## Open Days Workshop

**Offshore Renewable Energies: Exploring the Synergies**

Tuesday, October 5th (09.00 - 10.45)

*Scotland House, Rond Point Schuman 6, Brussels*

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:30 - 09:00</td>
<td>Welcome coffee</td>
</tr>
</tbody>
</table>
| 09:00 - 09:05 | Welcome and introduction from the North East of England  
Tbc | North East England office partner                   |
| 09:05 - 09:10 | How can regions boost the competitiveness of the offshore RES sector by exploiting synergies?  
Chair: Hans Van Steen | Head of unit - DG Energy | European Commission |
| 09:10 - 10:00 | The role of regions in the offshore wind sector  
Gloria Rodrigues | Head of policy analysis | EWEA  
The concept of ‘super clusters’ and interregional cooperation  
Steve Clarke | UK Content Manager | Mainstream Renewable Power  
The role of the regions in the marine renewables sector  
Nathalie Rousseau | Executive Director | EU - OEA |
| 10:00 - 10:35 | Panel discussion and floor debate with regional experts  
Chair: Hans Van Steen | Head of unit - DG Energy | European Commission |
| 10:35 - 10:45 | Conclusions and close                                                  |
Deploying offshore wind

The role of regions

Glória Rodrigues
Head of Policy Analysis Unit

Give Europe a Breath of FRESH AIR

www.eweа.org/freshair

5, October, 2010
What is the European Wind Energy Association?

EWEA is the **voice of the wind industry** in Europe

Activities include:

- **Researching** the latest developments in the wind sector
- **Coordinating** EC-funded projects
- **Disseminating** high quality, up-to-date information
- **Raising awareness** of the benefits of wind power
- **Organising** Europe’s premier wind energy events
More than 600 members from almost 60 countries

- Manufacturers with a leading share of the global wind power market
- Component suppliers
- Research institutes
- National wind and renewable associations
- Developers
- Electricity providers
- Finance and insurance companies
- Consultants
- Contractors

This combined strength makes EWEA the world’s largest and powerful wind energy network

www.ewea.org/membership
Members include the following leading players:
1. Deploying offshore wind: market analysis

2. Boosting economic and social development in EU regions

3. Developing a clear and integrated industrial strategy: the regions’ role
1. Deploying offshore wind: market analysis

2. Boosting economic and social development in EU regions

3. Developing a clear and integrated industrial strategy: the regions’ role
1. Deploying offshore wind

2009 Offshore wind market
- 584 MW installed in 2009
- Increase of 56% compared to 2008

1st semester of 2010
- 333 MW installed = 118 wind turbines in 6 wind farms
- 440 MW installed but not yet connected to the grid

Cumulative market
- 2,396 MW = 948 wind turbines installed & grid connected
- across 43 wind farms in 9 European countries
1. Deploying offshore wind

INSTALL CAPACITY: CUMULATIVE SHARE BY COUNTRY END

2009 IN MW

FIGURE 3.2

- United Kingdom 43% (882.8 MW)
- Denmark 31% (646.35 MW)
- Sweden 8% (163.65 MW)
- Norway 0% (2.3 MW)
- Netherlands 12% (246.8 MW)
- Ireland 1% (25.2 MW)
- Germany 2% (42 MW)
- Belgium 2% (30 MW)
- Finland 1% (24 MW)
1. Deploying offshore wind

Scenarios

• 2020 low scenario: 40 GW
• 2020 high scenario: 55 GW

• 2030: 150 GW
1. Deploying offshore wind

Offshore wind energy market in the EU 2011 – 2020 (MW)

- 2011: annual installations of 1.5 GW
- 2020: annual installations of 6.9 GW
- 2020: cumulative installations of 40 GW

Source: EWEA 2009
1. Deploying offshore wind

Offshore wind energy market in the EU 2021 – 2030 (MW)

- 2021: annual installations of 7.7 GW
- 2030: annual installations of 13.6 GW
- 2030: cumulative installations of 150 GW

Source: EWEA 2009
1. Deploying offshore wind

Northern Europe Offshore Wind installed capacity 2020-2030
OUTLINE

1. Deploying offshore wind: market analysis

2. Boosting economic and social development in EU regions

3. Developing a clear and integrated industrial strategy: the regions’ role
2. Boosting economic and social development

- Annual and cumulative investments in offshore wind power 2011-2020 (€billion 2005) almost TRIPLE
  - 2011: investments of €3.3 billion
  - 2020: investments of €8.8 billion

Source: EWEA 2009
2. Boosting economic and social development

- Offshore wind energy employment in the EU will more than triple, from 34,000 in 2010 to almost 156,000 by 2020 and to 293,000 by 2030.
2. Boosting economic and social development

Practical example:

Bremerhaven (Germany)

• Bremerhaven used to be blighted by declining shipping and fishing industries
• In the last years, €250 million of private and public funds have been invested in offshore wind energy industry development in the city
• This brought about the creation of 1,200 direct jobs in companies manufacturing turbines and components between 2006 and 2008

Esbjerg (Denmark)
1. Deploying offshore wind: market analysis

2. Boosting economic and social development in EU regions

3. Developing a clear and integrated industrial strategy: the regions’ role
3. The regions’ role

1. Facilitating the development of the necessary support infrastructures
   - Manufacturing and construction capacities
   - Testing facilities
   - Research and training facilities
   - Dedicated harbours
     • Specially adapted ports are needed (deep water, reinforced quaysides, large storage areas, suitable space for moving)
3. The regions’ role

Source: Windenergie Argentur
3. The regions’ role

2. **Supporting the creation of a qualified and specialised work force**
   - Upgrading skills: reviewing education programmes; lifelong learning programmes; on-the-job training...
   - More flexible labour market, based on labour mobility across and within borders, and sectors (from declining to the new expanding ones)

3. **Facilitating the planning and consenting process**
   - Simplification and more efficient permitting and licensing process, providing the necessary certainty for long term investments
   - Transparent and accountable decision making mechanisms enabling the effective coordination/integration of different sectoral interests
     - Transparency and early stakeholder involvement
     - Mechanisms to prevent/solve sector conflict management
   - Improvement of the knowledge base and exchange of information/experiences
   - Cross border cooperation mechanisms
EWEA events: the winning formula

GRIDS 2010
23 - 24 November 2010

EWEC 2011
14 - 17 March 2011

OFFSHORE 2011
29 November – 1 December 2011

www.ewea.org/events
Thank you
EU Regions Days
Offshore Renewables
“Exploring Synergies”

**Developing the SuperCluster**

Steve Clarke, UK Content Manager, SMart Wind
5th October 2010, 9am-10:45am
Scotland House, 6 Rond Point Schuman, Brussels
Introducing Mainstream

- Founded in February 2008
- Innovative, entrepreneurial and ambitious global renewable energy company
- Owned by Eddie O’Connor and Staff/Management
- 90+ Employees
- Management Team Includes:
  - Dr. Eddie O’Connor: Founder & Chief Executive Officer
  - Fintan Whelan: Co-Founder & Corporate Finance Director
  - Andy Kinsella: Executive Director and CEO, Offshore
  - Torben Andersen: Executive Director and CEO, Onshore
- Board Members Include:
  - Fintan Drury: Chairman
  - Chuck Watson: Former Chairman and CEO of Dynegy Inc
  - Sir Roy Gardner: Former CEO of Centrica
  - Brendan Halligan: Chairman, Sustainable Energy Ireland
  - John Lavery: Co-Founder, Airtricity
  - Mark Brown: Barclays Capital

- Sponsoring Members of Renewable UK
  - Chris Hill: General Manager, SMart Wind & Board Director, Renewable UK
SMart Wind – World Leading Companies...

- The world’s leading environmental company with total revenue in 2008 €19bn from its environmental portfolio
- To maintain its Number 1 position in UK offshore wind energy

- A leading developer of large scale renewable energy projects that accelerate global progress towards a sustainable future
- To make the UK the powerhouse of Europe by accelerating and maximising offshore wind delivery and realising the supergrid

- The fourth largest construction company in the world
- To become the construction company of choice to the offshore wind industry through excellence in performance, innovation and delivery

...with complimentary objectives
SMart Wind – Equipped for Success
Addressing the Economic Challenge

Source: Garrad Hassan for BWEA, 2009
New Offshore Turbines on their way
Supergrid is defined as:
“an electricity transmission system, mainly based on direct current, designed to facilitate large-scale sustainable power generation in remote areas for transmission to centres of consumption, one of whose fundamental attributes will be the enhancement of the market in electricity.”
Defining SuperCluster

“a geographic region based around a relevant and credible Port location, which incorporates most if not all of the offshore wind energy value chain including supply chain manufacture & assembly of products, provision of services which support the sector (including the wider low carbon energy sector); academic links to support the research, development and deployment of tomorrow’s turbines, foundations and interconnection technologies and the training and skills provision needed to deliver the growth in human capital which underpins every part of the sector value chain”
Clustering Model

...when individuals and organisations are brought closer together in terms of physical geography or communication, business is accelerated...

Support for Relocation and Co-location
- Access to Quality Office & Manufacturing Space
- Strong Regional, National & International Transport Links
- Access to Long-Term Investment & Finance
- Access to Specialist Advice & Support, Ideally Sector-specific
- Permanent & Temporary Accommodation, Schools & Colleges, etc

Physical Characteristics
- Large physical waterside area
- Plus room for future expansion
- Deep & wide river channel
- Clean land (contamination)
- Strong transport links (Road, Rail & Air)
- 24/7/365 Availability

Academic Linkages
- Proactive Local/Regional Universities
- Access to Relevant Research Base
- Access to Academic Expertise
- Support academic spin-out ventures
- Further & Higher Education Services
- LSCs

Support for Growth
- Access to existing & new Supply Chains and Service Providers
- Technology Development & Demonstration Capabilities
- Ability to integrate & deliver local training and up-skilling
- Public & Private Investment Schemes
- Supportive local/regional planning authority

Activity Concentration

Technology
OEM’s

Service
Providers

Existing &
New Supply
Chains
Financial Instruments Available to the Offshore Renewables Sector

Presentation to the Open Days Workshop on Offshore Renewable Energies: Exploring the Synergies

Brussels
Contents

- General update on financial credit climate
- Key offshore challenges
- Notable structural features
Financial credit climate
Small improvements

- Project finance markets unfreezing
  - More transactions
  - Margins trending down

- Offshore wind still very difficult
  - Too few banks with arranging experience
  - Even less construction risk capacity
  - Everybody counting on EIB & ECAs
Offshore vs. Onshore wind

Key offshore challenges

Regulatory

- Offshore wind is more expensive and the regulatory framework that supports onshore wind is usually not sufficient to support that additional cost.

- In particular, the cost of the long distance connection to the grid, and how it was borne, is a major obstacle.

Construction

- Offshore projects are more complex and require more coordination and project management than onshore players usually had.

Long term O&M

- The very different risks and parties involved (in particular turbine manufacturers and offshore contractors) has meant an unwillingness to provide wrapped EPC contracts.

- The harsher environment and the requirement for special vessels for both minor and major maintenance creates uncertainty as to the overall long term operating costs.
Notable Structural Features (1)

Structure

- Project Finance - repayment of the loan based on project cash flow
- Revenues from sale of electricity (PPA) benefits from an incentive scheme (green certificates, fixed tariff, ROC) for 20 years by law

Financing

- Total project cost of EUR 650M (capacity of 170 MW)
- 70% senior debt, 10% mezzanine and 20% equity
- EIB loan – EUR 300M-EUR 150M at project risk (SFF), EUR 150M guaranteed by Export Credit Agency
- SFF loan secured pari passu with other senior lenders
Notable structural features (2)

Contingent facility

**Contingency analysis**

- Technical advisor to evaluate potential downside scenarios and assess delays and additional cost to solve

- ‘Worst case’ scenario and corresponding funding (extra cost + delayed income) requirement has been determined by independent engineer

**Contingent Facility**

- *In most cases commercial lenders have agreed to provide contingent facilities* which, together with contingent equity, cover the required contingency

- EUR 70M contingency, split 70/ 30 D/E
Notable structural features (3)

Cash Sweep

- Excess cash
- Shorten tenor
- Prepayment
- Trigger level