Affordable Cooling & Business Models

UNFCCC – COP23

Energy Efficiency Services Limited

Bonn, 14th November 2017
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Energy Efficiency Services Limited (EESL) – Who We Are

- A state-owned public Energy Service Company (ESCO) under Ministry of Power enabling consumers, industries, governments effectively manage their energy needs through efficient & green technologies.
- Implementing the world’s largest non-subsidised energy efficiency portfolio across lighting, buildings, agriculture, etc.,
- Solution-driven innovation with no-subsidy, no capex and the Pay-As-You-Save model, which obviates the need for any upfront capital investment in any interventions
- Our mission is to unlock the $12 billion energy efficiency sector in India through simple and innovative business models, introducing new technologies to the consumers
- The turnover of the company has grown from USD 0.7 Mn in 2012-13 to USD 187 Mn in 2016-17 and is expected to reach USD 537 Mn in 2017-18
The Imperative- ACs contribute to peak demand

Studies show that the additional demand from room ACs in India is equivalent to 200-300 large (500 MW) power plants by 2030 i.e. 100-150 GW and 10% of energy demand (~ 300 TWh)

This implies
- Significant addition to the grid generation capacity (read Coal based)
- Investing in in-situ diesel generators or battery inverters
- Eventually increasing consumer tariffs

Source: Lawrence Berkeley National Lab (LBNL), USA
The Case for Market Side Intervention

- Policy led rating programme has improved energy efficiency with time

<table>
<thead>
<tr>
<th>Star Rating</th>
<th>2014-15</th>
<th>2015-16</th>
<th>2016-17</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EER(W/W)</td>
<td>EER(W/W)</td>
<td>EER(W/W)</td>
</tr>
<tr>
<td>1 star</td>
<td>Min. 2.30 Max. 2.49</td>
<td>Min. 2.50 Max. 2.69</td>
<td>Min. 2.70 Max. 2.89</td>
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<tr>
<td>2 star</td>
<td>Min. 2.50 Max. 2.69</td>
<td>Min. 2.70 Max. 2.89</td>
<td>Min. 2.90 Max. 3.09</td>
</tr>
<tr>
<td>3 star</td>
<td>Min. 2.70 Max. 2.89</td>
<td>Min. 2.90 Max. 3.09</td>
<td>Min. 3.10 Max. 3.29</td>
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<tr>
<td>4 star</td>
<td>Min. 2.90 Max. 3.09</td>
<td>Min. 3.10 Max. 3.29</td>
<td>Min. 3.30 Max. 3.49</td>
</tr>
<tr>
<td>5 star</td>
<td>Min. 3.10 Max. 3.30</td>
<td>Min. 3.30 Max. 3.50</td>
<td>Min. 3.50 Max. 3.50</td>
</tr>
</tbody>
</table>

- Urbanization led rising AC demand (CAGR ~ 15%)

**Yet**

- Slow inverter technology push (only 20% till date; major markets >75%)

- No R&D on inverter Window AC (market share today <10% from over 90% in early 2000s)
### Payback Analysis

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<thead>
<tr>
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<tr>
<td>ISEER</td>
<td>3.3</td>
<td>3.5</td>
<td>5.2</td>
</tr>
<tr>
<td>All inclusive price (USD)</td>
<td>$456</td>
<td>$548</td>
<td>$837</td>
</tr>
<tr>
<td>Savings from Operational (annual)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Output (W)</td>
<td>5275</td>
<td>5275</td>
<td>5275</td>
</tr>
<tr>
<td>Input (W)</td>
<td>1598</td>
<td>1507</td>
<td>1014</td>
</tr>
<tr>
<td>Operating expense (USD)/annum</td>
<td>$265</td>
<td>$250</td>
<td>$168</td>
</tr>
<tr>
<td>Annual gains - Using ESEAP AC</td>
<td></td>
<td></td>
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<tr>
<td>Operating savings/annum</td>
<td>-$96</td>
<td>-$81</td>
<td></td>
</tr>
<tr>
<td>% Savings</td>
<td>37%</td>
<td>33%</td>
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### Conclusion

Drop the idea of buying only star rated AC today;

Simply purchase EESL super efficient AC.

1. ESEAP AC analysed against 5 star AC - 2014, 2015
2. Payback time based on expected consumer savings against incremental spend on 5 star product
3. All inclusive price includes installation, warranty and annual service

Source: EESL calculations,
Customers Want

• Product
  • First Costs & Running Costs
  • Warranty
  • After Sales experience

• Financing options

ESEAP Offering

• 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, Pollution

• Convenience
  • Installation and 3 year annual service by brand
  • Buyback option
  • Financing options
GoI aspires to have 100% EVs by 2030 and has approved the National Mission on Electric Mobility in 2011 and subsequently National Electric Mobility Mission Plan 2020 was unveiled in 2013.

EESL is aggregating demand by procuring electric vehicles in bulk to get economies of scale - provide them on lease, both wet and dry, to Government organisations.

- Completed first phase of procurement of 10,000 EVs - world’s largest single EV procurement drive.
- Innovative business model that addresses the barriers that have so far triggered market failures and to create incentives for all stakeholders in the value chain.

Vision – to promote e-mobility in India

Strategy- Govt leadership by replacing 500,000 vehicles to create ecosystem needed for market transformation

Innovative Business Model- e-cars to government at same terms and conditions as petrol/ diesel cars

Demand aggregation
Bulk procurement – leverage economies of scale
Innovative and simple business models
Transparent operations, outcomes in public domain

Impact of deploying 500,000 EVs

- 8,000 Fuel Savings (Mn Litres)
- USD 4.3 Bn Net Savings in Fuel/Energy
- 20 Mn Tonnes Reduction in CO₂
Smart Meters

- Smart meters represent a fundamental component of the evolving grid whose adoption by utilities shall lead to a more intelligent grid.
- GoI has the vision of ensuring smart meter installation to all consumers with a consumption of more than 200 units by financial year 2019.
- EESL under Smart Meter National Programme aims to replace all the 250 million conventional meters with smart meters in India (5 million under implementation).
- Business model include revamping the current manual system of revenue collection & noting meter readings which leads to low billing and poor collection efficiencies.
- Roll-out is proposed under the BOOT model on cost plus approach, which means all Capex/ Opex is done by EESL and the States/ Utilities are not required to invest upfront.

Enabling More

Vision – to promote smart grids in India

Strategy - Attract Utilities in the programme to aggregate demand

Innovative Business Model - No upfront cost; Improved billing efficiency; repayments part of enhanced revenue

Demand aggregation – 250 m smart meters to be covered
Bulk procurement – leverage economies of scale
Innovative and simple business models
Transparent operations, outcomes in public domain

Impact of replacing 250 Mn Meters

75-100% Billing Efficiency Improvements
USD 2.1 Bn Potential increase in revenue to Utilities
60-70% red. Market Transformation through price reduction

Potential increase in revenue to Utilities
Solar Projects

**Enabling More**

**Vision:** To promote clean and efficient use of energy

**Strategy:** Attract ULBs/DISCOM in the programme to aggregate demand

**Innovative Business Model:** Clean energy generation capacity being built with different models

**Demand aggregation**
Transparent operations, outcomes in public domain

**Innovative and Simple Business mode**

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**Solar Agri-Pumpsets**

- EESL with finance, design, install, own and operate a solar PV pumping solution at the farmer end
- These can irrigate the farms during the day time eliminating the dependence on DISCOM for operating the irrigation pumps & dependence on DGs
- Excess energy generated can be exported to the grid
- Under Ph-1 - 300 MW project covering 20,000 pumpsets across two states
<table>
<thead>
<tr>
<th>Barrier</th>
<th>Mitigation Strategy</th>
<th>Expected Outcome</th>
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</thead>
</table>
| **Consumers** | - Aggregate demand  
- Awareness programmes  
- Warranty provided to consumers  
- Economies of Scale to bring down prices  
- EMI payment options/PAYS to ensure easy accessibility  
- Turnkey solution – all utility requirements part of EESL solution | - Upto 88% reduction in price  
- Enhanced attractiveness  
- Increase demand  
- Growth in manufacturers  
- Improved quality of Life |
| **Utilities** | - Standardised solution to include incentive for utility evolved  
- Energy Efficient technology provided to consumers with attractive business propositions | - Close to 7 thousand MW peak demand reduced (UJALA) |
| **Industry/consumers** | - Payment guarantee with EESL  
- Awareness activities by EESL  
- Aggregated demand for bulk procurement | - Promoting manufacturing/industries  
- Increased global share of EE technologies  
- Direct and indirect job creation |
| **Policy Makers and Regulators** | - Attractiveness increases to enhance coverage | - Biggest non-subsidy schemes  
- Positive spin off in enabling manufacturing |
EESL Impact

The Business Model has enabled EESL to implement:

• UJALA - over 270 million LED bulbs distributed

• SLNP - over 3.7 million street lights retrofitted

• Building Energy Efficiency Program (BEEP)-retrofitting work in 4,000 Government Buildings under progress

• Municipal Energy Efficiency Program (MEEP) in 20 states for water & sewage pump replacement - audit work underway for 337 cities

• Agriculture Demand Side Management (AgDSM)- 1.1 million pumps under replacement including 20,000 solar pumps

• 20 MW solar roof top for buildings in New Delhi

• 5 Million Smart Meter Program

• E-mobility with 10,000 Electric Vehicles for use of government.
<table>
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<tr>
<th><strong>EESL – International</strong></th>
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<tbody>
<tr>
<td><strong>UK</strong></td>
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<tr>
<td>- Operations started – 7 ESPC acquired – revenues started to come in</td>
</tr>
<tr>
<td>- UJALA launched by Minister of Power in UK – target 100 million in 3 years</td>
</tr>
<tr>
<td>- Building EE project started in Indian High Commission</td>
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<tr>
<td>- Pipeline of projects worth investments of Pound 100m identified</td>
</tr>
<tr>
<td>- Process for selection of partners started</td>
</tr>
<tr>
<td><strong>Canada</strong></td>
</tr>
<tr>
<td>- Expression of Interest in Battery storage project</td>
</tr>
<tr>
<td>- Identification of partners initiated</td>
</tr>
<tr>
<td><strong>Other Locations</strong></td>
</tr>
<tr>
<td>- SE Asia – Vietnam and Cambodia – lighting/Building projects</td>
</tr>
<tr>
<td>- South Asia – agreement for supply of 20 m LED in Nepal – 10 m in Sri Lanka in pipeline</td>
</tr>
<tr>
<td>- UJALA in Indonesia being discussed</td>
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<tr>
<td>- Proposal for supporting Saudi Arabia in pipeline</td>
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</table>
EESL – Vision 2020

- A multinational company – world leader in clean energy and innovation
- Turnover of $1.5b crore by 2020 from $300 m last year - public listed company
- Sustained high growth rate – doubling of turnover every year till 2020
- Investments in appliances, buildings, pumping and RESCO of $5 billion
- Thrust on significantly enhancing international operations
- Improving and innovating the sustainable EESL business models to cover more sectors like SMEs, Industry
Thank you.

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