Financing a changing UK power sector

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Overview

1. The changing UK power market – problems facing investors

2. Investment levels – past and future

3. Policy design – impact on investor risks

4. Next steps
The UK electricity market faces significant long-run challenges

Fifth of existing fossil-fuel plant due to close over next decade

Long-run electricity demand could double by 2050

Weak price signals in the wholesale market for low-carbon generation

Need to create right incentives for low-carbon and flexible generation
Investment risks in low-carbon generation differ from those in fossil-fuel plant ...

- UK is **on target** to reduce its greenhouse gas emissions in 2020, in line with carbon budgets and the EU.

- From 2020, **further cuts in emissions from the power sector** are likely to be necessary to keep us on a cost-effective path to meeting our 2050 commitments.

- Differences in cost structures between low-carbon and conventional generation, combined with price-setting role of flexible fossil-fuel plant, means that the **electricity price is more highly correlated with the costs of fossil-fuel plant**.

- While **non price-setting plant** can benefit from increased input costs for price-setting plant, they are **exposed to lower fuel** prices that price-setting plant are not.

- This **increases the risk of investment** in low-carbon capacity relative to investment in conventional capacity.
... while more low carbon generation changes the economics of existing and new fossil-fuel plants

- Increasing evidence of ‘missing money’ problem in energy-only market, may be mitigated by Ofgem plans on cash-out reform

- Likely tighter future capacity margins and price spikes in wholesale prices exacerbate perceived risk of ‘missing money’ among investors

- Two key factors increasing demand for flexible generating capacity:
  - Increasing retirements due to impact of environmental regulations on existing plants
  - Increasing intermittency on system as a result of increased wind and solar generation

- But remuneration for flexible capacity increasingly uncertain in future as it is increasingly displaced in the merit order by low-carbon generation

- Therefore, flexible plant will run less frequently and hence become increasingly reliant on scarcity rents at times of high demand/system stress to recoup costs
Overview

1  State of the changing power market – problems facing investors

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The scale of future power sector investment requirements is considerable...

![Electricity investment, 1995-2020 (£bn)](chart)

- Actual investment (ONS/DECC)
- Forecast investment (DECC)
...but investment to date suggests we are on track to meet challenging targets (£bn)

<table>
<thead>
<tr>
<th>Source</th>
<th>Latest data</th>
<th>Actual investment</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013 (YTD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generation</td>
<td></td>
<td>21.6</td>
<td>5.4</td>
<td>5.4</td>
<td>8.4</td>
<td>2.4</td>
</tr>
<tr>
<td>Renewables</td>
<td>2013 Q1</td>
<td>16.1</td>
<td>2.5</td>
<td>4.7</td>
<td>6.4</td>
<td>2.4</td>
</tr>
<tr>
<td>Biomass</td>
<td>2013 Q1</td>
<td>1.4</td>
<td>0.1</td>
<td>0.7</td>
<td>0.2</td>
<td>0.5</td>
</tr>
<tr>
<td>Wind – onshore</td>
<td>2013 Q1</td>
<td>4.6</td>
<td>0.9</td>
<td>1.0</td>
<td>2.0</td>
<td>0.7</td>
</tr>
<tr>
<td>Wind – offshore</td>
<td>2013 Q1</td>
<td>6.2</td>
<td>1.0</td>
<td>1.3</td>
<td>3.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Other</td>
<td>2013 Q1</td>
<td>3.8</td>
<td>0.5</td>
<td>1.8</td>
<td>1.2</td>
<td>0.3</td>
</tr>
<tr>
<td>Non-renewables</td>
<td>2012</td>
<td>5.5</td>
<td>2.9</td>
<td>0.7</td>
<td>2.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Networks</td>
<td></td>
<td>11.9</td>
<td>3.3</td>
<td>3.6</td>
<td>5.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Distribution</td>
<td>2012</td>
<td>4.9</td>
<td>2.3</td>
<td>2.3</td>
<td>2.4</td>
<td>N/A</td>
</tr>
<tr>
<td>Transmission</td>
<td>2012</td>
<td>7.0</td>
<td>1.0</td>
<td>1.3</td>
<td>2.6</td>
<td>N/A</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>33.5</td>
<td>8.7</td>
<td>9.0</td>
<td>13.4</td>
<td>2.4</td>
</tr>
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</table>
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EMR introduces a package of measures to increase certainty for investors

**Contract for Difference**
Feed-in Tariff with Contracts for Difference (CfD) will provide long-term electricity price certainty and reduced revenue volatility

**Capacity Market**
Capacity Market (CM) will convert unpredictable scarcity rents into more predictable capacity payments, helping to put adequate reliable capacity in place and protect consumers against the risk of supply shortages

**Carbon Price Floor**
The Carbon Price Floor (CPF) will provide long-term certainty about the cost of carbon in the UK electricity generation sector

**Emissions Performance Standard**
An Emissions Performance Standard (EPS) will provide further certainty on the regulatory environment for fossil fuel plant by providing clarity on the emissions cap from new non-abated thermal plants
CfDs offer significant potential for de-risking relative to current arrangements

<table>
<thead>
<tr>
<th>Type of risk</th>
<th>Comparison with current arrangements</th>
<th>Impact on investor risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue variability</td>
<td>While off-take and forecasting/balancing risks remain with generators, long-term wholesale price risk is removed, <strong>stabilising revenues</strong> and helping reduce cost of capital</td>
<td><strong>↓</strong></td>
</tr>
<tr>
<td>Change in support levels</td>
<td>In contrast to the Renewables Obligation (RO), <strong>early certainty on allocation and price setting levels</strong> in the project development process.</td>
<td><strong>↓</strong></td>
</tr>
<tr>
<td>Credit risk</td>
<td>Although not tradable like RO, CfD counterparty will establish a <strong>framework of backstops to ensure CfD payments</strong> (e.g. collateral, mutualisation, Supplier of Last Resort/Energy Company Administration scheme)</td>
<td>-</td>
</tr>
</tbody>
</table>
CfDs offer significant potential for de-risking relative to current arrangements (cont’d)

<table>
<thead>
<tr>
<th>Type of risk</th>
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</tr>
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<tbody>
<tr>
<td>Change in law</td>
<td>In contrast to RO, some <strong>contractual protection</strong> for both specific and discriminatory changes, and for general changes in law that have discriminatory effects without objective justification exists.</td>
<td>-</td>
</tr>
<tr>
<td>Indexation</td>
<td>Annual RO price linked to RPI, <strong>CfD strike price fully indexed to CPI</strong>; no material change in risk, with any differentials in inflation rates reflected in strike price</td>
<td>-</td>
</tr>
<tr>
<td>Refinancing</td>
<td>No change to current arrangements (no refinancing clause in CfD contract)</td>
<td>-</td>
</tr>
<tr>
<td>Duration</td>
<td>RO support provided for RO for 20 years (except biomass conversions), <strong>CfD support for 15 years</strong> (except biomass conversions); no clear net effect on risk, but differential support duration reflected in strike price</td>
<td>-</td>
</tr>
</tbody>
</table>
The levy control framework provides an affordability envelope and sighting to investors.

- The EMR package will allow the UK to meet its 2020 renewables and carbon budget targets.
- Coalition government reached an agreement on the amount of support available to low carbon projects: £7.6bn (2011/12 prices) in 2020/21.
- Long-term commitment and transparency on the amount of support available will ensure affordability and sustainability of the proposed measures.

**Evolution of the Levy Control Framework (£bn, real 2012 prices)**

![Bar chart](Image)

- LCF 2012/13: 2.35
- LCF 2020/21: 7.60

Source: DECC
The capacity market is designed to reduce investor risks

- **Capacity market will help in turning scarcity rents into fixed capacity payments:** capacity market will allow resources to obtain fixed revenue stream rather than relying on scarcity rents in wholesale market.

- Helps **tackle perceived regulatory risk**, e.g. that government will intervene to prevent spiky prices in energy only market or regulator will investigate parties that price to recover fixed costs.

- **OECD quote**: “In the future, dispatchable technologies....will require that a portion of their revenues be derived from other sources than “energy-only” electricity markets if they are to stay in the market and provide the necessary back-up services. Capacity payments or markets with capacity obligations will play an important part in addressing this issue” (OECD Nuclear Energy Agency, “Nuclear Energy and Renewables”).
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We are working towards implementation in 2014

Jun/Jul 2013
- Key CfD terms & strike prices
- Capacity Market design & timing of first auction
- Consult on draft EMR Delivery Plan (closes 25 Sept)

Aug 2013
- Details on CfD allocation and contract drafting
- Update on Supplier Obligation

Oct 2013
- Consult on EMR secondary legislation (closes Dec 2013/Jan 2014)

Dec 2013
- Royal Assent for Energy Bill (subject to Parliament scrutiny)
- Final EMR Delivery Plan published
- Final CfD contract published

Mar/Apr 2014
- Final secondary legislation for EMR published

Mid 2014
- First CfDs signed under enduring regime

Late 2014
- First Capacity Market auction