Energy Indicators for Sustainable Development

Social Dimension

Presentation by Kathleen Abdalla
Workshop on Capacity Development for Mainstreaming Sustainable Development Goals, Targets and Indicators into Statistical Programmes in Selected Latin American Countries
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Social Dimension

- Access to Energy
- Affordability
- Equity
- Safety
- Reliability
Access to Modern Energy Services

• 1.3 billion lack access to electricity—18% of the world’s population—22% of developing countries’ population
• 2.7 bn lack access to modern energy services for cooking and heating—37.5% of the world’s population
• Mostly in subSaharan Africa and Asia
• Mostly in rural areas
Access to Modern Energy Services

• Necessary for reducing poverty – income generation activities – mechanical power transport, telecommunication services
• Improving health – better nutrition and avoiding respiratory illnesses -- 4,3 mn premature deaths/year from indoor air pollution
• Essential for clean water, sanitation and health care
• Education for children – less likely to miss school
• Education for children – reliable and efficient lighting
Access to Modern Energy Services

• Situation in Latin America -- better than other developing country regions
• 23 mn without access to electricity –5% of population
• Many countries have electricification rates of over 99%
• Some have rates below 70%; only Haiti is below 50% at 28%
• Urban areas – 99% electrified
• Some say...
  – 18% of rural population lack access to electricity
  – 15% of rural population – rely on traditional biomass for cooking and heating
Indicators can influence...

- Policies at the national, provincial and local levels
- Investment in infrastructure
- Public Private partnerships
- Focus on environment
Need for Indicators

• Measurement brings attention to the issue/raises awareness among
  – policy makers
  – the public in general
  – experts in the field
  – investors
  – implementers
## Social Dimension Indicators

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<th>Theme</th>
<th>Sub-theme</th>
<th>Energy indicator</th>
<th>Components</th>
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<td>Equity</td>
<td>Accessibility</td>
<td>SOC1 Share of households (or population) without electricity or commercial energy, or heavily dependent on non-commercial energy</td>
<td>-Households (or population) without electricity or commercial energy&lt;br&gt;-Total number of households or population</td>
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<td></td>
<td>Affordability</td>
<td>SOC2 Share of household income spent on fuel and electricity</td>
<td>-Household income spent on fuel and electricity&lt;br&gt;- Household income (total and poorest 20% of population)</td>
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<td>Disparities</td>
<td>SOC3 Household energy use for each income group and corresponding fuel mix</td>
<td>-Energy use per household for each income group (quintiles)&lt;br&gt;-Household income for each income group (quintiles)&lt;br&gt;-Corresponding fuel mix for each income group (quintiles)</td>
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<tr>
<td>Health</td>
<td>Safety</td>
<td>SOC4 Accident fatalities per energy produced by fuel chain</td>
<td>-Annual fatalities by fuel chain&lt;br&gt;-Annual energy produced</td>
</tr>
</tbody>
</table>
Social Dimension Indicators

• SOC1 – Accessibility – Share of households (or population) without electricity or commercial energy, or heavily dependent on non-commercial energy

• Data needed
  – Households (or population) without electricity or heavily dependent on non-commercial energy
  – Total number of households or population
Figure 1: Share (%) of biomass in total primary energy supply (TPES) (IEA, 2013a)
Energy Use in household sector

Cuba

[Graph showing energy use in household sector for Cuba with various energy types such as Wood, LPG, Alcohol, City gas, Electricity, and Charcoal, with population in millions on the x-axis and energy use in ktoe on the y-axis.]
Change in share of population with electricity, selected countries (2005-2011)
Social Dimension Indicators

• SOC2 – Affordability – Share of household income spent on fuel and electricity

• Data needed
  – Household income spent on fuel and electricity
  – Household income (total and poorest 20% of population)
Share of household expenditures for fuel and electricity in selected countries, 2010
Social Dimension Indicators

• SOC3 – Disparities – Household energy use for each income group and corresponding fuel mix

• Data needed
  – Energy use per household for each income group (quintiles)
  – Household income for each income group (quintiles)
  – Corresponding fuel mix for each income group (quintiles)
Monthly Household Energy Expenditures by Income levels, Brazil

- Energy expenditure per month (US$ PPP-2000)
- Energy expenditure per average income (%)

Income classes:
- < 2 m.w.
- 2-3 m.w.
- 3-5 m.w.
- 5-10 m.w.
- >10 m.w.
- Average

Expenditures and percentages:
- Energy expenditure per month: $0 to $120
- Energy expenditure per average income: 0% to 16%

Income levels:
- 4%
- 2%
- 6%
- 7%
- 9%
- 14%
- 0%
- 20%
- 40%
- 60%
- 80%
- 100%
- 120%
- < 2 m.w.
- 2-3 m.w.
- 3-5 m.w.
- 5-10 m.w.
- >10 m.w.
- Average

Legend:
- Energy expenditure per month (US$ PPP-2000)
- Energy expenditure per average income (%)

Graph shows the distribution of monthly household energy expenditures across different income levels in Brazil.
Per capita expenditures and share in energy expenditures, selected countries, 2000

- Japan
- Austria
- Argentina
- Mauritius
- Senegal
- Zimbabwe
- Kenya
- Nigeria

- Per capita expenditures
- Share energy expenditures
Social Dimension Indicators

• SOC4 – Safety – Accident fatalities per energy produced by fuel chain
• Data needed
  – Annual fatalities by fuel chain
  – Annual energy produced
Global deaths per TWh by energy source 2011

Reliability Indicator – Electricity

- Weather related damage
- Equipment failure
- Conflict
- Lack of Investment in New Capacity
- Poor Maintenance
Reliability Indicator

Electric outages experienced by firms – Average number of days per year

![Bar chart showing the number of days per year for different countries.](chart.png)
Reliability Indicator
Percentage of surveyed firms that own/share electricity generator, 2013

<table>
<thead>
<tr>
<th>Country</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Cameroun</td>
<td>79.7%</td>
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<tr>
<td>Congo</td>
<td>86.0%</td>
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<tr>
<td>Botswana</td>
<td>48.8%</td>
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<tr>
<td>Malawi</td>
<td>30.0%</td>
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<tr>
<td>Côte d'Ivoire</td>
<td>17.4%</td>
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<tr>
<td>Madagascar</td>
<td>34.7%</td>
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<tr>
<td>DR Congo</td>
<td>41.7%</td>
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<tr>
<td>Eritrea</td>
<td>14.3%</td>
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<tr>
<td>Gabon</td>
<td>31.6%</td>
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<tr>
<td>Mali</td>
<td>27.2%</td>
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<tr>
<td>Mauritius</td>
<td>29.0%</td>
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<tr>
<td>Benin</td>
<td>50.1%</td>
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<tr>
<td>Angola</td>
<td>86.0%</td>
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