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Current Legal and Regulatory Framework for Renewable Energy in Mexico

INSTITUTO DE INVESTIGACIONES ELECTRICAS
 Jorge M Huacuz
 Non-Conventional Energy Unit
 Electrical Research Institute
 Mexico

Mexico: General Information

United States of America
Central America

Total land area: 1,964,375 Km²
 Population: 104 Million (2008)
 Arid Land: About 65%
 US-Mexico Border: 3,152 Km
 Central American Border: 1,149 Km
 Coast Line: 11,122 Km
 Official language: Spanish

Pacific Ocean
 Gulf of Mexico

Escala 1: 12500000
 UTM Zona 14

The Mexican Electrical System

Type of Fuel

- Combustible fuel
- Hydroelectric
- Nuclear
- Geothermal
- Viento

- Two State-owned utilities (CFE, LFC)
- Other main actors:
 - IPP's
 - Self-suppliers
 - Small generators (under 30 MW)
 - Co-generators (heat & electricity)
 - Electricity exporters
- Over 55 GW of capacity installed
- Demand growth rate at 5% per year
- Additional generating capacity soon to be required
- Fossil fuels supply 76.5% of primary energy for power generation
- Large hydro & geothermal in second place
- Very low contribution from wind, solar and other renewables

Legal Framework for the Electrical Sector

- Self Supply**
 - Electricity for the generator's own usage
 - No sell to third party allowed
 - Self-supplier association with third parties allowed
 - Surplus electricity can be sold to the national utility (CFE)
 - Banking of electricity with CFE allowed
- Co-generation**
 - Simultaneous production of heat and electricity
 - Production of electricity from waste heat included } For self supply only
- Independent Power Production**
 - No limitation in the amount of power produced
 - Electricity produced only for sale to CFE
 - Must fit capacity expansion plans of CFE
 - Long-term contracts by CFE awarded on levelized least costs basis (US\$/kWh)
- Small Generation**
 - Generating capacity under 30 MW
 - Electricity only for sale to CFE
 - Free choice on location, building schedule and type of technology
 - Purchase price slightly under CFE's short term marginal cost
- Electricity for Export**
 - No main constraints



Bottom Line of Legal Framework

- No electricity sells to third parties allowed
- Electricity for sell to the national utility must compete with conventional alternatives on levelized per kWh cost over the plant useful life
- Economic competitiveness of electricity for self-generation depending on the tariff system
- No direct money incentives of premiums over and above short term avoided costs allowed



Mexico's RE Resource Potential



Average solar irradiance:
5 kWh/m²-día
Widely available



Geothermal

- High Temp. >250°C: >2,000 MWe
- Low Temp. <250°C: >40,000 MWt
- Waste heat from geothermal fields under exploitation: N/C
- Geopressurized: N/C

N/C: Not quantified



Wind: ~5,000 MW proven
15,000 MW estimated



Mexico's RE Resource Potential



Bioenergy (early estimates):

- Total potential: (>3,000 MW)
- Forest residues and energy plantations: (>600 MW)
- Cattle manure and agriculture residues: (ca 1,330 MW)
- Solid urban waste: ca 1,000MW
- Sugarcane bagasse: ca 250 MW



Small & mini hydro:

- Total potential: N/C (At least 3,500 MW)



Ocean energy

- Total potential: N/C >11,000 km coastline



N/C: Not quantified



Current RE Installed Capacity



Wind:
185 MW installed
250 MW under construction
100 MW contract awarded
~2,000 MW in generating permits by CRE



Peak-shaving PV: ~500 kW
Projects underway for larger capacity

Small hydro: ~80 MW under development



210 MW
Cogeneration from sugarcane bagasse

7.4 MW with biogas from sanitary landfills
85 MW under development
Trash-to-electricity projects under development





Recently Approved Bills

Law for the Promotion and Development of Biofuels (early 2008)

- Aims at the production of biofuels as an element of energy diversification and sustainable development
- Seeks to open new business opportunities for farmers
- Emphasizes production of ethanol and biodiesel
- Creates the National Biofuels Commission
- Trust fund has been created to support building of support infrastructure, development of clean technology to increase productivity and to foster R&D



Recently Approved Bills

Law to Foster the Use of Renewable Energy (late 2008)

- Creates the Consulting Council for Renewable Energy
- Seeks to foster local development of efficient technology
- Seeks to foster commercial application of all renewables
- Defines renewable energy as a tool for mitigation of climate change
- Mandates the Energy Regulatory Commission to establish regulations for electricity production from RE
- Mandates the National Electricity Dispatch Center to develop rules for the dispatch of renewable energy
- Mandates the Secretariat of the Environment to set methodologies for environmental valuation of renewables
- A special renewable energy program must be established which will set the share of renewable energy in the production of electricity
- Creates facilities for R&D and technological innovation
- Mandates RE resource assessment and mapping at the national level
- Creates a Trust Fund to facilitate financing of renewables and efficient use of energy



Additional Existing Regulations

- ***Project of Ecological Norm for Wind Farms*** Will prevent and mitigate negative environmental impacts from wind farm projects in the national territory. In approval process.
- ***Net Metering for Commercial and Domestic Applications***
Applies for grid-connected photovoltaic generators under 30 kW for commercial and 10 kW for domestic systems. CFE banks electricity for up to one year on a one-to-one kWh basis
- ***Green Mortgages***
Financing from the National Institute for Housing available for new house buyers who want to install solar water heaters. Under negotiations for expansion to finance photovoltaic systems



Additional Existing Regulations

- ***Accelerated Depreciation for Environmental Investment***
Investments in renewable energy technology can be depreciated 100% in one year.
- ***Zero Import Duty***
Applies to environmentally friendly equipment purchased abroad
- ***New Law for Science and Technology***
Assigns fiscal incentives to private companies who invest in renewables R&D



Additional Existing Regulations

- **Grid interconnection contract for renewable energy**
Self-suppliers can inject surplus electricity to the grid for use at a later time. The value of electricity in either direction is calculated by a set of formulas established in the contract terms.
- **Wheeling Service Agreement for electricity from renewable energy sources**
Establishes a fee for service according to the type of interconnection contract between the self-supplier and the utility.
- **Methodology to determine service charges for transmission of renewable electricity**
Establishes a predictable, transparent and flexible regime to avoid overcharges to the producer.



Programs in Place

Large Scale Renewable Energy

- Objective: to prime the market for renewable energy IPPs in Mexico
- Technology of choice: grid-connected wind farms
- Operational scheme: Complementary fund with seed money from the GEF to provide incentives on per kWh basis
- Status: Contract already awarded for the first wind farm (101 MW) under this modality



Programs in Place

Measures for the efficient use of electricity

- Buy-back old hardware mechanisms and soft financing to lower electricity consumption in the domestic sector
- Users payback loans through their electricity bills from their monthly savings in electricity
- Technologies of choice:
 - Thermal insulation of roofs in critical weather regions to lower air conditioning loads
 - Switching old domestic appliances for new modern and more efficient ones (including air conditioners)
 - Replacing incandescent light bulbs with high efficiency compact fluorescent ones



Concluding Remarks

- Mexico, an oil producing and exporting country, is (finally!) including renewable energy as important element of its energy policy
- Regulatory and institutional mechanisms are being put in place to facilitate mainstreaming of renewable energy, but it is only the beginning. A lot remains to be done in other areas, such as industrial infrastructure and human resource development, so that most of the value from renewables remains in the country
- Many such mechanisms are *ad hoc* instruments adapted to the national conditions, considering the limitations imposed by the supreme law regarding the types of incentives renewable energy producers can receive

