Promoting Energy Efficiency Investment: Opportunities and Challenges

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Morocco import more than **95%** of its primary energy (**coal, natural gas**)  

Total installed capacity is almost **6400 Mw** and a total consumption is 30 TWh with an annual consumption growth of more than **7,2%** → 981 Kwh/capita  

Electricity price is among the highest in the region **17,2 $c** (industry) and **12,8 $c** (consumer)  

- Rural electrification reach **90%** (energy access to remote area)  
- Economic growth and advancing industrialization
Challenges

- As a strategic option, Morocco promotes the investment in energy efficiency and renewable energy:
  - Install a capacity of 6000 Mw (hydropower, wind and solar power plant)
    - 42% of total installed capacity by 2020 and
    - 10-12% part of Renewable in the energy mix
  - Achieve a 12% of energy saving by 2020 either in building, industry, transport.

- Expected outcomes
  - To provide a mix solution that reduce energy dependency and energy costs as well as avoiding CO2 emissions.
  - Promoting job and SMEs creation as well as competitiveness
Operational Platform I

Regulatory and legal framework

- **Liberalization of the electricity market** for Extra and High voltage (*medium voltage is planned for 2015*)

- **Renewable energy law 13-09** aims to promote energy production from renewable sources (> 2 MW)

- **Law 47-09** dates in 2011 aims to promote energy efficiency.
  - Mandatory energy audit,
  - energetic assessment impact,
  - energy saving company, ...

- **Mechanism for public-private partnership** a draft was launched on 2011
Operational Platform II

Institutions

- **ADEREE**: National "Agency for the development of renewable energy and energy efficiency"

- **SIE**: state owned energy investment company; energy development fund ($1 billion)

- **IRESEN**: economy-based knowledge (promoting R&D in wind, solar and thermal innovations)

- **MASEN**: specific framework for solar projects
The general states "etats généraux" a multidimensional and inclusive process
to assess energy consumption, to quantify energy saving potential and to map the solution deployed in EE in industry, transport, building, agriculture, street lighting.

Program "Jiha-tinou" aims to assess municipalities in terms of their technical and financial capacity to deal with energy efficiency namely street lighting (European Energy Award).

Green platform for capacity building as well as to test and guaranty the quality of equipments at the technological park at Marrakech
Technical Programs Launched

- **Industrial EE program** considered 360 among the 1855 manufacturing units (representing 90% total energy consumption) – with 53 with high energy consumption.
  - Accreditation of about 200 auditors, some ISO 50001 certification

- Large-scale programs throughout Moroccan Kingdom with a relatively reduced investment
  - Program **SHEMSI** oriented to access solar water heater
  - Solar heat pump for agricultural purpose
  - Electricity based PV panel for rural electrification in remote area

- **Street lighting**. The municipality of Salè is undertaking a project related to street lighting within the PPP mechanisms and SIE funding

- **In industry**: Various enterprises are actually, implementing the concept behind ESCO.
  - Enterprises are dealing with their core business and externalizing the energy management (biomass)
### Energy Source

<table>
<thead>
<tr>
<th>Energy Source</th>
<th>Potential</th>
<th>Target 2020</th>
<th>Done</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind*</td>
<td>25 GWh</td>
<td>2 Gw</td>
<td><strong>860 Mw</strong>: (700 Mw, 160 Mw Next by 2015)</td>
</tr>
<tr>
<td>Solar</td>
<td>5.5 Kw/m²/day; 3000 hr/yr</td>
<td>2 Gw</td>
<td><strong>900 Mw</strong>: (500 Mw Ourzazate; 400 Mw Oujda)</td>
</tr>
<tr>
<td>Hydropower</td>
<td>2 Gw</td>
<td></td>
<td><strong>1745 Mw</strong></td>
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* a wind atlas at high resolution is available at ADEREE (Site identification for Renewable)

More than 200,000 housing units constructed each year (building represents 35% of energy consuming in Morocco)
Opportunity for investment

Investment potential in Moroccan kingdom over

- $13 billions in renewable energy
- $3 billions for energy efficiency in the consumer and industrial sectors
Promoting EE investment I

- **Market oriented**
  - **Public procurement**: calls for tenders (municipalities, state building,...)
  - **Identifying and selecting EE projects** (urban labs, veille technologique)
  - **Large-scale successful** flagship project

- **Enterprise oriented**
  - Industries should consider **EE as an opportunity** for enhancing their competitiveness and not as a mandatory goal.
  - Promoting the multiplication of ESCO along with the energy saving performance contract.
Promoting EE investment II

- Clear Monitoring and verification on EE deployment
- Risk mitigation to increase investor trust and confidence *(who guarantee the payment?)*
  - need to develop contractual and operational PPP mechanism and a business model in order to maximize investment and to reduce uncertainty

- **Capacity building and** Economy-based knowledge

- to support theses challenges is essential (specifying the requirement in human resources (quality and quantity) : (Engineers, auditors, SMEs,...).  
  - 20 Msc launched
  - Engineers in Energy efficiency and Renewable Energy
Thank You

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