FINANCING RENEWABLE ENERGY PROJECTS

Presented at Climate Parliament’s Parliamentary Forum in Jordon | November 7, 2014
In this presentation

1. Why is Financing, an important consideration for RE?
2. Link between financing, and policies!
3. International examples
4. India specific analysis
5. Key message
Global Growth in Installed Capacity

Cumulative Capacity (GW)

- Solar PV
- Wind

Only 3.6% by energy in 2013
RE Costs (India) – Close to Grid Parity!

Globally, investments in RE are critical, to reap future benefits.
## Constituents of cost of energy (per unit)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Depleting Resources (Coal/ Gas/ Oil)</th>
<th>Renewable Resources (primarily Solar/ Wind/ Hydro)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of capital</td>
<td>10 – 50%</td>
<td>70 – 90%</td>
</tr>
<tr>
<td>Operating costs (OPEX)</td>
<td>50 – 90%</td>
<td>10 – 30%</td>
</tr>
<tr>
<td>Cost of Fuel</td>
<td>High and variable</td>
<td>Nil</td>
</tr>
<tr>
<td>Maintenance</td>
<td>High</td>
<td>Moderate</td>
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Cost of capital for RE is significant
Project Funding Sources

Primary Sources – driven by markets

**Equity Investments**
- High return expectations
- Limited availability
- Risk money

**Debt (loans)**
- High costs (in developing countries)
- Short repayment periods
- Typically risk averse

Additional Sources – typically from Government

**Capital / Fiscal support**
- Tax benefits
- Capital subsidies

**Operating support**
- Preferential tariff
- Performance based subsidies
Cost of Capital

Components:

1. Extent of investment (technology costs)
2. Return expected by investors (return on equity)
3. Interest rates of loans (cost of debt)

Equity and debt costs are governed by state of economy, state of sector (RE) and competing requirements.

Markets will deal with RE like any other investments.

To bring costs down, RE specific policy interventions must
Expectations from Policymakers

- Support growth of RE by legislative and policy dispensations towards
  - Reducing sector level risks
  - Enhanced pace of deployment
  - Creating dedicated pool of resources
  - Leveraging government resources to enhance private sector participation

- Least disruption to commercial financial markets

Equally important to grid and off grid RE
## Financing – Policy linkages

- **Risk increases costs**

<table>
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<tr>
<th>Issues</th>
<th>Policy based Solutions</th>
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<td>Non certainty of demand</td>
<td>RE targets (China, Germany)</td>
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<td>Non certainty of Price</td>
<td>Feed in tariffs (many)</td>
</tr>
<tr>
<td>Long term project cycles</td>
<td>RE investment Zones (USA)</td>
</tr>
<tr>
<td>Non clarity on Incentives</td>
<td>National incentive mechanisms (Solar GBI in India)</td>
</tr>
</tbody>
</table>

- **Lack of access to long term, low cost capital**
  - Dedicated funds (China’s Central Development Fund)
  - Green bonds / Green Banks (USA)
Feed-in-Tariff (FIT) – Ensuring returns to investors

- Most widely adopted globally – as of 2013, 99 jurisdictions have implemented it
- German experience
  - Enabled new stakeholders to participate in RE
  - Leveraged larger capital for investing in RE
  - Revenues from RE flow to individuals, cooperatives, etc. leading to more economic development

![Pie chart showing ownership distribution of installed RE capacity for power production in Germany.](source: trend research; as of: 04/2013)
China’s Story

**Feed-in tariffs.**
- Renewable electricity generators received a subsidy at market rates for electricity

**Renewable Power Quotas.**
- Quotas set annually
- Directed at, and enforced by, the grid companies (not the consumers)

**Priority Dispatch**
- Regulations require grid companies to give priority electricity dispatch to RE

**Central Development Fund**
- Renewable energy surcharges allocated to a central renewable energy development fund
- Central government manages the fund, instead of provincial grid companies, to spur further financial investment and development
If India chooses to make buyers indifferent between RE (till RE becomes cheaper) and fossil fuel based generation, what would be a rough estimate of the costs?

To achieve 20% RE in grid by 2020
Financial Support Vs. Avoided Coal Import Bill

Rs 1000 Crore ~ USD 170 Mn

Coal Price: Rs. 4200/tonne

Annual reduction in coal import bill

Annual National Subsidy Required

Amount of Subsidy is less than 1.6% of Total Power Purchase Cost in all years
Possible Range of Specific Interventions

**De-risk:** By project development and long term policy/regulatory certainty

- Reduced return expectations by investors

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**Enhanced finance availability through regulatory tools**

- Special green bonds
- Pension funds, insurance, sovereign funds
- Lower sovereign guarantee fee for NBFCs
- Tradable tax credits
- Infrastructure Debt Fund

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**Reduction in cost of capital using innovative mechanisms**

- Pooling commercial and non-commercial capital from domestic and international sources – Green Banks
- Government of India to offer hedging support for debt (through its remittances)
Thank you

For more information, please contact:

Deepak Gupta  
Senior Program Manager (Power)  
Shakti Sustainable Energy Foundation  
Delhi, India  
www.shaktifoundation.in  
deepak@shaktifoundation.in
Annual Financial Support (Rs/kWh)

Amount of Subsidy is less than 1.6% of Total Power Purchase Cost in all years

Rs. 1 ~ 2 cents
Annual Financial Support Requirement

Support in form of low cost finance or direct financial support

Rs 1000 Crore ~ USD 170 Mn