



Clean energy from  
the northern seas

## norstec's vision

Harnessing the domestic renewable energy resources from Europe's northern seas represents an extraordinary economic and investment opportunity. Over 40GW of offshore wind capacity could be deployed in the region by 2020, generating enough electricity to power London, Paris, Berlin, Dublin, Edinburgh, Copenhagen, Amsterdam, and Brussels combined <sup>i</sup>. In the longer term, the total potential of economically-accessible offshore wind energy resources in Europe is larger than current European production of oil and gas put together <sup>ii</sup>.

This clean and secure energy resource creates a new impetus for growth. In the 18th and 19th centuries sea-borne trading links across the region enabled a first wave of industrial development in our ports and coastal cities. From the 1960s onwards, oil and gas resources fuelled a second wave of investment. Today, new technologies for accessing sustainable energy resources from the northern seas provide an engine for driving forward industrial renewal and economic development for cities and communities across the region.

North-west Europe is now the global leader in offshore wind, adding capacity equivalent to a nuclear power station annually <sup>iii</sup>. Across Europe, offshore wind investments of over €6 billion are expected over the next year <sup>iv</sup>. In the UK, private investment in offshore wind will this year outstrip investment in roads, airports and gas infrastructure combined <sup>v</sup>.

As in previous eras this new industrial revolution will be led by the ingenuity of the private sector, backed by strong pro-active government support, and enabled through a high-quality skills base in science, technology and engineering. This new revolution is also strongly backed by the public, with over two-thirds of UK citizens supporting offshore wind <sup>vi</sup>.

## The objective

The goal of the norstec network is to maximise the potential of the abundant offshore renewable energy resources in Europe's northern seas, so that:

- By 2020, large-scale deployment of offshore wind in Europe's northern seas is fully underway, making a major contribution to the region's energy security and economic development
- Offshore renewables in Europe's northern seas become the largest new source of competitive sustainable energy to 2030 and beyond
- The expertise, skills, and technologies developed in the region can be exported as offshore renewables are constructed in markets across the world.

## The opportunity

- By 2020, the number of people directly employed in offshore wind in the UK alone could surpass those at the height of North Sea oil and gas production <sup>vii</sup>. Up to 185,000 high quality jobs could be directly or indirectly created in the UK, driven by the skills being developed in world class colleges and universities <sup>viii</sup>.
- By 2022, over 8000km of high voltage offshore transmission lines could be laid across the northern seas region – creating thousands of jobs, linking electricity markets, boosting the potential for trade and connecting offshore energy to where the demand is <sup>ix</sup>.
- By 2035, the global cumulative investment in offshore wind could reach up to €490 billion <sup>x</sup>. The manufacturing centres, skills base and technologies developed through offshore wind deployment in Europe's northern seas will put companies from the region in a prime position to capitalise from this market opportunity.
- By 2050, the electricity equivalent of 1 billion barrels of oil could be generated annually in UK waters alone, matching North Sea oil and gas production <sup>xi</sup>. This would save 1.1 billion tonnes of CO2 emissions, helping to keep Europe on track for its 2050 climate targets.

## The requirements

To succeed in achieving these outcomes, we will need:

- Innovation throughout the sector to push forward technological development, creating competitive and well-established supply chains which bring down costs and enable economic sustainability
- Collaboration between academia, industry and investors to promote technology standardisation and to develop a highly-skilled and well-trained workforce, and cooperation between countries around the northern seas to link markets together and share resources
- Commitment by industry participants and governments to create a favourable investment environment, including a continued stable and supportive political context underpinned by formal policies and challenging targets which promote development of the offshore renewables sector.

## Making it happen

The norstec network brings together key players in the offshore renewables sector, across developers, the supply chain and other stakeholders (investors, academia and NGOs). Through collaboration and information-sharing, it will ensure that the benefits offered by vast clean energy potential in the northern seas are fully realised. It will promote the development of all forms of marine energy, initially focusing on the development of offshore wind. We will do this by delivering an agreed measurable plan of activity which will:

- Communicate the scale of the opportunity and the benefits of clean energy in Europe's northern seas to the public and the business and political spheres;
- Identify and constructively promote the establishment of the framework conditions necessary for realising this vision; and
- Foster exchange and co-operation within the private sector, including knowledge transfer and scientific co-operation necessary to sustain the vision.

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<sup>1</sup> Analysis based on National Renewable Energy Action Plans. [www.ecn.nl/nreaps](http://www.ecn.nl/nreaps)

<sup>2</sup> Sources: European Environment Agency (2009) Europe's onshore and offshore wind energy potential: An assessment of environmental and economic constraints.

<http://www.eea.europa.eu/publications/europes-onshore-and-offshore-wind-energy-potential>; European Commission (2012) EU Energy in Figures: Statistical Pocketbook 2012.

<http://ec.europa.eu/transport/publications/statistics/doc/2012/pocketbook2012.pdf>

<sup>3</sup> EWEA (2012). The European offshore wind industry - key trends and statistics 1st half 2012.

[http://www.ewea.org/fileadmin/ewea\\_documents/documents/publications/statistics/EWEA\\_OffshoreStats\\_July2012.pdf](http://www.ewea.org/fileadmin/ewea_documents/documents/publications/statistics/EWEA_OffshoreStats_July2012.pdf)

<sup>4</sup> EWEA (2012) Wind in our sails: the coming of Europe's offshore wind energy industry. [http://www.ewea.org/fileadmin/ewea\\_documents/documents/publications/reports/Offshore\\_report\\_web\\_01.pdf](http://www.ewea.org/fileadmin/ewea_documents/documents/publications/reports/Offshore_report_web_01.pdf)

<sup>5</sup> Calculated from HM Treasury infrastructure investment pipeline database, ([http://www.hm-treasury.gov.uk/infrastructure\\_pipeline\\_data.htm](http://www.hm-treasury.gov.uk/infrastructure_pipeline_data.htm)), based on analysis from Green Alliance

([http://www.green-alliance.org.uk/uploadedFiles/Publications/reports/UK%20Success%20Story%20data%20explanation\(1\).pdf](http://www.green-alliance.org.uk/uploadedFiles/Publications/reports/UK%20Success%20Story%20data%20explanation(1).pdf)).

<sup>6</sup> DECC (2012) DECC Public Attitudes Tracker – Wave 2. 18 September 2012. [http://www.decc.gov.uk/en/content/cms/statistics/public\\_att/public\\_att.aspx](http://www.decc.gov.uk/en/content/cms/statistics/public_att/public_att.aspx)

<sup>7</sup> The Centre for Economic and Business Research forecasts 40,530 direct jobs by 2020 in the 'Gone Green' scenario and 77,977 jobs in the 'Accelerated Growth' scenario

(CEBR [2012] The Macroeconomic Benefits of Investment in Offshore Wind <http://www.cebr.com/?p=911>); Direct employment in oil and gas extraction in the UK peaked at 36,970 in 1991

(UK energy sector indicators 2011: economic indicators dataset. <http://www.decc.gov.uk/en/content/cms/statistics/publications/indicators/indicators.aspx>)

<sup>8</sup> CEBR (2012) The Macroeconomic Benefits of Investment in Offshore Wind <http://www.cebr.com/?p=911>; accelerated growth scenario.

<sup>9</sup> ENTSO-E (2012) Regional Investment Plan North Sea 2012. [https://www.entsoe.eu/fileadmin/user\\_upload/\\_library/SDC/TYNDP/2012/120705\\_NS-RegIP\\_2012\\_report\\_FINAL.pdf](https://www.entsoe.eu/fileadmin/user_upload/_library/SDC/TYNDP/2012/120705_NS-RegIP_2012_report_FINAL.pdf)

<sup>10</sup> IEA (2010) World Energy Outlook 2010. <http://www.worldenergyoutlook.org/publications/weo-2010/>

<sup>11</sup> The Offshore Valuation Group (2010) The offshore valuation: a valuation of the UK's offshore renewable energy resource. [http://www.offshorevaluation.org/downloads/offshore\\_valuation\\_exec.pdf](http://www.offshorevaluation.org/downloads/offshore_valuation_exec.pdf)