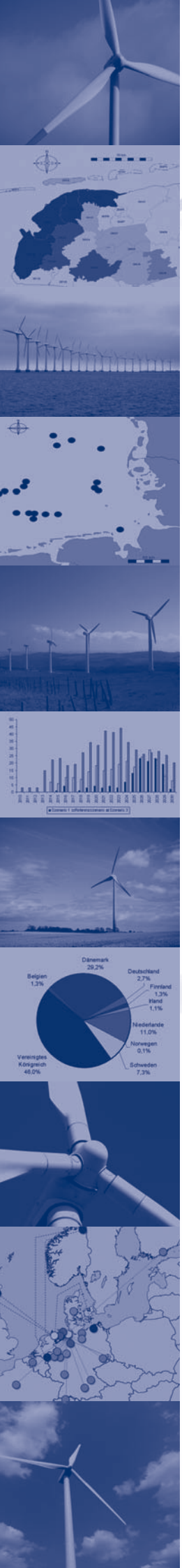

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Short Study

The Market for Foundation Structures in the Offshore Wind Energy in Europe until 2030 (3rd edition)

Technology, Research and Development, Market, Potentials and Competition

- *Political and legal framework conditions for offshore wind energy in Europe and EU countries*
- *Installed and planned offshore wind parks incl. planned and possible fundament types in Europe*
- *Overview of technological development*
- *New installation processes*
- *New manufacturing processes*
- *Cost reduction potentials*
- *Logistic concepts and optimization of supply chain*
- *Market development and potentials*
- *Trends, chances and risks*

The growing offshore wind energy market is facing a range of challenges in the coming years. One in particular is the technological development of foundation structures, enabling the construction of offshore wind parks in water depths of over 50 meters. Likewise, optimization processes have to be developed, in order to reduce costs. Due to stringent requirements on noise emissions greater emphasis will have to be put on new installation processes.

A number of technological solutions already exist: monopiles, tripods, jackets, tripiles and heavy weight foundations. Based on experience and empirical values those are constantly further developed or in some cases deferred. New developments are for example swimming foundations, suction foundations, bionic foundations or delta hybrid foundations.
A comparison of the new developments shows that particularl importance is given to the topics operational capability (e. g. load capacity), manufacturing and installation costs, as well as noise emissions during installation.

Ocean currents, waves and extreme wind conditions, as well as heavy wind turbines of up to 850 tonnes put exceptionally high dynamic strains on the steel and concrete structures. Therefore, the demands on foundation structures are specifically high. The extreme weather conditions at sea also pose a great challenge on the construction of offshore wind parks. According to the interviewed experts, new logistic concepts for wind turbine construction will have to be developed in order to reduce costs and at the same time increase safety.

The planned new edition of the study „The Market for Foundation Structures in the Offshore Wind Energy in Europe until 2030" responds to the rapid pace of the developments in the market. It provides a current overview of e. g. specific data, fields of application, capacity growths as well as advantages and disadvantages of available types of foundation structures in the market. Moreover, the study points out future opportunities and risks in the international market.

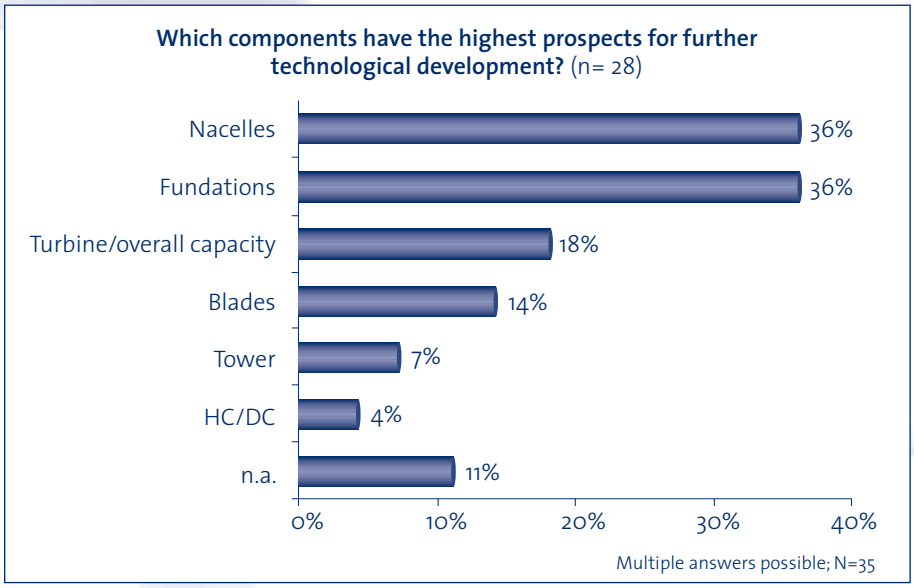

Figure from 2nd edition: One out of three interviewees attributes the highest technological development potential to the foundation structures (Source wind:**research**, 2012)

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The study contains approximately 250 pages. The content may be subject to change.

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