Sri Lanka

Power Sector Overview

Nalinda Illangakoon RWP RSP
Chairman
Ceylon Electricity Board
When written in Chinese the word

**Crisis**

is composed of two characters

First one represents

**DANGER**

And the other represents

**Opportunity**
Never Let good crisis go to waste

Winston Churchill
Sri Lanka is probably one of the best examples of converting a Crisis into an Opportunity.

Within Sri Lanka Power Sector is definitely the best example.
Transformation of the power sector

**Pre-Crisis**
- Loss making
- Public Funded
- Vertically Integrated
- Loosely Regulated
- Policy Incoherent
- Unionized

**Post-Crisis**
- Profitable
- PPP funded
- Unbundled
- Strong Regulations
- Policy instruments
- Inclusive decision making
Transformation of the power sector

- Renewable Development Plan
- Transmission Network Capacity Development
- Cost Reflective Tariff
- Sector Unbundling
- Investment Opportunities
- Wholesale energy market
- Open Access and power wheeling
- Regional Interconnection
Renewable Development Plan

2023

Renewable Energy
9,850 GWh
53.2%

Thermal Energy
8,650 GWh
46.8%

Total Energy
18,000 GWh

2024

Bio-Mass
Solar
Wind
Mini Hydro
Hydro
Gas Turbines
Oil based
Combine Cycle
Coal

2030

Renewable Energy
28,000 GWh

Thermal Energy
19,850 GWh
70.8%

Thermal Energy
8,150 GWh
46.8%

Bio-Mass
Solar
Wind
Mini Hydro
Hydro
IC Engines
Combine Cycle
Coal
### Renewable Development Plan

**World Bank Study on Off-shore wind**
- 2GW – On-shore wind
- 27GW – Off-shore wind

**SEA Study on Solar**
- 8.5GW – Ground Mounted Solar
- 3GW – Floating Solar
- 3GW – Rooftop Solar

*The Maximum Demand of the System at present = 2.7GW*
## Renewable Development Plan

<table>
<thead>
<tr>
<th>Type</th>
<th>Major</th>
<th>Mini</th>
<th>Biomass</th>
<th>Wind</th>
<th>Distribution</th>
<th>Grid</th>
<th>Total Solar</th>
<th>BESS at 4h</th>
<th>PSP (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hydro</td>
<td>Hydro</td>
<td>(MW)</td>
<td>(MW)</td>
<td>Network</td>
<td>Connecte</td>
<td>(MW)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(MW)</td>
<td>(MW)</td>
<td></td>
<td></td>
<td>Embedded</td>
<td>d Solar</td>
<td>(a)</td>
<td>(b)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Solar (MW)</td>
<td>(a+b)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2023 to 2026</td>
<td>188</td>
<td>90</td>
<td>80</td>
<td>575</td>
<td>555</td>
<td>1240</td>
<td>1795</td>
<td>300</td>
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<tr>
<td>2027</td>
<td>-</td>
<td>25</td>
<td>20</td>
<td>250</td>
<td>170</td>
<td>330</td>
<td>500</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>2028</td>
<td>-</td>
<td>25</td>
<td>20</td>
<td>200</td>
<td>170</td>
<td>350</td>
<td>520</td>
<td>350</td>
<td></td>
</tr>
<tr>
<td>2029</td>
<td>-</td>
<td>25</td>
<td>20</td>
<td>250</td>
<td>170</td>
<td>370</td>
<td>540</td>
<td>150</td>
<td>350</td>
</tr>
<tr>
<td>2030</td>
<td>-</td>
<td>10</td>
<td>20</td>
<td>200</td>
<td>170</td>
<td>280</td>
<td>450</td>
<td>125</td>
<td>350</td>
</tr>
<tr>
<td>Total</td>
<td>188</td>
<td>175</td>
<td>160</td>
<td>1475</td>
<td>1235</td>
<td>2570</td>
<td>3805</td>
<td>1125</td>
<td>700</td>
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</table>
### Renewable Development Plan

<table>
<thead>
<tr>
<th>Zone</th>
<th>Solar (MW)</th>
<th>Wind (MW)</th>
<th>Total RE (MW)</th>
<th>BESS* (MW)</th>
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</thead>
<tbody>
<tr>
<td>Northern Zone</td>
<td>481</td>
<td>900</td>
<td>1,381</td>
<td>430</td>
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<tr>
<td>Mannar Zone</td>
<td>504</td>
<td>504</td>
<td>504</td>
<td></td>
</tr>
<tr>
<td>Eastern Zone</td>
<td>854</td>
<td>75</td>
<td>929</td>
<td>300</td>
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<tr>
<td>Southern Zone</td>
<td>674</td>
<td>674</td>
<td>674</td>
<td>300</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,009</strong></td>
<td><strong>1,479</strong></td>
<td><strong>3,488</strong></td>
<td><strong>1,030</strong></td>
</tr>
</tbody>
</table>
Renewable Development Plan

World Bank Study on Off-shore wind

- 2GW – On-shore wind
- 27GW – Off-shore wind
• Investment Opportunities

Estimated Investment requirement for Tentative RE Generation & Storage during the period 2023-2030 (MUSD)

<table>
<thead>
<tr>
<th>Generation Technology</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
<th>2028</th>
<th>2029</th>
<th>2030</th>
<th>Total (MUSD)</th>
</tr>
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<tbody>
<tr>
<td>Mini Hydro</td>
<td>36</td>
<td>36</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>18</td>
<td>315</td>
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<tr>
<td>Wind</td>
<td>36</td>
<td>87</td>
<td>291</td>
<td>422</td>
<td>364</td>
<td>291</td>
<td>364</td>
<td>336</td>
<td>2,191</td>
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<tr>
<td>Solar PV</td>
<td>306</td>
<td>461</td>
<td>510</td>
<td>478</td>
<td>502</td>
<td>519</td>
<td>537</td>
<td>434</td>
<td>3,747</td>
</tr>
<tr>
<td>Biomass</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>280</td>
</tr>
<tr>
<td>Battery Energy Storage</td>
<td>-</td>
<td>30</td>
<td>147</td>
<td>265</td>
<td>295</td>
<td>515</td>
<td>221</td>
<td>184</td>
<td>1,657</td>
</tr>
<tr>
<td>Pump Storage Power Plant</td>
<td>-</td>
<td>16</td>
<td>62</td>
<td>167</td>
<td>275</td>
<td>294</td>
<td>248</td>
<td>142</td>
<td>1,204</td>
</tr>
<tr>
<td>Total</td>
<td>413</td>
<td>665</td>
<td>1,090</td>
<td>1,412</td>
<td>1,516</td>
<td>1,699</td>
<td>1,450</td>
<td>1,149</td>
<td>9,394</td>
</tr>
</tbody>
</table>

Transmission Investment requirement is USD 1.86B
Northern Grid Development
- Extension of 400kV Network to Killinochchi
- Extension of 220kV Network to Poonakary
- 1720MWh Grid Support Battery

Southern Grid Development
- Enhancement of Hambanthota GSS
- 1200MWh Grid Support Battery
- Extension of 220kV to Monaragala

Central Backbone
- Habarana-Wicktoria-Kirindiwela 400kV transmission Line

System Control Centre Enhancements
- Renewable Energy Prediction desk
- Western Grid resilience through fast acting supplementary generation
- 800MWh Grid Support Battery

Eastern Grid Development
- Extension of 220kV Grid to Kappalthurai
- 1200MWh Grid Support Battery

India-Sri Lanka Interconnection

Transmission Network Capacity Development
• Transmission Network Capacity Development

- 400kV/220kV Northern Feeder and Collector System
- 400kV Central Feeder and Collector System
- 220kV Eastern Feeder and Collector System
- 220kV Southern Feeder and Collector System
Cost Reflective Tariff

- **Regulated Tariff**
  - Revision period of 3 months
  - Tariff calculation period of 1 year
  - Tariff window of 5 years
  - Regulated by PUCSL
  - Statutory binding to provide all approved costs of the utility

- **Operationalization of tariff variation**
  - Automatic adjustment of the tariff within the tariff period
  - Cost Reflectivity is ensured
  - Triggered by the cash flow to the Bulk Supply Transaction Account
• Sector Unbundling
Surplus renewable resources shall be developed for export purposes

- The India-Sri Lanka interconnection is a mission-critical infrastructure
- The Renewable resource development needs to be attended to with the view of the 90% export rather than 10% local consumption
Thank You