The Future of Britain’s Energy Mix
National Symposium on Future Electricity Networks – January 2011

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UK energy landscape is changing

- Sustainability
- Affordability
- Security of supply

Existing powerstation closures
~25% of total capacity by 2020

Gas from UK sources
~25% of total supplies by 2020

The need for change

<table>
<thead>
<tr>
<th>2010</th>
<th>2020</th>
<th>2050</th>
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<tbody>
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<td>No renewable target</td>
<td>15% of electricity from renewables</td>
<td>80% reduction in CO₂ emissions vs 1990</td>
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- Electricity
- Gas
- Oil

Carbon intensity (gCO₂/kWh)

- End use oil & gas excludes oil and gas used in power generation
- Heat pump
- New homes & retrofit
- Decarbonised electricity…
- and decarbonise transport
- Efficiency and innovation
- Insulate and reduce
- Smart Meters & Appliance efficiency

The future – efficiency and electrification

Coal fired power stations

- ~28GW today
- ~15GW by 2020
- zero* by 2050

Gas fired power stations

- ~28GW today
- ~31GW by 2020
- zero* by 2050

Coal fired power stations

- Photo courtesy of Drax
- *non-CCS plant
- zero by 2050

Gas fired power stations

- Photo courtesy of Centrica
- *non-CCS plant
- zero by 2050
Nuclear power stations

~10GW today
~11GW by 2020
~30GW by 2050

Photo courtesy of British Energy

Wind & other renewables

~8GW today
~37GW by 2020
~47GW by 2050

Renewables include wind, wave, tidal, biomass, waste etc.

Carbon Capture & Storage (CCS)

zero today
~3GW by 2020
~25GW by 2050

Building the electricity network

Historic power flows generally north – south.
Future power flows vary in time and direction.

Onshore Regime

Efficient
Economic
Environment
Co-ordinated

New Connections

Connection Offer
Use Existing
Uprate
Additional
**Optioneering Reports**

- Evaluate reasonable options
- Overhead, Underground, AC/DC, Subsea

**Document**

**Preferred Connection**

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**Consenting**

- Technology and costs
- IET/KEMA Consultation
- Approach to Undergrounding
- IPC/MIPU

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**Offshore regime**

- National electricity transmission system (onshore & offshore) operated by:
  - National Grid Electricity Transmission

- Offshore transmission built and owned by:
  - National Grid Electricity Transmission
  - Scottish Power Transmission Ltd
  - Scottish Hydro-Electric Transmission Ltd

- Offshore transmission built and owned by:
  - Wind farm developer (build option only)
  - Offshore transmission owner (OFTO) – competitive tender process

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**Offshore transmission**

- Radial solution
- Integrated solution

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**UK energy landscape is changing, we must:**

- Inform and partner with customers and communities
- Work and lead with our regulators and policy makers
- Seize the opportunity