Current status and perspectives for Renewable Energy in Mexico

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The regulatory and political context

- Sustainable development is defined as the rector principle in the National Development Plan of the Federal Government
- Mexico ratified the Climate Change Convention in 1993 and the Kyoto Protocol in 2000
- The Energy National Plan establishes a goal, for 2006, of 1,000 MW of additional installed capacity based in Renewable Energy (not including big hydro)
- The Federal Government has the committment of increasing the electricity provision from 95 to 97% of the 100 million inhabitants population, which means that we must extend the grid and install RE systems for some 5 million persons
- Renewable Energy applications are strategic for the Mexico Government, in consideration of their environmental and social benefits

The regulatory and political context

- As stated in the Mexican Constitution, the state is the only one authorized for electricity generation and distribution for public service
- However the private sector is allowed to generate in two cases:
  - Self/consumption
  - Independent Power Producer of energy for the state-owned companies: Comision Federal de Electricidad (CFE) and Luz y Fuerza del Centro (LyF).
- The state companies must provide the electricity at the lowest possible cost to their customers

Advantages of Renewable Energy

- Conservation of non-renewable resources, such as fossil fuels, wood, etc.
- Access to remote areas
- Energy cost is not depending of the international oil and gas markets
- Less environmental impacts, in the local, regional and global scale
- In many cases, RE contributes to the development local capacities and creation of jobs

Disadvantages of Renewable Energy

- Attached to specific location
- Intermittence
- In some cases, such as wind and hidro, they need a lot of land
- In many cases the investment is very expensive as compared with conventional sources
- Financing Renewable Energy projects use to be more complex than conventional, because of the risk perception and lack of experiences from the sources of resources

Renewables Energy in Mexico, 2000

Installed capacity with Renewable Energy : 10,460 MW

- Hydro: 9,600 MW
- Geot: 845 MW

- Solar 12.2 MW
- Wind 2.0 MW
- Biogas 18 MW
- Minihydro 8 MW

Opportunity areas for Renewable Energy applications in Mexico

- Wind farms
- Electricity generation with Mehane
  - Landfills
  - Manure in farms (cows, porks, etc)
  - Water treatment systems
- Minihydro and Geothermal
- Solar hot-water systems for residential and hopital uses, among others
- PV systems for rural electrification and pumping
- Efficient use of ovens in the rural sector: wood
- Cogeneration in sugar industry, and others

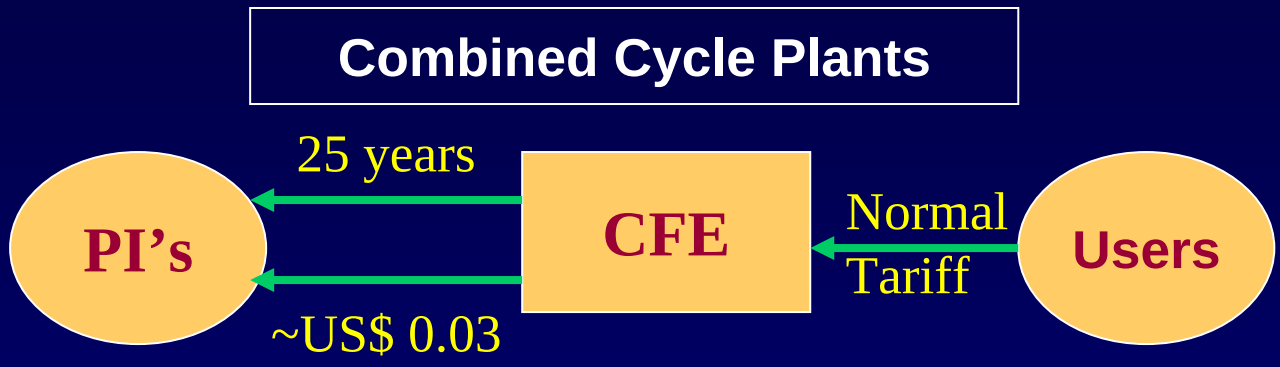
Programs for RE promotion in Mexico

- **Green fund (USD$ 70 Million, grant from GEF)**
- **National Program for Rural Energy (USD $110 Million mix funds)**
- **Action plan to overcome barriers for wind generation development in Mexico (UNDP*-GEF: US$12.5M)**
- **Acknowledgment of capacity for Renewable Energy**
- **Fiscal incentives: accelerated depreciation**
- **Resource evaluation: Geographic Information System for Renewable Energy and maps of resources**
- **Regulation for Solar Hot-water Systems**
- **Others:**
  - **Structural Environmental Adjustment Program for the Federal Government, togheter with the World Bank (4 sectors: Energy, Forestry, Tourism, and Water)**
  - **Sectorial Program for Energy and Environment**

Green fund

- Performance incentive for power generation (MWh), not for installed capacity
- Access to incentive through a competitive process for Independent Power Producers

Green fund



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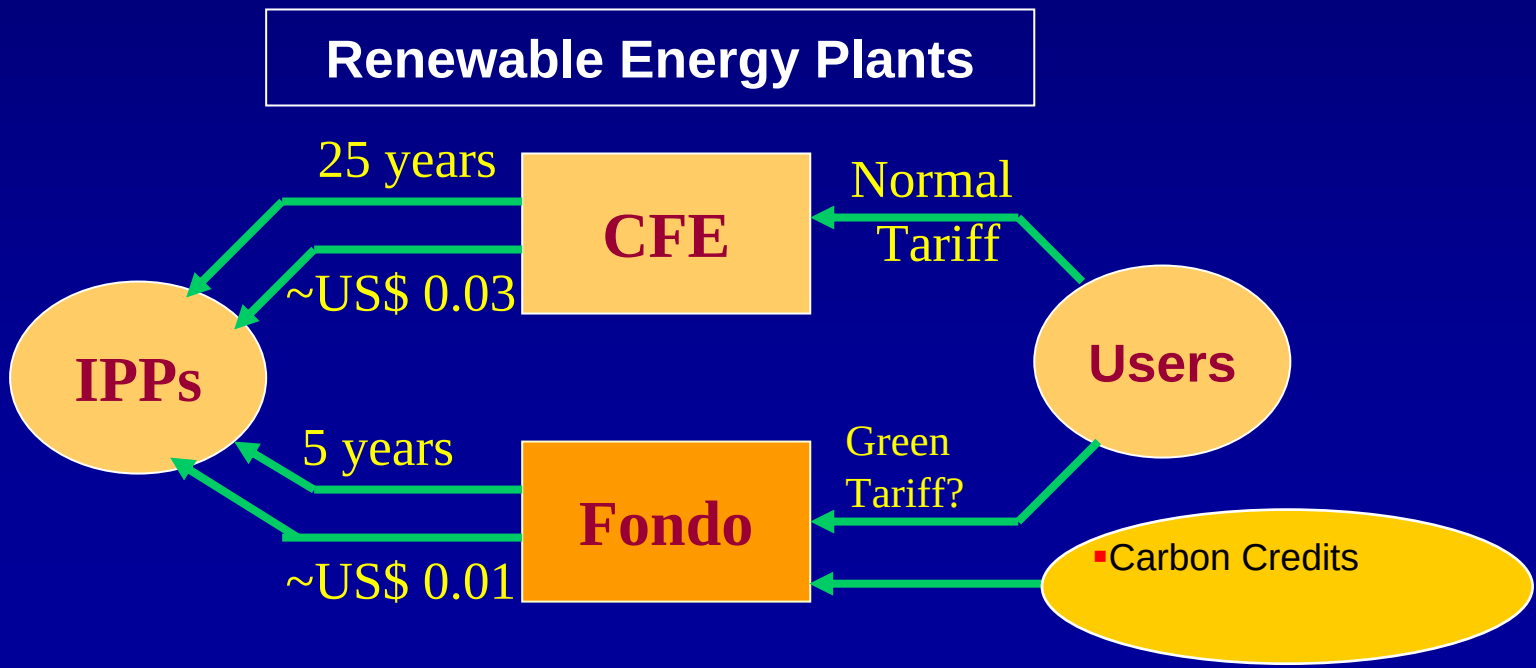


National Program for Rural Energy

- **Goal: 50,000 homes from 2005 to 2008. First phase 2005 –2006: 10,000 homes.**
- **Resources for the first phase: 100-110 MM dls (Federal, State, and Municipal resources, grant from GEF 15-20 MM dlls).**
- **Strategies: joint efforts with SEDESOL, CDI, and CFE, considering diverse technological options (grid connection, solar, biomass, wind, minihydro, hybrid, etc.).**

National Program for Rural Energy

- Participation of the Global Village Energy Partnership (GVEP), World Bank and USAID
- Creation of local institutions for Renewable Energy promotion, quality assurance and social acceptance
- Creation of local technical capacities
- Aim at capitalizing experiences at successful States
- Participation of the private sector, research institutions and NGOs

Promotion activities

- **Workshop for RE, energy efficiency and rural electrification: a regional approach (Huatulco, Oaxaca, Nov. 2003).**
- **Regional Workshop for Renewable Energy: analysis metodologies and financial support mechanisms (Temixco, Morelos, June 2004).**
- **Seminar-Workshop on policies, pograms and training for Renewable Energy and Rural Electrification in Mexico and Central America Plan Puebla Panama (Merida, Yucatan, September 2004)**

Elements for a promotion policy

What we want to achieve:

- Acknowledgement of Capacity by CFE (IPPs and self-supply).
- Use for bioenergy projects a similar approach to conventional schemes for intermitent sources
- Fiscal incentives: accelerated depreciation, in discussion with Treasury Ministry
- Import Incentives for RE

Elements for a promotion policy

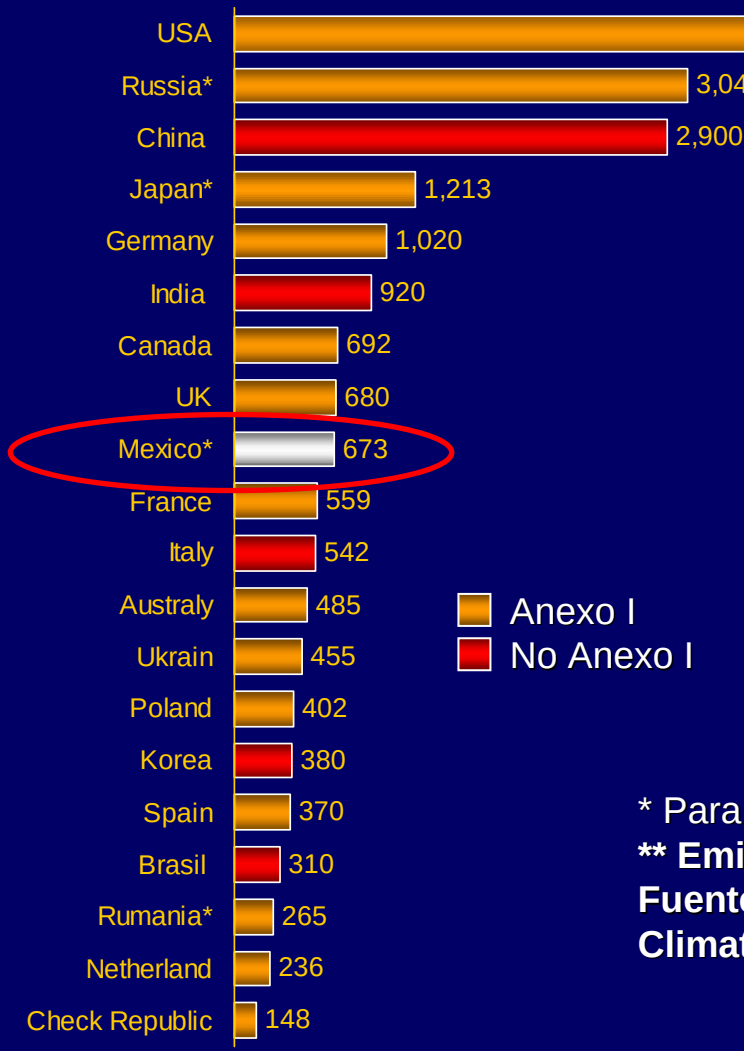
What we want to achieve:

- Incorporation of Environmental and health externalities of fossil fuels within the Electricity Sector planning
- Consideration of the Renewable Energy share for the energy sources diversification and to the stability of the supply, as important elements in the sector policies
- Creation of a Sectoral Fund (SENER-CONACYT) for R&D for RE

Renewable Energy and Climate Change

Green-house gas emissions worldwide

GEI Totales, 1998**
(*Millones de Tons.*)



- **La cantidad de emisiones está relacionada directamente con el nivel de industralización**
- **Los países desarrollados tienen las emisiones totales más altas**
- **Mexico is el noveno país emisor de GEI, responsable del 3% del total de emisiones**

* Para **1996.**
**** Emisiones agregadas de CO_2, CH_4 y N_2O.**
Fuente: United Nations Framework Convention on Climate Change (Sept. 2000)

Committments of Mexico in the Kyoto Protocol

As a Non Annex I party:

- No quantitative obligations to emission reduction
- Must implement GHG mitigation programs
- Needs to decrease the emissions intensity (emissions/ energy consumption)
- Can attain benefits through its participation in the Clean Development Mechanism, promoting projects that contribute to GHG reduction and commercializing them in the international carbon market.

Participation of the Energy sector in the Clean Development Mechanism

- Renewable Energy
  - Electricity Generation (wind, biogas, biomass, mini-hydro, etc.)
  - Application in the rural sector (PV and mini-hydro)
- Energy Conservation
  - CONAE, FIDE, PEMEX, PAESE, etc.
- Cogeneration (including potential projects with sugar mills)
- Geological sequestration of Carbon (Mexico is a member of the Carbon Sequestration Leadership Forum)
- Hydro-electric re-powering

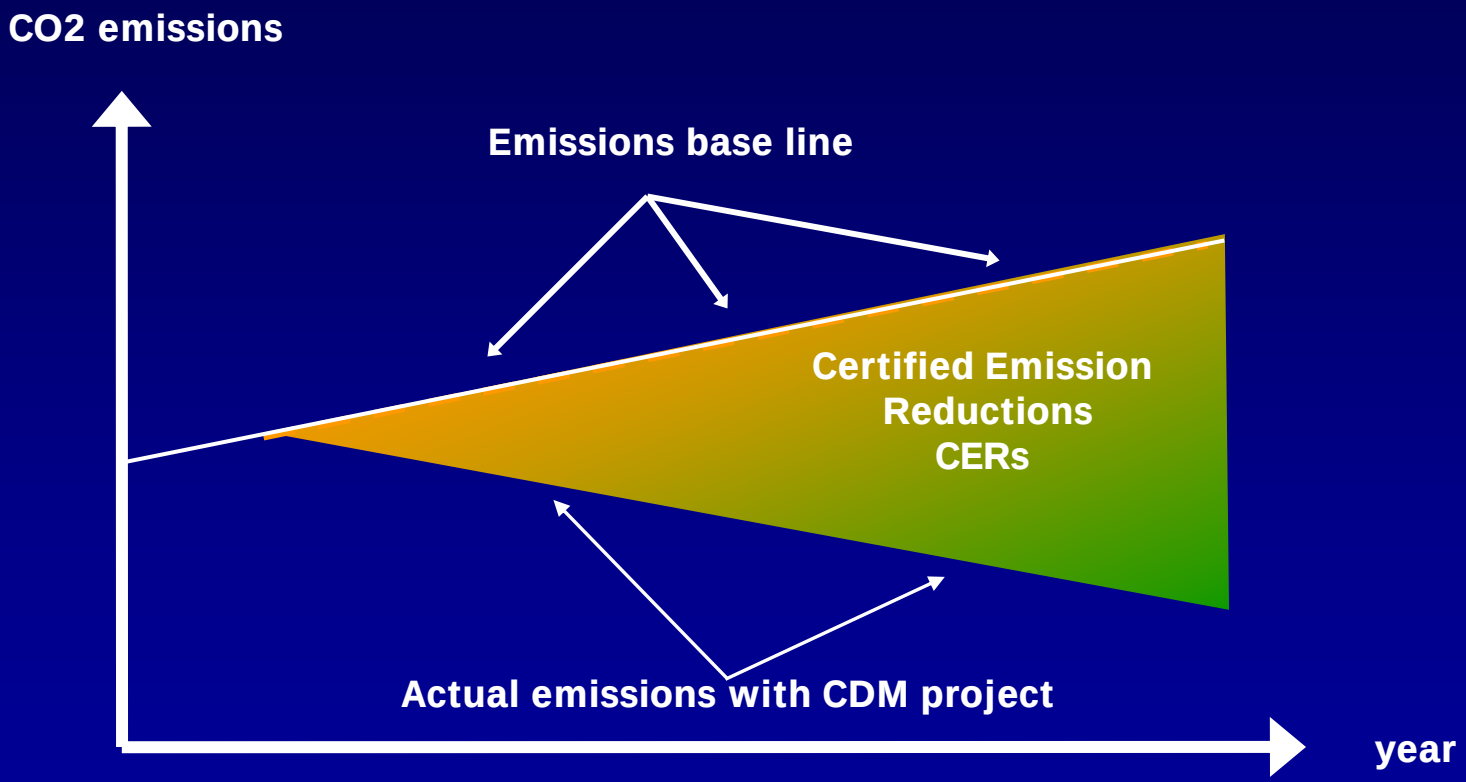
Importance of the Clean Development Mechanism for the National Renewable Energy Market

- According to estimations of the National Ecology Institute, INE, Mexico has a total GHG emissions potential reduction of about **81 million tonnes of CO_2** annual (most of them derived of RE projects) for the first committment period (2008-2012).

- Within the CDM market this would bring economic benefits to the country around **300 to 400 million Euros** per year.

- These additional benefits can increase the project cost effectiveness.

Base Line


CO2 emissions
Emissions base line
Certified Emission
Reductions
CERs
Actual emissions with CDM project
year

Additional activities to develop

- Strengthening the economical instruments to support Renewable Energy: investment funds and guarantees in order to simplify access to credit
- Assessment and establishment of a Renewable Energy Certificates Market
  - Determination of sectors, consumers' decision factors, incentives and payment mechanisms
- Massive Programs with financial support, e.g., Solar Hot Water Systems for Residential Sector
- Proper institutional participation: private sector, Associations and Chambers, Research Institutions, etc.
- Development of instruments to ensure the technical quality of the projects, such as Standards and certification processes
- Strengthening international cooperation