Issues on Energy and Environmental Planning in El Salvador
Overview – Actions Fields

• Renewable Energy
  • Electricity Generation: Hydroelectric, Geothermal, Wind and Biomass Power Plants in big and small scale
  • Implementation of the CDM
  • Fuelwood: rural areas
  • Biofuels: Ethanol, Biodiesel (transportation sector)

• Energy Efficiency
  • Power Plants Upgrade
  • Public, Industrial, Commercial and Residential Sectors
  • Cogeneration
UBICACION DE CENTRALES GENERADORAS existentes
SISTEMA EL SALVADOR 2003

<table>
<thead>
<tr>
<th>CENTRAL</th>
<th>CAPACIDAD INSTALADA</th>
</tr>
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<tbody>
<tr>
<td>CESSA</td>
<td>32.6 MW</td>
</tr>
<tr>
<td>Guajoyo</td>
<td>19.8 MW</td>
</tr>
<tr>
<td>Ahuachapán</td>
<td>95 MW</td>
</tr>
<tr>
<td>CASSA</td>
<td>20 MW</td>
</tr>
<tr>
<td>Nejapa Power</td>
<td>144 MW</td>
</tr>
<tr>
<td>Cerrón Grande</td>
<td>153.9 MW</td>
</tr>
<tr>
<td>Soyapango</td>
<td>16.2 MW</td>
</tr>
<tr>
<td>5 de Noviembre</td>
<td>99.4 MW</td>
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<tr>
<td>15 de Septiembre</td>
<td>156.6 MW</td>
</tr>
<tr>
<td>San Miguel</td>
<td>6.7 MW</td>
</tr>
<tr>
<td>Berlín</td>
<td>66.2 MW</td>
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</table>

<table>
<thead>
<tr>
<th>TIPO</th>
<th>CAPACIDAD TOTAL</th>
</tr>
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<tbody>
<tr>
<td>H = HIDRÁULICO</td>
<td>429.7 MW</td>
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<tr>
<td>G = GÉOTÉRMICO</td>
<td>161.2 MW</td>
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<td>T = TÉRMICO</td>
<td>514.6 MW</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1105.5 MW</td>
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</tbody>
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100.0%
Electricity Generation

Energy policy oriented to the development of the renewable energy resources: Hydroelectric, Geothermal Power Plants

Main Activities:

• Feasibility study of the hydroelectric project Chaparral: 60 MW (EPC Engineering Procurement and Construction Modality: 2006).

• Feasibility study of the hydroelectric project El Cimarrón: 243 MW (EPC 2007).

OPEN ELECTRICITY MARKET

• Investment in geothermal projects Italian company ENEL GREEN POWER as a strategic partner of LaGeo.
• Capacity expansion of geothermal resource: in 2006 increase of 44 MW (Berlin Plant).
Financing Small-Scale renewable energy projects (hydroelectric, geothermal and cogeneration power plants):


Upgrade of power plants:
- 2003 – 2004 hydroelectric power plants of Guajoyo, 5 de Noviembre and Cerrón Grande – increased of installed capacity 40 MW,
- 2005 – 2006 hydroelectric power plants of Cerrón Grande and 15 de Septiembre – increase of installed capacity 40 MW more
Procedure of Evaluation and Endorsement:

- Project preparation (project developers)
- Request of the letter of no objection (MARN)
- Revision of the project (MARN)
- Approval and Awarding of the letter of no objection (MARN)
- Elaboration of the project document
- Approval and Emission of the letter of Endorsement (MARN)

Implementation of the CDM
Fuelwood Supply System

Modeling and policy based on an agro-ecological regional concept that use the process analysis approach

Main Aspects:
• Consideration of the specific ecological conditions and agriculture activities of the regions
• Use of the Reference Energy System to modeling the whole fuelwood supply system and its interaction with agriculture and forestry
• Processing of satellite images with a geographical information system in order to obtain precise and reliable data on different types of vegetation and land use
• Analysis of different options (reforestation, substitution of fuelwood, introduction of efficient cooking technology) for specific strategies
Biofuels: Ethanol, Biodiesel (transportation)

Answer to the high oil prices: Ethanol and Biodiesel for transport system

Agro-industry of sugar cane and Jatropha Curcas:

- Studies of the impact of Legislation
- Pilot projects
- Law promulgation

ACTORS
- Private sector companies (local and international),
- Government: Ministries of Agriculture, Economy, Environment
Main Activities:

- Public sector
- Energy Labeling: Lighting in offices and public lighting
- Industrial and Trading Sector: Development of ESCOs
- Residential sector: Promotion and activities with the Regulator and Trading companies
Cogeneration with Biomass

Development of Electricity Generation of Sugar Mills Deliver to the Grid
Generación de Ingenios de Azúcar entregada a la red electrica
2001 - 2004

Ingenios:
- El Ángel
- Empresa Eléctrica del Norte
- Compañía Azucarera Salvadoreña
- La Cabaña

MWh

THANK YOU