United Nations Development Programme

# Using Carbon Finance to Fund Energy-Efficiency Projects


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## Presentation Structure

1. Global Climate Change
2. The Kyoto Protocol and Carbon Trading
3. Different Mechanisms to encourage Energy-Efficiency
4. Carbon Trading to Fund Energy-Efficiency Projects
5. Role of UNDP in Carbon Finance

# 1. Global Climate Change

- Why EE is so important
- Historical variations in temperature
- IPCC

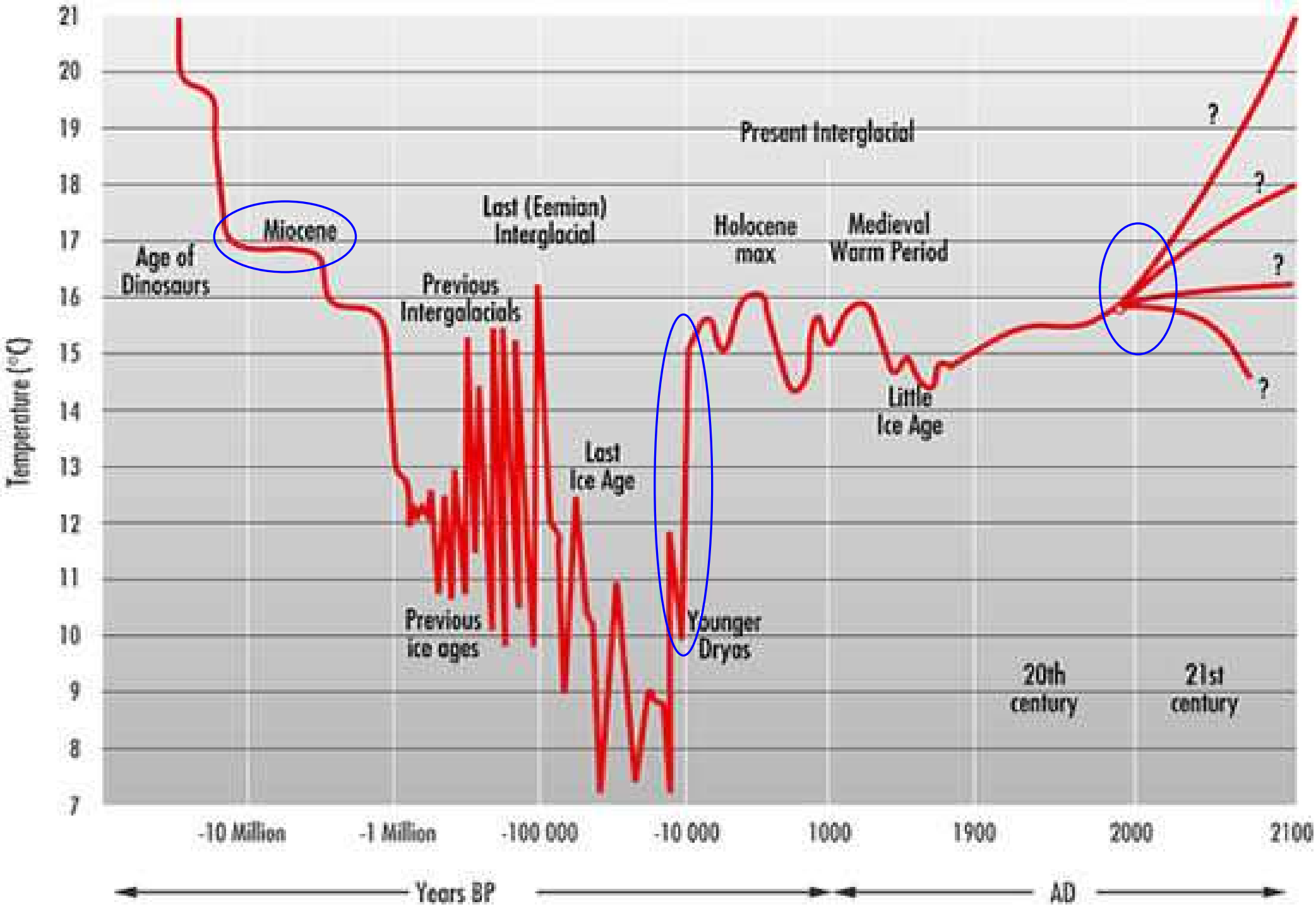
# Why is energy-efficiency so important?

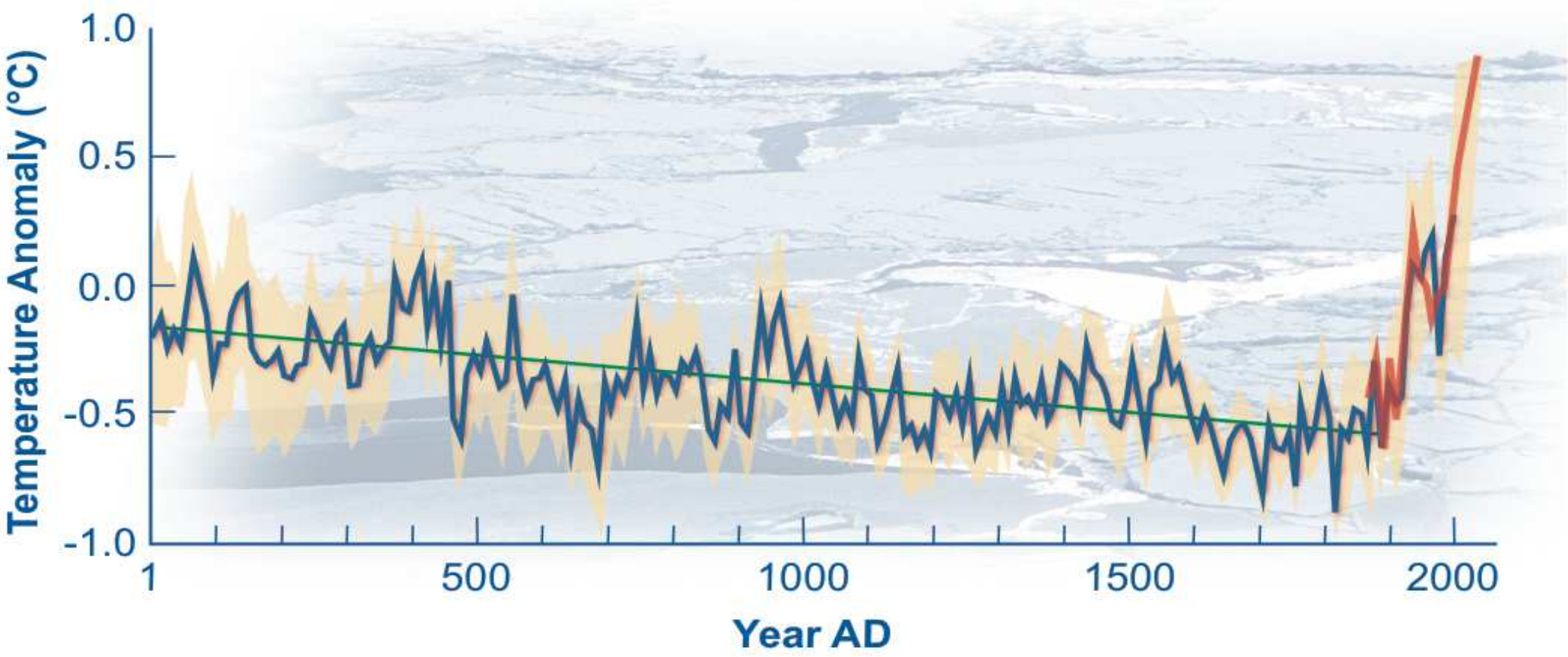
**Win-Win opportunities**
**-Good for business**
**-Good for the environment**

**World governments should exploit energy efficiency as their energy resource of first choice because it is the least expensive and most readily scalable option to support sustainable economic growth, enhance national security, and reduce further damage to the climate system.**

**Doubling the rate of energy efficiency improvement would:**

- ✓**Allow the world to hold CO2 concentrations below 550 ppm**
- ✓**Avoid $3.0 trillion worth of new generation**
- ✓**Save consumers $500 billion per year by 2030**
- ✓**Eliminate the same amount of energy supplied by 2,000 coal power plants**
- ✓**Return the globe to 2004 energy consumption levels**
- ✓**Drive business productivity improvements and new employment opportunities**


Temperature (°C)
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
Age of Dinosaurs
Miocene
Previous Intergalacials
Last (Eemian) Interglacial
Present Interglacial
Holocene max
Medieval Warm Period
Little Ice Age
Last Ice Age
Previous ice ages
Younger Dryas
20th century
21st century
?
?
?
?
-10 Million
-1 Million
-100 000
-10 000
1000
1900
2000
2100
Years BP
AD




Arctic air temperature change reconstructed (blue), observed (red)

# IPCC

**Intergovernamental Panel On Climate Change**

Scientific Body established by UNEP and WMO to evaluate the risk of climate change caused by human activity. IPCC established in 1988 and is based in Geneva.

## About the IPCC

**Second Assessment Report (1995)**

✓ The balance of evidence suggests a discerning human influence on climate change which is expected to continue in future

**Fourth Assessment Report (2007)**

✓ Warming of the climate is unequivocal

✓ Most of the increases in temperature are Anthropogenic (i.e – caused by humans)

✓ Probability that it is naturally caused (< 5%)

✓ World temperature increases 1.1 – 6.4% is predicted in the 21st century

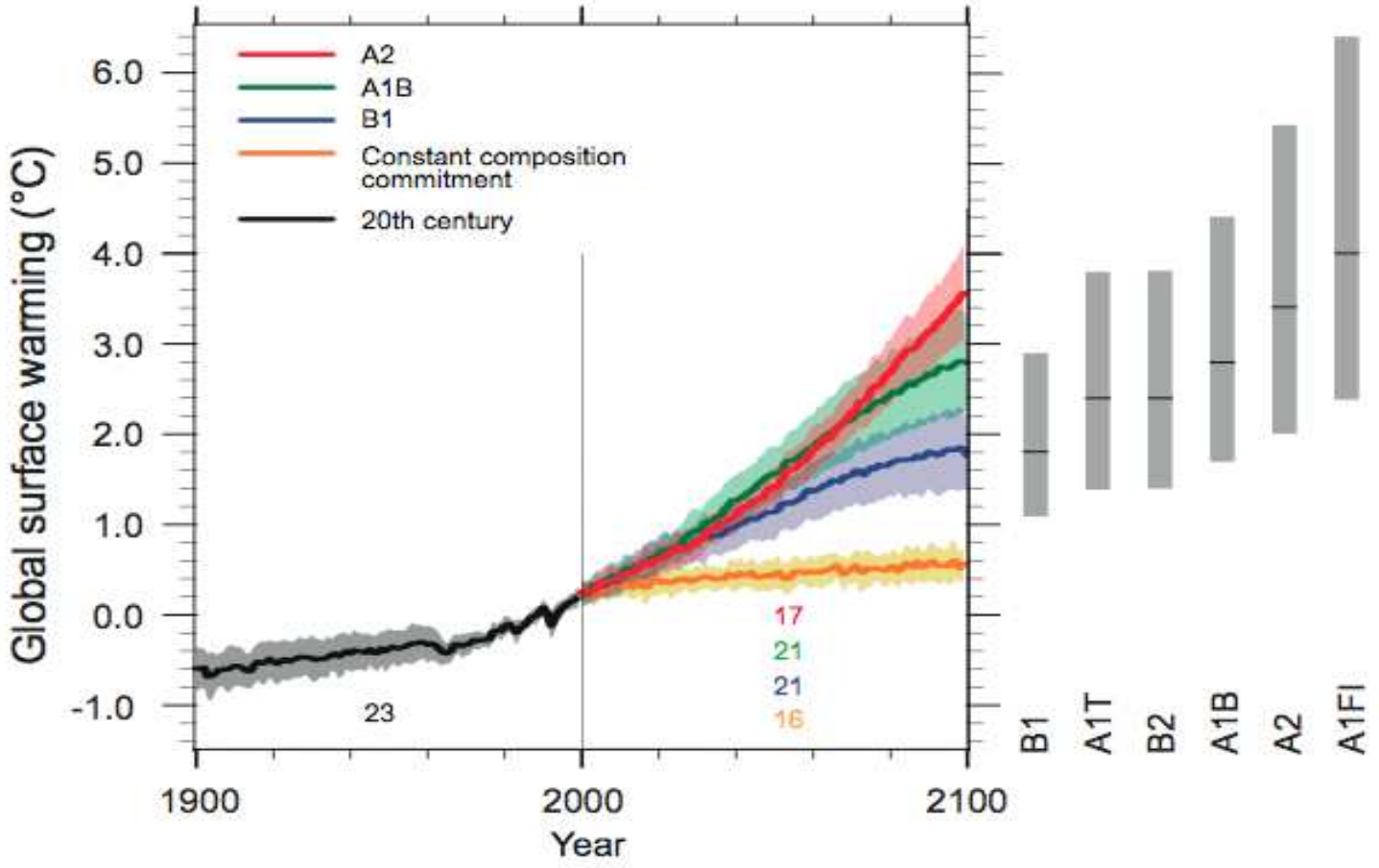
✓ Sea level rise of 18 to 59 cm predicted

✓ 66% probability more storms, droughts, cyclones

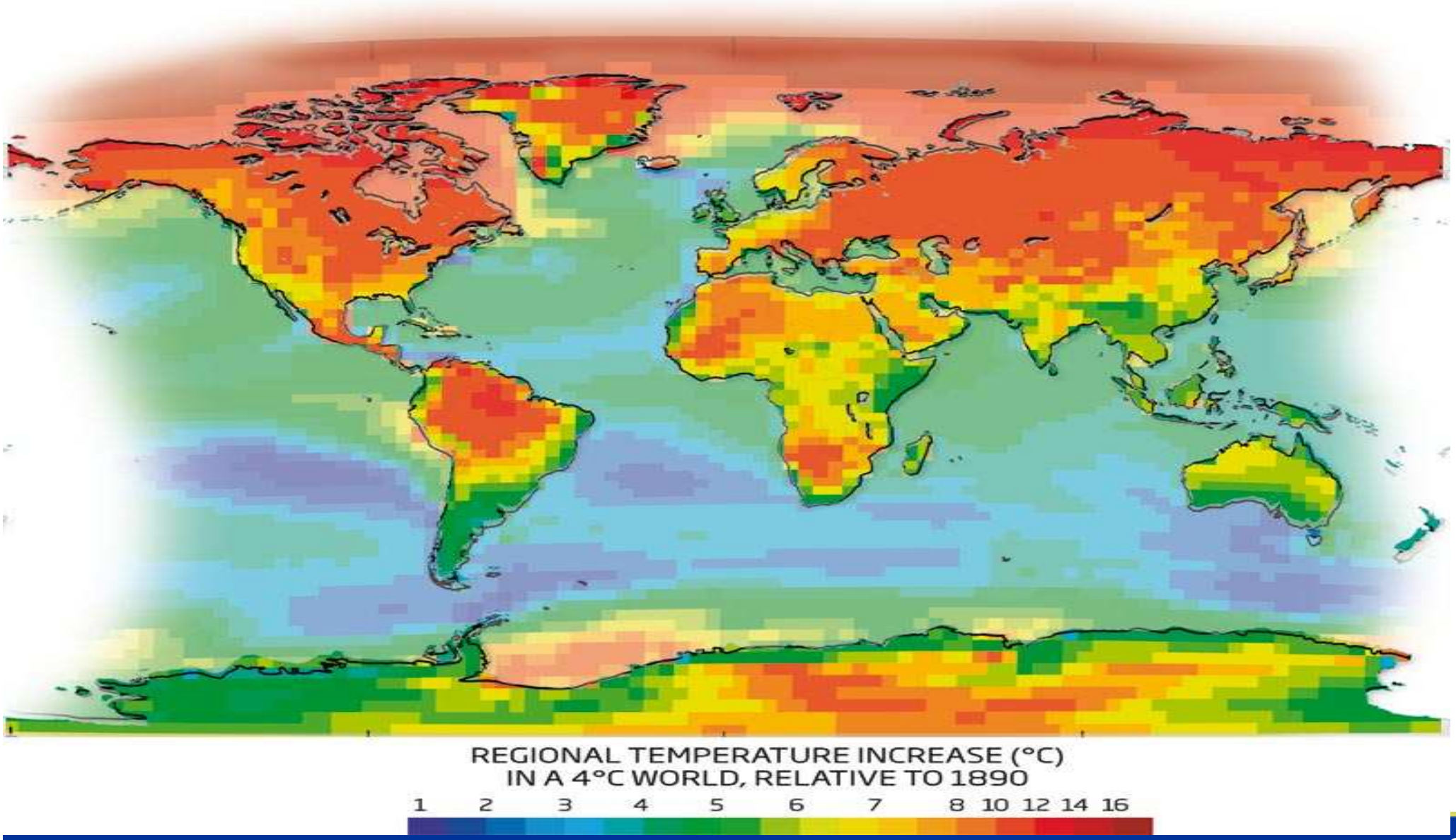
**Fifth Assessment Report**

✓ Scheduled for 2014

# Projected Changes in global surface temperature for the 21st Century - (2 degrees celcius is acceptable)




**Projected change in global surface temperature for the 21st Century** [Source: Alley *et al.*, 2007]


REGIONAL TEMPERATURE INCREASE (°C)
IN A 4°C WORLD, RELATIVE TO 1890
1 2 3 4 5 6 7 8 10 12 14 16

# 2. The Kyoto Protocol and Carbon Trading

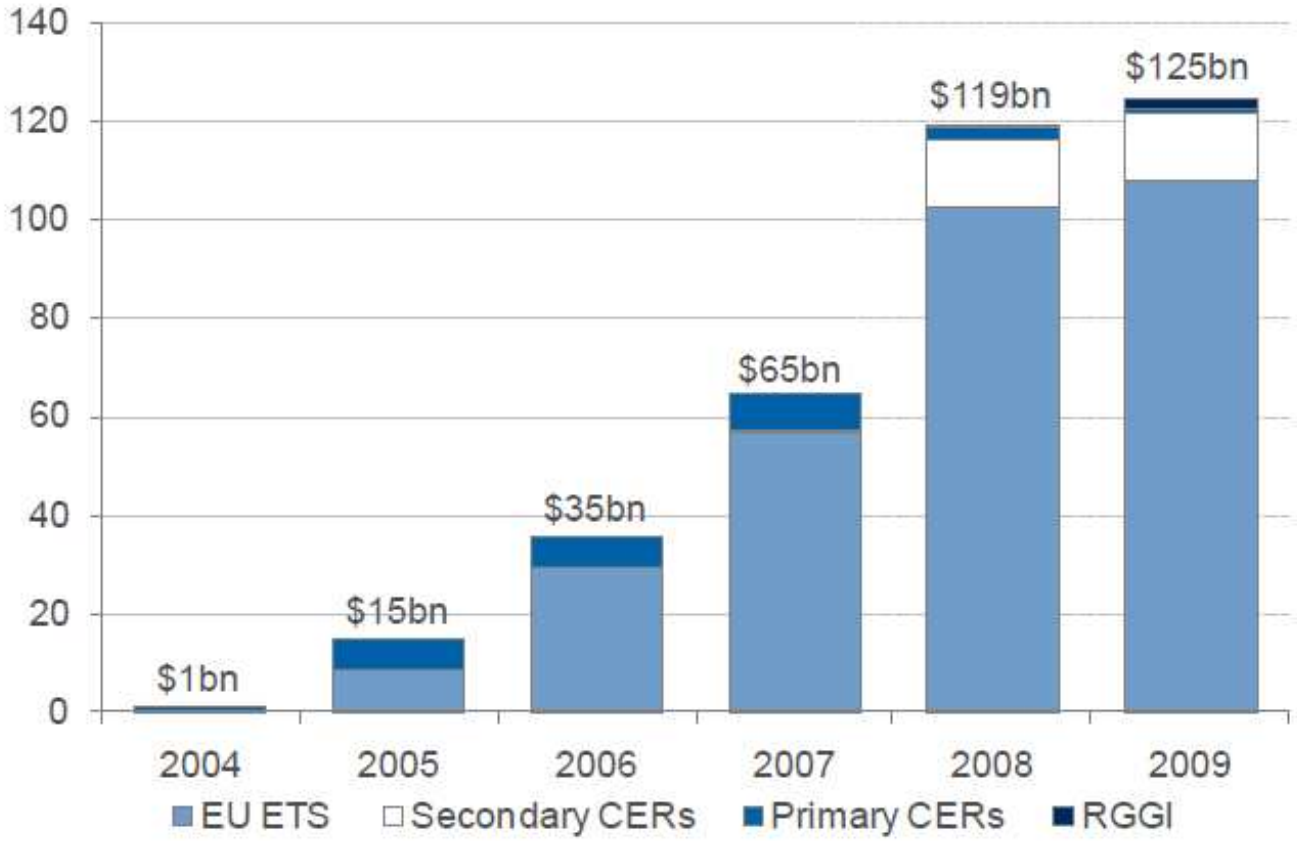
-History
-Growth in Carbon Trading
-Flexibility Mechanisms of KP

# The Kyoto Protocol and Carbon Trading

| What | When | Target | Target Met |
|---|---|---|---|
| United Nations Framework Convention on Climate Change (UNFCCC) | 1992 | Stabilize at 1990 levels by the year 2000 | No |
| Kyoto Protocol | 1997 | 5.2% below 1990 levels by 2008-12 | Unlikely |
| Copenhagen Accord | 2009 | New Legal Framework Required by 2012 | Lots of work remains to be undertaken |

# The Carbon Market has continued to grow in size and dwarves ODA…

**Global carbon market size 2004–09 ($bn)**




*Source: Trading figures taken from ECX, Bluenext, EEX, Reuters, CCX, LEBA*

# The Kyoto Protocol defined three different mechanisms for Carbon trading …

**Clean Development Mechanism (CDM) –** creates Certified Emission Reductions (CERs)

**Joint Implementation (JI) –** creates Emission Reduction Units (ERUs)

**International Emissions Trading (IET) –** creates Assigned Amount Units (AAUs)

# 3. Different Mechanisms to Encourage Energy-Efficiency

- Different means for raising revenues
- Why EE is so important
- CDM and energy-efficiency

# Different means for raising revenues and raising capital …

| Raising Revenue | Raising Capital |
|---|---|
| **Fiscal**: carbon taxes, road taxes, vehicle excise taxes, registration fees, non-compliance fees. | **Debt**: Loans-IFIs, national development and commercial banks; securities-municipal green bonds, cat bonds, weather derivatives. |
| **State transfers**: shared tax resources with central government | **Equity**: from private sector, IFIs or central government |
| **Grants**: from central government, ODS, philanthropy | **Market**: CDM, JI or domestic carbon markets, voluntary markets |
| **Innovative**: auctioning of emission allowances, lottery. | **Innovative**: Lease purchase agreements, debt for efficiency swaps |

# Standards, Mandates and Information

| | | |
|---|---|---|
| Standards | Emission | Tailpipe emission standards |
| | | Sulphur content of fuel emissions to be checked |
| | Product | Appliance/equipment standards for energy efficiency |
| | | Building energy codes with energy standards |
| | | Product standards for RE technology |
| | | Ethanol content in gasoline |
| | Process | Best available emission technology, process standards |
| | Renewable Portfolio Standards | Set volume targets, generating compliance certificates |
| | Voluntary Green Power Options | Mandatory green power to be offered by utilities as an opt out from RFS or complementing it-user has the option of choosing energy mix. Rates have to be published (link to labelling) |
| Labelling & Certificatio | Labelling | Greenhouse gas labelling of new vehicles |
| | Disclosure Certification | Mandatory GHG reporting of certain companies and/or sectors. Certification scheme for green ethanol |
| Prohibitions & Restrictions | | • Ban on inefficient light bulbs;<br>• High Occupancy Vehicle lanes extended to hybrid and electric vehicles<br>• Phase out coal-fired power plants |
| | | Ban of import of high emitting vehicles |
| | | Phase out of installation of electric hot water systems in existing homes |

# Standards, Mandates and Information (Continuation)

| | | |
|---|---|---|
| Facilitated approval procedures | | Statewide cap for permit fees for active solar energy device s issued by counties and municipalities for solar PV systems and solar WH systems |
| | | Prohibiting unreasonable public and private restrictions on the installation of wind energy systems on single-family residential properties |
| | | Model As-of Right Zoning Ordinance or Bylaw: allowing use of wind energy facilities, model ordinance for wind energy systems or guidance |
| | | Standards for Municipal Small Wind Regulations to prevent municipalities from adopting regulations that place unreasonable limits or hinder the performance of small wind energy systems.<br>New Forest Code fostering conservation |
| | | Zero deforestation policy from 2010 (mandatory offsetting of new trees planted for every tree removed |
| | | Land use zoning: avoid significant new development in areas that cannot be adequately protected (planning, permitting, development and building) from flooding, wildfire and erosion due to climate change) |
| | | Relocation and modernisation of abattoir and relocation of animal waste plant and conversion of waste to methane for electricity generation |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# Standards, Mandates and Information (Continuation)

| | |
|---|---|
| Green procurement | All government procurement according to environmental criteria |
| | State owned buildings EE standards |
| | Purchase of green electricity for all government buildings |
| | Fuel efficient car fleet |
| | Resilience requirements in public buildings, infrastructure and electricity grid |
| | Sustainable agricultural practices programme: technical and financial assistance to farmers to reduce emissions |
| | Advisory services to individuals and small businesses on energy efficiency and alternative energies |
| DSM | Smart meters |
| | Time of day metering of domestic and business clients to be set by DERC |
| | Time differential tariffs |
| Audits | Small business energy audits |
| | Home audits and then possibility to retrofit |
| | Energy audits of large buildings |


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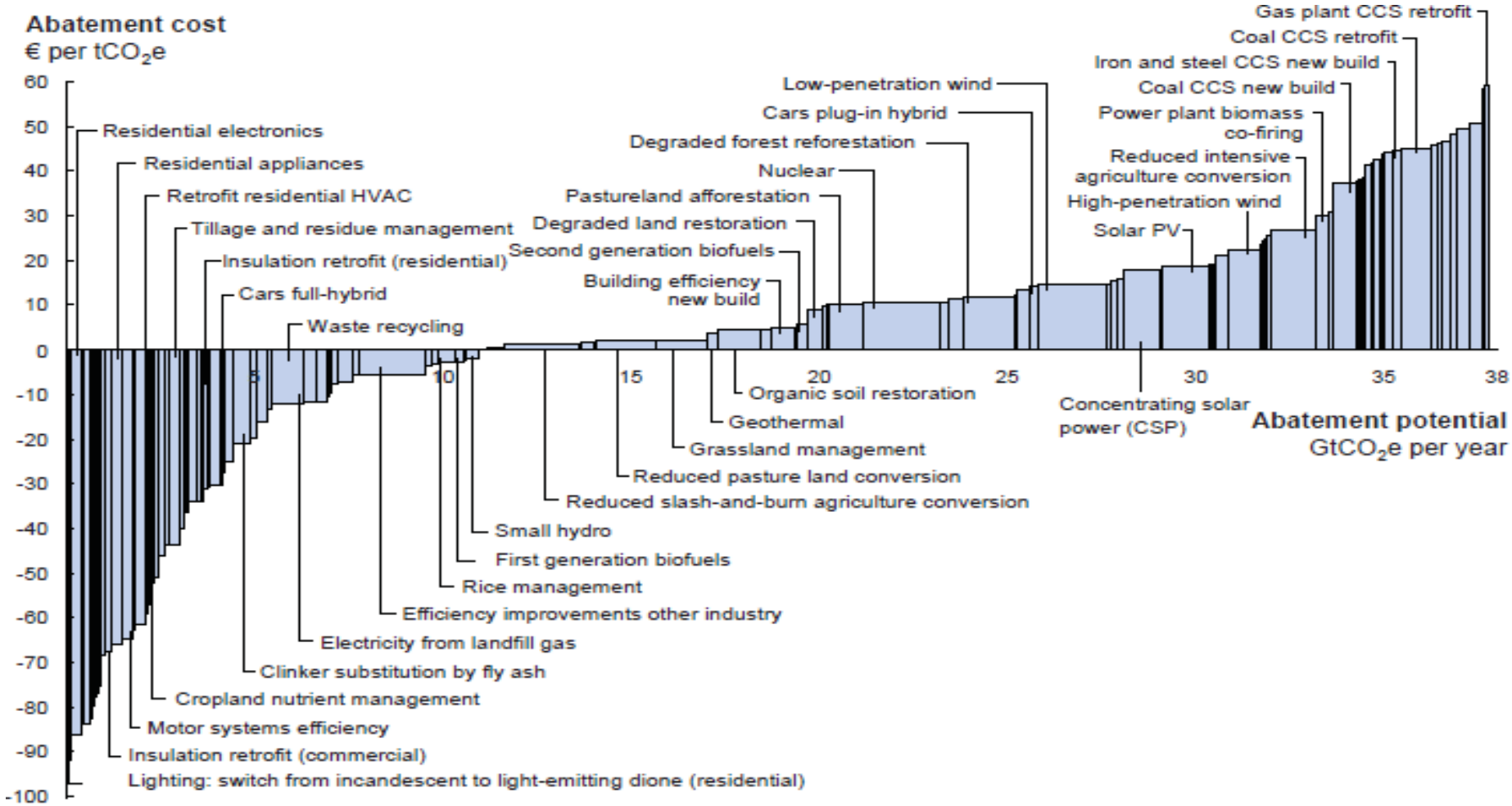
# GHG Abatement Cost curve shows EE one of the best options




Source: Global GHG Abatement Cost Curve v2, McKinsey (2009)

# Despite the high potential carbon trading has not really taken off for Energy-Efficiency projects due to a number of barriers…

| Barrier | Barrier Explained … |
|---|---|
| Awareness Barriers | Lack of awareness of the benefits of EE. |
| Policy Barriers | Lack of government policies to promote EE measures |
| Regulatory Barriers | Lack of legislation and regulations to promote EE measures |
| Enforcement Barriers | Lack of enforcement of EE legislation |
| Opportunity Cost Barriers | Senior Management in Companies focus on increasing profits. Energy often treated as a fixed cost. |
| Financial Barriers | Inability to easily finance EE projects |

# 4. Carbon Trading and Energy-Efficiency Projects

- History of CDM
- Why EE proects are underrepresented in the CDM

# CDM: Any Low-hanging Fruit Left?

| GHG | Project Sector |
|---|---|
| $HFC_{23}$ | $HFC_{22}$ Production |
| $N_2O$ | Nitric & Adipic Acid Production |
| $CH_4$ | Landfills, Coal-mines, Gas Networks, Biogas |
| $SF_6$ | Magnesium Production |
| $CO_2$ | Renewable Energy<br>Forestry<br>Energy-efficiency |

**These CDM Projects have quick pay-back periods:**
***Normally 3 years or less***

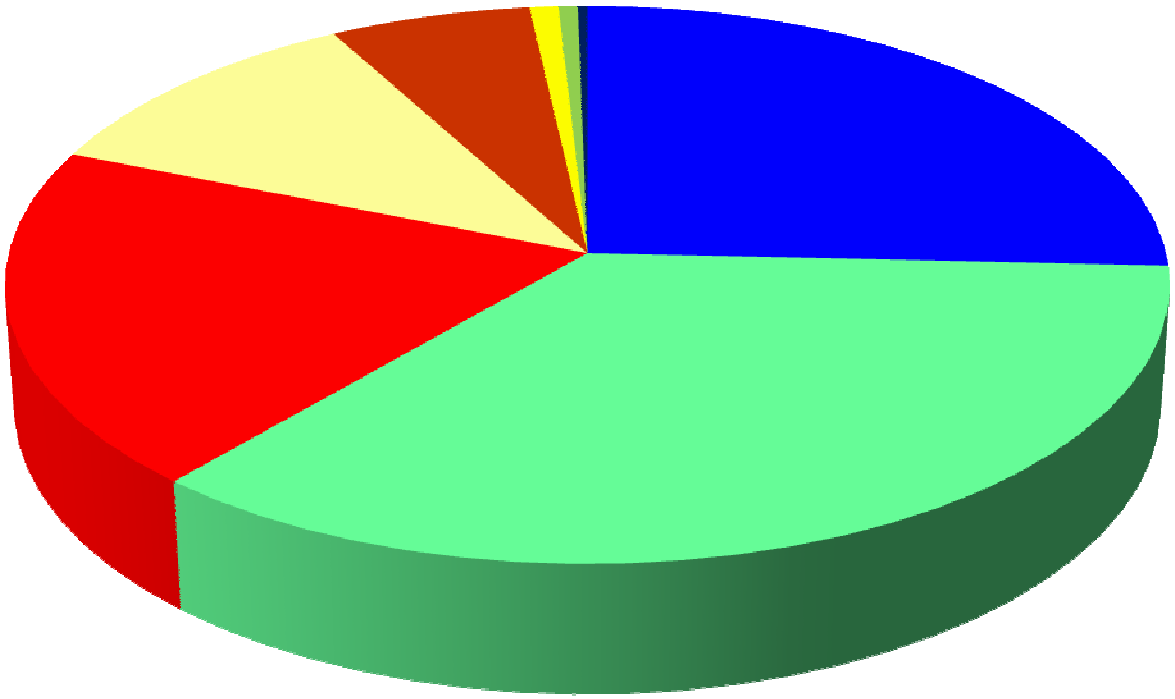
**Carbon pays for 50% to 100% of project cost!**
**Typically high IRR**

**Typically longer payback periods:**
***5 years and greater***

**Larger upfront capital requirements**

# Despite high potential carbon finance for EE has not taken off …

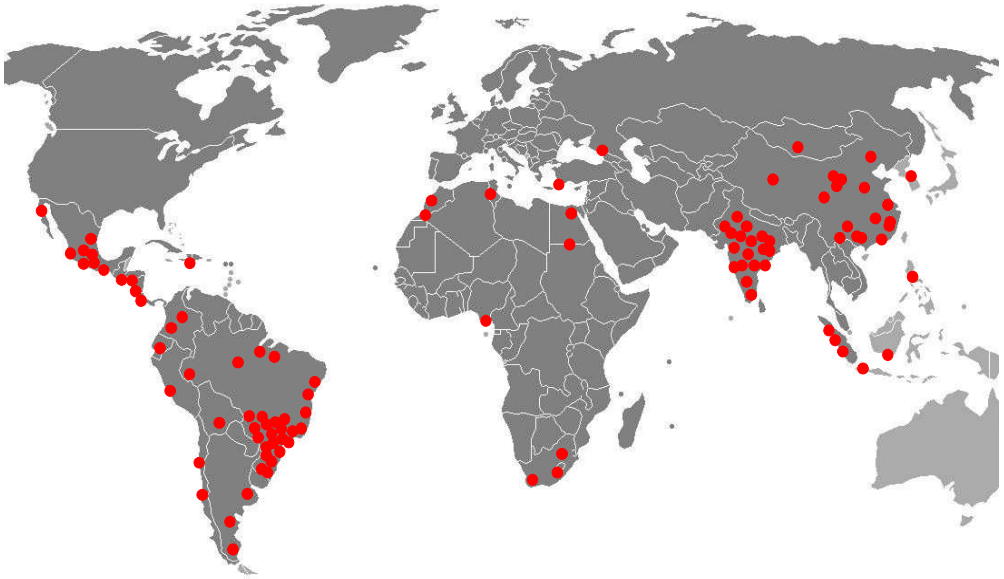
## CDM Projects by Type (% of Total CERs) – Sept 2010



- HFCs, PFCs, and N2O reduction (26)
- Renewables (36)
- Methane Capture Projects (20)
- Supply Side EE (11)
- Fuel Switch (6.3)
- Demand Size EE (0.9)
- Afforestation & Reforestation (0.6)
- Transport (0.6)

# The need to strengthen the capacity of developing countries to access new sources of Finance – China dominates CDM market!

## Location of CDM Projects



Ex: Geographical imbalance in the CDM

- 4 countries (China, India, Brazil and South Korea) account for 70% of CDM projects and 80% of CERs through to 2012
- 50% of all issued CERs are from 50 projects (over 2000 projects registered to date)
- Sub-Saharan Africa accounts for 2% of registered projects and 5% of CERs through to 2012
- However, the WB estimates a technical potential of 3,200 in Africa, that could provide 170 GW of additional power-generation capacity, more than twice the region's current installed capacity

## Reasons for Under Representation of EE projects in Carbon Market ? – Programmatic CDM the future?

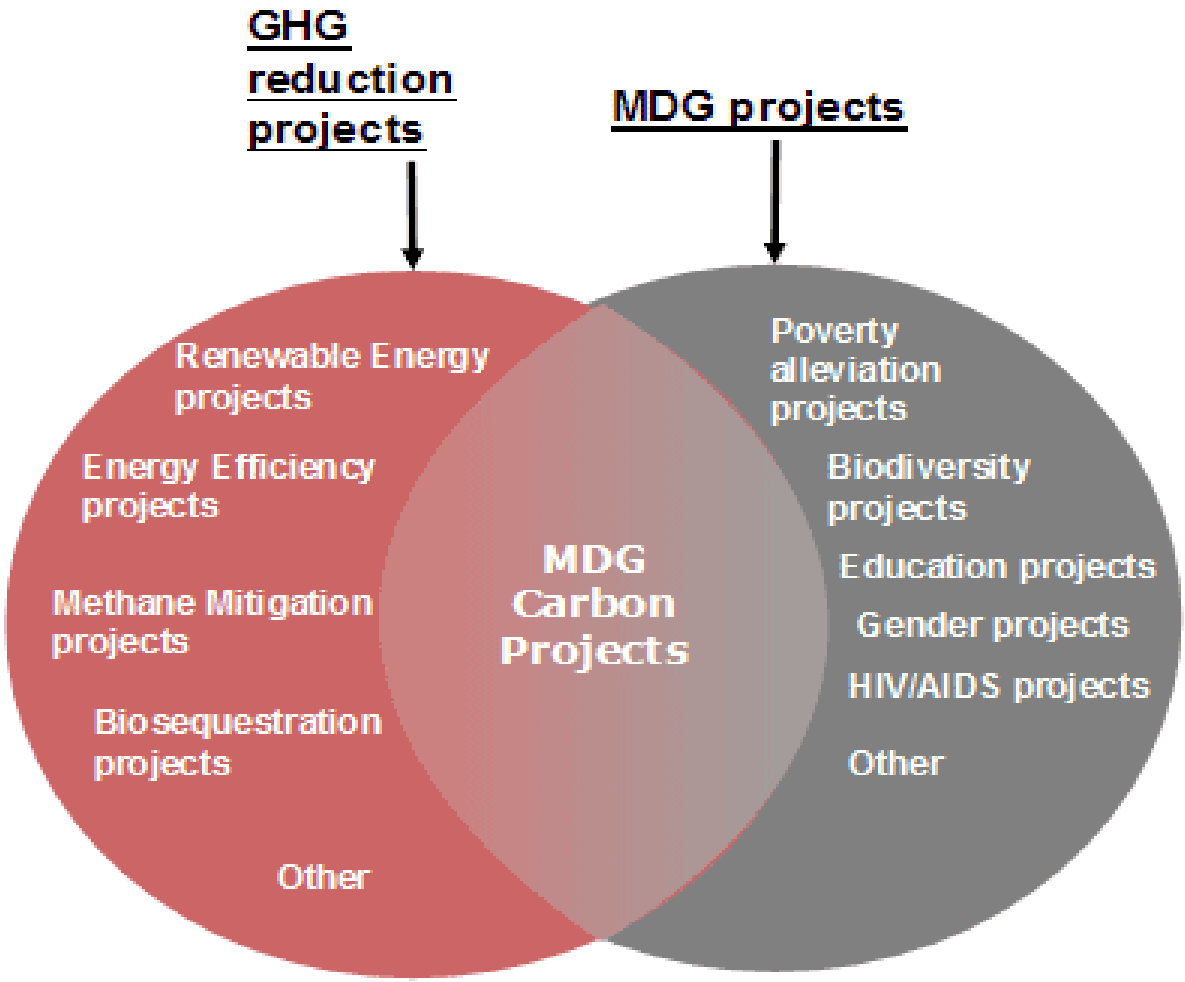
- Small project size vs high transaction costs (PDD, validation, approval, verification)
- Higher transaction costs for very small projects (Small Scale Methodologies)
- Additional methodological issues (discretionary retrofit, planned replacement, new installations)
- Validating Emissions ex-Ante;
- Issues with 'additionality' for high IRR projects

# 5. Role of UNDP and Carbon Finance

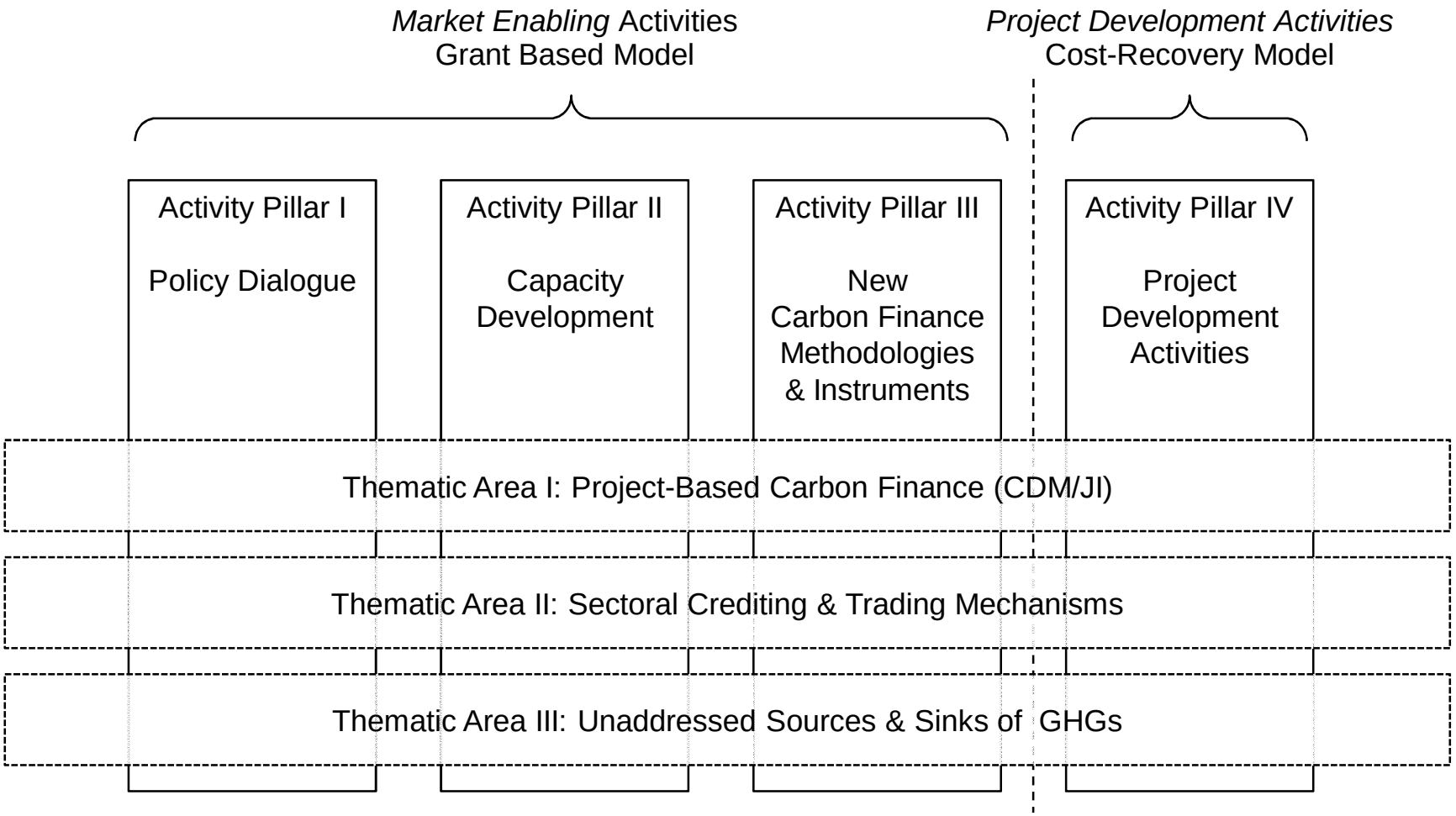
- MDG Carbon Facility
- Concluding Thoughts about Future of Carbon Market

# MDG Carbon Facility – what does it mean?

www.mdgcarbonfacility.org



# MDG Carbon Facility



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Carbon Finance
- The World Bank | UNDP
UNFCCC

## OVERVIEW

This platform aims at providing comprehensive guidance on financial options available for climate action in developing countries. Here you can find information on where to access the wide range of funds available from multilateral and bilateral institution, as well as public and private sources. Learn more on how these funds are governed and whether your project is eligible. Users are invited to be a resource to share their experiences with investment projects and offer feedback and comments on ongoing projects.

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# What about the future of the carbon market post-2012?

- Uncertainty of Regime post-2012 (no agreement) = higher risk profile for CDM and JI at the current time;
- Carbon Market likely to get smaller next few years;
- Growth of Regional Carbon Markets (USA, Japan, maybe Australia, NZ);
- Global fungible carbon market is some ways away – regional markets with some fungibility is more likely;
- Need for scale and depth in the carbon market – “Programmatic CDM is the future” (Cristiana Figueres);
- Developed countries must show leadership in particular the United States (4% of world’s population – 25% of world’s GHG emissions);

## Thank You!!!!

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