Technical & Economic Aspects for developing energy efficiency (EE) investment projects

Energy efficiency projects design and financing tools

24 September 2012
Content

- EE project profitability
- Economic barriers to EE project development
- Financial mechanisms of energy efficiency
- Conclusion
EE project profitability

Typology of projects

- **Capitalistic projects**
  - Concentrated investment
  - Large investments
  - Limited number of investors
  - Low transaction cost for financing
  - Ex: cogeneration, process modification, etc.

- **Decentralized projects**
  - Scattered market
  - Small investments
  - High transaction cost for financing
  - Ex: EE in building (SWH, envelop retrofitting, etc.)
EE project profitability
Profitability factors

- Investment cost (KPEX)
- Operation cost (OPEX)
- Amount of saved energy compared to the investment
- End use energy tariffs

KPEX
OPEX

Saved energy
Energy tariffs

+ Profitability
Economic barriers to EE project development

Economic barriers

1. Low profitability for the end-user
   - Tariff distortions
   - High KAPEX
2. Investissement barriers
   - Investment capacity of the target
   - Access to finance
Economic barriers to EE project development

Tariffs effects

LPG and natural gas tariffs for residential use in MEDA Country

November 2008 - all taxes included

€/kWh

LPG Price (USD)

NG Price (USD)
Economic barriers to EE project development

Tariffs effect

Electricity tariffs for residential use in MEDA Country
November 2008 - all taxes included

$/kWh

Min
Max

Algeria 0,067 0,150
Egypt 0,087 0,142
Jordan 0,125 0,162
Lebanon 0,087 0,142
Morocco 0,087 0,154
Syria
Tunisia
Turkey

Source: Rafik MISSAOUI, MED-ENEC 2009
Economic barriers to EE project development
Tariffs effect: example

LPG Tariff and SWH profitability for the end users

Pay back period (years)

LPG Tariff in €/T

Egypt
Algeria
Syria
Jordan Morocc
Tunisia
Palestine
Lebanon
Israel
Turkey
**Economic barriers to EE project development**

**Tariffs effect: example**

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**Electricity Tariff and SWH profitability for the end users**

- **Pay back Period (years):**
  - Egypt
  - Syria
  - Algeria

- **Electricity Tariff in €/MWh:**
  - Turkey
  - Jordan
  - Tunisia
  - Lebanon
  - Morocco
  - Israel
  - Palestine

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**Graph:**
- X-axis: Electricity Tariff in €/MWh
- Y-axis: Pay back Period (years)
- Countries represented:
  - Egypt
  - Syria
  - Algeria
  - Turkey
  - Jordan
  - Tunisia
  - Lebanon
  - Morocco
  - Israel
  - Palestine
Economic barriers to EE project development
Investment cost barriers

Average SWH price in different countries in 2008

$/m² of collectors

- France: 1095
- Allemagne: 1061
- Portugal: 958
- Autriche: 931
- Italie: 753
- Maroc: 696
- Espagne: 684
- Finland: 561
- Tunisie: 361
- Grèce: 342
- Chypre: 283
- Turquie: 274
- Israel: 274

Source: ESTIF, adapted by ALCOR
**Economic barriers to EE project development**

**Investment cost barriers**

### Average price of SWH in different countries in 2008

**Parity of Power Purchase**

<table>
<thead>
<tr>
<th>Country</th>
<th>Average Price (ppp/m² of collector)</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>905</td>
</tr>
<tr>
<td>Allemagne</td>
<td>877</td>
</tr>
<tr>
<td>Portugal</td>
<td>1,071</td>
</tr>
<tr>
<td>Autriche</td>
<td>795</td>
</tr>
<tr>
<td>Italie</td>
<td>673</td>
</tr>
<tr>
<td>Maroc</td>
<td>1,547</td>
</tr>
<tr>
<td>Espagne</td>
<td>1,127</td>
</tr>
<tr>
<td>Finland</td>
<td>676</td>
</tr>
<tr>
<td>Tusnie</td>
<td>464</td>
</tr>
<tr>
<td>Gréce</td>
<td>372</td>
</tr>
<tr>
<td>Chypre</td>
<td>490</td>
</tr>
<tr>
<td>Turque</td>
<td>547</td>
</tr>
<tr>
<td>Israel</td>
<td>344</td>
</tr>
</tbody>
</table>

Source: ALCOR, 2009
Financial mechanisms of energy efficiency
Measures to improve the profitability for the end-user

Objective

- Reducing the payback period for the end-user: Improvement of EE option attractiveness;
- Using the measure as a communication vector;
- Stimulating the supply by market initialization: progressive decrease of investment costs.

Types of measures

- Public investment subsidy;
- Indirect taxes advantage (VAT, customs duties, etc.);
- Reduction of direct taxes: tax credit.
# Financial mechanisms of energy efficiency

## Measures to improve the profitability for the end-user

<table>
<thead>
<tr>
<th>Measures</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public investment subsidy</td>
<td>- Clear effect on the cost reduction</td>
<td>- Pressure on the public finances</td>
</tr>
<tr>
<td></td>
<td>- Strong signal to the market</td>
<td>- Low sustainability</td>
</tr>
<tr>
<td></td>
<td>- Good vector for awareness</td>
<td>- High management cost</td>
</tr>
<tr>
<td></td>
<td>- Stimulation effect for supply side</td>
<td></td>
</tr>
<tr>
<td>Indirect taxes advantage</td>
<td>- Easy implementation</td>
<td>- Low visibility</td>
</tr>
<tr>
<td></td>
<td>- Low pressure on public finances</td>
<td>- Low efficiency in case of informal market</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Difficulty to apply on services cost</td>
</tr>
<tr>
<td>Reduction of direct taxes</td>
<td>- Low pressure on public finances</td>
<td>- Low efficiency in developing countries</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Complexity of implementation in developing countries</td>
</tr>
</tbody>
</table>
Financial mechanisms of energy efficiency
Measures to overcome the investment barriers

Objective
- Overcoming the initial investment barrier
- Using the measure as a communication vector
- Market transforming by involving the banking sector (leverage effect)

Types of measures
- Specific credit line
- Interest rate subsidy
- Credit guarantee systems
## Financial mechanisms of energy efficiency

### Measures to improve the investment barriers

<table>
<thead>
<tr>
<th>Measures</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Specific credit lines</strong></td>
<td>- Solve the problem of down stream resources</td>
<td>- Implementation slowness</td>
</tr>
<tr>
<td></td>
<td>- Involvement of banking sector</td>
<td>- High cost of loan distribution and management</td>
</tr>
<tr>
<td></td>
<td>- Good vector of awareness</td>
<td>- Exclusion of non banked households</td>
</tr>
<tr>
<td></td>
<td>- Possibility to neutralize the reimbursement of loan by the saving on the energy bill</td>
<td></td>
</tr>
<tr>
<td><strong>Interest rate subsidy</strong></td>
<td>- Good vector of awareness</td>
<td>- Currency risk coverage</td>
</tr>
<tr>
<td></td>
<td>- Improve the profitability for the end user</td>
<td>- Sustainability of the interest subsidy</td>
</tr>
<tr>
<td><strong>Credit guarantee systems</strong></td>
<td>- easy access to the credit</td>
<td>- Financial market distortion</td>
</tr>
<tr>
<td></td>
<td>- Incentive for the banking sector</td>
<td>- Pressure on public finance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Complexity of implementation in developing countries</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Risk of derive</td>
</tr>
</tbody>
</table>
**Financial mechanisms of energy efficiency**

**Other financing sources**

- **tools:**
  - Clean Development Mechanism:
    - Adapted to large EE projects
    - Will be finished by the end of 2012
  - Programmatic CDM:
    - Suitable to decentralized EE projects
    - Will be finished by the end of 2012
  - Nationally Appropriate Mitigation Actions:
    - Unilateral NAMA
    - Supported NAMA

- **Objectives**
  - Improving profitability for the end-user
  - Bring soft financing
Conclusion

**Ideal profile of a financial mechanism for EE in MENA countries...**

Mechanisms combining several types of tools, instruments and measures

1. **Financial instruments:**
   - **Win –Win** Public subvention to improve project profitability for end-user
   - Indirect taxation measures
   - Bank credit over an enough long period to alleviate the payment capacity barrier
   - Sufficient upstream resources for both public subsidy and loan distribution
   - Carbon financing mechanisms

2. **Institutional and organizational instruments**
   - Simple and effective distribution system of loans;
   - Effective Operators, accredited to be eligible to the programs;
   - Effective quality control, but simple and cost-effective;
   - Accompanying measures including awareness and capacity building.
   - Coordinating agency to monitor all the mechanisms
Merci pour votre attention