Scottish Enterprise
Supporting the Scottish Energy Systems Approach

Seonaid Vass
Scottish Enterprise
Head of Energy, Renewables
### About Scottish Enterprise

Scottish Enterprise is Scotland's main economic development agency and aims to deliver a significant, lasting effect on the Scottish economy. Our approach is guided by four interconnected drivers of economic growth:

<table>
<thead>
<tr>
<th>Image</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Internationalisation" /></td>
<td>Our <strong>internationalisation</strong> ambitions are to attract new investment into Scotland, and work with an increased number of companies to export more of their products and services.</td>
</tr>
<tr>
<td><img src="image2.png" alt="Innovation" /></td>
<td>Our <strong>innovation</strong> ambitions are to support more companies to innovate to grow, at home and overseas, and increase Scotland’s business expenditure on R&amp;D.</td>
</tr>
<tr>
<td><img src="image3.png" alt="Investment" /></td>
<td>Our <strong>investment</strong> ambitions are to build Scotland’s assets in key sectors; and, help more businesses access growth finance to invest, innovate and expand at home and overseas.</td>
</tr>
<tr>
<td><img src="image4.png" alt="Inclusive Growth" /></td>
<td>Our <strong>inclusive growth</strong> ambitions are to help build workplaces, workforces and places that help businesses and sectors be fairer and more creative in their growth and development.</td>
</tr>
</tbody>
</table>
Energy makes a significant contribution to the Scottish Economy

- £9.8bn generated by oil & gas for Scottish economy in 2015
- £11.6bn oil & gas investment in 2015
- 2,000 oil & gas supply chain companies
- 124,500 Scottish jobs supported by oil & gas in 2016
- 22bn barrels of oil still to be recovered from UKCS
- £5.5bn turnover generated by R&LCT companies in 2015
- £11.6bn oil & gas investment in 2015
- 31,000 Scottish jobs supported by renewables & low carbon technologies sector in 2015
- £910m renewables investment in Scotland in 2015
- 8.6GW renewables installed
- 1.9GW under construction
- 4.9GW with planning consent
- 20,000 companies active in Scottish R&LCT sector in 2015
- £11.6bn oil & gas investment in 2015
- 124,500 Scottish jobs supported by oil & gas in 2016
- 22bn barrels of oil still to be recovered from UKCS
- £5.5bn turnover generated by R&LCT companies in 2015
- £11.6bn oil & gas investment in 2015
- 31,000 Scottish jobs supported by renewables & low carbon technologies sector in 2015
- £910m renewables investment in Scotland in 2015
- 8.6GW renewables installed
- 1.9GW under construction
- 4.9GW with planning consent
- 20,000 companies active in Scottish R&LCT sector in 2015

Energy makes a significant contribution to the Scottish Economy
Scotland has developed strengths across a range of energy subsectors. The transition to a lower-carbon, better integrated energy system incorporating local solutions can create new opportunities for Scottish businesses.

Scotland’s Subsector Strengths

- Oil & Gas
- Offshore Wind
- Marine
- Onshore Wind
- Low Carbon Heat
- Decommissioning
The three core themes of Scotland's new Energy Strategy have the potential to stimulate new economic opportunities for the Scottish energy supply chain.

- **A stable, managed energy transition**: Creates opportunities for oil and gas diversification into renewable energy.
- **An integrated, whole systems view**: Promotes new technologies & solutions to energy management.
- **A local approach**: Creates pipeline of local integrated innovative solutions, new business opportunities and models.

---

**Scottish Development International**

**Scottish Enterprise**
Scottish Energy Efficiency Programme (SEEP):

- £10bn, 20 year programme to improve energy efficiency and decarbonise the heating supplies of homes and buildings across Scotland

Scottish strengths include:

- Substantial energy efficiency research base - at least 12 research institute including Construction Scotland Innovation Centre (CSIC)
- 1,800 companies active in retrofit energy efficiency-building technologies, energy management
Scottish strengths include:

- **Company base** – key strengths in knowledge provision; digital platforms, sensors, controls, and security; engineering services; and power electronics.

- **Academia** – Scottish Universities strengths in data analytics for simulation and modelling. Strathclyde is the lead on the European Energy Research Alliance Joint Programme for Smart Grids.

- **R&D and T&D** – world-leading facilities e.g. PNDC and the National HVDC Test Centre. Internationally significant T&D projects e.g. Orkney Smart Grid and NINES.
Project opportunities include:

- Caledonia Clean Energy project - proposed new integrated gasification combined cycle power plant near Grangemouth. Will use existing pipeline infrastructure for CO2 transportation and storage in the North Sea.
- North Sea CO2 storage – Scottish North Sea has some of most well understood storage sites in Europe. Could be strategically important CO2 storage asset for rest of Europe due to its significant storage capacity.

Scottish strengths include:

- Company base – Scotland’s 50+ year history of oil and gas exploration and production has created much of the infrastructure and supply chain necessary to support the emergence of CCS in the UK.
- Academia – Scottish Carbon Capture & Storage (SCCS) provides a single point of coordination for all aspects of CCS research, ranging from capture engineering, geoscience, social perceptions and environmental impact, through to law and petroleum economics.
Scottish strengths include:

- **Company base** – Includes companies like Shetland-based Pure Energy, which designs complete hydrogen systems, and Edinburgh-based Logan Energy, which has installed over 130 fuel cell systems worldwide. Scotland also has experience of large-scale hydrogen production for the chemical feedstock industry.

- **Academia** – Particular strengths in green hydrogen production, storage and fuel cells. St Andrews University directs research on the UK Supergen Fuel Cell Consortium and Glasgow University is involved in the EPSRC SUPERGEN initiative.

Facilities & projects include:

- **The Hydrogen Office** – 750kW wind turbine, 30kw electrolyser, 10kW hydrogen fuel cell and a 5kW hydrogen boiler to provide power and space heating to the office and nearby buildings.

- **Orkney Surf & Turf** – UK’s first community project to produce hydrogen from excess wind & tidal

- **Orkney BIG HIT** – Pan EU project with 12 partners across 6 countries, using a 1MW electrolyser producing hydrogen for 10 vans and 2 hydrogen boilers.
Economic Potential - Low Carbon Transport

Facilities & projects include:

- Aberdeen Hydrogen Bus Project – Europe’s largest fleet of fuel cell buses and a state of the art refuelling station with a 1MW electrolyser to produce hydrogen.

- The Levenmouth Community Energy Project - Utilises green hydrogen for transport and local electricity supply. The project comprises 750kW wind turbine, 200kW solar PV array, 250kW electrolyser, 2 hydrogen refuelling stations and 17 fuel cell vehicle fleet (including the world’s first hybrid hydrogen refuse vehicles).

Scottish strengths include:

- **Company base** – Particular strengths in niche low carbon vehicles, components and associated infrastructure. Notable companies include Alexander Dennis (buses), Farid Hillend (refuse vehicles) and Ferguson Marine (ferries).

- **Academia** – Active biofuel sector including Scottish Crop Research Institute and Biofuel Research Centre (BfRC) at Napier University. Scotland engaged in world-leading research capability in hydrogen fuel cell technology, most notably at St Andrews University.
Economic Potential - Smart Local Energy Systems
Continuing importance of energy to Scottish economy

Scottish Government draft Energy Strategy highlights emerging new economic opportunities

Importance of integrated energy systems approach

Scottish Enterprise focus on maximising economic opportunities from low carbon energy transition
Thank You

Seonaid Vass
seonaid.vass@scotent.co.uk