Promoting EE Technologies, Finance and Business Models for Developing Countries

Deep Dive Workshop

5th June 2018

ACEF 2018
Energy Efficiency Services Limited

Joint venture of four National Public Sector Undertakings under Government of India

Mandate to unlock the potential of Indian energy efficiency landscape through innovative market-based interventions

Interventions create access to innovative and future-ready technologies for domestic consumers, including households, commercial establishments, industries & public facilities

Targeted energy savings, viz current consumption

US$ 12 billion
Annual market for energy efficiency in India

US$ 1.5 billion
Target company size by 2020

Growth-oriented organization founded in 2010, has become a leader in transforming markets for energy efficiency in India and abroad
Proven business model has saved over 41bn kWh energy

**FEATURES**

- Oriented to **savings & outcomes**
- Innovative, effective **technology**
- Flexible & scalable to drive **access**
- Self-sustaining without public funds
- Attractive by being **affordable**
- **Timebound, transparent, standardised** implementation
- Turnkey offering that provides **value-for-money**

**SUCCESSES**

<table>
<thead>
<tr>
<th>Program</th>
<th>Details</th>
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</table>
| **Unnat Jyoti by Affordable LEDs for All** | - 300 mn LEDs
  - 85% price reduction
  - Annual energy savings: 39 bn kWh |
| **Street Light National Program**           | - 6 mn streetlights
  - 83,000 km of road
  - Annual savings: 1.6 bn kWh |
| **Building Energy Efficiency Program**      | - 3,723 buildings retrofitted
  - Annual savings: 65 mn kWh |
| **Agricultural Demand Side Management**     | - 18,000 pumps replaced
  - Energy & monetary savings to farmers |
| **National eMobility Program**              | - 10,000 cars to be delivered by 2019
  - Market competitive price of $16,923 |
| **Smart Meter National Program**            | - 5 million meters procured
  - 40-50% cost reduction |

**GROWTH**

- **50x profit growth** in 4 years
- Well positioned to be **listed on stock exchange** in 2019
- **Global expansion** with programs operational in UK, Malaysia, Thailand, Saudi Arabia, Ireland, Canada, Vietnam and Myanmar
Business Model in Emerging World

- **Business Models** in the emerging world need to be innovative, scalable, embrace technology, learn to survive without public funds, incentivise all stakeholders and deliver outcomes in a time bound manner.

- The **Business case** has to be simple and easy to comprehend by all.

- **Transaction cost of joining is low** – easy to aggregate demand.

- **Compelling rationality** and transparency – enable fast adoption – effective communication.

- **Value for money** for all stakeholders is essential.

- **Standardization** of technology, services and

- **Turnkey implementation** - to seamlessly integrate all the elements.
Value proposition driven by philosophy of Enabling More

Enabling More

- No Subsidy
- No Capex
- Mitigate investment Risks
- Overcome market entry barriers
- Pay-As-You-Save (PAYS)

Demand aggregation
Bulk procurement to leverage economies of scale
Transparent operations, outcomes in public domain

Need for Air conditioning in India

<table>
<thead>
<tr>
<th>Climate type</th>
<th>Summer temperatures (°C)</th>
<th>Winter temperatures (°C)</th>
<th>RH (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot &amp; Dry</td>
<td>20 to 45</td>
<td>0 to 25</td>
<td>55</td>
</tr>
<tr>
<td>Warm-humid</td>
<td>25 to 35</td>
<td>20 to 30</td>
<td>70-90</td>
</tr>
<tr>
<td>Composite</td>
<td>27 to 43</td>
<td>4 to 25</td>
<td>20-95</td>
</tr>
<tr>
<td>Temperate</td>
<td>17 to 34</td>
<td>16 to 33</td>
<td>&lt;75</td>
</tr>
<tr>
<td>Cold</td>
<td>17 to 30</td>
<td>-3 to 8</td>
<td>70-80</td>
</tr>
</tbody>
</table>

(Source: National Building Code, 2005)

- About 1,000 BU electricity consumption annually by Acs. Expected increase @7% per annum
- 30% consumption in Building Sector – 60% contributed by ACs
- About 5 million new AC enter into market every year – Existing penetration is over 20 million
EESL’s Super Efficient AC Program – For Buildings

Completed Procurement of 100,000 Super-Efficient ACs

Super Efficiency (ISEER 5.2, 1.5 ton)
• Split configuration Inverter technology
  • 33% efficient from 5 Star
• Low GWP

Assurance
• Comprehensive warranty – 3 year; Compressor (5 years)
• Tested to work in conditions like 52°C
• Financing options

Convenience
• Installation and 3 year annual service by brand
• Buyback option
• Financing options
Building Energy Efficiency Programme

• GoI mandate to implement this programme in all central Government buildings

• Agreement signed for implementation of Energy efficiency measures in over 5000 buildings belonging to Central / State Governments as well as private sectors

• As on 25\textsuperscript{th} May 18, EESL has completed \textbf{3723 buildings}, which has led to cost savings of about \textbf{USD 13 Million} with reduction of over 69,000 tonnes CO\textsubscript{2} and avoided peak demand of over \textbf{19.2 MW}

• EESL has target of 5,000 buildings in FY 2018 – 19 on implementation of Energy efficiency measures

• EESL has launched “National Building Dashboard” \textcolor{blue}{http://www.eeslbeep.com}, which provides information of real time/deemed energy savings after EESL intervention of energy efficiency measures in all buildings on pan India basis
## Cost-Benefit Scenario

<table>
<thead>
<tr>
<th></th>
<th>3 Star Inverter AC</th>
<th>5 Star Inverter AC</th>
<th>EESL Super Efficient Inverter AC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISEER</td>
<td>3.2</td>
<td>4.2</td>
<td>5.2</td>
</tr>
<tr>
<td>Electricity Wattage</td>
<td>1650</td>
<td>1250</td>
<td>1015</td>
</tr>
<tr>
<td>Market price (US $)</td>
<td>615</td>
<td>692</td>
<td>838</td>
</tr>
<tr>
<td>5 year AMC (US $)</td>
<td><strong>308</strong></td>
<td><strong>308</strong></td>
<td><strong>46</strong></td>
</tr>
<tr>
<td>Annual operating days</td>
<td>225</td>
<td>225</td>
<td>225</td>
</tr>
<tr>
<td>Operating Hours per day</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Annual Electricity Consumption Units</td>
<td>3000</td>
<td>2275</td>
<td>1850</td>
</tr>
<tr>
<td>Annual Electricity Charges (at $0.12)</td>
<td>369</td>
<td>280</td>
<td>228</td>
</tr>
<tr>
<td>Electricity Charges for 5 years</td>
<td>1,846</td>
<td>1,400</td>
<td>1,139</td>
</tr>
<tr>
<td>Total Cost for 5 years</td>
<td><strong>2,769</strong></td>
<td><strong>2,400</strong></td>
<td><strong>2,023</strong></td>
</tr>
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</table>
Tri-Generation: Importance in India

- Growth in Commercial Buildings & facilities (> 15,000 million sq. ft by 2020) requiring substantial use of Electricity, Heat and Cooling - almost 90% of the energy bill

- High Energy Consumption in Industrial Sector – Energy Cost is about 30 to 50 % of manufacturing cost

- High (and increasing) Energy Price; Non-Availability of Reliable Energy

- Availability of Natural Gas in most part of India; Almost Stabilized Gas Price

- Regulatory Compulsions for Industrial and Commercial Establishments to reduce Specific Energy Consumption

- Proven Technology – Viability to be worked out

- Availability of national level agency who could take financial and technical risks – Upfront Investment by ESCO

- Availability of Integrators – May be suitably developed

- Increase in System Efficiency from 30 % to 60 % to 80 %
**EESL's intervention in Tri-generation**

Investment of £55 million in acquisition of Combined Heat & Power (CHP) asset – Edina Power, leading CHP integrator in UK and Ireland

- Revenue: £100m; 200+ Staff; 8 offices; 500+ installations

- £208m of potential in CHP based ESCO market in UK

- 11.5GW of potential in Tri-generation in India

- Feasibility study ongoing at few locations
Thank You

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