



Results

WINDENERGY TREND:INDEX

AN ONSHORE AND OFFSHORE WIND ENERGY SURVEY

wind:research

 Hamburg
Messe + Congress

in cooperation with



 WindEnergy
Hamburg
The global on- & offshore expo

windenergyhamburg.com

INTRODUCTION

OVERVIEW, PARTICIPATION

The industry's barometer of mood has found its place: The participation remains high and stable, and the rate of completely answered questionnaires is increasing. Representativeness likewise maintains at a high level.

Survey period	Participants	100% answered	Share
1st survey – spring 2018 (16 March to 19 April 2018)	1,187	674	57%
2nd survey – autumn 2018 (25 September to 9 November 2018)	1,655	958	58%
3rd survey – spring 2019 (2 April to 13 May 2019)	1,254	817	65%
<i>Total</i>	<i>4,096</i>	<i>2,449</i>	<i>60%</i>

Representativeness was determined based on the following categories: Regional distribution, activities across the value chain, coverage of different production areas, onshore and offshore segments, responsibilities of the respondent. The distribution of response rates (based on IP addresses) across countries and regions corresponds to the market volume of the respective country or region while accounting for the onshore and offshore segments. This ensured a high level of representativeness. The only exception is China which, due to its relatively isolated market and low response rate, is proportionally underrepresented compared to the rest of the Asia region. This statement relates to existing onshore and offshore capacities as well as the importance, or rather market share, of the wind industry (turbines, towers, foundations, projects, development, etc.).

INTRODUCTION

TASK, METHODOLOGY, PARTICIPANTS

*WindEnergy Hamburg, the leading global trade fair for onshore and offshore wind energy, and wind:research, the leading market research institute for the wind energy industry, have jointly designed an 'industry barometer of mood' which measures the WindEnergy trend: **index** (WETix).*

*The **first survey** took place from 16 March until 19 April 2018. It received roughly 1,200 responses, with more than 700 respondents answering all questions. The **second survey** was held from 25 September until 9 November 2018. This time roughly 1,700 wind energy experts participated and approximately 1,000 of them answered all questions. The **third survey** ran from 2 April until 13 May 2019. 1,254 market experts responded, of whom 817 answered all questions.*

The distribution of response rates (based on IP addresses) across countries and regions corresponds to the market volume of the respective country or region while accounting for the onshore and offshore segments. This ensured a high level of representativeness. The only exception is China which, due to its relatively isolated market and low response rate, is proportionally underrepresented compared to the rest of the Asia region. This statement relates to existing onshore and offshore capacities as well as the importance, or rather market share, of the wind industry (turbines, towers, foundations, projects, development, etc.).

Furthermore, respondent's activities are primarily in the onshore segment; there were nearly twice as many responses from the onshore segment than from offshore. About 40per cent of respondents are active in both market segments.

More than half of responding companies are involved in O&M business activities, among others. Furthermore, nearly half participate in project development activities, and more than 38per cent are manufacturers. Main activities within manufacturing are distributed relatively evenly, with the majority focused on making turbines and rotor blades, as could be expected.

More than two thirds of respondents focus on the German respectively European market. One third of respondents are also active in the Asian and North American markets.

As in previous surveys, a large portion of responding wind energy experts hold a management position (1/4). Nearly 15per cent of respondents work in sales while close to 12per cent are involved in research and development.

In the following diagrams, Germany is represented separately; however, the results for all of Europe include Germany.

SUMMARY

KEY FINDINGS – COMPARISON OF 1ST, 2ND AND 3RD SURVEYS

The third online survey from April until May 2019 again saw a high participation rate and a higher response rate in relative terms. All in all more than 4,000 market stakeholders have taken part to date. The key results are as follows:

For this survey the leading onshore and offshore wind energy nations and regions were determined. North America was another possible option. The rest of the world (ROW) includes Africa, Australia as well as Central and South America.

Representativeness continues to be high and the distribution of respondents has remained nearly the same or similar. Responses from the onshore segment are trending upwards, which may be owed to consolidation in the offshore segment.

The current international environment for onshore wind energy is seen by the experts in a much more positive light than in 2018. However, this does not apply to Germany where conditions are being judged even more critically than before.

The current conditions for offshore wind energy have been receiving increasingly positive reviews, especially so in Asia and North America; only in Germany these values are decreasing, if less markedly than in the onshore segment and overall still on the positive side.

The overall mood in onshore wind energy is by and large positive internationally and in some regions, such as Asia and North America, the spring 2019 values are clearly pointing upwards. The mood in Germany has worsened whereas the European trend is more positive.

The excellent mood in offshore wind energy, which reached a peak value above the two-thirds mark on the scale in 2019, is impressive. Here again a positive trend is discernible in North America, Asia and ROW. The assessments given for the German market are less positive, however the downward trend is not as dramatic as in the onshore segment.

SUMMARY

KEY FINDINGS – COMPARISON OF 1ST, 2ND AND 3RD SURVEYS

The third online survey from April until May 2019 again saw a high participation rate and a higher response rate in relative terms. All in all more than 4,000 market stakeholders have taken part to date. The key results are as follows:

While expectations for the future of the onshore market in Asia or ROW were trending slightly downwards in 2018, they are now significantly more optimistic. Similarly, expectations for North America are much more positive than in 2018 while in Germany there is not very much hope being placed in the market, based on past tenders.

The outlook on the offshore segment in Asia, North America and Europe for the year 2021 is decidedly trending upwards, at least for some regions. The ROW is seen in a more positive light, as well. The mood in Germany has stabilised somewhat compared to 2018.

Experts expect the current wave of consolidation processes to continue at a high level into the coming year. Massive consolidation activities are expected for both the onshore and the offshore segments.

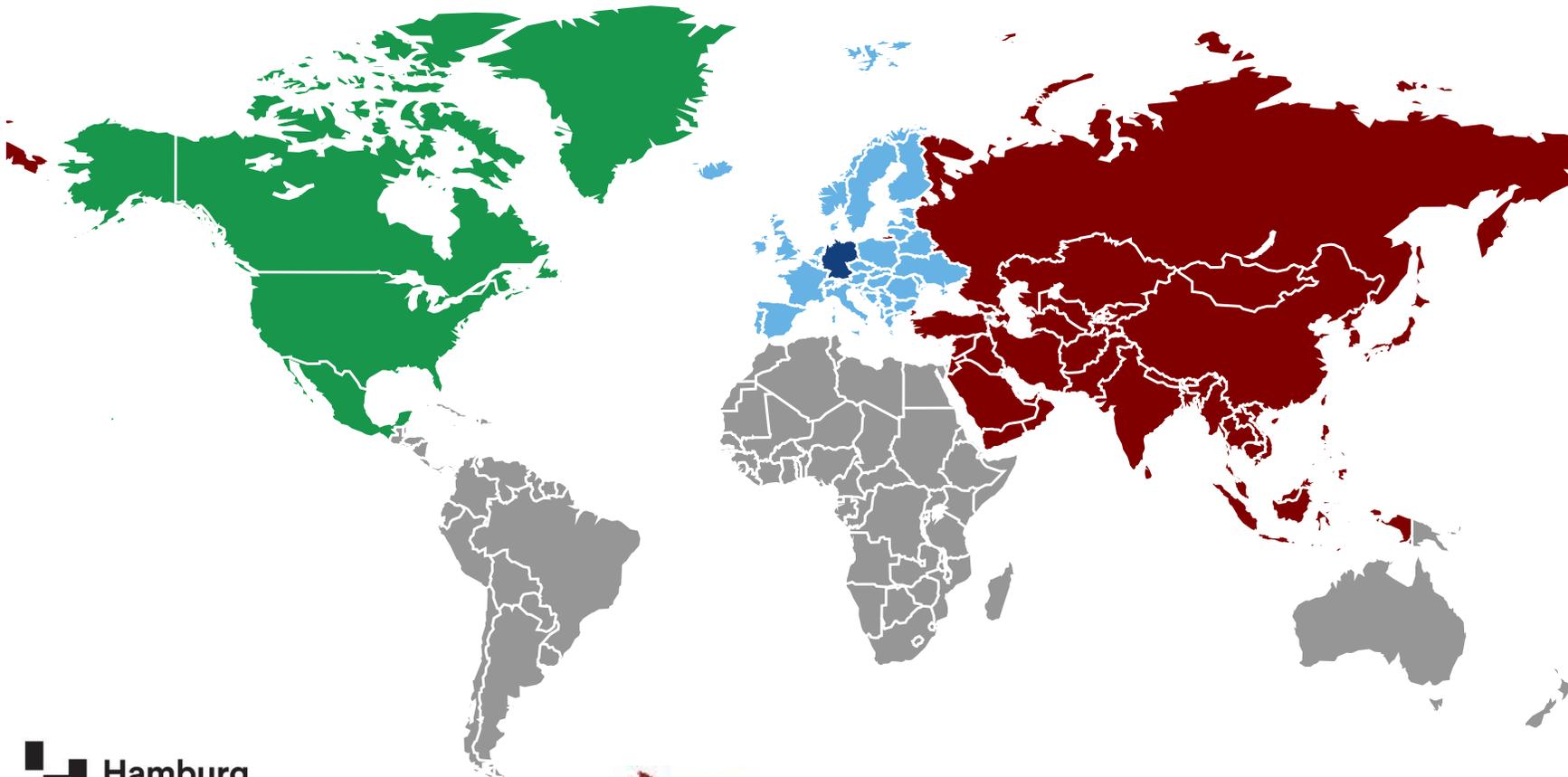
Regarding the optimisation potential through digitalisation there is a strong sense of anticipation and last year's high values have risen even further. There is a notable increase in the offshore wind energy segment in the spring 2019 survey.

There are high to very high expectations of cost savings enabled by new technologies; the values for the onshore segment have remained nearly unchanged whereas the offshore results have topped their high 2018 levels in the spring 2019 survey.

MAP

OVERVIEW OF SURVEYED COUNTRIES

The survey includes all onshore and offshore wind energy nations and regions. Europe, North America and Asia were defined as additional market regions. The rest of the world (ROW) includes Africa, Australia as well as Central and South America.



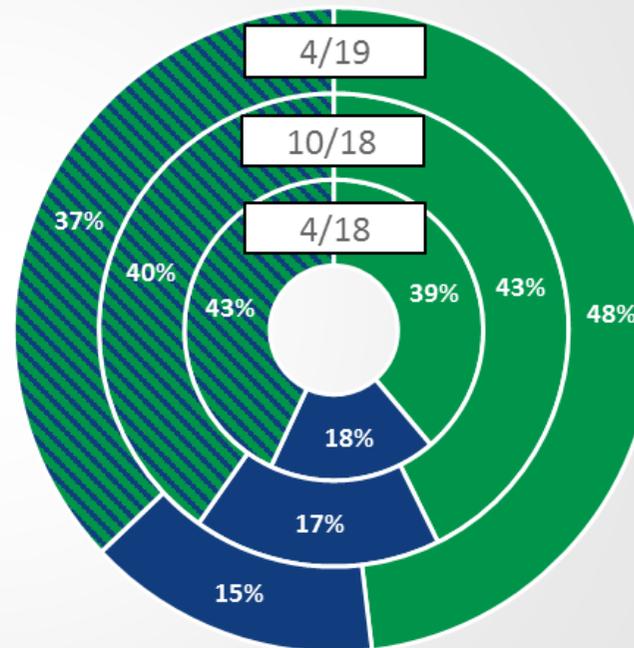
MARKET SEGMENT

Representativeness continues to be high and the distribution of responses has remained nearly the same or similar. Responses from the onshore segment are trending upwards, which may be owed to consolidation in the offshore segment.

In which segment of the wind industry is your company's focus?

Comparison of surveys in 4/18, 10/18 and 4/19; Participants: n(4/18) = 1,091, n(10/18) = 1,504, n(4/19) = 1,206

- Onshore
- Offshore
- Both



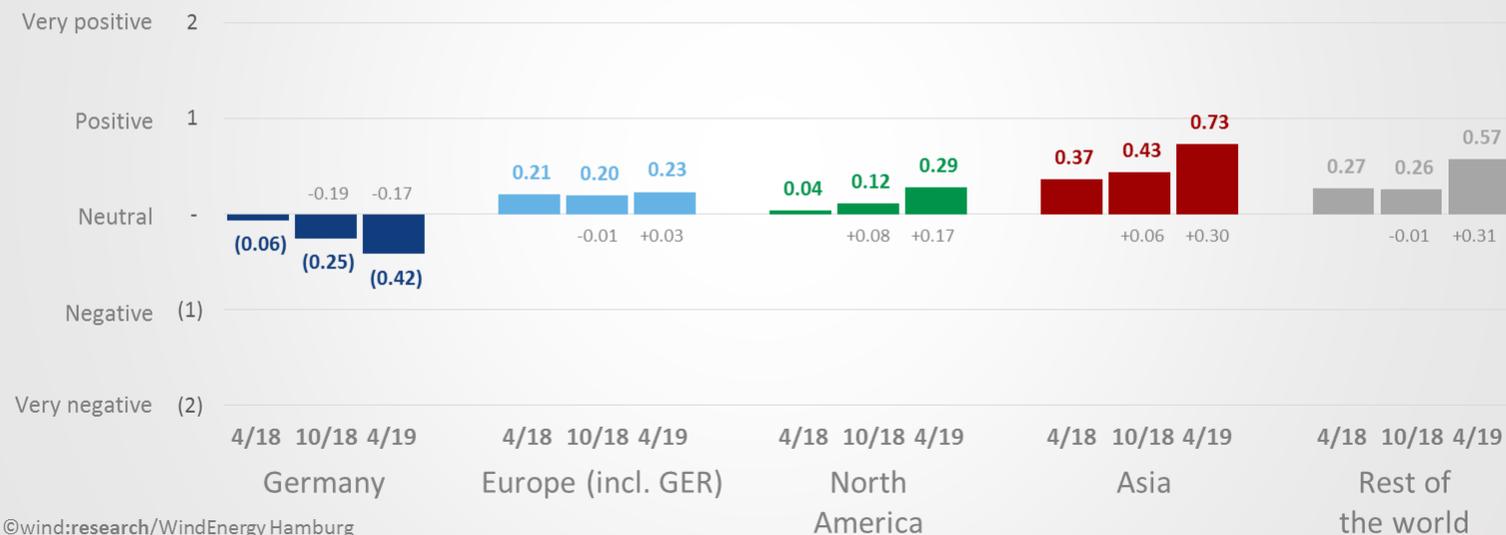
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ASSESSMENT OF THE GENERAL CONDITIONS – ONSHORE

The current international environment for onshore wind energy is seen by the experts in a much more positive light than in 2018. However, this does not apply to Germany where conditions are being judged even more critically than before.

How do you assess the current development of the framework conditions for **onshore** wind energy (overall: legal, political and social)?

Index of surveys in 4/18, 10/18 and 4/19; Scale: very negative (2) to very positive 2



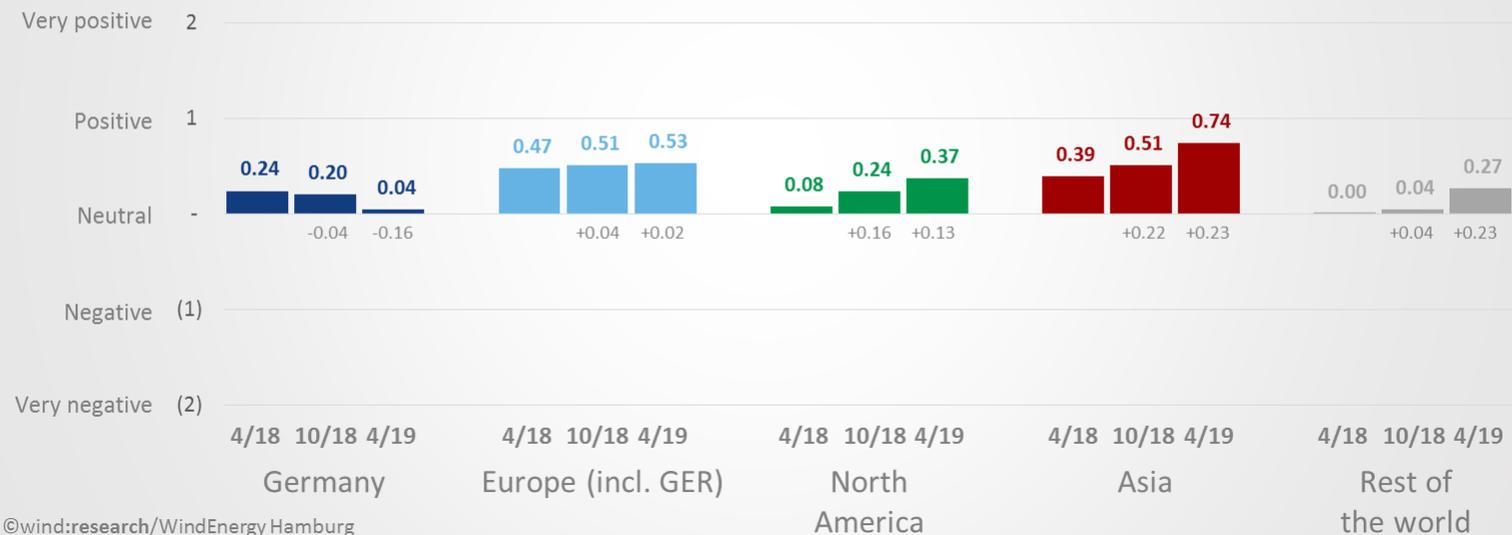
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ASSESSMENT OF THE GENERAL CONDITIONS OFFSHORE

The current conditions for offshore wind energy have been receiving increasingly positive reviews, especially so in Asia and North America; only in Germany these values are decreasing, if less markedly than in the onshore segment and overall still on the positive side.

How do you assess the current development of the framework conditions for **offshore** wind energy (overall: legal, political and social)?

Index of surveys in 4/18, 10/18 and 4/19; Scale: very negative (2) to very positive 2



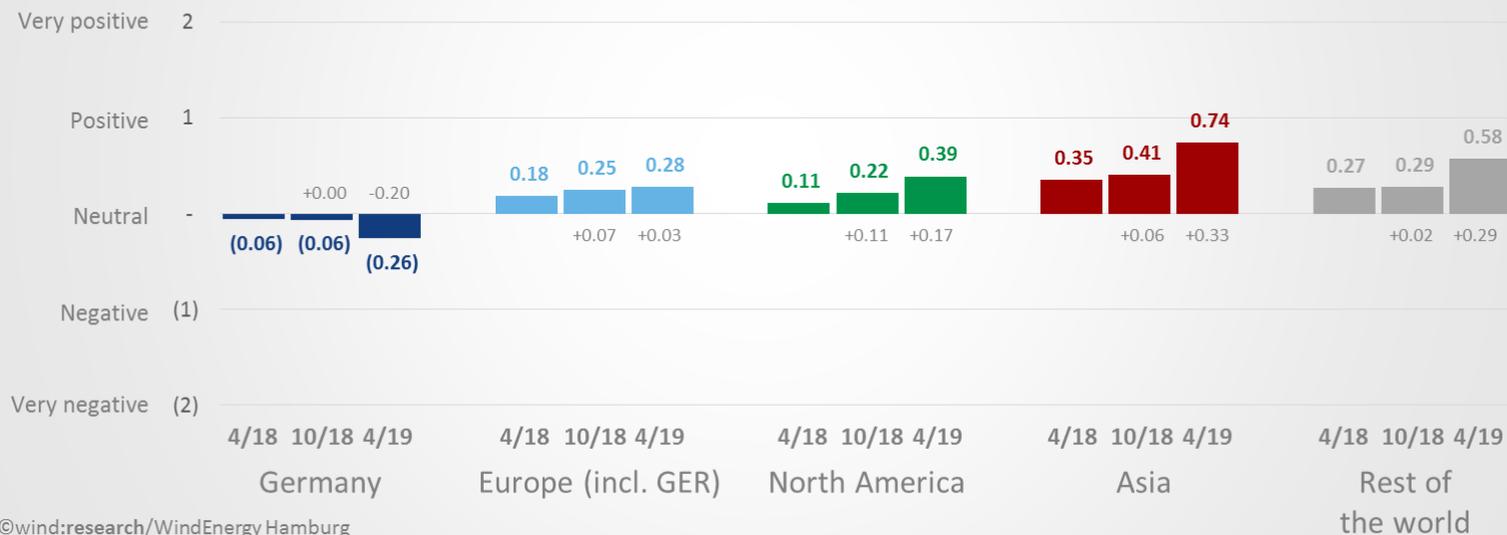
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ASSESSMENT OF THE GLOBAL WIND MARKET – ONSHORE

The overall mood in onshore wind energy is by and large positive internationally and in some regions, such as Asia and North America, the spring 2019 values are clearly pointing upwards. The mood in Germany has worsened whereas the European trend is more positive.

How do you assess the global market for the **onshore** wind industry for the current year?

Index of surveys in 4/18, 10/18 and 4/19; Scale: very negative (2) to very positive 2



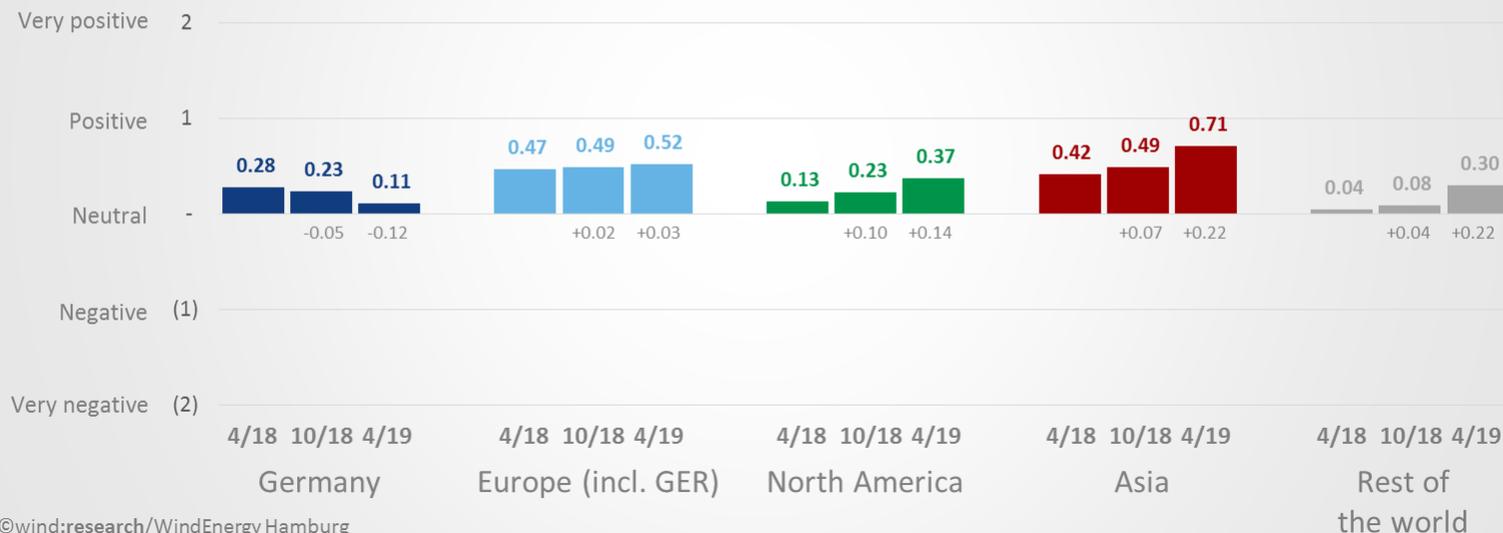
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ASSESSMENT OF THE GLOBAL WIND MARKET – OFFSHORE

The excellent mood in offshore wind energy, which reached a peak value above the two-thirds mark on the scale in 2019, is impressive. Here again a positive trend is discernible in North America, Asia and ROW. The assessments given for the German market are less positive, however the downward trend is not as dramatic as in the onshore segment.

How do you assess the global market for the **offshore** wind industry for the current year?

Index of surveys in 4/18, 10/18 and 4/19; Scale: very negative (2) to very positive 2



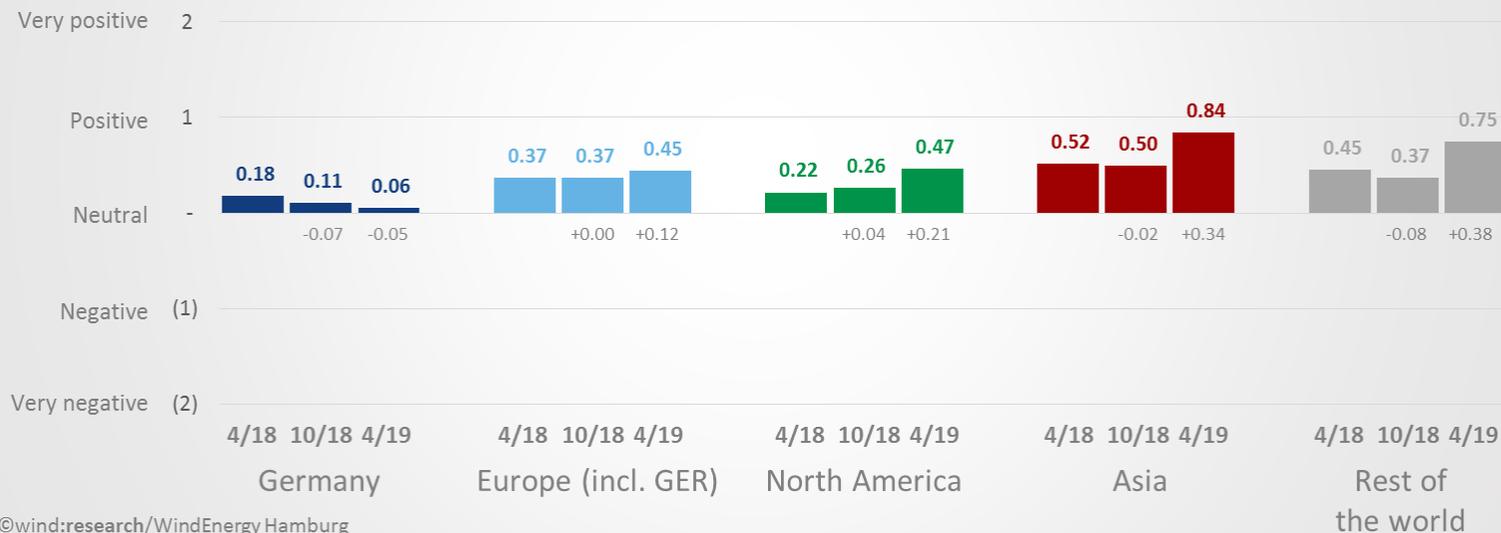
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ASSESSMENT OF THE GLOBAL WIND MARKET – ONSHORE

While expectations for the future of the onshore market in Asia or ROW were trending slightly downwards in 2018, they are now significantly better. Similarly, expectations for North America are much more positive than in 2018 while in Germany there is not very much hope being placed in the market, based on past tenders.

How do you assess the global market for the **onshore** wind industry in two years?

Index of surveys in 4/18, 10/18 and 4/19; Scale: very negative (2) to very positive 2



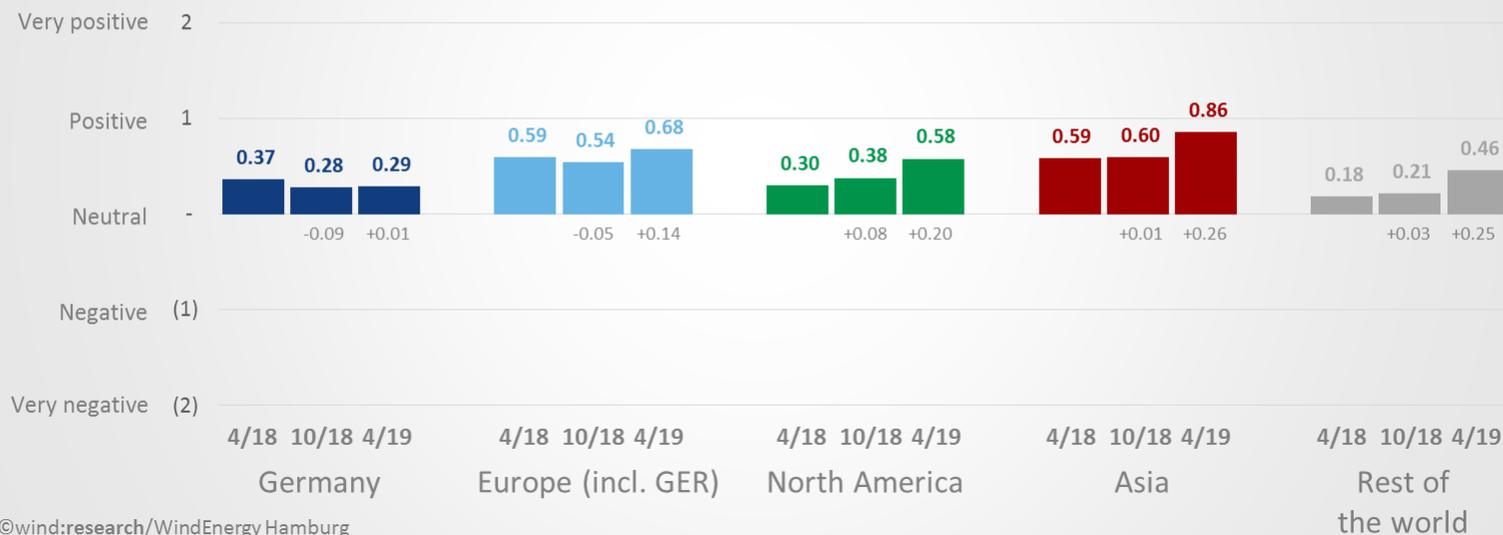
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ASSESSMENT OF THE GLOBAL WIND MARKET – OFFSHORE

The outlook on the offshore segment in Asia, North America and Europe for the year 2021 is decidedly trending upwards, at least for some regions. The ROW is seen in a more positive light, as well. The mood in Germany has stabilised somewhat compared to 2018.

How do you assess the global market for the **offshore** wind industry in two years?

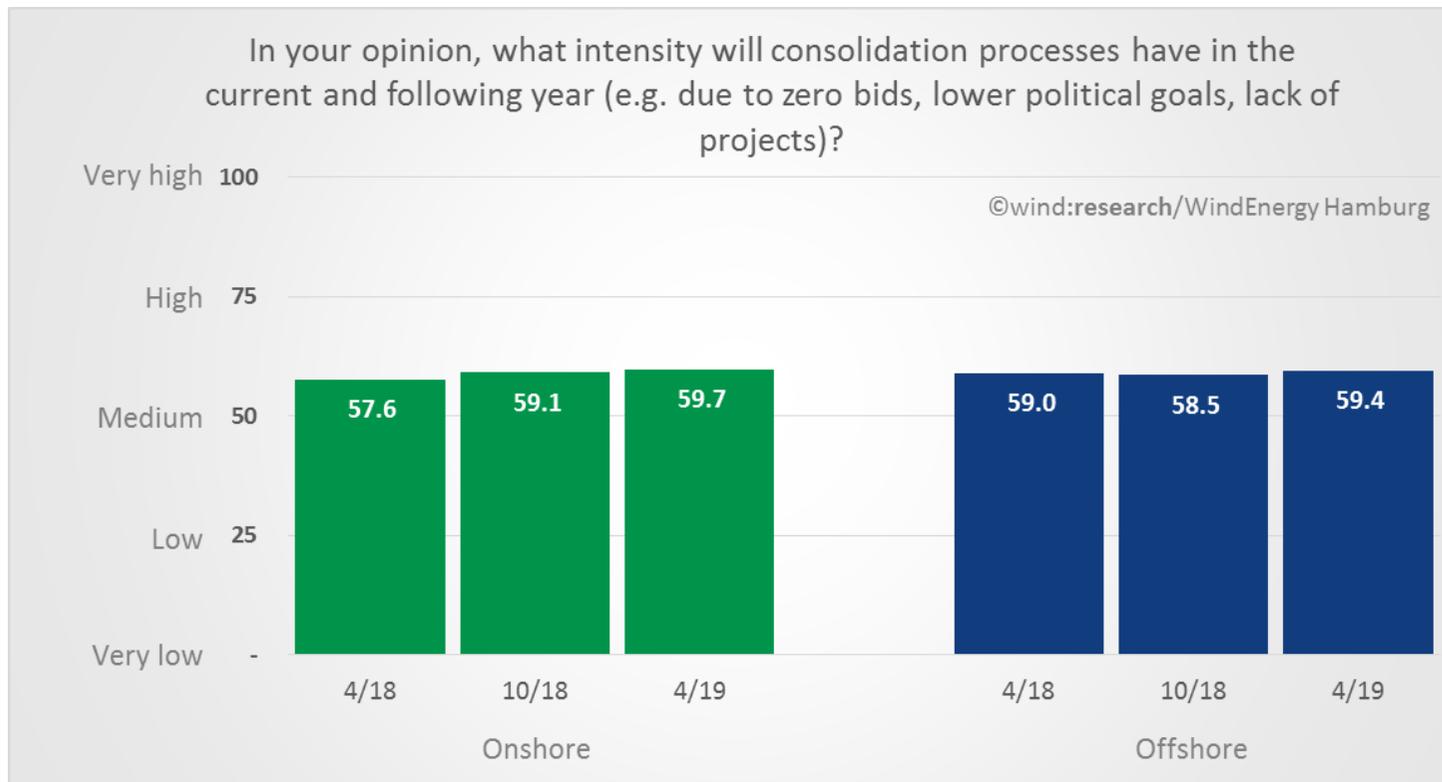
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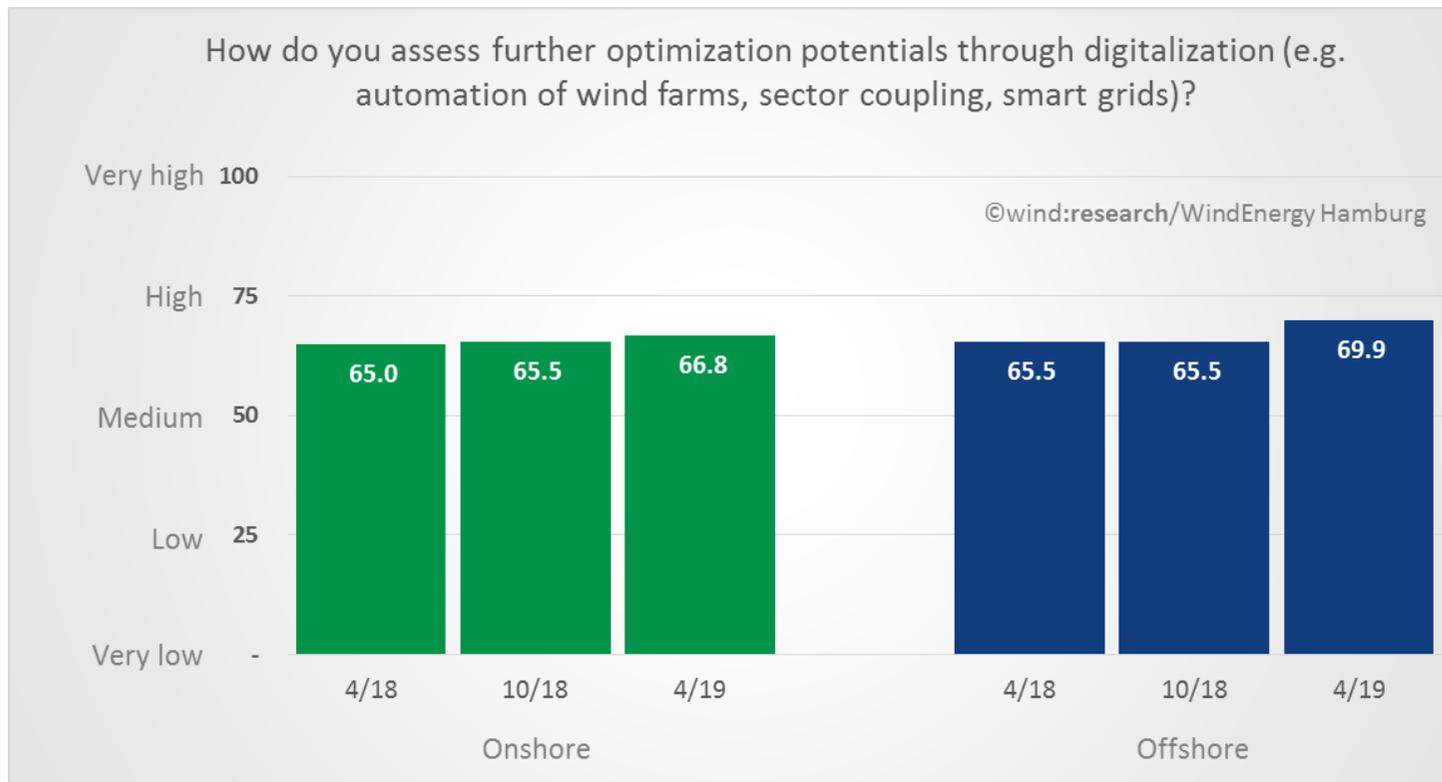
INTENSITY OF CONSOLIDATION PROCESSES

Experts expect the current wave of consolidation processes to continue at a high level into the coming year. Massive consolidation activities are expected for both the onshore and the offshore segments.



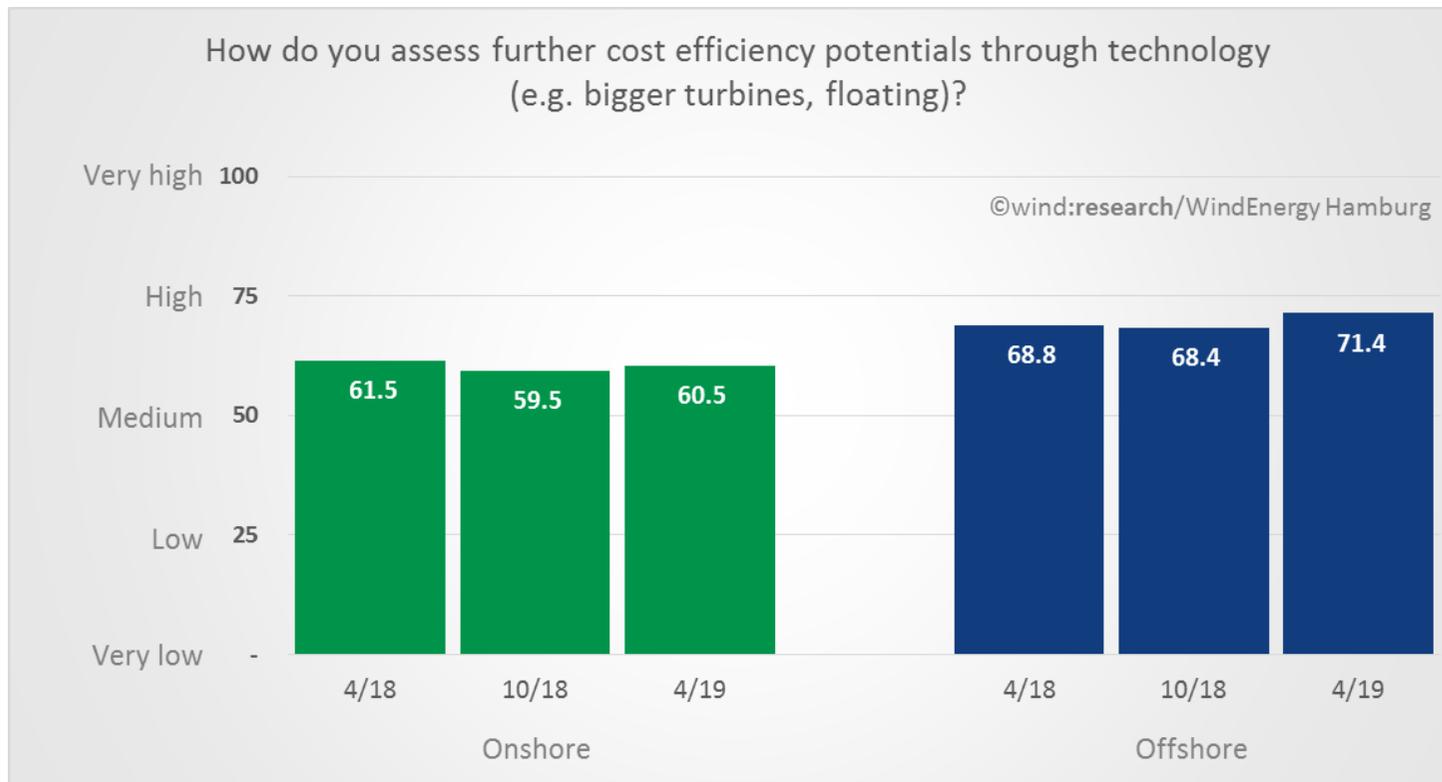
OPTIMIZATION THROUGH DIGITALIZATION

Regarding the optimisation potential through digitalisation there is a strong sense of anticipation and last year's high levels have risen further. There is a notable increase in the offshore wind energy segment in the spring 2019 survey.



COST REDUCTION THROUGH NEW TECHNOLOGIES

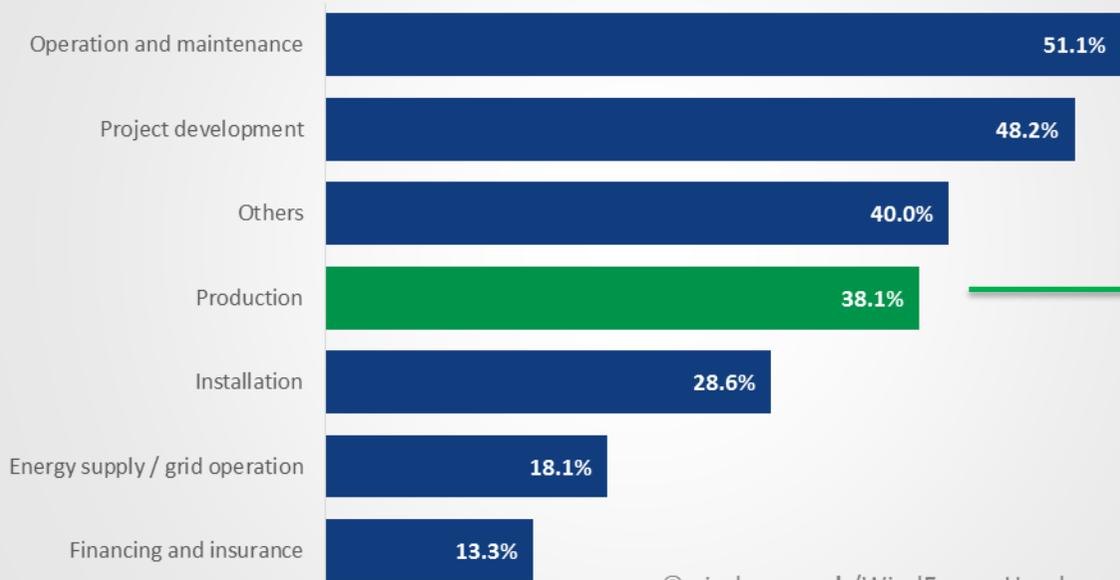
There are high to very high expectations of cost savings enabled by new technologies; the values for the onshore segment have remained nearly unchanged whereas the offshore results have topped their high 2018 levels in the spring 2019 survey.



VALUE CHAIN ACTIVITIES

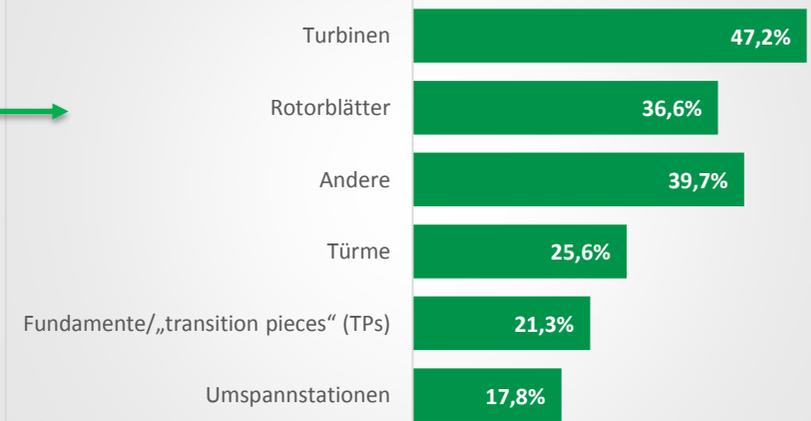
More than half of responding companies are involved in O&M business activities, among others. Furthermore, nearly half participate in project development activities, and more than 38per cent are manufacturers. Main activities within manufacturing are distributed relatively evenly, with the majority focused on making turbines and rotor blades, as could be expected.

On which level of the value chain is your company's activity in the wind energy industry? (Multiple answers possible)



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Itemization of answer "Production"

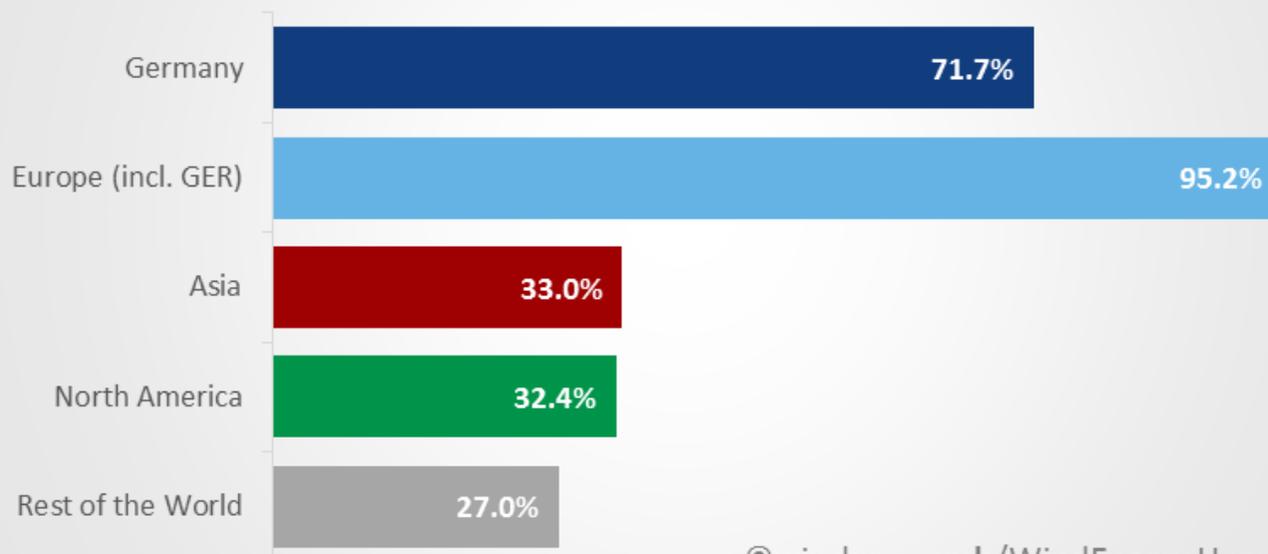


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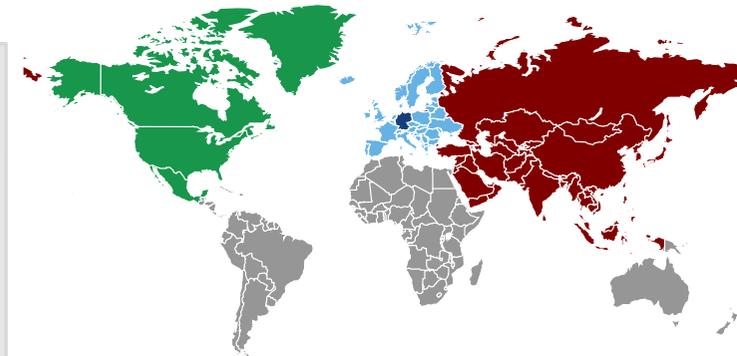
REGIONAL FOCUS

More than two thirds of respondents focus on the German respectively European market. One third of respondents are also active in the Asian and North American markets.

On which countries is your company's focus?
(Multiple answers possible)

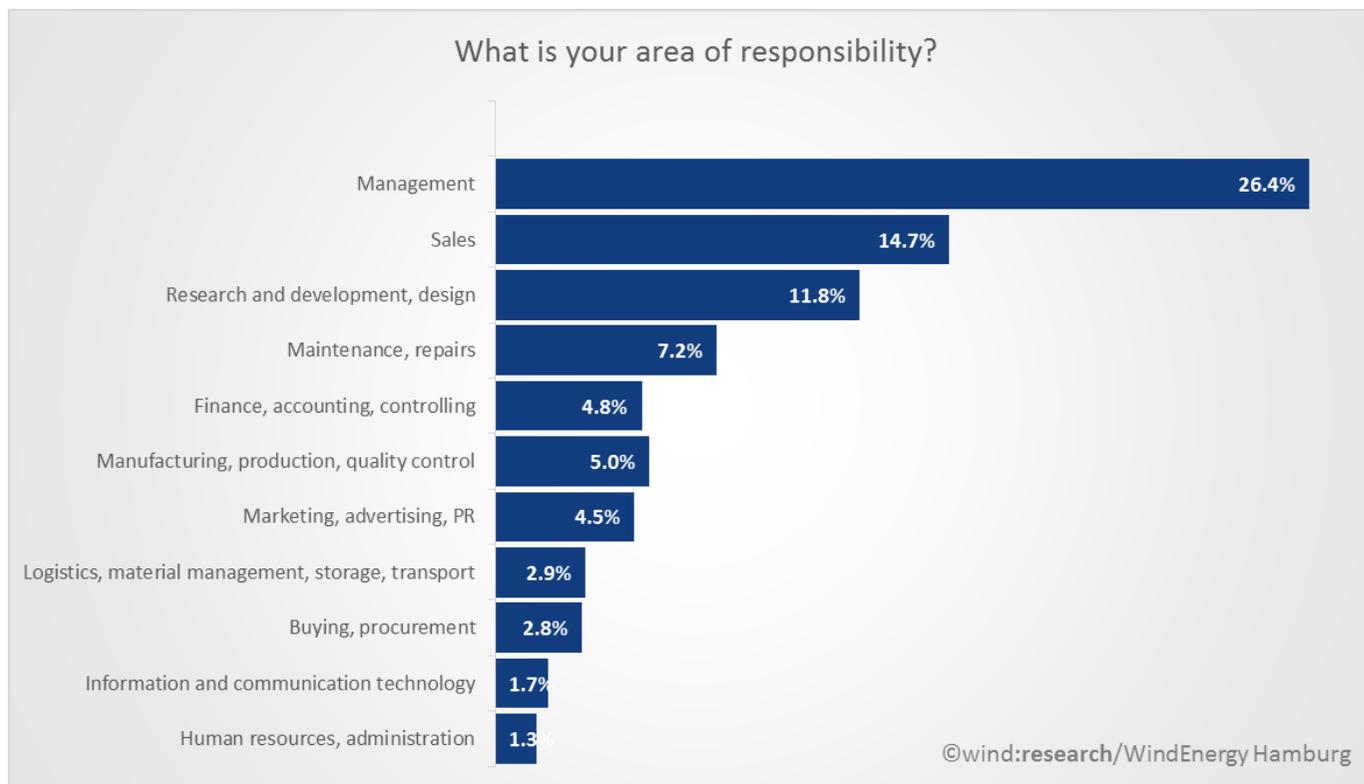


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RESPONSIBILITIES OF THE PARTICIPANTS

As in previous surveys, a large portion of responding wind energy experts hold a management position (1/4). Nearly 15per cent of respondents work in sales while close to 12per cent are involved in research and development.



WETIX: WIND ENERGY TREND INDEX

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