Future Energy Scenarios and Some Strategic Options for Nepal

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End-use Consumption of Energy in Different Sectors in 2010

Total consumption: 390 million GJ
Energy Consumption in 2010

- Total Energy Consumption: 390 million GJ

- Traditional: 87.70%
- Renewable: 0.50%
- Coal: 1.80%
- Petroleum: 8.20%
- Electricity: 1.80%

WECS, 2010
Consumption of Petro-products


HSD
KL
Petrol
Kero
LPG

10/18/2010
Import of petro products against commodity exports

Commodity exports around 69 billion in 2010.
Major Issues in energy sector

- Consumption of traditional fuels - unsustainable
- Dependence on imported petroleum products – too much
- Harnessing of the indigenous hydropower resources – very poor
- Fuel substitution - strongly needed
## Energy Resources Potential

<table>
<thead>
<tr>
<th>Renewable energy sources</th>
<th>Theoretical potential MW/MWa</th>
<th>Economical potential MW/MWa</th>
<th>Utilized MW/units</th>
<th>% of utilization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydropower</td>
<td>83,000</td>
<td>42,000</td>
<td>688</td>
<td>1.6</td>
</tr>
<tr>
<td>Microhydro</td>
<td>50</td>
<td></td>
<td>10.2</td>
<td>20</td>
</tr>
<tr>
<td>Solar PV power plant</td>
<td>9,750</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Solar PV home system</td>
<td>122</td>
<td></td>
<td>3.2</td>
<td>3</td>
</tr>
<tr>
<td>Wind Power</td>
<td>1,215</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Biogas plant (MWa)</td>
<td>864</td>
<td></td>
<td>60</td>
<td>7</td>
</tr>
<tr>
<td>Solar water heating Urban (MWa)</td>
<td>82</td>
<td></td>
<td>23</td>
<td>28</td>
</tr>
</tbody>
</table>

Based on NEA, 2009; WECS, 2006; AEPC, 2008 and author’s calculations
Biogas Plants under UN Habitat Support

- Since 2007, promotion of 8 institutional level biogas systems in Kathmandu Valley with support from UN-Habitat
- In addition, successful performance of 3 reed bed wastewater treatment systems with support from the UN-Habitat
Fuel Mix at Reference & combined policy scenarios

Reference case

Combined case
Per Capita Electricity Consumption in 2007

Key World Energy Statistics, IEA, 2009
Share of Renewable Energy in Total Final Energy

<table>
<thead>
<tr>
<th>Year</th>
<th>Reference case</th>
<th>Combined Policy case</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>2010</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>2015</td>
<td>3%</td>
<td>5%</td>
</tr>
<tr>
<td>2020</td>
<td>4%</td>
<td>8%</td>
</tr>
<tr>
<td>2025</td>
<td>6%</td>
<td>14%</td>
</tr>
<tr>
<td>2030</td>
<td>6%</td>
<td>19%</td>
</tr>
</tbody>
</table>
GHG Emissions in CO₂ equivalent

12 billion NR through carbon trading (164 million USD) in 2030.

25 million tons in 2030 savings
Some Major Strategic Options

- Hydropower is our indigenous and clean resource. Hence, develop it as the lead energy resource.
- Apply DSM tools to reduce the demand.
- Introduce electric and hybrid vehicles for switching from fossil to renewable energy.
- Discourage use of fossil fuels by promoting alternative fuels in transport and machineries like electric and hybrid vehicles and mixing of biodiesel and ethanol in diesel and petrol respectively.
Major Strategic Options – Fossil Fuels

- Promote alternative fuels in transport mixing of biodiesel and ethanol in diesel and gasoline respectively.
- Improve/replace traditional energy by renewable energy resources
- Establish a mechanism for ensuring sustained supply of biomass materials for energy
- Identify, Introduce and Promote new and efficient traditional energy combustion devices like ICS.
Thank you!