Wind Energy - The Facts: Project funding and website

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INTELLIGENT ENERGY EUROPE (IEE) PROGRAMME

- **Wind Energy – The Facts:** IEE financed project of 2 years (01/11/07 - 31/10/09) that delivered the publication

- **IEE:** EU’s *funding tool* to encourage the use of renewable energy sources and energy saving

- **Operational objectives:** improve sustainability, boost investment, remove non-technological barriers
Energy efficiency
- Buildings
- Energy-efficient products

Renewable energy sources
- Electricity
- Heating + cooling
- Biofuels
- Small-scale in buildings

Mobility
- Alternative fuels and clean vehicles
- Energy-efficient transport
- Capacity building in agencies

Source: European Info Day, Intelligent Energy - Europe, EACI
INTELLIGENT ENERGY EUROPE (IEE) PROGRAMME in figures

- **Budget:**
  2007-13: € 730 million

- **Maximum funding rate:** 75%

- **Projects supported to date:**
  400+ projects

- **Number of beneficiaries:**
  > 3,000

*Source:* European Info Day, Intelligent Energy – Europe, EACI
IEE: CONVERT POLICY INTO ACTION

EU energy efficiency and renewables objectives

- Creating and spreading effective methods and best practice
- Training and education
- Know-how transfer
- Market intelligence
- Inform policy development and implementation

Real changes on the ground

€ 730 million from 2007-13
IEE: PROMOTION AND DISSEMINATION PROJECTS

- help deliver the key EU climate change and energy objectives
- match the priorities of the IEE Work Programme
- involve at least 3 partners from different countries
- take 2-3 years to deliver
- are NOT “hardware” type investments or research & development projects.

Source: European Info Day, Intelligent Energy – Europe, EACI
More information available at:

http://ec.europa.eu/energy/intelligent/contact/index_en.htm
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IEE PROGRAMME

WIND ENERGY - THE FACTS PUBLICATION

WIND FACTS WEBSITE
WIND ENERGY – THE FACTS PUBLICATION

• The most important wind energy reference in the world

• Detailed overview of the wind energy sector

• Prepared by a consortium of leading experts from different sectors all over Europe

• 2nd year: dissemination workshops
WIND ENERGY – THE FACTS VOLUMES

I. Technology

II. Grid Integration

III. The Economics of Wind Power

IV. Industry and Markets

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IEE PROGRAMME

WIND ENERGY - THE FACTS PUBLICATION

http://www... WEBSITE
Clipper Wind (Figure 3.33) manufactures 2.5 MW wind turbines, with a hybrid drive train of very distinctive design. After initial research into systems with multiple induction generators, Clipper developed a system with an innovative gearbox with outputs to four PHGs. As with other hybrids, this again leads to a very compact drive train.

**Figure 3.34: 5 MW Multibrid Wind Turbine**

Prokon Nord Energiesystem GmbH, based in Loco, acquired the previous Multibrid company in 2003. The prototype MS680 (Figure 3.34) was installed in Warnemünde, and commissioned in 2005. The Multibrid technology was subsequently acquired by Areva in June 2008.

Distinctive features of the MS680 include a highly compact integrated slow rotating drive system, comprising a single main bearing (no main shaft), a single-stage gearbox and a medium sized PHG (3.1 MW). With a tower head mass of 310 tonnes, the MS680 is apparently the lightest wind turbine rated around 5 MW.

**OTHER DRIVE TRAIN DEVELOPMENTS**

Hydraulic components have figured in drive train design for some time in motors, brakes, fluid couplings or torquer limiting systems. Hydraulic drives comprising pump(s) and motor(s) for main power transmission were employed in the unsuccessful Siemens 3 MW prototype of the early 1990s. However, for most of the modern wind industry, hydraulic drive trains have not been a significant factor.
Investment costs per MW range from a low of €1.2 million/MW (Middegrunden) to €2.7 million/MW (Rønne Røg) (Figure 11.2.3).

The higher offshore capital costs are due to the larger structures and the complex logistics of installing the towers. The costs of offshore foundations, construction, installations, and grid connection are significantly higher than for onshore. For example, offshore turbine installation costs are generally 20% per cent more expensive and towers and foundations cost more than 2.5 times the price of those for a similar onshore project.

In general, the costs of offshore capacity have increased in recent years, as is the case for land-based turbines, and these increases are only partly reflected in the costs shown in Figure 11.2.3. As a result, the average costs of future offshore farms are expected to be higher. On average, investment costs for a new offshore wind farm are expected to be in the range of €2.0–2.2 million/MW for a near-shore, shallow-water facility.

To illustrate the economics of offshore wind turbines in more detail, two largest Danish offshore wind farms can be taken as examples. The Horns Rev project, located approximately 15 km off the west coast of Jutland (west of Døboløg), was finished in 2002. It is equipped with 60 machines of 3 MW, with a total capacity of 180 MW. The Nyminde offshore wind farm is located south of the island of Lolland. It consists of 72 turbines of 2.34 MW and has a total capacity of 165 MW. Both wind farms have their own on-site transformer stations.
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