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## Role of Forestry in the Carbon Market

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# Equator, LLC

- Leading asset management firm focused on investments in *forest carbon, sustainable timberland* and *ecosystem services* instruments.
- Established in 2007
- Focused on the convergence between timberland investments and environmental markets
  - ❖ Co-manager of *The Eco Products Fund* (with New Forests Inc.) for investment in carbon, wetlands and biodiversity mitigation
  - ❖ US\$ 400M+ committed capital for timberland investments in Brazil
- Members of Equator's team have executed over 50 carbon projects worldwide, including some of the *first carbon projects in the world* as well as the *largest US forest carbon transaction* project to date.
- Focus on US regulated and unregulated markets
- 22 professional staff, 5 administrative staff
- Headquartered in New York, NY, with offices in Seattle, WA, São Paulo (Brazil), and Minas Gerais (Brazil)





## Index

- Overview of Cap and Trade & Carbon Offsets
- Current Trends in the U.S.
- Forestry Offsets



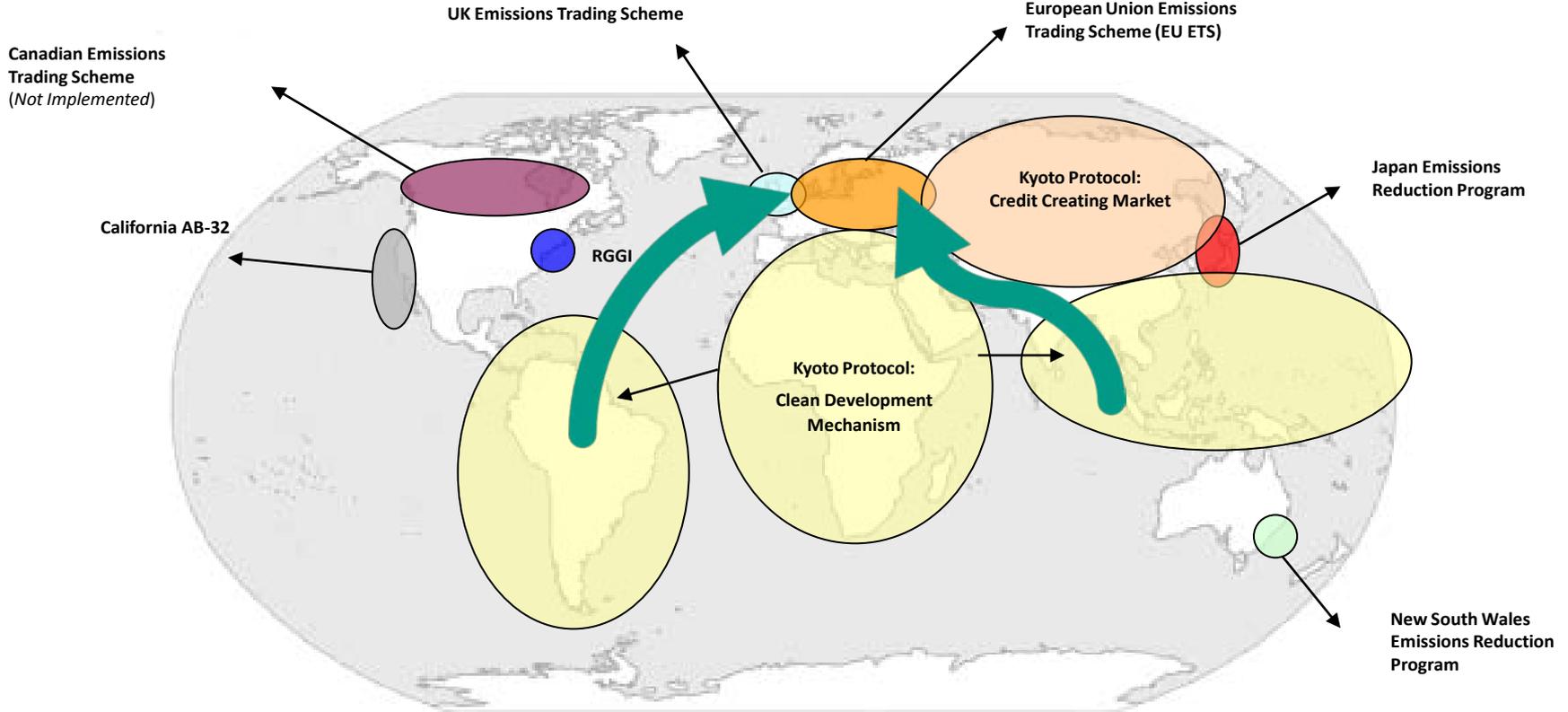
# Cap & Trade: A Market-Based Solution to Climate Change

*Cap and trade is ONE of several environmental policy tools that reduces emissions. Fundamentally it employs a mandatory cap while providing regulated entities flexibility to trade with the intent of using the market to find efficiencies.*

- **The “Cap”:**
  - A governing authority (usually a government or international body) sets a limit or cap on the amount of a pollutant that can be emitted from each contributing sector
- **The “Trade”:**
  - Allowances: Regulated – or “capped” – entities are issued allowances, which represent the right to emit a specific amount of a pollutant. Capped entities that cannot meet their binding target can buy allowances from those who pollute less
  - Offsets: Capped entities can also finance or purchase offset credits, which are generated by verified and accredited emission reductions in unregulated – or “uncapped” – sectors
- **The Goal:**
  - Emissions are reduced such that the total amount of allowances cannot exceed the cap
  - Enforcement is achieved via penalties for non-compliance (e.g., €100 penalty for each tonne under the EU’s emission trading scheme)



# Cap & Trade: No “single” system



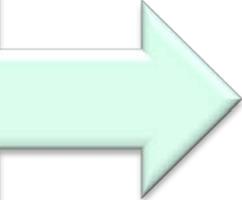
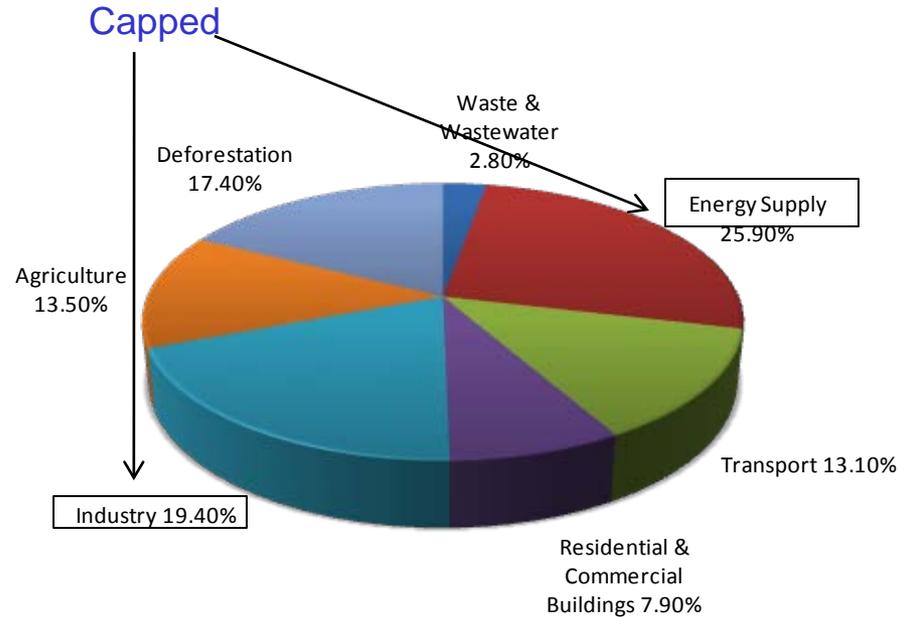
**There is no single carbon market, defined by a single commodity, a single contract type or a single set of buyers and sellers**



# GHG Sources & Solutions

## *Emissions by sector.*

Many sectors are voluntarily taking action now in anticipation of federal regulation

Source: IPCC Climate Change 2007 Synthesis Report, November 2007

## *What are the possible solutions?*

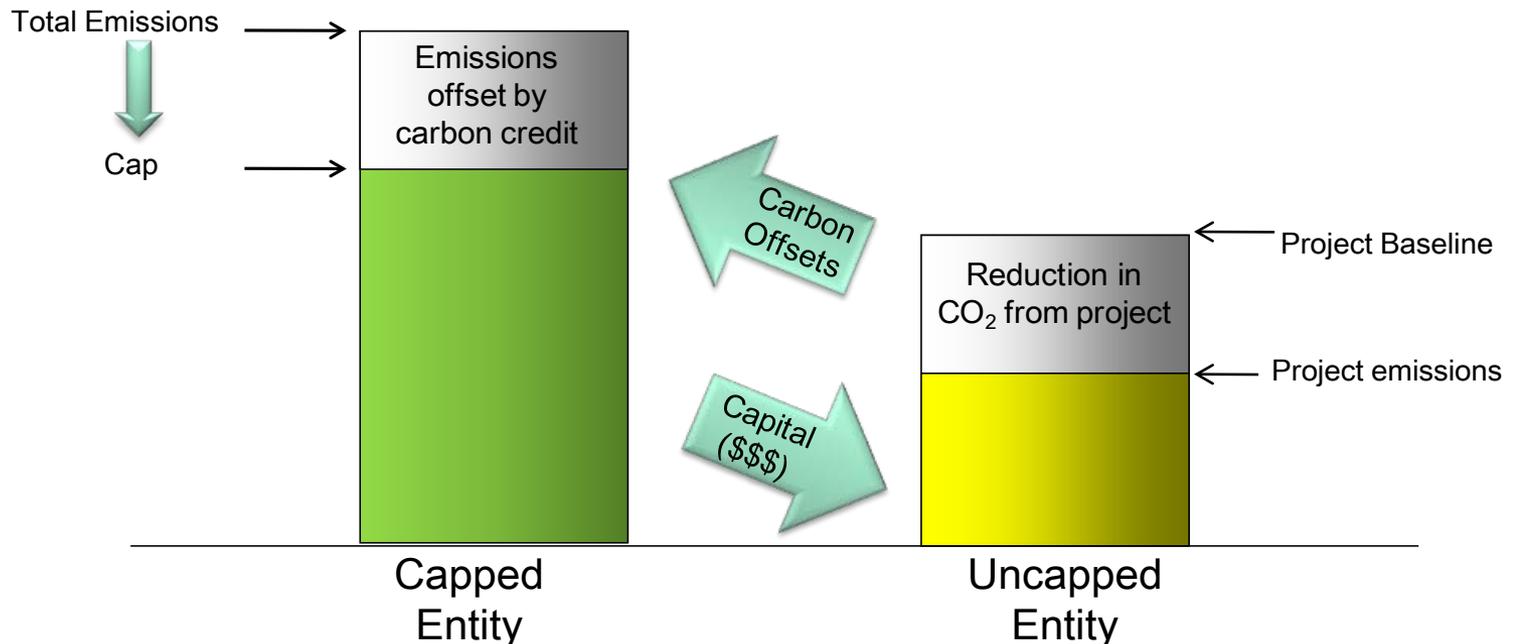
INCREASED EFFICIENCY	ALTERNATIVE TECHNOLOGIES	CARBON SEQUESTRATION
 FOSSIL FUEL POWER	 NUCLEAR	 RENEWABLES
		 REFORESTATION



# What is a Carbon Offset?

- Offsets are generated via emissions reduction projects undertaken “outside” the cap
- Offset credits are generated when the project lowers emissions below a predetermined baseline (e.g., emissions generated under “business as usual”)
- Provide capped sectors with flexibility and “least cost” way of meeting emissions reduction targets while lower emitting technologies are developed
- Reduces overall costs to society

## Capital Flows to Offset Projects





# Offset fundamental principles

At a minimum, any offset standard should require credits to be:

**Real:** projects and emissions reductions exist

**Measurable:** reductions are measured using accepted methodologies

**Permanent:** emissions are permanently avoided, destroyed, etc.

**Additional:** project activity represents over and above BAU

**Independently verified:** by an expert third party verifier

**Not double-counted:** credits are used once and retired, through credible registry system



# Main Offset Markets & Standards

Each of these “standards” produces its own instrument

## Voluntary Markets:

### • Over-the-Counter (OTC) Transactions:

- Climate Action Reserve (CAR)
  - Offsets that meet standards are termed Climate Reserve Tonnes (CRTs)
  - Identified by Waxman-Markey bill as eligible for U.S. compliance
- Voluntary Carbon Standard (VCS)
  - Offsets that meet standards are termed Voluntary Carbon Units (VCUs)
  - VCS ensures offsets are real, additional and verifiable
  - Optimism that VCS projects will be compliance grade
- American Carbon Registry (ACR)
  - Offsets that meet standards are termed Emission Reduction Tons (ERTs)
  - First private voluntary registry in U.S.
  - Optimism that ACR projects will be compliance grade



### • Exchange-Traded Credits:

- Chicago Climate Exchange (CCX)
  - Offsets that meet standards are termed Carbon Financial Instruments (CFIs)
  - North America’s only voluntary, legally binding GHG reduction and trading system
- NYMEX GreenExchange
  - EU allowance (EUA) contracts
  - Certified Emissions Reduction (CER) contracts
  - RGGI contracts



## State or Regional Compliance Markets:

- Regional Greenhouse Gas Initiative (RGGI) → Operational
- Western Climate Initiative (WCI) → Planned
- Midwestern Greenhouse Gas Reduction Accord → Planned



# Risk Versus Reward for Early Offset Credits

*Risk-reward is determined by markets view on a standards perceived “quality” and likelihood to count in a compliance system. Market is pricing credits generated by different standards according to this calculus.*





## **Policy Status - ?**

- **Impact of Health Care passage**
- **California AB 32 implementation continues**
- **Can the international track find its “footing?”**
- **Stabenow bill informing domestic offsets at federal level**
- **Big question:**
  - **How much progress can Kerry-Graham-Lieberman make in this session?**
  - **A cap-and-trade program for utilities beginning in 2012**



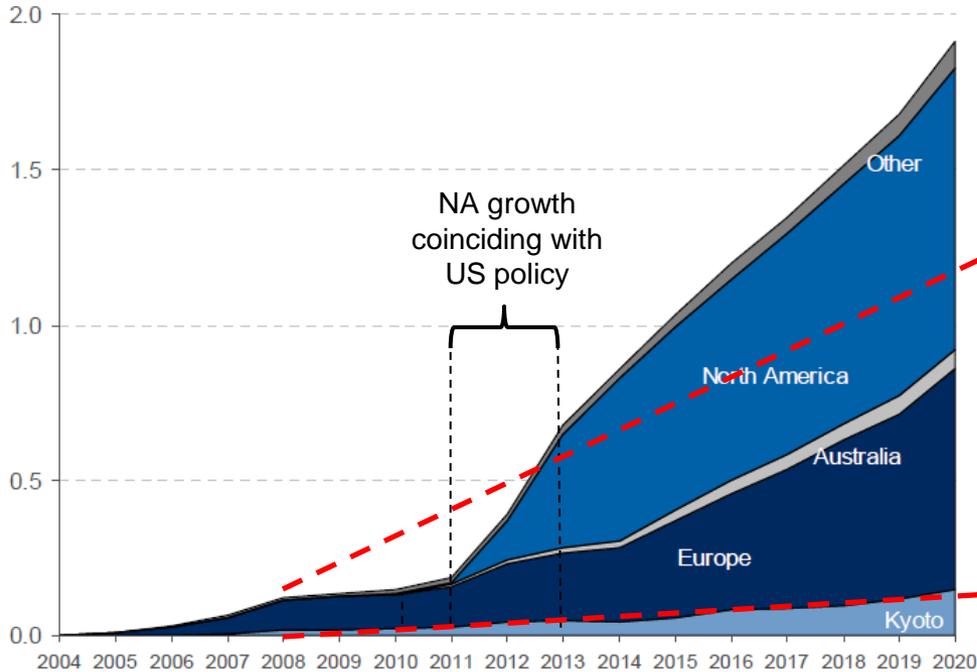
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# US legislation and carbon market growth

Trillion USD

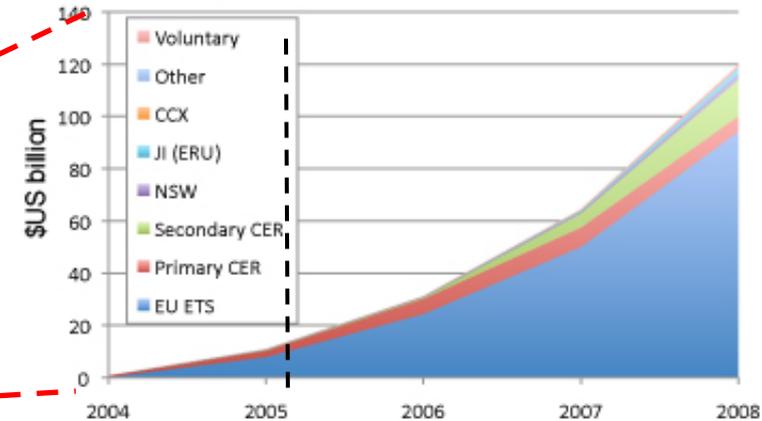


Source: Bloomberg New Energy Finance

## Regulatory clarity driving exponential growth

- 2004 - \$US 1B
- 2005 - \$US 11B ←
- 2006 - \$US 31B
- 2007 - \$US 64B
- 2008 - \$US 118B

## Value of global carbon markets, 2004-2008



February 16, 2005 Kyoto Ratified

- A decreasing emissions cap creates increased demand for emissions reductions and offset demand will be dictated by the cost of marginal abatement alternatives and economic growth
- Bankability of allowances and offsets and minimal holding costs suggests that offset values will increase on an inflation adjusted basis
- Order of magnitude of global carbon market with US legislation could be \$1T to \$2T



## U.S. Trends & Voluntary Action

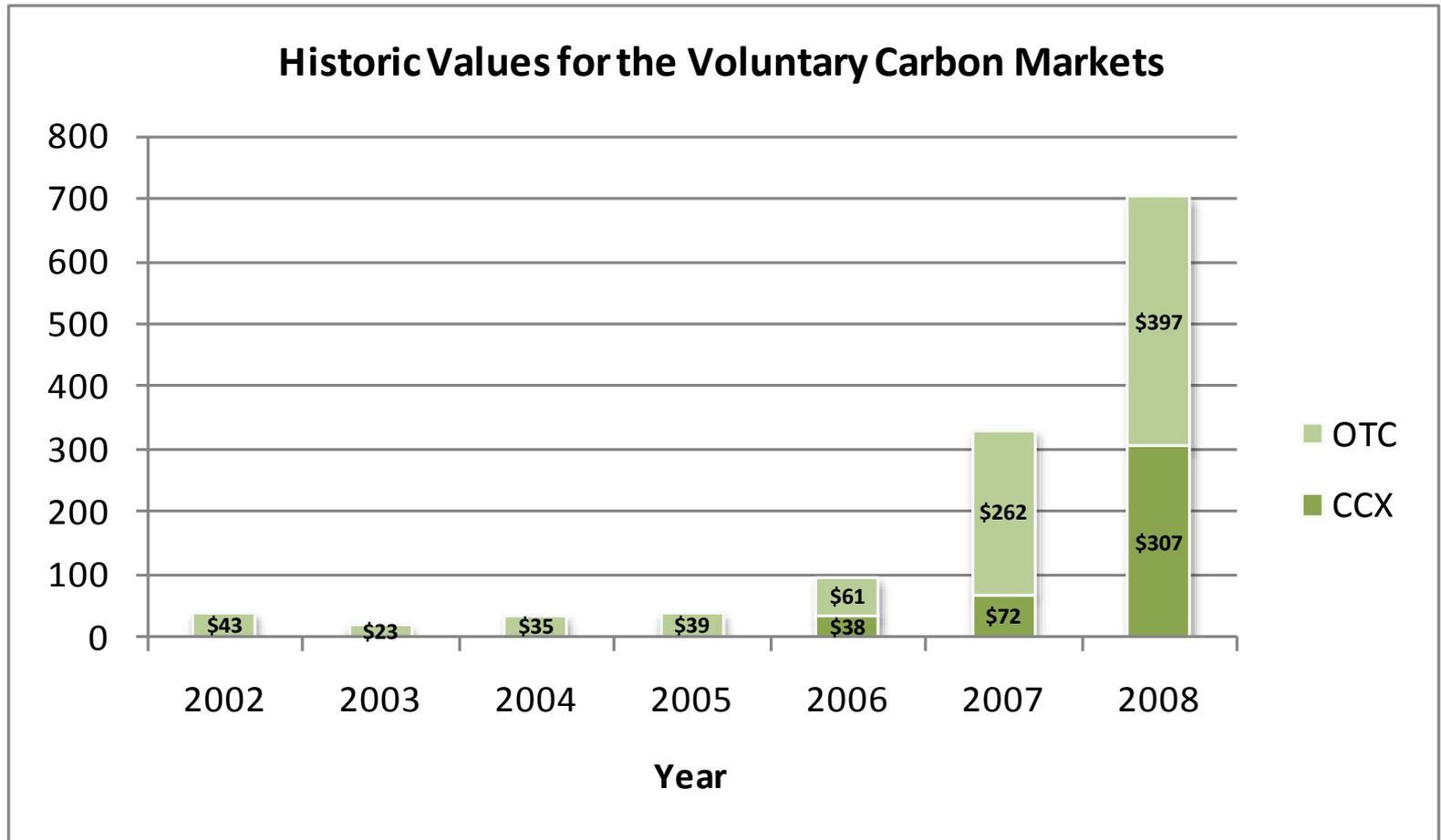
*Policy developments and anticipation of higher future offset prices have caused increased demand for voluntary carbon credits:*

- **Pre-compliance**
  - Anticipation of U.S. GHG legislation is leading to early transactions by utilities and other companies subject to future regulations
  - Offset credits issued by various standards have significantly different market values depending on perceptions of quality and likelihood of acceptance in a federal regime
- **Corporate Social Responsibility (CSR) buyers**
  - Driven primarily by CSR and carbon neutrality initiatives creating product and brand value (e.g., Google, HSBC, etc.)
- **Retail carbon offset buyers**
  - Driven by consumer demand to offset lifestyle (e.g., air travel, car travel, etc.)



## Size & Growth of Voluntary Market

*Voluntary carbon markets nearly doubled in 2008, reaching \$705M and 123.4MtCO<sub>2</sub>e in volume:*



Source: State of the Voluntary Carbon Markets 2009



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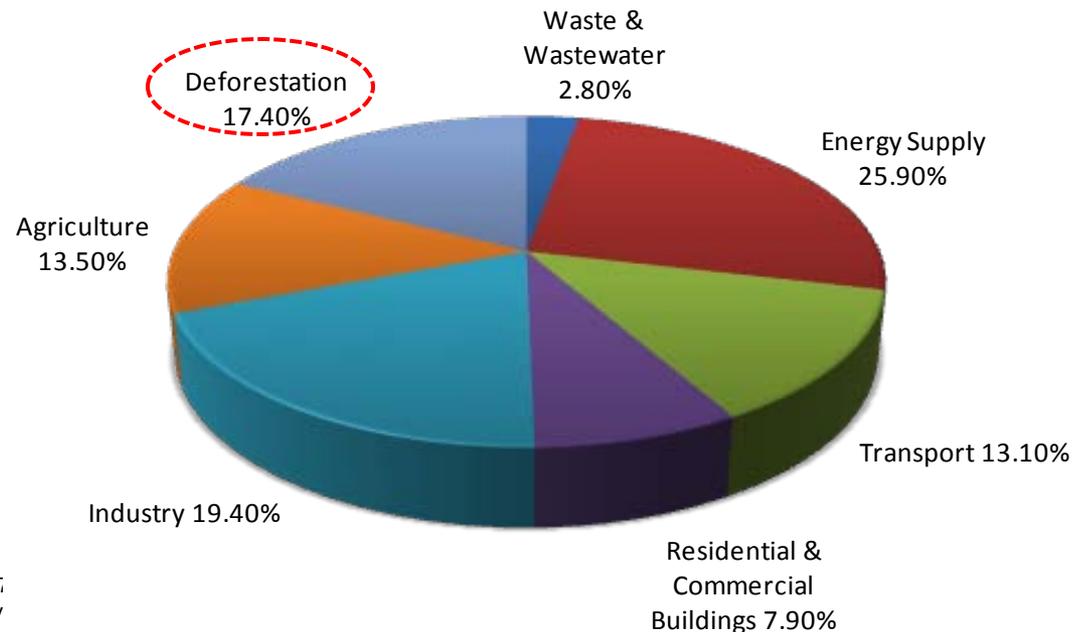


# Forestry, Deforestation and GHG Emissions

*Deforestation is one of the largest sources of anthropogenic GHG emissions:*

- Approximately 32 million acres are deforested every year
- On an annual basis, deforestation accounts for approx 17% of all anthropogenic GHG emissions:
  - More than the amount produced by the global transport sector (13.1%)<sup>1</sup>
  - Comparable to the total GHG emissions produced by China (24%) and the U.S. (21%)<sup>2</sup>
- Forestry was treated differently in the Kyoto offset system (CDM)

**GHG EMISSIONS BY SECTOR**



<sup>1</sup> IPCC Climate Change 2007

<sup>2</sup> Based on Netherlands Env



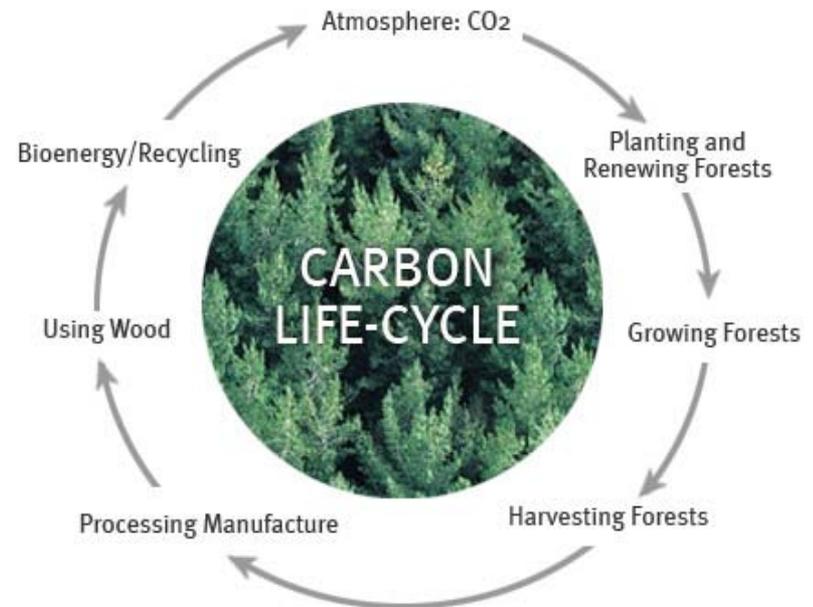
# Forests as a Sink of Emissions

- **Forestry Carbon Sequestration:**

- Trees act as natural “carbon sinks” by removing CO<sub>2</sub> from the atmosphere via photosynthesis
- Over time, 1 acre of new forestland can sequester 200 tons of CO<sub>2</sub> depending on species and location<sup>1,2</sup>

- **Forestry Offset Project Types:**

- **Improved Forest Management (IFM):** Activities that increase forest-based sequestration and/or decrease emissions (e.g., increasing harvest rotations, tree improvements, PCTs, stocking)
- **Avoided Conversion:** Activities that prevent or reduce the rate of deforestation below a predetermined “baseline”
- **Afforestation/Reforestation:** The conversion of bare or previously forested land into forest

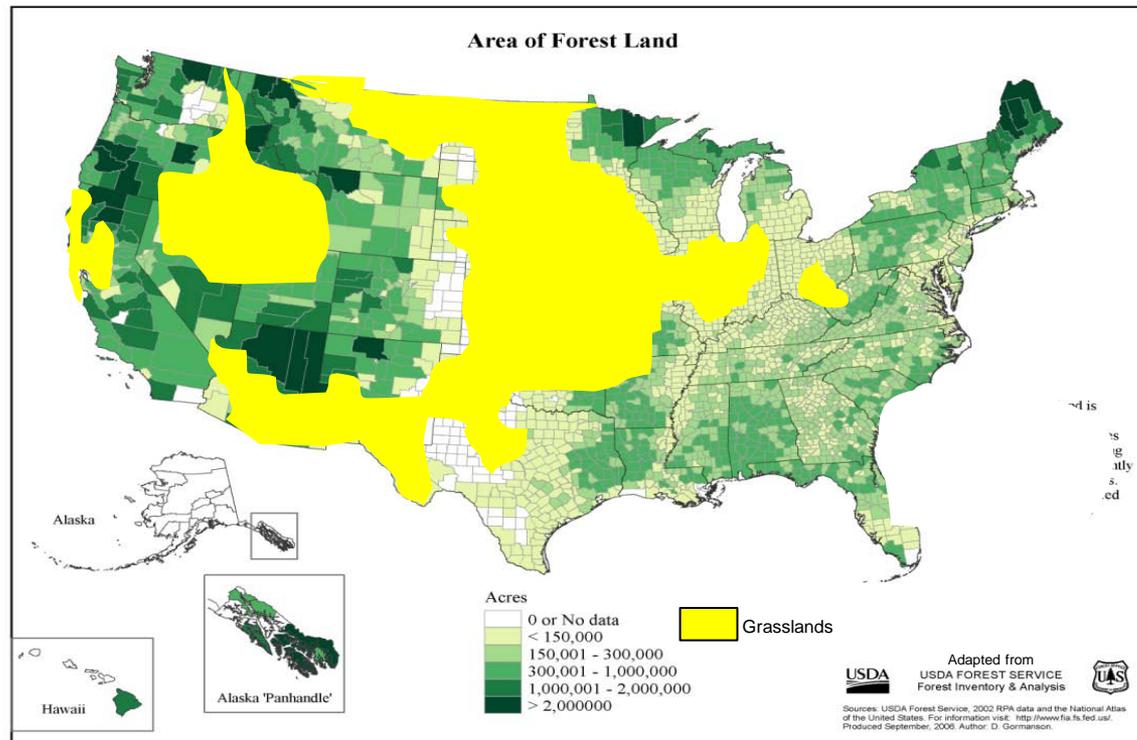


<sup>1</sup> Pew Center on Global Climate Change, “The cost of U.S. forest-based carbon sequestration,” January 2005

<sup>2</sup> Center for Clean Air Policy, “Activities and Policies to Enhance Forest and Agricultural Carbon Sinks in California,” October 2005



## TERRESTRIAL OFFSETS: OPPORTUNITY



- Approx. 750 million acres of forested lands in the U.S.
  - Eastern Forests- 83% Private
  - Western Forests- 43% Private
- Approx. 525 million acres of grasslands in the U.S.



## Three Defining Factors for Forestry Offset Projects

- (1) Forest Productivity – soils, species, etc
- (2) Management of the Stand – even, uneven, harvest cycle, easements, etc
- (3) Protocol Selected – CAR is leader



## TERRESTRIAL OFFSETS: POTENTIAL

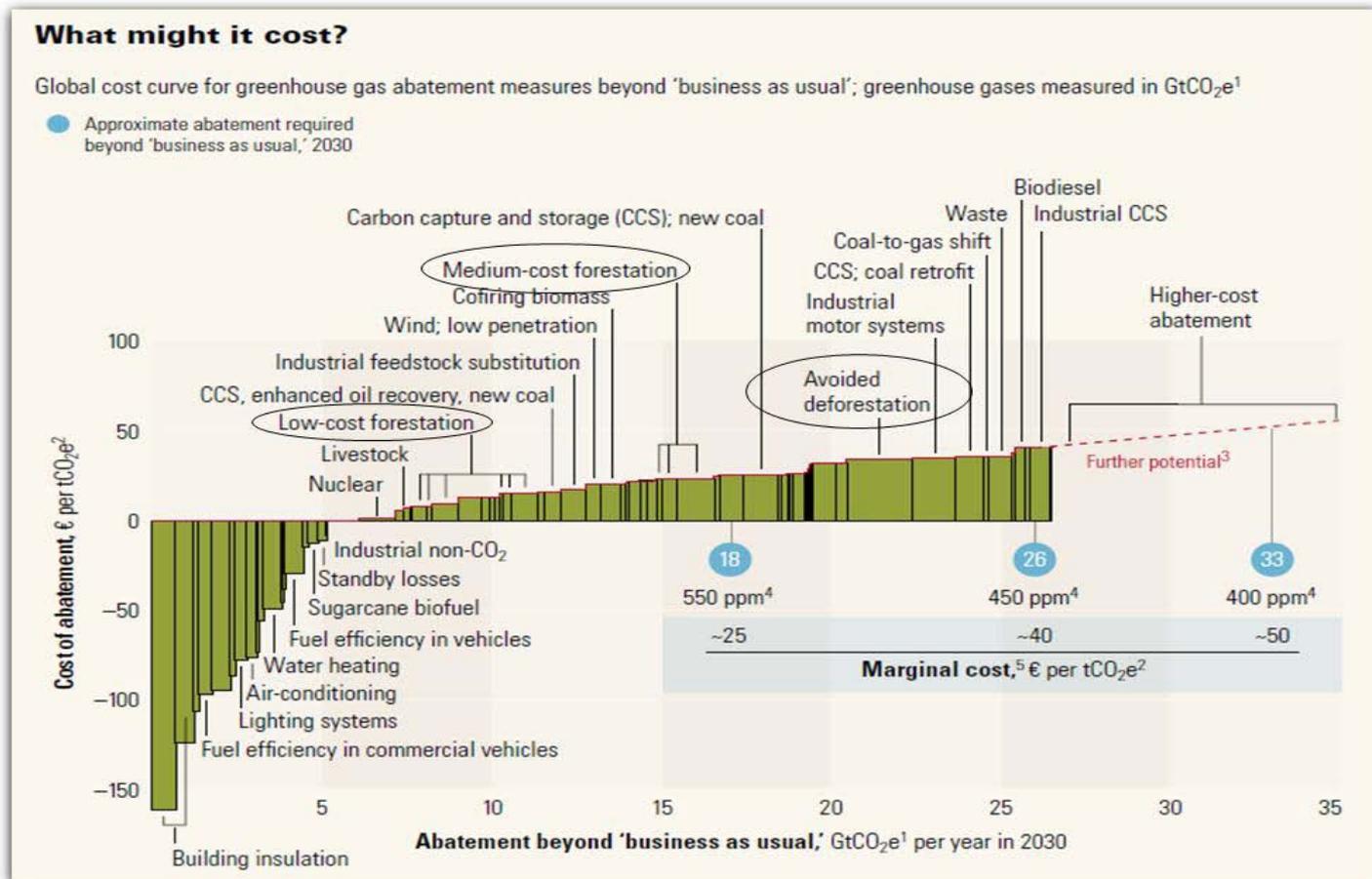
### Terrestrial Offset Projects Have High Sequestration Rates And Are Among The Lowest Cost Offset Opportunities

Activity	Representative Carbon Sequestration Rate in U.S. (Metric tons of CO <sub>2</sub> per acre per year)
Afforestation	2.2 – 9.5
Reforestation	1.1 – 7.7
Avoided Deforestation	83.7 – 172.1
Changes in Forest Management	2.1 – 3.1
Reduced Tillage on Croplands	0.6 – 1.1
Changes in Grazing Management	0.07 – 1.9
Cropland Conversion to Grassland	0.9 – 1.9
Conservation of Riparian Buffers	0.4 – 1.0
Wetlands	0.5 – 2.5
Avoided Grassland Conversion	0.9 – 1.9



# Advantages of Forestry Offsets

- Scalability allows for greater potential GHG mitigation
- Natural process not reliant on technological developments
- Ancillary benefits (e.g., biodiversity preservation, water management, social welfare, etc.)
- Inexpensive mitigation option

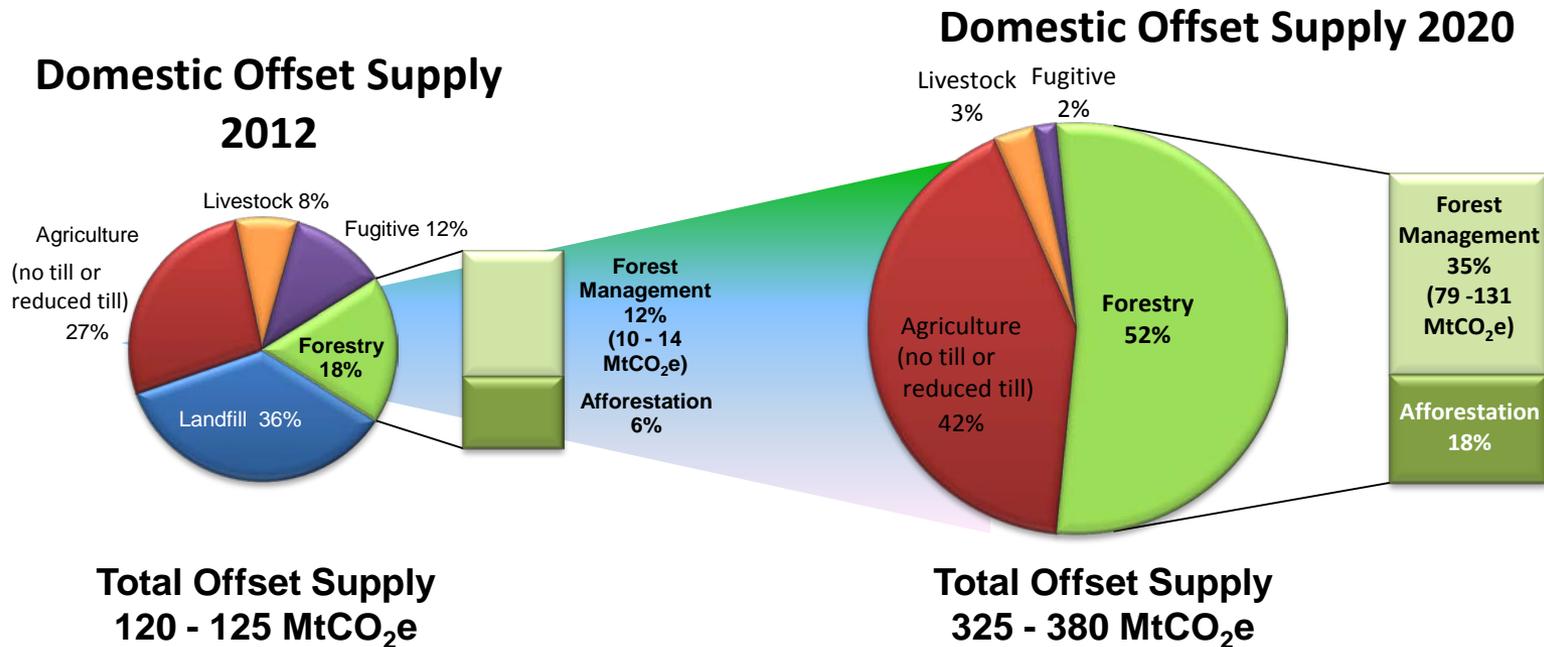


Source: McKinsey



# Forestry Offset Projections

*Forestry offsets account for 18% of total U.S. supply at the start of Federal compliance and grow to 52% by the year 2020<sup>1</sup>*

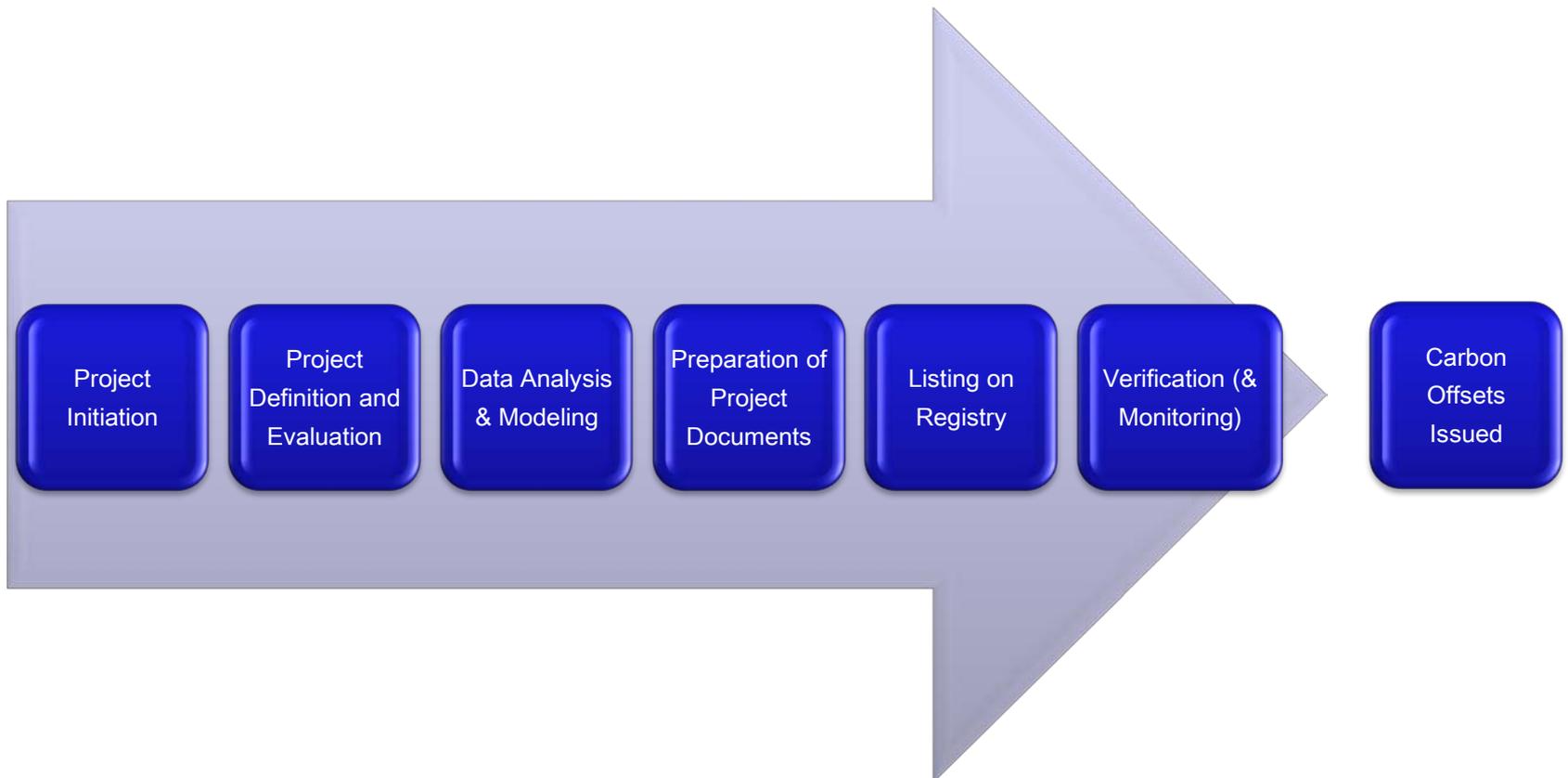


<sup>1</sup> New Energy Finance, 2009



# Offsets: Typical Project Development Cycle

*Project development cycles for offsets depend heavily on the requirements of each standard, but typically involve the following steps. Timelines can range from a few months to years!*





## Current Offsets Prices

- CAR \$6-\$8/ton
- VCS: \$2-\$4/ton
- RGGI: \$2/ton
- CCX: 20 cents/ton
- ACR: ?



# Example Transactions

## Sierra Pacific Industries



- CAR IFM
- Three projects - Protect Giant Sequoia trees, improve stocking, enhance biodiversity
- 80,000 acres in total
- Over 2 million tCO<sub>2</sub>e sequestered over 5 years
- Single largest pre-compliance forest carbon transaction

## Ecotrust Forest Management



- CAR IFM
- Extended Rotations, Expanding Riparian Buffers
- Sooes Property on Olympic Peninsula
- 3,276 acres
- Long lived Doug Fir, Sitka Spruce, Western Hemlock
- Protection for T&E Species: Pacific salmon, northern spotted owl



## Summary

- An offset credit is produced from emissions reductions undertaken “outside” the “cap.
- The purpose of an offset is to reduce costs and to use the market to find efficiencies
- The primary demand driver for offsets is compliance and in the US pre-compliance buyers
- Offsets in the US are priced based on the standard against which they are verified and the likelihood of these being included in a compliance system.
- Forestry will likely play an important role in the future carbon market.



# EQUATOR, LLC

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**Thank you!**

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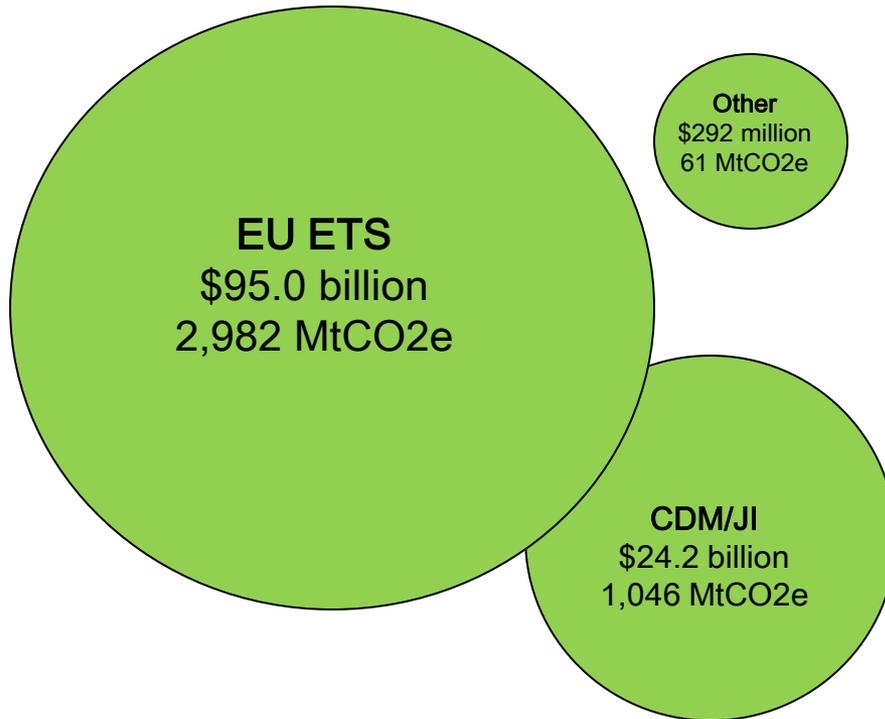




# Global Carbon Markets Breakdown

## Compliance Markets

\$119.5 billion  
4,090 MtCO<sub>2</sub>e



## Voluntary Markets

\$704.8 million  
123 MtCO<sub>2</sub>e

