RENEWABLE ENERGIES
REGULATION & INCENTIVES
THE CASE OF MEXICO

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GLOBAL WORKSHOP ON LOW
CARBON POWER SECTOR
DEVELOPMENT

Washington, D.C. December 14, 2011
THE REGULATORY FRAMEWORK


<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>LSPEE Bylaw Publication.</td>
</tr>
<tr>
<td>1995</td>
<td>Approval of the Energy Regulatory Commission Act (CRE).</td>
</tr>
<tr>
<td>2001</td>
<td>Interconnection Contract for Renewable Energy Sources (capacity credit).</td>
</tr>
<tr>
<td>2009</td>
<td>LAERFTE Bylaw Publication.</td>
</tr>
<tr>
<td>2010</td>
<td>In April, the CRE published a number of regulatory instruments in order to promote the development of projects with renewable energy sources and efficient cogeneration.</td>
</tr>
</tbody>
</table>

**REGULATORY FRAMEWORK**

**Enabled more private participation in electric power generation**

**Establishment of a regulating agent for the electric sector**

**Solar, wind and hydroelectric energy**

**Net metering**

**The CRE has new attributions that allow the profit of renewable energies for power generation**
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**REGULATORY FRAMEWORK**

- **2010**
  - In April, the CRE published a number of regulatory instruments in order to promote the development of projects with renewable energy sources and efficient cogeneration.
    - Interconnection contracts (small & medium scale projects, generation plants)
    - Transmission agreements

- **2011**
  - During this year, the CRE published various methodologists in order to promote the efficient cogeneration and recognition of plant capacity.

  - The CRE is working in a document called “general interconnection rules” to regulate the access of new projects for electricity generation comes from renewable energy and cogeneration systems into the transmission infrastructure of the Grid Operator.
THE POWERS OF REGULATORY ENERGY COMMISSION

From the Renewable Energy (RE) Act, CRE got the following powers:

• Issue standard, orders, methodologies, model contracts and all other rules to regulate the generation of electricity with RE and Cogeneration.

• Issue regulatory tools to calculate payments for services.

• To verify and approved technical requirements for the interconnection into the national grid.

• To require the system operator to modified its dispatching rules.
REGULATORY TOOLS & INCENTIVES
Interconnection Contract

- Represents the core of the regulation for projects under the Self-supply scheme.
- Contains legal, economic and technical conditions that CFE and private participants should abide by.
- Contains provisions that recognize the characteristics of RE technologies.
- The contract eliminates the intermitency complication on RE and Cogeneration projects.
ENERGY BANK

• Any excess energy be taken by CFE.

• The monetary equivalent be added to the permit holder individual energy bank account.

• Thus, loads always get their demand satisfied.
How the Energy Bank works?

Energy exchange

- Base period
- Intermediate period
- Peak period
- Surplus energy
- Energy deficit
- Power generation
- Energy demand
WHEELING FOR RENEWABLE AND COGENERATION PROJECTS

• It is dealt with by using a Postage Stamp Methodology.

• The costs of the Power System constitute the price calculation vital variable.

• Postage Stamp Methodology offer, perhaps, the simplest way to calculate wheeling charges under a direct, easy to grasp and manage procedure.
PRIVATE PARTICIPATION IN RENEWABLE ENERGY PROJECTS

Source CRE / October 30, 2011: MW authorized

<table>
<thead>
<tr>
<th>PERMITS</th>
<th>IN OPERATION</th>
<th>UNDER CONSTRUCTION</th>
<th>IDLE</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>WIND</td>
<td>26</td>
<td>484.1</td>
<td>2,427.6</td>
<td>-</td>
</tr>
<tr>
<td>HYDRO</td>
<td>27</td>
<td>132.3</td>
<td>132.6</td>
<td>25.5</td>
</tr>
<tr>
<td>PV</td>
<td>2</td>
<td>-</td>
<td>33.6</td>
<td>-</td>
</tr>
<tr>
<td>BIOMASS</td>
<td>55</td>
<td>511.3</td>
<td>68.4</td>
<td>-</td>
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<tr>
<td>BIOGAS</td>
<td>10</td>
<td>40.2</td>
<td>4.6</td>
<td>-</td>
</tr>
<tr>
<td>TOTAL</td>
<td>120</td>
<td>1,167.8</td>
<td>2,666.7</td>
<td>25.5</td>
</tr>
</tbody>
</table>
NET METERING

• The exchange of electricity between generators and the System is on a 1:1

• Whereas mid tension consumers carry out the exchange with the help of a meter that takes into account the value of energy at any given moment and whose net results are used for monthly billing.

• Consumers may do so without the need of obtaining a permit from CRE.
COGENERATION

• The cogeneration projects have the same treatment as in the case of RE projects but it considers a minimum efficiency for them to be subject to the incentives.

• CRE is responsible for setting this minimum.

• The methodology chosen for cogeneration efficiency is based on the concept of “Free fuel electricity”
COGENERATION

• CRE considers that for a cogeneration project to have access to the benefits of the regulation, it must comply with:

\[ \eta \geq \eta_{\text{min}} \]

<table>
<thead>
<tr>
<th>Capacity of the cogeneration project</th>
<th>( \eta_{\text{min}} ) %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.03 &lt; Capacity MW &lt; 0.5</td>
<td>5</td>
</tr>
<tr>
<td>0.5 \leq \text{Capacity MW} &lt; 30</td>
<td>10</td>
</tr>
<tr>
<td>30 \leq \text{Capacity MW} &lt; 100</td>
<td>15</td>
</tr>
<tr>
<td>Capacity MW \geq 100</td>
<td>20</td>
</tr>
</tbody>
</table>

• CRE is working in the development a National Standard and the Certification of companies that may carry out the verification of cogeneration efficiency levels is a forthcoming task for CRE.
**DISPATCH RULES**

Principles:

- The short term cost of the energy generated is closed to 0.

- The more expensive generation should be displaced in the merit order for the sake of maintaining an economic dispatch.

- Keeping security of the System at the top of priorities.
INTERCONNECTION RULES

Principles:

• Maintaining the security, reliability and stability of the Power System.

• Wind turbines to participate in voltage control / reactive power control.

• Wind turbine operators have to fulfill all communication requirements that the System Operator requires for grid control

• Management of abnormal grid operation conditions.
CRE organized an Open Season procedure for the sake of building transmission capacity that could wheel power generated by wind farms to be install in Oaxaca.

The stakeholders guaranteed the cost of the request transmission capacity with letters of credit.

Some projects are all ready connected and operating (484.1 MW)
OPEN SEASON

Gulf of Mexico

Pacific Ocean
SUCCESSFUL EXPERIENCE

Wind Farm EURUS, Oaxaca
250 MW
Tender

• The deployment of renewable energy resources in small energy projects, up to 20 MW.
• It considers RE technologies: geothermal, mini hydro, biomass, biogas and PV.
• This scheme will give the chance for small project developers to participate in the energy sector increasing job creation.
• CRE is working on a particular tender scheme for this kind of projects.
SMART GRID REGULATORY ROADMAP

- To optimize the integration of renewables by managing demand instead of the managing supply.
- Reduce the cost of electricity for end users.
- Improve the quality of the public service.
- Improve efficiency and reliability.
CONCLUSIONS

• Specific actions for the promotion of these projects have been carried out and an outstanding.

• Strong competitive conditions within a region or a country may be the desirable outcome of regulation.

• Technological characteristics of all RE developments should be taken into account to level the field of competition in a given electric System.

• Policy makers and regulators must work together in order to achieve maximum results.
THANKS

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