



## Offshore wind network event

## East of England visit to Denmark



## Programme



Wednesday 28<sup>th</sup> of February

- 15:00 **Welcome and introduction to POWER and Offshore Wind Energy in Denmark**  
Morten Holmager, Offshore Center Danmark
- 15:30 **Spatial planning and approval procedures for offshore wind parks**  
Mette Cramer Buch, Danish Energy Authority
- 15:50 **Offshore Wind Energy in The East of England**  
Michael Moll, East of England POWER partnership
- 16:10 **Coffee Break**
- 16:30 **Business networking**  
One-2-one meetings
- 19:00 **Dinner**  
Hotel Britannia, Esbjerg



## Programme

Thursday 1<sup>st</sup> of March



- 09:00 **Welcome and introduction**  
Morten Holmager, Offshore Center Danmark
- 09:10 **DONG Energy in the East of England – Gunfleet Sands and London Array**  
DONG Energy
- 09:45 **How can local service companies support Operation & Maintenance?**  
Poul Martin Wael, Offshore project group leader and Troels Andre Poulsen,  
Service group leader, Siemens Wind Power
- 10:10 **Coffee Break**
- 10:30 **Offshore Wind safety Training**  
Eigil Jensen, Course Manager, Survival Training Maritime Safety
- 11:05 **HSEQ package (safety training etc.) for offshore wind farms**  
Ib C. Nielsen, Director, Esbjerg Safety Consult
- 11:45 **Lunch**





- **Offshore Center Danmark**
- **The POWER project**
- **Offshore Wind Energy in Denmark**



# Pushing Offshore Wind Energy Regions (POWER)



Offshore companies



Consultants



Universities



Offshore Center Denmark



Authorities



# Pushing Offshore Wind Energy Regions (POWER)



Offshore Center Denmark



## Focus

Coordination and development of knowledge and competences within the Danish offshore sector

## Background

- Founded 2003
- Membership based organization – currently 150 members
- ½ private / ½ public funded
- Activities within: Offshore wind, oil and gas, wave energy and maritime

## Activities

- Networking and knowledge – Business forums, internet, seminars, conferences
- Courses – Basic and technical courses
- Projects – Innovative development projects



[www.offshore-power.net](http://www.offshore-power.net)



## POWER creates a North Sea competence network for offshore wind energy

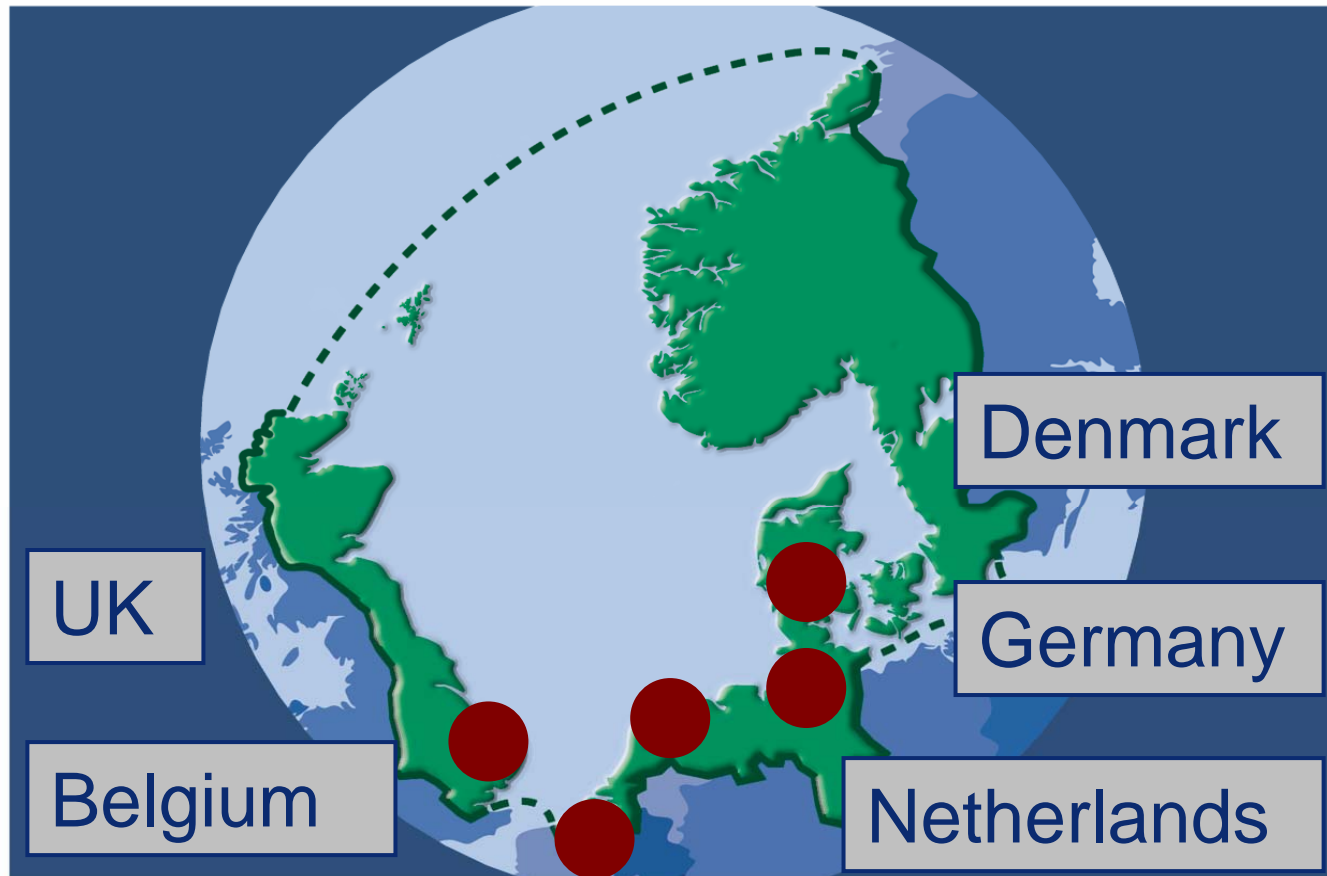


*POWER is co-financed by European Regional Development Funding through the Interreg North Sea Programme*





## THE POWER PARTNERS



*Leading offshore wind energy regions*





## THE POWER PARTNERS

Members based  
Energy Business  
Organisations

Local/Regional  
Authorities

Business  
Support  
Agencies

Universities,  
Research  
institutes etc.

*A total of 37 partners*





## The POWER activities

- strategies and knowledge  
good practice guidance; information centres; Kids4Offshore competition etc.
- supply chain development  
supply chain studies; practical cooperation; facilitating business networking opportunities etc.
- skills development  
skills requirement study; summer school; harmonisation of vocational training certification; exchange on BA/MA etc.



SLP Yard, Lowestoft , UK



Multibrid 5MW, Germany



Horns Rev, Denmark





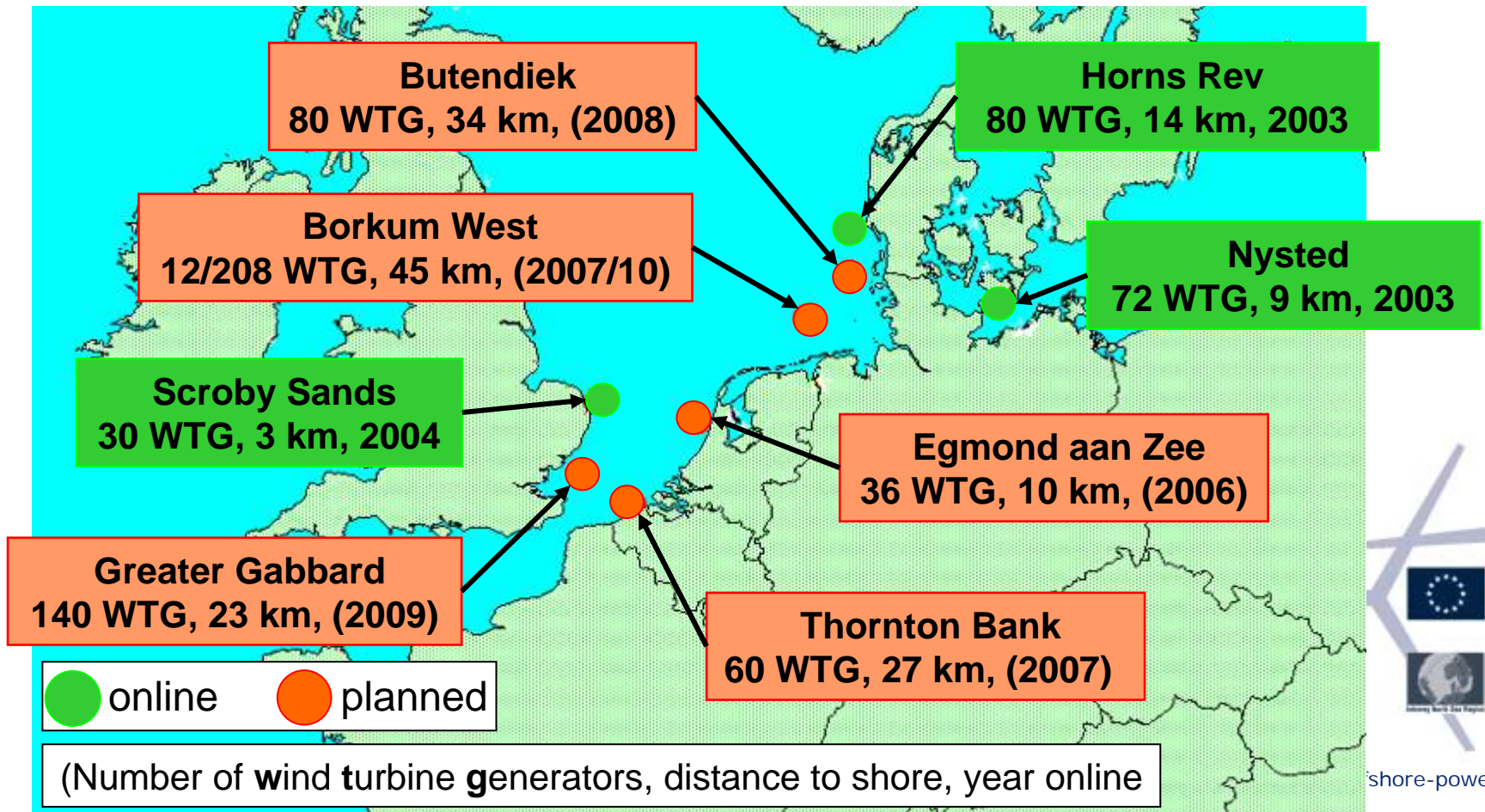
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# Pushing Offshore Wind Energy Regions (POWER)

## Case Study: Analysed Offshore Wind Farms by dena, Deutsche Windguard and University of Groningen







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## **POWER Transnational Supply Chain Study**

**(conducted by Douglas-Westwood Ltd)**



- Based on four regional supply chain studies, from North-Western Germany, East of England, Denmark and North Holland
- Combines the four regional studies, to show North Sea Region as an international market
- Forecast total region market value expenditure and man-hours
- Supply chain compatibility and opportunities for co-operation

*Also featuring:*

- List of future offshore wind projects
- Assessment of all ports in the regions with potential to serve the offshore wind industry





## POWER Transnational Supply Chain Study

### Some conclusions

- The transnational POWER region has total capability throughout the offshore wind supply chain
- But no single region is entirely self-sufficient
- **Different capabilities in each of the regions:**  
Combination of expertise in offshore oil & gas and onshore wind – complementarity of supply chains



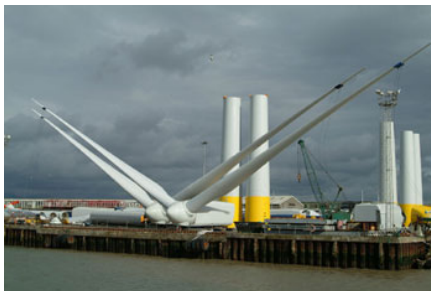


## POWER Transnational Supply Chain Study

### Ports analysis

Study analysed 18 ports in the POWER regions

- **Few ports fully capable** of economically handling large future projects
- Therefore, **port choice is not local** or national, but international
- Opportunities for **multiple ports** to be used for individual projects  
E.g. Lowestoft and Great Yarmouth (UK) for Scroby Sands



# Pushing Offshore Wind Energy Regions (POWER)

POWER Transnational study:

## Regional Strengths & Weaknesses



Country & Region	Key Strengths	Key Weaknesses
<b>Denmark</b>	<ul style="list-style-type: none"> <li>• Turbine manufacturing</li> <li>• Established wind supply chain</li> <li>• Early experience in offshore wind</li> <li>• O&amp;G skills/experience</li> <li>• Key industry players</li> </ul>	<ul style="list-style-type: none"> <li>• Few suitable ports</li> <li>• Lack of offshore projects planned</li> <li>• Long-term prospects uncertain</li> </ul>
<b>Germany</b> Schleswg-Holstein & Bremen/Niedersachen	<ul style="list-style-type: none"> <li>• Turbine manufacturing</li> <li>• Established wind supply chain</li> <li>• Good long-term market prospects</li> </ul>	<ul style="list-style-type: none"> <li>• No projects yet</li> <li>• Offshore Germany technologically difficult</li> <li>• Highly dependent on next-generation turbines</li> <li>• Lacks offshore 'leaders'</li> </ul>
<b>The Netherlands</b> Kop van Noord-Holland	<ul style="list-style-type: none"> <li>• Good ports</li> <li>• Manufacturing capability of support structures and turbine components</li> <li>• O&amp;G skills/experience</li> </ul>	<ul style="list-style-type: none"> <li>• Uncertain market conditions</li> </ul>
<b>The United Kingdom</b> East of England	<ul style="list-style-type: none"> <li>• High growth market</li> <li>• Long-term market prospects</li> <li>• O&amp;G skills/experience</li> <li>• Proven O&amp;M capability</li> <li>• Support mechanisms in place</li> </ul>	<ul style="list-style-type: none"> <li>• Very limited manufacturing</li> <li>• Use of ports depends on upgrades</li> <li>• Poor local infrastructure</li> </ul>



## Business networking between North Sea Regions



POWER brings together a number of key energy business associations around the North Sea:



### Organisation of international business networking events e.g.

- Visit of German businesses to the East of England, 5/6 Oct 2006
- Visit of UK businesses to Denmark, 28 Feb/1Mar 2007



*German delegation visiting Lowestoft College; A2Sea vessel and Scroby Sands*





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## POWER Offshore Wind Summer Schools

1<sup>st</sup> POWER Offshore Wind Summer School: 4-9 September 06;  
Bremerhaven, Germany



Safety Training at the summer school



Bremen Senator visiting the summer school

Further Offshore Wind Summer Schools planned for 2007  
in Lowestoft (Lowestoft College) and Esbjerg (OCD)





## POWER WorkShop

### Harmonisation of Training for the Offshore Wind Energy Industry



Thursday, April 26<sup>th</sup> 2007

10.00 – 17.00

Bremen



Attempt to harmonize offshore wind training in the following areas:

- Academic Training
- Vocational Training
- Safety Training





## **POWER profile raising and branding**

POWER gaining high profile regionally, nationally, internationally  
Development of the “POWER” brand

### ***POWER presence at conferences and trade fairs***

*Past: HusumWind 05, Copenhagen Offshore Wind 05, All Energy 06, Hamburg Windenergy 06, POWER Business Breakfast Lowestoft 06; EEGGr Summer Conference 06; North Sea Conference 06; Territorial Cooperation Event Cambridge 06; Renewable Energy Conference in Patras (Greece); EU Brussels Open Days 2006; Euregia Leipzig 2006; DEWEK 2006 – the German wind energy conference; Southern North Sea Conference 2007*

### ***Future:***

*European Commission Conference “Regions for economic change“ 2007; EWEC 2007; All Energy 2007; EEGGr Summer Conference 2007; HusumWind 2007; POWER Final Conference 2007*





## **POWER Offshore Wind Final Conference**

14-15 June 2006 in Bremerhaven (Germany):  
high profile public sector oriented conference



Photo: Scroby Sands Wind Farm; ODE/E.On



**Further information at**  
**[www.offshore-power.net](http://www.offshore-power.net)**



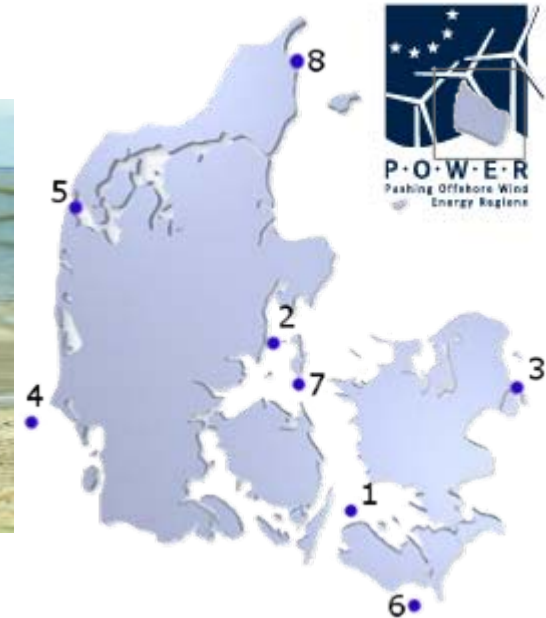
## Offshore Wind Energy in Denmark A tour around the Danish wind farms



# Pushing Offshore Wind Energy Regions (POWER)



Horns Rev



Placering	Opførselsår	Antal turbiner	Output pr. turbine [kW]	Output total [kW]
Vindeby (1)	1991	11	450	4.950
Tunø Knob (2)	1995	10	500	5.000
Middelgrunden (3)	2000	20	2.000	40.000
Horns Rev (4)	2002	80	2.000	160.000
Rønland (5)	2003	8	2.150	17.200
Nysted (6)	2003	72	2.300	165.600
Samsø (7)	2003	10	2.300	23.000
Frederikshavn (8)	2003	3	1 * 3.000 + 2 * 2.300	7.600
<b>Total</b>	<b>1991-2003</b>	<b>214</b>	<b>1.978</b>	<b>423.350</b>
<b>Rest of the World</b>	<b>1994-2006</b>	<b>181</b>	<b>2.088</b>	<b>377.800</b>





## Installeret offshore vind

