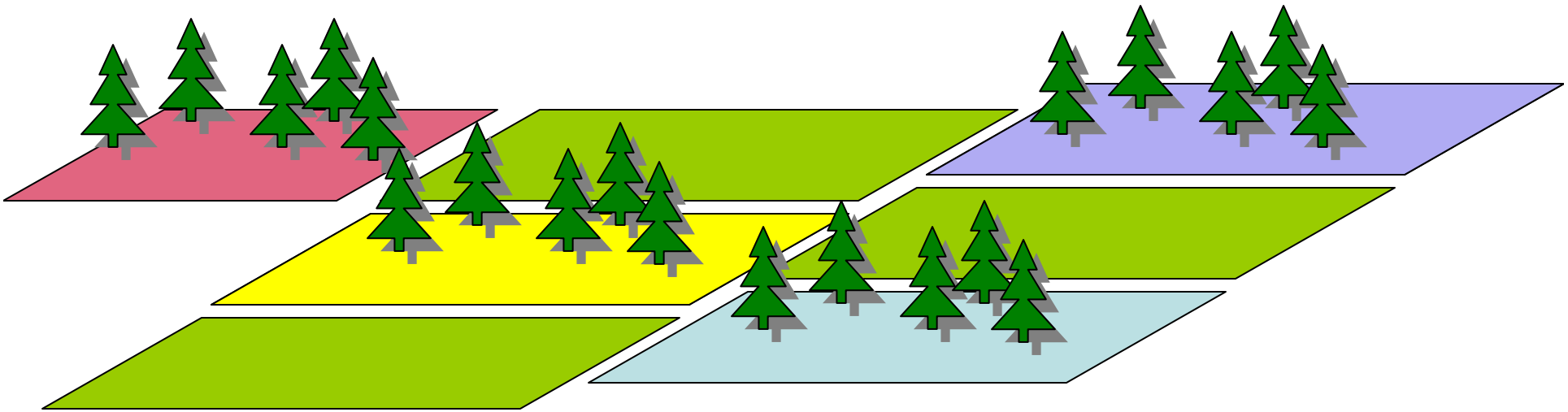
Capping the Use of Offsets Lowers the Offset Price and Increases the Allowance Price



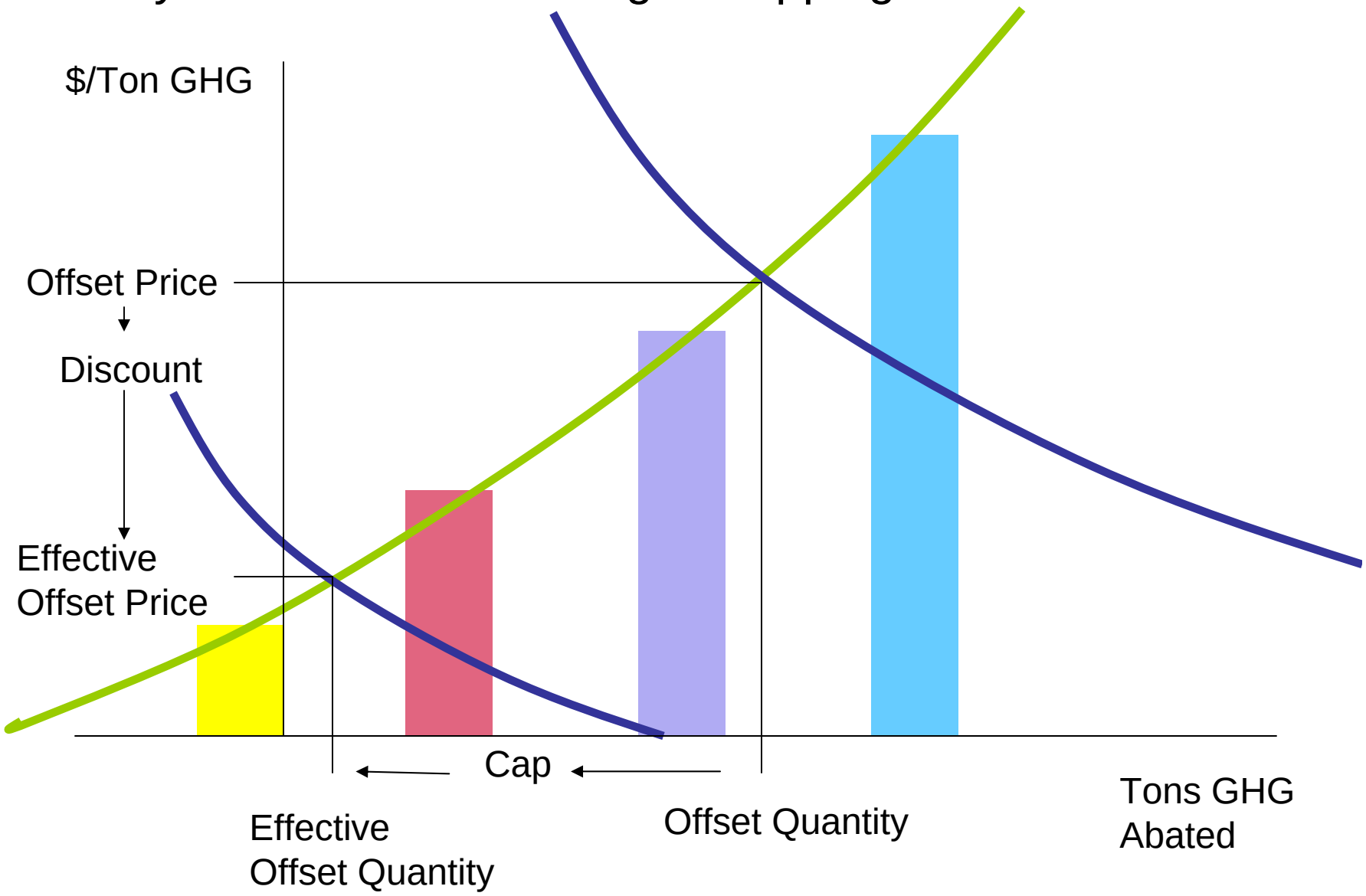
Problems with Discounting and Caps on Offsets

Farmer 1 Farmer 2 Farmer 3 Farmer 4

Carbon Payment	0 $ $ $
Effect of cap on offset value	-$
Additionality Discount	-$
Leakage Discount	-$



Another way to look at discounting or capping the use of offsets



Points to Consider when Assessing Offsets

- Additionality and leakage can be addressed at the project-level or in setting national goals;
- Capping credits, increasing transaction costs, and discounting benefits will amplify problems with additionality;
- Discounting to address market leakage penalizes the behavior that is being incentivized … not the activities that the policy is trying to avoid.
- Permanence can be dealt with by assigning liability;
- Uncertainty is different than bias – unbiased estimators should provide the best approximation of expected benefits;
- Internal and market leakage are different phenomena;

Additional slides….

Early Actors….

- The decision to allow credits for early action will not effect the efficiency of the policy … but will change equity.
- Comparable to decision to provide allowances to companies with current emissions.
- It will be important to avoid gaming... Changing practices in the run up to policy implementation

Potential roles for USDA in Carbon Offset Markets

- Determine of eligible practices;
- Establish metrics for quantifying greenhouse gas benefits;
- Establish reporting requirements;
- Provide technical assistance – technical service provision to assist in planning and implementation;
- Certify implementation;
- Maintain registry of information, recordkeeping, including ensuring against duplicate records;
- Conduct audits and spot checks;
- Award offsets or issuance of incentive payments;
- Monitor against loss of carbon that is sequestered.

Implications of Using Technology Standards for Baselines