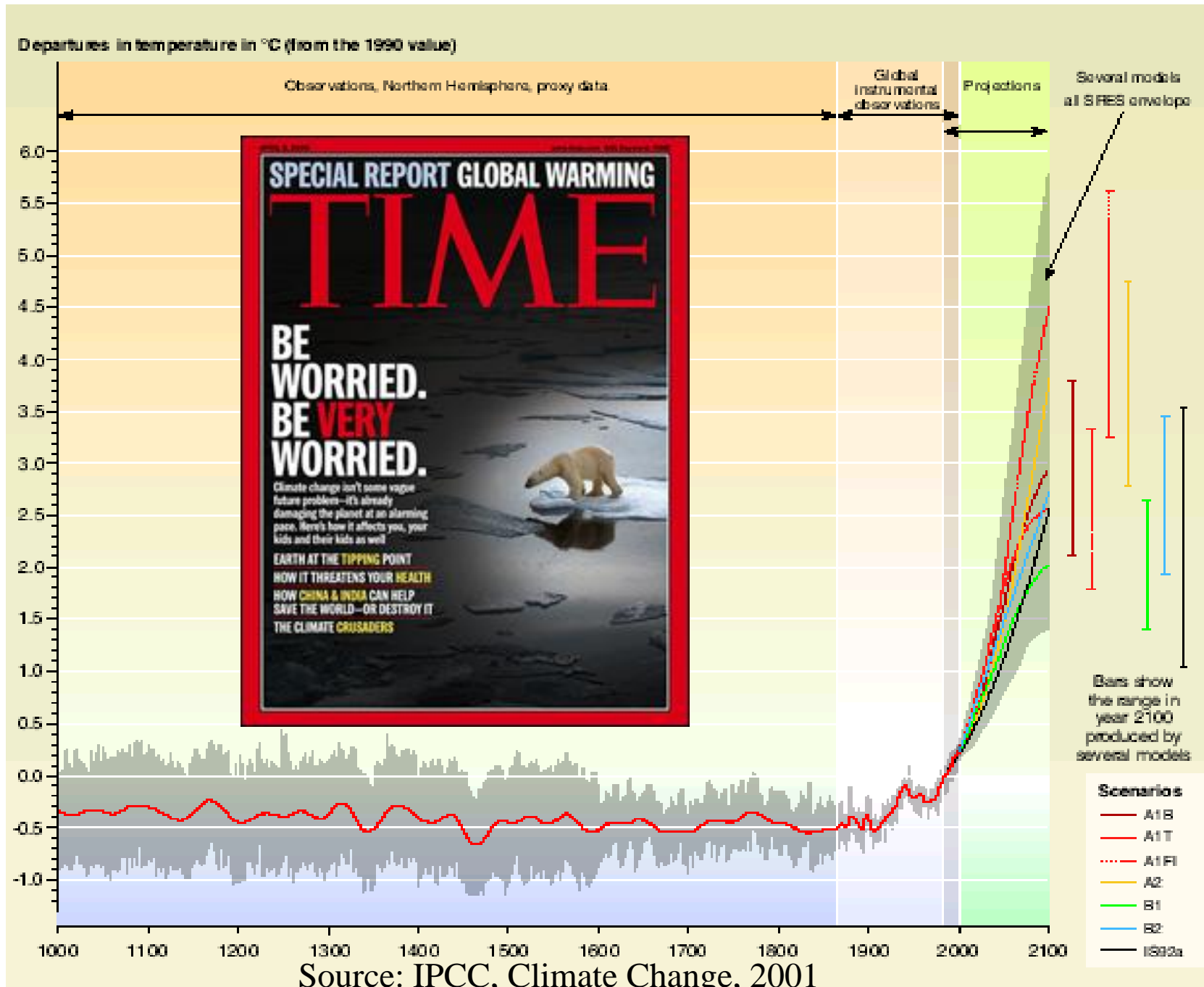


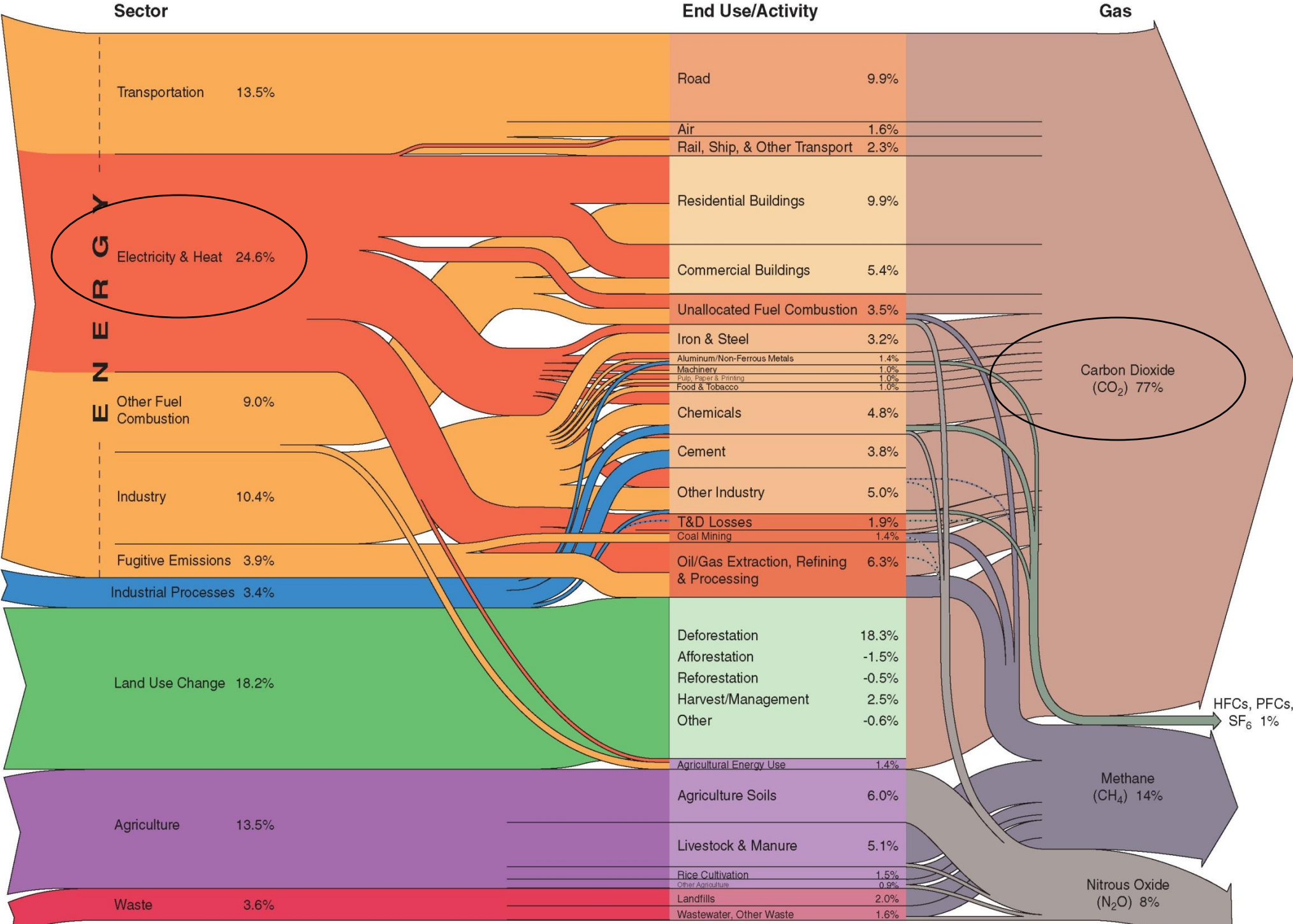
Mobilizing Resources for a Green Energy Matrix

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Increasing greenhouse gases and atmospheric temperature



GHG Flow Diagram: Global Emissions



Source: WRI

International Agreements to Address Climate Change

United Nations Framework Convention On Climate Change (UNFCCC) - 1992

- Ultimate objective of **stabilizing** global greenhouse gas concentrations in the atmosphere
- Developed countries (Annex I countries) to
 - **aim to restore** GHG emissions to 1990 levels
 - Support **capacity building** in, and facilitate **technology transfer** to developing countries to mitigate, and to adapt to climate change
- Key concept: “**common but differentiated responsibility according to respective capabilities**”

The Kyoto Protocol to the UNFCCC - 1997

- 38 Developed Countries and Economies in Transition (Annex B countries) agreed in 1997 to:
 - reduce GHG emissions by 5.2 % below 1990 levels in the commitment period 2008-2012
 - Create market mechanism to manage the cost of GHG reductions
- **Status:** In force since February 2005
 - Coming into force: required ratification of 55 Parties to UNFCCC representing 55 % of CO2 emissions
 - United States (36% of GHG emission) is not a Party
- Marrakech Accord: agreed in Nov 2001 sets rules of implementation

The Copenhagen Accord

Drafted at a meeting between the US, China, India, Brazil and South Africa on the last day and >100 countries have signed up to the accord, representing more than >80% of global emissions.

- Aims to limit global mean temperature increase to 2°C
- Technology transfer and financing (of \$ 100 billion/ year by 2020)

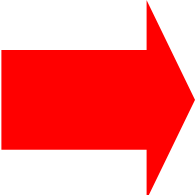
Developed countries take on 2020 targets:

- Japan: 25% below 1990 levels
- New Zealand: 10-20% below 1990 levels
- Australia: 5-25% below 2000 levels
- Europe: 20-30% below 1990 levels
- United States: 17% below 2005 levels
- **Implications:** Cap and trade schemes to meet target cost-effectively and measures to increase renewable energy and energy efficiency investment.

Nationally Appropriate Mitigation Actions (NAMAs) of developing countries:

- China - reduce carbon intensity by 40%-45% on 2005 levels by 2020
- India - reduce carbon intensity by 20%-25% on 2005 levels by 2020
- **Implications:** new investment in renewable sources of energy and energy efficiency. Many new investment and carbon offset opportunities.

Policy measures for mitigation of GHG emissions

	Instrument	Advantages	Limitations
Market/ Price- based	Cap-and-trade & Carbon Offsets	<ul style="list-style-type: none"> • Allows market to set price of carbon • Catalyzes lowest-cost abatement • Engages private sector • Markets can be linked 	<ul style="list-style-type: none"> • Price signals can be volatile and short-term • International leakage a problem • Transaction costs can be high
	Carbon tax	<ul style="list-style-type: none"> • Creates clear price signal • Mobilizes public sector resources • Can offset with tax reduction 	<ul style="list-style-type: none"> • No uniform application across borders • Cannot be certain of quantity of emission reductions • Politically unattractive
Other policies and measures	Standards and regulations	<ul style="list-style-type: none"> • Can be targeted at specific behaviors • Implement and monitor directly 	<ul style="list-style-type: none"> • May be less efficient and more costly than market mechanisms
	Subsidies for clean technologies	<ul style="list-style-type: none"> • Can effectively catalyze investment into targeted sectors • Relatively simple to implement and monitor 	<ul style="list-style-type: none"> • May be less efficient and more costly than market mechanisms
	R&D	<ul style="list-style-type: none"> • Can accelerate development of new technologies • Helps overcome market failure (under-investment in public goods) 	<ul style="list-style-type: none"> • May be less efficient and more costly than market mechanisms
	Carbon markets	<ul style="list-style-type: none"> • Needed to implement cap-and-trade with development benefits • Can complement other measures 	

Climate Change Financing Instruments

Global Environment Facility:

- For “incremental costs”
- Current replenishment \$1 billion for CC until 2010, ~\$250 m per year
- WB’s cumulative GEF portfolio in CC = \$1.7b linked to \$14b investments

Climate Investment Funds: to scale of climate finance

- Clean Technology Fund: ~ 5 billion to finance scaled-up demonstration, deployment and transfer of low carbon technologies for larger countries
- Strategic Climate Fund: ~2 billion for targeted programs with dedicated funding to pilot new approaches with potential for scaling up
 - Pilot Program for Climate Resilience
 - Forest Investment Program for REDD activities
 - Scaling Up Renewable Energy in Low Income Countries

Carbon Finance:

- Performance based payments for GHG reduction based on market determined price
- Began with PCF, has worked to establish 11 funds with over \$2 billion under management across range of technologies & sectors
- Currently working on Carbon Partnership Facility (CPF) for beyond 2012

CLIMATE INVESTMENT FUNDS

Clean Technology Fund

Finance scaled-up demonstration, deployment and transfer of low carbon technologies

Country Investment Plans

- Support countries' development strategies
- Leverage financial products of International Financial Institutions
- Stimulate private sector engagement

±\$5 billion

Strategic Climate Fund

Targeted programs with dedicated funding to pilot new approaches with potential for scaling up

Pilot Program for Climate Resilience

Mainstream climate resilience into core development planning

Scaling Up Renewable Energy in Low Income Countries

Begin transformational change by use of renewable energy

just approved

Forest Investment Program

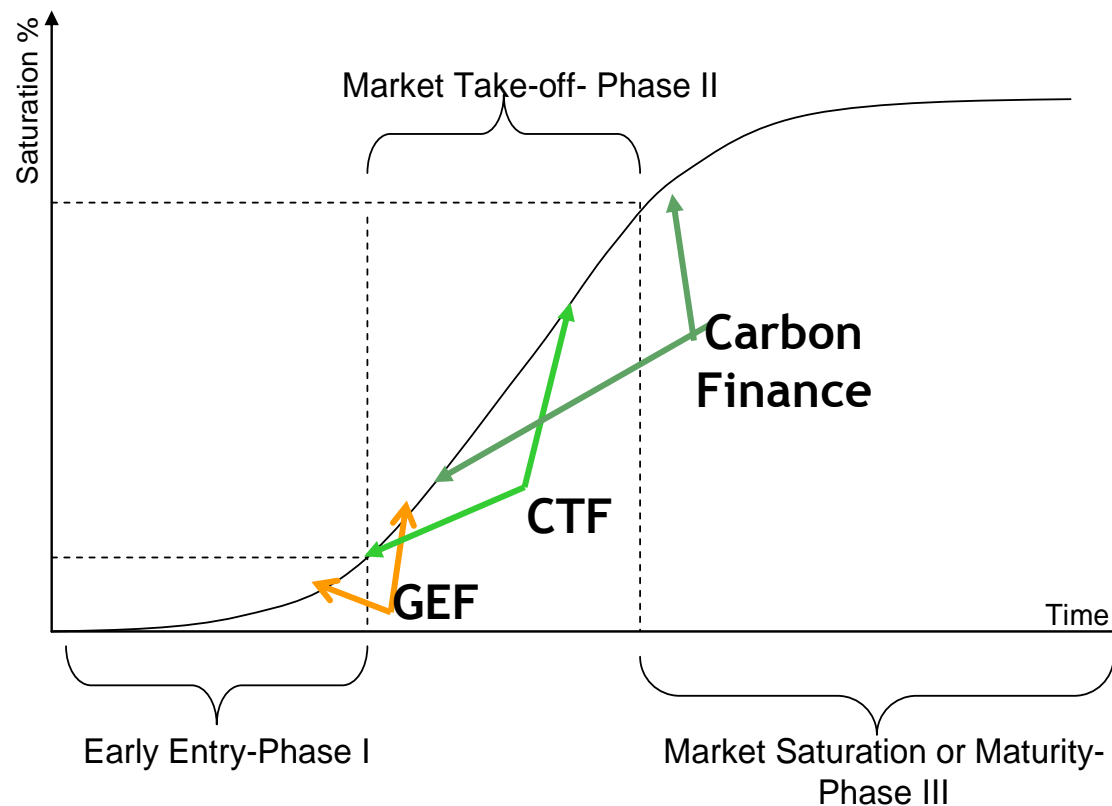
Reduce emissions from deforestation and forest degradation

under design

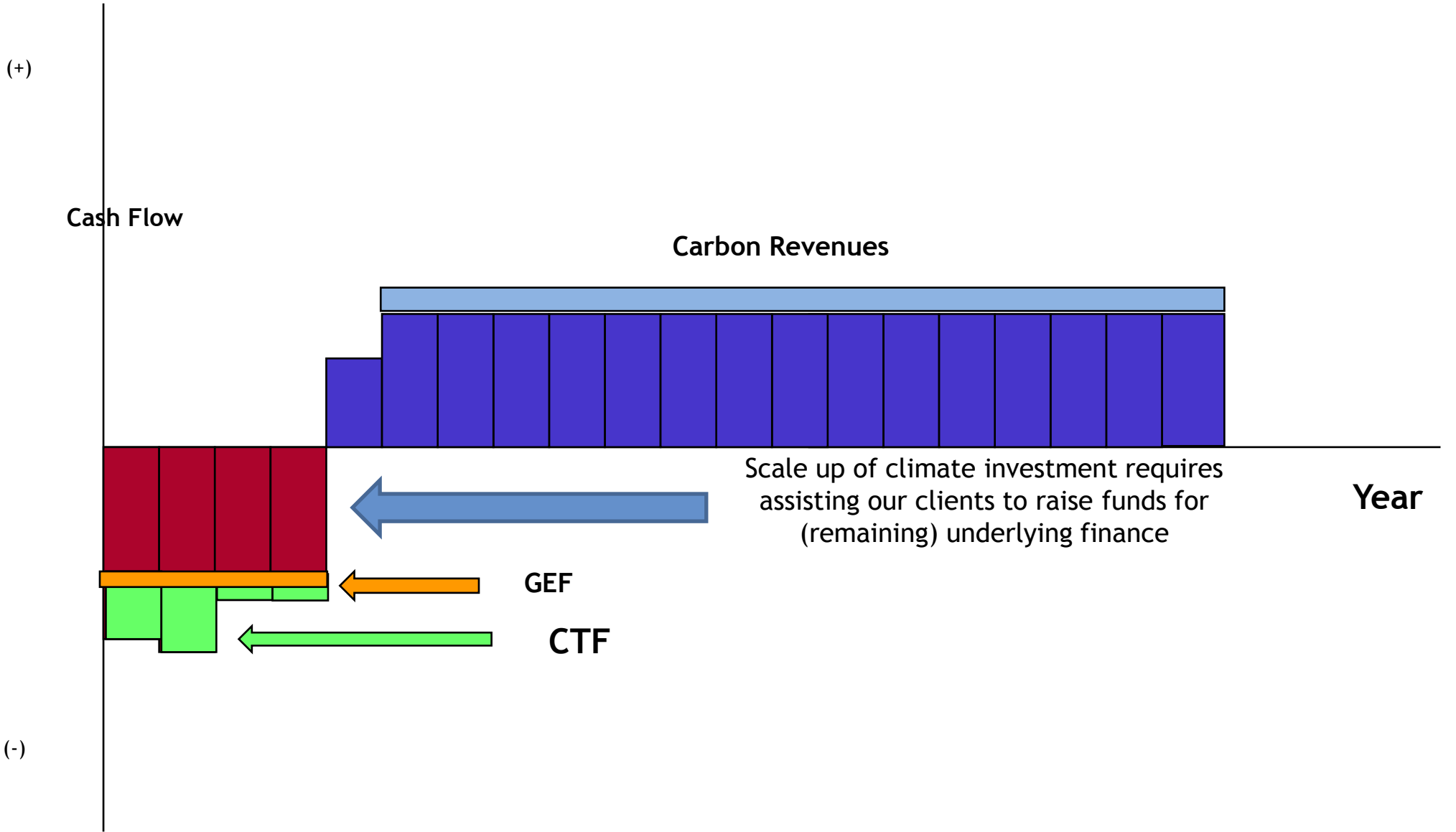
±\$2 billion

GEF, CTF and Carbon Finance Working to Grow Low-Carbon Market

Adoption of Innovation

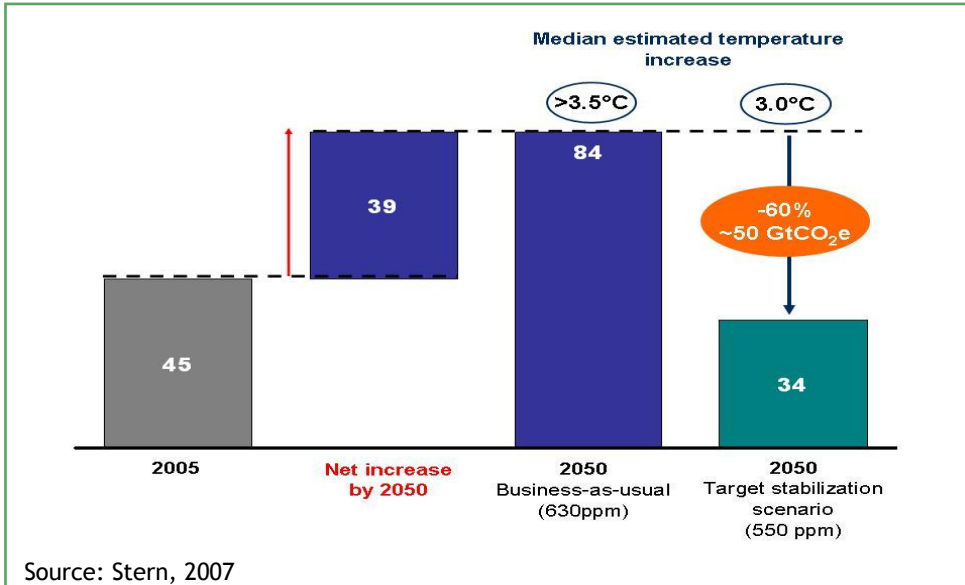


Climate Finance Instruments



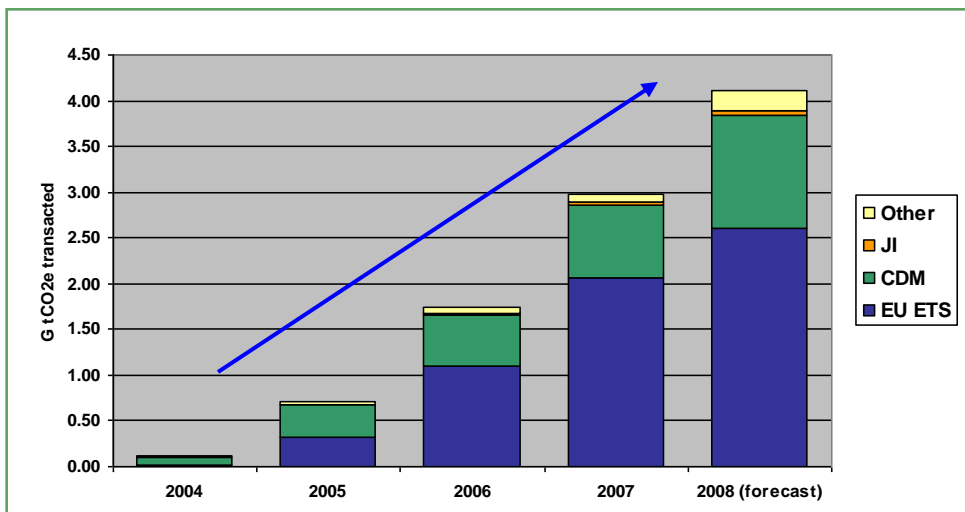
Reductions of 50 GtCO₂e/year needed by 2050: Current trading is very small (only 4 GtCO₂e* expected in 2008)

1. Effort required to stabilize emissions by 2050 (GtCO₂e)



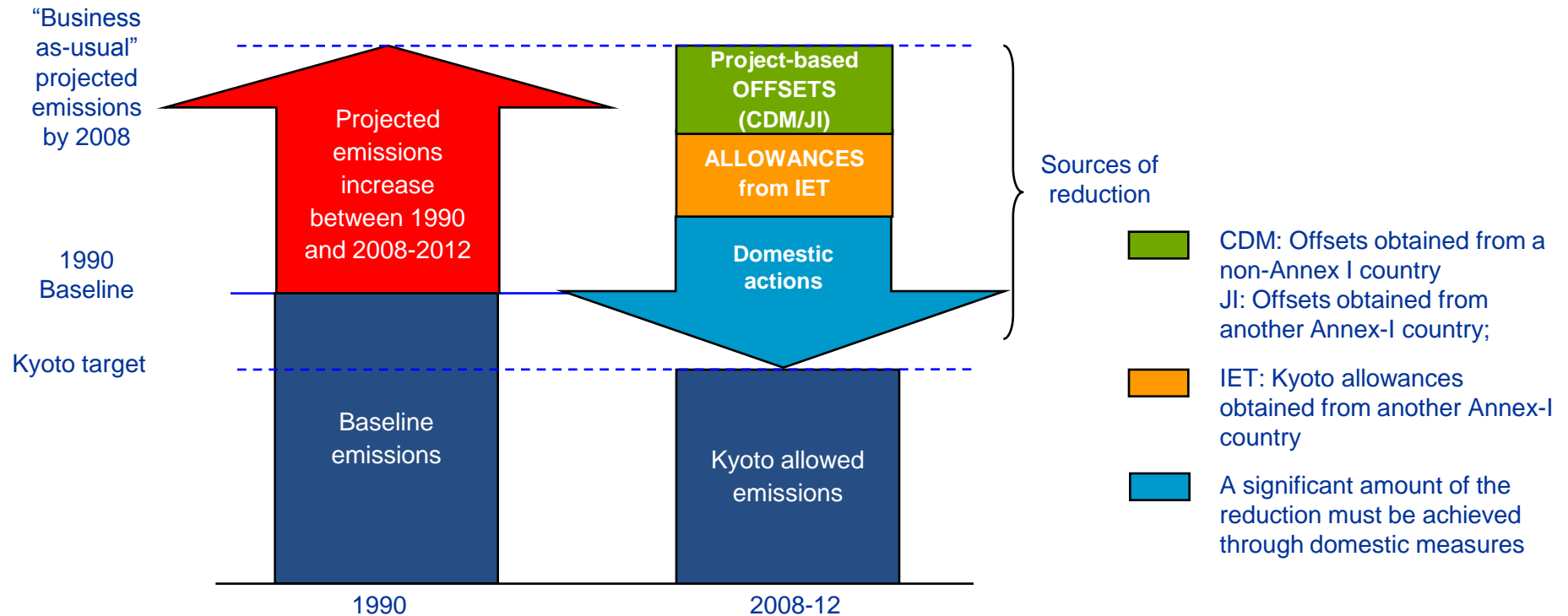
- Dramatic reductions of GHG emissions required. Unless addressed, emissions and temperature will rise to unacceptably high levels.
- Stabilization at 550 ppm CO₂e by 2050 needs emissions to go down 60% from business-as-usual.
- Mitigation efforts over the next two to three decades will be critical.
- 50 GtCO₂e per year needed by 2050.

2. Volume of carbon transacted (GtCO₂e)



- Current carbon trading is 4 GtCO₂e but actual physical volume of reduction barely half of that amount as the market includes large trade in permits (essentially quotas repeatedly changing hands).
- Enormous gap between effort needed and current volumes.

Kyoto Protocol and the creation of the carbon markets



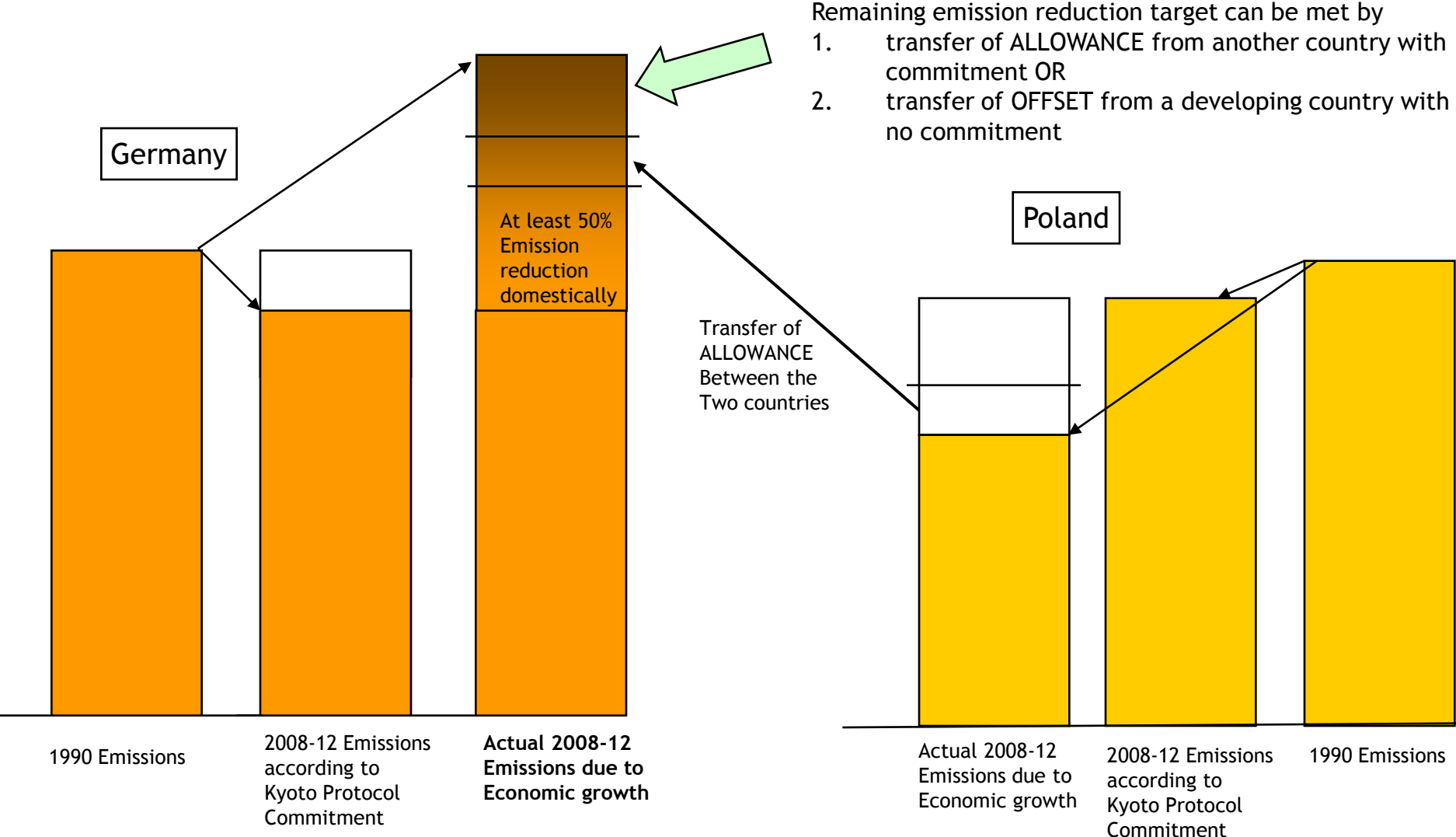
Beyond domestic actions to reduce emissions, a country can use trading to purchase reductions in another country to achieve compliance with its Kyoto obligations.

Examples of trading options include:

- Buying emissions allowances (AAUs) from other countries with commitments which are below their Kyoto cap (International Emissions Trading)
- Purchasing carbon offsets from projects
 - In developing countries (Clean Development Mechanism - CDM)
 - In economies in transition (Joint Implementation - JI)

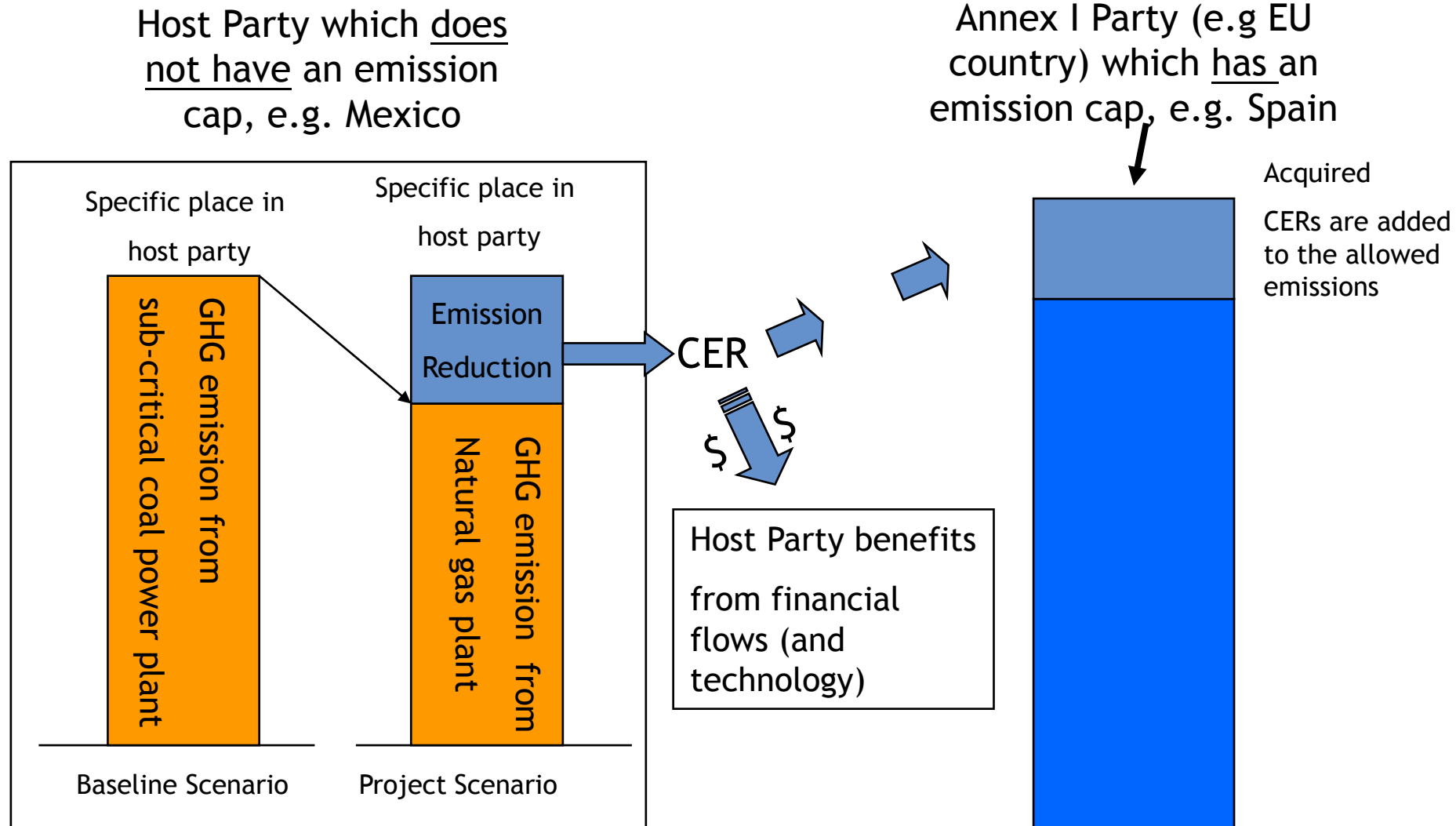
Carbon Market and the Kyoto Protocol

1. Kyoto creates binding greenhouse gas emission limit of about 5.2% but the growth in emissions imply reductions of the range of 20-30% from business as usual for most OECD
2. Collapse of many former Soviet Union economies allows these countries to engage in trade of allowances



Carbon Market and the Kyoto Protocol

1. Kyoto creates binding greenhouse gas emission limit only for OECD and FSU economies
2. Allows a part of the OFFSETS (= emission reductions, also called Certified Emission Reductions) to be generated in developing and emerging (host) economies



How do carbon markets work?

What is the underlying principle?

Cost-effectiveness: a ton of CO₂ emitted anywhere in the world has exactly the same impact on climate change and should therefore be reduced/ mitigated where the cost of doing so is lowest.

What is traded?

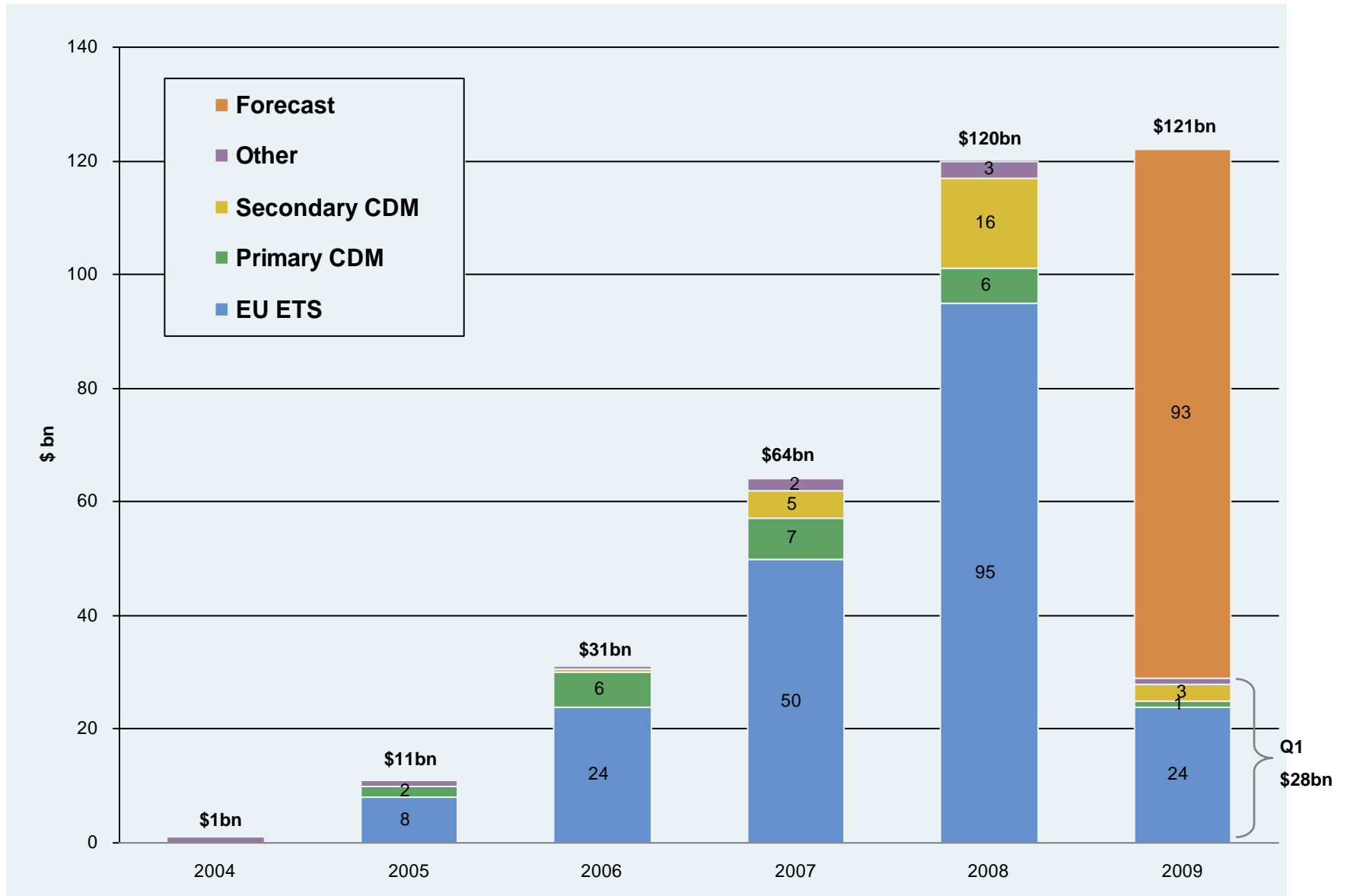
Units = tons of carbon dioxide (or equivalent) allocated as part of an emission cap or “reduced” by a project or program activity. These units are labeled based on the market segment in which they are traded : AAUs, CERs, ERUs, EUAs, VERs, etc.

Regulation	Offset	Allowance
Kyoto Protocol	CER	AAU
EU Emission Trading	CER	EUA
USA - RGGI	VER (CAR, VCS, etc.)	RGGI-A

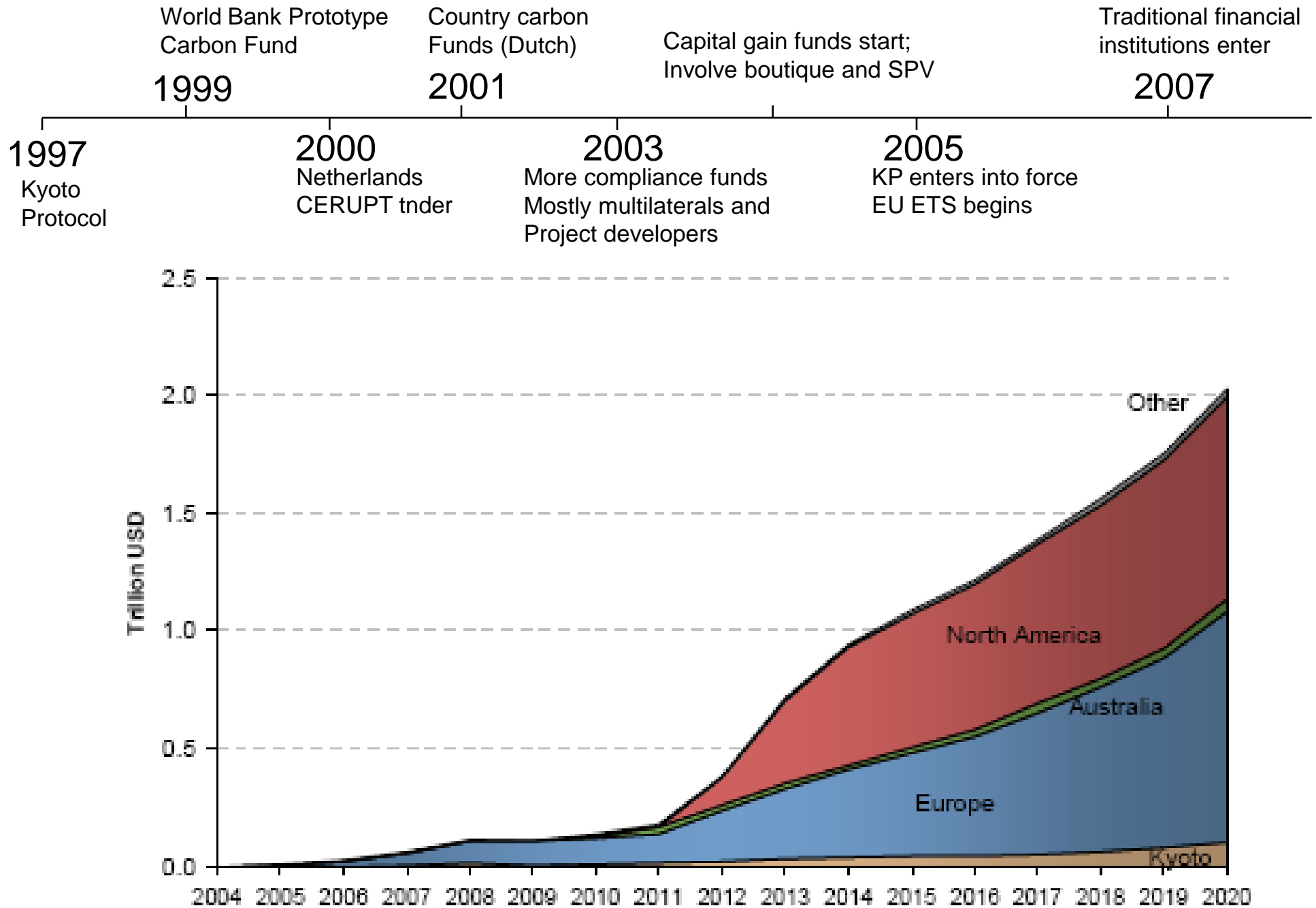
What are the benefits of the carbon market?

- Lowers compliance costs in countries with obligations to reduce emissions;
- Catalyzes financial and technology flows to developing countries to facilitate low-carbon growth;
- Creates a global and long-term price signal to lower carbon intensity.

Carbon Market Growth and Asset Classes



Evolution and projected growth of the carbon market

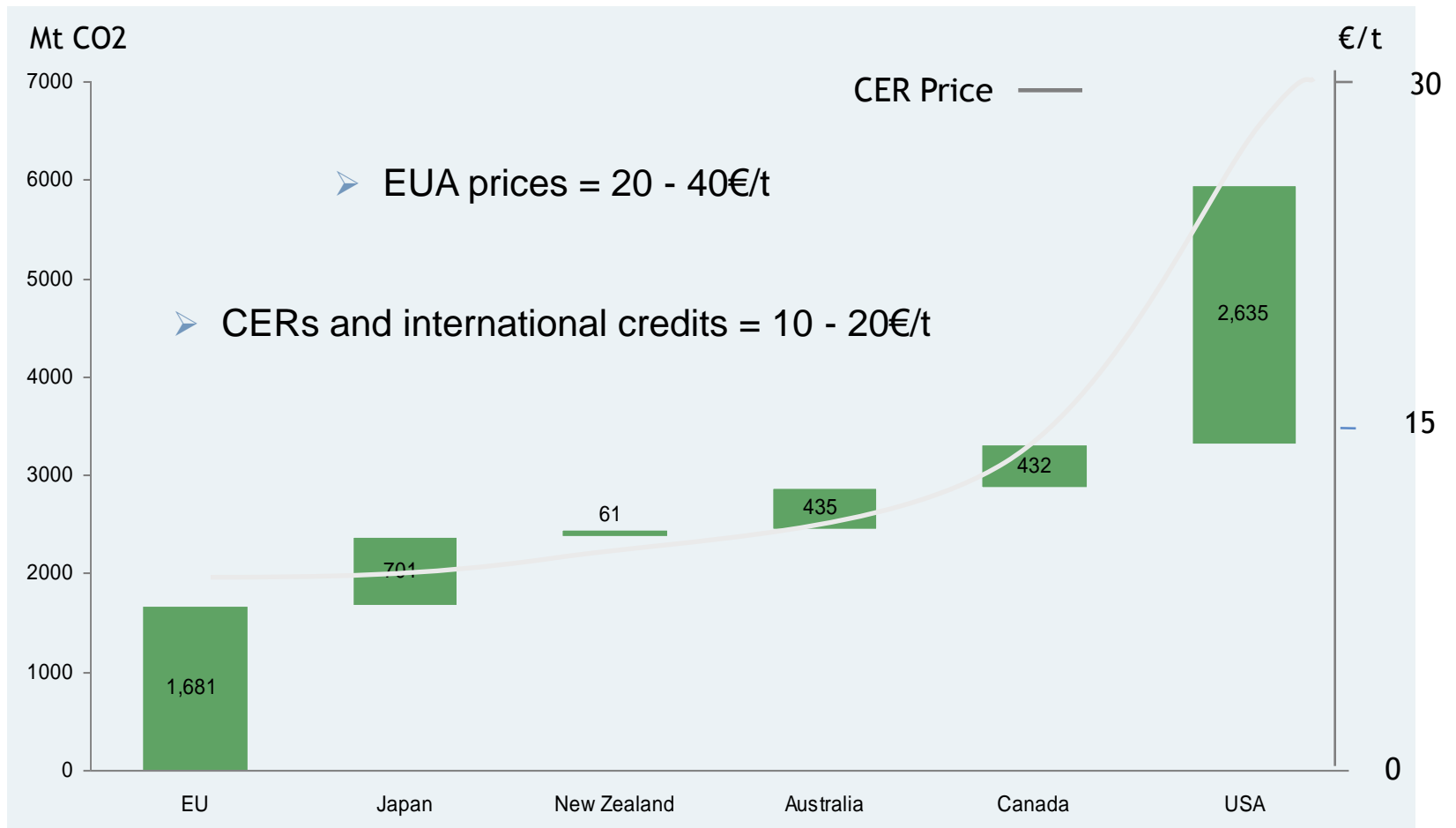


Source: *New Carbon Finance*

Carbon Demand and Price Outlook for 2013-2020

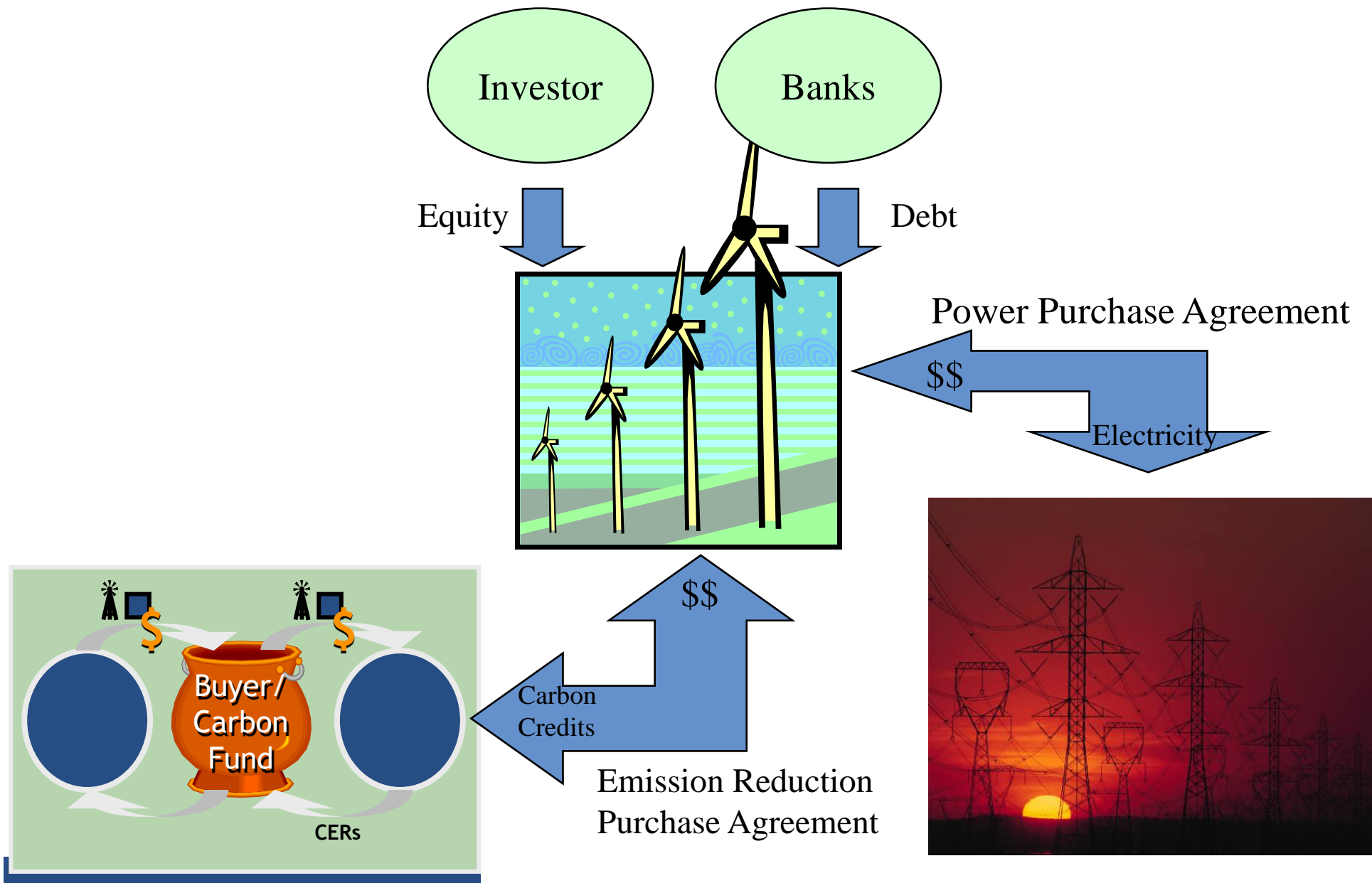
- Assuming an international agreement -

Demand for CERs MT CO2 across Phase III



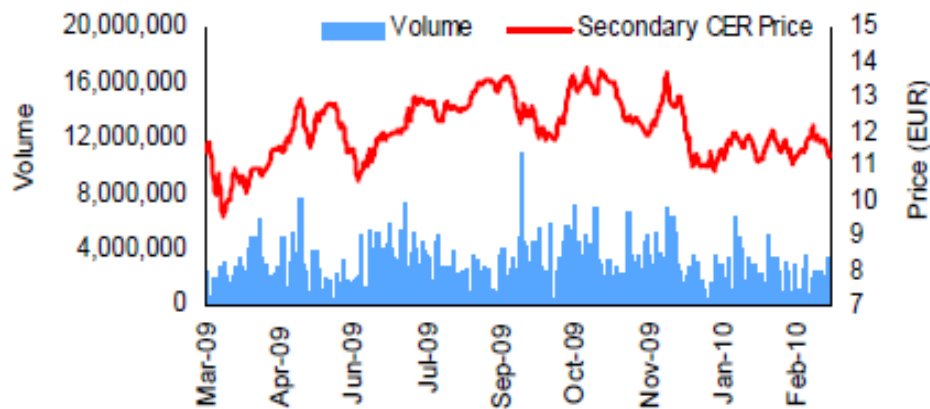
Source: New Energy Finance, J.P.Morgan

Nature of Carbon Financing Contract

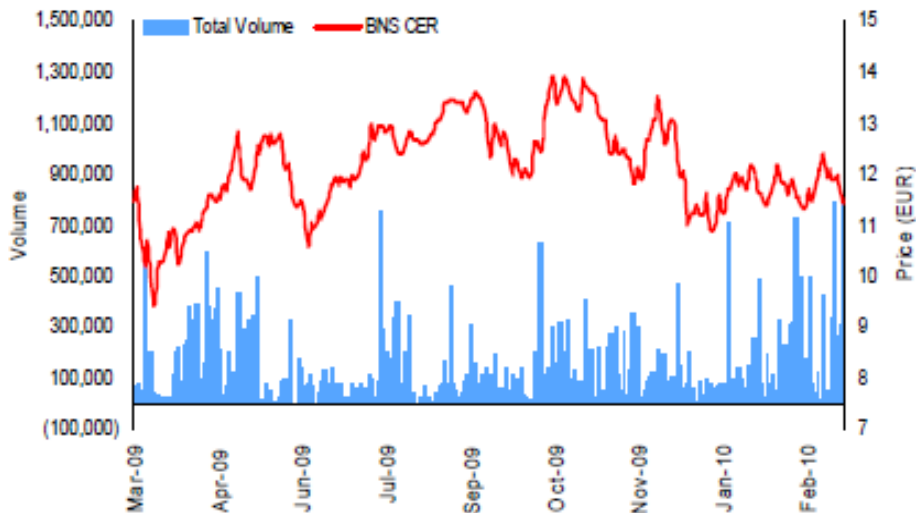


Prices of carbon offsets

ECX CERs Futures Price - Volume (Last One Year)



Bluenext Spot CERs Price - Volume (Last One Year)



- CER Prices peaked in first week of July 2008 €23.55 when the EUA price was €30.53
- CER prices were at their lowest in Q1 09 around €8
- In the last year prices have remained in the range of €9.00 to 14.00
- Likely to remain in the range except:
 - Towards 2012 when CERs delivery shortfalls for the Phase II ETS (due to low issuance) are likely to lead to price hike
 - If the prospect of post Kyoto agreement (which is likely to allow CER banking) improves

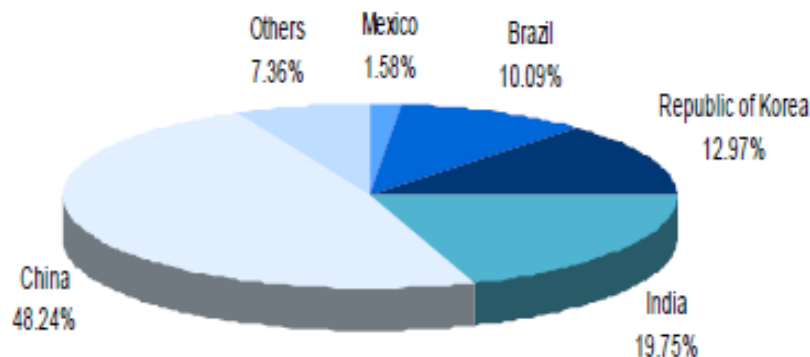
Performance of the CDM

	ANNUAL AVERAGE CERS*	EXPECTED CERS UNTIL END OF 2012**
CDM PROJECT PIPELINE: > 4200		
OF WHICH:	N/A	> 2,900,000,000
--- 2090 ARE REGISTERED	347,902,812	> 1,740,000,000
--- 53 ARE REQUESTING REGISTRATION	10,962,667	> 20,000,000

ISSUANCE STATUS	CUMULATIVE	LAST WEEK - ISSUED
TOTAL CERS ISSUED / REQUESTING	391,386,154 / 2,378,771	2,152,686
CHINISE PROJECTS, ISSUED / REQUESTING	188,798,985 / 241,326	381,770
INDIAN PROJECTS, ISSUED / REQUESTING	77,296,186 / 69,079	310,114

Source: UNFCCC

CERs issued by host party. Total 391,386,154

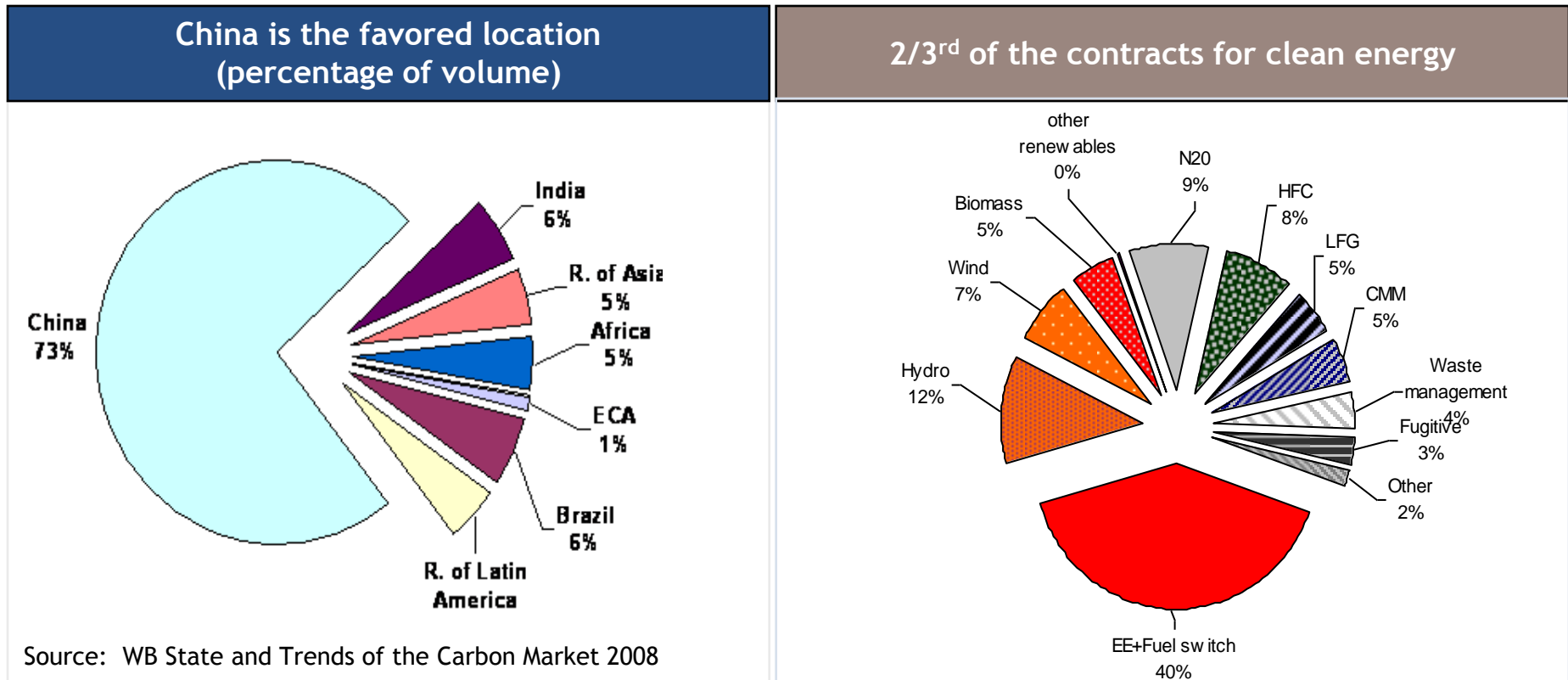


Total CDM Project Registration data is misleading

Issuance rates give more accurate estimates

- Pre-2012 CERs likely to be well below 1 billion TCO₂e (~800 m TCO₂e)
- China will Issue 50% of the CERs. LAC countries less than 15%

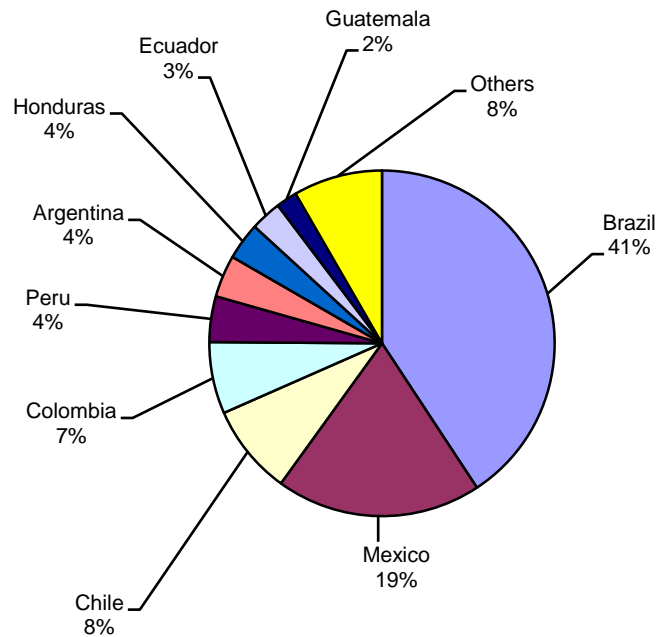
Tremendous untapped potential in developing countries



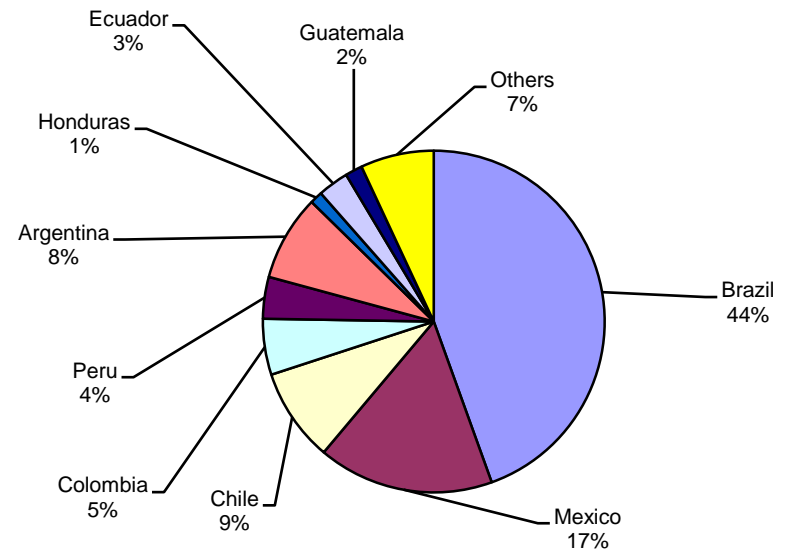
- **Uneven regional focus; China, India and Brazil = 85% of CDM market share;**
- **Africa still emerging, some successes in in recent years;**
- **Smaller projects and aggregation opportunities bypassed;**
- **Reductions from reforestation and avoided deforestation largely absent.**
- **Many countries with high emissions have relatively low presence in carbon markets.**
- **Low participation by public sector enterprises, particularly in India**

Carbon finance by country in Latin America

Number of CDM projects in Latin America by country

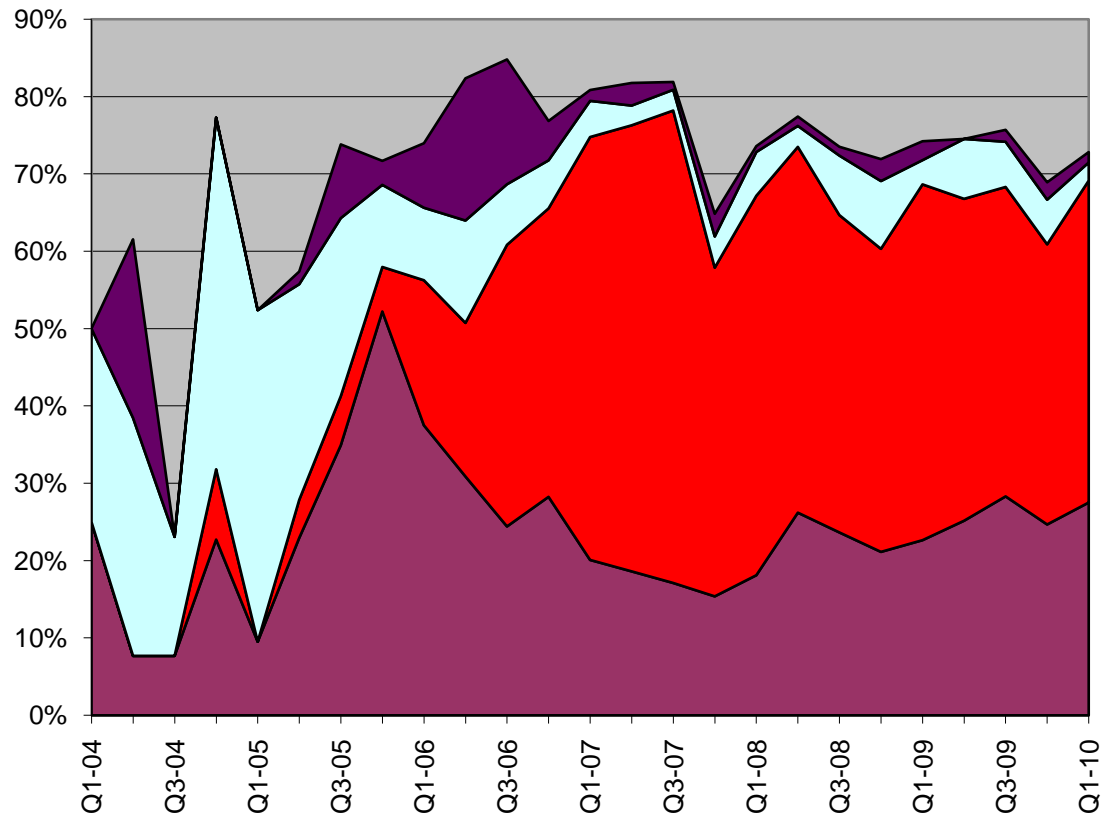


Volume of CERs until 2012 in Latin America by country



All CDM Projects in the Pipeline in Brazil + Mexico + India + China as a fraction of all projects

Projects



Mexico

Brazil

China

India

Green bonds linked to carbon market

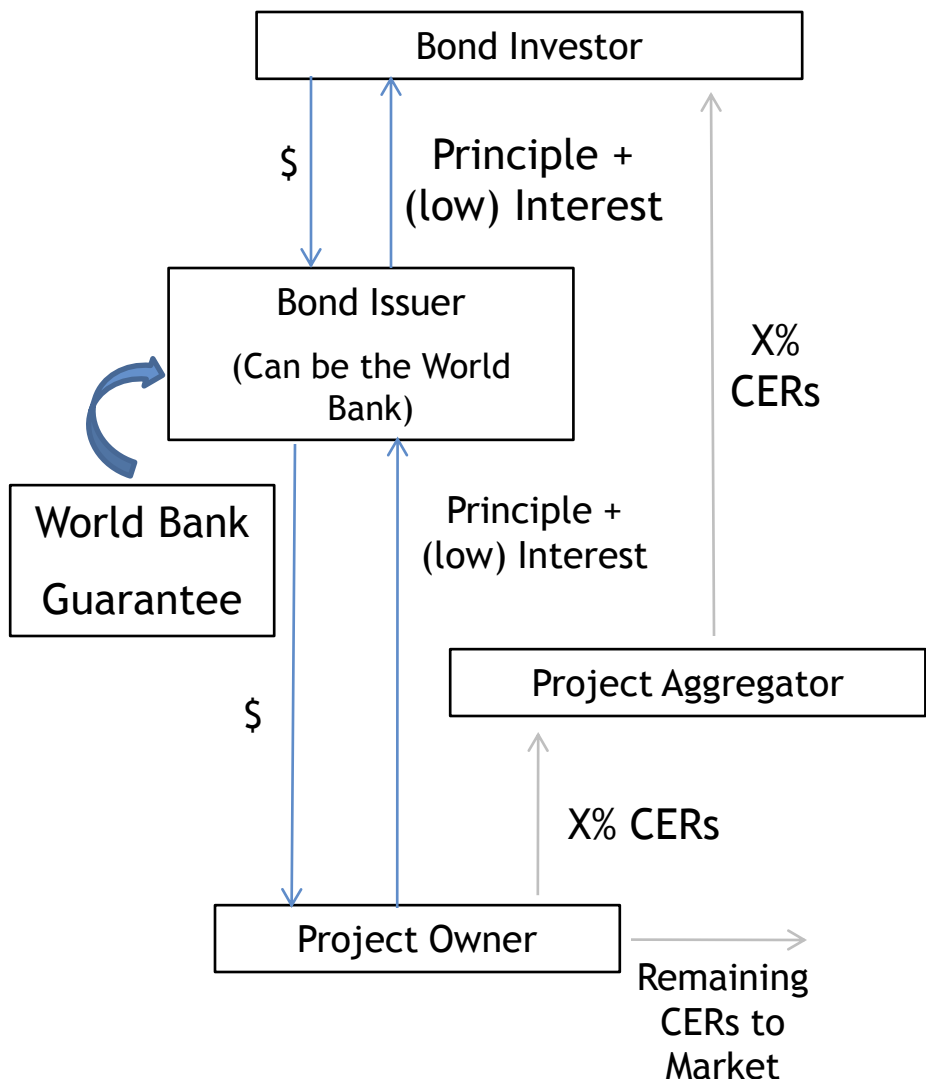
Bond Products

- World Bank Green Bonds where proceeds used to finance the green investments
 - Issues: fit with investors needs? Risk vs. rewards, tenor and spreads. Bank procedures and timelines.
- Sovereign (emerging markets?) Green bonds issued by client
 - potential for a (partial) credit guarantee by the World Bank
 - Issues: Investors willingness to accept country risk. Risk premiums. Portfolios for smaller and/or riskier countries?
- Potential to use CTF and other public financing from OECD for under writing Green Bonds?

Asset-backed (carbon) securities

- Backed by revenue from carbon credits (long-term and relatively illiquid asset)
- Some experience with securitization already present in the market
- Issues: Appetite in the market for securitized instrument, cash flows volatility.

Carbon-linked Green Bond



Bond investor receives a below-market interest rate and a variable additional return based on a share of the carbon offset revenue

Bond issuer is responsible for protecting the principle and making interest payment. Bond issuer may need credit enhancement (for example, a guarantee by World Bank)

Project aggregator

- Identifies and prepares the portfolio of projects (including carbon offset component)
- Provides this to the Bond Issuer to determine size of Bond issue
- Responsible for ongoing carbon offset monitoring, verification and issuance of the CERs and signs the offset purchase agreement with the project owners

Project owner is responsible for payment of the principle and the interest on the use of Bond proceeds and to transfer the agreed fraction of the offset to the Bond investor through the Project Aggregator

Conclusions

- The risk of climate change is real and the culprit is primarily CO₂ and energy
- There ARE solutions but to date, investment is not consistent with the scale of the problem
- Energy sector is likely to receive the most attention to reduce greenhouse gas emissions
- New financing instruments are being put in place
 - In addition to public sector resources (like the Climate Investment Funds), market based instruments (like carbon finance) is expected to play a major role in leveraging clean investment
- To date, Latin America has not been effective in capturing the benefits of the carbon market
 - Concerted effort is necessary to reverse this trend
 - In Central America, the chances of success will be much greater if regional initiatives are designed

Thank you!

Questions?

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