The Impacts of Policy on the Financing of Renewable Projects

CPI Webinar
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Agenda

Introduction to Climate Policy Initiative (CPI) and our study of the financing of renewables

The case study results

Next steps
Our case studies cover three dimensions

<table>
<thead>
<tr>
<th>Technology/Project Type Maturity</th>
<th>Geography</th>
<th>Finance Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mature Renewables</td>
<td>Europe</td>
<td>Debt</td>
</tr>
<tr>
<td>- e.g. Onshore wind</td>
<td>US</td>
<td>- Investment Grade Bonds</td>
</tr>
<tr>
<td>Maturing Renewables</td>
<td>India</td>
<td>- Bank Loans</td>
</tr>
<tr>
<td>- e.g. Solar PV</td>
<td></td>
<td>- Government Loans</td>
</tr>
<tr>
<td>Developing Renewables</td>
<td>Brazil</td>
<td>- Junk Bonds</td>
</tr>
<tr>
<td>- e.g. Offshore wind or CSP</td>
<td>China</td>
<td>Project Equity</td>
</tr>
<tr>
<td>Mature Non-renewable</td>
<td></td>
<td>- Sponsorship / Project finance equity</td>
</tr>
<tr>
<td>- CCGT or Coal (for comparison)</td>
<td></td>
<td>- On balance sheet finance</td>
</tr>
<tr>
<td>Equipment Manufacturers</td>
<td></td>
<td>Mezzanine</td>
</tr>
<tr>
<td>- Facilities/ Factories</td>
<td></td>
<td>- Tax Equity</td>
</tr>
<tr>
<td>Equipment Manufacturers and</td>
<td></td>
<td>- Preferred Equity or Convertible Debt</td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td>- Passive equity</td>
</tr>
<tr>
<td>- Research</td>
<td></td>
<td>Venture Capital</td>
</tr>
</tbody>
</table>

- At project level
- At company level

Current Scope
Our six case studies enjoyed both cost and revenue supports.

### U.S. Wind
- **LCOE Without Supports**: 110 USD/MWh
- **Cost Supports**: 45 USD/MWh
- **Financing and Reserves**: 4 USD/MWh
- **Total Revenues**: 61 USD/MWh
- **Revenue Supports**: 11 USD/MWh
- **Revenue at Market Rates**: 50 USD/MWh

### U.S. PV
- **LCOE Without Supports**: 184 USD/MWh
- **Cost Supports**: 83 USD/MWh
- **Financing and Reserves**: 6 USD/MWh
- **Total Revenues**: 107 USD/MWh
- **Revenue Supports**: 68 USD/MWh
- **Revenue at Market Rates**: 39 USD/MWh

### US Power Tower
- **LCOE Without Supports**: 205 USD/MWh
- **Cost Supports**: 87 USD/MWh
- **Financing and Reserves**: 22 USD/MWh
- **Total Revenues**: 96 USD/MWh
- **Revenue Supports**: 32 USD/MWh
- **Revenue at Market Rates**: 63 USD/MWh

### Spanish Wind
- **LCOE Without Supports**: 117 USD/MWh
- **Cost Supports**: - USD/MWh
- **Financing and Reserves**: 12 USD/MWh
- **Total Revenues**: 105 USD/MWh
- **Revenue Supports**: 38 USD/MWh
- **Revenue at Market Rates**: 67 USD/MWh

### Italian PV
- **LCOE Without Supports**: 408 USD/MWh
- **Cost Supports**: 8 USD/MWh
- **Financing and Reserves**: 8 USD/MWh
- **Total Revenues**: 408 USD/MWh
- **Revenue Supports**: 322 USD/MWh
- **Revenue at Market Rates**: 86 USD/MWh

### Danish Offshore Wind
- **LCOE Without Supports**: 152 USD/MWh
- **Cost Supports**: - USD/MWh
- **Financing and Reserves**: 7 USD/MWh
- **Total Revenues**: 159 USD/MWh
- **Revenue Supports**: 88 USD/MWh
- **Revenue at Market Rates**: 71 USD/MWh

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Five of the projects fell within expected benchmark returns

Equity Returns (IRR) Relative to Benchmark Range for Similar Projects

- **US Wind**
- **US PV**
- **US Power Tower**
- **Spanish Wind**
- **Italian PV**
- **Danish Offshore Wind**

Range of Benchmarks

Expected Equity IRR
We explored different pathways for policy to impact financing costs and availability.

<table>
<thead>
<tr>
<th>Policy Impact Pathways</th>
<th>Increase in Total Project Costs Driven by Additional Financing Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration of Revenue Support</td>
<td>➢ 10 Year reduced duration</td>
</tr>
<tr>
<td>Revenue Certainty</td>
<td>➢ Move from fixed tariff to fixed premium</td>
</tr>
<tr>
<td>Risk Perception</td>
<td>➢ High equity return req’d</td>
</tr>
<tr>
<td>Completion Certainty</td>
<td>➢ More debt security req’d</td>
</tr>
<tr>
<td>Cost Certainty</td>
<td>➢ 1 Year construction delay</td>
</tr>
<tr>
<td>For Future Study</td>
<td>➢ 5% Cost overrun</td>
</tr>
<tr>
<td>Risk Distribution</td>
<td></td>
</tr>
<tr>
<td>Development Risks</td>
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</table>
Conclusions

For all projects:

1. The duration of revenue support had the largest impact on financing costs.
2. Revenue certainty is the second most important factor.
3. Investors’ perceptions of risk also impact project financing costs.

For less mature or more innovative projects:

- Protection against losses is critical due to higher perceived risks of project failure.

Construction and completion risk can usually be covered through commercial arrangements.

Institutional investors with the expertise to evaluate renewable projects will invest in renewable projects.

- If there is revenue certainty and arrangements to insulate them from policy and completion risk.
Further Work

CPI intends to continue this work, in particular working with policymakers to identify areas where analysis of past and current policies can help design better policies. Some areas for future work include:

- Extending the analysis to other geographies
  - Tunisia – PROSOL, Available online
  - India – Financing Renewables, Summer 2012
  - Morocco – CSP, Summer 2012

- Exploring a greater set of policy design options and evaluating the impact of changes in design features
  - Tax Incentives in the US, Summer 2012
  - RECs in India, Summer 2012

- Analyzing the tradeoffs of lower financing costs against policy costs and risks absorbed by government/consumers
  - UK – Walney, Available online

- Understanding how financiers and developers will alter their financial requirements when investing in portfolios of projects
  - Institutional Investors, Timeline TBD
Thank you for your attention.

For further information or if you have additional questions, please contact:
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