

RESULTS

WIND ENERGY

trend:index

MOOD BAROMETER FOR
THE ONSHORE AND
OFFSHORE WIND INDUSTRY
SPRING 2023

09-05-2023



WindEnergy
Hamburg
The global on & offshore event



wind:research

INTRODUCTION

OVERVIEW & PARTICIPATION

This edition of the WEtix online survey was visited by almost 1,000 people, 443 of whom completed the questionnaire entirely, and 543 in part. This puts participation at 55 %, a median value compared to earlier surveys.

#	Survey period	Visitors	Survey started	Survey completed	Visitor participation rate	Visitor completion rate	Survey completion rate
1	Q2 2018 (16/03 – 19/04/2018)	1,952	1,187	674	61 %	35 %	57 %
2	Q4 2018 (25/09 – 09/11/2018)	2,414	1,655	958	69 %	40 %	58 %
3	Q2 2019 (02/04 – 13/05/2019)	2,299	1,254	817	55 %	36 %	65 %
4	Q4 2019 (23/10 – 30/11/2019)	1,582	1,026	712	65 %	45 %	70 %
5	Q2 2020 (17/03 – 29/04/2020)	1,867	1,156	782	62 %	42 %	68 %
6	Q4 2020 (27/08 – 16/10/2020)	2,517	1,277	865	51 %	34 %	68 %
7	Q2 2021 (23/03 – 04/05/2021)	1,384	501	334	36%	24 %	67 %
8	Q4 2021 (09/09 – 28/10/2021)	1,459	502	322	34 %	22 %	64 %
9	Q2 2022 (14/03 – 14/04/2022)	1,477	874	608	59 %	41 %	70 %
10	Q4 2022 (26/09 – 03/11/2022)	1,360	842	518	62 %	38 %	62 %
11	Q2 2023 (13/03 – 28/04/2023)	986	543	443	55 %	45 %	82 %
Total		19,297	10,817	7,033	55 %	36 %	66 %

Representativeness was determined based on the following categories: Regional distribution, activities across the value chain, coverage of different production areas, onshore and offshore segments, position of 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 ensures 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 market share, of the wind industry (turbines, towers, foundations, projects, development, etc.)₂

INTRODUCTION

Objective, Method, Participants

*WindEnergy trend: **index** (WEtix) is a semi-annual survey first launched in 2018 by WindEnergy Hamburg, the leading global trade fair for onshore and offshore wind energy, in collaboration with wind:research, the leading market research institute for the wind energy industry, to gauge the mood in the industry.*

- The survey covers all onshore and offshore regions globally. The following market regions were defined: Germany, Europe (including Germany), North America, Asia, and Rest of World (RoW).
- In the following diagrams, Germany is reflected individually; however, the results for all of Europe include Germany, as well.
- Around 15 per cent of respondents work in the offshore segment exclusively and roughly 40 per cent are primarily active in the onshore segment. About 38 per cent are involved in both the onshore and offshore segments.
- 37 per cent of respondents work in operation and maintenance. Furthermore, around 40 per cent are active in manufacturing as well as planning and project development, and roughly one fifth perform installation-related work. Activities within manufacturing – by far the most prominent sector, accounting for significantly more than 52 per cent – are mostly focused on production of turbines and rotor blades.
- About 69 per cent of respondents primarily do business in Germany, and around 70 per cent are focused on Europe. 30 per cent each are active in North America and Asia, and 22 per cent in the rest of the world.
- More than one third of survey participants hold positions in business, corporate or operations management, followed by respondents from sales, R&D and design as well as maintenance and service.

INTRODUCTION

KEY FINDINGS –

COMPARING SURVEYS 1 to 10

The excellent results from the previous surveys were mostly repeated in this WETix survey. The mood among the respondents to the current WETix received better marks for both, the onshore and offshore segments.

- The general conditions for wind energy again received mostly positive assessments. Compared to the previous six-month survey period, some of the assessments are now trending upwards, with only Europe and the rest of the world declining slightly.
- For Germany, the views about the economic environment for wind have improved somewhat. Following a steep rise since the second half of the year 2019, the overall picture has stabilised more recently.
- Across all regions, assessments of the global market generally draw a uniform picture: After a slight downturn in the previous survey, there is now a subdued upward trend.
- Assessments of the market situation in Germany are unfavourable by comparison. However, in the present survey Germany no longer shows the sharpest declines, with improvements visible here or there. Notwithstanding, Germany places second worst on the four questions addressing the market situation.

INTRODUCTION

KEY FINDINGS –

COMPARING SURVEYS 1 to 10

Assessments of the global markets betray a slightly positive mood. In a short-term retrospective especially, all markets are showing improvements.

- With assessments changing only minimally – whether in a positive or negative direction – the European market is practically stagnating. The curve very much resembles that for Germany, a plausible outcome since as a European country, Germany influences the market assessments for the entire continent.
- Opinions about the long-term North American market are maintaining their high level. While short-term ratings are improving more visibly, this is consistent with the more general picture of periodical mood changes.
- Asia is showing a slight improvement, especially looking ahead to the coming twelve-month period. The long-term changes are very small, creating a general impression of stagnation.
- The rest of the world reveals a minor improvement over the short term, with the general level always remaining below that of other regions, both for the onshore and offshore markets.

INTRODUCTION

KEY FINDINGS –

COMPARING SURVEYS 1 to 10

The mood in Germany receives similar assessments as in other regions (i.e., apart from some rising trends there are some items showing losses). Thus Germany retains its high assessment level, and compared to all surveys conducted to date, the result remains in the upper mid-level.

- The overall mood remains positive. There is no industry segment, time or region with the mood declining into the negative quadrant; in the context of all WETix trend surveys conducted so far, most ratings are still in the medium to upper range. This applies to Germany in particular, a country which used to return the poorest results among all regions in nearly every one of the past surveys. Following a slight decline in previous surveys, an upwards tendency can now be detected.
- All regions continue to show very similar assessment levels. While in past surveys, assessments for some regions differed substantially from the others, the picture in the present WETix is very similar everywhere.
- What has also shrunk in this WETix is the difference between the onshore and offshore segments. Nevertheless, the mood remains somewhat better in the offshore wind industry although some of the short-term expectations for the onshore market are very positive.

INTRODUCTION

KEY FINDINGS –

COMPARING SURVEYS 1 to 10

*The results of the WindEnergy trend:**index** confirm the impression of wide-spread concerns throughout the wind industry about insufficient education and training options. Meanwhile, the perception of saving potential stagnates.*

- This WETix again reflects wide-spread concerns regarding the availability of skilled labour. More than 66 % of respondents assign high or very high importance to the availability of education and training programmes for wind energy.
- After the last issue of this report signalled an end to the period of stagnation in the assessments of saving potential, the latest survey hardly shows a change of opinions.
- The question about turbine sizes and power output expected by 2030 for both the onshore and offshore segments, included in this WETix survey for the first time, addresses the potential for further technological progress. For both segments, respondents expressed expectations of an increase of turbine output power.

INTRODUCTION

KEY FINDINGS –

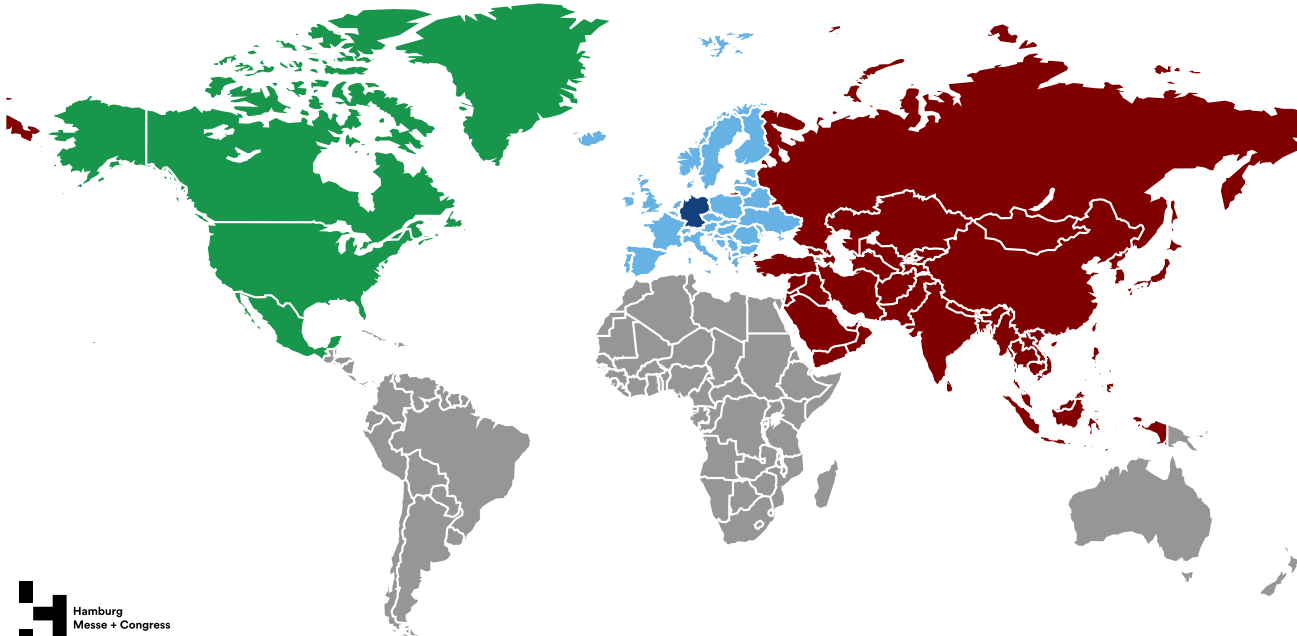
COMPARING SURVEYS 1 to 10

In this WETix survey, the importance of hydrogen production for wind energy was rated lower than ever before.

- Following the sharp downturn of the mood regarding the role of green hydrogen production for the wind industry as seen in the last edition of the WETix, a further decline is visible this year.
- Only 20 per cent of respondents now ascribe 'high' or 'very high' importance to hydrogen production. A major portion of survey participants say the importance is 'low' at best. More than one fourth see the importance at an intermediate level.
- This negative outcome might reflect continuing "disillusionment" after the presentation of the national hydrogen strategy and other current energy policy-related challenges.

OVERVIEW OF COUNTRIES STUDIED

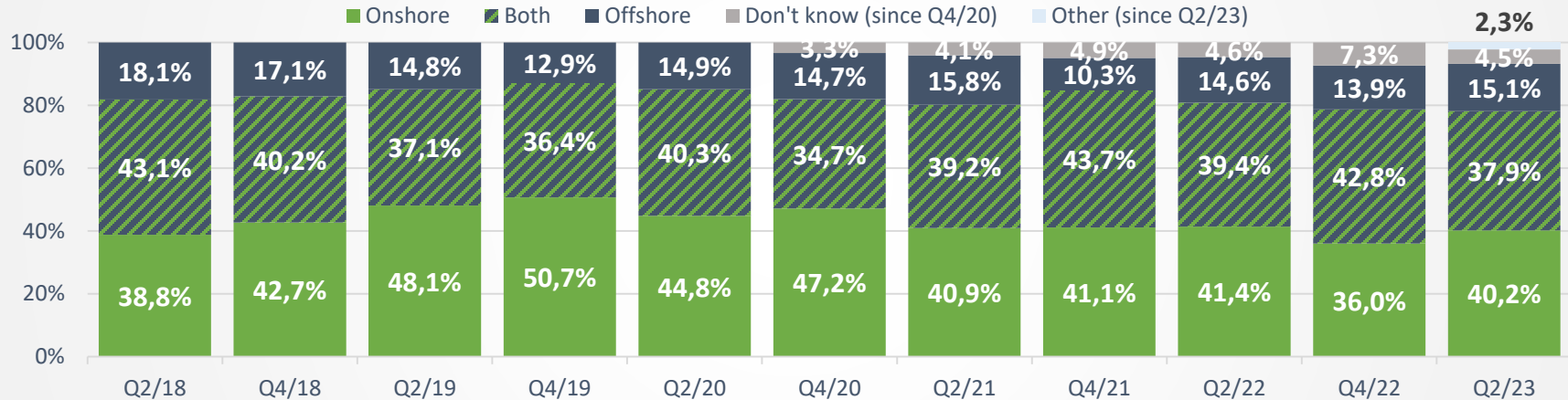
The survey covers all onshore and offshore wind energy regions globally. The pre-defined market regions were: Germany, Europe (including Germany), North America, Asia and Rest of World (RoW), including Africa, Australia as well as Central and South America.



MARKET SEGMENTS

Around 15 per cent of respondents work in the offshore segment exclusively and roughly 40 per cent are primarily active in the onshore segment. About 38 per cent are involved in both the onshore and offshore segments. Companies identifying as “other” often hail from the hydrogen or photovoltaics industries.

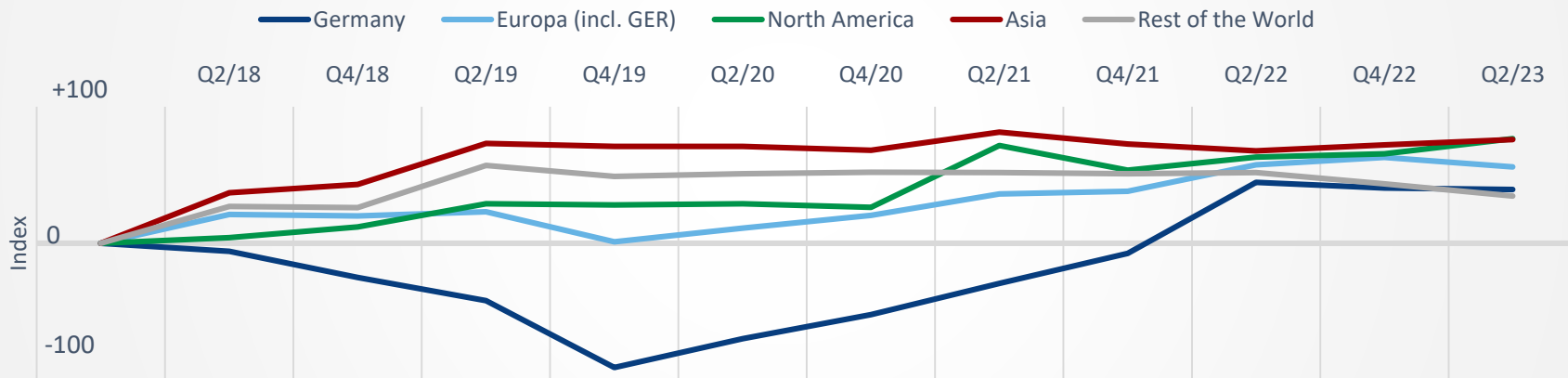
In which segment of the wind industry is your company's focus?



ASSESSMENT OF ECONOMIC ENVIRONMENT ONSHORE WIND

Assessments of the current business environment for offshore wind in Asia and North America continue to trend upwards, now showing very similar values. Germany is stagnating around the index value of 40, which means that for the first time Germany no longer has the lowest rating.

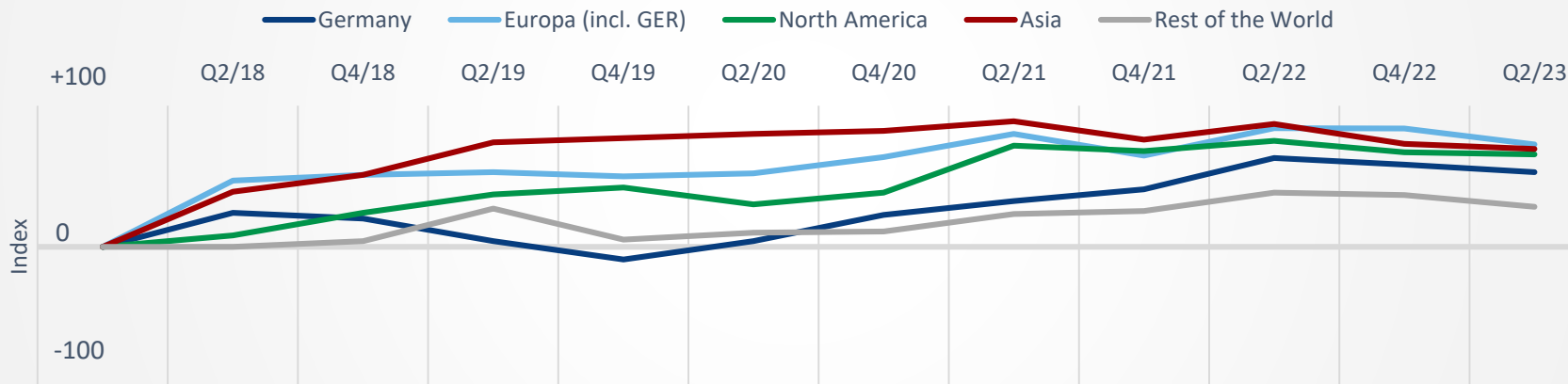
How do you assess the current development of the framework conditions for **onshore wind energy** (overall: legal, political and social)?



ASSESSMENT OF ECONOMIC ENVIRONMENT OFFSHORE WIND

In this WETix, the assessments of the business environment for the offshore wind segment are slightly more negative than six months ago. The most pronounced decline is seen for the rest of the world which continues to receive the poorest marks.

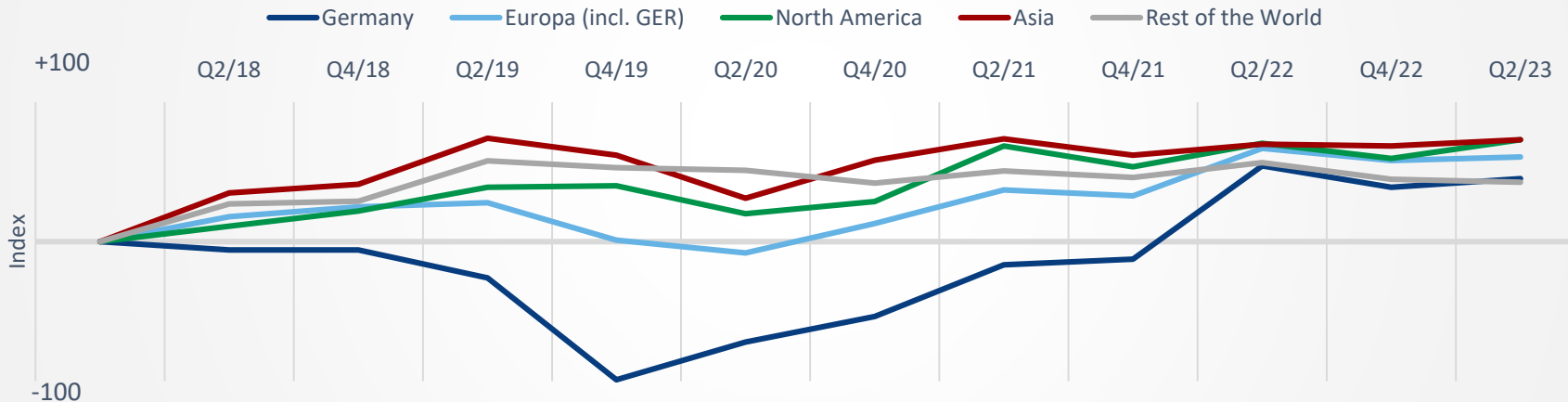
How do you assess the current development of the framework conditions for **offshore wind energy** (overall: legal, political and social)?



ASSESSMENT OF ONSHORE WIND MARKET GLOBAL – PRESENT

Views of the current global market for the onshore wind industry are mostly optimistic: Asia and North America are now nearly neck-and-neck, approaching the top rating. Germany has gained significantly, for the first time receiving more positive ratings than the rest of the world.

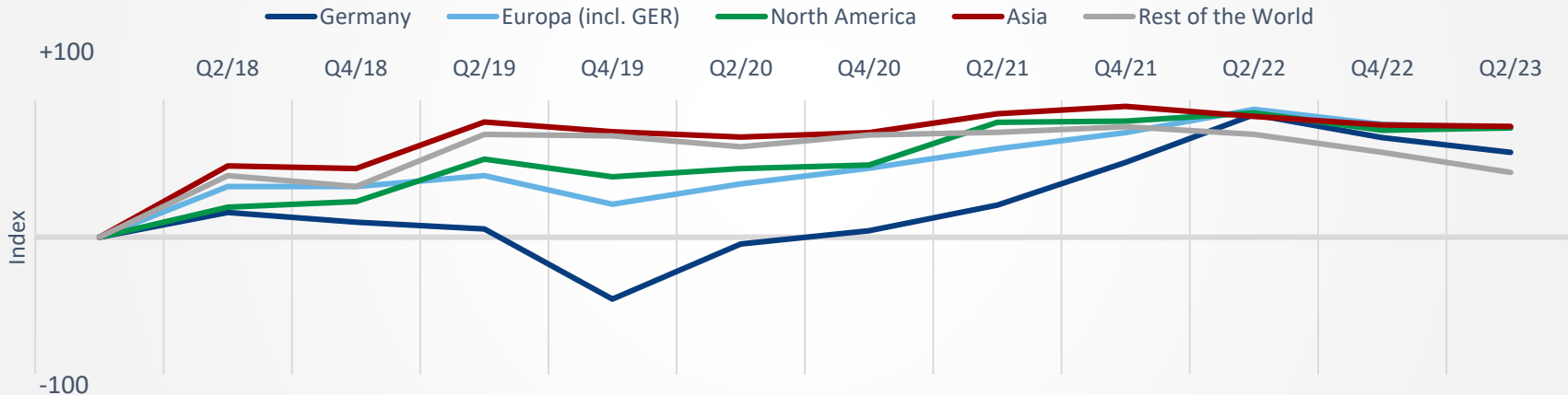
How do you assess the global market for the **onshore wind industry**
in the next twelve months?



ASSESSMENT OF ONSHORE WIND MARKET GLOBAL – NEXT TWO YEARS

As in previous WETix editions, expectations for the future market are more positive than the assessments of the present situation. The European, North American and Asian markets continue to receive very positive marks, if with slight losses here or there. Ratings of the German market, while still clearly in the positive quadrant, show the most pronounced decline, apart from the rest of the world.

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

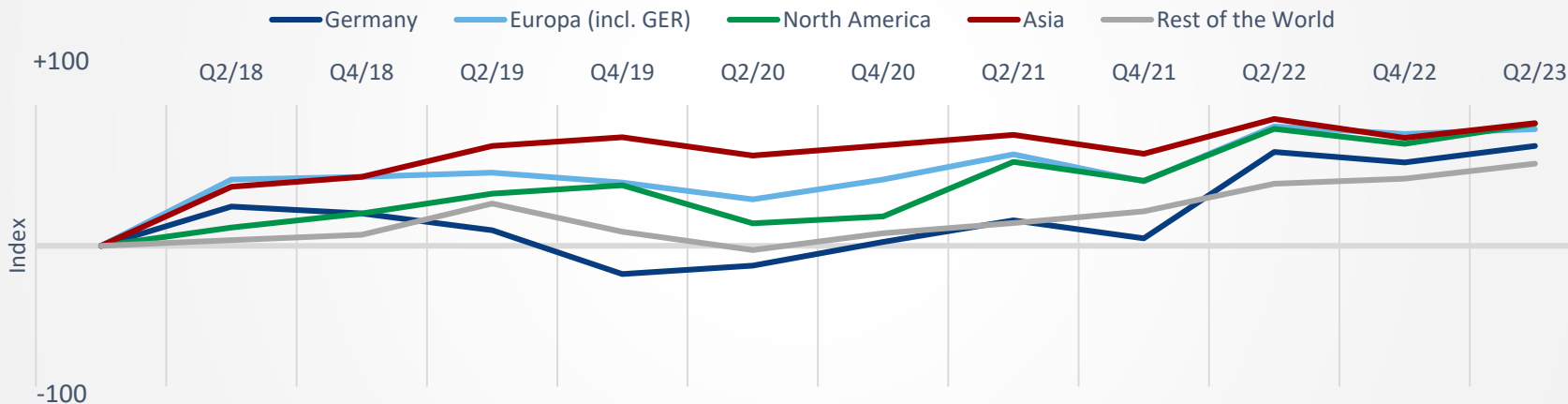


ASSESSMENT OF OFFSHORE WIND MARKET

GLOBAL – PRESENT

As in the previous WETix, the current market for offshore wind energy is receiving better marks than the onshore market in every single region. Across all regions, the mood has improved somewhat; Germany is seeing the second strongest improvement, approaching the assessment level of the European region.

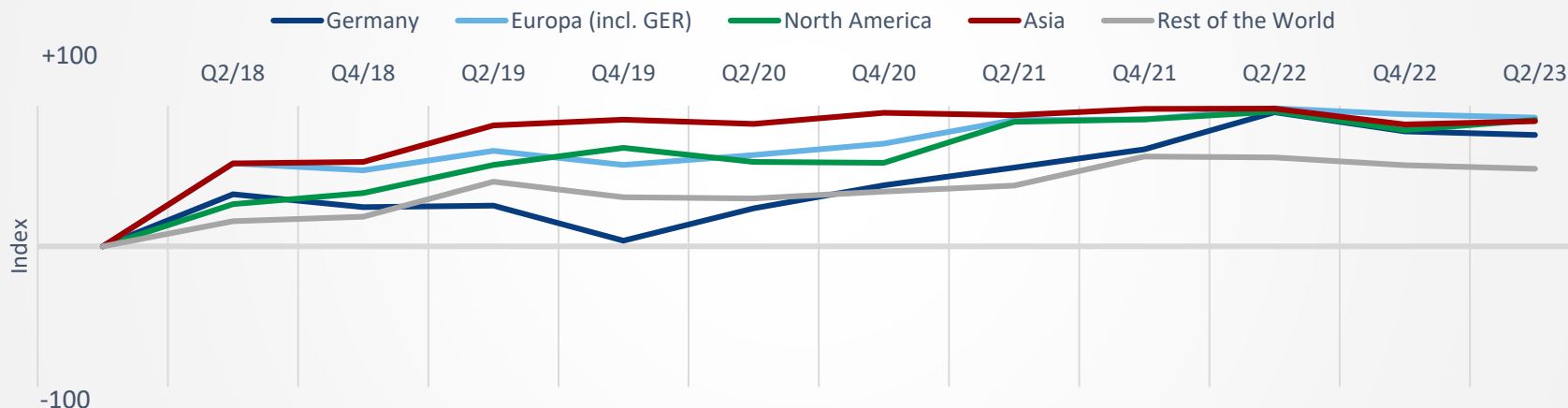
How do you assess the global market for the **offshore wind industry** in the next twelve months?



ASSESSMENT OF OFFSHORE WIND MARKET GLOBAL – NEXT TWO YEARS

The assessments of the future global market for the offshore wind industry draw a mixed picture. Germany, Europe and the rest of the world indicate a slight decline, while Asia and North America again receive slightly more positive ratings in this WETix.

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

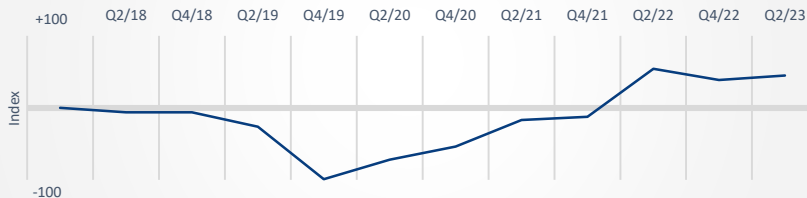


ASSESSMENT OF THE ONSHORE AND OFFSHORE WIND MARKET IN GERMANY

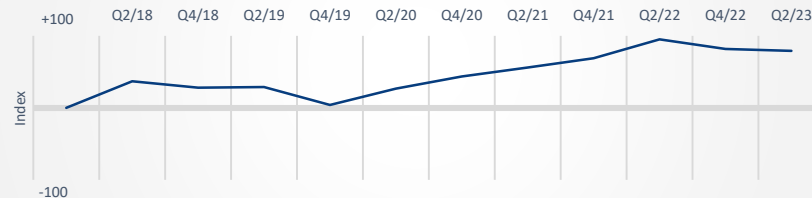
COMPARISON CURRENT VS. IN TWO YEARS

After the mood in the German market had waned somewhat in recent surveys, this WETix reveals an upturn in both segments for the coming twelve-month period. However, expectations for the next two years are again a bit more negative.

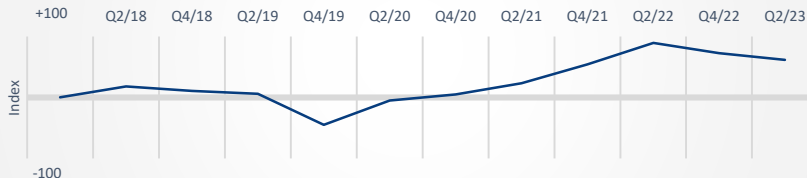
How do you assess the global market for the **onshore wind industry** in Germany in the next twelve months?



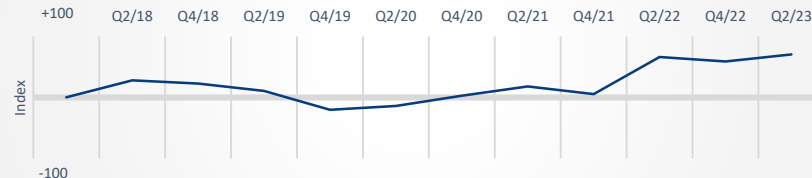
How do you assess the global market for the **offshore wind industry** in Germany in the next two years?



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



How do you assess the global market for the **offshore wind industry** in Germany in the next twelve months?

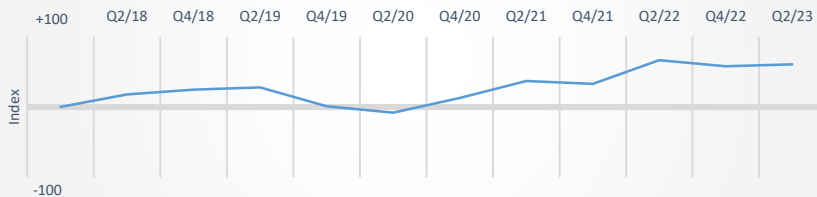


ASSESSMENT OF THE ONSHORE AND OFFSHORE WIND MARKET IN EUROPE (INCL. GERMANY)

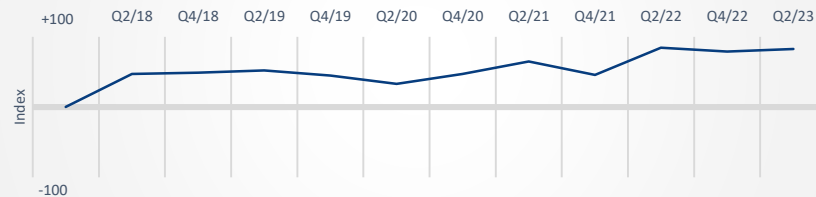
COMPARISON CURRENT VS. IN TWO YEARS

The general development of the mood in Europe resembles that in Germany – which is explicitly included in the Europe results. However, the decline for all of Europe is so slight that the latest results should be seen as indicative of a stagnation at a high level.

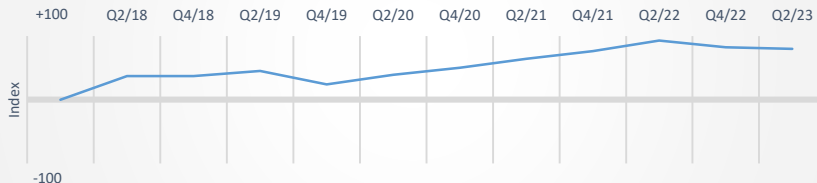
How do you assess the global market for the **onshore wind industry** in Europe (incl. GER) in the next twelve months?



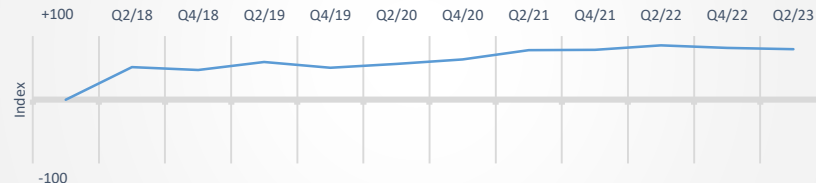
How do you assess the global market for the **offshore wind industry** in Europe (incl. DE) in the coming twelve months?



How do you assess the global market for the **onshore wind industry** in Europe (incl. GER) in the next two years?



How do you assess the global market for the **offshore wind industry** in Europe (incl. GER) in the next two years?

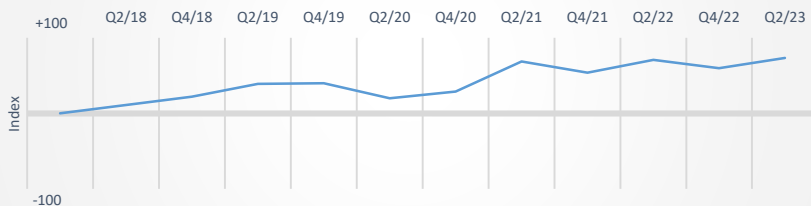


ASSESSMENT OF THE ONSHORE AND OFFSHORE WIND MARKET IN NORTH AMERICA

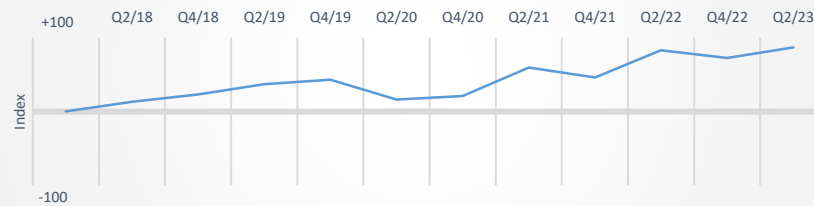
COMPARISON CURRENT VS. IN TWO YEARS

Assessments of the mood within the North American market, especially for the present market situation, have again improved significantly from the previous WEtix survey, remaining at a very high level.

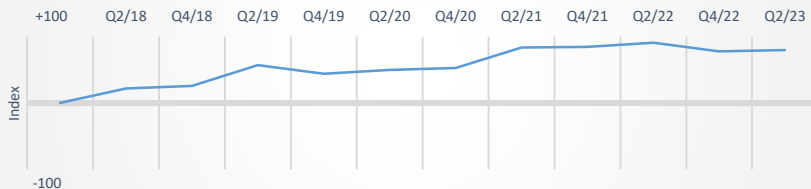
How do you assess the global market for the **onshore wind industry** in North America in the next twelve months?



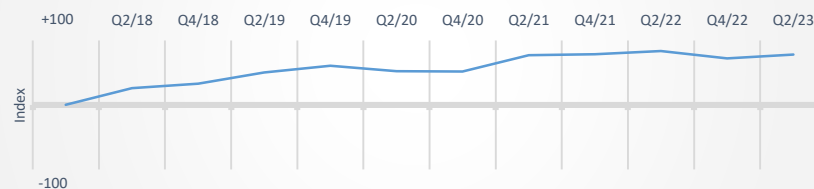
How do you assess the global market for the **offshore wind industry** in North America in the next twelve months?



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



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

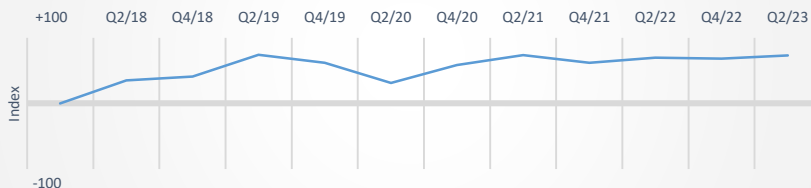


ASSESSMENT OF THE ONSHORE AND OFFSHORE WIND MARKET IN ASIA

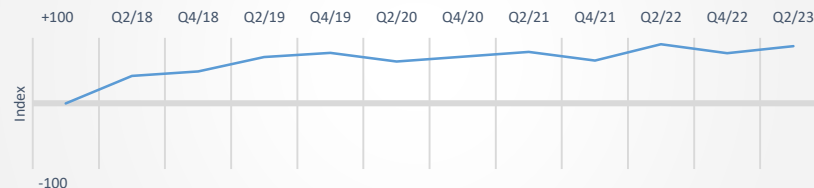
COMPARISON CURRENT VS. IN TWO YEARS

The picture for Asia is similar to that for North America: the current situation in both, the onshore and offshore segments of the wind industry received slightly more positive marks. On the other hand, the long-term perspective has only improved somewhat for the offshore wind industry; nevertheless, the mood for onshore wind remains at a high level.

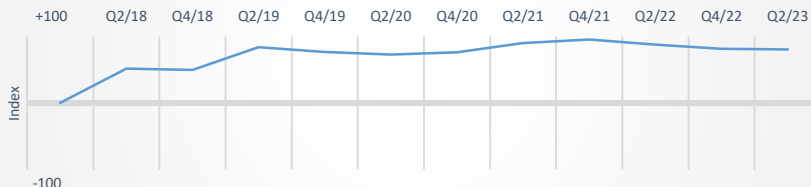
How do you assess the global market for the **onshore wind industry** in Asia in the next twelve months?



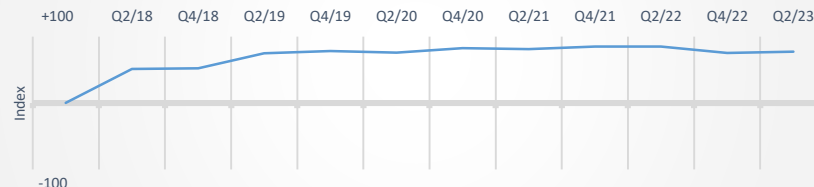
How do you assess the global market for the **offshore wind industry** in Asia in the next twelve months?



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



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

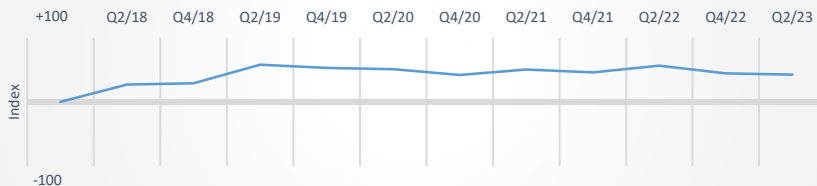


ASSESSMENT OF THE ONSHORE AND OFFSHORE WIND MARKET – REST OF THE WORLD

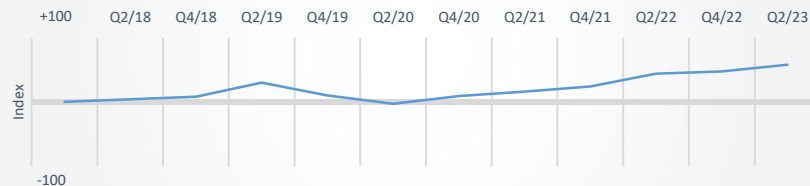
COMPARISON CURRENT VS. IN TWO YEARS

Compared to all regions, the 'rest of the world' receives the lowest marks; however, a positive trend is discernible in the short-term assessments of both the onshore and offshore markets. The long-term perspective for both segments is trending downwards.

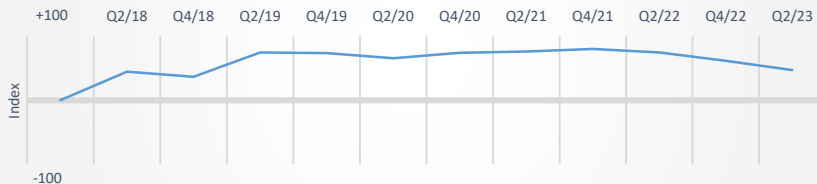
How do you assess the global market for the **onshore wind industry** in the **rest of the world** in the next twelve months?



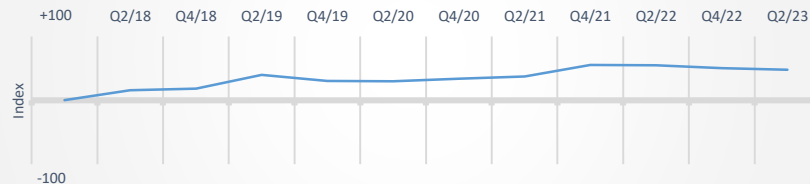
How do you assess the global market for the **offshore wind industry** in the **rest of the world** in the next twelve months?



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



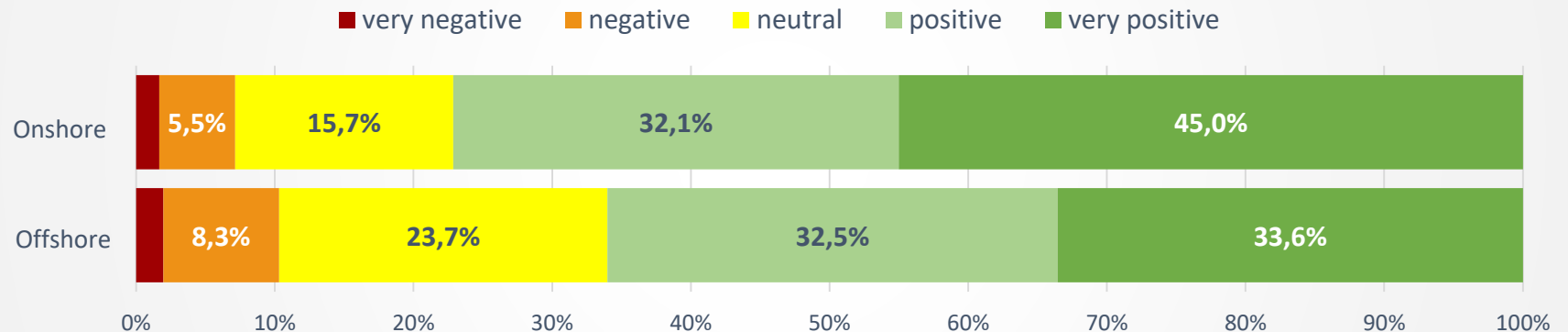
How do you assess the global market for the **offshore wind industry** in the **rest of the world** in the next two years?



IMPORTANCE OF EDUCATION AND TRAINING

The wind industry assigns utmost importance to education and continued training. Nearly two thirds of respondents rate the importance of adequate training as “high” or higher for the onshore segment, with the same marks given for the offshore segment by more than 66 per cent.

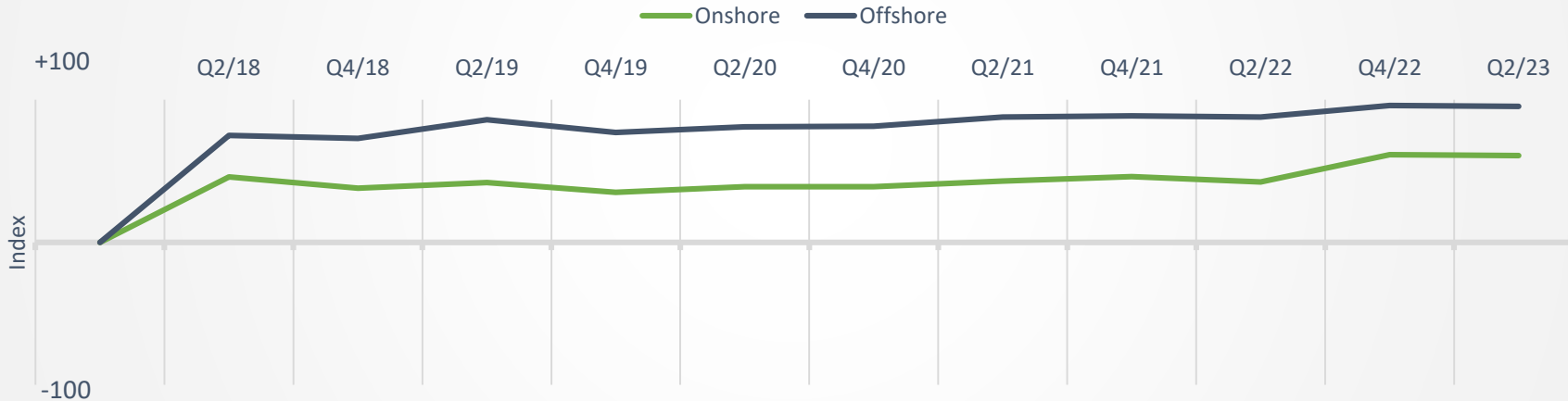
What impact have **education and training** in your opinion for the wind energy industry in the next twelve months?



COST REDUCTION THROUGH NEW TECHNOLOGIES

After further saving potential enabled by technology had received positive marks lately, there is hardly any change noticeable in the current WETix, suggesting stagnation.

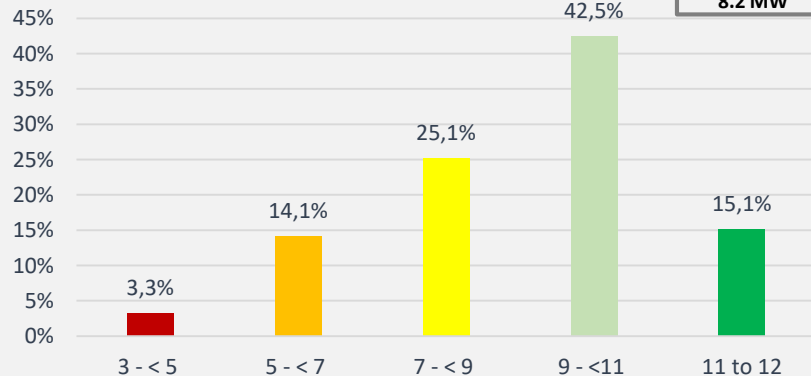
How do you assess further **cost efficiency potentials through technology** (e.g. bigger turbines, floating)?



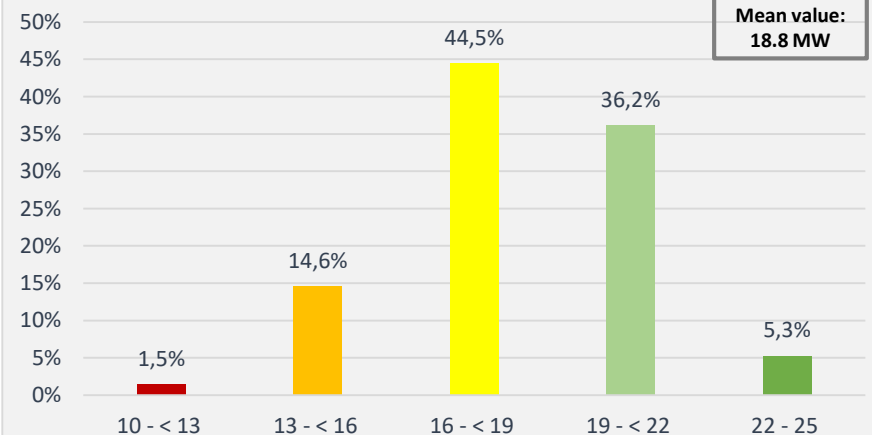
ASSESSMENT OF THE TURBINE MARKET

The future development of turbine sizes and the respective turbine output (in MW) is generally rated positively. For both the onshore and offshore segments, respondents estimate average power output ratings of newly installed wind turbines to be larger than the current standard (8.2 MW Onshore and 18.8 MW Offshore) by the year 2030.

Specifically, how do you estimate the future development of turbine size: **How much power will newly installed onshore turbines have on average in 2030?**



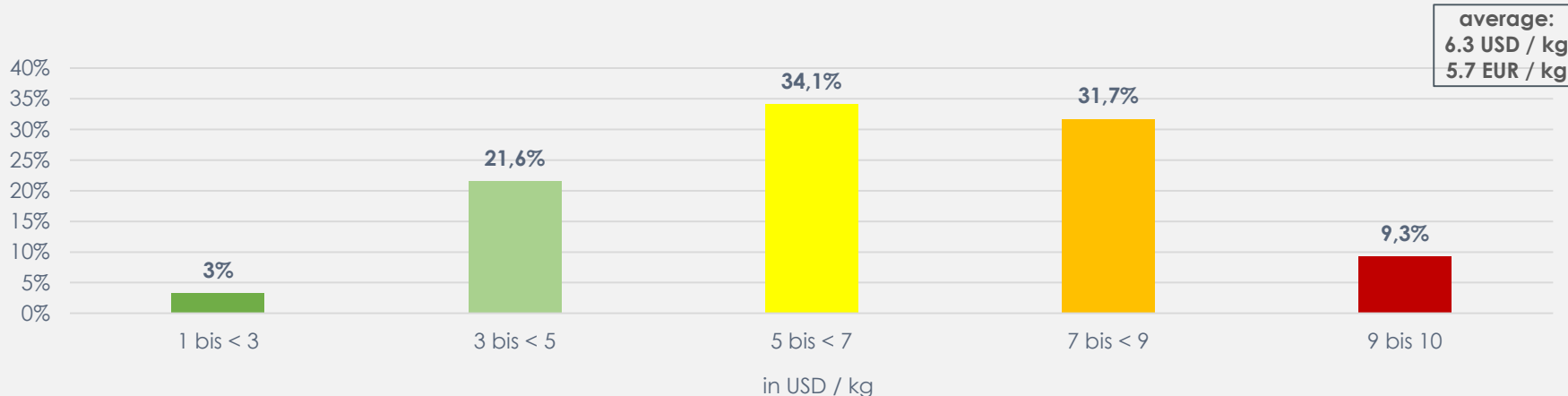
Specifically, how do you estimate the future development of turbine size: **How much power will newly installed offshore turbines have on average in 2030?**



HYDROGEN PRICE BY THE YEAR 2030

Respondents estimate the average price of one kilogramme of hydrogen to be around USD 6.00 by the year 2030, with a majority of respondents – more than 65 per cent – anticipating prices anywhere between USD 5.00 and less than USD 9.00 per kg. Only 9.3 per cent of survey participants believe hydrogen will cost more than USD 9.00 per kg, and even fewer – 3 per cent – expect prices below USD 3.00 per kg.

How do you estimate the probability of hydrogen: **What will be the average cost of a kilogram of hydrogen in 2030?**

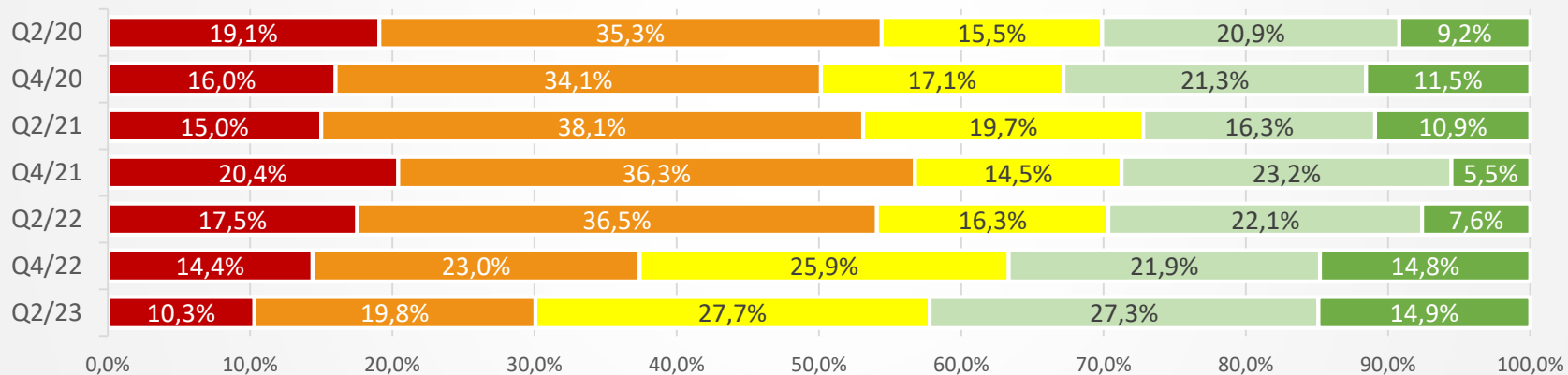


IMPORTANCE OF GREEN HYDROGEN

In this edition of the WETix, the importance of green hydrogen production received the lowest ratings ever. Only slightly more than 20 per cent of respondents continue to assign at least high importance to green hydrogen, yet another decline from the last WETix.

How high do you estimate the probability that the production of **green hydrogen** will play a major role for wind energy in the next two years?

■ very high ■ high ■ medium ■ low ■ very low

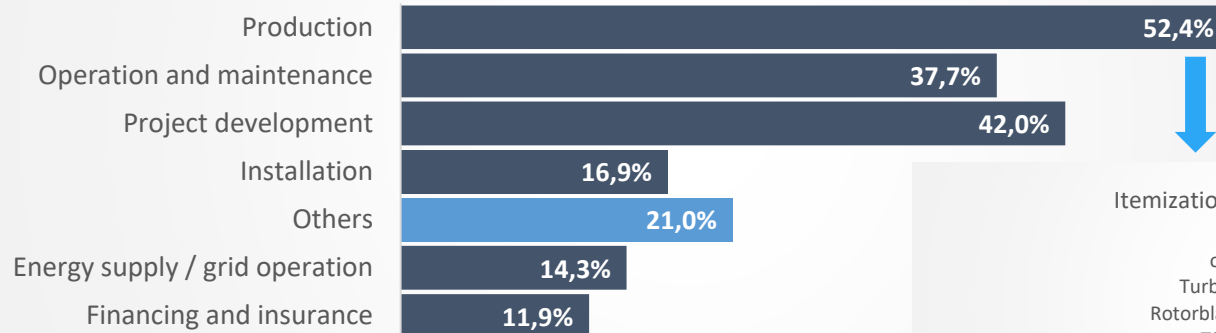


ACTIVITIES WITHIN THE VALUE CHAIN

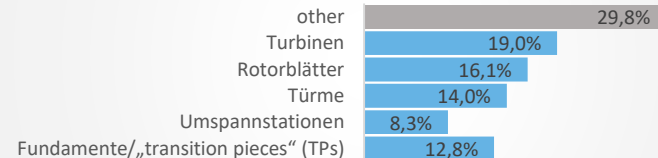
(MULTIPLE RESPONSES ALLOWED)

Many companies from the manufacturing segment took part in this WETix, with more than half of respondents identifying with that segment. The "Others" section of the value chain denotes companies active in fields such as consulting.

On which level of the value chain is your company's activity in the wind energy industry?



Itemization of answer production

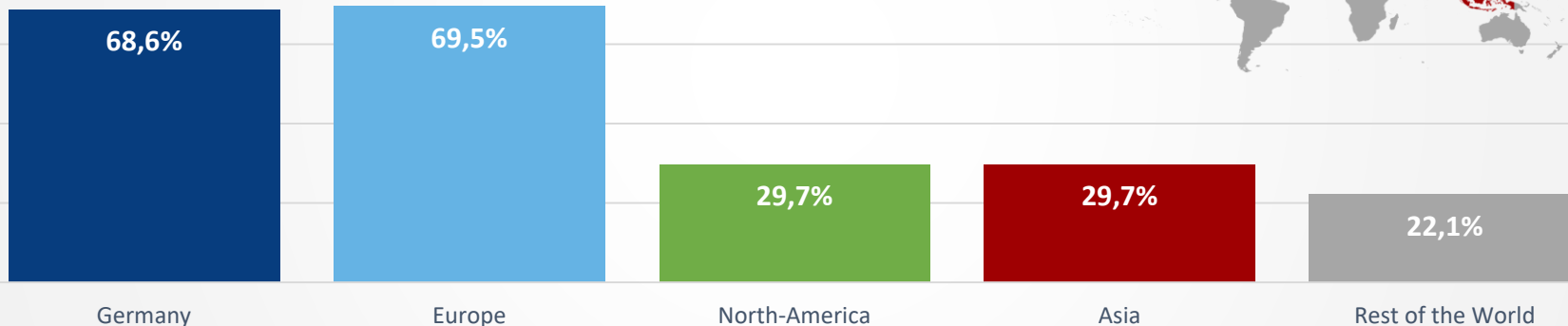
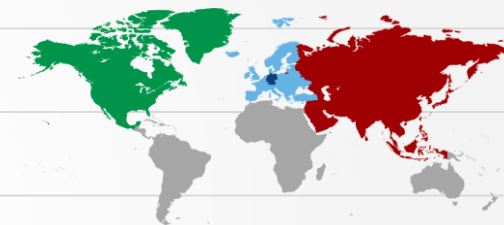


REGIONAL FOCUS

(MULTIPLE RESPONSES ALLOWED)

Two thirds of respondents mainly operate in Germany, and nearly 70 per cent in Europe. Surprisingly, the proportions are nearly identical for North America and Asia, with both world regions now contributing about 30 per cent of responses.

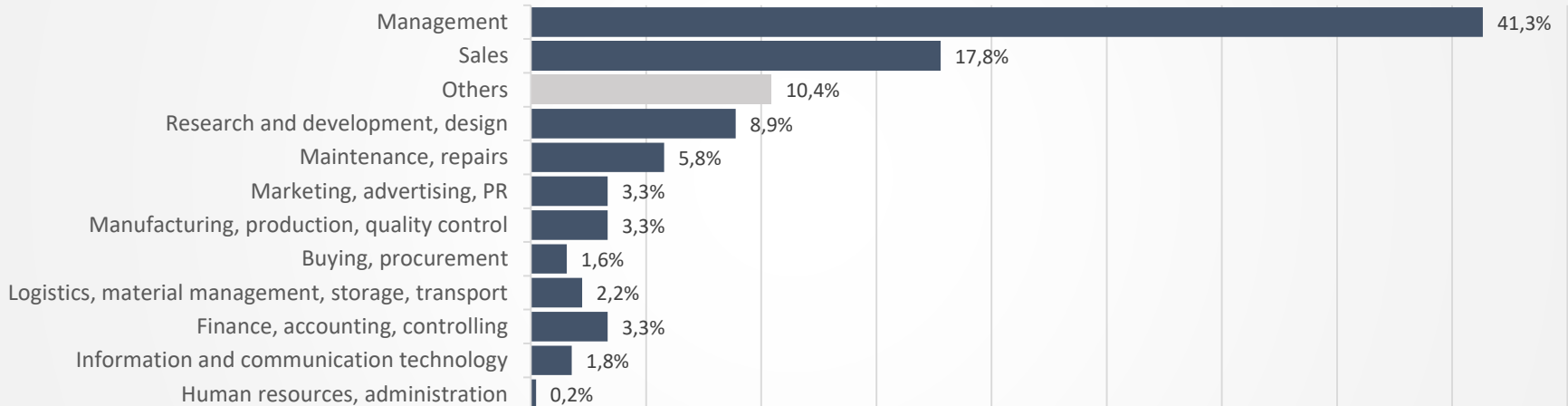
On which countries is your company's focus?



RESPONDENTS' FIELDS OF ACTIVITY

As in earlier editions of the WETix, the largest group of respondents have leadership positions in their companies; this time, more than 40 per cent fit this description. Other major groups comprise employees working in sales or research & development, respectively, design.

What is your area of responsibility?



wind:research

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