The Role of Electricity Price Stability and Long-Term Financing for Nuclear New Build

Paris, Thursday 19th September 2013

Under Which Conditions Are Pension Funds and other Infrastructure Investors Interested in Nuclear New Build?

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KPMG Infrastructure
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Introduction

Challenges financing nuclear

The Investor perspective

Risk vs Return

Conclusions
The investment case for nuclear is tough!

- Size and complexity of project(s):
  - Cost uncertainty
  - Programme uncertainty
  - Revenue uncertainty
  - Regulatory uncertainty:
    - Licensing
    - Planning
    - Decommissioning
- Political risk
What makes a nuclear programme attractive to potential investors?

- Secured off taker and a power price that supports nuclear
- An established and robust nuclear regulatory regime
- Intention of the Government role
- National plan for long term waste storage and pricing
- Commitment to a Fleet programme
- Internationally recognised approach to nuclear liability
- Plan for addressing planning and environmental issues
- Clear indication of the Government risk appetite
- Strong political / state / local support for the project
- A streamlined approach to the interaction with Government departments
Sources of financing will evolve over the various project stages

<table>
<thead>
<tr>
<th>Stage 1: Pre-project</th>
<th>Stage 2: Pre-construction</th>
<th>Stage 3: Construction/commissioning</th>
<th>Stage 4: Operation/maintenance</th>
<th>Stage 5: Decommissioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk profile</td>
<td>High risk</td>
<td>High / Moderate risk</td>
<td>Low risk</td>
<td>High / Moderate risk</td>
</tr>
<tr>
<td>Project cash flow profile</td>
<td>Cash flow positive (illustrative profile for discussion purposes)</td>
<td>Cash flow negative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financing source profile</td>
<td>Sh. loans</td>
<td>Sh. loans</td>
<td>Sh. loans</td>
<td>Sh. loans</td>
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<tr>
<td></td>
<td>Equity</td>
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</tbody>
</table>

Cash flow positive: 40-60 years

- Stage 1: High risk, nominal cash flows
- Stage 2: High risk, nominal cash flows
- Stage 3: High / Moderate risk, nominal cash flows
- Stage 4: Low risk, nominal cash flows
- Stage 5: High / Moderate risk, nominal cash flows

Possible financing sources:
- Sh. loans
- Equity
- Bilateral credit
- Bank financing
- Vendor/export financing
- Structured financing
- Bonds
- Bilateral credit
- Bank financing
- Vendor/export financing
- Sh. loans
- Equity

?? Infrastructure Funds / Pension Funds / SWFs ??

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The Investor Perspective

Looking to invest in mature operational assets with a stable regulatory platform

View infrastructure as a highly de-risked asset class which offers inflation-protected cash flows at a reasonable risk-adjusted return (i.e. unable to pass down risk and hence manage risk)

Limited (or no) experience (or appetite) of taking development / construction risk and in some cases will have an absolute prohibition on taking development / construction risk

Constitutional restrictions on the level of investment that can be made into a Greenfield project (e.g. as a % of the total fund)

May have a large overall fund size but a single asset investment limit

May only have a 3-5 year investment period and a 10-12 year life and a requirement for a yield from day one

Lack of Sector familiarity (investor / home country)

Some investors may consider nuclear as “un-investable” from a reputation / PR standpoint
## Relative Risk Considerations

<table>
<thead>
<tr>
<th></th>
<th>Regulated Utility</th>
<th>Standard Construction PFI (Availability Based)</th>
<th>International IWPP Power Plant</th>
<th>Offshore Wind</th>
<th>New Nuclear Power Station (UK &amp; Non-UK)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development (inc. design) Risk</td>
<td><img src="Diagram1" alt="Diagram" /></td>
<td><img src="Diagram2" alt="Diagram" /></td>
<td><img src="Diagram3" alt="Diagram" /></td>
<td><img src="Diagram4" alt="Diagram" /></td>
<td><img src="Diagram5" alt="Diagram" /></td>
</tr>
<tr>
<td>Construction Risk</td>
<td><img src="Diagram6" alt="Diagram" /></td>
<td><img src="Diagram7" alt="Diagram" /></td>
<td><img src="Diagram8" alt="Diagram" /></td>
<td><img src="Diagram9" alt="Diagram" /></td>
<td><img src="Diagram10" alt="Diagram" /></td>
</tr>
<tr>
<td>Financing Risk</td>
<td><img src="Diagram11" alt="Diagram" /></td>
<td><img src="Diagram12" alt="Diagram" /></td>
<td><img src="Diagram13" alt="Diagram" /></td>
<td><img src="Diagram14" alt="Diagram" /></td>
<td><img src="Diagram15" alt="Diagram" /></td>
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<tr>
<td>Operating Risk</td>
<td><img src="Diagram16" alt="Diagram" /></td>
<td><img src="Diagram17" alt="Diagram" /></td>
<td><img src="Diagram18" alt="Diagram" /></td>
<td><img src="Diagram19" alt="Diagram" /></td>
<td><img src="Diagram20" alt="Diagram" /></td>
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<tr>
<td>Revenue Risk</td>
<td><img src="Diagram21" alt="Diagram" /></td>
<td><img src="Diagram22" alt="Diagram" /></td>
<td><img src="Diagram23" alt="Diagram" /></td>
<td><img src="Diagram24" alt="Diagram" /></td>
<td><img src="Diagram25" alt="Diagram" /></td>
</tr>
<tr>
<td>Regulatory Risk</td>
<td><img src="Diagram26" alt="Diagram" /></td>
<td><img src="Diagram27" alt="Diagram" /></td>
<td><img src="Diagram28" alt="Diagram" /></td>
<td><img src="Diagram29" alt="Diagram" /></td>
<td><img src="Diagram30" alt="Diagram" /></td>
</tr>
<tr>
<td><strong>OVERALL PROJECT RISK</strong></td>
<td><img src="Diagram31" alt="Diagram" /></td>
<td><img src="Diagram32" alt="Diagram" /></td>
<td><img src="Diagram33" alt="Diagram" /></td>
<td><img src="Diagram34" alt="Diagram" /></td>
<td><img src="Diagram35" alt="Diagram" /></td>
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**Key:**
- High
- Low

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## Returns Considerations

### Typical Project (nominal) WACC \(^{(1)}\)

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<tr>
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<th>Regulated (non nuclear) Utility</th>
<th>UK PFI</th>
<th>Off Shore Wind</th>
<th>Nuclear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>–</td>
<td>6% – 7%</td>
<td>10% – 12%</td>
<td></td>
</tr>
<tr>
<td>Operation</td>
<td>6% – 8%</td>
<td>5% – 6%</td>
<td>7% - 9%</td>
<td></td>
</tr>
<tr>
<td>Typical Leverage</td>
<td>60% - 80%</td>
<td>80% - 95%</td>
<td>60% - 70%</td>
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</table>

Investors will typically be looking for “low to mid teens” equity returns

will only happen post-construction unless there is guaranteed debt

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Source: KPMG internal Research Analysis
Financial investors are unlikely to consider nuclear new build in the near future due to construction risk, lack of early yield and lack of long term yield certainty.

If developers want capital during construction they will need to insulate investor and provide yield, hence new build needs large developer balance sheets or Govt support.

Nuclear developers should focus now on developing project structures so they can bring in investors at first refuel, hence focus on operational risks.

Track record of delivery needs to be improved and “nuclear preconceptions” addressed.

For most current new build projects, operation is 7 - 10 years away - about the time infra funds have been in the market – the market will continue to evolve.
Thank You

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