The Cost of Capital for Renewable Generation Capacity Ownership

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Overview

• IHS Markit assessed for EIA the cost of capital for renewable companies in the broader context of power-generation owning companies’ cost of capital in the US.

• Study used observable and reported market data (equity, debt, company financials) and standard financial approaches to estimate the weighted average cost of capital (WACC).

• Estimates for companies without observable market data were based on comparables aggregated by type.

• Estimates were applied to generating-unit level ownership in order to develop averages by region and type.

• Additional portions of the study examined sensitivities for scenarios around tax rates and tax credits on the costs to finance renewables.

• Full study will be available on EIA’s website.
Power sector company estimates

Cost of capital aggregates and ranges by owner type

Comments

- Renewable generators show the highest cost of capital of power-sector company types. Possible reasons:
  - Smaller and newer companies
  - Newer business models (e.g., “yieldcos”)
  - Lower leverage than merchant generators
- The largest utilities (> $25 in equity market cap) exhibit the lowest cost of capital. Possible reasons:
  - Broader diversification
  - Greater liquidity in capital markets

Aggregates include entities with observable market equity and debt.
Source: IHS Markit

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Company type averages and share

Cost of capital ranges and capacity-weighted averages

Share of owned capacity

Source: IHS Markit

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Regional averages and share

Regional average cost of capital and share by type

Capacity-weighted average WACC

<table>
<thead>
<tr>
<th>Region</th>
<th>Weighted Average WACC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERCOT</td>
<td>7.1%</td>
</tr>
<tr>
<td>Northeast</td>
<td>6.4%</td>
</tr>
<tr>
<td>PJM</td>
<td>6.3%</td>
</tr>
<tr>
<td>CAISO</td>
<td>6.3%</td>
</tr>
<tr>
<td>WECC</td>
<td>5.7%</td>
</tr>
<tr>
<td>MISO</td>
<td>5.6%</td>
</tr>
<tr>
<td>SPP</td>
<td>5.5%</td>
</tr>
<tr>
<td>Southeast</td>
<td>5.3%</td>
</tr>
<tr>
<td>US average</td>
<td>6.0%</td>
</tr>
</tbody>
</table>

Share by company type

- **Utilities**
- **Merchant generators**
- **Renewable generators**
- **Other**

Source: IHS Markit

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Wind return tax sensitivity

Notes

- Pro forma wind project assumptions:
  - 8.5% unlevered IRR
  - 13.3% Sponsor equity return
  - 6.0% Sponsor debt, backlevered (64% of sponsor contribution)
  - 8.5% Tax equity rate, 55% of initial capital, 9.5 years
  - 38% capacity factor, 30 year life

- As tax rate decreases, either
  - Required unlevered IRR must increase to maintain sponsor return (cost of energy goes up), or
  - Sponsor return decreases if 8.5% IRR is maintained (cost of energy stays the same)
Solar PV return tax sensitivity

Returns for solar PV project under varying US federal tax rates

<table>
<thead>
<tr>
<th>Tax Rate</th>
<th>4%</th>
<th>5%</th>
<th>6%</th>
<th>7%</th>
<th>8%</th>
<th>9%</th>
<th>10%</th>
<th>11%</th>
<th>12%</th>
<th>13%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline IRR (35% tax rate)</td>
<td>7.0%</td>
<td>7.2%</td>
<td>7.4%</td>
<td>7.6%</td>
<td>7.8%</td>
<td>8.0%</td>
<td>8.2%</td>
<td>8.4%</td>
<td>8.6%</td>
<td>8.8%</td>
</tr>
<tr>
<td>At 25% tax rate</td>
<td>8.3%</td>
<td>8.5%</td>
<td>8.7%</td>
<td>8.9%</td>
<td>9.1%</td>
<td>9.3%</td>
<td>9.5%</td>
<td>9.7%</td>
<td>9.9%</td>
<td>10.1%</td>
</tr>
<tr>
<td>At 20% tax rate</td>
<td>8.8%</td>
<td>9.0%</td>
<td>9.2%</td>
<td>9.4%</td>
<td>9.6%</td>
<td>9.8%</td>
<td>10.0%</td>
<td>10.2%</td>
<td>10.4%</td>
<td>10.6%</td>
</tr>
<tr>
<td>At 15% tax rate</td>
<td>9.3%</td>
<td>9.6%</td>
<td>9.9%</td>
<td>10.2%</td>
<td>10.5%</td>
<td>10.8%</td>
<td>11.1%</td>
<td>11.4%</td>
<td>11.7%</td>
<td>12.0%</td>
</tr>
<tr>
<td>Sponsor equity return (at unlevered IRR of 7.0%)</td>
<td>8.4%</td>
<td>8.6%</td>
<td>8.8%</td>
<td>9.0%</td>
<td>9.2%</td>
<td>9.4%</td>
<td>9.6%</td>
<td>9.8%</td>
<td>10.0%</td>
<td>10.2%</td>
</tr>
<tr>
<td>Sponsor equity return (at unlevered IRR of 12.0%)</td>
<td>7.7%</td>
<td>7.9%</td>
<td>8.1%</td>
<td>8.3%</td>
<td>8.5%</td>
<td>8.7%</td>
<td>8.9%</td>
<td>9.1%</td>
<td>9.3%</td>
<td>9.5%</td>
</tr>
</tbody>
</table>

Comments

- Pro forma solar PV project assumptions:
  - 7.0% unlevered IRR
  - 12.0% Sponsor equity return
  - 5.0% Sponsor debt, backlevered (73% of sponsor contribution)
  - 7.0% Tax equity rate, 50% of initial capital, 5 years
  - 22% capacity factor, 30 year life
- Directionally the results are similar to those of wind, though impact on returns is magnified
Wind return PTC sensitivity

Returns for wind projects without PTC, under varying tax rates

- Sensitivity around non-tax credit (PTC) scenarios assumes no need for tax equity investment
- Tax equity capital generally more expensive than other capital available to project sponsors
- Required return drops almost 1 percentage point, keeping sponsor returns constant
- Impact of potential tax reductions muted without tax credits

Source: IHS Markit

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Solar PV return ITC sensitivity

Returns for solar PV project without ITC, under varying tax rates

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Unlevered IRR, no ITC (at sponsor return of 12.0%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline IRR (35% tax rate)</td>
<td>7.0%</td>
</tr>
<tr>
<td>IRR without ITC (35% tax rate)</td>
<td>6.1%</td>
</tr>
<tr>
<td>No ITC at 25% tax rate</td>
<td>6.7%</td>
</tr>
<tr>
<td>No ITC at 20% tax rate</td>
<td>6.9%</td>
</tr>
<tr>
<td>No ITC at 15% tax rate</td>
<td>7.2%</td>
</tr>
<tr>
<td>Baseline sponsor equity return</td>
<td>12.0%</td>
</tr>
<tr>
<td>Sponsor equity return, no ITC</td>
<td>12.0%</td>
</tr>
<tr>
<td>No ITC at 25% tax rate</td>
<td>9.6%</td>
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<tr>
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</tr>
<tr>
<td>No ITC at 15% tax rate</td>
<td>8.3%</td>
</tr>
</tbody>
</table>

Source: IHS Markit

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Comments

- Sensitivity around non-tax credit (ITC) scenarios assumes no need for tax equity investment
- Required return drops almost 1 percentage point (similar to wind), keeping sponsor returns constant
- Impact of potential tax reductions muted without tax credits