"The Development of Nuclear Energy Policy in the UK"

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First Secretary (Nuclear), British Embassy Tokyo

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Calder Hall, where it all started
Tokai-1
UK Nuclear Industry – The Future

• New Build is the future

• Operating is the future

• Decommissioning is the future
Energy Policy Drivers

- UK remains committed to the Paris Agreement which calls on countries to keep global temperature rises below 2°C.

- UK own legally binding commitment to reduce carbon emissions by 80% by 2050 compared with 1990 levels.
Nuclear Energy Policy Drivers

SECURITY OF SUPPLY
Reduced reliance on volatile fossil fuels or intermittent renewables.
Baseload power – generates energy 85-90% of the time

AFFORDABILITY
Costs comparable with other large scale low carbon generation.
Modelling consistently shows that decarbonising the UK is cheaper with nuclear power than without

LOW CARBON
Similar lifetime carbon emissions to renewables
Nuclear power’s reliable base load power reduces the challenges of managing intermittent renewables on the Grid.
Major commitments include:

- Progress discussions with nuclear developers to secure a competitive price for future projects
- £557m for further renewables subsidies
- £1bn to support the take-up of ultra low emission vehicles
- £3.6bn to improve household energy efficiency
- £4.5bn on low carbon heat technologies in homes and businesses

Source: UNFCCC; World Bank; BEIS
Electricity capacity, 1996 to 2016

(1) Renewable capacity is on an Installed Capacity basis. Data for other fuels/technologies relates to Declared Net Capacity from 1996 to 2005, data for 2006 onwards is transmission entry capacity (TEC)
(2) Includes coal, non-CCGT gas, oil and mixed/dual fired. Does not include thermal renewables.
The UK Electricity Mix

- Gas: 30%
- Nuclear: 21%
- Coal: 22%
- Renewables: 24.6%
- Other Fuels: 2.8%
## Nuclear Power in the UK – Operating Stations

### Advanced Gas-Cooled Power Stations (7)

<table>
<thead>
<tr>
<th>Station</th>
<th>Start Year</th>
<th>End Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dungeness B</td>
<td>1983</td>
<td>2028</td>
</tr>
<tr>
<td>Hartlepool</td>
<td>1983</td>
<td>2024</td>
</tr>
<tr>
<td>Heysham 1</td>
<td>1983</td>
<td>2024</td>
</tr>
<tr>
<td>Heysham 2</td>
<td>1988</td>
<td>2030</td>
</tr>
<tr>
<td>Hinkley Point B</td>
<td>1976</td>
<td>2023</td>
</tr>
<tr>
<td>Hunterston B</td>
<td>1976</td>
<td>2023</td>
</tr>
<tr>
<td>Torness</td>
<td>1988</td>
<td>2030</td>
</tr>
</tbody>
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### Pressurised Water Reactors (1)

<table>
<thead>
<tr>
<th>Station</th>
<th>Start Year</th>
<th>End Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sizewell B</td>
<td>1995</td>
<td>2035</td>
</tr>
</tbody>
</table>

Estimated decommissioning dates – subject to approval and life extensions
More people in the UK support new build than oppose
The UK currently has 8 nuclear power stations across the UK comprising 15 individual reactors (19% of the UK electricity).

Without new nuclear build, the share of nuclear generation could dip to 3% in 2030.

Hinkley Point C – 7% of UK’s generation needs

Wylfa/Oldbury

Moorside

Sizewell

Bradwell
Small Modular Reactors

- SMRs present an opportunity for the UK supply chain and *could* reduce the cost of energy through modularisation and lower financing costs.
- Government have been exploring this potential through the **SMR Competition** and studies such as the **Techno-Economic Assessment**.
- Wide range of technologies, at different levels of maturity and market readiness; suggesting that a **multi-track** approach to SMR policy is needed.
- We are making targeted investments, including **£7m** to develop capability of nuclear regulators to support and assess advanced nuclear technologies.
- Government working with industry to explore role that emerging nuclear technologies could have in UK. **Announcement on next steps for SMRs soon.**
## Nuclear Power in the UK – Decommissioning Stations

### Magnox Power Stations (11)

<table>
<thead>
<tr>
<th>Station</th>
<th>Commissioned</th>
<th>Decommissioned</th>
<th>Operational Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wylfa</td>
<td>1971</td>
<td>2015 (44 years)</td>
<td>(40 years)</td>
</tr>
<tr>
<td>Bradwell</td>
<td>1962</td>
<td>2002 (40 years)</td>
<td>(45 years)</td>
</tr>
<tr>
<td>Chapelcross</td>
<td>1959</td>
<td>2004 (45 years)</td>
<td>(41 years)</td>
</tr>
<tr>
<td>Dungeness A</td>
<td>1965</td>
<td>2006 (41 years)</td>
<td>(25 years)</td>
</tr>
<tr>
<td>Hunterston A</td>
<td>1964</td>
<td>1989 (25 years)</td>
<td>(35 years)</td>
</tr>
<tr>
<td>Hinkley Point A</td>
<td>1965</td>
<td>2000 (35 years)</td>
<td>(35 years)</td>
</tr>
<tr>
<td>Calder Hall</td>
<td>1956</td>
<td>2003 (47 years)</td>
<td>(47 years)</td>
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<tr>
<td>Trawsfynndd</td>
<td>1965</td>
<td>1991 (26 years)</td>
<td>(26 years)</td>
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<tr>
<td>Berkeley</td>
<td>1962</td>
<td>Safestore 1989 (27 years)</td>
<td>(27 years)</td>
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<tr>
<td>Oldbury</td>
<td>1967</td>
<td>2012 (45 years)</td>
<td>(45 years)</td>
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<tr>
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<td>(40 years)</td>
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</tbody>
</table>
NDA Estate
Sometimes a ‘Skyline Change’ is necessary to demonstrate progress.
UK Programme Approach to Decommissioning of a Reactor Fleet

- Appropriate project management arrangements
  - Decommissioning project management isn’t the same as construction project management

- Appropriate Waste Management
  - A lot of the cost is in waste management
Reducing Decommissioning Costs

• Appropriate project management arrangements
  • Decommissioning project management isn’t the same as construction project management

• Appropriate Waste Management
  • A lot of the cost is in waste management
Dounreay
The Importance of Nuclear Communities
Scrabster Harbour
The National Nuclear Archive
UK-Japan Collaboration on Decommissioning
Cricket in Fukushima Prefecture

NUCLEAR MELTDOWN DOES NOT STOP PLAY

Despite the nuclear disaster that hit Fukushima Prefecture in 2011, cricket continues to be played in the area. The players are determined to keep the sport alive, even in the face of adversity. 

The story of how cricket has taken root in Fukushima is one of resilience and determination. Despite the challenges posed by the nuclear crisis, the players and teams have persevered, using makeshift pitches and equipment to keep the game going.

The cricket pitch in Fukushima is located in a field that was once contaminated by radiation. The players have had to adapt to the challenging conditions, but they remain undeterred in their pursuit of the sport they love.
Summary

• Nuclear Energy is very much part of the future policy for the UK

• Decommissioning, Operations and New Build are all part of the future of the industry

• The challenges of decommissioning are not just technical, and tackling them successfully can significantly reduce the costs

• The UK has 8 proposed sites for new nuclear build, with proposals for build on 5 of them