The Kyoto Protocol

- **The KP entered into force with Russian ratification - all industrialized governments, except the US and Australia have ratified it**
- **No obligations on developing countries to reduce their emissions**
- **The KP calls for a 5.2% reduction, on average, in GHG emissions in Annex I countries (i.e. 38 industrialized countries and countries with economies in transition) during the first commitment period (2008-2012) compared to 1990.**
- **The KP contains the following provisions:**
  - **The flexibility mechanisms – carbon trading among and between industrialized and developing countries**
  - **Land-use, land-use change and forestry activities**
  - **Funding mechanisms to assist developing countries**
  - **Recognizes the importance of adaptation**

Legally binding GHG reductions for industrialized countries (Annex I) --if they choose to ratify the Protocol

Market-Based Mechanisms

- Under the Kyoto Protocol, Annex I countries may achieve these reductions either domestically or supplementing their domestic efforts through **three international market-based mechanisms:**
- **International Emissions Trading**
- **Clean Development Mechanism (CDM)**: Developed countries purchasing emission reductions from developing countries.
- **Joint Implementation (JI)**: Developed countries purchasing emission reductions from developed countries and economies in transition (EITs are Eastern Europe and Central Asia)

Defined: credit for emission reduction (CERs) from investments

in developing (non-Annex B) countries

Objectives:

- To promote sustainable development in developing countries
- To assist Annex B countries in meeting their emission reduction targets in cost-effective manner

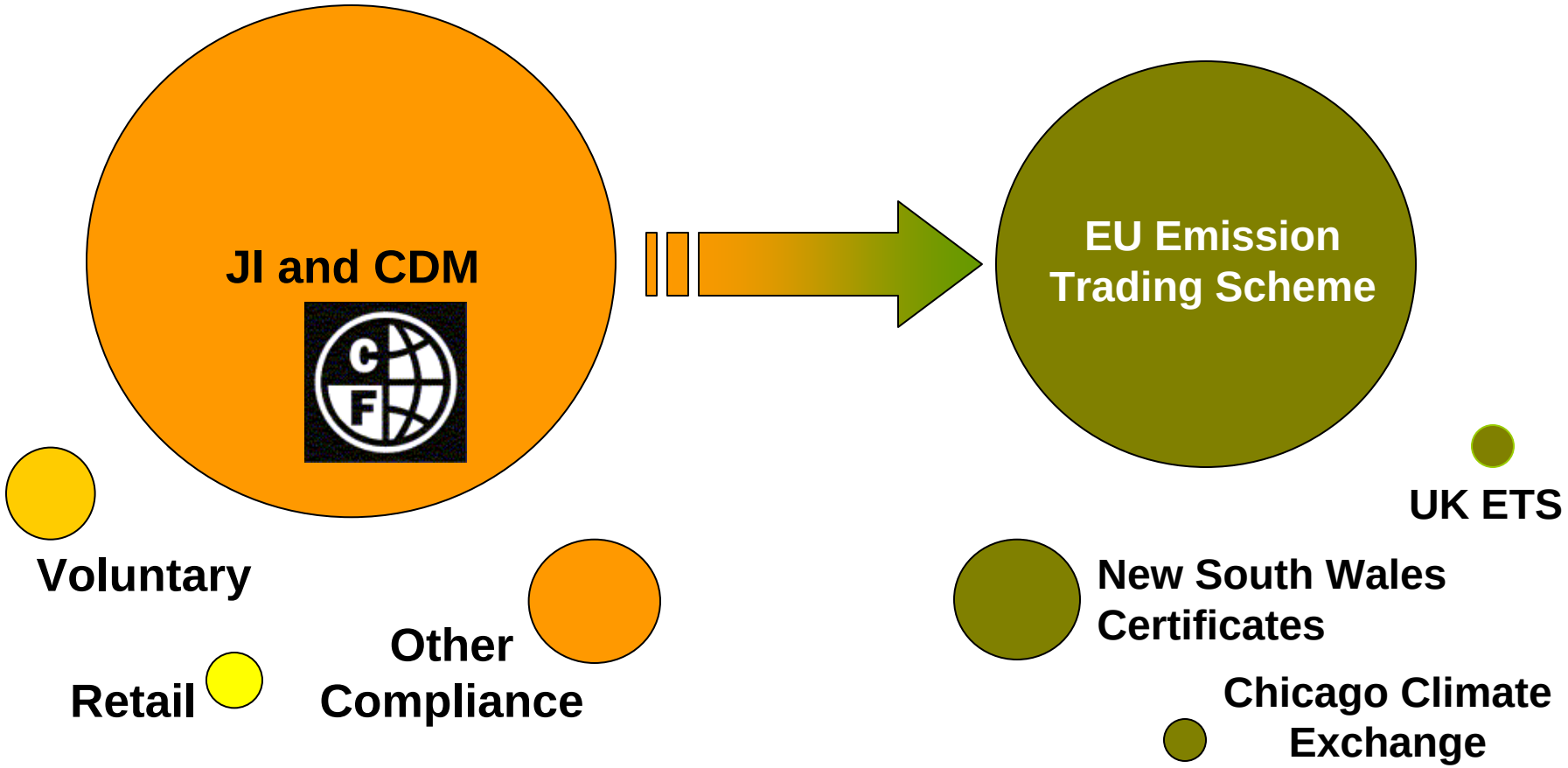
Certified Emission Reductions (CERs) must:

- Create ***real***, ***measurable***, and ***long-term*** benefits related to the mitigation of climate change. (Art. 12.5b)
- Be ***additional*** to any that would occur in the *absence* of the certified project activity. (Art. 12.5c)

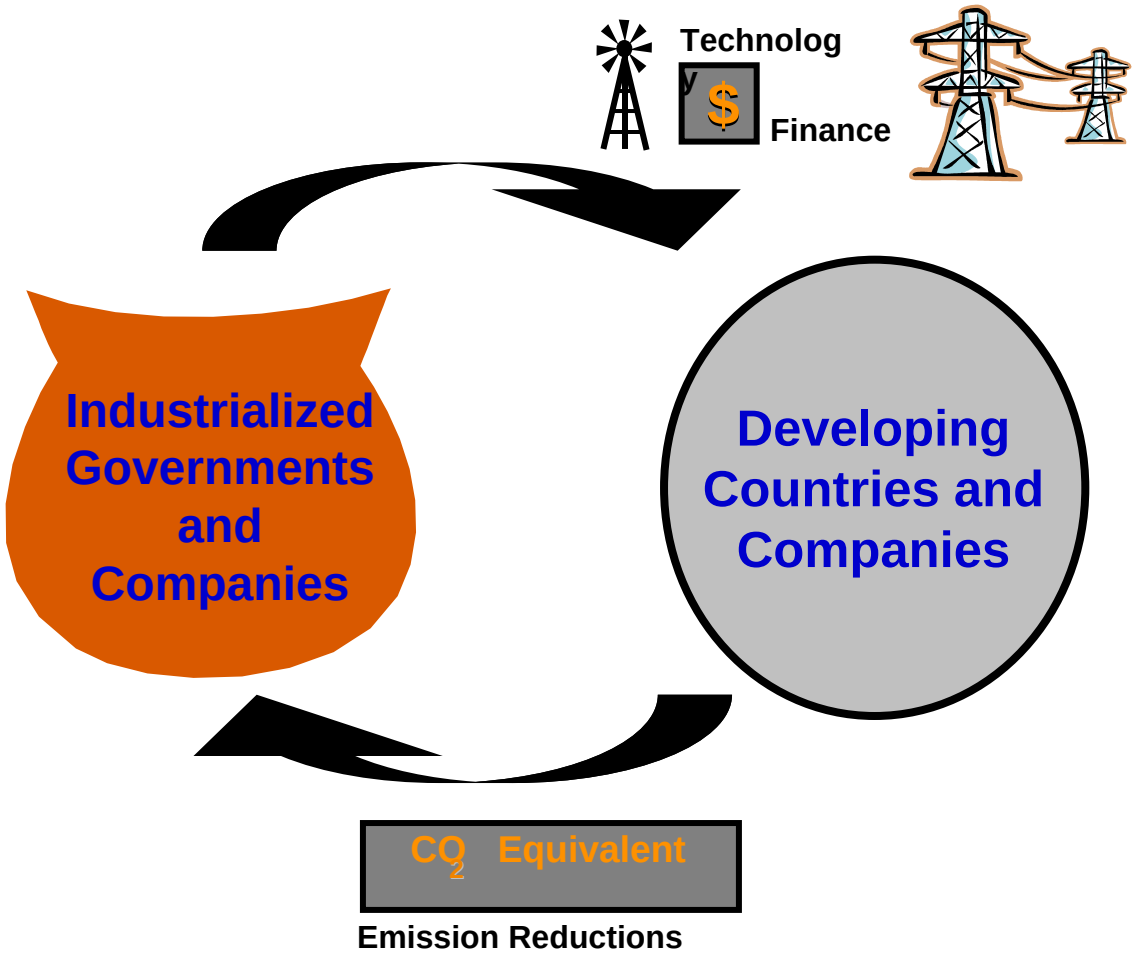
Structure of the Carbon Market

Project-Based Transactions

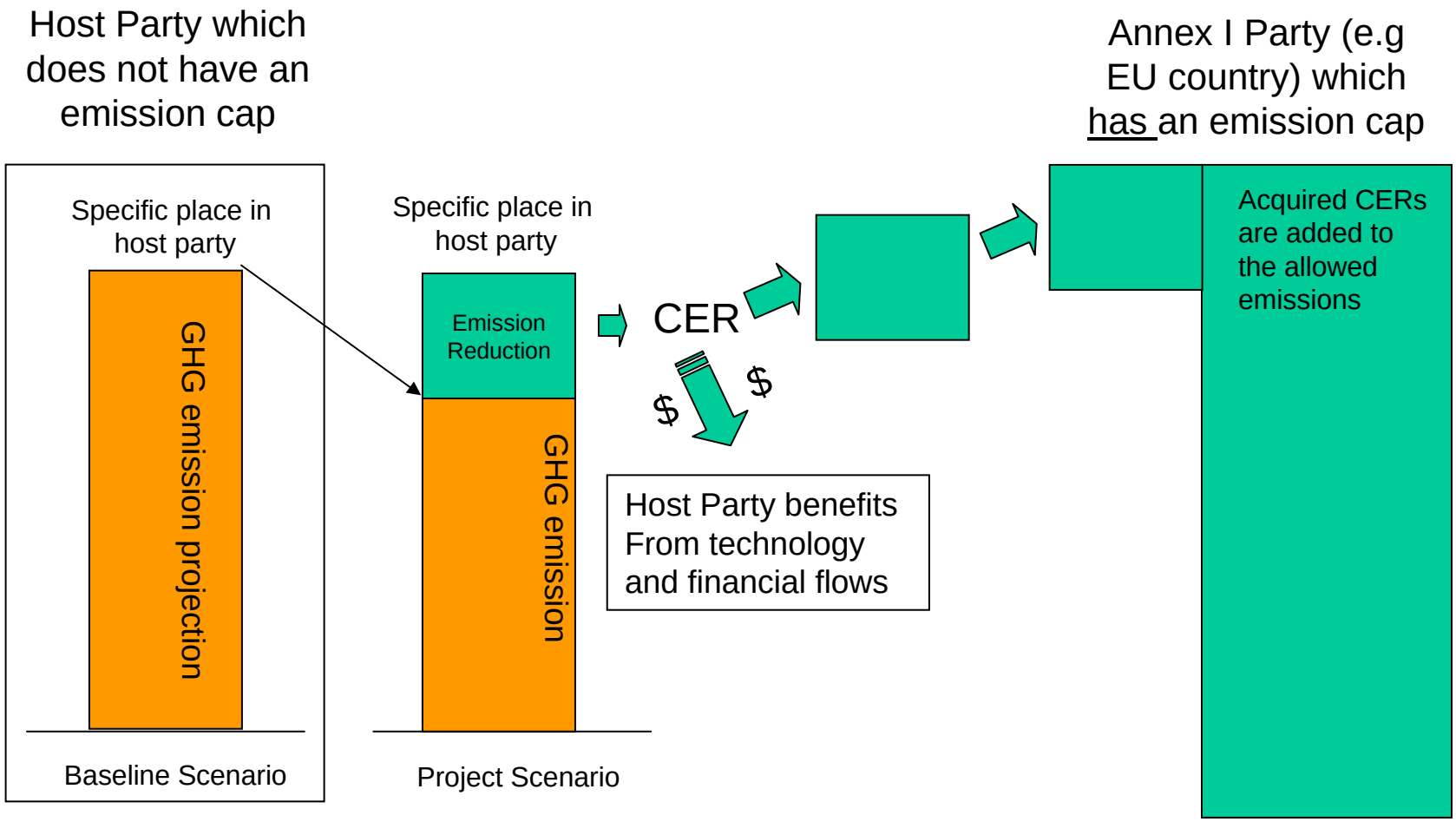
Allowance Markets



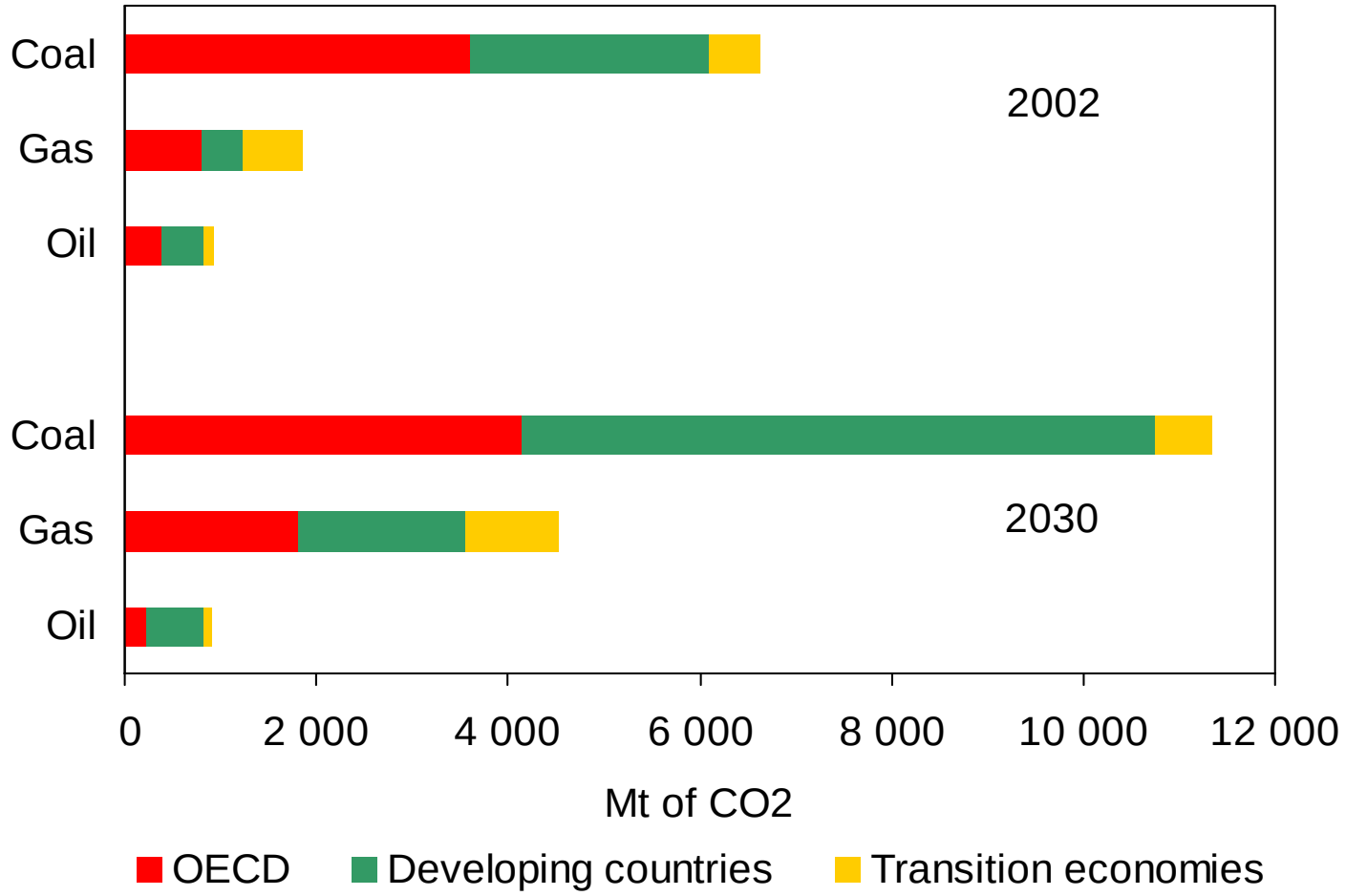
CDM and Power Generation



Emissions Trading under the Kyoto Protocol



Context: Power Sector CO_2 Emissions

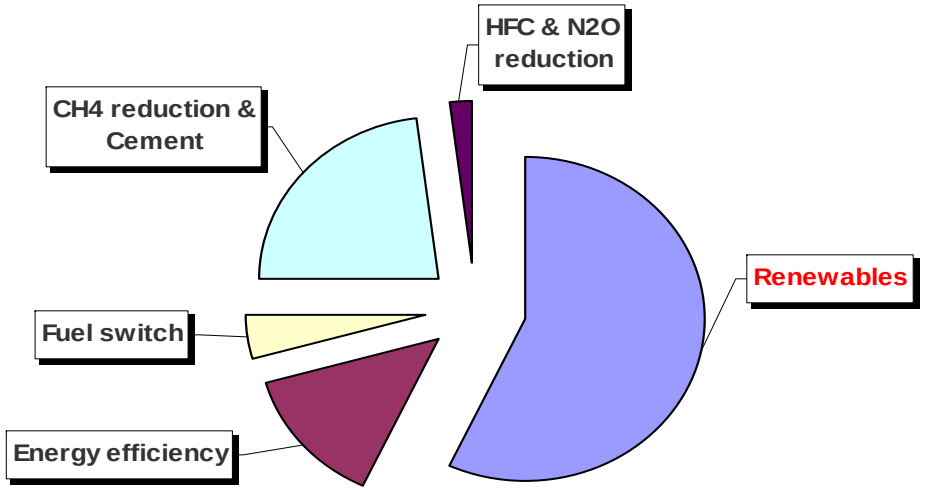


Power generation will contribute half the increase in global CO2 emissions; In 2030, coal plants in developing countries will produce more CO_2 than the entire power sector in the OECD;

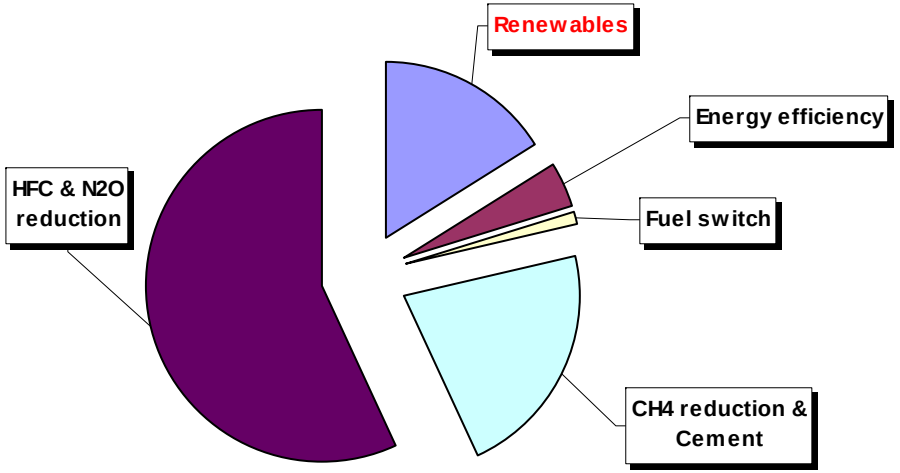
- Source: IEA, World Energy Outlook 2004

CDM Portfolio (projects at PDD stage)

Number (%) of CDM projects in each sector
Total: 589

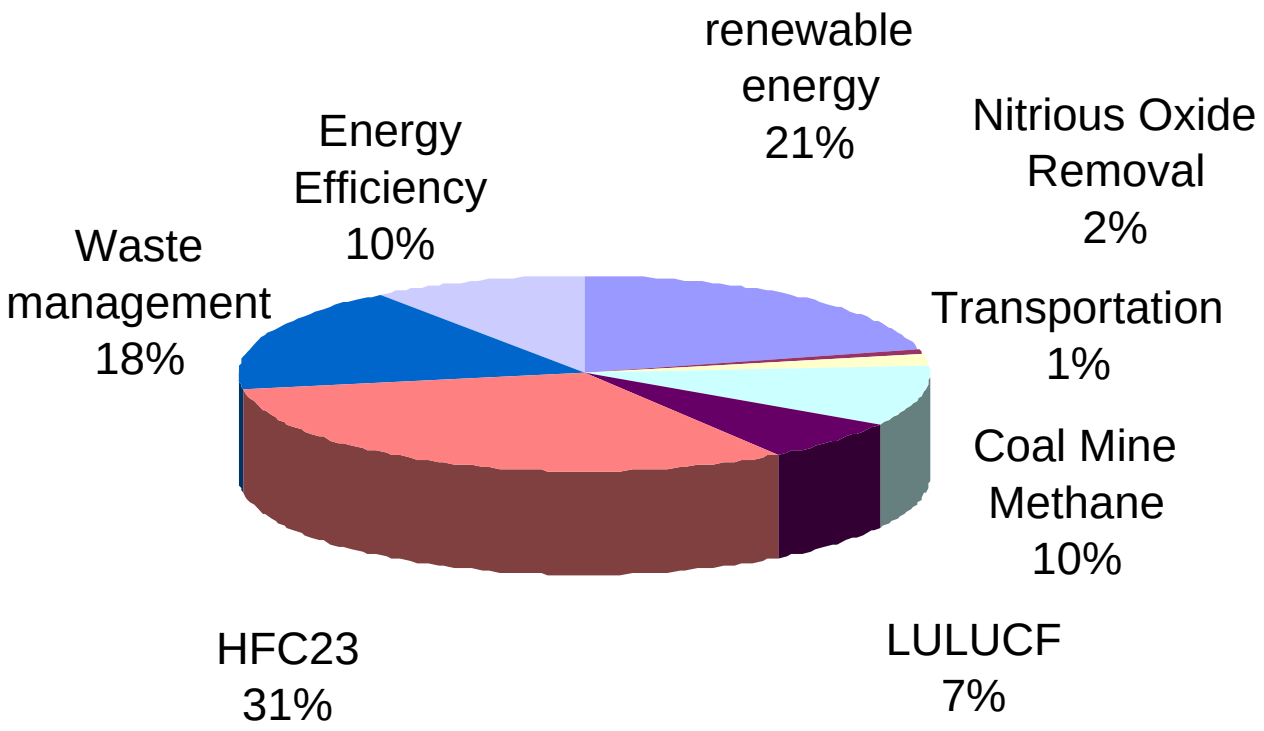


Annual CERs from CDM projects by sector
Total 116.8 million



Source: UNEP Risoe database
(17 January. 2006)

Distribution of World Bank's Carbon Finance Portfolio (total $629 million)



Source: Carbon Finance Annual Report 2005

Impact of Carbon Finance

- Revenue boost
  - $3 to $5 per MWh for renewables, EE
  - Up to $20 per MWh /$60/tcm for CH_4 mitigation
- High quality cash flow
  - OECD - sourced
  - Investment-grade “off-taker”
  - $- or €- denominated
  - ➢Eliminate FX risk
  - ➢Financial engineering may tap capital

Revenue Enhancement (US$/MWh) for Grid Connected RE Project

		CER Price (US$/tCO2)			
Country/Grid Baseline	**EF***	**5.00**	**10.00**	**15.00**	**20.00**
Hydro Dominated	***0.30***	1.50	3.00	4.50	6.00
Natuaral gas	***0.60***	3.00	6.00	9.00	12.00
Coal	***0.90***	4.50	9.00	13.50	18.00

* Emission factors (EF) based on actual PDDs from projects in….

- Costa Rica > Hydro Dominated
- SE Brazil Grid > Natural Gas
- South Africa > Coal/Fuel Oil

Financial Impact of CO2 Revenues for RE

	Investment Cost US$ / KW	CO2e Revenues as % of Inv. Cost by Country Baseline		
		Hydro	Gas	Coal
Hydropower-Small	1,500	2.4%	4.7%	7.1%
Wind Turbines - kW Size	1,300	1.6%	3.3%	4.9%
Wind Turbines - MW Size	900	2.4%	4.7%	7.1%
Large Scale Biomass	1,250	4.8%	9.7%	14.5%
Small Scale Biomass	800	7.5%	15.1%	22.6%

Carbon Revenues make a difference, but not a big difference

Actual Impact by project sector

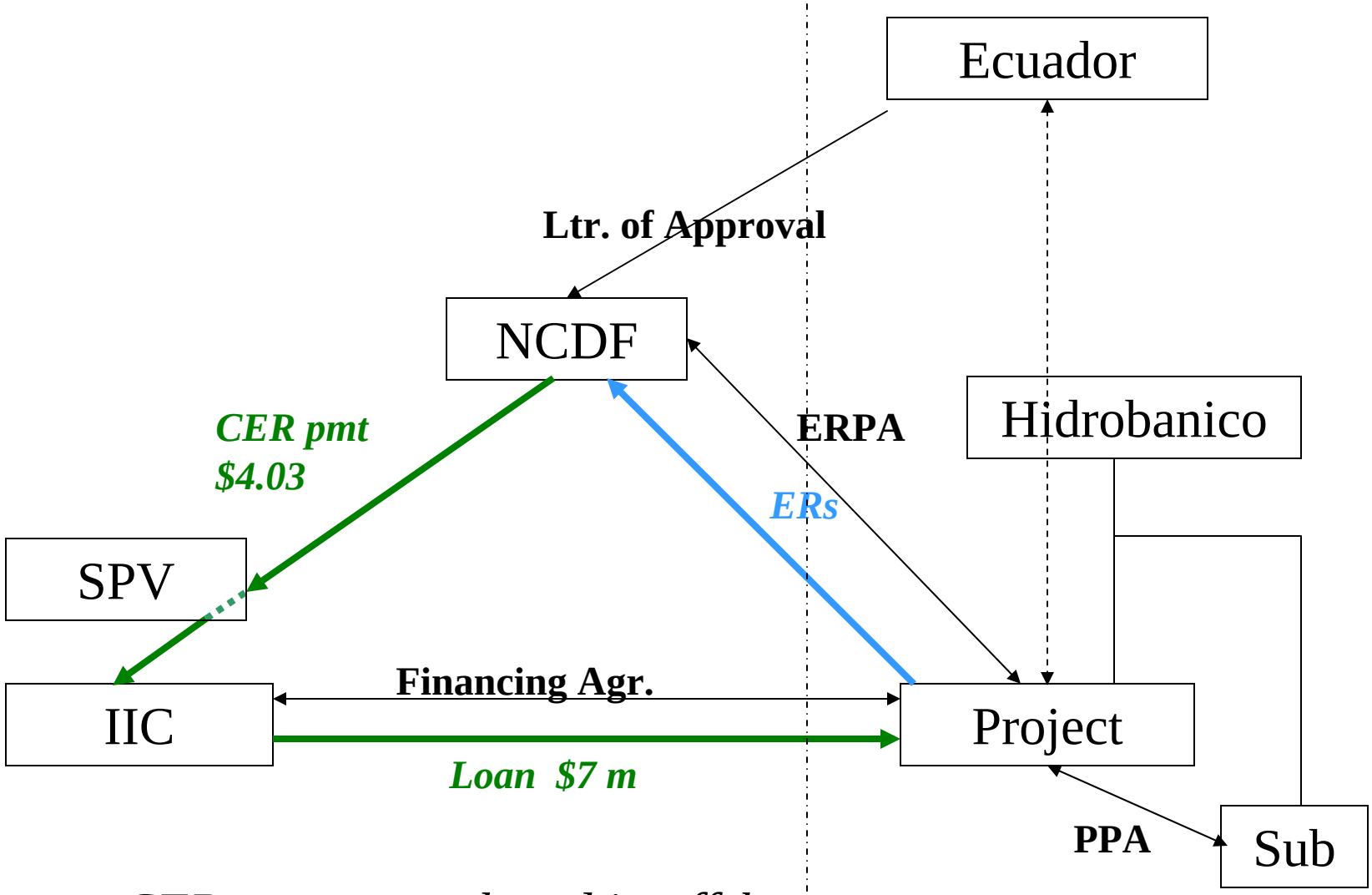
Sector	Country/Project	Incremental IRR
Landfill CH4	Brazil: Nova Gerar	32.70%
Landfill CH4	South Africa: Durban	32.60%
Landfill CH4	Argentina: Olavarria	13.30%
Energy Eff.	Indonesia: Indocement	12.80%
Coalmine CH4	China: Jincheng	8.00%
Biomass+CH4	Bulgaria: Svilosa	5.00%
Biomass	Hungary: Pannonpower	2.00%
Forestry+Bio	Brazil: Plantar	4.70%
Forestry	Romania: Afforestation	0.60%
Hydro	Ecuador: Abanico	0.73%
Hydro	Peru: Poeches	0.70%
Wind	Philippines: Northwind	0.40%
Wind	Colombia: Jepirachi	0.70%

Ecuador: Abanico Hydro

- 30 MW ROR hydro
- 85% capacity factor
- $33.3m cost
- IRR 15.6%

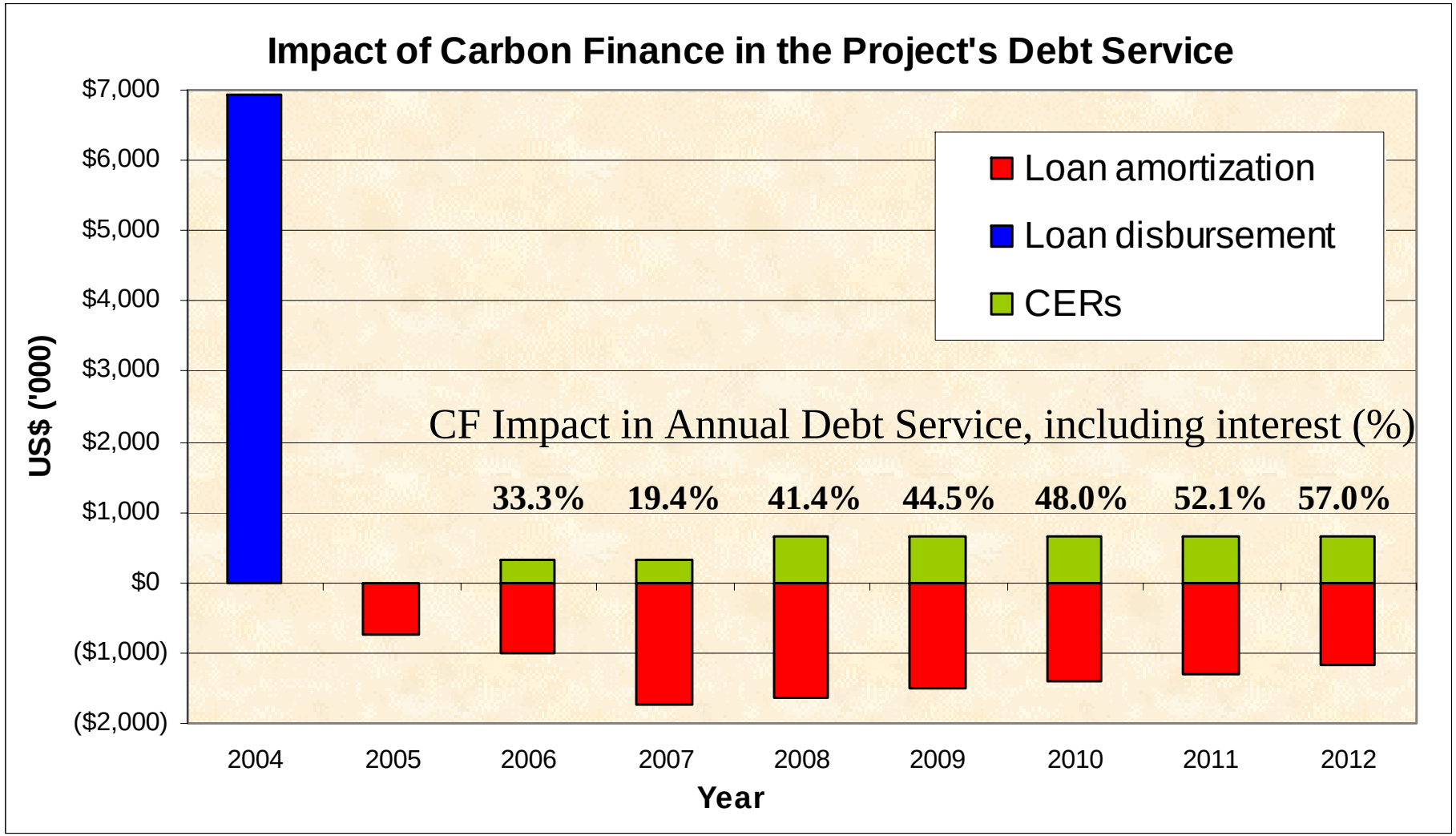
- 800,000 tCO_2e ERs
- ERPA $4m
- △IRR 0.73% => 16.3%

Future flow structure: Abanico



CER payments placed in offshore escrow

Abanico Cash Flows



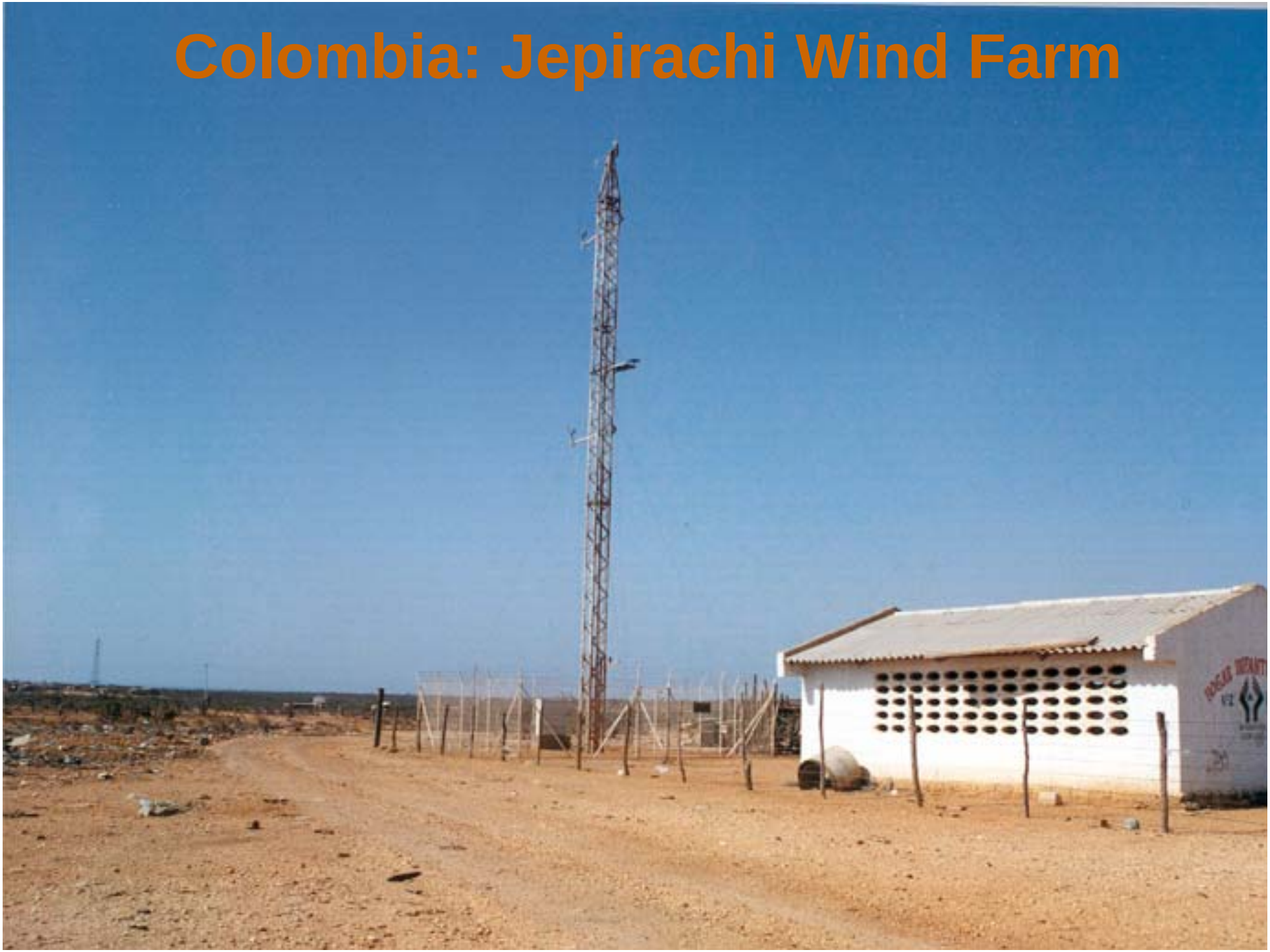
CER payments helped project meet IIC's investment criteria

Abanico Project

- Carbon finance enabled project to:
  - Meet IIC's investment criteria
  - Lower interest rate by 100 bp
  - Expedite financial closure

…In one of Latin America's riskiest countries

Colombia: Jepirachi Wind Farm



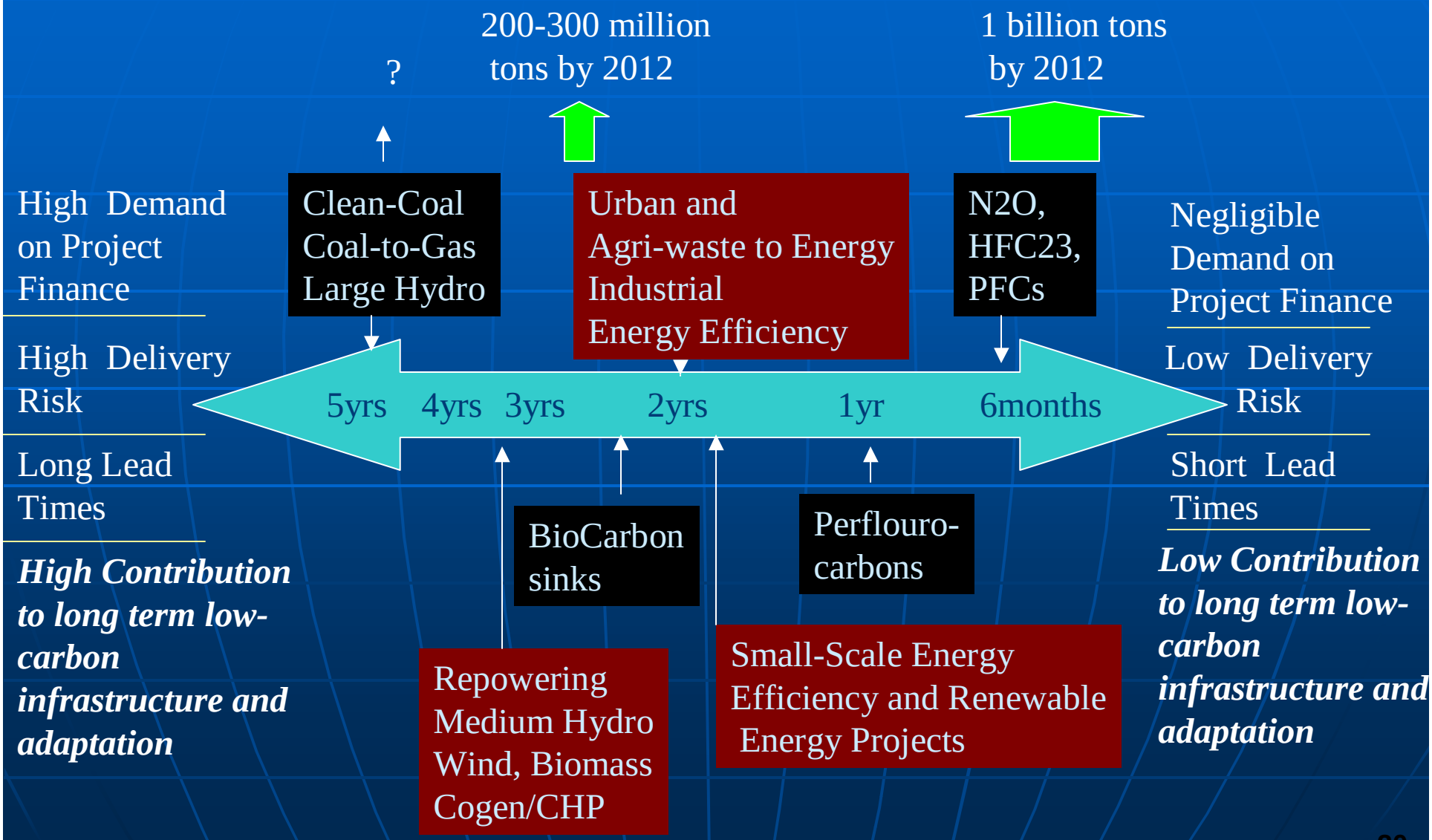
Colombia: Jepirachi Wind Farm

- First wind farm in Colombia
- Inaugurated 1/04
- 19.5 MW capacity
- Will displace 1.17 m tonnes CO2e over 20 years by displacing natural gas and coal generation
- Project will provide resource assessment for future wind parks
- Located in Wayuu Indian territory: poor, arid northern coastal region
- Carbon revenues will support investments in health, water, education

Summary of Catalytic Power

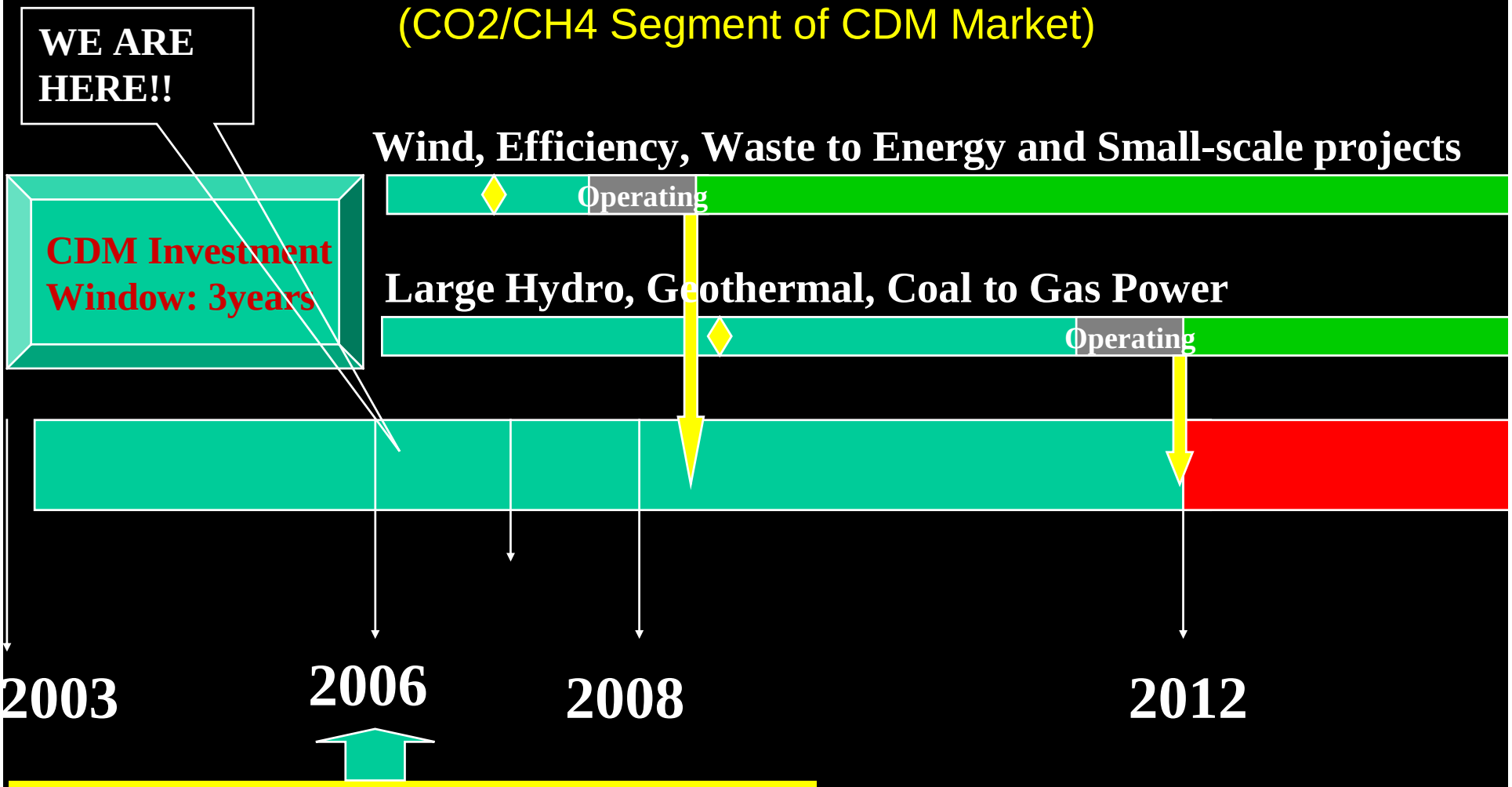
- Carbon finance:
  - ⇨Lowers compliance costs
  - ⇨Improves returns on climate-friendly projects
  - ⇨Provides a bankable revenue stream
- World Bank Group's role
  - ⇨Support sustainable development
  - ⇨Prepare the ground for the private sector
  - ⇨Facilitate carbon market development
  - ⇨**Purchase ERs to catalyze investment**

CDM Market Segmentation and Delivery Potential



Challenge of the Closing Window to Deliver Projects for First Commitment Period

(CO2/CH4 Segment of CDM Market)



The Challenge

- ✓Without clear signal post 2012….RE investment window for CDM is closing
  - – Long lead time projects (Hydro, clean coal, etc) are being overlooked.
  - – Unless project is already in construction, CDM may not be cost/benefit to sponsors.
  - – CER buyers will place more emphasis on CH4 (landfills) and/industrial gas projects.

What We Can Do Now

- ✓Push for post 2012 clarification
- ✓Provide advance payments for RE projects
- ✓Purchase post 2012

The main question still is……

Role of Carbon Finance

The main question still is…….

WILL THIS BE ENOUGH!