

Carbon Market Opportunities in Forestry



September 23, 2009

Trey Schillie

Rocky Mountain Region, US Forest Service

Presentation Road Map



- ❑ **Introduction: Forests and Climate Change**

- ❑ Forests and Carbon Markets
 - Voluntary Carbon Markets

 - Regulatory Carbon Markets

- ❑ Looking Ahead



Introduction



▣ Forests and Climate Change

- Climate change
 - Adaptation: How climate change impacts forests



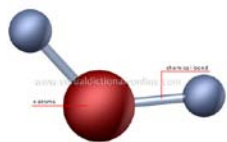
- Mitigation: How forests impact climate change



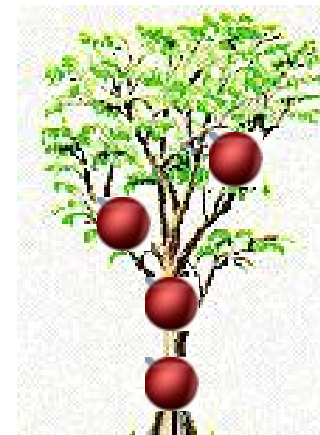
Introduction



- ▣ Forests and Climate Change
 - Trees and the carbon cycle
 - Carbon Dioxide in: Oxygen out



CO₂



Time

Introduction



▣ Forests and Climate Change

- Increase greenhouse gases



- Decrease greenhouse gases



Presentation Road Map



- Introduction: Forests and Climate Change
- **Forests and Carbon Markets**
 - Voluntary Carbon Markets
 - Regulatory Carbon Markets
- Looking Ahead



Forests and Carbon Markets



- Voluntary Carbon Markets
- Regulatory Carbon Markets
- Accounting
 - Additionality: More than “business as usual”
 - Leakage: Activity shifting
 - Permanence: How long?

Voluntary Carbon Markets



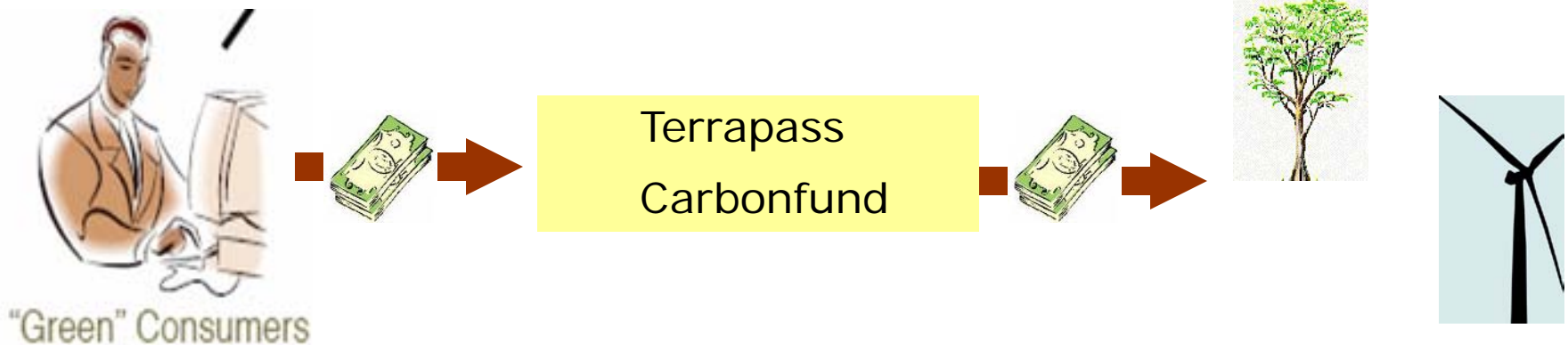
- Voluntary efforts to offset greenhouse gas emissions (no legislative driver)
 - Industries, organizations, individuals
 - Motives: altruism, green marketing, pre-compliance

- Two marketplaces
 1. Over-the-counter
 2. Chicago Climate Exchange

Voluntary: Over-the-Counter

□ Characteristics

- 100+ providers
- Web-based, carbon calculators
- Invest in “offset” projects
- Unregulated, buyer beware
- \$2-\$40/mT (\$7.50 average)



Voluntary: Over-the-Counter



- US Forest Service: Ecosystem Service Markets
 - Forest-based carbon
 - Water quality trading, wildlife habitat, wetlands

- Tool for private landowners
 - Keep working forests “working”
 - Keep open space “open”



Voluntary: Over-the-Counter

- ❑ Custer National Forest: 250 pine/acre
- ❑ 87 mT CO₂e/acre in year 100
- ❑ \$5 per mT = \$435/acre

YEAR	20	40	60	80	100
Natural regeneration	.8	.6	.5	.5	.4
Planting w/typical mgmt	1.8	8.3	17.5	19	24
Additional carbon per acre (offsets)	1	7.7	17	18.5	23.6 (87 mT CO ₂) ¹

————— Cumulative —————>

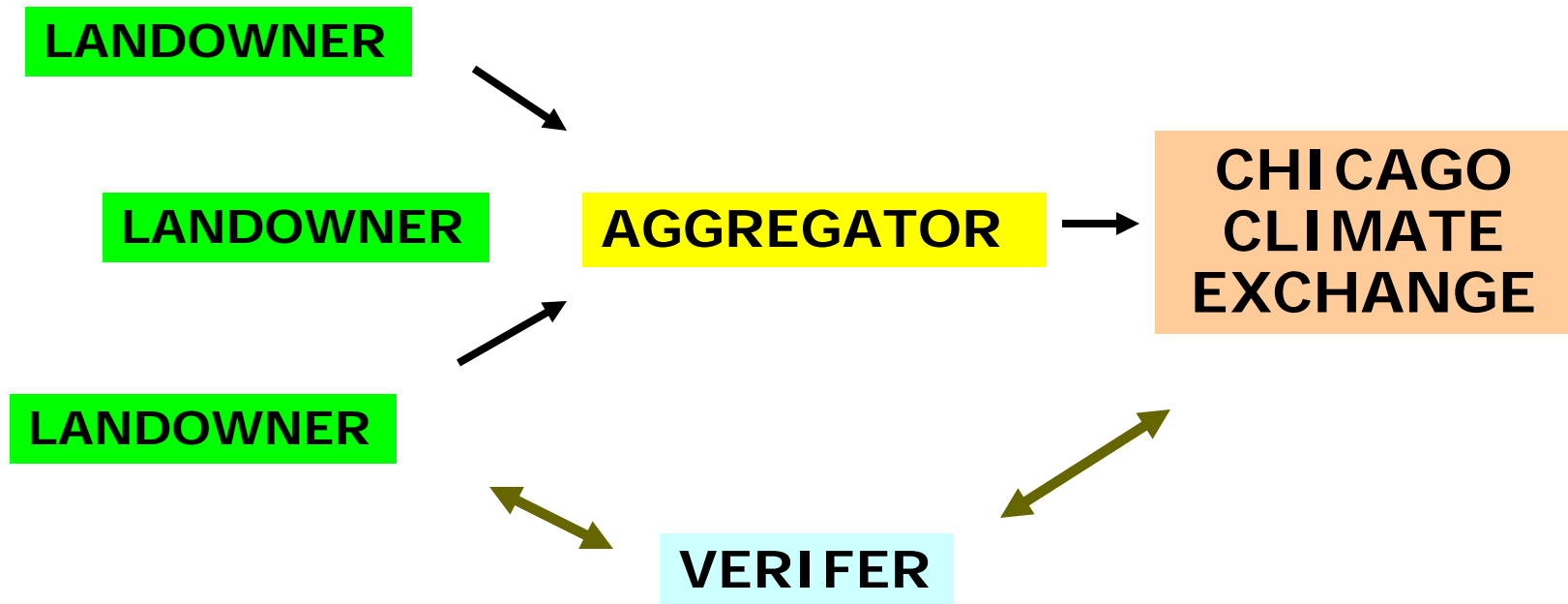
Voluntary: Chicago Climate Exchange

□ Characteristics

- Voluntary Cap and Trade
- Diverse membership
- Robust forestry offset program
 - Reforestation
 - Avoided deforestation
 - Forest management
 - Wood products and woody biomass

Voluntary: Chicago Climate Exchange

- ▣ Infrastructure: getting carbon to market



Voluntary: Chicago Climate Exchange

- Landowner considerations
 - Low prices (\$1.00 - \$5.00/mT)
 - Ease of entry
 - No easement requirements (conservation easements, etc)
 - Straightforward verification

Presentation Road Map



- Introduction: Forests and Climate Change
- Forests and Carbon Markets
 - Voluntary Carbon Markets
 - **Regulatory Carbon Markets**
- Looking Ahead



Regulatory Carbon Markets



- Regulatory efforts to reduce greenhouse gas emissions (legislative driver)
 - Cap and Trade
 - Motives: compliance
 - Black box (a ton, is a ton, is a ton)

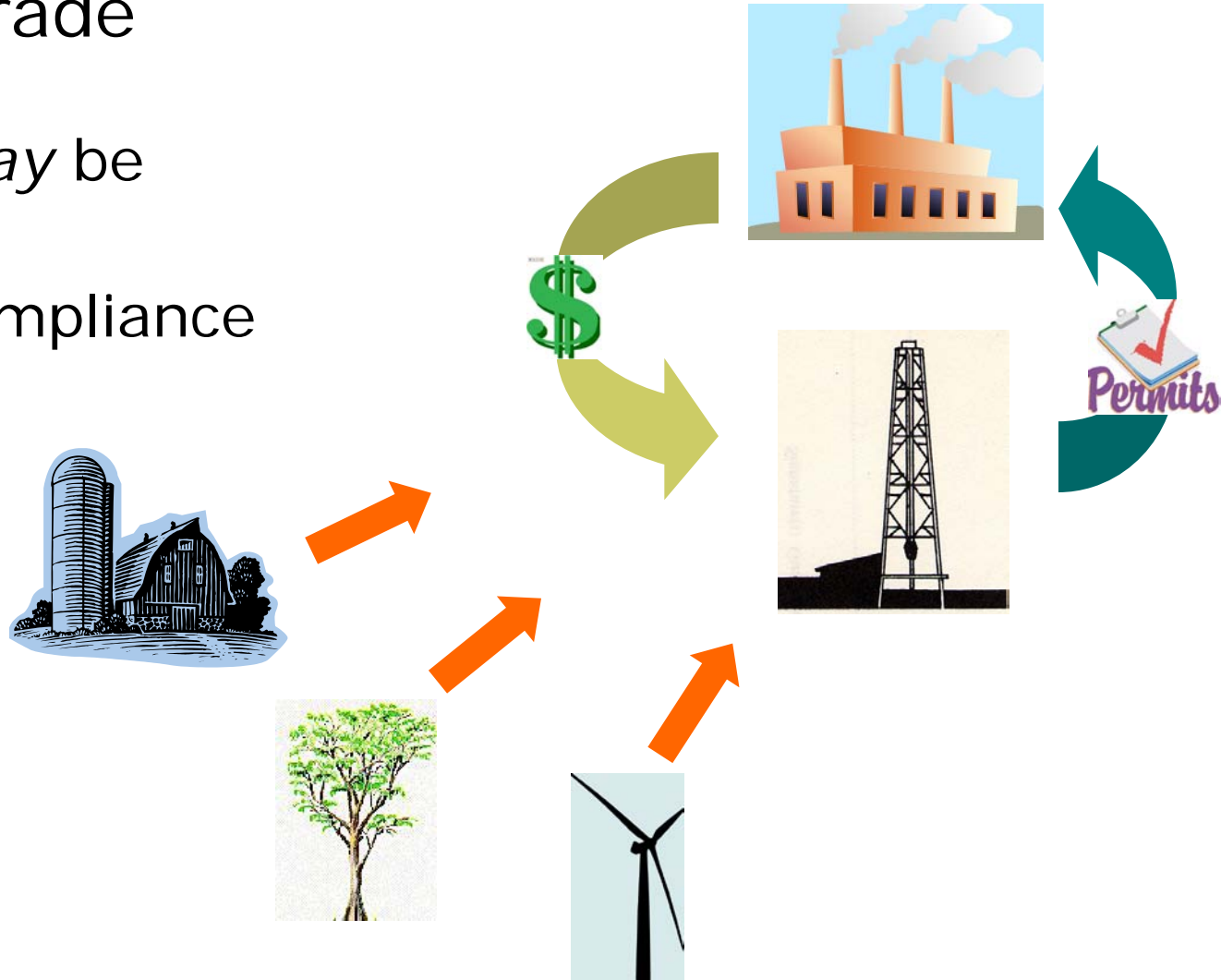
Regulatory Carbon Markets

- Cap and Trade
 - Defines regulated “sectors”
 - Transportation, Energy, Manufacturing, etc
 - Government allocates pollution permits
 - Firms can buy and sell permits



Regulatory Carbon Markets

- Cap and Trade
 - Offsets *may* be included
 - Lowers compliance costs



Regulatory Carbon Markets



- Examples
 - EU ETS – Kyoto Protocol
 - Forestry largely excluded
 - US did not ratify
 - Expires in 2012
 - Regional Greenhouse Gas Initiative (RGGI)
 - Limited engagement for forestry – afforestation
 - Market is “live,” but anemic

Regulatory Carbon Markets



- Examples (continued)
 - California – Global Warming Solutions Act
 - Offset protocols likely for:
 - Reforestation
 - Forest conservation
 - Forest management
 - Federal – Yet to be determined

Presentation Road Map



- Introduction: Forests and Climate Change
- Forests and Carbon Markets
 - Voluntary Carbon Markets
 - Regulatory Carbon Markets
- **Looking Ahead**



Looking Ahead



- Small, but robust voluntary carbon market
 - Over-the-counter
 - Chicago Climate Exchange

- Chicago Climate Exchange – most direct entry into carbon market
 - Landowners work through aggregators

Looking Ahead



- Regulatory opportunities are regional
 - Few opportunities, could change with California
- Federal cap a possibility in the future
- Kyoto expires in 2012, new international framework likely

Thanks !