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# Carbon Offset Markets

Gia Schneider, Partner, EKO Asset Management

Carbon Sequestration on Farms & Forests

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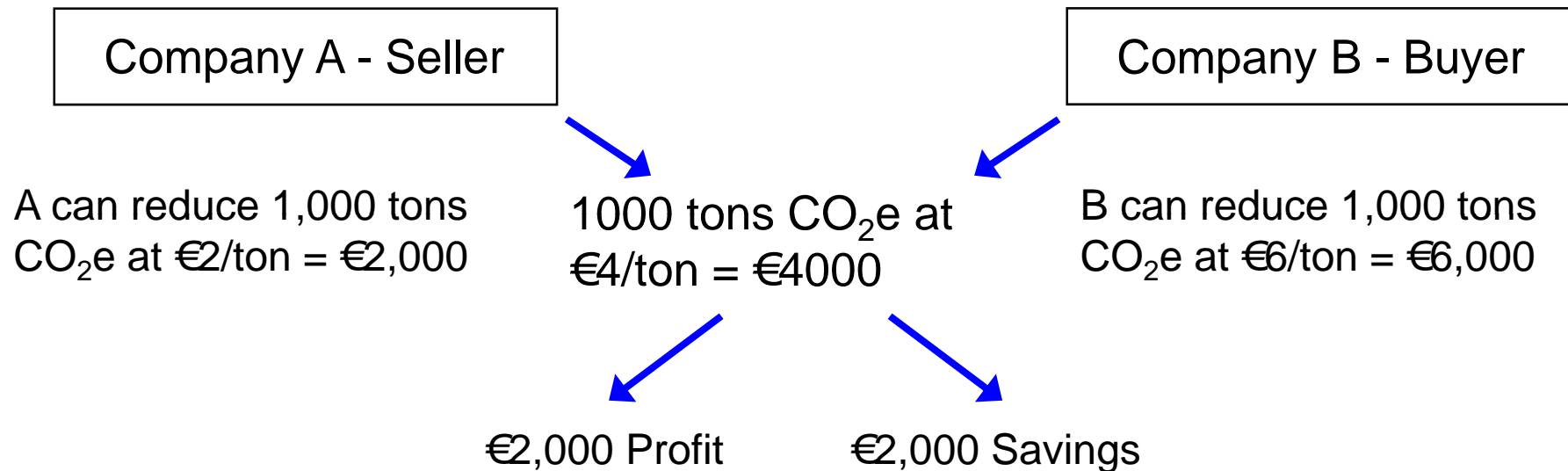
# Agenda

- Current Carbon Market
- Role of Offsets
- Current Offset Markets

# Current Carbon Market

# What is Emissions Trading?

Cost of abatement is lowered for Company B from trading



- Use market forces to reduce GHG emissions in most cost-effective and flexible way
- Benefits:
  - Incent innovation
  - Lower aggregate & individual costs
  - Additional revenue for over-achievement

# What is the “Carbon Market”?

- Market driven by ratification of Kyoto Protocol
  - Trading unit is 1 metric ton of CO2 equivalent, or tCO2e
- Market is large and growing
  - \$11 billion in 2005 (0.7 billion tCO2e)
  - \$31 billion in 2006 (1.7 billion tCO2e)
  - \$64 billion in 2007 (3.0 billion tCO2e)
- EU ETS annual allocation is approximately €40 billion
- But is still a relatively early stage market structure
  - Fragmented
  - Policy uncertainty

# The Greenhouse Gases

There are six primary greenhouse gases defined in terms of Global Warming Potential (GWP)

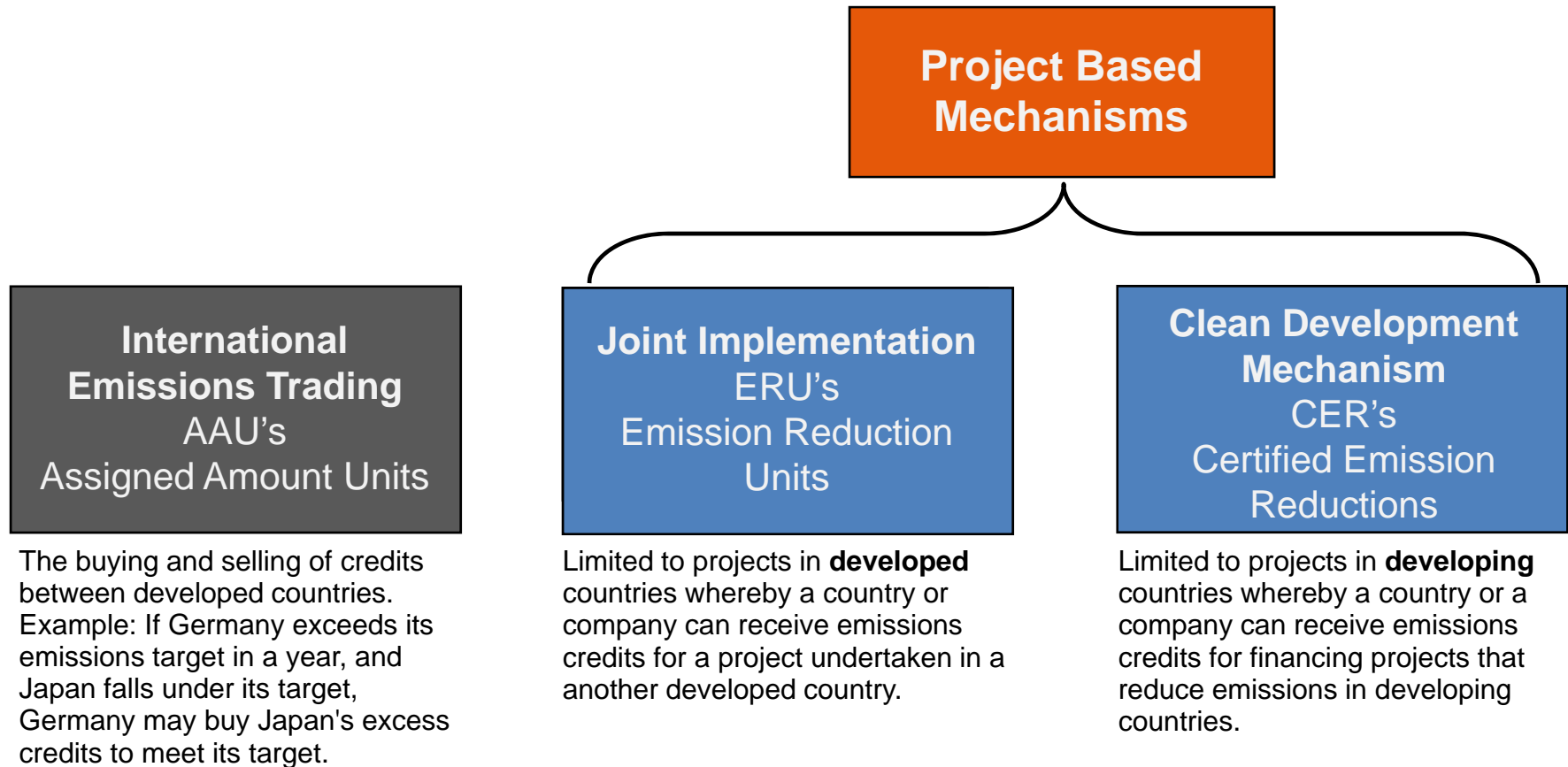
Greenhouse Gas	Global Warming Potential
Carbon dioxide	1x GWP
Methane	21x GWP
Nitrous oxide	310x GWP
Hydrofluorocarbons	1,000 – 11,700x GWP
Perfluorocarbons	6,500 – 9,200x GWP
Sulfur hexafluoride	23,900x GWP

# Carbon Market Framework

- Kyoto Market
  - Agreement between 84 countries signed in 1997; Entered into legal force in Feb 2005 when Russia signed the treaty
  - 36 industrialized countries (Annex 1 countries) became legally bound to meet emissions targets
    - Average target is ~5% below 1990 levels by 2012
- EU ETS is a young but liquid market
  - Established to help meet the Kyoto targets of the EU's 27 member states
  - 2006: 817 million tons traded worth ~€14.6 Bn
  - 2007: 1.6 billion tons traded worth ~€28 Bn
  - Covers 12,000 “installations” in Europe generating 2 BT CO2 annually
- Australia has ratified Kyoto and announced it is moving to a national cap-and-trade system
- Japan is evaluating a national trading system
- Non Kyoto Markets
  - United States: state and regional activity as well as new bill from House Commerce Committee
  - Voluntary markets
  - Global problem requires global regulatory framework and participation

# Kyoto Protocol Mechanisms

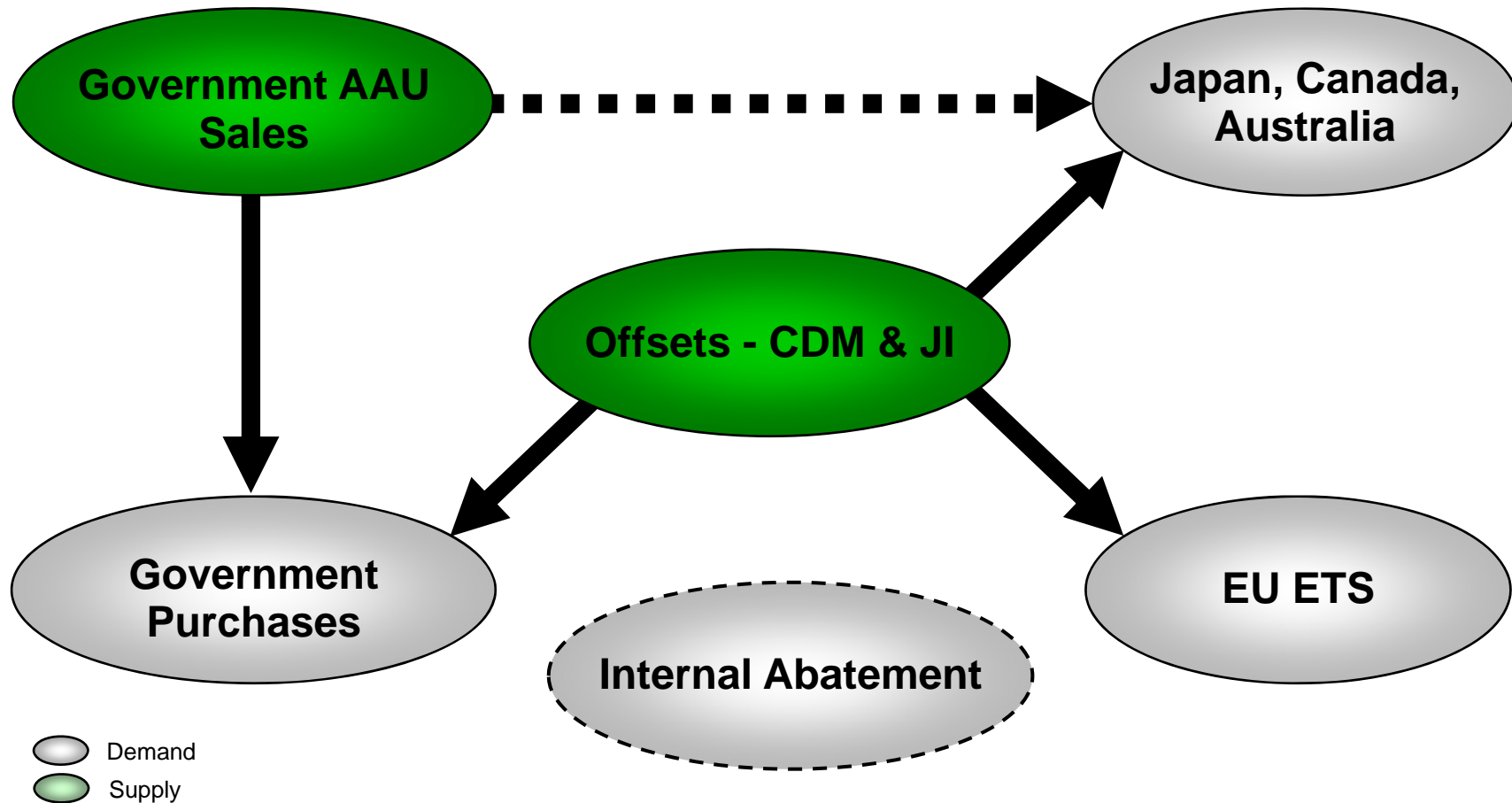
Kyoto intent was to provide a path to low cost compliance solutions. Three market based mechanisms were established to provide flexibility in meeting emissions reductions targets



# Current International Framework

## Government Actions

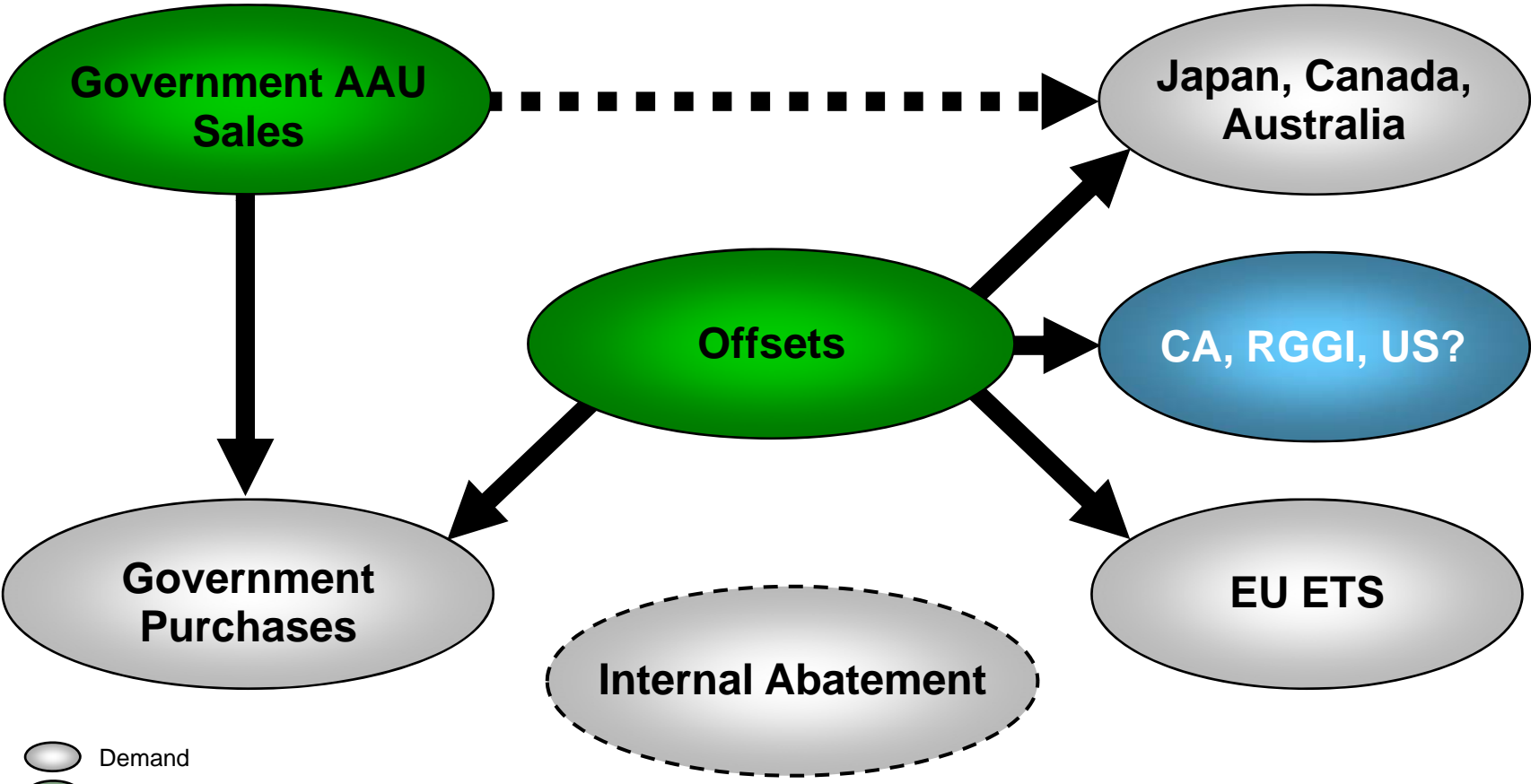
## Emissions Trading Programs



# The Future

## Government Actions

## Emissions Trading Programs



○ Demand  
● Supply

# Role of Offsets

# Role of Offsets

- Certain sectors may not fit well under a cap system, but are able to undertake projects that reduce emissions and adhere to the necessary standards and thus can contribute to reducing emissions
- Lower cost of a cap-and-trade system by giving market participants wider access to a range of emission reduction opportunities
- Entities that are not included in the cap can participate in the market by investing in or developing offset projects
- Offsets provide an indirect linking mechanism between regional or national carbon markets
  - Regional and national market design inherently leans towards heterogeneity due to varying baseline rigor, methods of allocation, use of safety valves, etc

# Criteria for Offsets

- Real Reductions – offsets should represent true emissions reductions, rather than artificial surplus from inaccurate baselines
- Verifiable – offsets should come from projects where performance and operation is fully monitored and independently confirmed
- Additional – offsets should result from activities that are beyond the course of normal activity and that are not “business as usual”
- Permanent – offsets should reflect permanent emissions reductions or else have an independent system for replacement if reversed (ie wild fires)
- Enforceable – offsets must be backed by legal contracts that clearly define their nature and creation, ensure exclusive ownership and allow for easy transfer of ownership

# Standardization of Offsets

## Real, Permanent Reductions → Accounting standards

- Identification of project baselines
- Additionality
- Leakage
- Ensure no double-counting or double claims

## Verifiable → Process standards

- Validation of projects
- Monitoring and verification of project operation and GHG reductions
- Certification of GHG reductions

## Enforceability → Contract standards

- Delivery and payment terms
- Transfer of offset rights
- Project risk allocation
- Reinforce no double-counting or claims

# Market Design Framework

Long-Term Regulatory Framework

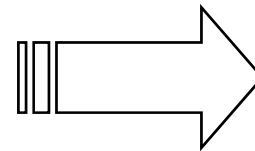
Multi Sector & Emissions Coverage

Accurate & Rigorous Baselines

Standards-based Offsets

Limited Price Caps or Safety Valves

Linkages to Other Markets



**Price Signal**

**Innovation**

**Investment**

**EKO**

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# Current Offset Markets

# Current Offset Mechanisms: CDM

- CDM: Clean Development Mechanism
  - Annex 1 countries assist non-Annex 1 countries to implement projects that reduce emissions
  - Projects generate Certified Emissions Reductions (“CER”)
  - Pricing is \$12 to \$15 in the primary market; \$24 in the secondary market
  - Current status
    - 1,186 projects registered
    - 200.5 million CERs issued
    - 1.3 billion CERs expected through 2012
  - Concerns
    - Oversight (both too much and too little)
    - Additionality

# CDM Project Cycle

## CDM STAGE

## RELEVANT ENTITIES

## RESULTS

Design



Project

Project Design Document

Validation



Designated Operational Entity (DOE)  
& Designated National Authority (DNA)

Host Nation Approval

Registration



CDM Executive Board

Project Registration

Monitoring



Project

Project Operation

Verification /  
Certification



DOE

Issuance



CDM Executive Board

Project receives credits

Source: UNFCCC CDM website

# Current Offset Mechanisms: JI

- JI: Joint Implementation
  - Annex 1 countries assist other Annex 1 countries to implement projects that reduce emissions
  - Projects generate Emissions Reduction Units (“ERU”)
  - Pricing is \$8 to \$15 in the primary market; relative parity with CERs in the secondary market
  - Current status
    - 175 projects in progress
    - 300 million ERUs expected through 2012
  - Concerns
    - Complex process
    - Additionality

# U.S. Regional Programs

- RGGI
  - 5 categories of offsets
  - Projects must start after December 20, 2005
  - Projects cannot be result of any law, regulation or order
- California & Western Climate Initiative
- Midwest Climate Initiative
- Florida

# Voluntary Markets

- Proliferation of standards to meet market demand
  - Voluntary Carbon Standard
  - Gold Standard
- More progress on inclusion of carbon sinks in the U.S.
  - California Climate Action Registry Forestry protocol

# Conclusions

- Offsets are useful transitional mechanism
  - Encourage emissions reductions in non-capped sectors
  - Flexible supply
  - Cost moderation
- Required framework
  - Clear, enforceable standards
  - Data for monitoring and verification
  - Registry system for tracking offsets from issuance to retirement
- Carbon sinks can provide offsets, but data and standards are key

Thank you