Renewable Energy Policies in Sri Lanka
- the needs and potentials for additional international support

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Sri Lanka – An island in the Indian Ocean
Lower middle income country

- Land area (square km): 65,610
- Population: 20 m
- Total Households: 5.3 m
- On grid Commercial entities: 400,000
- On grid Government Institutions: 134,000
- On grid Hotels: 546
- On grid Industries: 43,000
- Per capita energy consumption (toe): 0.478 (lower middle income country average of 1.02 toe)
- Per capita CO2 emissions (tons/y): 0.62 (World average – 4.29)
Power Sector in Sri Lanka

- SLSEA
- Independent Power Producers (oil & RE)
- CEB Generation
- Regulator - PUCSL
- GOSL / Ministry
- CEB Transmission
  - CEB Dis 1
  - CEB Dis 3
  - CEB Dis 3
  - CEB Dis 4
- LECO
- Consumers
- Off grid
Electricity for everybody, everyday

End Of Year 2010
End Of Year 2011
End Of Year 2012

‘100% electrification by the end of 2012
Business as usual Generation Expansion Plan of Sri Lanka

Coal - 4000 MW; 85% of the capacity by 2025

% generation | 2010 | 2011 | 2012 |
---|---|---|---|
Renewables | 52% | 37% | 33% |
Oil | - | 50% | 52% |
Coal | 48% | 13% | 15% |
Renewable Energy policy in Sri Lanka

• Planning and Strategy

Official targets for renewable energy

- 2010 - 40% renewables (large hydro)

2016 - 60% demand increase
- 2016 - 38% renewables (large hydro+ NCRE- 10%)

2020 – 100% demand increase
- Demand side management – 10%
- 2020 - 43% renewables (large hydro+ NCRE- 20%)

Statements of intend
- Carbon neutral growth by 2020
- Start carbon reduction by 2030
Avoided Generation Cost - early 1990

- Generated enthusiasm for mini-hydro power
- Lack of transparency in calculating the actual avoided cost
- Hidden subsidies given to fossil fuel

Technology Specific Financial Cost Reflective Tariff - (Flat and 3-tier) - 2007

- Generated enthusiasm for mini-hydro and wind power
- There was no way to meet the additional cost

Above 25 MW - should have government shares
Between 10 MW to 25 MW - negotiated price - Private companies
Less than 10 MW - First come first serve basis - Private companies
Small Renewables (GWh)

2010 - 6.5%
The state of play of renewable energy policy in Sri Lanka

• Generation-Based Incentives/Feed-in-Tariffs (FITs)

FIT and its basic features:

The tariffs and the Special Power Purchase Agreements for projects with a rated generating capacity up to 10 MW are:

• first come first serve
• standardized
• non-negotiable
• cost-based
• sources - specific
• technology-specific
• either a three-tier tariff or a flat tariff
• valid for a period of 20 years
• extendable by mutual consent
# Flat Tariff in 2011

<table>
<thead>
<tr>
<th>Technology</th>
<th>All inclusive rate for years 1-20</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>(LKR/kWh)</td>
</tr>
<tr>
<td>Mini-hydro</td>
<td>13.04</td>
</tr>
<tr>
<td>Mini-hydro - Local</td>
<td>13.32</td>
</tr>
<tr>
<td>Wind</td>
<td>19.43</td>
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<tr>
<td>Wind - Local</td>
<td>19.97</td>
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<tr>
<td>Biomass (Dendro)</td>
<td>20.70</td>
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<tr>
<td>Biomass (Agricultural &amp; Industrial Waste)</td>
<td>14.53</td>
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<tr>
<td>Municipal Waste</td>
<td>22.02</td>
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<tr>
<td>Waste Heat Recovery</td>
<td>6.64</td>
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<tr>
<td>Other</td>
<td>20.70</td>
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</table>

Ex rate: USD1=LKR 113
# Small renewable energy power plants

<table>
<thead>
<tr>
<th>Category</th>
<th>Biomass No</th>
<th>Biomass MW</th>
<th>Mini Hydro No</th>
<th>Mini Hydro MW</th>
<th>Solar No</th>
<th>Solar MW</th>
<th>Wind No</th>
<th>Wind MW</th>
<th>All REPs No</th>
<th>All REPs MW</th>
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<tbody>
<tr>
<td>Commissioned</td>
<td>3</td>
<td>13</td>
<td>87</td>
<td>189</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>31</td>
<td>98</td>
<td>234</td>
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<tr>
<td>Under Construction</td>
<td>15</td>
<td>74</td>
<td>112</td>
<td>211</td>
<td></td>
<td></td>
<td>10</td>
<td>99</td>
<td>137</td>
<td>384</td>
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<tr>
<td>Valid Provisional Approval</td>
<td>7</td>
<td>81</td>
<td>37</td>
<td>41</td>
<td>1</td>
<td>10</td>
<td></td>
<td></td>
<td>46</td>
<td>142</td>
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<tr>
<td><strong>Total committed at present</strong></td>
<td><strong>25</strong></td>
<td><strong>167</strong></td>
<td><strong>236</strong></td>
<td><strong>441</strong></td>
<td><strong>5</strong></td>
<td><strong>11</strong></td>
<td><strong>14</strong></td>
<td><strong>130</strong></td>
<td><strong>281</strong></td>
<td><strong>759</strong></td>
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<tr>
<td>Wind Farm</td>
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<td></td>
<td></td>
<td>1</td>
<td>100</td>
<td></td>
<td></td>
<td>1</td>
<td>100</td>
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<tr>
<td>Solar Farm</td>
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<td></td>
<td></td>
<td>1</td>
<td>100</td>
<td></td>
<td></td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
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</tbody>
</table>

**Total – Committed at present** 2000 GWh/y – 13% by 2016
**Total – with parks** – 2430- 16% by 2016
Geo Thermal - PA - 10 MW; Applied - 109 MW
Sea Wave - Applied 3 MW
Escalation due to inflation: fuel - 5.09%; O&M - 7.64%
Escalation due to scarcity of coal resources: 3%
Estimated Renewable energy potential in Sri Lanka

- Hydro Power Potential - 1960 MW @ 40% pf (1290 MW all ready tapped)
- Dendro Power Potential - 900 MW @ 70% pf; BEASL estimate - 3,000 MW
- Wind Power Potential - 3000 MW @ 30% pf; NREL estimate 20,000+24,000 MW
- Solar Power Potential - 4.5 to 6.0 kWh/m2/day @ 16% pf
- Wave Power Potential - 200 MW @ 65% pf; NARA estimate- 2000 MW)
- OTEC Potential - Trincomalee Canyon is the one of the world best places
- Geothermal Potential - 30 MW (GSMB estimate)
Pump Storage Solution

Major Technical issue to be addressed
- systems ability absorb fluctuations

Potential sites

Samanalawewa (Keriketi Oya) 1000 MW
Maussakele (Adam's Peak Falls) 500 MW
Randenigala (Halgran Oya) 500 MW
Kotmale (Maha Oya, Gurugal Oya, Kuda Oya) 900 MW
Upper Kotmale (Dambagastalawa, Agra Oya) 600 MW

Total 3500 MW

500 MW plant: capital - 360 to 500 million USD
- 730 – 1000 USD/kW

Discussions are currently under way.
International Support

- Generation and Transmission expansion planning (Technical & Capacity building)
- Concessionary financial support (Financial)
- Subsidy reforms (Technical)
- FIT for other renewable energy technologies such as Solar PV, Concentrated Solar Thermal (Technical and capacity Building)
- Study on Wave Power, Geothermal and Ocean Thermal Energy Conversion (OTEC) (Technical & Capacity Building)
- Biomass collection, storage and clearing houses (Financial)
- Pump Storage (Financial & Technical)
- Smart Grid for the Sri Lankan Power System (Financial, Technical & Capacity Building)
- Civil Society Strengthening (Capacity Building)

for achieving new renewable energy targets