



Honeywell Building Solutions

The Voluntary Carbon Markets

Honeywell

Today's Speakers

- Ron Blagus, Director of Marketing Energy Services - North America
- Fleming Ray, MGM International
- Mike Kempa, Director of Marketing Energy Services - Public Sector

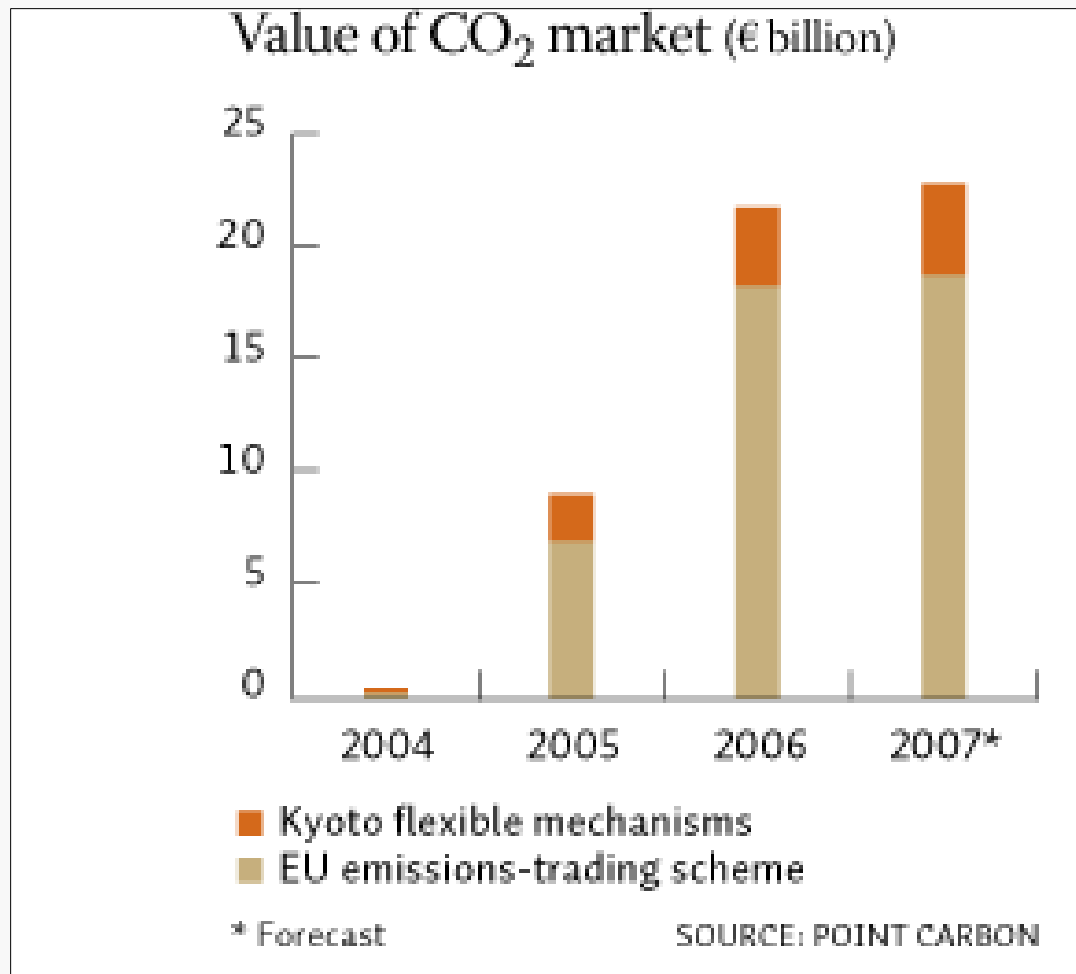


Today's Agenda

- Overview of the World's Carbon Trading Market
- U.S. Voluntary Carbon Trading Market
 - Carbon Credits
 - Renewable Energy Credits
- Pathway to Achieving ACUPCC Commitment



The Worlds Carbon Trading Market



Kyoto Protocol

- 180 industrialized countries agreed to reduce (GHGs)
- Agreed to levels 5.4% below their 1990 emissions by 2012
- Based on a cap-and-trade model
- Legally-binding agreement
- Came into effect in 2005

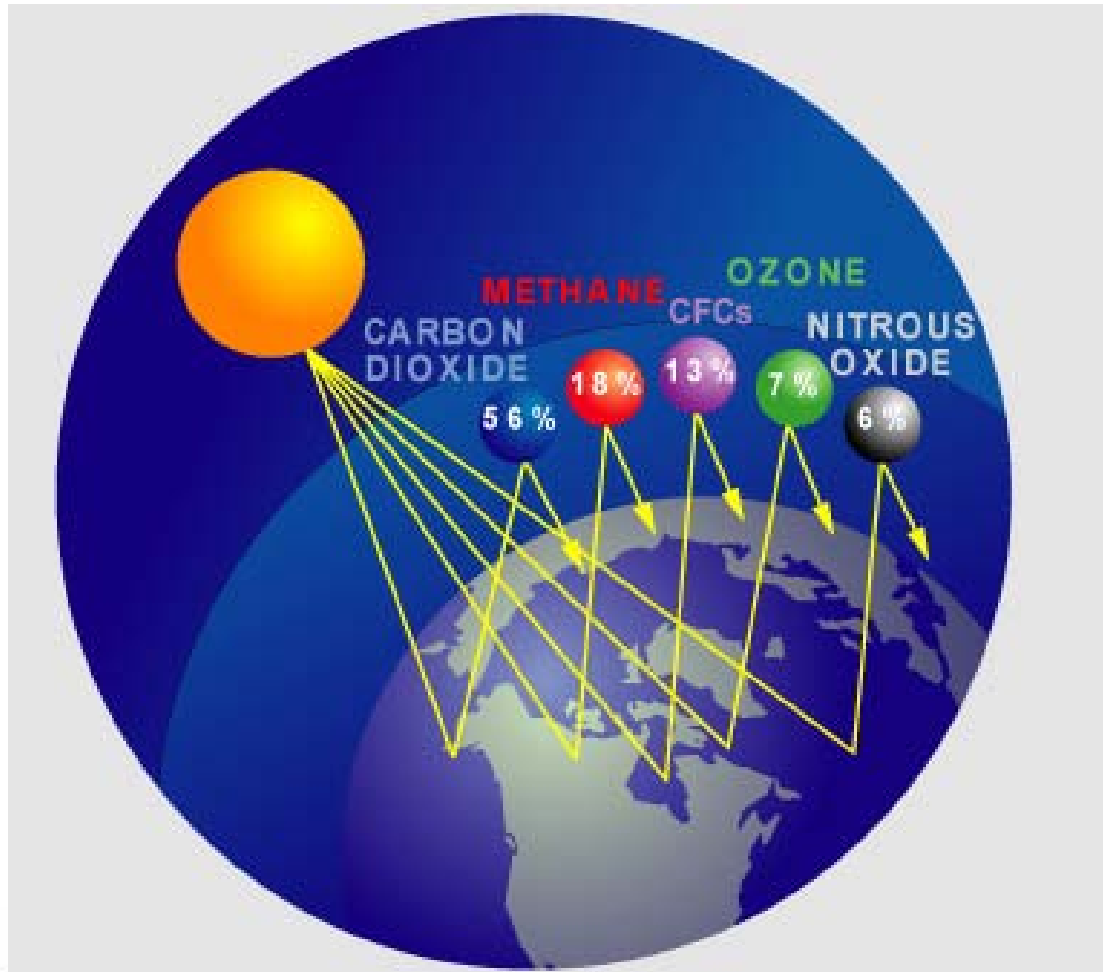


Kyoto Protocol

- Three major “flexibility mechanisms”
 - Emissions Trading
 - Joint Implementation
 - Clean Development Mechanism



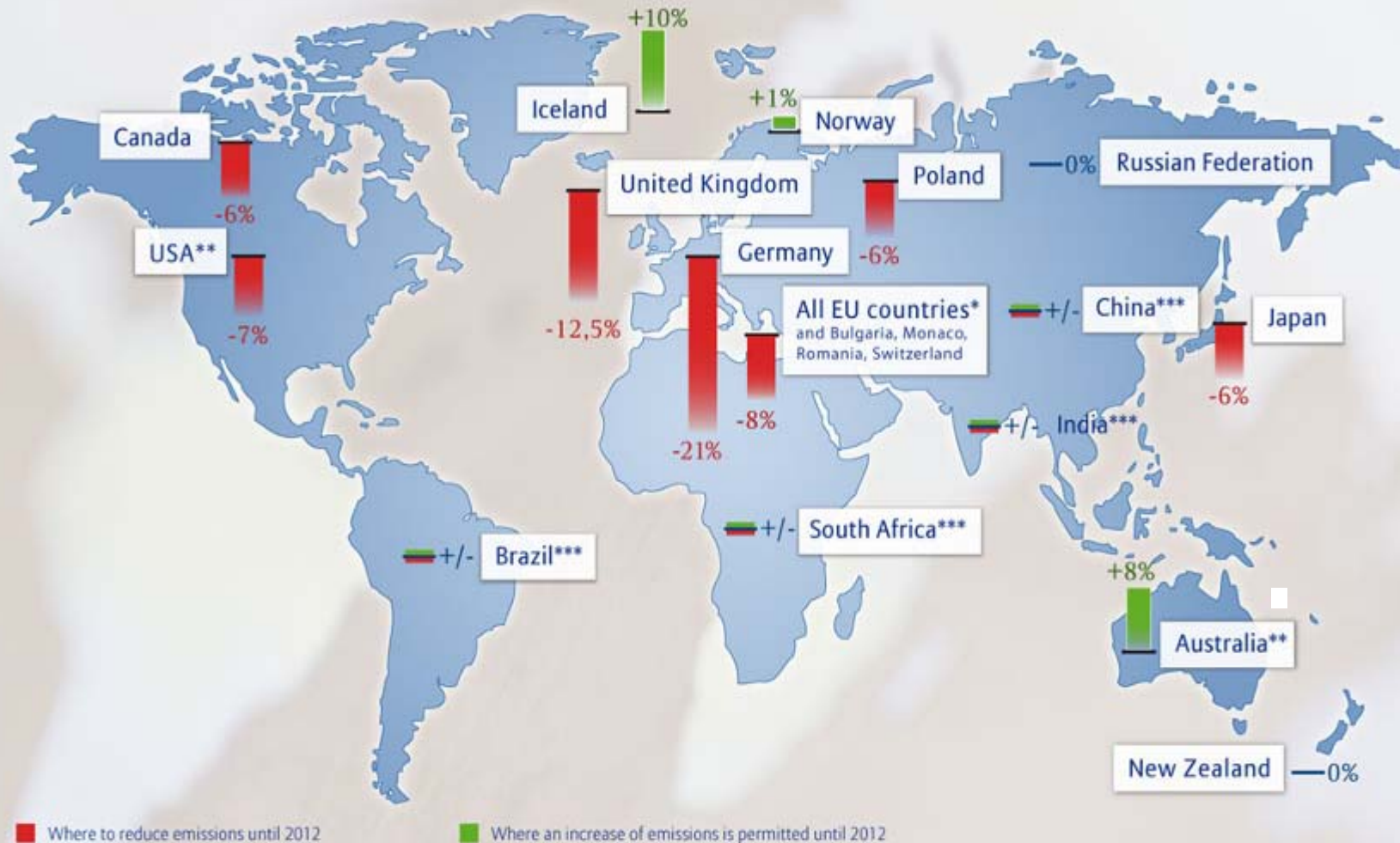
GHG listed under Kyoto



Distribution of Greenhouse Gases in the Earth's Atmosphere

Emission Targets

Emission Targets for Selected Countries (Kyoto Protocol)



Emissions Trading

- Allowance-based transaction system
- Enables developed countries and countries with economies in transition to purchase carbon credits from other developed countries
- Fulfill their emissions reductions commitments
- Mechanism used in the European Union Emission Trading System (EU ETS)



European Union Emission Trading System

- Scheme involves all EU member states
- World's largest multi-national GHG emissions trading scheme
- Credits traded are called European Union Allowance (EUAs).
- 2006, the EU ETS market traded 1,044M tCO₂e
- 2007 the EU ETS market traded 2,060M tCO₂e
- 2007 Market was valued at \$50 billion



Emissions Trading - Example

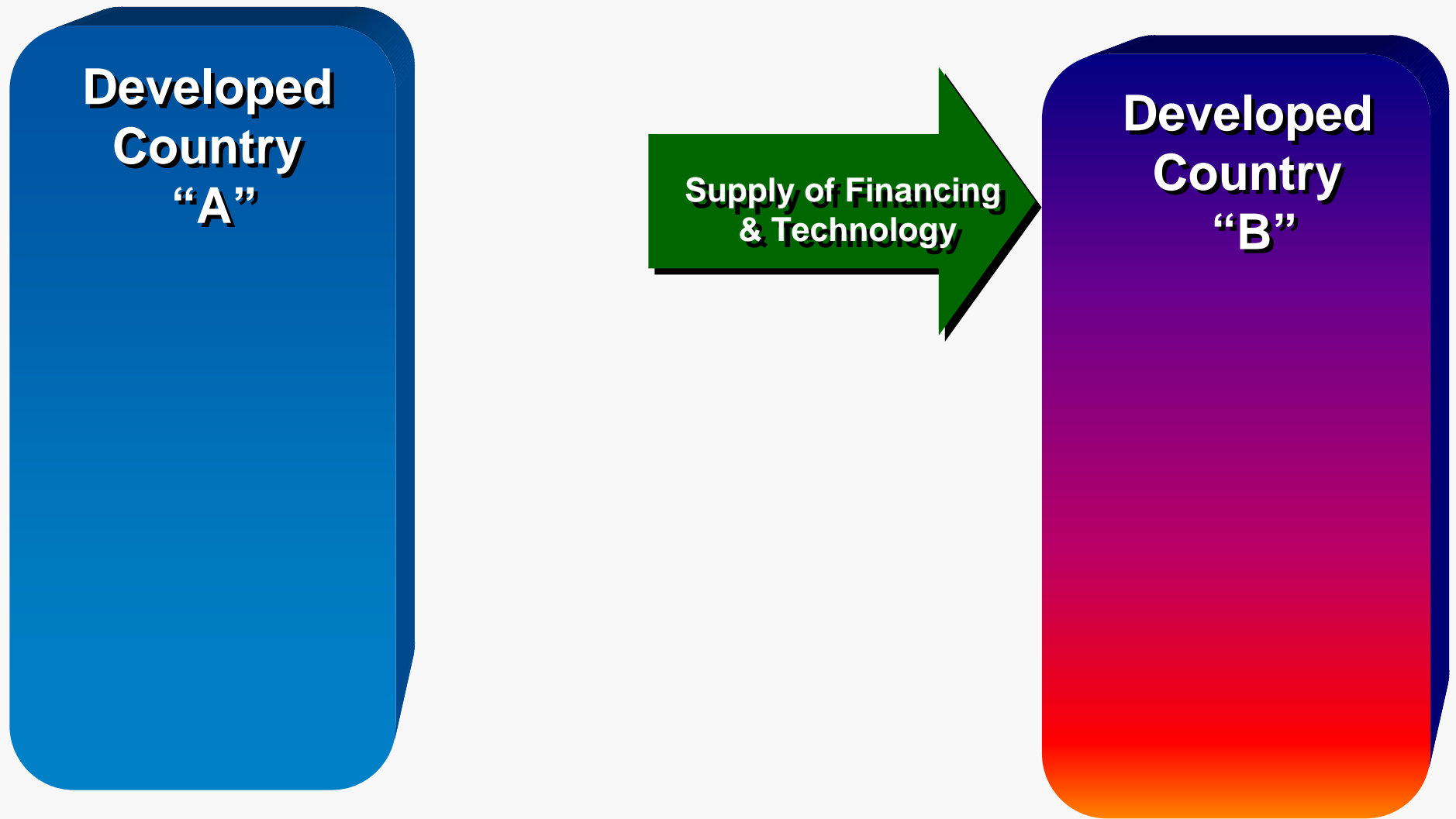
	Company A	Company B
Emissions before cap	100,000 tonnes	100,000 tonnes
Cap	95,000 tonnes	95,000 tonnes
Reduction needed to meet cap	5,000 tonnes	5,000 tonnes
Cost to reduce	€ 5/tonne	€ 15/tonne
Actual reduction	10,000 tonnes	0 tonnes
Total cost of reduction	€ 50,000	€ 0
Sold / Purchased in market (€10/tonne)	Sold 5,000 tonnes to Company B	Purchased 5,000 tonnes from Co. A
Revenue / Cost of market activity	Revenue € 50,000	Cost € 50,000
Total cost to meet cap	€ 0	€ 50,000
Reduction cost if there were no trading	€ 25,000	€ 75,000
Summary	By utilizing the market, Company A was able to meet its cap at no cost by selling unneeded reductions at market price.	By utilizing the market Company B was able to meet its cap at a cost of € 50,000 instead of reducing its own emissions which would have cost € 75,000

Joint Implementation – Annex 1

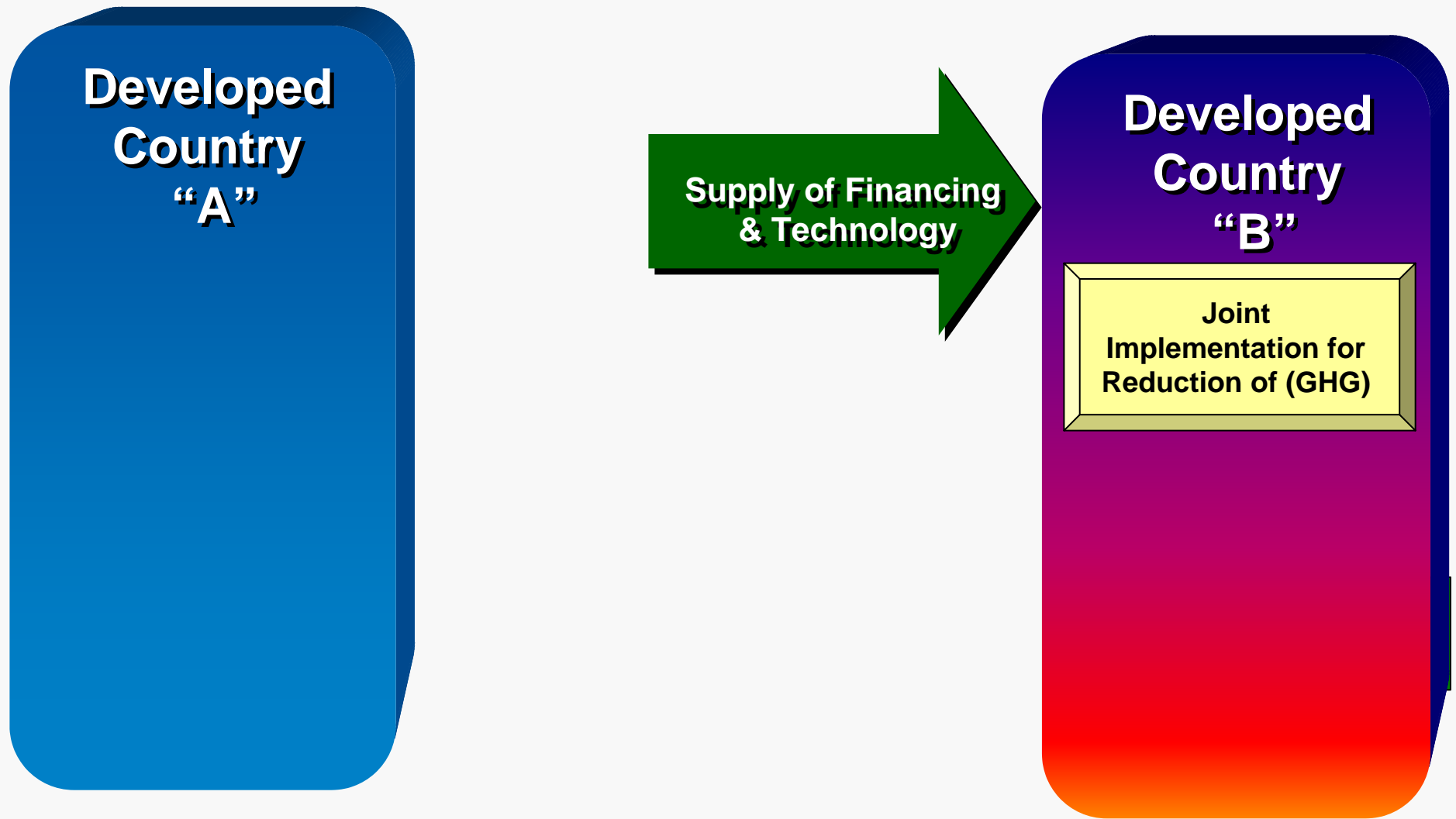
**Developed
Country
“A”**

**Developed
Country
“B”**

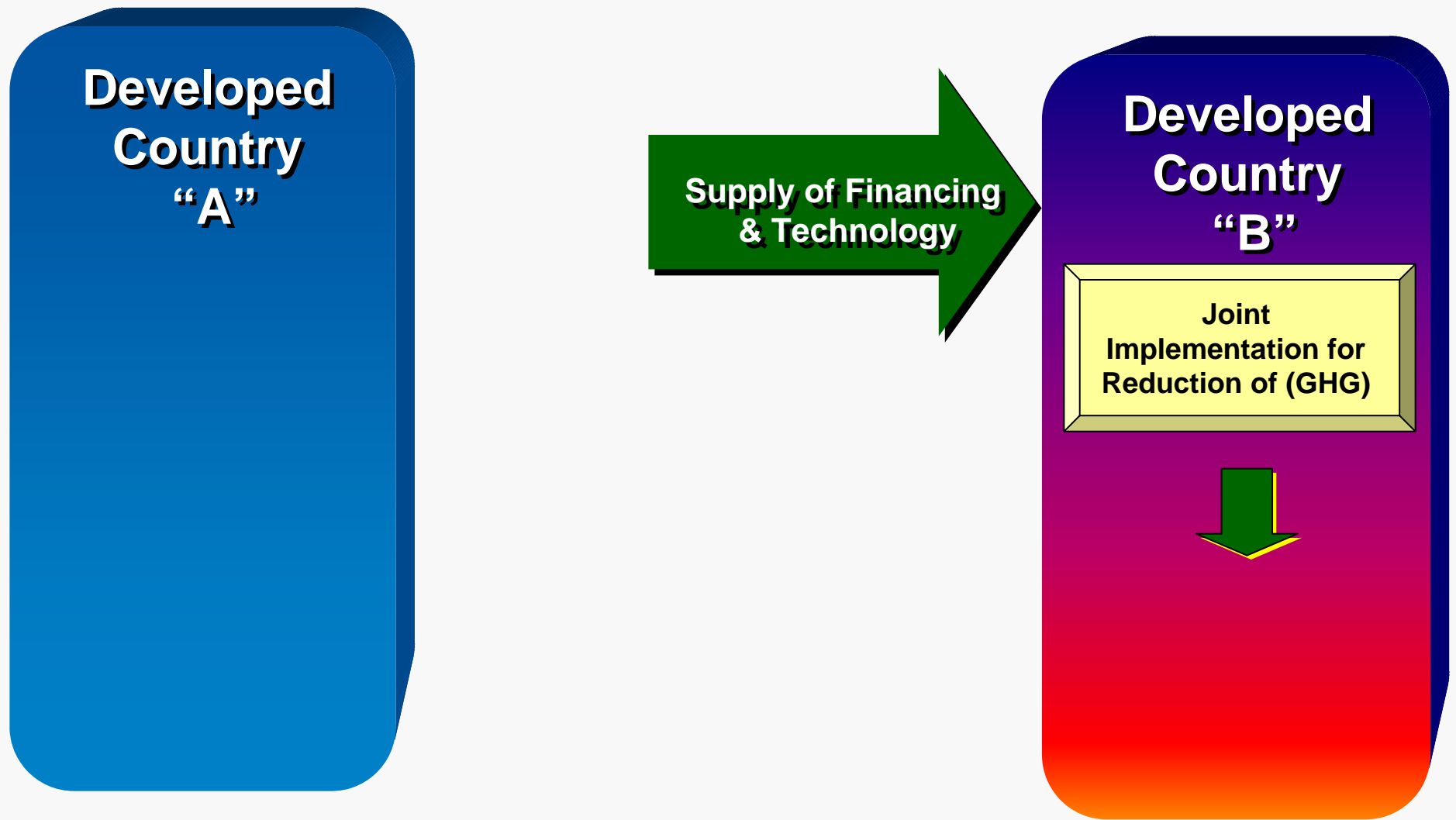
Joint Implementation – Annex 1



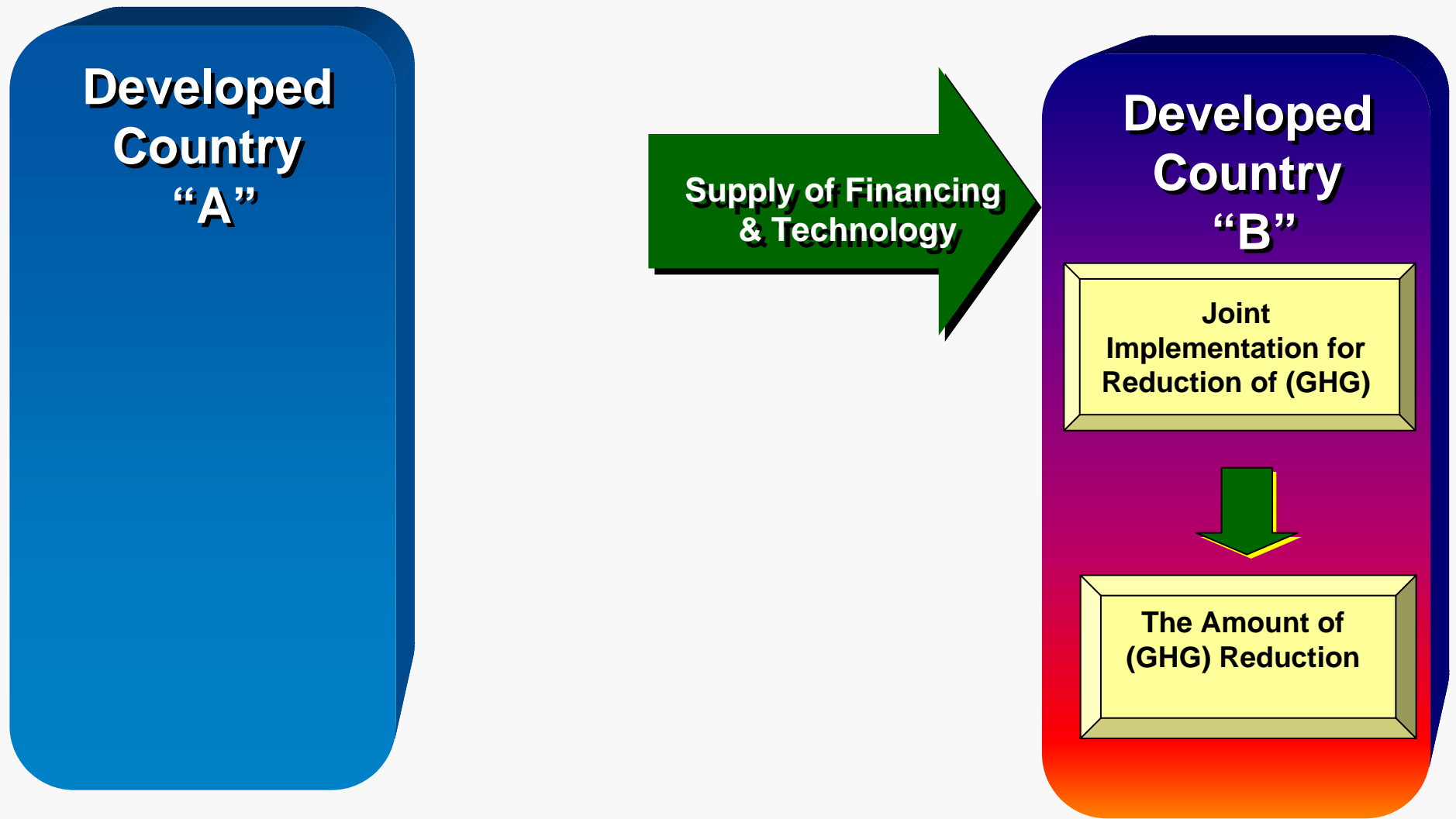
Joint Implementation – Annex 1



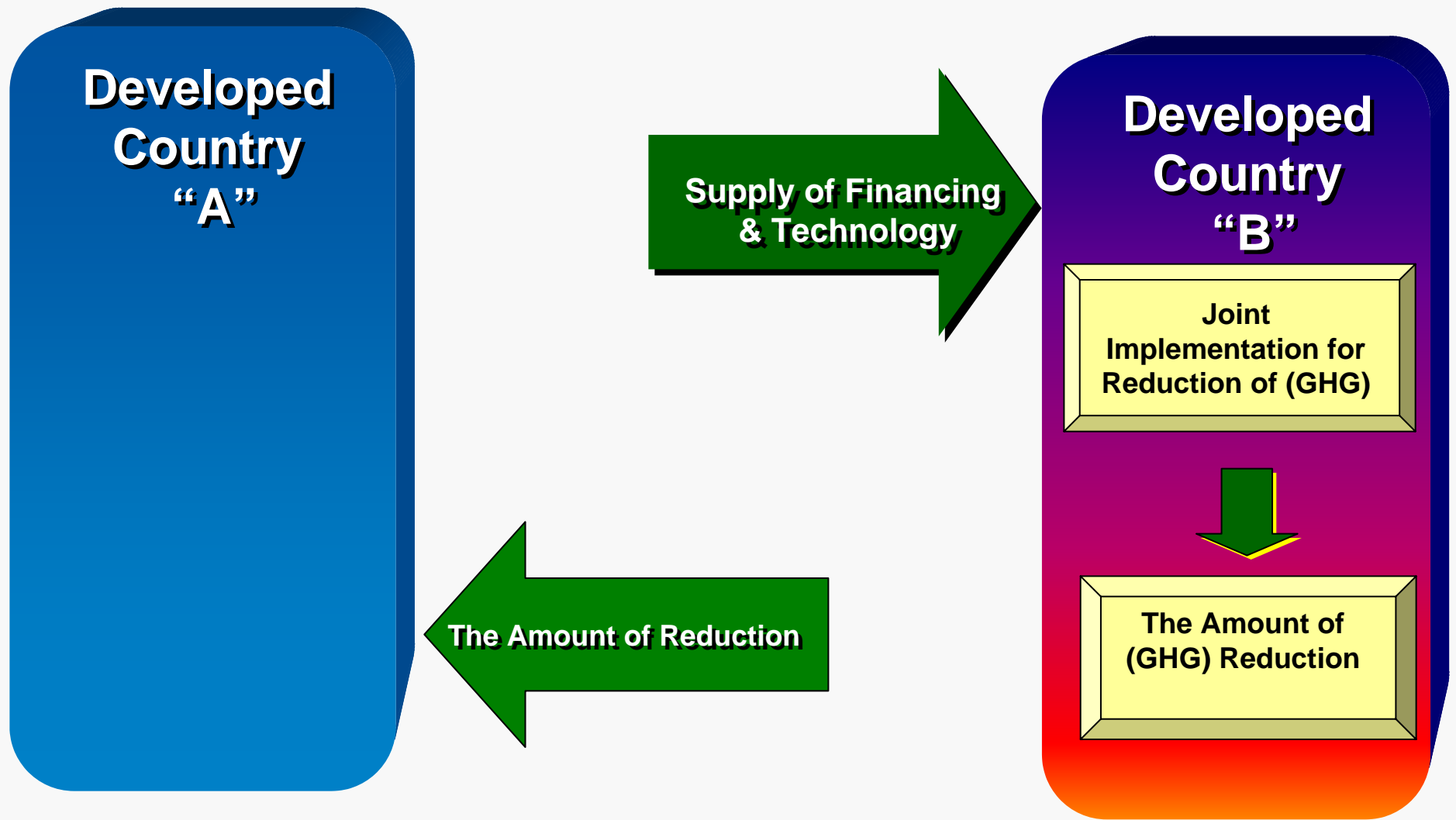
Joint Implementation – Annex 1



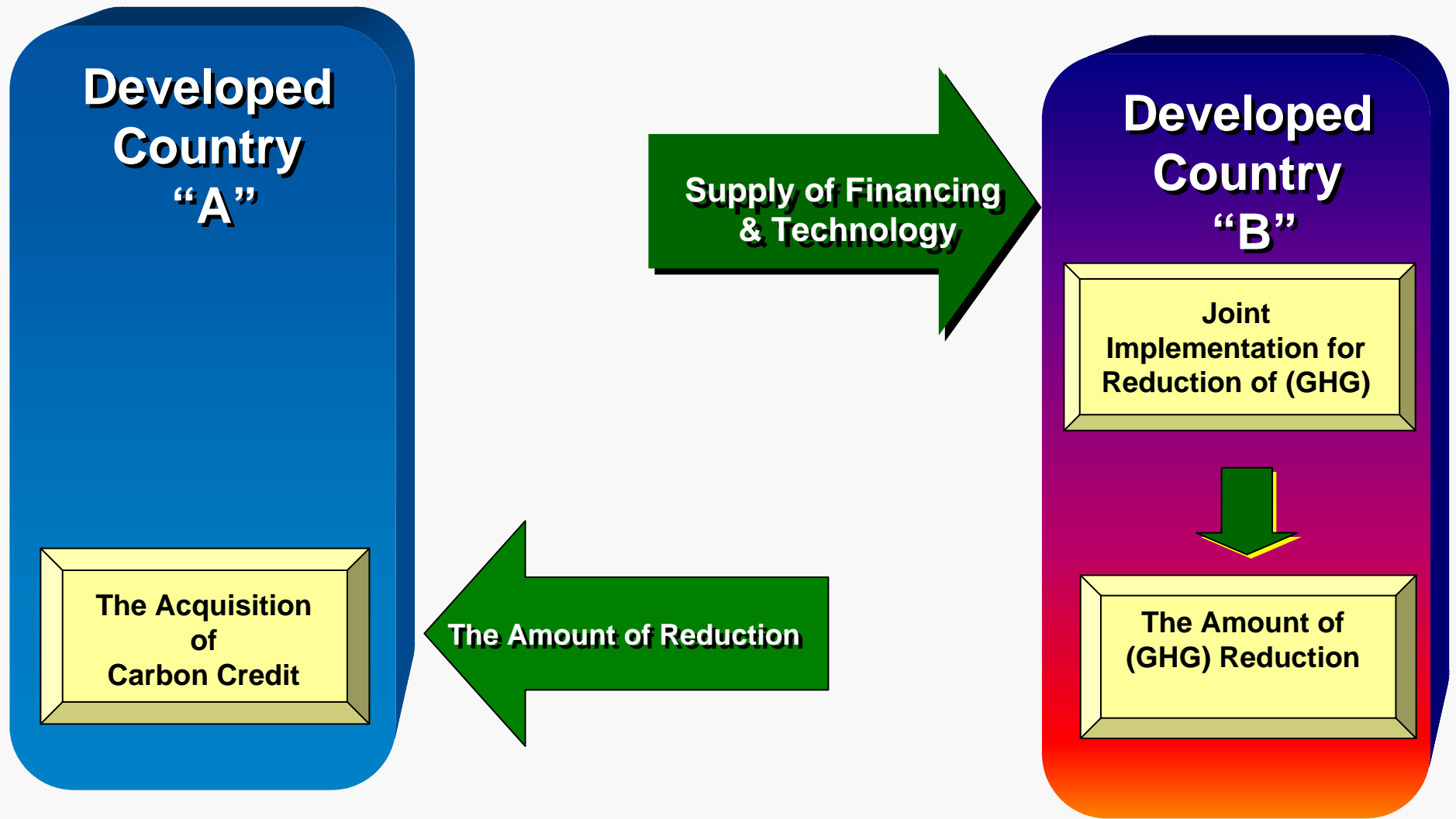
Joint Implementation – Annex 1



Joint Implementation – Annex 1



Joint Implementation – Annex 1



Joint Implementation

- Allows emitters in developed countries under the Kyoto Protocol to purchase carbon credits via a “project-based” mechanism
- Transactions implemented in either another developed country or in a country with an economy in transition
- Emissions from JI projects are Emission Reduction Units (ERUs).
- In 2006 - 16.3M tCO₂e of ERU credits were transacted at an average price of US\$8.70
- 2007 - 41.1M tCO₂e of ERU credits were transacted
- Market was valued at \$499 million



Clean Development Mechanism

Developed Country

- Europe
- Japan
- Canada

Developing Country GHG Abatement Project

China
India

Mexico
Brazil

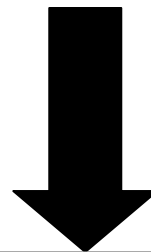


Clean Development Mechanism

Developed Country

- Europe
- Japan
- Canada

Project
Finance

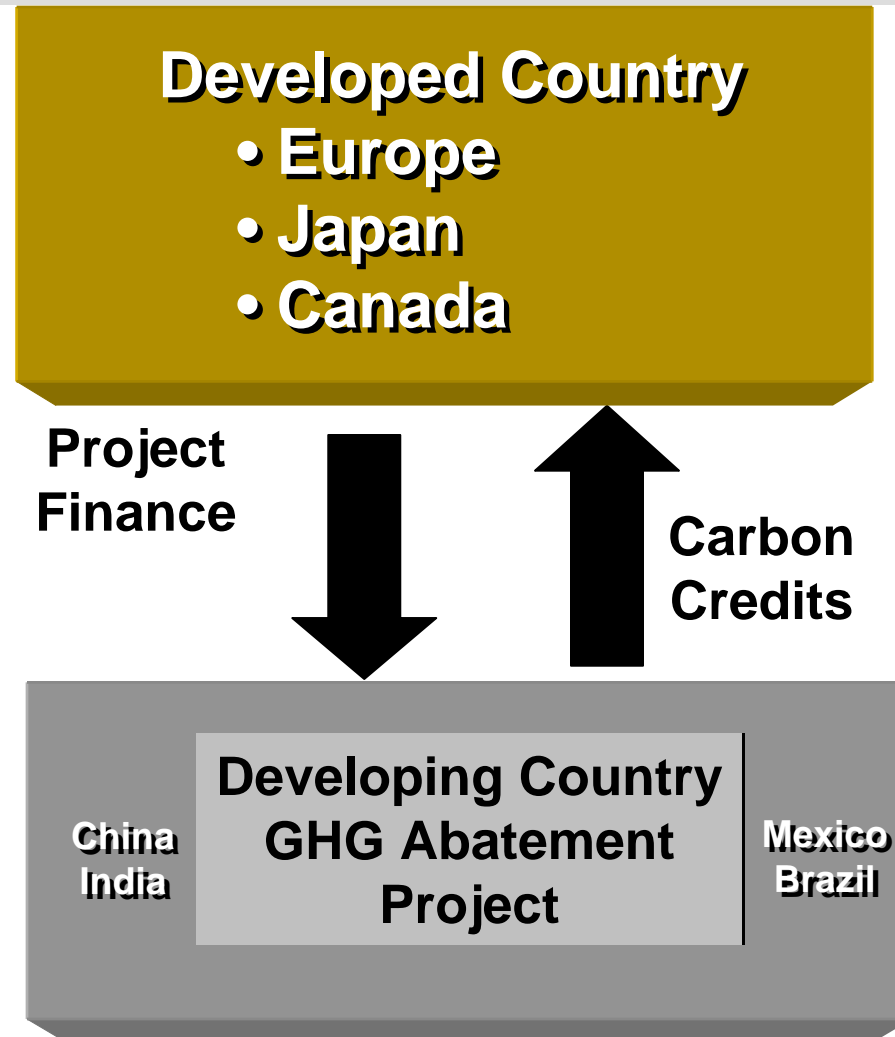


Developing Country GHG Abatement Project

China
India

Mexico
Brazil

Clean Development Mechanism



Clean Development Mechanism

- Acquired by financing carbon reduction projects between developed and developing countries
- Mechanism is critical link between developed and developing countries
- Carbon offsets from registered and approved CDM projects are called Certified Emissions Reductions (CERs)
- Accepted CDM projects the Quality Standard for offset projects in developing countries
- CERs and ERUs can also be sold on the voluntary markets



Clean Development Mechanism

- Primary CDM - 2006
 - Transactions valued at ~US\$5.8 billion
 - Representing reductions of 537 MtCO₂e
 - Average Primary CER price: \$10.80
- Secondary CDM – 2006
 - Traded 25 MtCO₂e of secondary CDM credits
 - Valued at US\$ 445 million
- Primary CDM – 2007
 - 551 MtCO₂e credits were transacted
 - Valued at \$7.4 billion
- Secondary CDM – 2007
 - 240 MtCO₂e of secondary CERs traded
 - Valuation: \$5.5 Billion



EU Cap and Trade

- 2005 EU launches GHG Trading Scheme for all 25 member states
- Members set an overall Emissions Cap for industry
- Issue allowances (rights to emit one ton of CO₂) equal to that Cap
- Capped facilities surrender allowance for every CO₂ ton they emit
- Total number of allowances under the Cap are reduced annually
- Allows for emissions continually ratcheting down

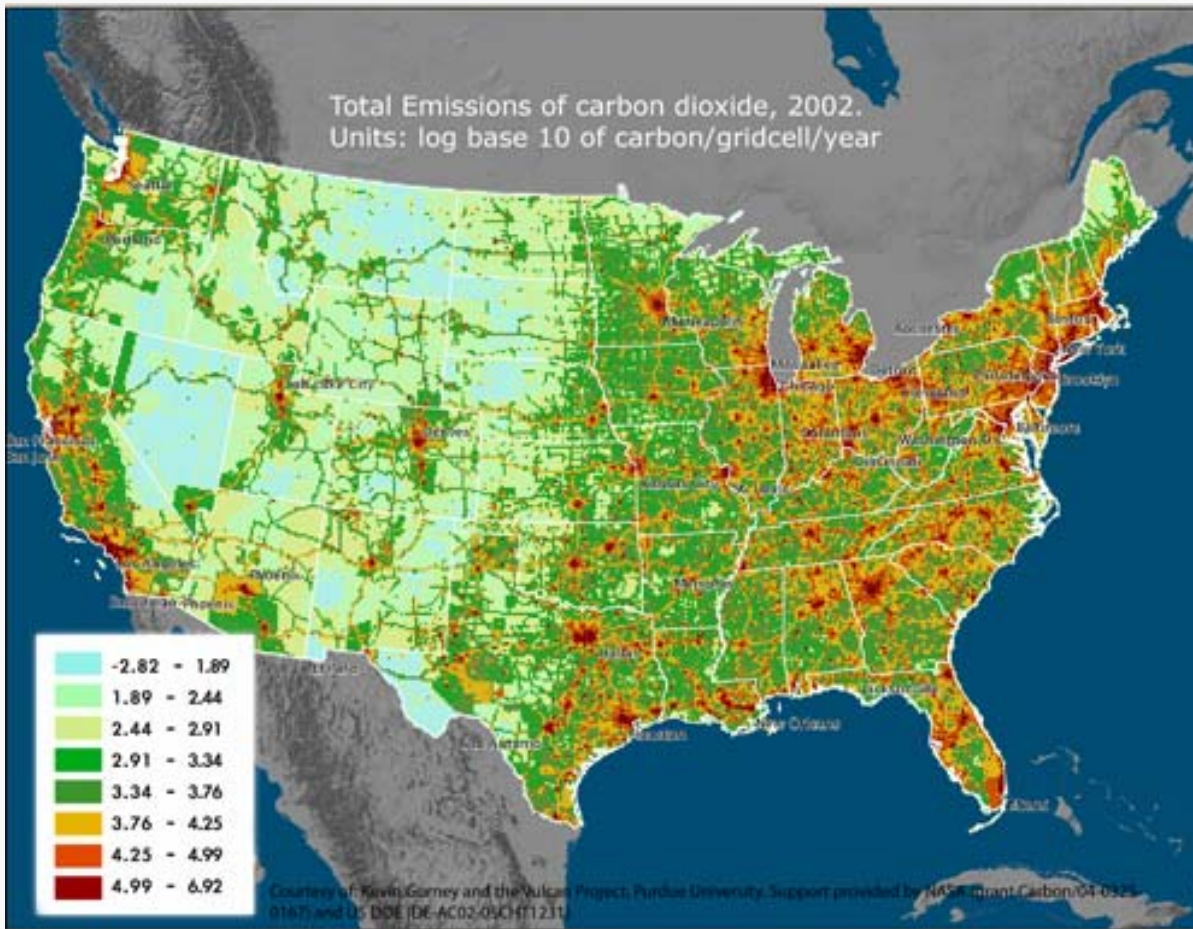


EU Cap and Trade System

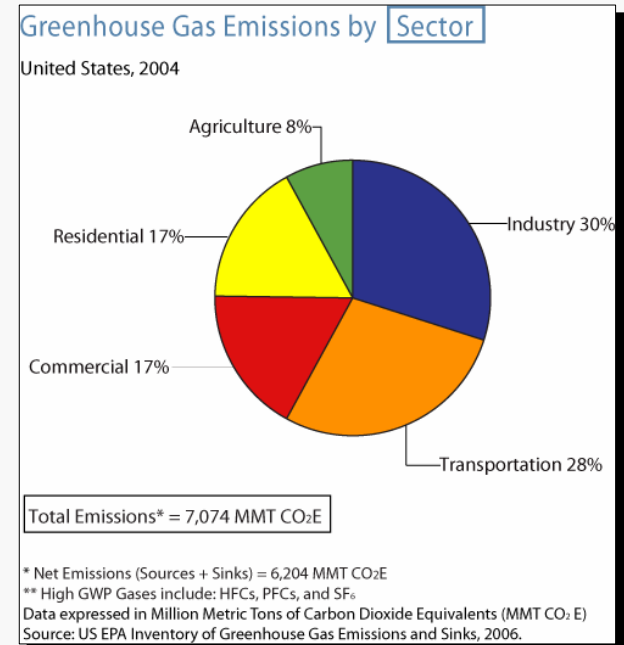
- System regulates the CO₂ emissions of approximately 15,000 sites
 - oil and gas facilities
 - power generation
 - pulp and paper
 - cement and glass
 - steel sectors
- Installations are allocated tradable emissions allowances each year
- Companies who exceed their store of allowances will face penalties
 - 40 Euros per ton of excess carbon dioxide emitted annually during 2005-2007
 - 100 Euros per ton during the period 2008-2012



U.S. Green House Emissions



Mapping the US Carbon Footprint



Legislation at a Glance

Bill	Cap-&-Trade / Carbon Tax	International Provisions	Energy Efficiency	Nuclear Energy	Clean Coal Technologies	CAFE Standards	Renewable Energy	R&D	Carbon Sequestration	STATUS
S. 1168 Clean Air/Climate Change Act of 2007	X	-	X	-	-	-	X	-	X	Referred to the Environment and Public Works Comm.
S. 1177 Clean Air Planning Act of 2007	X	-	X	-	X	-	X	X	X	Referred to the Environment and Public Works Comm.
S. 280 / H.R.620 Climate Stewardship and Innovation Act of 2007	X	X	X	X	X	-	X	X	X	Referred to Fisheries, Wildlife and Oceans Sub Comm.
S.317 Electric Utility Cap and Trade Act of 2007	X	X	X	X	X	-	X	X	X	Referred to the Environment and Public Works Comm.
S.309 Global Warming Pollution Reduction Act	X	X	X	-	-	X	X	X	X	Referred to the Environment and Public Works Comm.
S. 485 Global Warming Reduction Act	X	X	X	-	-	X	X	X	X	Referred to Finance Committee
S. 1766 Low Carbon Economy Act	X	X	X	-	-	-	X	X	X	Referred to the Environment and Public Works Comm.
H.R.1590 Safe Climate Act of 2007	X	X	X	-	-	X	X	-	-	Referred to Energy and Commerce and Foreign Affairs Committees
H.R. 2069 Save Our Climate Act of 2007	X	-	-	-	-	-	-	-	-	Referred to Ways and Means Comm.

Legislation at a Glance

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Climate St...										life and
Electric Utili...										ent and Public
S.309 Global Warming Pollution Reduction Act	X	X	X	-	-	X	X	X	X	Referred to the Environment and Public Works Comm.
S. 485 Global Warming Reduction Act	X	X	X	-	-	X	X	X	X	Referred to Finance Committee
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S. 2191 Americas Climate Security Act of 2007

Voluntary / OTC Markets

- Voluntary carbon markets can be broken into two categories
 - Chicago Climate Exchange (CCX)
 - “Over-the-Counter” (OTC) market
- Voluntary OTC market was worth \$54.9 million in 2006
- CCX market range from around \$1.50 to almost \$7
- Global voluntary market on CCX was worth \$97 million in 2006
- CCX reporting 180% growth in the first quarter of 2008
- 2008 projection; 80M tCO₂e trade



Voluntary Market - VERs

- OTC market is dominated by (3) types of Projects
 - forestry sequestration (36%)
 - renewable energy (33%)
 - industrial gases (30%)
- 2007 average price was US\$4.1 per ton of CO₂e
- Referred to as Verified or Voluntary Emissions Reductions (VERs)
- Current price of carbon credit transacted on OTC market = \$6.10
- 49% increase from the 2006 average of \$4.10



Voluntary Market

- Strong demand for high quality projects in these sectors:
 - landfill methane
 - coal mine methane
 - forestry projects
 - long term sustainable development projects
 - energy efficiency
 - off-grid renewable energy



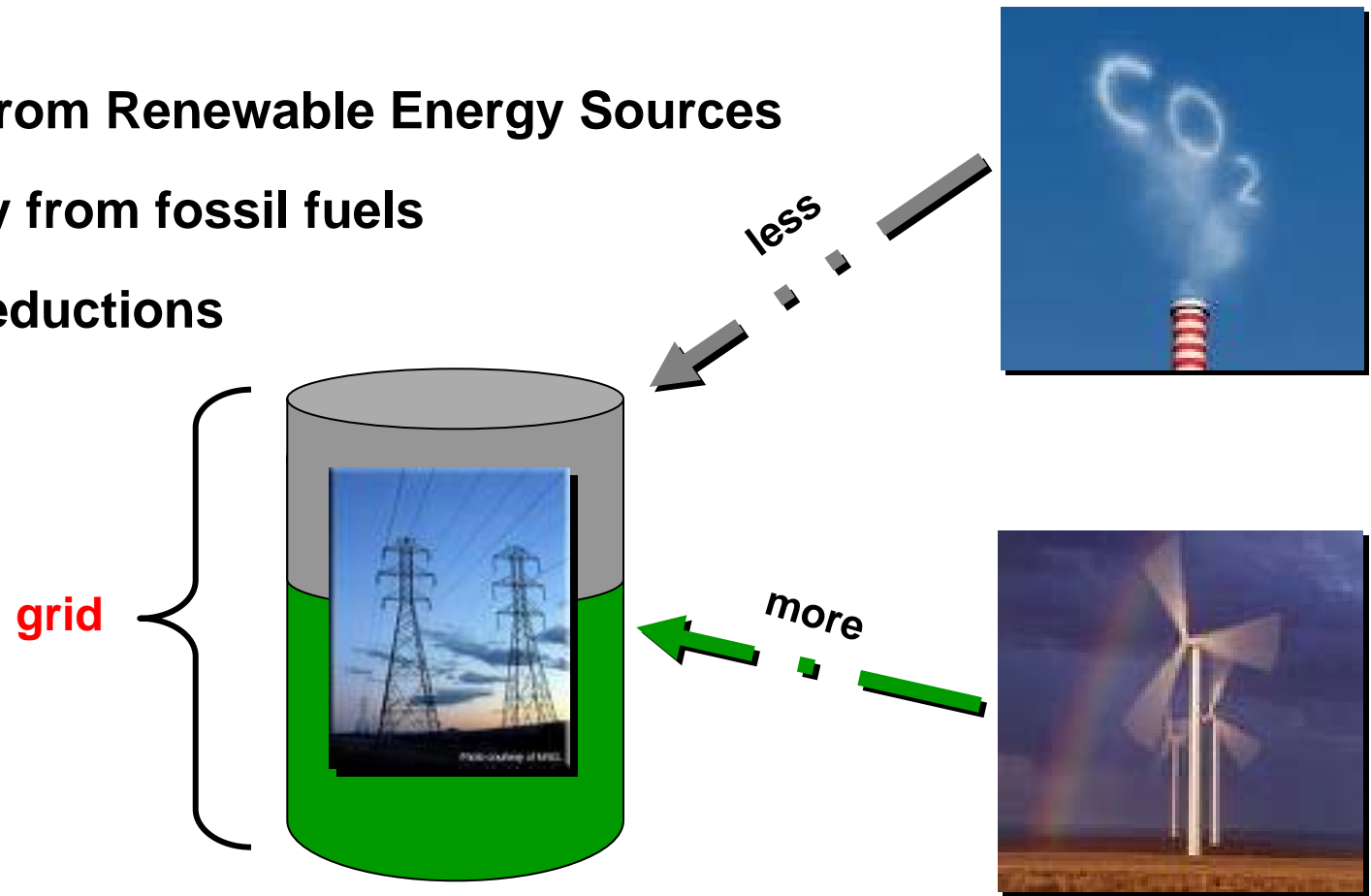
Renewable Energy Credits

How new renewable energy creates CO₂ emission reductions

More Electricity from Renewable Energy Sources

= LESS electricity from fossil fuels

= CO₂ emission reductions

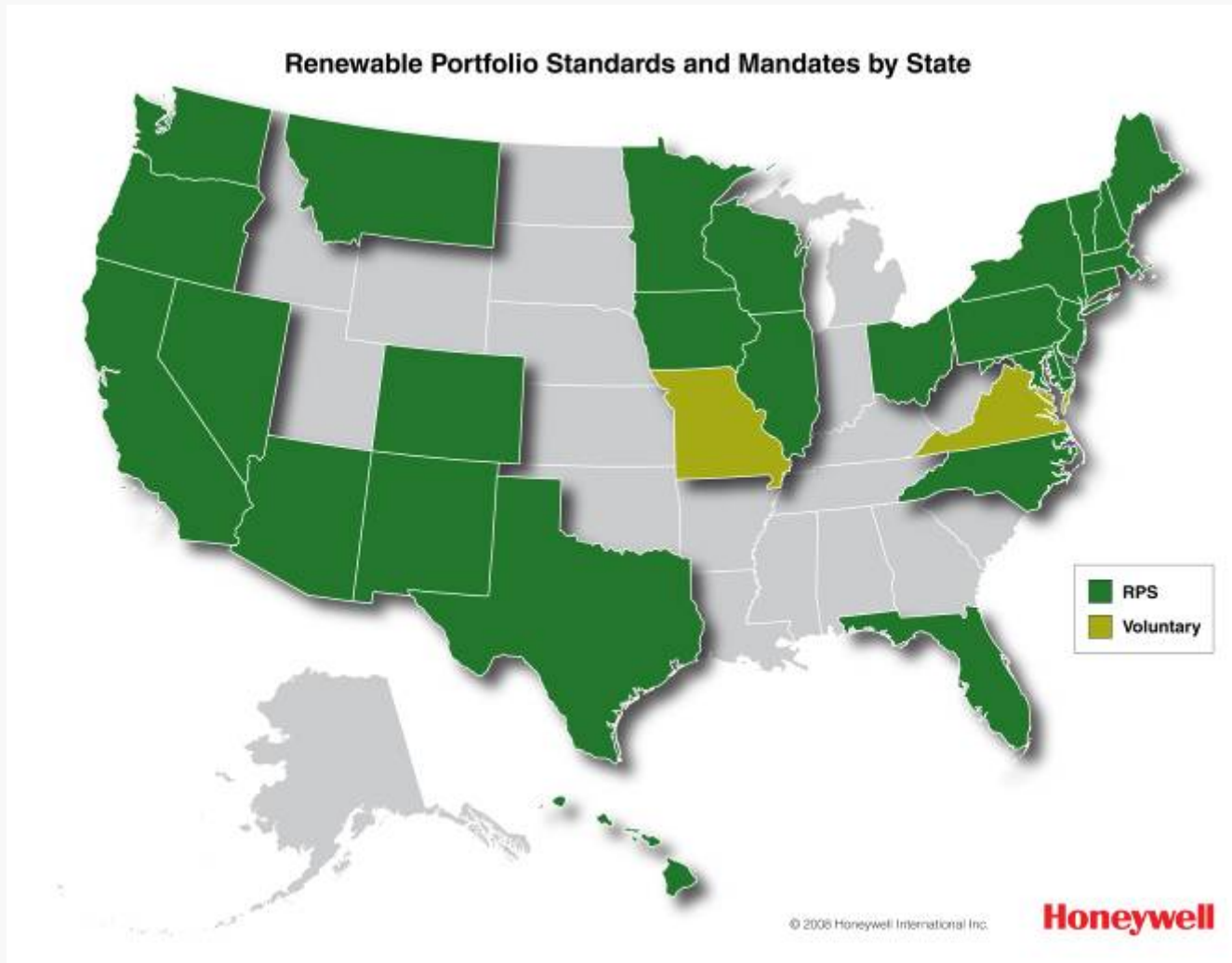


Renewable Energy Credits

- RECs are also known as Green Tags
- NREL expects US REC Sales to reach \$900 million by 2010
- 2004 Sales were \$200M
- Growth comes from trying to meet State requirements
- Tags represent positive attributes from generating renewable energy
- One megawatt hour of renewable energy produces one REC
- Utilities and competitive suppliers use credits to meet Renewable Portfolio Standards (RPS)
- State by State RPS rules mandate specified amounts of power sold to consumers come from green sources



Renewable Portfolio Standards



Renewable Energy Credits

- Mixing RECs and Carbon Offset Markets is an issue
- Integrating these markets has been primarily focused on:
 - Conversion factors
 - Additionality
 - Ownership



REC's vs. Carbon Offsets

- **Conversion factors**

- Since renewable energy is measured in kWh, calculating the amount of fossil fuel “backed off” the grid by a kWh of renewable energy is a key step in converting RECs to carbon offsets
- It is critical that suppliers utilize a conversion factor that matches the geographic location of the REC produced

- **Additionality**

- Unlike the carbon markets, the REC markets do not utilize additionality tests
- Critics of using RECs as carbon offsets believe a REC must pass an appropriate additionality test in order to be sold as a carbon offset

- **Ownership**

- Ambiguity concerning ownership in the REC market raises concerns that the environmental benefits associated with a REC could be ‘double counted’ when RECs are sold into the carbon offset market



Other Credits

- Buyers also pursue so-called 'Voluntary' Credits
- Voluntary Credits fund renewable projects as an act of goodwill
- White Tags
- Similar to a green tag
- White tag is equal to 1 MWh
- Represents energy saved through conservation
- Rather than energy produced through renewable



“Standards” - Major Trends for 2007

- The role and rise of 3rd party standards
- Approx. 87% of credits transacted in the OTC market were verified by a 3rd party
- High Quality leads to legitimacy
- Buyers increasingly asked for certified credits
- Several standards, were launched in 2007
 - includes the Voluntary Carbon Standard and the Verifiable Energy Reduction (VER+)



“Standards” - Major Trends for 2007

- Most utilized OTC market project standards were (in order):
 - Voluntary Carbon Standard (VCS)
 - VER+
 - Gold Standard for VERs.
- Already-established standards or protocols further defined their roles in the market



Pathway to ACUPCC Commitment

Overview

**Commitment
Letter
Signed**



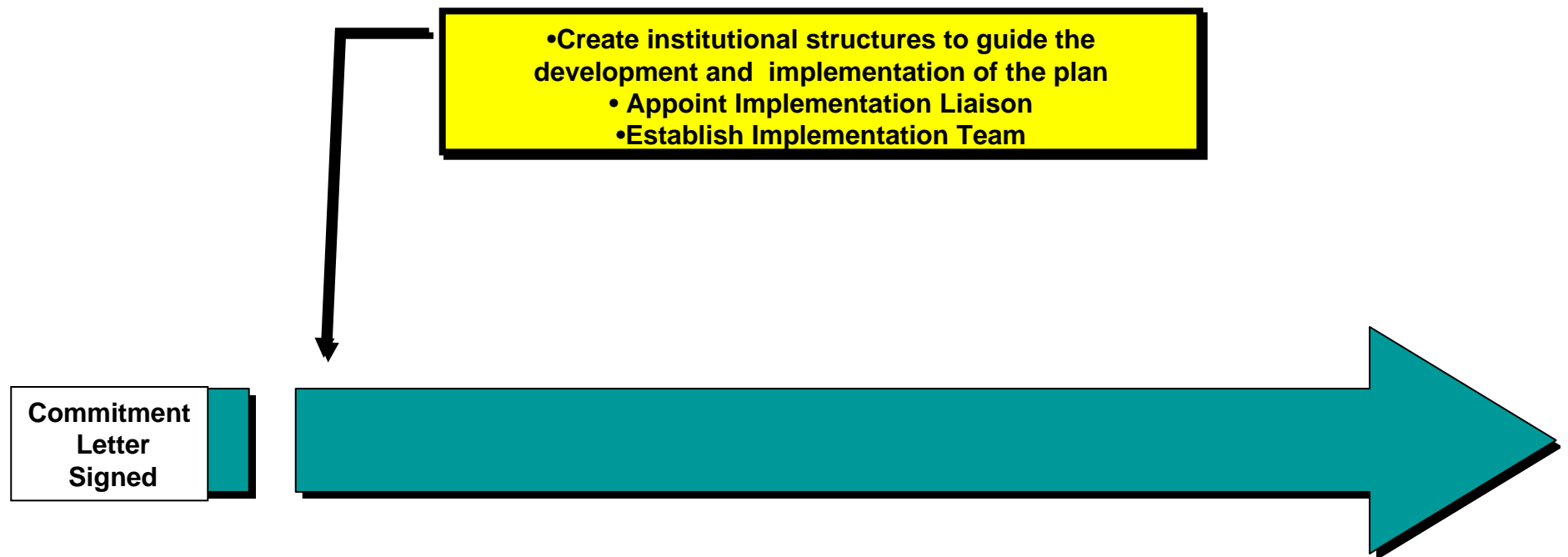
Pathway to ACUPCC Commitment

Overview



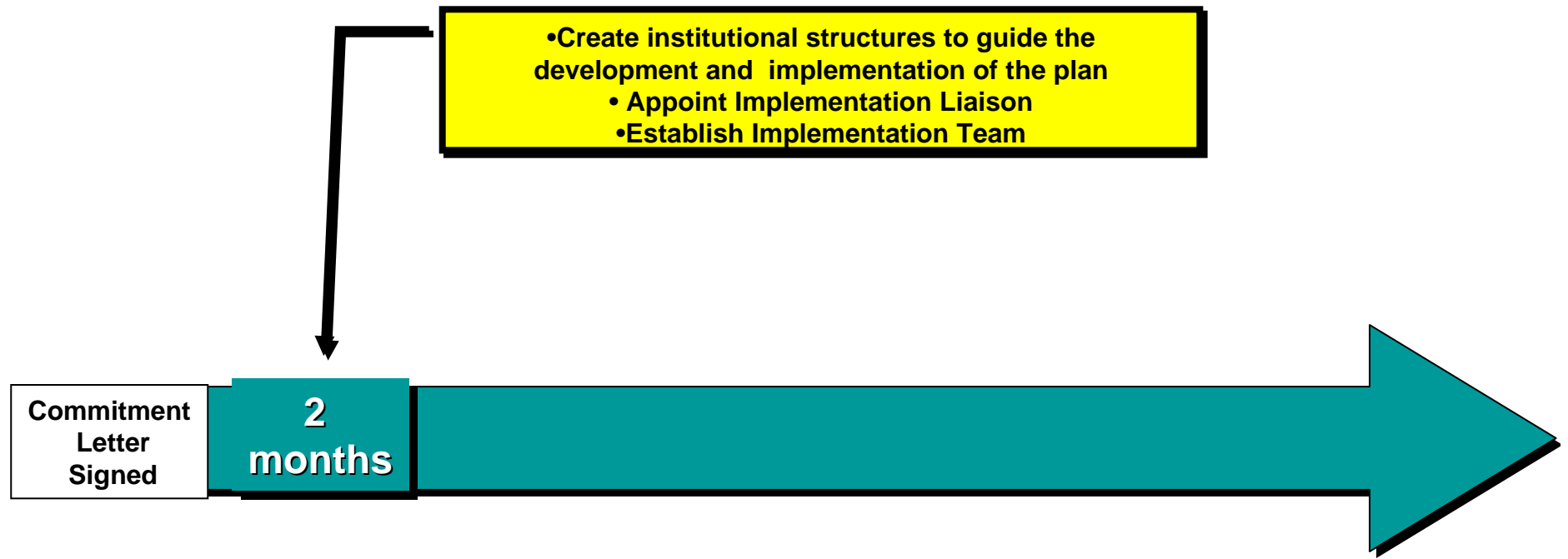
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Overview



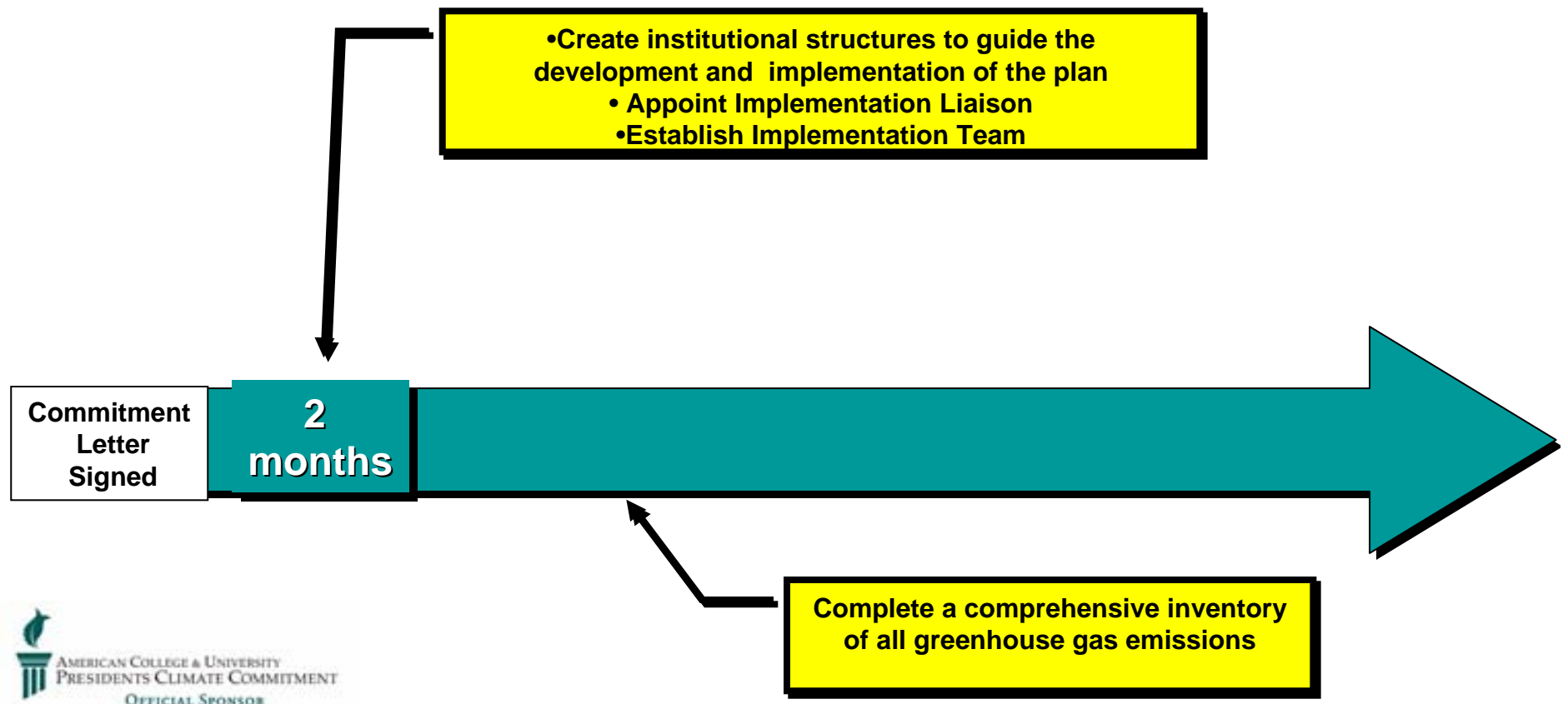
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Overview



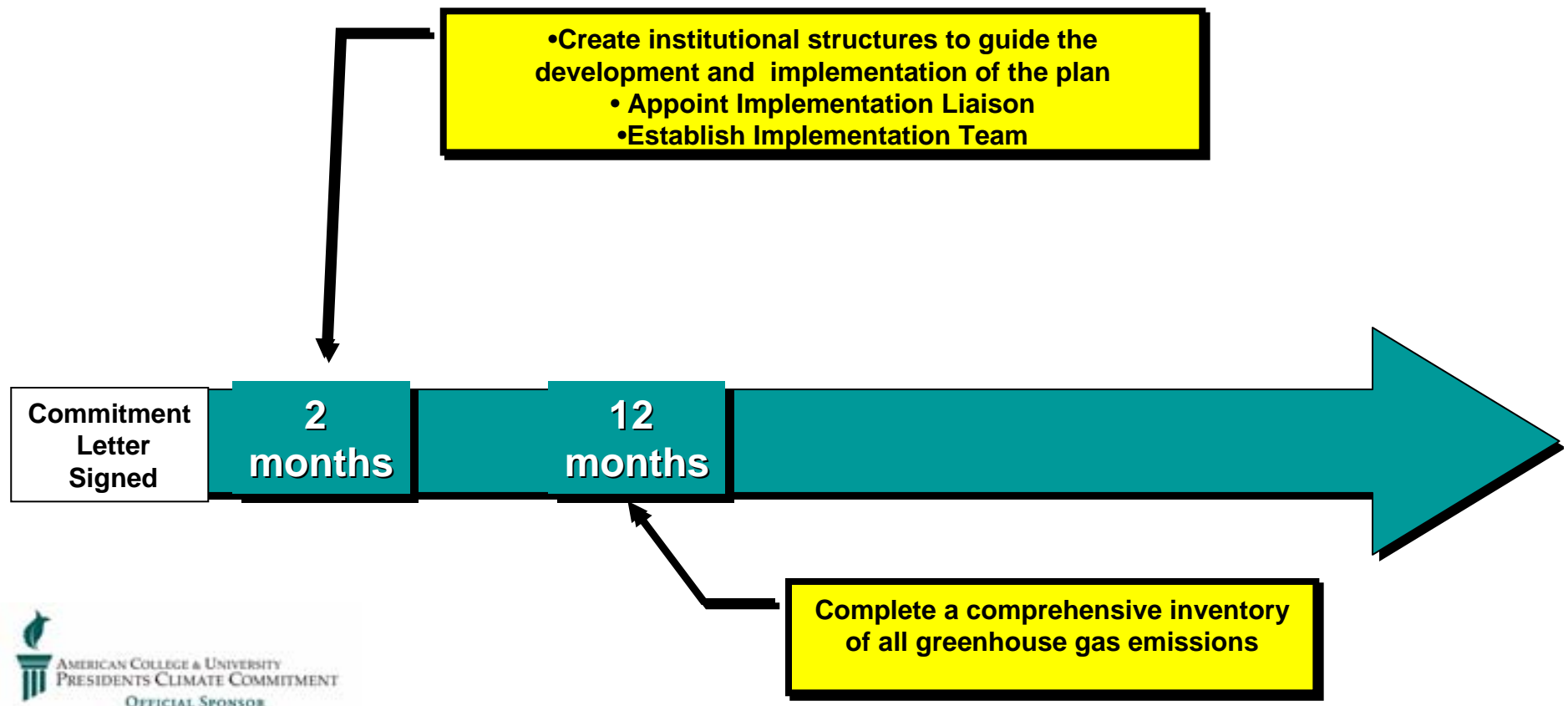
Pathway to ACUPCC Commitment

Overview



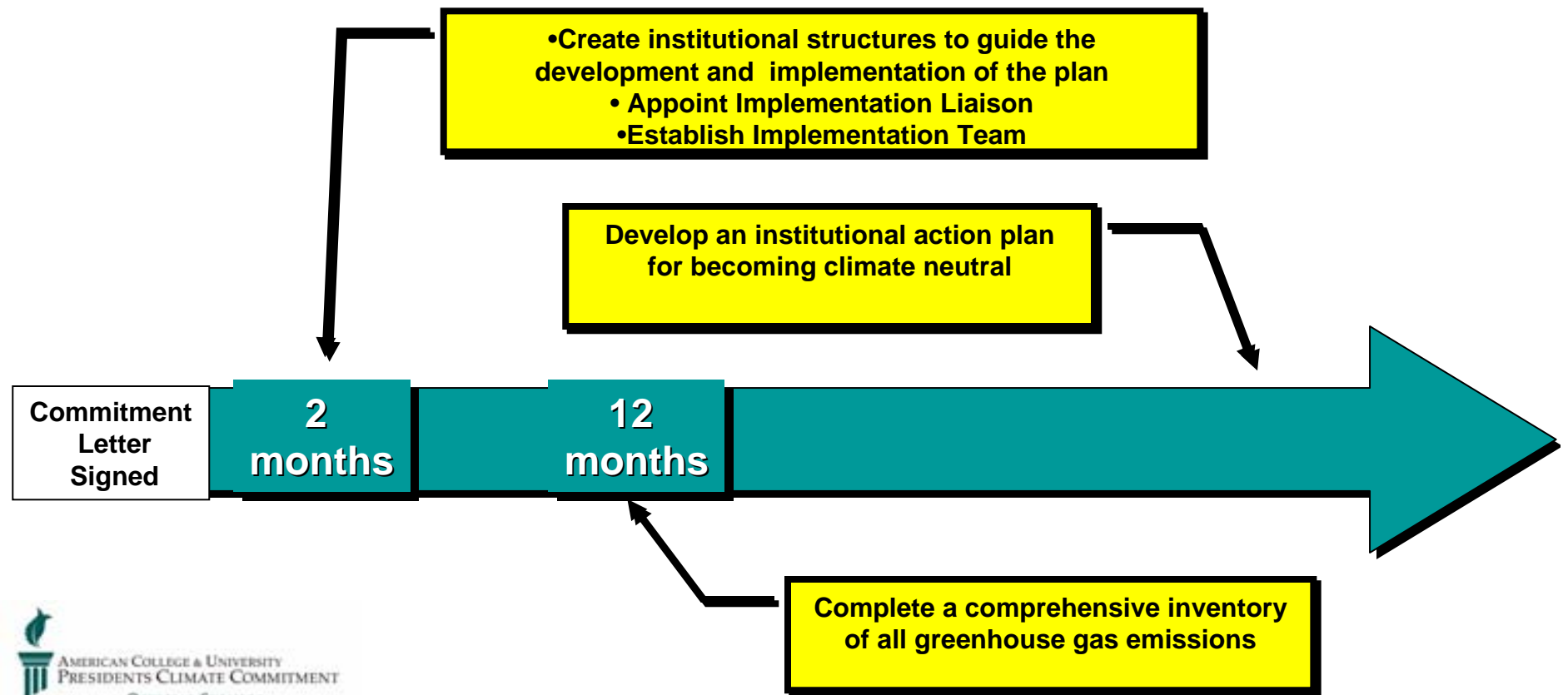
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Overview



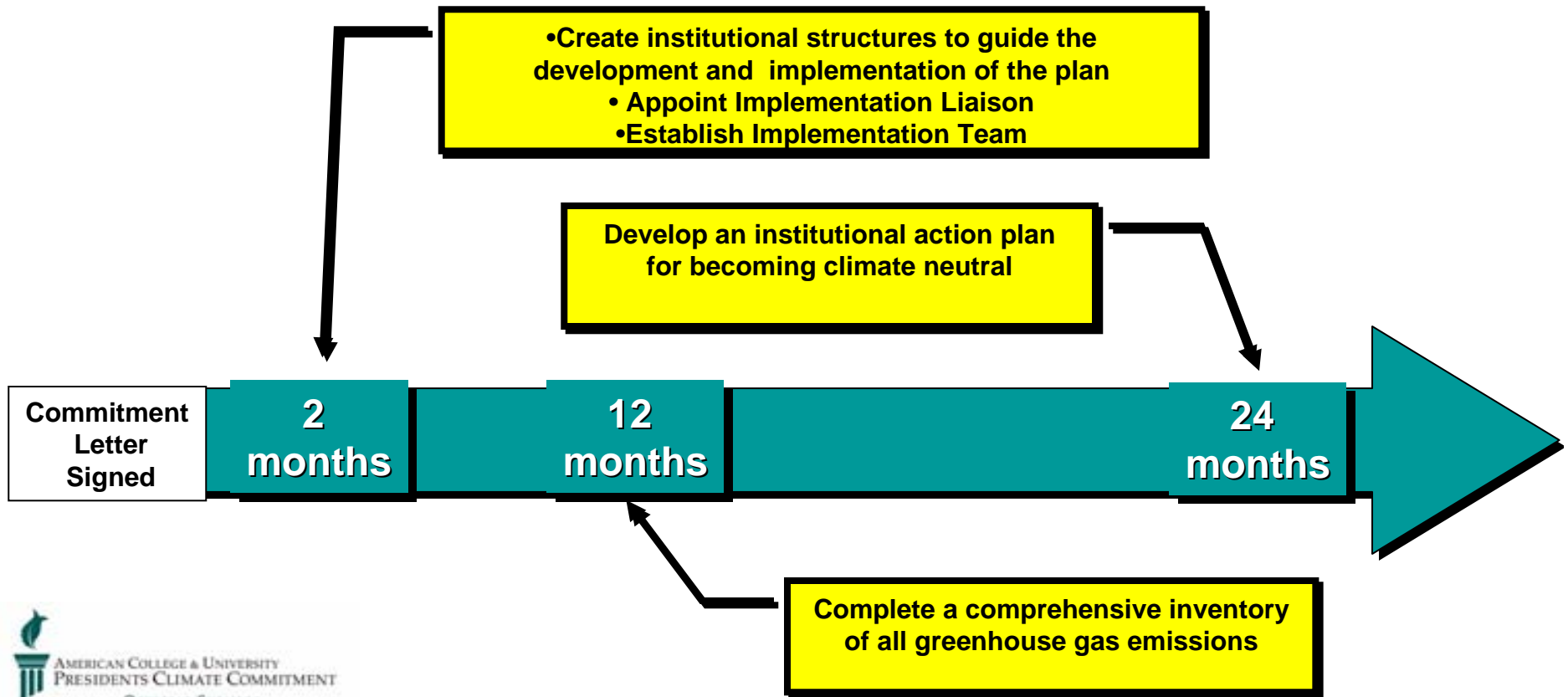
Pathway to ACUPCC Commitment

Overview



Pathway to ACUPCC Commitment

Overview



ACUPCC Voluntary Carbon Offset Protocol

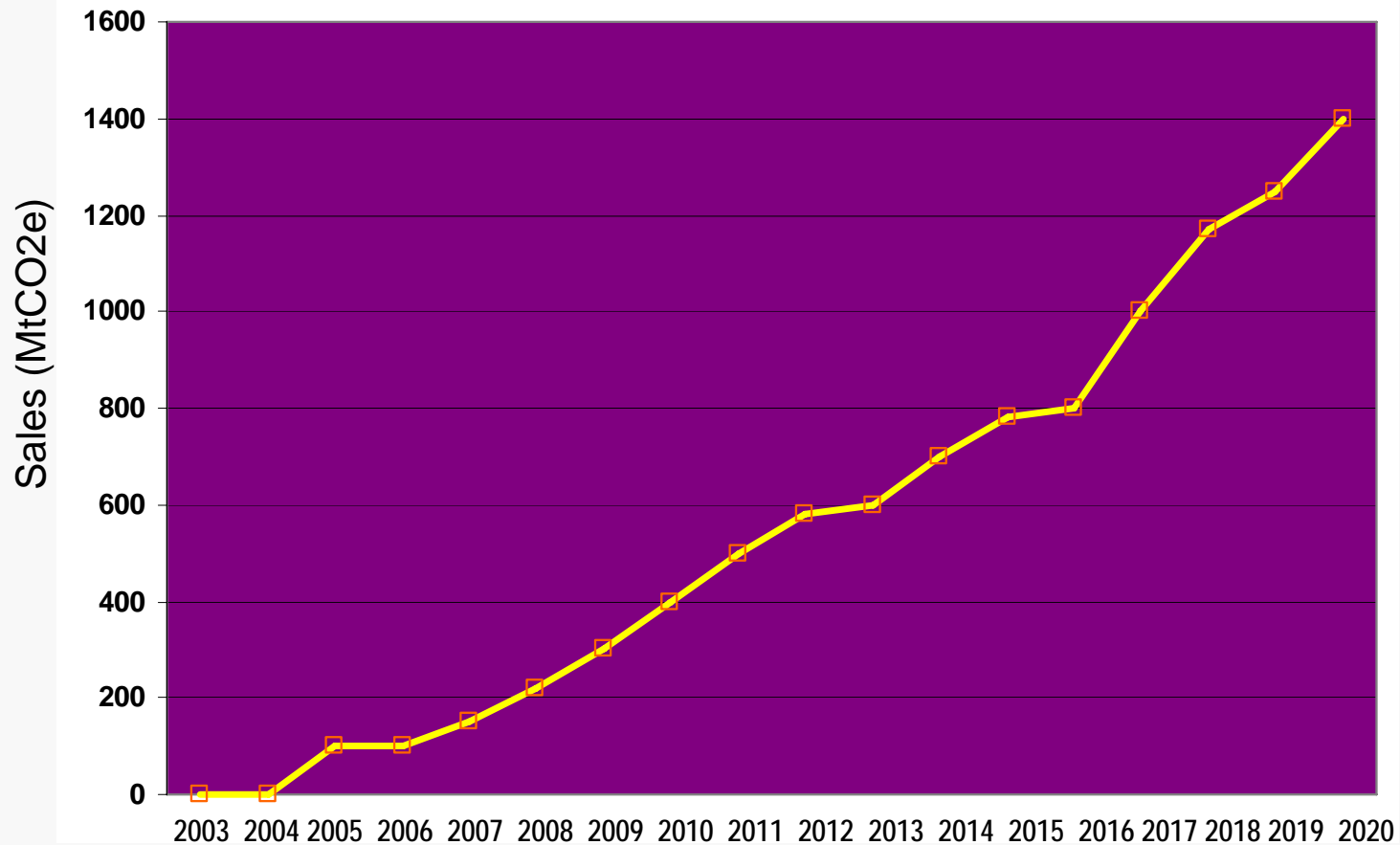
- Spearheaded by ACUPCC Signatory Presidents
- Goals:
 - Provide clarity, reduce risks, and create opportunities around investing in offsets by providing guidelines
 - Make a necessary contribution to the international dialogue on these emerging markets
- Timeline: 1st draft in May, 2nd draft in July, final protocol release September
- First draft and more details available at:
<http://presidentsclimatecommitment.org/offsetprotocol.php>
- Comments due May 27th, please review and provide feedback!



Thank You

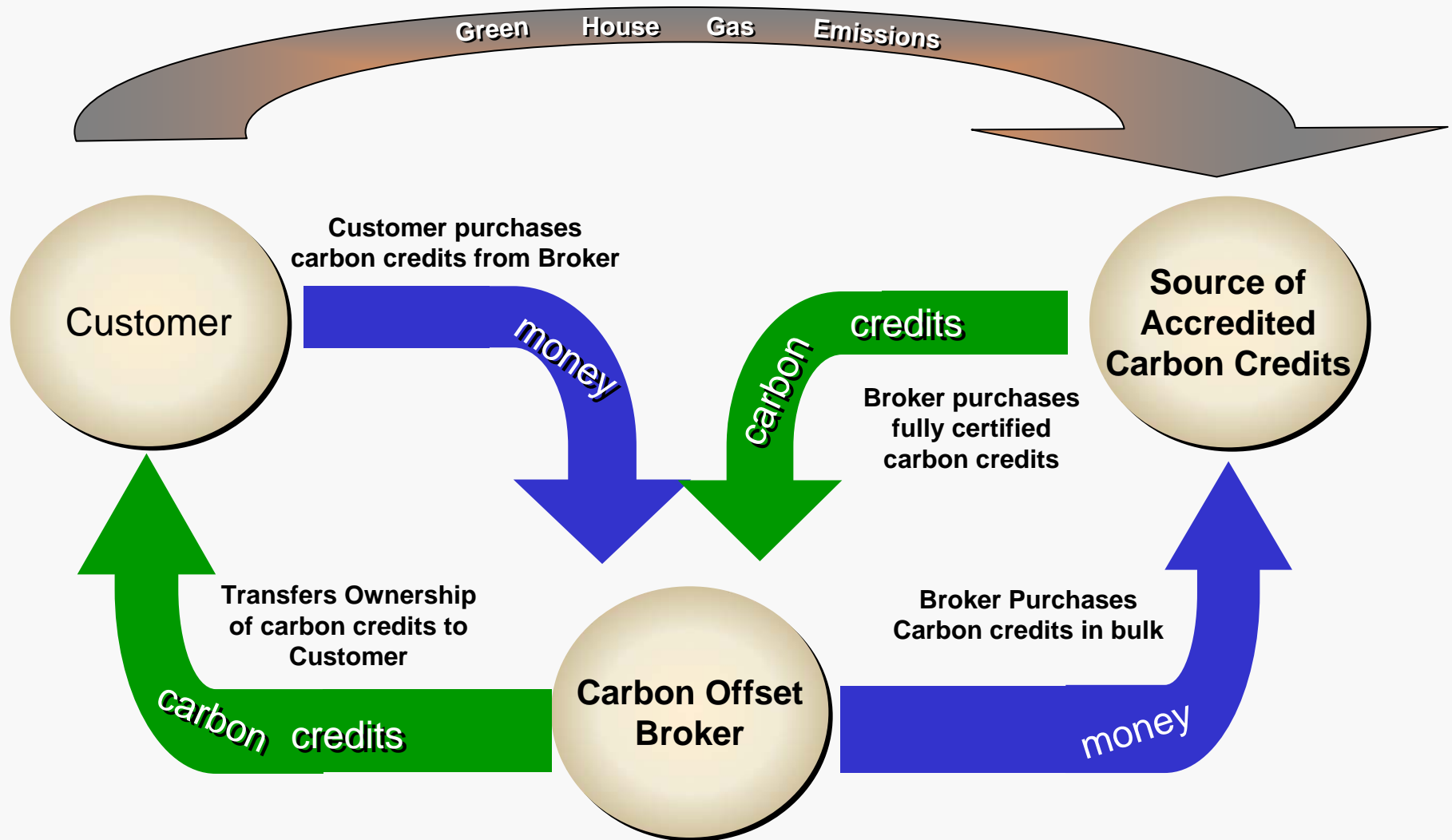


Future Growth for the Voluntary Carbon Markets



Source: Ecosystem Marketplace, New Carbon Finance

Carbon Credits - Offsets



ANTHRACITE		WOOD PELLETS		WOOD SCRAP		FUEL OIL		NATURAL GAS		ELECTRICITY	
25,000,000 BTUs Per Ton		14,000,000 BTUs Per Ton		20,000,000 BTUs Per Cord		138,690 BTUs Per Gallon		1,000,000 BTUs Per Thousand MCF		3,413 BTUs Per Kilowatt-Hour (KWH)	
Fuel Unit Cost \$/Ton	Unit Cost \$/MMBTUs	Fuel Unit Cost \$/Ton	Unit Cost \$/MMBTUs	Fuel Unit Cost \$/Cord	Unit Cost \$/MMBTUs	Fuel Unit Cost \$/Gal.	Unit Cost \$/MMBTUs	Fuel Unit Cost \$/MCF	Unit Cost \$/MMBTUs	Fuel Unit Cost \$/kWh	Unit Cost \$/MMBTUs
\$130.00	\$5.20	\$150.00	\$10.71	\$130.00	\$6.50	\$1.50	\$10.82	\$12.00	\$12.00	\$0.07	\$20.51
\$140.00	\$5.60	\$160.00	\$11.43	\$140.00	\$7.00	\$1.60	\$11.54	\$12.50	\$12.50	\$0.07	\$21.68
\$150.00	\$6.00	\$170.00	\$12.14	\$150.00	\$7.50	\$1.70	\$12.26	\$13.00	\$13.00	\$0.08	\$22.85
\$160.00	\$6.40	\$180.00	\$12.86	\$160.00	\$8.00	\$1.80	\$12.98	\$13.50	\$13.50	\$0.08	\$24.03
\$170.00	\$6.80	\$190.00	\$13.57	\$170.00	\$8.50	\$1.90	\$13.70	\$14.00	\$14.00	\$0.09	\$25.20
\$180.00	\$7.20	\$200.00	\$14.29	\$180.00	\$9.00	\$2.00	\$14.42	\$14.50	\$14.50	\$0.09	\$26.37
\$190.00	\$7.60	\$210.00	\$15.00	\$190.00	\$9.50	\$2.10	\$15.14	\$15.00	\$15.00	\$0.09	\$27.54
\$200.00	\$8.00					\$2.20	\$15.86	\$15.50	\$15.50	\$0.10	\$28.71
						\$2.30	\$16.58	\$16.00	\$16.00	\$0.10	\$29.89
						\$2.40	\$17.30	\$16.50	\$16.50	\$0.11	\$31.06
						\$2.50	\$18.03	\$17.00	\$17.00	\$0.11	\$32.23
						\$2.60	\$18.75	\$17.50	\$17.50	\$0.11	\$33.40
						\$2.70	\$19.47	\$18.00	\$18.00	\$0.12	\$34.57
						\$2.80	\$20.19	\$18.50	\$18.50	\$0.12	\$35.75
						\$2.90	\$20.91	\$19.00	\$19.00	\$0.13	\$36.92
						\$3.00	\$21.63	\$19.50	\$19.50	\$0.13	\$38.09
								\$20.00	\$20.00	\$0.13	\$39.26
								\$20.50	\$20.50	\$0.14	\$40.43
								\$21.00	\$21.00	\$0.14	\$41.61
								\$21.50	\$21.50	\$0.15	\$42.78
								\$22.00	\$22.00	\$0.15	\$43.95
								\$22.50	\$22.50	\$0.15	\$45.12

Fuel Cost Comparisons

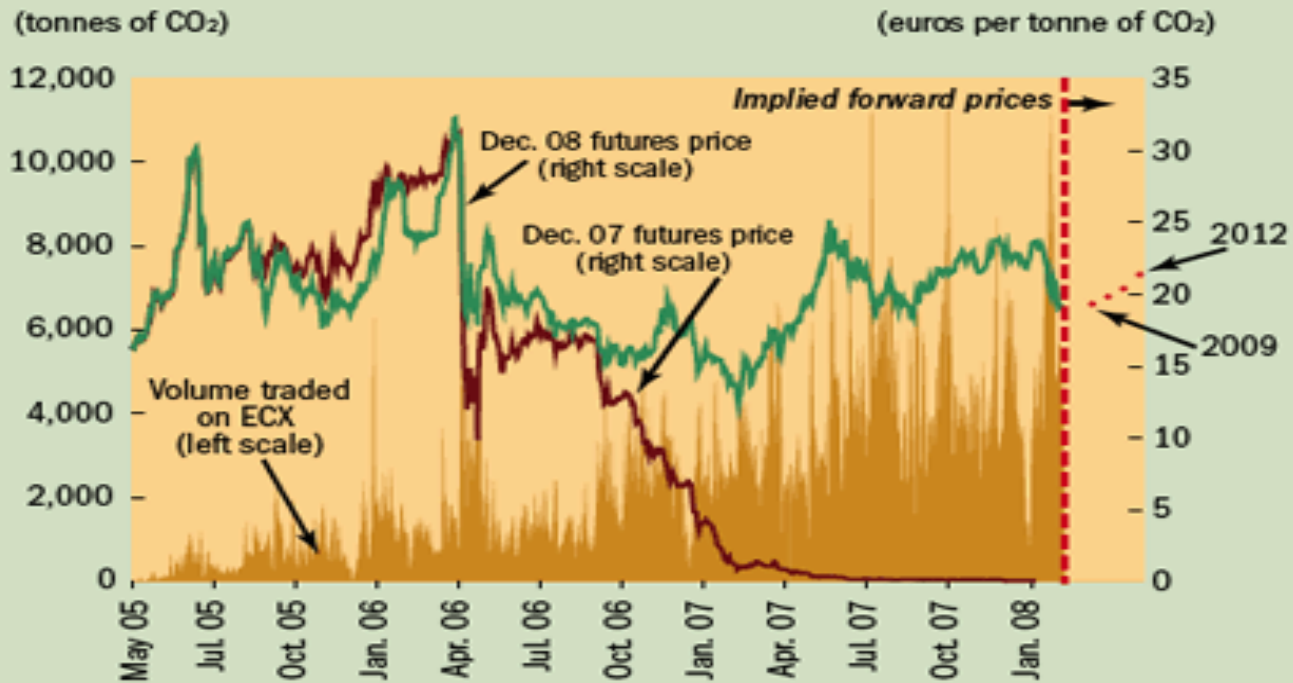


EU Cap and Trade

Chart 1

Active green trading

Carbon trading in the European Union has been growing, despite price volatility.



Source: European Climate Exchange (ECX).
Note: Data as of February 5, 2008.