


The evolution of wind turbines and wind park concepts

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Overview

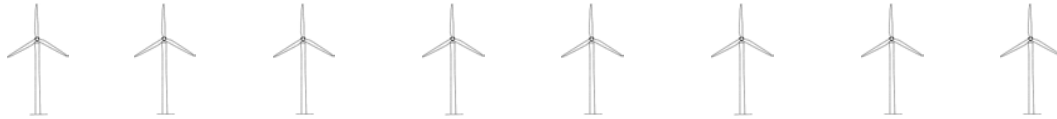
- 
- How wind energy can make a big impact on the electricity balance
 - Giant steps summarised

InWaterTec,

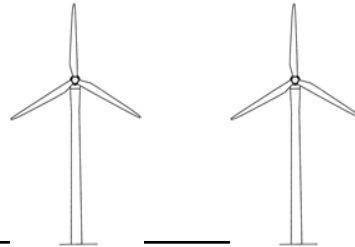
Kiel, September 1, 2005

Low energy density of the wind in combination with high energy demand density requires much space

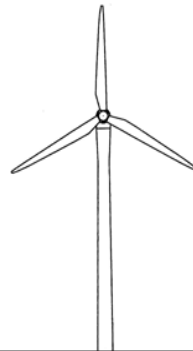
- Combine introducing RE with energy saving!
- • Large machines (visual impact per MW reduced)
- Large numbers of wind turbines required
- • Offshore
- Include large capacity of wind electricity in grid planning (DENA Study, EWEA Grid report)
- Legislation
- Political and public support needed



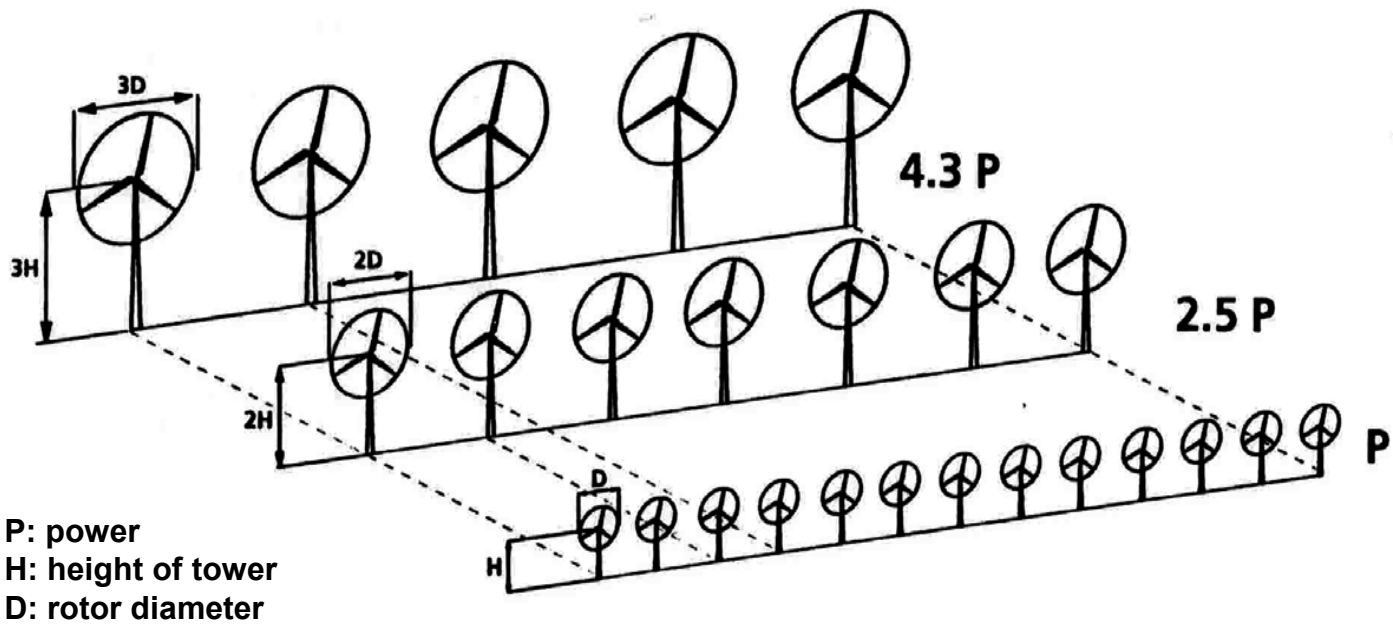
8 x 28m (0,25 MW)



2 x 53m (1 MW)



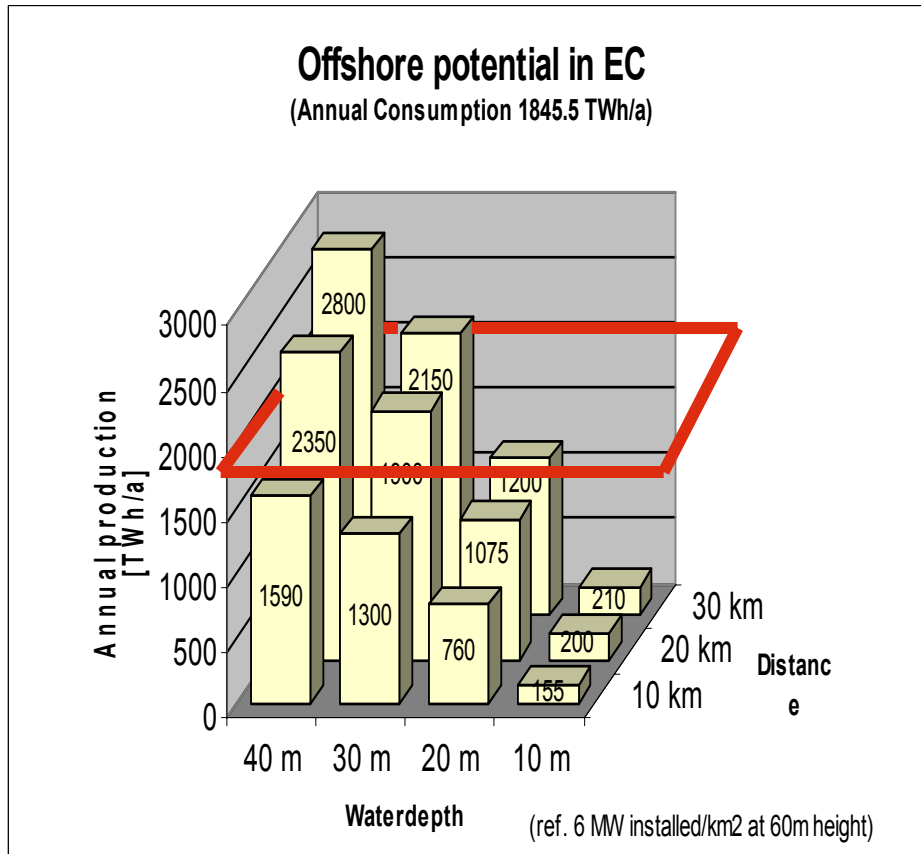
1 x 75m (2 MW)





Offshore wind power in the near future (based on specific projects in preparation)

- **in 2004: 619 MW** (77% in GB)
- **2005-2006: 1590 – 1675 MW** (GB, USA, B, NL, DK)
- **2006-2011: 13,000 MW** (GB 56%, D 31%, CND 10%)



European (12) potential

Far offshore excluded

More studies

Overview

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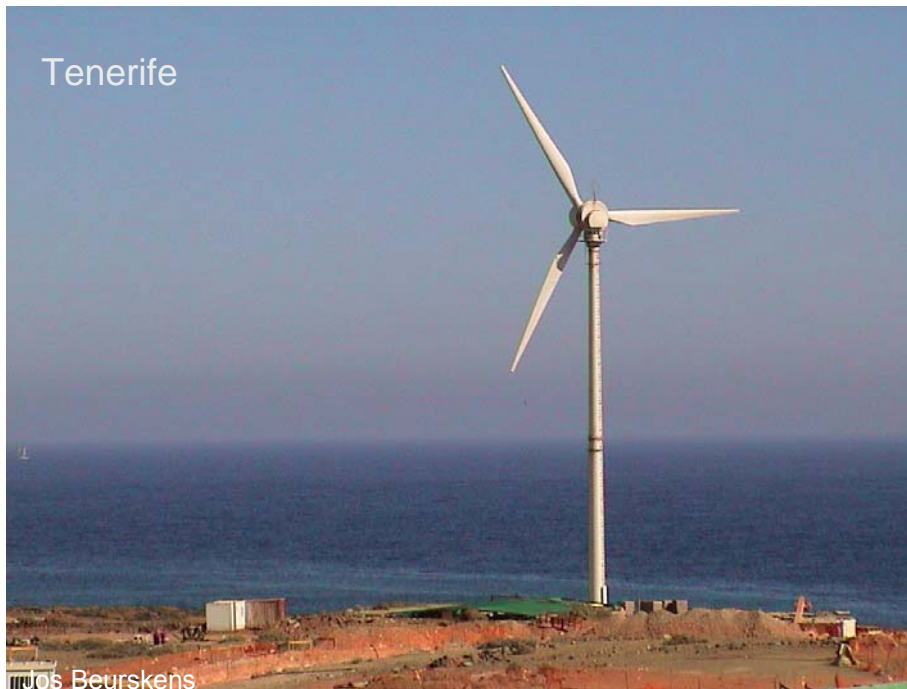
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Giant steps summarised

	1980	2005	Factor
Rotor size	15 m	126 m	8,4
Installed power largest wind turbine	55 kW	5,000 kW	90
Wind energy plant capacity	100 kW	200,000 kW	2,000
Installed power (world)	100 MW	50,000 MW	500
Contribution to electricity supply (Europe)	0.001%	3%	> 10,000

New applications

- **Water supply: pumping, desalination**
- **Food conservation: cooling**



Presently 80% of the installed wind power is located in countries that are not short of energy!

Thank you!