RENEWABLE ENERGY AND THE CLEAN DEVELOPMENT MECHANISM

Potential, Barriers and ways forward

A Guide for Policy makers

RET- WHY?

- To secure a sustainable global energy system.
- *one fourth of the world's population (1.6 billion people) have no access to electricity in their homes.*
- 1.5 million people die each year due to indoor burning of fuels, WHO.
- Climate changes – rising sea levels, extreme weather, lower agricultural leads and tropical diseases like Malaria.
- Dwindling reserves of fossil fuels.
- Need to balance the C02 emissions.

RET- BENEFITS AND POTENTIALS

Access to modern energy services is a prerequisite for economic and human development.

- *Economic development*
  - Power for enterprises
  - Light for education
  - Improvements in agricultural processes
- Poverty Reduction
  - Having to spend less time collecting firewood
  - Obtaining light to allow education and income
  - generation in the evenings
  - Reducing expenditure on petroleum-based
  - fuels or batteries

- *Reducing health risks.*
- Improve medical facilities
- Reduce exposure to indoor air pollution
- Facilitate the manufacture and distribution of medicines

MOREOVER,

- Renewable energy can contribute to *slowing climate change*
- Renewable energy improves supply security
- Renewable energy sources are available in most regions of the world.
- Renewable energy provides greater flexibility
- Renewable energy addresses environmental concerns.

BARRIERS TO DISSEMINATION OF RENEWABLE ENERGY

Barrier Group	Barrier	Effect / Impact
Financial & Economic	High specific up-front costs of RET versus low fuel prices and electricity tariffs (as a result of subsidised fossil fuels and electricity)	No level playing field; lacking willingness and/or ability to finance 'expensive' investments in RET; higher risk premiums
	Comparison of installation costs in €/kW instead of specific electricity generation costs in €/kWh	RET investments not implemented even if a project would be profitable over its lifetime
	Taxes and customs on imported equipment	RET installations become even more expensive
	High transaction costs due to small-scale and decentralised nature of RET applications	Potential RET applications not implemented
Institutional & Political	Conflicting objectives and interests among policy-makers	Shifts power to powerful lobbyists, hinders objective policy formulation, lack of policy coherence
	Institutions for RET promotion relatively powerless compared to institutions favouring use of fossil fuels	Government concentrates on fossil energy; RET potential not realised
	Unclear ministerial responsibilities and insufficient coordination between government agencies responsible for RET	Weak promotion of RET both generally and in specific sectors (e.g. biomass)
	Strong hierarchical structure of public institutions	Impedes bottom-up diffusion of new knowledge and ideas (especially serious barrier for small and medium enterprises)
	Monopolistic energy market	No guaranteed grid access and no fair feed-in tariffs for independent RE power producers; decentralised, small-scale RE potential in particular will not be realised and will be kept out of the market

Technical	Inadequate appliance quality; lack of technical standards and inappropriate technical designs	Gives RET a bad reputation, impeding their further dissemination
	Some RE technologies / components (e.g. solar thermal power plants, large-scale thermal storage) not yet commercially tested	Increased investment cost; financial risk for plant operators
	Negative externalities (e.g. air pollution from biomass projects)	Lack of social acceptance may hinder project implementation
Awareness / Information / Capacity	Lack of awareness of potential and the multiple benefits of RET utilisation among decision-makers at different political and administrative levels	Potential and positive side benefits of some RET still underestimated
	Lack of qualified personnel	Problems in technical implementation, maintenance and financial arrangements hinder RET market development in general
	Inefficient resources for data collection and information transfer	Insufficient information basis may lead to no, or wrong, decisions by project developers, investors etc.
	Inadequate, insufficient education of consumers/RE system users	Technological mistrust in case of system breakdown; overblown expectations followed by discontent; monetary losses to consumers

Source: Wuppertal Institute

CDM & ITS MECHANISMS

- Kyoto Protocol – GHG Emission Reduction
- *Under the Kyoto Protocol, industrialized countries committed to reducing their GHG emissions in the period 2008-2012 by an average 5.2% below 1990 levels.*
- *Three Flexible Mechanisms*
  - *International emissions trading*
  - *Joint Implementation (JI)*
  - *Clean Development Mechanism (CDM)*

HOW THE CDM WORKS

Source: Wuppertal Institute

CDN, AN OPPORTUNITY FOR DEVELOPING COUNTRIES

- Developing countries can benefit from CDM by,
- Attracting capital for projects that assist in shifting to a less carbon-intensive economy.
- Alleviating poverty by generating additional income and employment
- Providing a tool for technology transfer

- To host CDM projects, a developing country needs to have:
- Ratified the Kyoto Protocol
- Have designated a national authority (DNA) to evaluate and approve CDM projects and serve as point of contact to the government. The DNA needs to be notified to the UNFCCC secretariat.

THE CDM MARKET TODAY

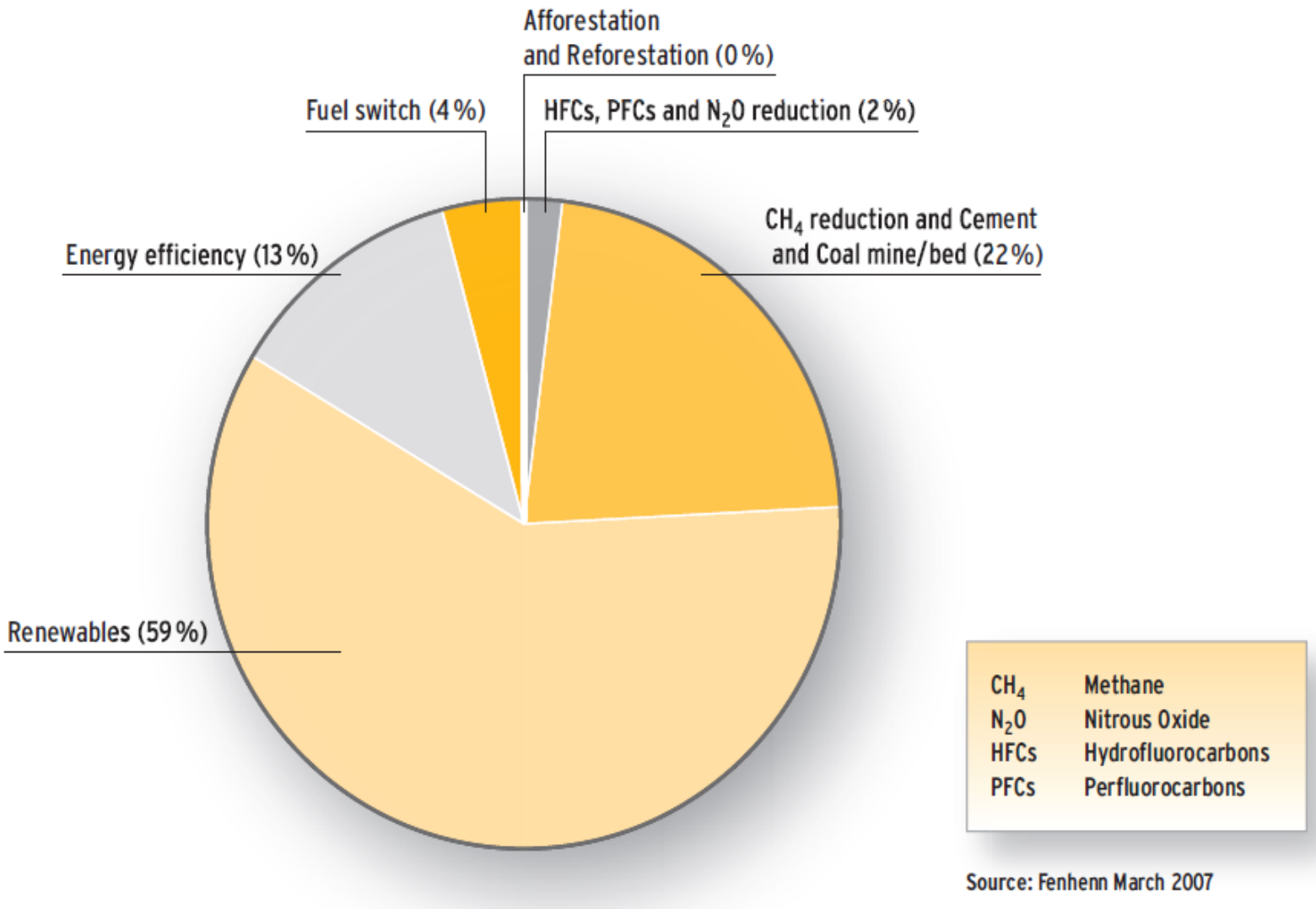
- Over 1,500 projects have already been registered or are at the validation stage, with the cumulative number of CERs issued expected to reach 1.7 billion by 2012.

- In February 2007, prices for CERs ranged from € 5 to € 12 depending on a project's implementation status and various other factors such as project technology and project/country risks.

CDM AND RET PROMOTION

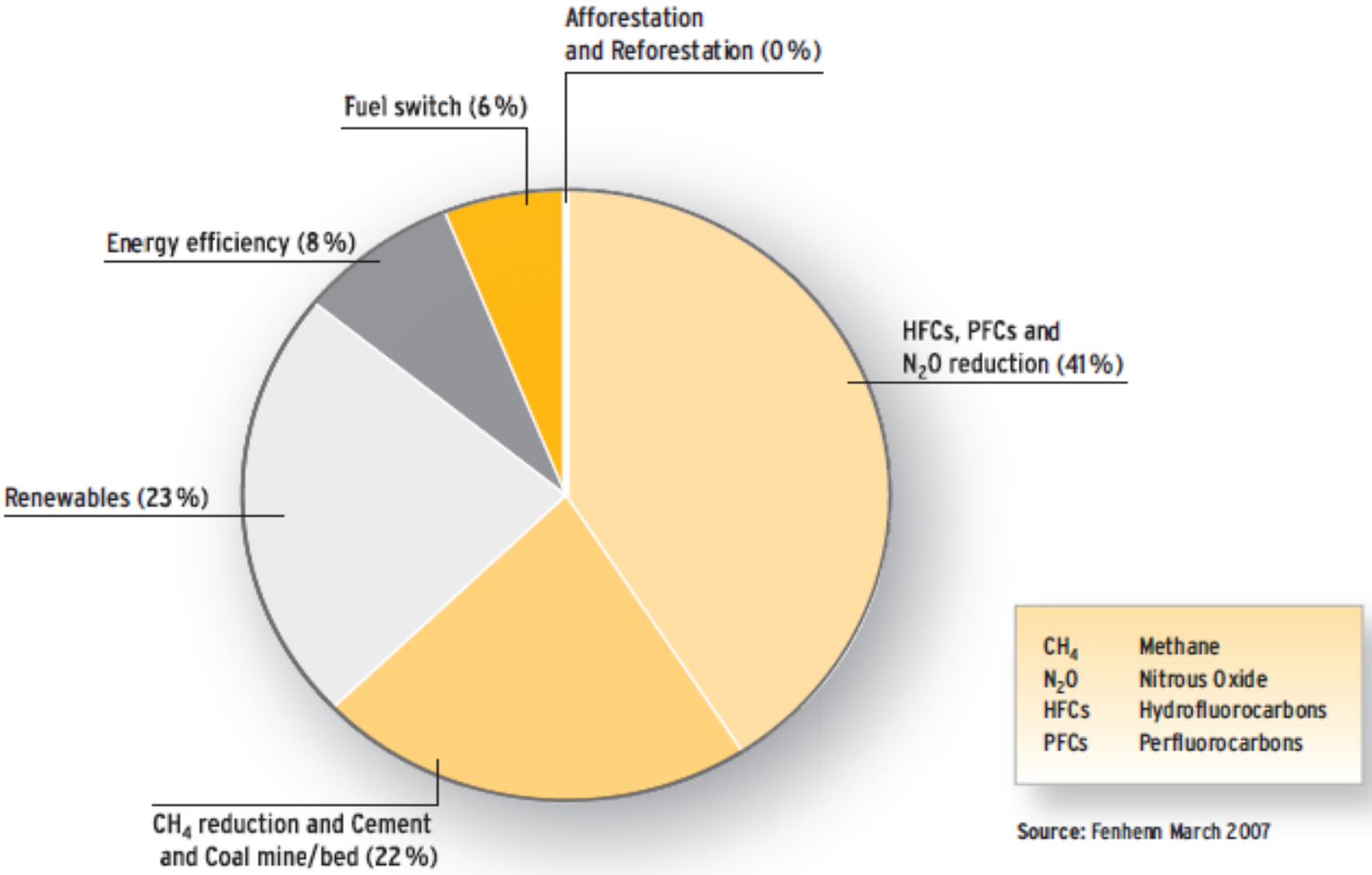
- The revenues attained from selling CERs from a CDM project can help compensate for this price difference to an extent.
- Among the 1,700 projects currently at an advanced stage of the CDM project cycle,
- biomass projects account for 21%,
- hydropower projects (including large hydro) at 19% and
- wind energy at 12%.
- In total, renewable energy projects constitute 59% of the project portfolio.

Number (%) of Clean Development Mechanism Projects in Each Sector



Source: Fenhenn March 2007

Certified Emission Reductions until 2012 from Clean Development Mechanism Projects in Each Sector



Source: Fenhenn March 2007

- Renewable energy projects account for only 24 percent of all expected CERs.
- The main reasons for this are:
  - Renewable energy projects typically reduce emissions of CO2, which has a global warming potential of 1.
  - Many renewable energy projects are relatively small scale.

- Moreover, The carbon intensity of a country's electricity mix is also an important factor
- Thailand or Egypt - 500 kg CO2/MWh
- China (916 kg CO2/MWh) and India (896 kg CO2/MWh
- Hence, double the benefits from CERs for each conventional kWh substituted by renewable energy.

- CDM helps up lifting the financial barriers on RET.
- CDM also strong promotes renewable energy projects (biogas for example) that avoid methane emissions.
- The CER revenues used to distribute RET applications at subsidized prices.

THE CDM AND HOST COUNTRY CONDITIONS

- *An analysis of the CDM project pipeline shows that the conditions in host countries are the decisive factor for CDM success.*

- Of the 1,700 projects, 36 percent are located in India, which, together with Brazil, China and Mexico combined, accounts for about three quarters of all projects.

Table 4: Renewable Energy CDM Projects in Selected Countries

	Brazil	China	India
Renewable energy CDM projects already registered	70	27	98
Renewable energy projects in CDM pipeline[1]			
Number of projects	150	185	360
Electric capacity in MW	3,293	7,143	5,897
CERs expected by 2012 in 1000t	56,395	123,206	121,171
CERs as share of global renewable energy CERs	12.7	27.7	27.2

1 Including the projects already registered and the project types agriculture, biogas, biomass energy, geothermal, hydro, solar, tidal and wind.

Source: Own calculations based on Fenhann March 2007

- India and China rank highly in analyses like the global Renewable Energy Country Attractiveness Index (Rank 5 for India and Rank 9 for China). This studies the national renewable energy markets, renewable energy infrastructures and their suitability for individual technologies.

POLICY OPTIONS FOR PROMOTING RENEWABLE ENERGY

- **Removing Key Barriers**
- economic performance of RET can be improved by,
  - Bringing down the costs of RET and their related energy services.
  - Abolishing market distortions that discriminate against these technologies, such as direct subsidies for fossil fuels or lacking internalization of external costs.

- *Reforming energy markets by reducing subsidies for fossil*
- *Fuels*
- *Setting ambitious targets for renewables expansion*
- *Giving independent power producers access to the grid*

- *Implementing supportive policies*
- Examples of supportive policies include feed-in laws, market incentive programmes, tax reductions and green certificates.
- Policy Example
  - US - 30 % tax credits on solar PV and solar hot water.
  - Spain, 2006 enacted new building codes.
  - Feed in Tariff the most successful policy instrument recently adapted by China and 6 states of India.

OTHER SUPPORTIVE MEASURES

- *Establish and enforce quality standards for renewable*
- *energy equipment*
- *Establish dedicated loan facilities*
- *Lower taxes and customs duties on RET equipment.*
- *Give practical support to those who implement renewable energy technology*

USING THE CDM TO PROMOTE RENEWABLE ENERGY

- *Speedy and transparent CDM approval process.*
- *CDM promotion and capacity building.*
  - For example, Egypt has developed a project portfolio of 24 projects and has advertised it at international carbon conferences and through other means.
- *Integrating the CDM into national energy and economic development planning.*
- *Giving preference to renewable energy CDM projects*
- *Exploring CDM programs of activities,*
  - E.g. replacing diesel-powered water pumps currently used in agriculture with solar-powered pumps and installing solar water heaters in all houses in a particular city district.

THE END