ENERGY EFFICIENCY AND COMPETITIVENESS IN COLOMBIA

TUNISIA
NOVEMBER 2014
Only by deeply knowing our companies, we can transform the Colombian industry to make it more competitive.

20 PTP sectors

Manufacturing
- Cosmetics and Personal Care Products
- Editorial and Graphic Communication Industry
- Auto parts and Vehicles
- Fashion Industry
- Shipyards, Metalworking and Steel Industry

Services
- BPO&O
- Software & IT
- Electric Energy and Services
- Medical and Wellness Tourism
- Nature Tourism

Agribusiness
- Aquaculture
- Beef and Cattle
- Palm, Oils and Biofuels
- Confectionary, Chocolate and Raw Materials
- Horticulture
- Dairy

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2014
2001 PRO URE Law for the rational and efficient use of energy resources
2002 Defined fiscal Incentives for equipment and machinery
2003 Research and development funds for PRO URE
2005 Development of technical requirements for electrical equipment (labelling)
2007 Best practices included in technical installation standard (Lights)
2008 Electrical installation standard was released for use
2009 Lighting standard was released for use
2010 Carbon emissions considered for electricity generation projects
2010 PROURE 2010 -2015 with specific targets for: residential, industrial, transport and energy sectors
2014. Law for promoting Energy Efficiency and renewables

Energy Security  -  Access  -  Sustainable Development  -  Competitiveness

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<table>
<thead>
<tr>
<th>Subprogram</th>
<th>Category</th>
<th>Requests</th>
<th>VAT (MM USD)</th>
<th>TAX (MM USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity consumption optimization</td>
<td><em>Electrical Motors upgrade</em></td>
<td>1</td>
<td>0.204</td>
<td>0</td>
</tr>
<tr>
<td>Combustion process optimization</td>
<td>Heat recovery</td>
<td>2</td>
<td>4.966</td>
<td>0.991</td>
</tr>
<tr>
<td>Vehicles technology improvement</td>
<td>Vehicles upgrade to hybrid</td>
<td>3</td>
<td>20.746</td>
<td>13.49</td>
</tr>
<tr>
<td>Transport systems optimization</td>
<td>Use of clean technologies</td>
<td>4</td>
<td>3.967</td>
<td>0</td>
</tr>
<tr>
<td><em>Use of non conventional sources of energy</em></td>
<td>Potential per technology</td>
<td>3</td>
<td>0.0235</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>13</strong></td>
<td><strong>29.9065</strong></td>
<td><strong>14.481</strong></td>
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</tbody>
</table>
Cultural Habits - Technology upgrade - Sustainable

• Institutional Arrangement
  – Roles and responsibilities assigned to the government

• Advertisement and technical support
  – Advertisement campaigns (school, public sector, industry)
  – Roll out of fiscal incentives
  – Development of targeted technical information to industry

• Measurement, Monitoring and Performance Indicators
  – Develop energy efficiency baselines for industry, residential, transport and public sector

• Regulation
  – Allow for energy price signals
  – Distributed generation
  – Demand management
Cultural Habits - Technology upgrade - Sustainable

• Incentives
  – Incentives for upgrading technology
  – Energy management certification (ISO 50001)

• Standards
  – Develop or adapt technical standards that include energy efficiency
  – Develop or adapt labelling standards for electrical equipment

• Financial Offering
  – Structure funds to finance energy efficiency projects
  – Improve risk management required for this type of projects
  – Define payment options for the public sector
MOU Workshop

EE Audits Identification

Inventory of Industry Generation Capacity

EE Goal in 2014-2018 Development Plan

Technical Data Gathered

1st Financing Workshop

EE project offer test

Fiscal Incentives Workshop

2nd Financing Workshop

EE Project report template

ESCOS Inventory

1st Auditors Training

Web Site

ESCOS proposals deadline

TIMELINE

16-dic. 25-feb. 1-abr. 15-may. 30-may. 15-jul. 29-jul. 6-agos. 1-sep. 1-sep. 11-sep. 13-sep. 17-sep. 26-sep. 8-oct. 10-oct. 21-oct.

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<table>
<thead>
<tr>
<th>Project Type</th>
<th>Qty</th>
<th>MMUSD</th>
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</thead>
<tbody>
<tr>
<td>1. Combustión</td>
<td>13</td>
<td>$ 9.0</td>
</tr>
<tr>
<td>2. EMS Implementation</td>
<td>2</td>
<td>$ 0.7</td>
</tr>
<tr>
<td>3. Cogeneration</td>
<td>3</td>
<td>$ 26.0</td>
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<tr>
<td>4. Cooling</td>
<td>2</td>
<td>$ 0.8</td>
</tr>
<tr>
<td>5. Electrical Motors</td>
<td>17</td>
<td>$ 4.0</td>
</tr>
<tr>
<td>6. Lighting</td>
<td>5</td>
<td>$ 0.6</td>
</tr>
<tr>
<td>7. Other (Electrical Energy)</td>
<td>7</td>
<td>$ 0.1</td>
</tr>
<tr>
<td>8. Other (Other energy sources)</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>9. Renewables</td>
<td>3</td>
<td>$ 0.3</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td>52</td>
<td><strong>$ 41.5</strong></td>
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</tbody>
</table>
• The main challenge is to create a market with enough demand for EE
• Energy Market is a takers market
• Climate change is not a priority for SME
• Industry, residential and public sector do not recognize EE as a cost saving tool
• Not every industry has the same financial needs or business priorities
• Industry underestimates the ROI of EE projects
• Financial institutions see low risk in EE projects once technical matters are understood
• Financial Institutions do not recognize the need for structured EE products
• The public sector must promote EE through the energy policy
• Engineering firms have limited financial capacity, few ESCOS in Colombia
EE Credit Line by BANCOLDEX

VALIDATION PHASES
- Contractor Validation
- Project Validation
- Investment Analysis

Cost assumed by the Bank

Performance Contract (optional)

Agents:
- ESCOS
- Hospitals
- Hotels

Clean Technology Fund

Energy Savings Technical Validation

Technologies:
- AC, AC Control, Cogeneration,
- Boilers, Pool Temperature Control, Water Heating

 ADJUSTMENTS

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Institutional Arrangement
- Government responsibility for EE

Promotion
- Advertisement campaigns
- Baselines and targets to be defined for the different sectors
- Pilot projects and technical information publicized for benchmark

Regulation
- Develop price signals for energy and electricity
- Distributed Generation
- Demand Response Management

Incentives
- For technology development and upgrading
- Promote Energy Efficiency certification (ISO 50001)

Standards
- Develop energy efficiency standards
- Develop performance indicators and standard for calculating the base line

Financial
- Financial Risk and technical risk to be built into the models with independent validation
- Define regulation to allow public sector to invest in EE through energy savings
- Shared risk models

Recommendations
Summary
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Manufacturas / Agroindustria / Servicios

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