



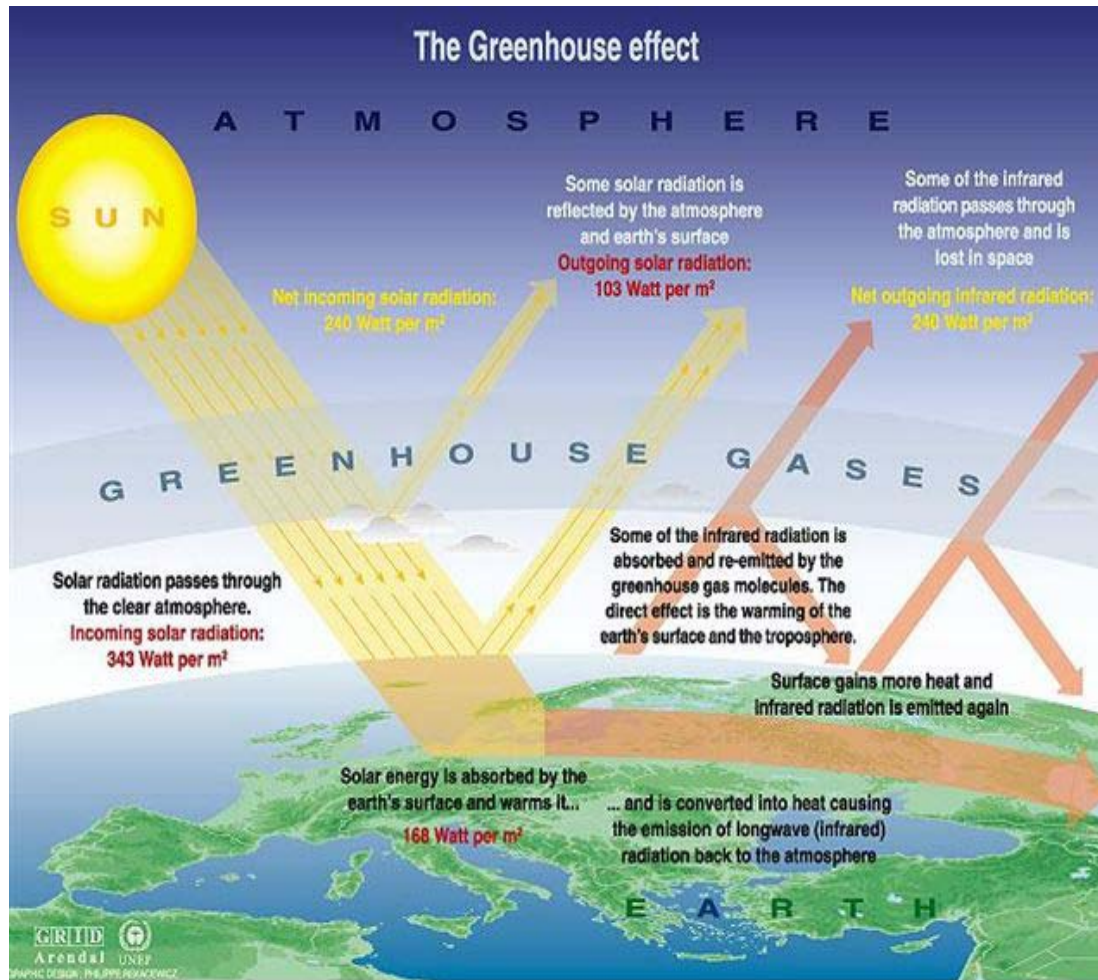
CARBON CREDITS

**Concept and International practice
November 20, 2008**

The background of the slide is a photograph of a snow-covered mountain range. A narrow, winding path or road is visible, leading from the foreground into the distance between the snow-covered peaks. The sky is a clear, bright blue, and a large, bright sun is positioned in the upper right quadrant, creating a prominent starburst effect and casting a lens flare across the sky.

CLIMATE CHANGE

Green House Gas (GHG) Effect



Sources: Okanagan university college in Canada, Department of geography, University of Oxford, school of geography; United States Environmental Protection Agency (EPA), Washington; Climate change 1995, The science of climate change, contribution of working group 1 to the second assessment report of the intergovernmental panel on climate change, UNEP and WMO, Cambridge university press, 1996.

- ✓ **GHGs retain sun's radiation, which helps to stabilize temperature**
- ✓ **Retention of sun's radiation supports the organic life on earth**
- ✓ **Human activities like industrial revolution, deforestation, land use change have disturbed the balance resulting in **global warming** and **climate change****

Climate Change - A Development Issue

Climate change threatens to disrupt the weakest economies and disadvantage the poorest people in developing countries.



Adverse changes in Ecosystem



Increase in sea level by one meter over this century



Reduction in agricultural productivity especially in part of Africa

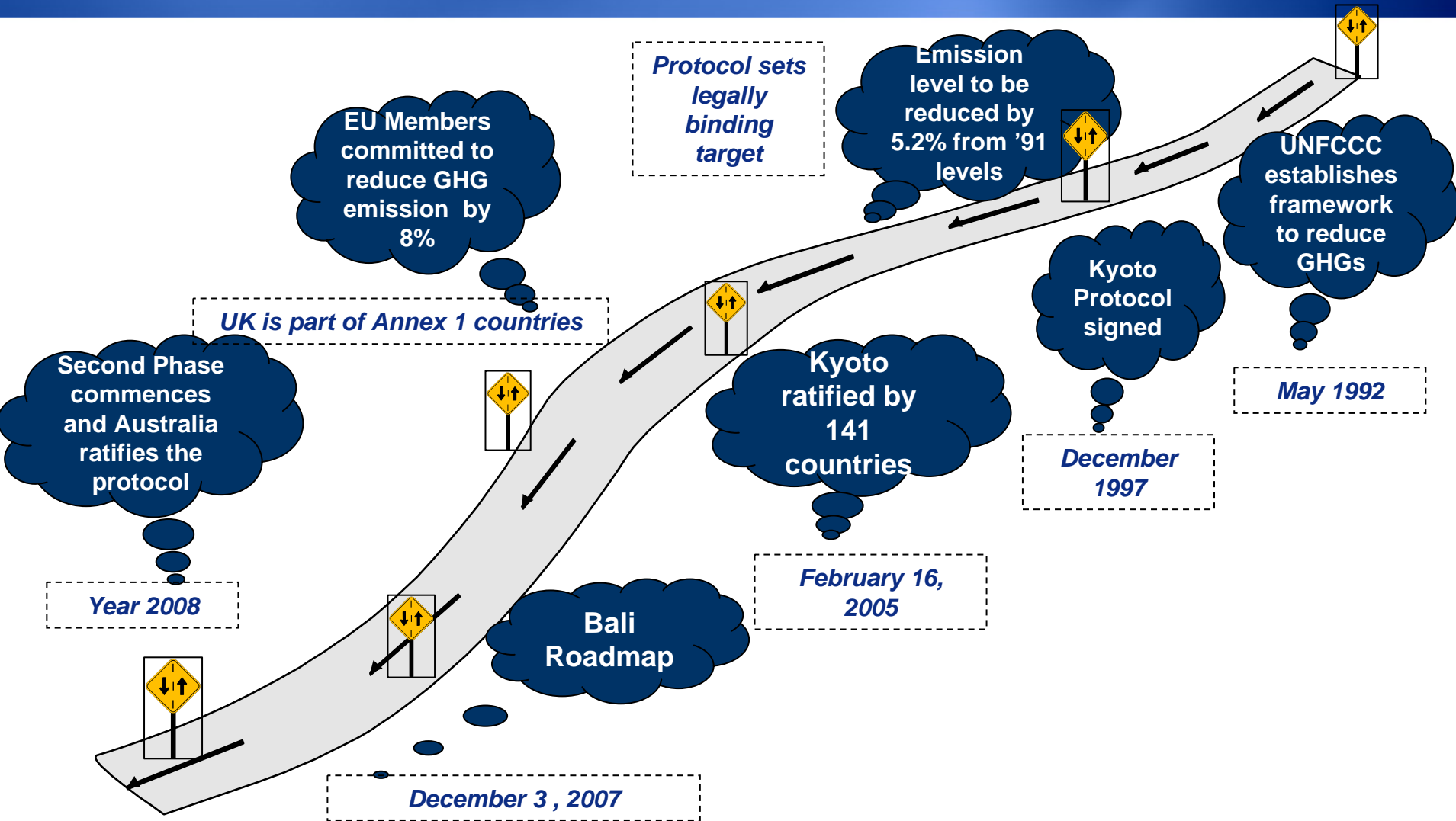


Water borne diseases and malnutrition



KYOTO PROTOCOL

International Efforts to mitigate Climate Change



Kyoto Protocol

- ✓ **Signed in 1997; in force since 16 February 2005**
- ✓ **Commits industrialized countries to reduce their GHG emissions by, on average of 5.2% below 1990 levels in 2008-12**
- ✓ **Individual, quantified emission targets for each industrialized/developed country called the Annex 1 countries**
- ✓ **Six GHG covered: CO₂, CH₄, N₂O, HFC/PFC, SF₆**
- ✓ **“Flexibility mechanisms” for financing emission reductions abroad:**
 - **Clean Development Mechanism (CDM)**
 - **Joint Implementation (JI)**
 - **International Emissions Trading**



Emission Reduction Mechanisms

Joint Implementation

It is an investment proposition between two Annex-1 countries.

Both invest in GHG reducing project and share the carbon credits.

International Emission Trading

A signatory country with accrued quantified and certified GHG reductions can trade in the international carbon credit market.

Major carbon credit trading exchanges are:

- Chicago Climate Exchange
- European Climate Exchange
- CO₂E Exchange, UK

Carbon Credit trading recently started in MCX and NCDEX exchange in India

Clean Development Mechanism (CDM)

Developed country can invest in a GHG mitigation project in a developing country. Developed country would get credit, while developing country would get capital and clean technology.

India is the second largest producer of carbon credits.

Carbon trading centres

Montreal

- Canadian ETS proposed
- MCEX, ICE Futures Canada

London

- EU ETS
- ECX – largest exchange
- Climate Spot Exchange

Paris

- EU ETS
- Bluenext / Powernext

Switzerland

- Centre for repatriating CERs into EU

Other European exchanges

- Utrecht - Climex
- Vienna – EXAA
- Leipzig – EEX

New York

- Green Futures

Oslo

- Nordpool

Chicago

- Various regional initiatives, SO_x / NO_x trading
- CCX, CCFE

Mumbai

- MCX
- NCDEX

Singapore

- Asia Carbon Exchange

Melbourne

- Australian ETS in development
- ACX

Forthcoming?

- Beijing
- Tokyo
- Middle East / South America?

Wellington / Auckland

- NZ ETS proposed
- NZCX

The background of the slide is a photograph of two hands, one from the left and one from the right, gently cupping a small, transparent globe of the Earth. The globe shows a blue sky with white clouds. The hands are positioned as if they are carefully holding the planet. The background behind the hands is a bright blue sky with scattered white clouds. At the bottom of the image, there is a dark blue horizontal bar containing the title text.

CLEAN DEVELOPMENT MECHANISM

Clean Development Mechanism

What is CDM ?

The Clean Development Mechanism (CDM) is an arrangement under the Kyoto Protocol allowing industrialized countries with a GHG reduction commitment (called Annex 1 countries) to invest in projects that reduce emissions in developing countries as an alternative to more expensive emission reductions in their own countries.

What is CER ?

- **Certificates issued to countries that reduce their GHG emissions.**
- **Measured in units of Certified Emission Reductions (CER), equivalent to one metric tonne of CO2 reductions.**
- **Surplus credits (collected by overshooting to emission reduction target) can be sold in the market.**

How CDM benefits?

Developed Countries

- Meeting emission reduction targets at lower costs
- Marginal Abatement cost:
 - Japan - 400 \$ / ton of Carbon
 - USA - 200 \$ / ton of Carbon
 - India - 25 \$ / ton of Carbon

Developing Countries

- Access to latest technology
- Additional investments / funds through carbon credit sale
- Quicker implementation of capital intensive projects

Overall

Reduction of GHG emission

Typical CDM Projects

↘ Renewable energy

- Wind power
- Solar
- Biomass power
- Hydel Power

↘ In waste management

- Capturing of landfill methane emission to generate power
- Utilization of waste and waste water emissions for generation of energy for captive use or power generation

↘ Energy efficiency measures e.g.

- Boiler and steam efficiency
- Improved Cogen efficiency
- Efficient cooling systems
- Back pressure turbines etc

↘ In power sector, induction of new technologies which are efficient (thermal), reduction in technical T&D losses

↘ Fuel switching (From fossil fuel to green fuel like biomass, ricehusk etc)

↘ In transport

- IC engines at micro level
- Fuel switch from gasoline and diesel to natural gas
- Modal shift from air to train, road to train at macro level
- Replacement of shipment of certain raw materials through road to pipelines

CDM Project Eligibility



- ✓ Project to be implemented in developing nations/ Non Annex-I countries
- ✓ Project should result in net CO₂ Emission Reduction & should establish additionality
- ✓ It should contribute towards Sustainable Development of the Host Nation
- ✓ Concept of CDM, Carbon reduction and Carbon revenue should be incorporated in the planning stage of the project
- ✓ Projects executed after year 2000 are eligible, provided CDM concepts had been incorporated as above
- ✓ Carbon Reduction must be Measurable & Verifiable
- ✓ Real measurable and long-term benefits related to mitigation of climate change effects

A man in a blue shirt is looking at a large globe of the Earth. The globe is the central focus, with the man's face partially visible on the right side, looking intently at the globe. The globe is overlaid with a white grid pattern. The background is a soft, out-of-focus blue.

CARBON MARKET

- *at a glance*

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Markets at a Glance

Activity within Kyoto's flexible mechanisms, specifically the CDM grew significantly to €12bn in 2007.

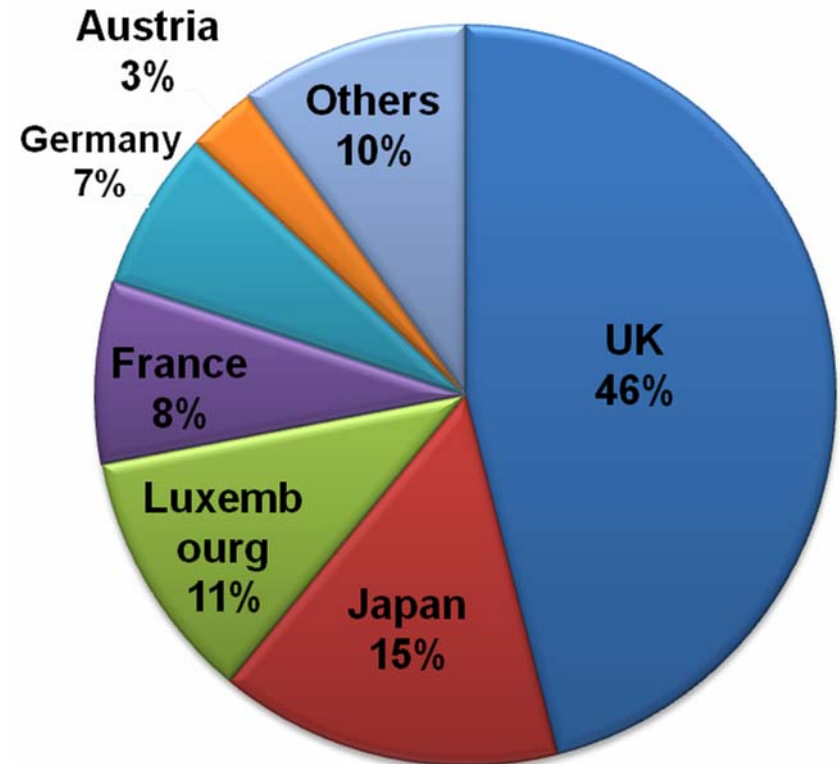
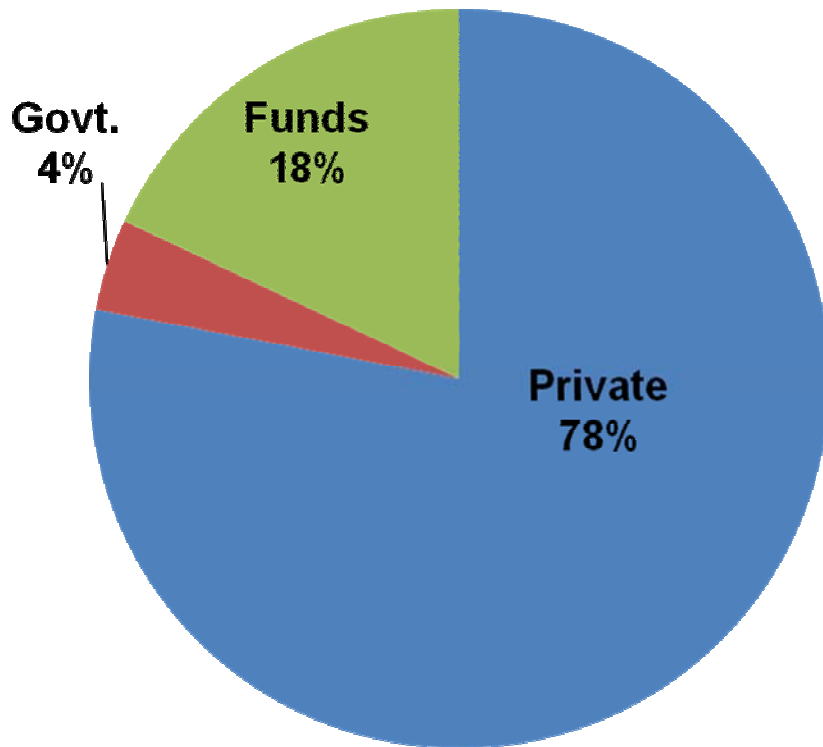
The Chicago Climate Exchange (CCX), the New South Wales Greenhouse Gas Abatement Scheme (NSW) and the United Kingdom Emissions Trading Scheme (UK ETS) all grew sharply.

The UNFCCC's pipeline of projects surpassed 2800 projects in 2007, compared to approximately 1500 a year earlier.

India continues to have a dominant market-share of the Clean Development Mechanism (CDM)

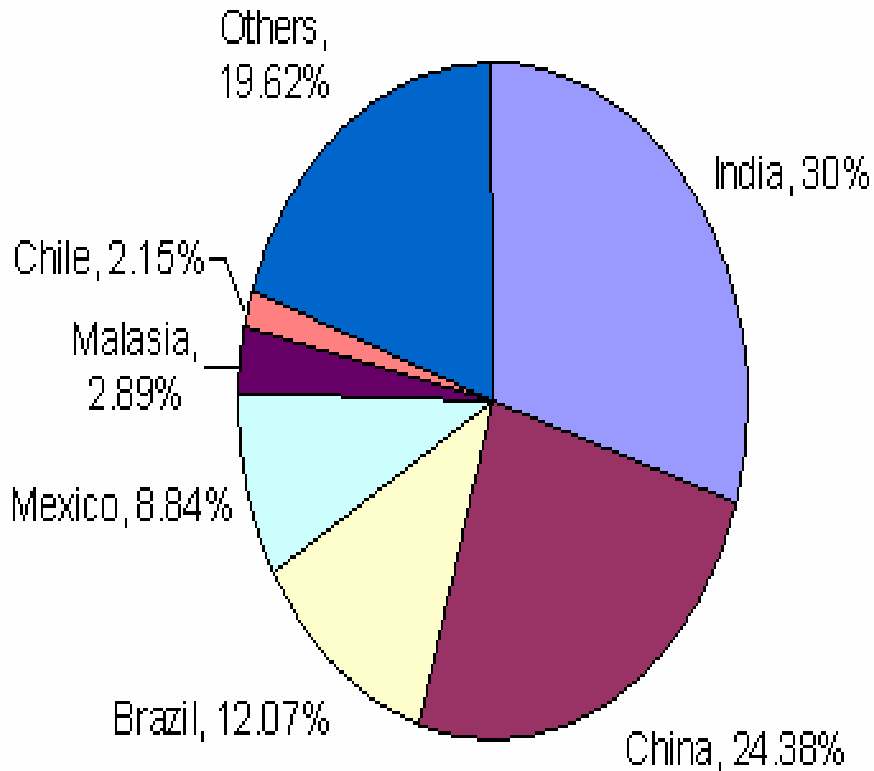
European buyers dominate the primary project-based market followed by Japan as the second largest buyer.

Major Buyers of CERs...

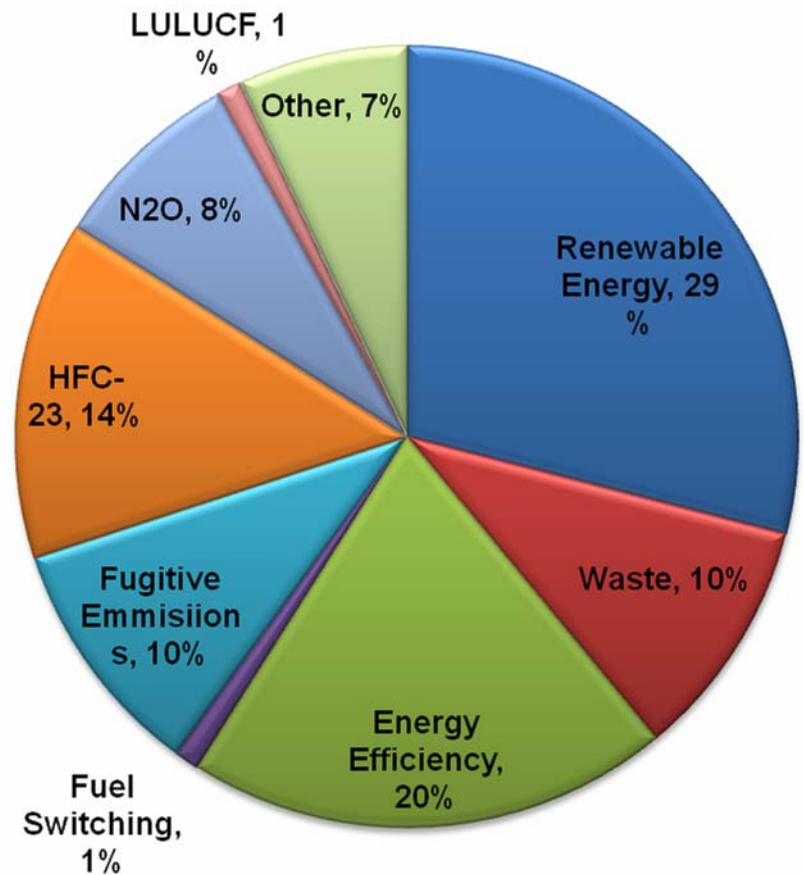


Point Carbon: Carbon 2008

Major Producers of CERs...



Registered Project Activities by HOST PARTY: UNFCCC



Point Carbon: Carbon 2008



MAJOR BUYER

-EU ETS

EU ETS: Largest Cap and Trade system in the World

PARTICIPANTS

- All EU 25 countries
- International links through Kyoto project crediting

ALLOCATION

- Member states develop National Allocation Plans (NAPs) by sector and installation
- To be consistent with Kyoto target and anti-subsidy provisions

TIMING

- 2005-7: phase 1, no national target
- 2008-12: governed by Kyoto target
- 2013+ ? Likely to strengthen

COVERAGE

- Sectors: electricity, ferrous metals, pulp & paper, cement
- Aviation to be included from 2011
- 12000 installations covering 46% emissions



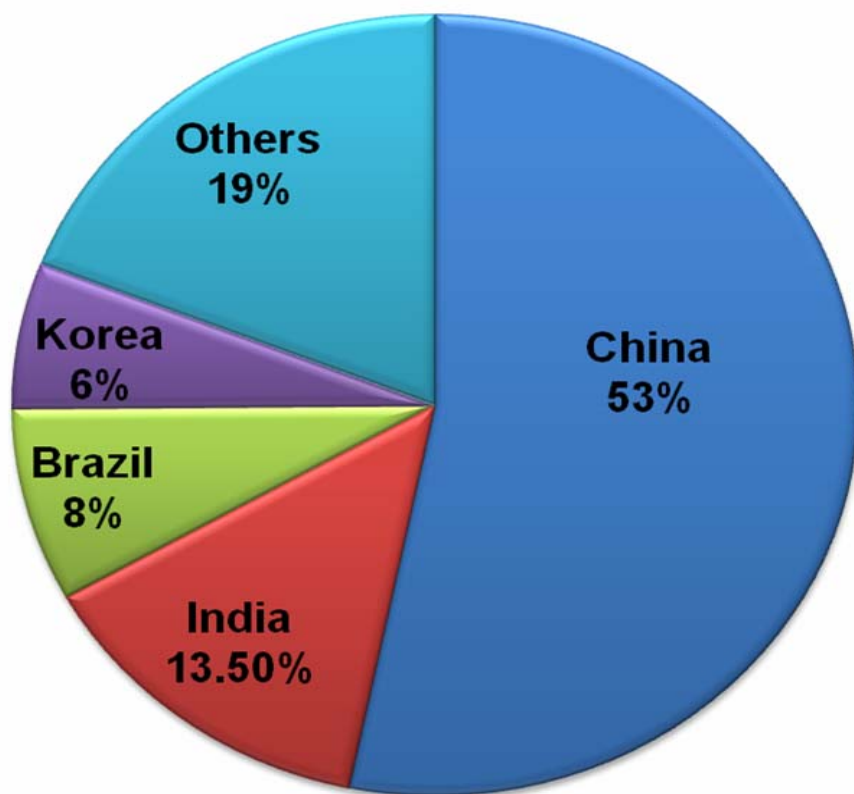
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CHINA

-the largest CER producer

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China- Largest producer of CERs



China dominates the CDM market being the largest producer of CERs

China's national Climate Change Programme unveiled in June 2007

Any gains derived from the transfer of CERs will be split between the Chinese Government and the Chinese Project companies

With a 53% market share China with 978 CDM projects until March 31, 2008

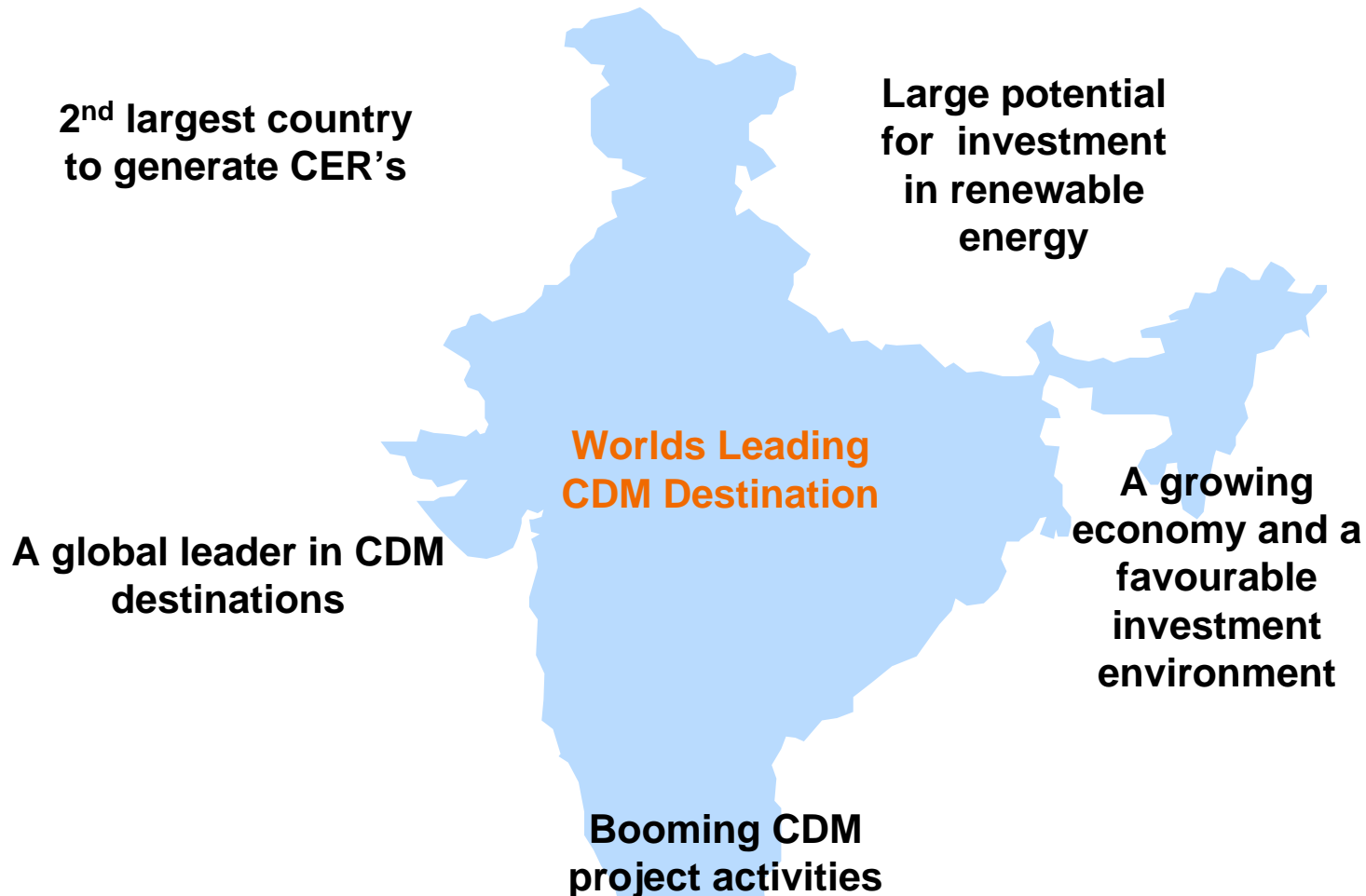
Chinese funded or Chinese-holding enterprises (>51%) within the territory of China are eligible to conduct CDM projects with foreign partners.

The background of the slide is a close-up photograph of a hand moving a white chess king piece on a chessboard. The hand is positioned at the top, with the thumb and index finger gripping the piece. The chessboard is in the foreground, with several other pieces, including a black king and a black rook, visible in the background. The lighting is soft and focused on the hand and the piece being moved.

THE INDIA STORY

Advantage India

India Most Attractive CDM Destination



Indian CER Market

**India signed Kyoto Protocol in December 1997 -ratified it in August 2002-
established NCA in December 2003**

India has the highest rating of any CDM host country (Source: Point Carbon)

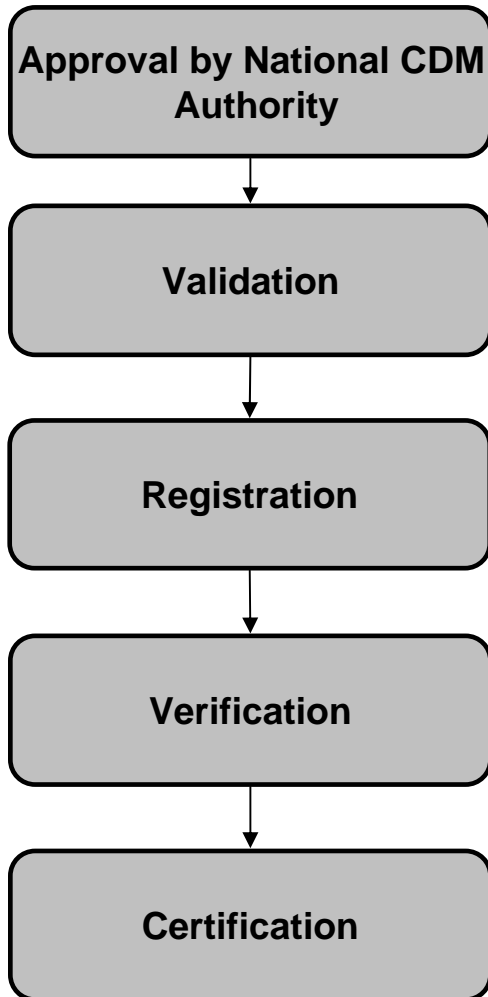
**340 projects registered by the CDM Executive Board and 969 CDM projects seek
host-country approval**

**These projects estimated to reduce the GHG emission by 114 mn ton CO2
equivalent per year**

Expected annual generation of CERs from CDM projects by 2012: 493 mn

**India accounts for 32% of the world total of 1081 projects registered with
CDM EB followed by China with 20% & Brazil 10% (Source: UNFCCC)**

Procedure for obtaining CER in India



Domestic Approval:

Project is reviewed and approved by National CDM Authority (NCA).

International Approval:

After the approval of NCA, it is reviewed and approved by EB (Executive Board)

- Validation : Project is independently evaluated by UNFCCC
- Registration : On satisfactory evaluation, project is registered
- Verification : Periodical independent review of reduction in emission level
- Certification : Credits are issued

INDIA- National Action Plan on Climate Change

- **National Solar Mission**
- **National Mission for Enhanced Energy Efficiency**
- **National Mission for Sustainable habitat**
- **National Water Mission**
- **National Mission for Sustaining the Himalayan ecosystem**
- **National Mission for Green India**
- **National Mission for Sustainable agriculture**
- **National Mission for Strategic Knowledge for Climate Change**



The KPMG logo is located in the top left corner. It consists of the letters 'KPMG' in a white, bold, sans-serif font, positioned to the right of a vertical stack of four blue squares of varying heights.

KPMG

The background of the slide is a photograph of a rocky beach. In the foreground, a tall, balanced stack of smooth, light-colored stones is the central focus. The beach is covered with many other similar stones, leading towards a calm blue ocean under a clear blue sky.

WHAT THE INDIAN INDUSTRY NEEDS....

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What the Indian industry needs...

More clarity on tax, and accounting aspects

On lines of Montreal Protocol exemption of income from Kyoto Protocol

Redemption of External Commercial Borrowings (ECBs) to be specifically permitted against export of CERs

Allow benefits such as accelerated depreciation for equipments used for CDM projects

Allowing advances to be received against future sale / export of CERs without any constraint on timelines for sale / export of CERs.



Hydro power

Project: 86 MW hydro power generation in the state of Himachal Pradesh.
Displacement of power in Northern grid

Carbon credit: 2,40,000 CER per year

Benefit: Revenue from carbon credit sales
Rs 60 crores+ from 10 year contract

Biomass based power generation

Project: 7.5 MW power generation based on mustard crop residue in the state of Rajasthan

Carbon Credit: 45,000 CER per year

Benefit: Revenue from carbon credit sales
Rs 11 crores+ from 10 year contract

Cement plant

Project: 2.6 mtpa cement plant in Rajasthan

- Fly ash mixing in production of PPC
38% PPC production,
32% fly ash blending
CER = 60,000 per year
- Waste heat recovery power generation in clinker cooling
9 MW plant
56 million unit generation
CER = 45,000 per year
- Use of alternate fuel in kiln
200 tpd biomass fuel
CER = 60,000 per year

Carbon credit: 1,65,000 CER per year

Benefit: Revenue from carbon credit sales
Rs 40 crores+ from 10 year contract

Power Generation From Waste Heat

Project: Waste heat recovery power generation (10MW) from DRI iron kiln of iron making process in Jharkand

Carbon dredit: 40,000 CER per year

Benefit: Revenue from carbon credit sales
Rs 10 crores+ from 10 year contract

Energy Efficiency in Fertiliser

Project: Energy efficient through modified CO2 removal system in Ammonia Plant. Net saving of 18 tph low pressure steam.

Carbon Credit: 23,000 CER per year

Benefit: Revenue from carbon credit sales
Rs 5.8 crores+ from 10 year contract

Sugar industry

Project: 20 MW Bagasse based cogeneration plant in UP

Carbon credit: 100,000 CER per year

Benefit: Revenue from carbon credit sales
Rs 25 crores+ from 10 year contract

Wind Power

Project: 15 MW Wind Power Project in Tamil Nadu

Carbon credit: 34,000 CER per year

Benefit: Revenue from carbon credit sales
Rs 8.5 crores+ from 10 year contract

