



# Introduction to carbon financing mechanisms for renewable energy technologies



Karachi, 27 March 2010



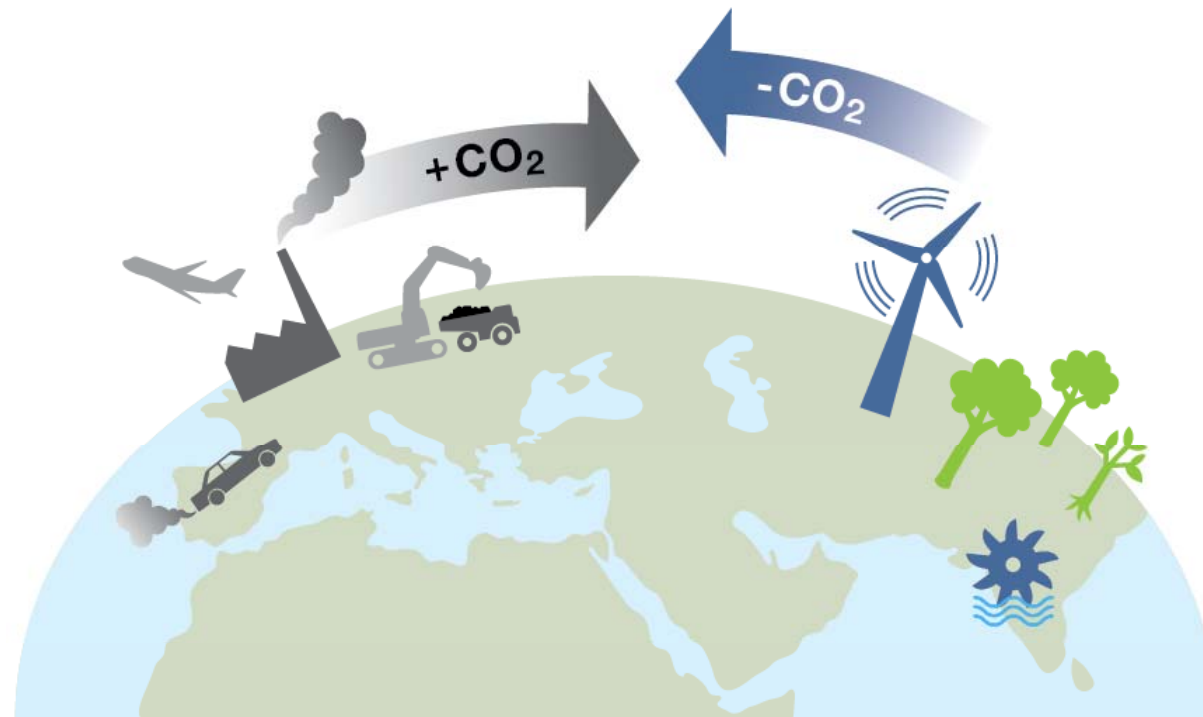
## **Overview of the carbon markets**

- Renewable energy and carbon markets
  - Introduction to Programme of Activities (PoA)
  - Overview of South Pole
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# Carbon credits – how it works

Man-made global warming threatens the basis of life, foremost it is threatening the poorest countries, and increasingly it threatens the standard of living in the industrialized world. Market based mechanisms are a strong and proven tool, beyond energy efficiency and savings, for the fight against climate change.

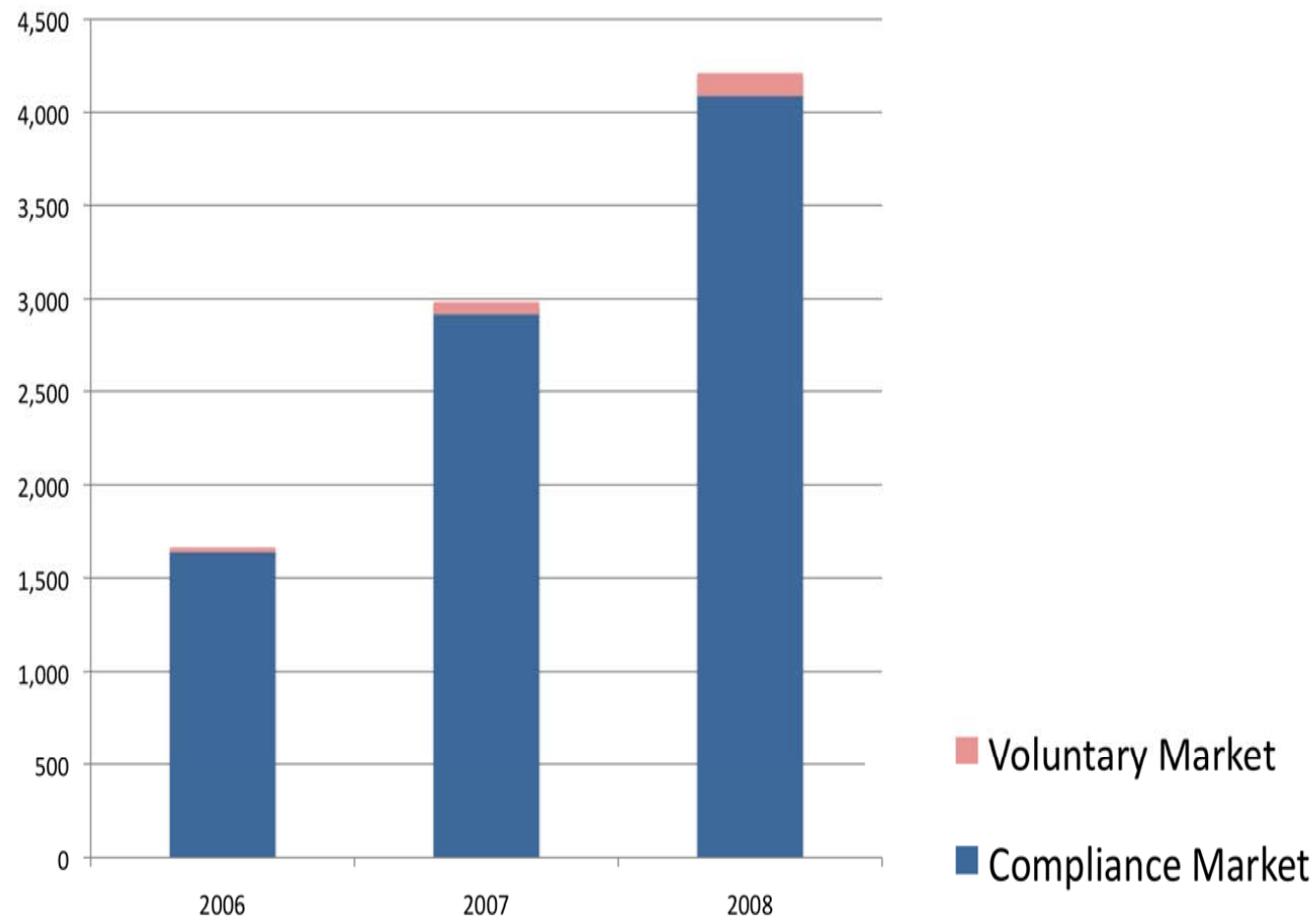


For every ton of avoided greenhouse gas emissions, achieved e.g. by replacing fossil fuel power with renewable energies, the project owner is receiving so called carbon credits which can be sold to companies and institutions with a voluntary or compliance carbon reduction strategy.

# Global carbon transactions reached over 4 billion tons CO<sub>2</sub>e\* (USD 120 billion) in 2008



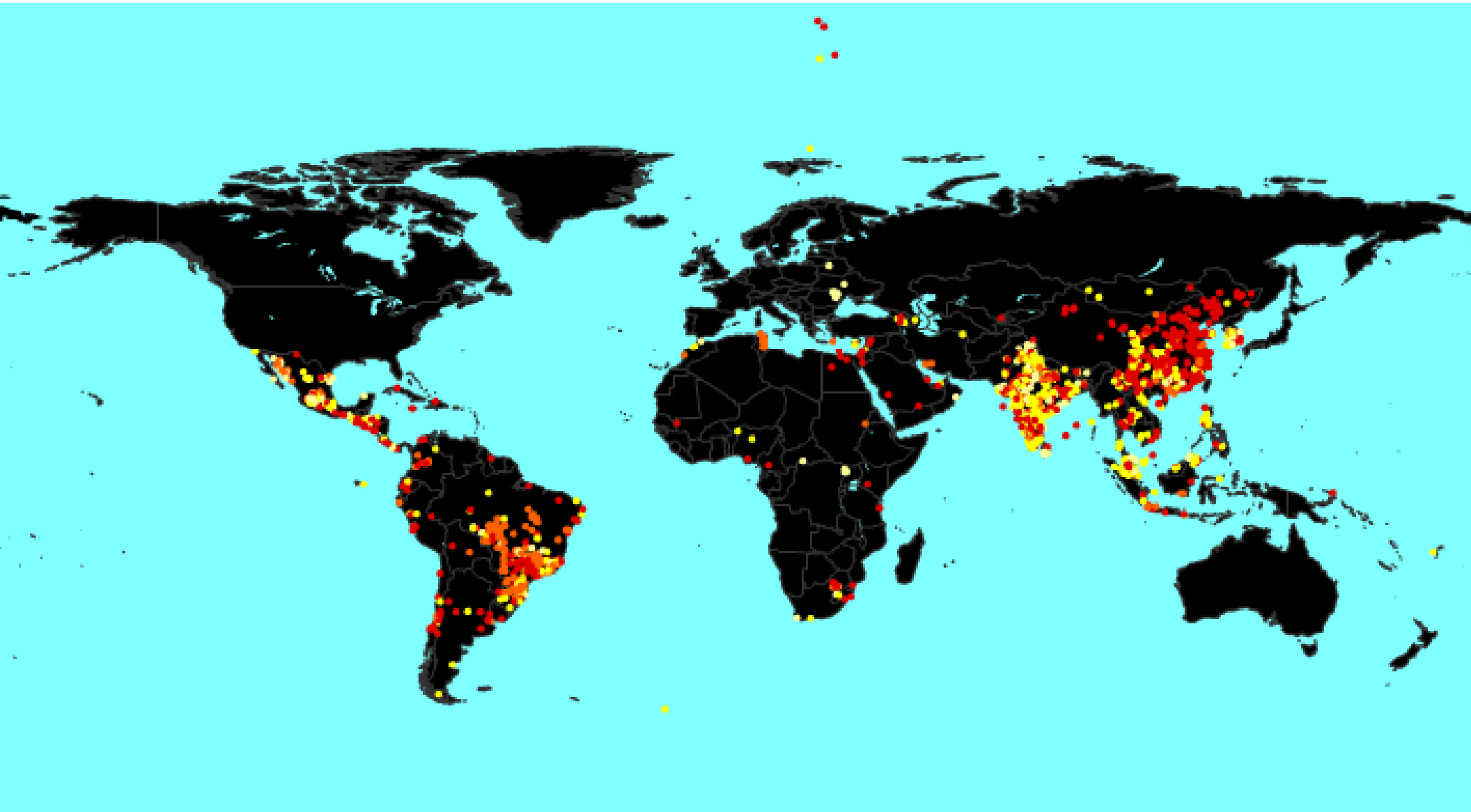
Market Volume (MtCO<sub>2</sub>e\*)



\*CO<sub>2</sub>e = CO<sub>2</sub> equivalents

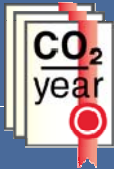

Source: New Carbon Finance

# The CDM world today



# We distinguish compliance and voluntary carbon markets



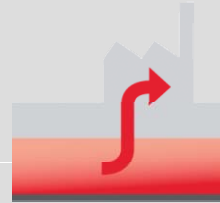
	Examples	Key features
<b>Compliance markets</b> 	<ul style="list-style-type: none"><li>• EU Emission Trading Scheme</li><li>• Kyoto Protocol Market</li><li>• New Zealand Emission Trading Scheme...</li></ul>	<ul style="list-style-type: none"><li>• Different types of compliance carbon credits</li><li>• Kyoto credits (CDM and JI) can be sold to Kyoto and EU markets</li><li>• High liquidity</li><li>• Unit price varies little across projects, but premium for Gold Standard certified projects</li></ul>
<b>Voluntary markets</b> 	<ul style="list-style-type: none"><li>• GS VERs</li><li>• VCUs</li><li>• VERs for Chicago Climate Exchange</li><li>• ...</li></ul>	<ul style="list-style-type: none"><li>• Carbon credits generated on the basis of voluntary standards</li><li>• Not suitable for compliance purposes (Kyoto)</li><li>• Prices vary with quality and origin of projects, with Gold Standard projects fetching the highest price</li></ul>

# Typical project types that qualify for voluntary or compliance carbon credits



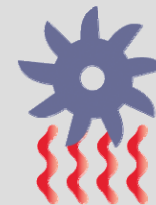
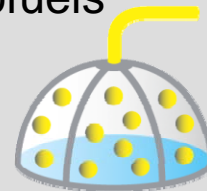
## Renewable Energies

- Hydropower
- Geothermal Energy
- Wind Power
- Solar Power
- Biomass



## Industrial Processes

- Methane capture from landfills and conversion to electricity
- Anaerobic digestion of wastewater, coupled with electricity generation
- Methane capture from mines and conversion to electricity
- Cogeneration with Biomass and Biofuels
- Waste Heat Recovery
- Energy efficiency



## Forestry

- Afforestation
- Reforestation





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- Overview of the carbon markets



## **Renewable energy and carbon markets**

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# Options for decentralized renewable energy technologies



Energy services	Income-generating value to rural households and enterprises	Renewable energy options
Irrigation	Better yields, higher value crops, greater reliability	Wind, solar PV, biomass
Illumination	Increased working hours	Wind, solar PV, biomass, micro-hydro
Grinding, milling, husking	Creation of value-added products	Wind, solar PV, biomass, micro-hydro
Drying, smoking	Creation of value-added products	Biomass, solar thermal, geothermal
Refrigeration, ice making	Preservation of produce	Wind, solar PV, biomass, micro-hydro, geothermal
Extraction	Production of refined oils from seed biomass	Solar thermal
Transport	Access to markets, public transport	Biomass (biofuels)
Communication	Access to information, business coordination	Wind, solar PV, biomass, micro-hydro
Battery charging	Services	Wind, solar PV, biomass, micro-hydro



# Key barriers to RE development

Availability of financing especially project finance for RE projects

A blend of corporate and project finance practiced by lenders

Mostly non-recourse or limited recourse financing

Higher due diligence requirement – longer processing times

Issues relating to under performance – Exposed to uncertainties in hydrology/wind pattern assumed at the time of financing

Initial risk is on developer , shifts to Contractor during construction and finally to financiers after COD

PPA: In most of the projects not co-terminus with loan, tariffs are mostly re-negotiable after initial periods, affects cash flow projections

Delay in payments by off-taker – Impacts directly the debt serviceability, forces to have credit enhancement mechanisms

**“Lenders can only fund assets/cash flows, not intentions”**



# Issues related to RE projects

Wind Power	Biomass
higher capital cost per MW (or cost/kWh)	lack of standardized technology
reluctance in off take on account of - no power on demand – seasonal generation, comparatively lower quantity generation, gets lower priority in merit order dispatch	issues related to policy frame work ( allotment, tariff, third party sale)
issues related to land acquisition, permission	risk related RM ( availability/price volatility, storage, difficulty in adhering working capital norms
low level of indigenization of spares/cost(g) grid availability	size related issues in terms of in contracting technology/funds



# Financing RE projects with carbon revenue

The Carbon Funds provide 10% to 25% of upfront payment against the forward contract of CERs


In case of non delivery the upfront payment gets converted in to unsecured loan

If ERPA is signed with AAA rated buyer, then discounting of Carbon Credits could support in equity raising

Need for Carbon Funds who can participate in the CDM projects

SPV Route/Bundling of small projects for raising resources against the CDM revenues



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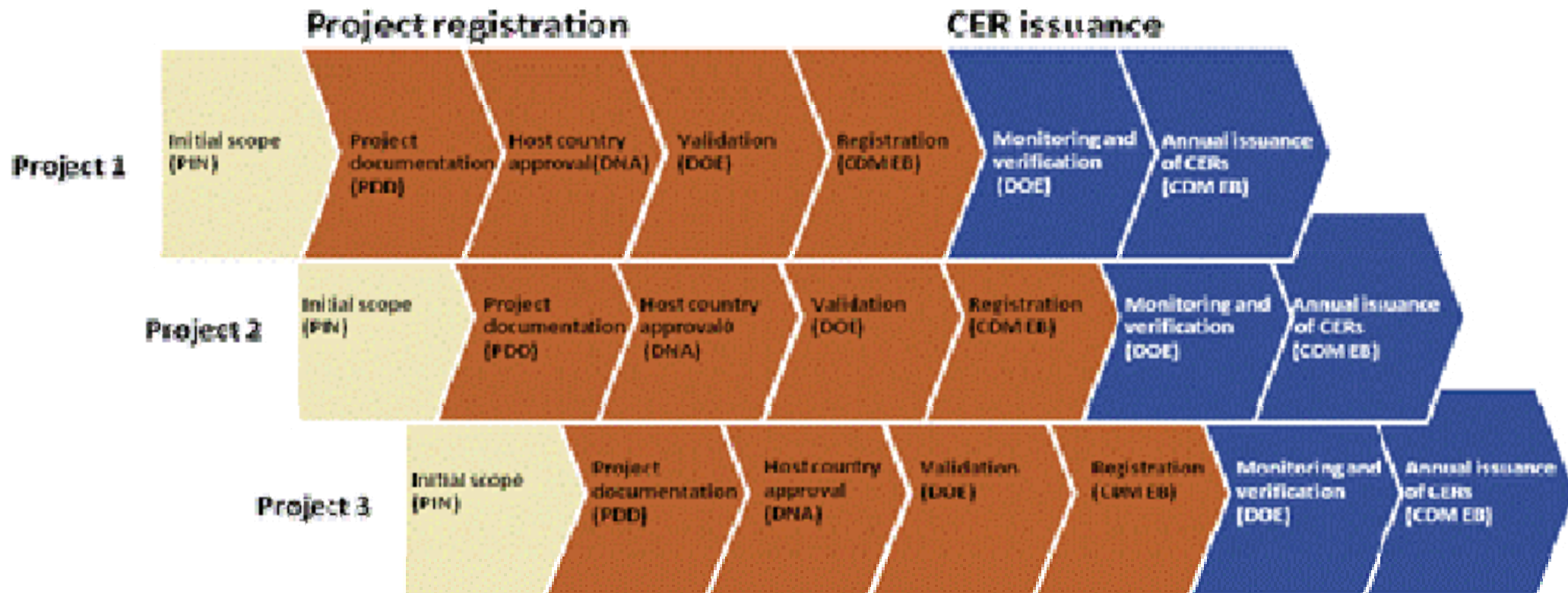


# Addressing barriers to RE development and CDM

Measure	Responsible/Involved	Barrier(s) addressed
Speedy and transparent CDM approval process	Government (MoE/DNA)	Transaction cost
Integrate CDM into national energy and economic development planning	Government	Lack of clear signal to government officials to support CDM
Preference to RET CDM projects	Government; Industrialised country governments	Competition from low-cost high-yield projects
Using CDM Gold Standard	Government; Project developers	High specific investment costs
Higher prices and up-front financing for RET CDM projects	Industrialised country governments	High specific investment costs
Pursue CDM Programme of Activities	Government, regional government(s), project developers	High specific investment costs

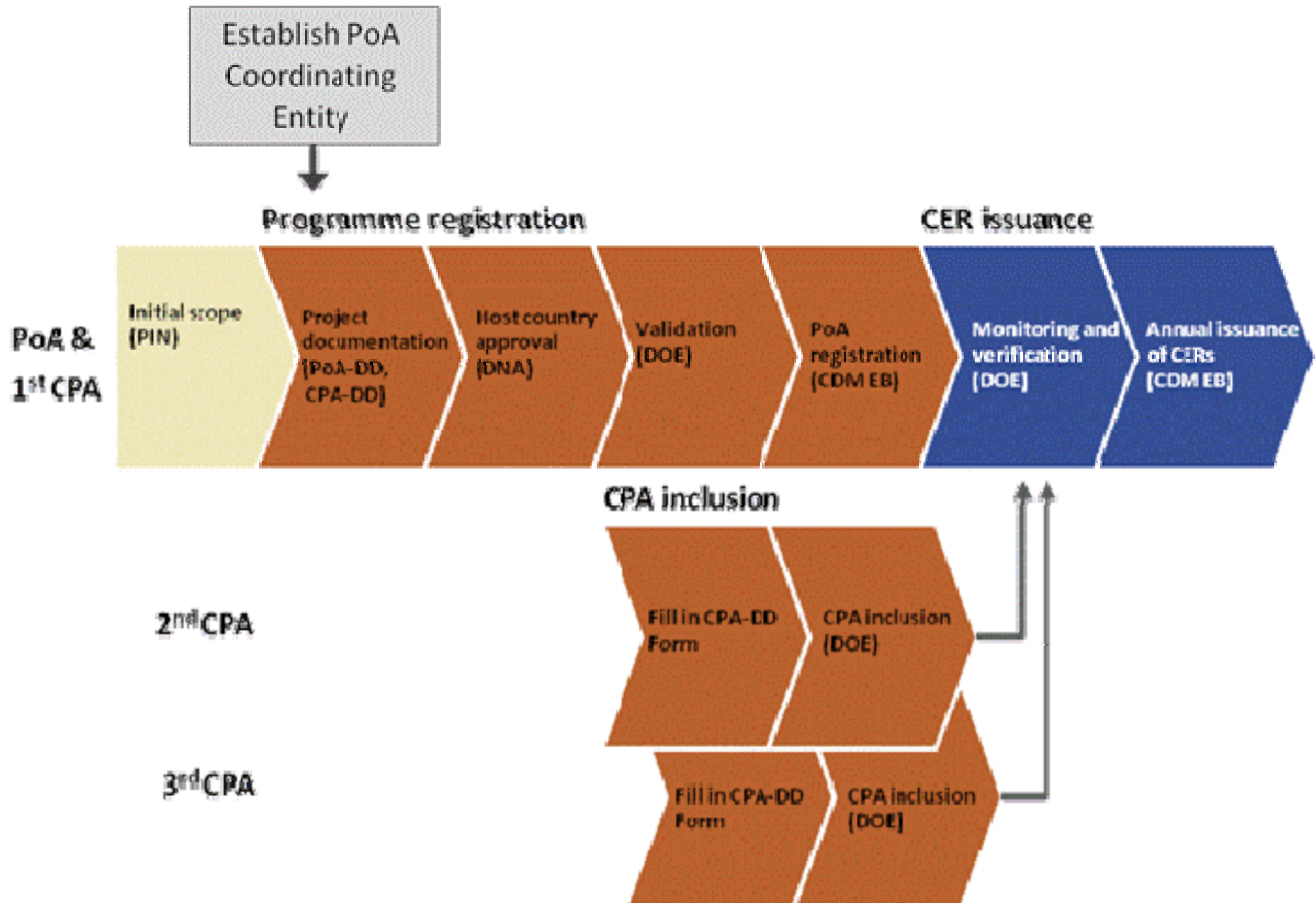


# The standard CDM project cycle



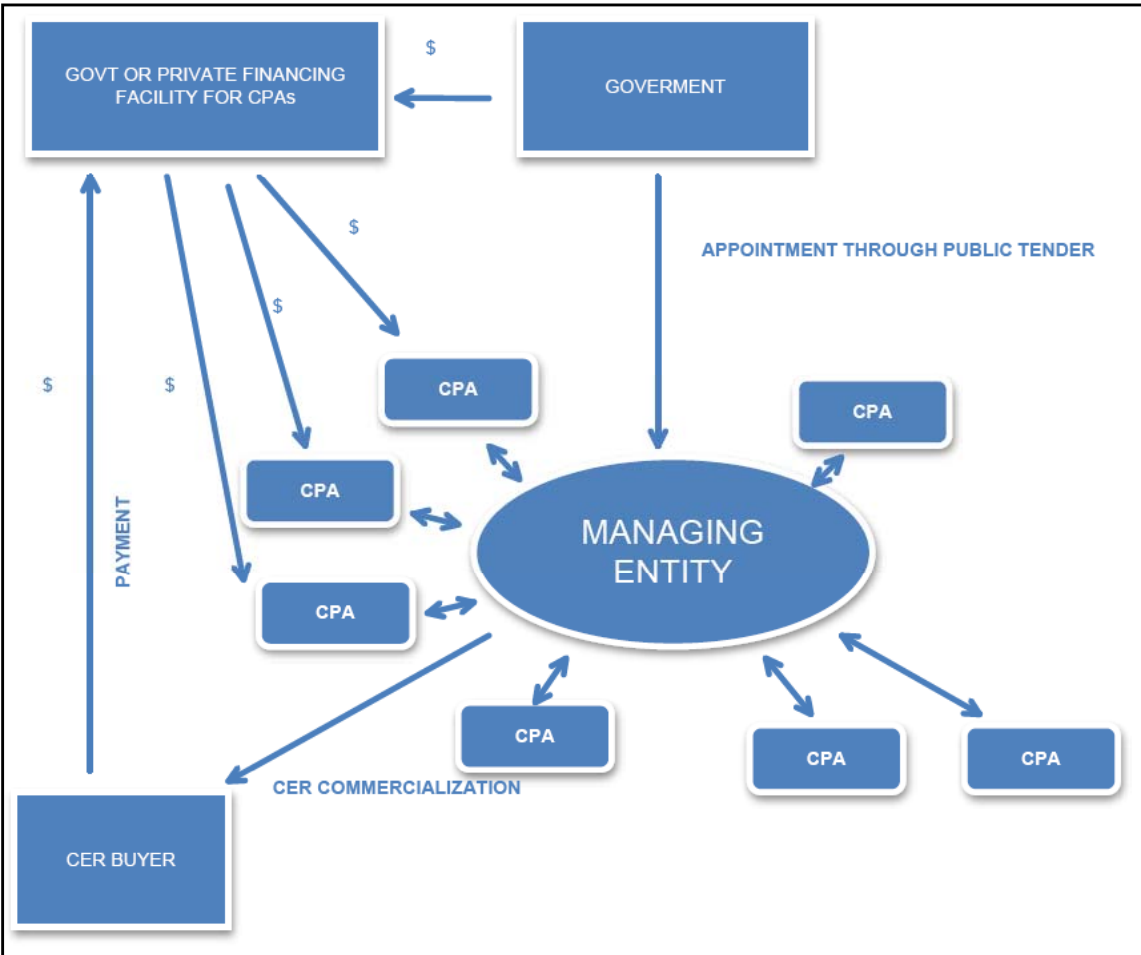
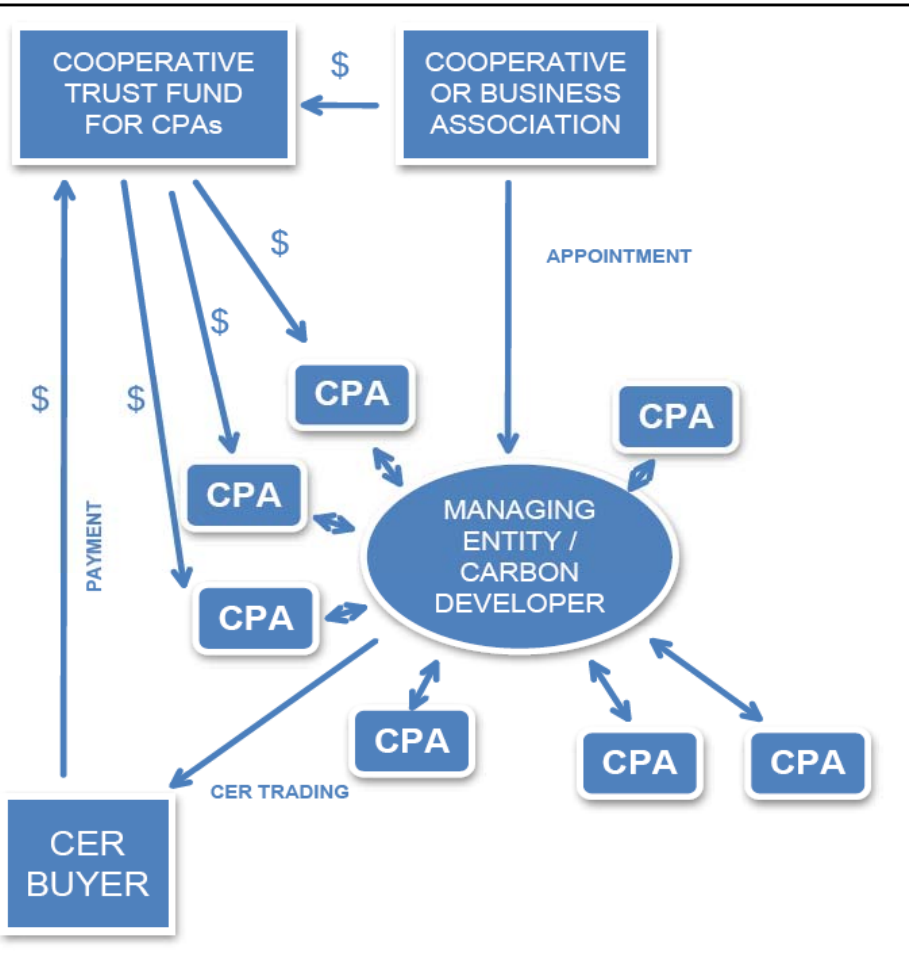


# The Programme of Activities cycle





# Possible structures of PoA





# How can PoAs kick-start the carbon markets?

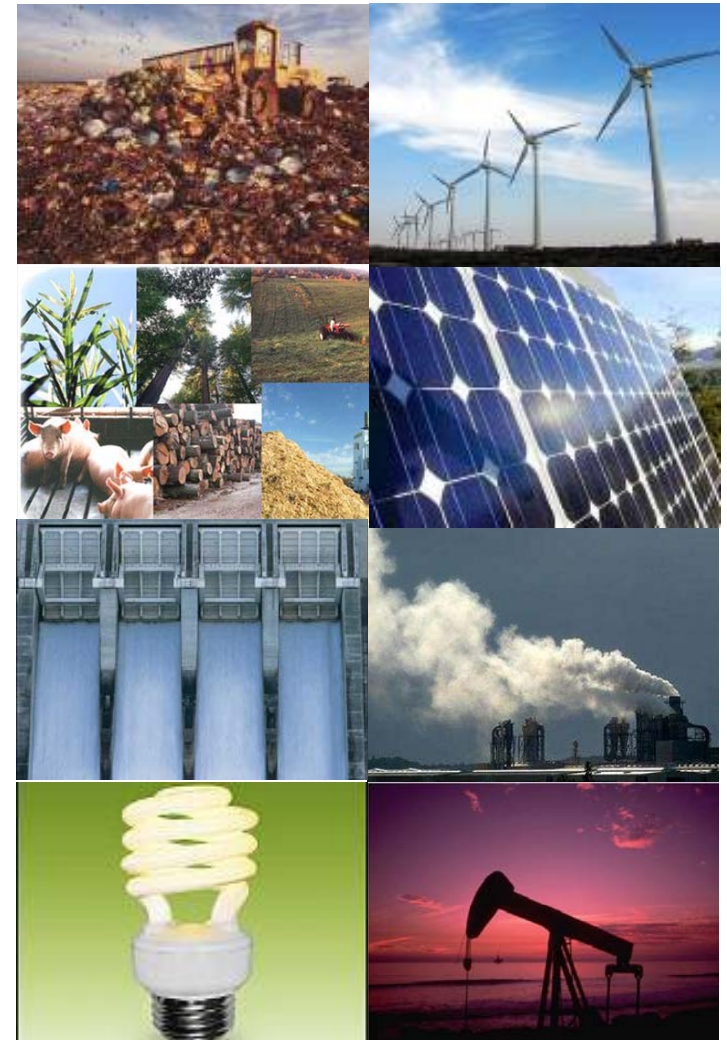
Lower transaction costs & faster registration

Enable small and micro projects (cook stoves, energy-efficient lights, etc.)

Link policies and carbon finance

Open-up carbon markets for least developed countries / regional PoAs

Access to carbon pre-payments (“Carbon Finance”)





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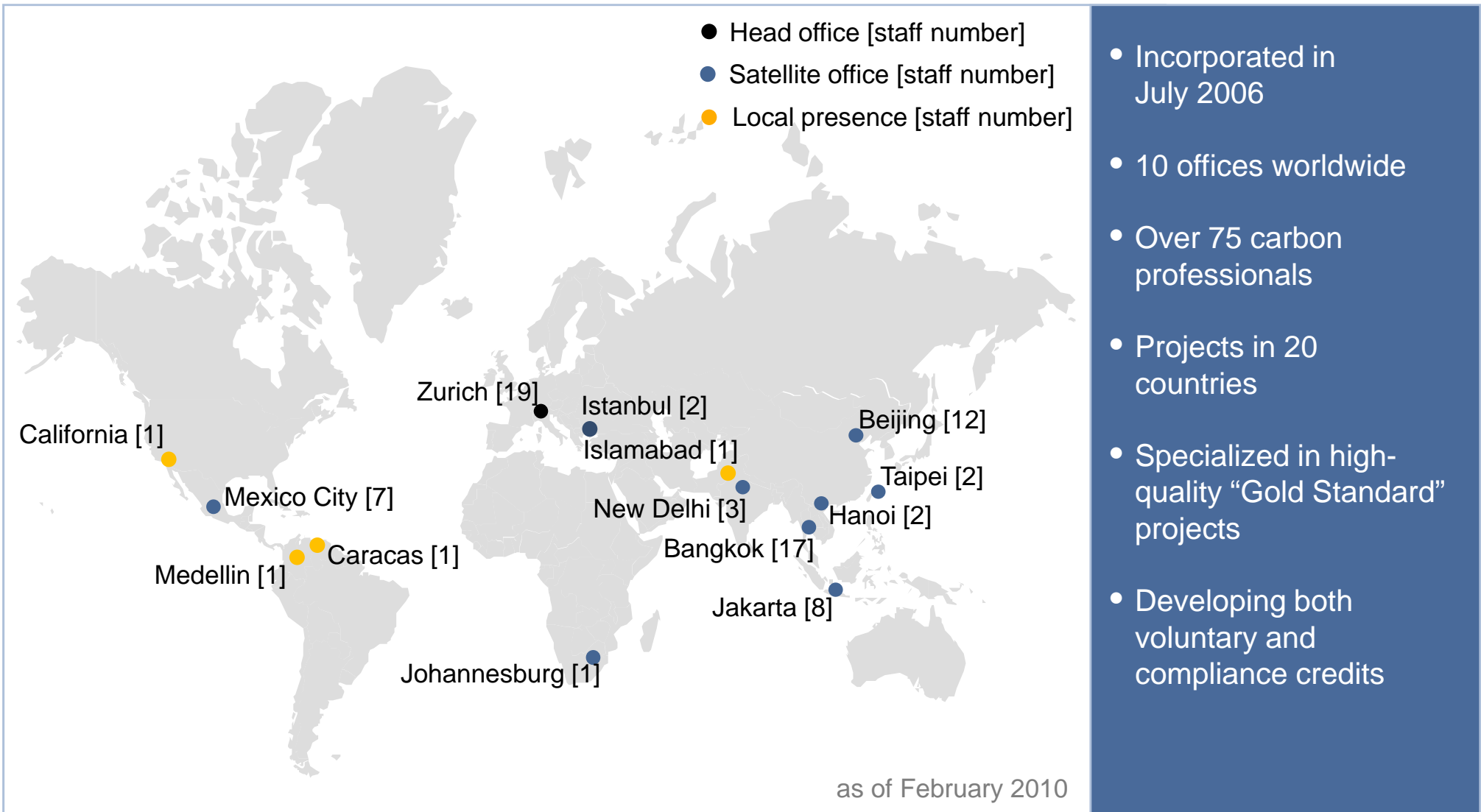


## **Overview of South Pole**

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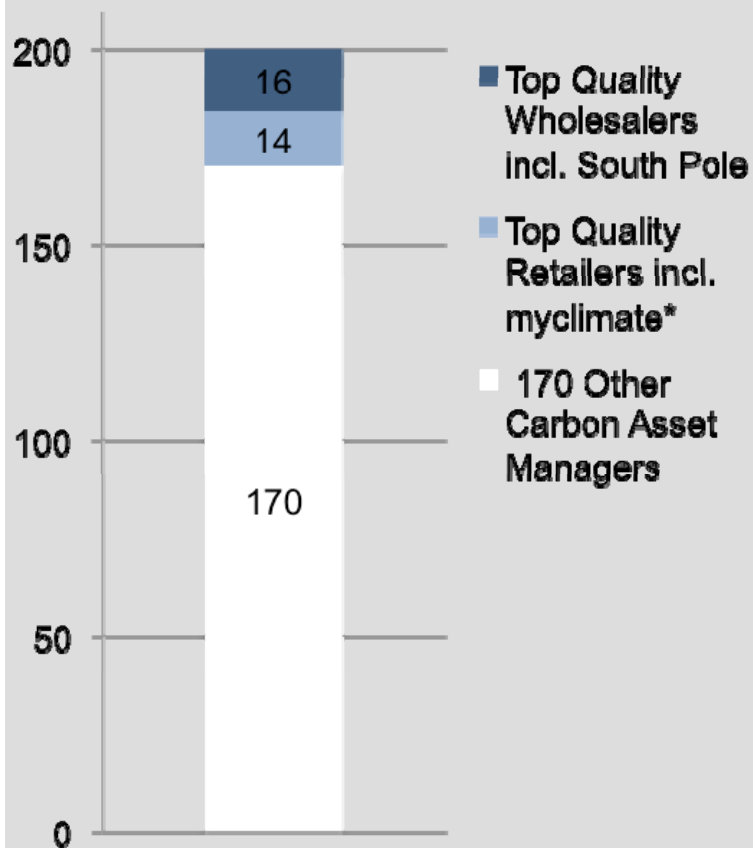
# South Pole has a wealth of international experience



# International Market Leader in compliance and voluntary market



## Rated among the World's Top Carbon Wholesalers



\*founded by South Pole partners in 2002

Source: The ENDS Guide to Carbon Offsets, 2008

## Carbon Market Firsts

- Brought to market the **first ever Gold Standard carbon** credits (Biomass Malawalli / India)
- Handled the **first ever international Kyoto carbon credit transfer**
- **First company to cancel CERs**, making sure that they cannot be resold

## Premium quality

- **Leadership Position on Gold Standard (GS) Registry**: 45 projects listed
- **One of the top GS VER developers** with 10% of entire GS VER pipeline
- **Leading developer of GS CER projects** with 25% of entire GS CER pipeline



# South Pole – a first mover by definition

## Compliance Market

- First ever trade worldwide of CERs
- First CER cancellation worldwide to offset emissions

## Gold Standard



- Largest portfolio worldwide of Gold Standard Certified Emission Reductions (CER) projects
- One of the largest portfolios worldwide of Gold Standard Voluntary Emission Reductions (VERs)
- First company worldwide who generated and brought to the market CERs with the Gold Standard quality label

## PoAs

- One of the world leaders in Programmes of Activities (PoAs), the second generation type of carbon projects

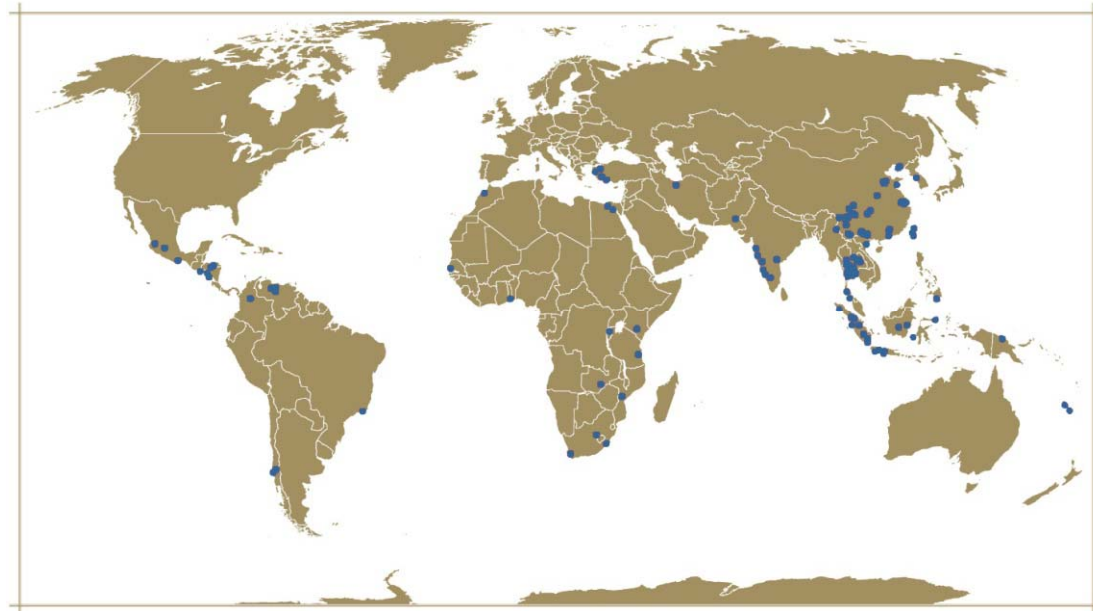
## IT Solutions

- In-house development of cutting edge software solutions to manage carbon projects, consultancies, and information exchange

# South Pole references – a rapidly growing portfolio of projects



South Pole  
Projects all  
around the  
globe



Broad project  
pipeline

- More than 120 contracted projects in over 20 countries with a total volume of more than 60 million tCO<sub>2</sub>e until 2012
  - ~50% are CDM projects
  - ~50% are Gold Standard projects
- Projects in advanced negotiations with roughly 30 million tCO<sub>2</sub>e until 2012

Most important  
project types

- Renewable Energy (Biomass, Hydro, Wind, Geothermal)
- Waste Treatment (liquid and solid)
- Energy Efficiency
- Reduction of Waste Gas (Oil, Gas and Chemical Industries)
- Forestry
- Programmatic Approach (PoAs)



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