

Offshore Renewables R&D Programme

Scottish Enterprise

Presentation to LUPS Programme Monitoring Committee
26 October 2011

Supporting a globally competitive Scotland



Strategic Context

- European Policy: second Strategic Energy Review - 2020 targets, 2050 Energy Roadmap, Europe 2020 - Resource Efficiency, Innovation Europe, Strategic Energy Technology plan....
- UK Renewable Energy Roadmap
- Scottish Renewables Action Plan, Low Carbon Economic Strategy
- Offshore Wind Route Map
- Marine Energy Roadmap
- Scottish Energy Advisory Board - Feb 2011 - Scottish Government and its agencies should work together to agree a joint funding package with industry to address shared challenges to deployment and integration of offshore renewables
- Scottish Enterprise – Industry Demand Statements, Sector Delivery Plan
- ERDF P1: stimulating demand for innovation through specific calls for R, D, D & D projects, coordinated approach to innovation in a key sector, additional, targeted grant support to SMEs to address technological challenges

Low Carbon Economic Strategy

By 2020



- reduce CO₂ emissions by 42%
- reduce total energy consumption by 12%
- produce 80% of our electricity (now 100%), 11% of our heat production and 10% of transport from renewable sources
- create 70,000 green jobs
- increase the value of our low carbon goods and services sector to more than 10% of the Scottish economy

Offshore Renewables - The Scottish Vision

- **Wave and Tidal**

- Scotland is a strong global leader (EMEC, Pentland Firth Orkney Waters) but other countries are chasing hard – the race is on
- Potential for high levels of Scottish content, particularly in wave
- 10-fold increase in global market by 2015 - will be worth \$500m
- £1bn GVA, 4500 jobs in Scotland by 2020 (400MW deployed)

- **Offshore Wind**

- Building a full, globally competitive Scottish industry by 2015 supplying 33% Scottish Market, 18% Rest of UK market , 4% European market and 1% other global markets
- 2020 “High Growth Scenario” - 28,000 direct, 20,000 indirect jobs, cumulative GVA of £7.1bn

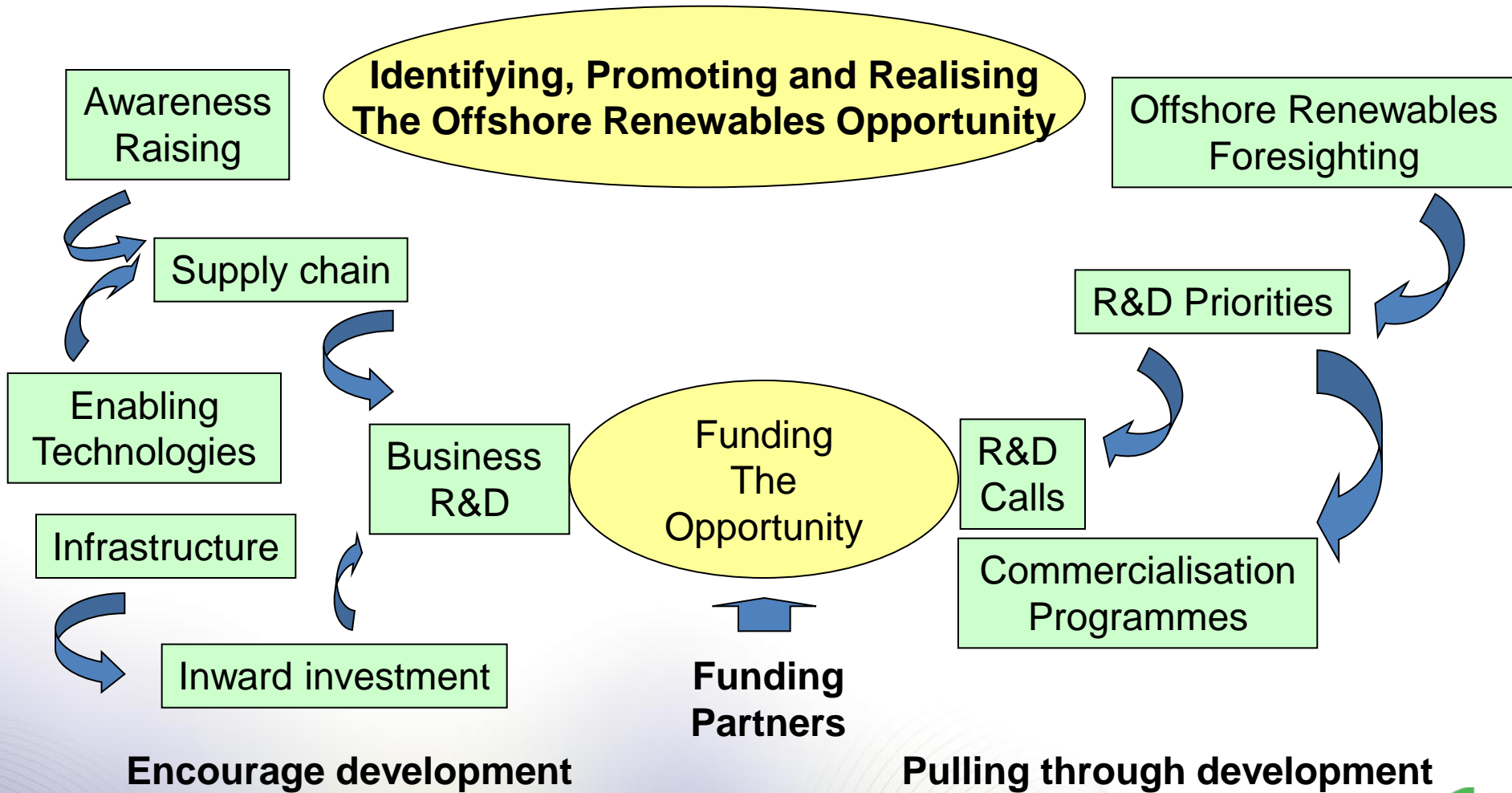
Offshore Renewables Challenges

- *Cost of energy*
- *Full, globally competitive supply chain*
- *Installation, operation & maintenance technologies*
- *Ongoing innovation of technologies and practices*
- Investment in infrastructure
- Access to investment
- Planning and consents
- Regulation of and access to the grid
- Skills

Key Initiatives

- £70M N-RIF fund - port and manufacturing infrastructure
- Attracting and securing key inward investor anchors – Mitsubishi, Gamesa, Technip
- IT-REZ + TIC, TSB Offshore Renewables TIC bid
- Supply chain development (Supported by P2 ERDF)
- Scottish Low Carbon Investment Conference
- Offshore Renewables Foresighting
- Offshore Wind Innovations Systems analysis
- Test and demonstration facilities, Scottish Energy Lab
- Offshore Wind Scotland web portal

Innovation and R&D Challenge



Supporting Investment in R, D, D &D

Objective: Supporting investment in innovation and R,D,D&D in Offshore Renewables in Scotland to drive technology development and to reduce project development costs

By: Ensuring clarity of innovation priorities and highly competitive support packages to accelerate innovation

- **Shared set of R&D Priorities, Influencing Key Funders/Partners**
- **Effective Innovation System**
- **Effective Collaboration and Knowledge Flows**
 - Energy Technology Partnership Knowledge Exchange Network
- **R&D and Commercialisation Calls**
 - **WATERS** – Wave and Tidal Energy Research Scheme
 - **POWERS** - Prototyping for Offshore Wind Energy Renewables Scotland - turbine manufacturers
 - ***Offshore Renewables R&D Programme***

Structure and Management

- **Targeted calls:**
 - Aligned to foresighting work, public sector and industry consultation, identification of priority areas for innovation
 - Covering wave and tidal, offshore wind and cross-cutting challenges e.g. offshore environment, marinisation, grid /cabling, O&M
- **Promotional approach** to encourage innovative projects, through a number of channels e.g.
 - Offshore wind and marine array deployment targeting to include supply chain companies
 - 2nd generation marine targeting to include unsuccessful WATERS applicants
- **Assessment process:**
 - Two stage process – EoI + full bid
 - Reviewed by SE R&D team using existing approved processes and management procedures or
 - Panel of assessors to include SE + external, including HIE, SG
 - Use of independent due diligence as required

Structure and Management

Grant rates:

- Per state aid notification under R&D&I Framework and GBER Article 23
- Up to 50% of eligible costs of “industrial research”, “experimental development” and 65 % capital costs of demonstration projects

Applicants required to demonstrate:

- the strategic importance of the project to the company
- that the R&D represents a significant innovation for the company
- their capability to deliver the project
- that the project will deliver commercial benefits to Scotland’s economy
- how the grant will be implemented to ensure long-term capacity or capability building and sustainability in Scotland to enhance the company’s future competitiveness through R&D.

Offshore Wind R&D – First Call

Addressing the challenges of Scottish offshore wind sites, such as:

- In waters typically 35 metres deep
- Where wind speeds typically average 9 m/second
- Where mean wave heights are 2 metres

Addressing key aspects of wind turbine designs:

- Improved jackets, support structures and foundations
- Effective and efficient operation and maintenance strategies
- Improved access (vessels and equipment) for inspection and light repair (including turbine equipment lifts of up to 2 tonnes)
- Alternative drive train designs
- Improved production volumes and quality

Marine Energy R,D&D – Calls

Array Deployment and Operation Support:

- Focused on technology challenges associated with array deployment and operation that are common across the industry
- Focus determined by PFOW / Saltire Prize lease holders and their partners, based on areas of common challenge – 5 themes have been identified.
- Calls for each technology challenge aimed at SME technology developers

Second generation wave/tidal devices:

- Follow-on from WATERS programme
- Targeting SME device developers with cost of energy 'step-change' technology
- Enabling market development, supporting product development in arena of limited investment availability

Outputs and Results

It is anticipated that 13 renewable energy research projects will be funded over 3 years

Allowing for collaborations, up to 23 SMEs supported

Results by Year 4 (1 year from completion):

Increase in turnover: £7.7m

Gross jobs created: 130

Results by Year 5:

Increase in turnover: £58m

Gross jobs created: 1144

Economic Impact

- Addressing technological challenges to accelerate deployment
 - Better developed indigenous supply chain
 - Increased innovation in Scottish companies
 - High value R&D jobs
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- Based on economic impact analysis for WATERS:
 - Increase in turnover £400m by 2020
 - Gross jobs created 500 by 2020