Energy Efficiency Policies for the SEMED/Arab Region

Introduction to Policy Development Working Session

16 April 2013

Grayson Heffner and Sara Bryan Pasquier
Agenda

- The Big Picture
- The role of energy efficiency policies in overcoming barriers to energy efficiency
- Organization of the policy development sessions
Energy demand will continue to grow – but the growth rate can be managed.

Global energy demand increases by one-third from 2010 to 2035, with China & India accounting for 50% of the growth.
Middle East and North African car ownership will double in 20 years

PLDV ownership in selected markets in the New Policies Scenario

Starting from a very low base, car ownership in non-OECD countries is set to grow considerably, driven by China. The extent of growth will determine future oil demand.
Energy intensity has worsened in Middle East and Africa regions

These regional trends are counter to the global trend
Middle East and North Africa account for about two-thirds of total fossil-fuel subsidies

Economic cost of fossil-fuel consumption subsidies by fuel for top twenty-five economies, 2010

- Iran
- Saudi Arabia
- Russia
- India
- China
- Egypt
- Venezuela
- UAE
- Indonesia
- Uzbekistan
- Iraq
- Algeria
- Mexico
- Thailand
- Ukraine
- Kuwait
- Pakistan
- Argentina
- Malaysia
- Bangladesh
- Turkmenistan
- Kazakhstan
- Libya
- Qatar
- Ecuador

IEA
World Energy Outlook 2011
Global investment in energy efficiency

Source: 2011 estimates, WEO 2012
Comparing 2011 business line results

USD billions

Global EE investment

US electricity sales

Apple 2010 revenues
Total Final Energy Consumption (TFC) – across countries in SEMED (+1) region

- Egypt: 64%
- Morocco: 16%
- Tunisia: 9%
- Lebanon: 5%
- Jordan: 6%
TFC by consuming sector - Egypt

- Industry: 26%
- Transport: 26%
- Residential: 22%
- Commerce and public services: 3%
- Agriculture/forestry: 7%
- Non-specified (other): 2%
- Non-energy use: 14%
- Total: 100%
TFC by consuming sector - Tunisia

- Industry: 28%
- Transport: 28%
- Residential: 27%
- Commerce and public services: 8%
- Agriculture/forestry: 6%
- Non-energy use: 3%
- Non-energy use: 0%

Total: 100%
TFC by consuming sector - Jordan

- Industry: 22%
- Transport: 38%
- Residential: 22%
- Commerce and public services: 8%
- Agriculture/forestry: 4%
- Non-specified (other): 3%
- Non-energy use: 3%
- Other: 0%
TFC by consuming sector - Morocco

- Industry: 23%
- Transport: 28%
- Residential: 21%
- Agriculture/forestry: 18%
- Commerce and public services: 4%
- Non-specified (other): 2%
- Non-energy use: 4%
TFC by consuming sector - Lebanon

- Industry: 16%
- Transport: 44%
- Residential: 26%
- Commerce and public services: 6%
- Non-specified (other): 6%
- Non-energy use: 2%
### Barriers to improved energy efficiency

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Examples</th>
</tr>
</thead>
</table>
| Market failures              | • Energy price subsidies  
• Agency problems, when benefits are split amongst several parties (e.g., renter-occupied housing), reducing the motivation to act  
• Project size                                                             |
| Financial                    | • Perceived risk  
• Transaction costs  
• Low capacity within the financial sector  
• Lending terms (period, interest rate, collateral requirements)               |
| Information                  | • Lack of awareness  
• Consumer indifference                                                      |
| Regulatory and institutional | • Energy tariffs that discourage EE investment  
• Institutional bias  
• Competing                                                                    |
| Technical                    | • Lack of affordable or suitable EE technologies  
• Measuring savings  
• Capacity to identifying and implementing EE projects  
• Project performance risk                                                   |
End-user awareness, low energy prices, financing, and implementation capacity are commonly cited.
IEA survey of energy efficiency barriers
Policies and interventions

- Information and education
  - Advice and assistance
  - Information and product labelling
  - Capacity building

- Economic instruments
  - Fiscal incentive
  - Financial measures
  - Market-based instruments

- Regulatory instruments
  - Building codes & appliance standards
  - Energy management requirements
  - Energy savings obligations

- Technology development

- Enabling frameworks
  - Legislation
  - Funding

- Institutional arrangements
  - Implementing agencies
  - Public-private partnerships
### Matching policies to barriers - examples

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited Information</td>
<td>Appliance labeling</td>
</tr>
<tr>
<td></td>
<td>Awareness and education campaigns</td>
</tr>
<tr>
<td>Perceived Risk</td>
<td>Public sector procurement</td>
</tr>
<tr>
<td></td>
<td>Guarantee facilities</td>
</tr>
<tr>
<td>Price or market distortion</td>
<td>Appliance standards</td>
</tr>
<tr>
<td>Technology and capacity shortfalls</td>
<td>Industry formation</td>
</tr>
<tr>
<td></td>
<td>Creating EE delivery agencies</td>
</tr>
<tr>
<td>Transaction Costs</td>
<td>Audit requirements</td>
</tr>
<tr>
<td></td>
<td>Project preparation facilities</td>
</tr>
<tr>
<td>Access to financing</td>
<td>Revolving funds</td>
</tr>
<tr>
<td></td>
<td>Public-private partnerships</td>
</tr>
</tbody>
</table>
## Enabling frameworks and institutional arrangements

<table>
<thead>
<tr>
<th>Frameworks &amp; Arrangements</th>
<th>Egypt</th>
<th>Jordan</th>
<th>Kuwait</th>
<th>Lebanon</th>
<th>Morocco</th>
<th>Tunisia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Efficiency Laws &amp; Decrees</td>
<td></td>
<td></td>
<td>√</td>
<td></td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>National Energy Strategies and Plans</td>
<td>√</td>
<td>√</td>
<td></td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Apex Agency for Energy Policy</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>EE Specialist Agency</td>
<td></td>
<td>√</td>
<td>√</td>
<td>√</td>
<td></td>
<td>√</td>
</tr>
<tr>
<td>Results Monitoring Capacity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Capacity Programs</td>
<td>√</td>
<td></td>
<td></td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>EE Regulations</td>
<td>√</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial Arrangements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>√</td>
</tr>
<tr>
<td>Academic &amp; Research Capacity</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Industrial Associations</td>
<td>√</td>
<td>√</td>
<td></td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
</tbody>
</table>

Questions to consider when formulating energy efficiency policies

- Will it work?
- How much will it cost?
- Who will pay?
- How long will it take?
- Will there be unintended impacts or interference with other policies?
- Does the capacity exist to implement?
Policy Development Session
Form small groups organized by sector

- Industry
- Buildings
- Transport
- Cross-sectoral
Sequence of group discussion

1. Energy efficiency improvement opportunities
   - Discuss and agree the major energy savings opportunities within the region
   - Identify any major differences across countries

2. Barriers to scaling-up energy efficiency
   - Discuss and agree the major barriers in your sector
   - Identify any major differences across countries

3. Consider the policy recommendations put forward by the IEA and WEC and others
   - Which of these are being implemented or considered?
   - Any others that might be appropriate to the region?
   - Which are not appropriate to the region? Why?
   - Identify any major differences across countries
Sequence of group discussion (con.)

4. Develop additional, regional potential policies
   - Discuss additional policies especially applicable to the SEMED/Arab region or your country
   - Identify any major differences across countries

5. Rank-order the potential policies
   - Work as a group to select the most important and less important potential policies
   - Were there major differences across countries?

6. Prepare to report-out your results
   - Work with your assigned rapporteur
   - Your presentation should cover each step of your work process, policy recommendations, and major differences across countries
Group Discussion Resources

<table>
<thead>
<tr>
<th>Sector</th>
<th>Opportunities to improve energy efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>Industrial processes, cogeneration, waste heat recovery, preheating, efficient drives.</td>
</tr>
<tr>
<td>Buildings and municipal services</td>
<td>Building design and measures such as better insulation, advanced windows, energy efficient lighting, space conditioning, water heating, and refrigeration technologies. District heating systems, combined heat and power, efficient street lighting, efficient water supply, pumping, and sewage removal systems.</td>
</tr>
<tr>
<td>Transport</td>
<td>Efficient vehicles, urban mass transport systems, modal shifts to inter- and intracity rail and water transport, compressed natural gas vehicles, traffic demand management.</td>
</tr>
<tr>
<td>Agriculture</td>
<td>Efficient irrigation pumping and efficient water use, such as drip irrigation.</td>
</tr>
</tbody>
</table>

Consuming Sector Insights

- **Manufacturing**: 13 percent of regional GDP and 17 percent of exports. Most energy-intensive manufacturing industries are cement, steel, fertilizers, and glass, consuming 25 percent of the energy and contributing a significant share of GDP.

- **Buildings**: Buildings are estimated to be responsible today for at least 40 percent of energy use in the region.

- **Transport**: No region of the world has a transport sector that is more energy intensive. Measures to bring down energy intensity in the transport sector could include fuel price increases, demand management, greater investment in public transport, measures to improve vehicle fuel economy, and integrated transport and urban planning.

- **Agriculture**: Nearly half (45.7 percent) of the region’s cultivated areas are irrigated, a fact that has huge implications for energy consumption and water-resource management.

*Source: Tapping a Hidden Resource, World Bank 2009*
## Transport energy savings opportunities

<table>
<thead>
<tr>
<th>Sector</th>
<th>Efficiency measure</th>
<th>Barriers</th>
<th>Policy recommendation</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger vehicles</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motorcycles and scooters</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trucks and inland freight</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air and maritime</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public transportation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rail</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Three transportation efficiency modalities - avoid/reduce, shift, and improve*
# Buildings and tertiary energy savings opportunities

<table>
<thead>
<tr>
<th>Sector</th>
<th>Efficiency Measure</th>
<th>Barriers</th>
<th>Policy recommendations</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street lighting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office lighting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heating, ventilation and air conditioning</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commercial refrigeration, freezing, cooking</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small and medium motors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office equipment and servers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Industry energy savings opportunities

<table>
<thead>
<tr>
<th>Sector</th>
<th>Efficiency Measure</th>
<th>Barriers</th>
<th>Policy recommendations</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy intensive&lt;sup&gt;1&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electric motors and drives</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Process heat</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-energy intensive&lt;sup&gt;2&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SMEs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>1</sup> cement, glass, paper, steel, petro-chemicals, desalination

<sup>2</sup> Food processing, services, textiles, other
## Appliances and lighting (Households) energy savings opportunities

<table>
<thead>
<tr>
<th>Sector</th>
<th>Efficiency Measure</th>
<th>Barriers</th>
<th>Policy recommendations</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential white goods</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential air conditioners</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TV and electronics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hot water heaters</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heating</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household Lighting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Agricultural and water supply energy savings opportunities

<table>
<thead>
<tr>
<th>Sector</th>
<th>Efficiency Measure</th>
<th>Barriers</th>
<th>Policy Recommendation</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irrigation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Desalination</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>