



Wind Industry in Germany

Economic report
Focus topic
Repowering in Germany

Companies
Leading companies present
their products and services

Industry directory
More than 350 addresses –
easy access to the right contact

2025



Wind Industry in Germany

2025

BWE INDUSTRY REPORT



→ ECONOMIC REPORT

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Editorial



Wind industry on a safe course despite political unrest

The year 2024 ends with two bombshells: the re-election of Donald Trump and the break-up of the traffic light coalition. The election outcome in the USA will challenge the EU as much as it will Germany. Economic, industrial, and even military policies will need to be redefined. The end of the coalition in Berlin and the imminent early elections are accompanied by a short-term legislative standstill, which is challenging given the backlog of actions accumulated at the end of the year.

Despite the dramatic political end to the year, the now-failed coalition has set an important direction, so that we expect more than 10,000 MW of new awards in tenders and a good 12,000 MW of new permits in 2024. The strong upward trend in permits is stabilising and creating an industrial political foundation for more employment along the entire product chain. Suppliers facing pressure in the automotive sector now have a stability anchor in wind energy. Manufacturers are preparing for a significant production ramp-up. The logistics sector is acquiring new vehicles. Due to the increase in demand for green energy, the next federal government must open doors to the market so that the industrial SMEs and our sector can directly work together. We also have specific proposals for better utilisation of the existing grid infrastructure and for accelerating grid expansion.

Wind energy is the driving force in the new energy system. We are willing and able to take on more responsibility for the overall system. This year, we demonstrated our capabilities at WindEnergy in Hamburg. Next autumn, we will meet in Husum. Until then, the industry report provides a good overview of the sector.

A handwritten signature in black ink that reads "Bärbel Heidebroek". The signature is written in a cursive, flowing style.

Bärbel Heidebroek
Präsidentin Bundesverband WindEnergie



© Hamburg Messe und Congress / Michael Zapf

WindEnergy Hamburg 2024: Global meeting place of the wind industry

Wind energy is the key to a successful energy transition everywhere in the world. Its potential provides an answer to the most pressing issue of our time: climate change. This importance is mirrored in the success of WindEnergy Hamburg as leading platform of the international wind energy industry.

More than 1,600 exhibiting companies, and over 43,000 participants from around 100 nations gathered at Hamburg's exhibition halls in September 2024 to jointly shape the future of wind energy. This enabled WindEnergy Hamburg to further grow its footprint as the largest international event of the wind sector. This year again the trade fair was accompanied by an open conference format featuring top-class speakers from politics, business and science. Whether state-of-the-art wind turbines, hybrid energy storage or digital monitoring solutions, the multitude of technologies presented at the fair demonstrated the industry's innovative power in impressive ways. Since its inauguration ten years ago, the leading global trade fair for wind energy has long become an indispensable event for both, the onshore and offshore segments.

The positive feedback we received for our Recruiting Days was a personal highlight for me this year. We were able to join young talents and experienced career changers with highly reputable employers, helping the industry find personnel resources it urgently needs for continued growth.

With WindEnergy Hamburg setting the pace for the global wind industry, we look at the future with confidence – committed to driving the green transformation together.

Heiko M. Stutzinger
CEO, Hamburg Messe and Congress



The new Industry Report: Small Adjustments, Greater Opportunities

Those who don't change remain stagnant – and miss out on opportunities. We've made minor adjustments to the Industry Report. The most significant change involves the publication method: we have shifted our focus to digital distribution. Together with our media partners, Hamburg Messe und Congress and Messe Husum & Congress, we now send the report to more than 90,000 recipients in the industry, reaching a much wider audience than before. Additionally, the digital format allows us to connect with more professionals in the fields of solar, hydrogen, and battery storage, enhancing our distribution among potential project partners.

For those who still want a printed version of the report, it is available for a nominal fee in the shop of the German Wind Energy Association. Naturally, we will also distribute printed copies at trade fairs and other industry events.

The reduction in the editorial section at the beginning reflects the shift in how digital content is consumed. This year's focus topic, "Repowering" addresses one of the most important issues in the wind industry today. Last year, the report already featured the top employers in the industry, as companies are increasingly defining themselves by their role as employers. The most important part – the addresses of potential clients and project partners – remains unchanged, as do the company profiles. Reports on innovative company projects and the latest research as well as the presentation of newly founded companies and start-ups round off the range.

We wish you an enjoyable read – whether digitally or in print.

Benjamin Gruhn
Lead Corporate Publishing, BWE-Service GmbH

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The sector is driven by its actors.

We have asked entrepreneurs of the German wind industry about their most important innovations, strategies and markets. Read their answers on pages [14/15](#), [20/21](#) and [27](#).

Briefly asked



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All images in this chapter show the dismantling of eight Enercon E66 with a height of 85 metres, one Nordex N43 with a height of 78 metres and one Enercon E40/644 with a height of 78 metres. The turbines were repowered at the Bad Sassenberg/Füchtorf wind farm.

We would especially like to thank the dismantling company Wörmann-Team from Schloß Holte-Stukenbrock and the crane company Schares.

Photos: Ulrich Mertens, Atelier für Kunst und Fotografie



ECONOMIC REPORT:

Wind Industry in Germany

Wind has become the most important source of energy in Germany in recent years. That took time and some turbines are getting on in years. Repowering, i.e. replacing old turbines with new ones, has become a driving force in the industry. Our focus topic.

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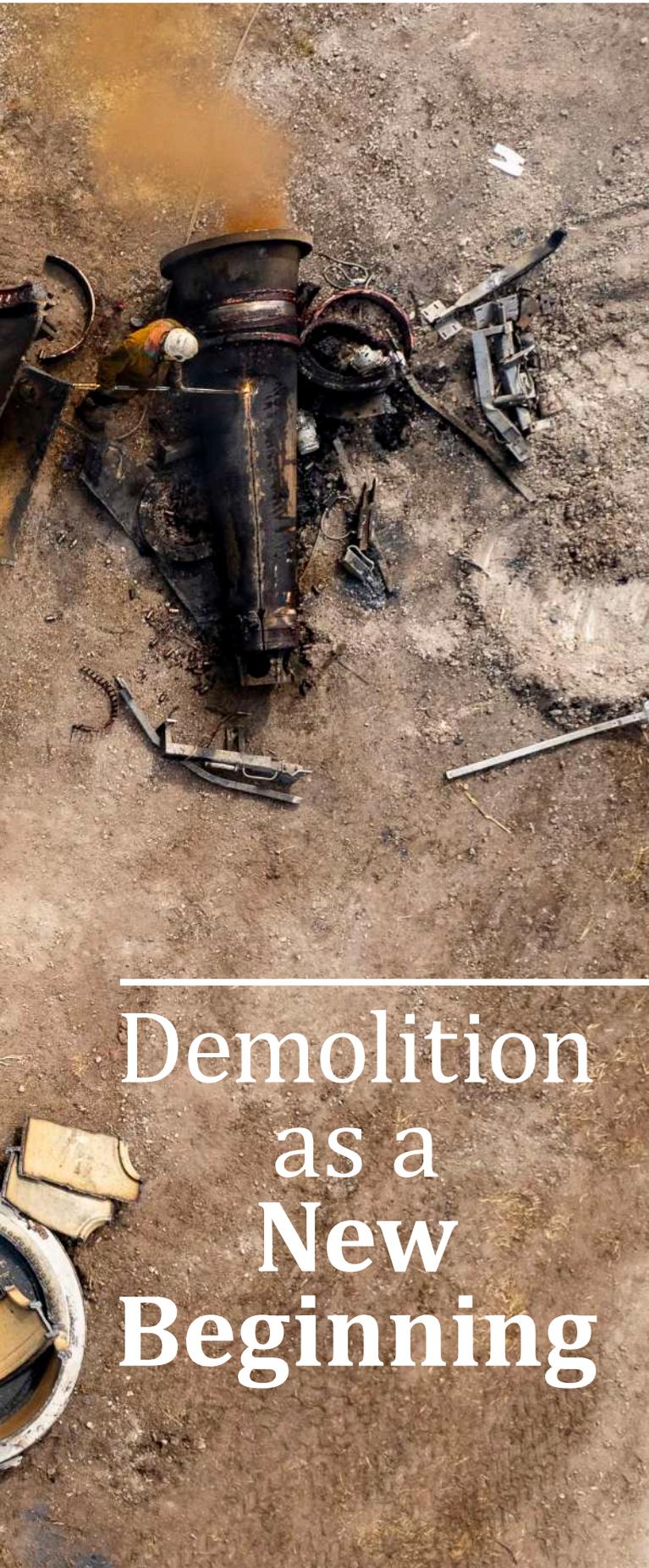
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Demolition as a New Beginning

Germany's old turbines are being retired. For some operators, repowering could account for half of all new installations in the country in the future. This is an attractive prospect but could be delayed, particularly if the operator of the wind turbines changes.

The life of a wind farm usually ends with a bang: shattered concrete, fireworks of explosions, and steel plates as thick as arms bending like straws, laying the broken wind tower into a "fall bed" – thus clearing the area for repowering.

"We're demolishing about a hundred turbines this year," says Rosita Kandlhofer, managing director of Reisch Demolition Technology from Peißenberg in Upper Bavaria. For this, demolition experts led by blasting master Eduard Reisch often head up north to Prussia, where most of the older turbines are located.

Repowering brings wind energy back to its regional roots. In the areas where, decades ago, idealistic pioneers began the expansion of wind power, most wind turbines are now being retired. Jürgen Quentin, a data expert from FA Wind, reports that there are currently around 10,000 megawatts (MW) of decommissioned wind energy in Germany, mostly located in Lower Saxony (2,600 MW), Schleswig-Holstein, and North Rhine-Westphalia (each about 1,300 MW). Brandenburg also has close to 1,500 MW. According to Quentin, the total decommissioned capacity will rise to around 17,000 MW by 2028, with these four states leading the way. In Bavaria, only about 350 MW will be eligible for repowering by 2028, but this is just the minimum of the turbines that will actually be replaced. In reality, many turbines are "due" for replacement after just fifteen years of operation (see "Timing: A Matter of Cost and Benefit").

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“We blow everything up”

That’s why many early-built steel-reinforced concrete towers from Enercon in the north account for a large portion of Reisch’s orders. “We blow everything up, whether it’s a steel or concrete tower,” explains Kandlhofer, cheerfully admitting that business is booming. From zero to one hundred turbines in just six years by 2024. The Bavarians blew up their first turbine in 2018, and things have been progressing ever since.

In the first half of 2024, repowering already accounted for nearly 30 percent of all new wind power installations in Germany. Repowering is most common among well-established developers – those who had enough capital early on to keep their wind farms rather than selling them to investors to finance their next wind farm project. Recently, newcomers to the German market have been specifically purchasing existing wind farms for repowering.

Repowering Share Ranges from One-Quarter to Two-Thirds

The share of repowering varies from company to company. For instance, Alexander Lennemann, spokesperson for PNE in Cuxhaven, expects repowering to account for about one-quarter of their projects. Other companies estimate up to two-thirds.

Peter Spengemann, a repowering expert from WPD Wind-manager, expects the share of repowering in Germany to

“We often achieve five times the annual yield.”

“increase significantly” over the next two to three years. His company alone currently has about 40 repowering projects in its planning pipeline. “Repowering developers have the advantage of a much clearer project pipeline compared to new developments,” says Spengemann. Operators know “very well which projects are due for repowering and when.” A second key factor for him is access to landowners, with whom developers have ideally built good relationships over decades. The increase in capacity also goes beyond the often-cited “1 MW old turbine replaced with 3 MW,” with annual electricity yields often increasing by a factor of five. “We often achieve five times the annual yield,” says Spengemann.

Repowering is easy – if everyone agrees. It becomes more difficult when landowners no longer want to work with the existing wind turbine operator. “In these cases, the parties either need to cooperate to find a solution, or repowering must wait until the old operator’s usage contracts expire,” Spengemann explains. This can delay repowering until the right to feed electricity into the grid at guaranteed rates ends, and the joint contracts expire.

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Question: “What was your most important strategic decision in the last two years?”



“Our opti.node Cockpit is the decisive answer to the massive regulatory effort that operators of renewable energy plants are confronted with in the field of commercial asset management. To offer renewable asset managers a centralized, effective solution for this, we have entered into development partnerships with industry leaders in commercial operations management, among others, in order to best serve their requirements with our energy data platform in a future-oriented manner.”

MATTHIAS KARGER, CEO, node.energy GmbH



“Important decisions were to broaden the company’s positioning for the coming years in the form of an additional location in Bremen and an expanded range of services to match the high training standards of our employees. At the same time, we are aiming to almost completely digitalise our company processes by 2025.”

CHRISTIAN HAMMERTHALER, Managing Director, Rotor Control GmbH



“Focusing on the core of our business model and intensifying strategic partnerships that directly contribute to this goal – the marketing of wind farms.”

BERND WEIDMANN, CEO, wind-turbine.com GmbH



“The energy transition is a joint responsibility. The start for our first battery storage Westküste 1 was a milestone for our company, as we are taking the first important step from electricity production to a holistic energy supply. We see this as an investment in the future and an important contribution to the energy transition in Schleswig-Holstein.”

STEPHAN FRENSE, CEO, ARGE NETZ



“Over the past two years, TotalEnergies has consistently implemented its development into an integrated power player in Germany. We have been awarded three concessions to build offshore wind farms totaling 4.5 GW in the North and Baltic Seas. In addition, TotalEnergies has acquired several German companies to accelerate and optimize its integrated development in this electricity market. These include NASH Renewables, a company that optimizes the planning and operational parameters of renewable projects; Quadra Energy, one of the three largest aggregators of renewable electricity in Germany with a “virtual power plant” that has a total capacity of 9.5 GW; and Kyon Energy, developing battery storage systems with a 2 GW project pipeline.”

CHRISTIAN CABROL, Country Chair of TotalEnergies in Germany & Managing Director of TotalEnergies Marketing Deutschland GmbH

Question: “Power-to-X: How are you setting the course in your company?”



“End-to-end digitization from acquiring sites to wind farm planning.”

HEIKO BARTELS, Founder and CEO, Caeli Wind GmbH



“An important milestone for us was the decision to have our practised quality and safety standards externally certified. We introduced ISO 9001 years ago and, as an operator of critical infrastructure, we are now also ISO 27001 certified. These certifications are essential for several reasons: on the one hand, they serve as a safeguard for our company. On the other hand, they also safeguard our customers' assets and make it easier for us to work with international investors. In addition, we have made significant progress in expanding our service portfolio in recent years and have broadened our positioning in this area. Through expanded services relating to our 24/7 control centre and solutions for cyber security, Redispatch 2.0, BNK, HSE and A&E.”

TILL SCHORER, Director Customer Relations, wpd windmanager GmbH & Co. KG



“The technical, organizational, and legal particularities associated with Power-to-X require a high level of professionalism and attention. We are already regularly working on solutions that are used in the supply of industrial companies. These are often combined with PPAs and storage solutions, sometimes in connection with the planning and operation of electrolyzers or Power-to-Heat systems. Such solutions are usually realized in cooperation with various stakeholders.”

HERIBERT STERR-KÖLLN, Founder of Sterr-Kölln & Partner



“Overall, despite the low level of efficiency in energy conversion, investments are lucrative and we see great potential here. We utilise unused capacities from green electricity production to replace fossil fuels.

In order to make progress in this area, we are planning our wind and photovoltaic projects comprehensively and are specifically looking for cooperation partners to realise sector coupling.

In Finland, for example, we are implementing a cooperation project with Koppö Energia, the centrepiece of which is a 200 MW plant for the production of green hydrogen / e-methane. The project enables us to cover both the producer and the consumer side – an important step in times of oversaturation. We will incorporate the experience gained into further projects, including in Germany.”

MELINA TACKE, CFO, CPC Germania GmbH & Co. KG

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Well-intentioned but not yet mature

Several legislative changes are intended to facilitate and accelerate the repowering of existing wind turbines. However, there are still issues, particularly with nature conservation and building regulations.

Since December 19, 2022, approval procedures for repowering projects may take no longer than six months – extensions are excluded. Otherwise, wind project developers may file claims for damages. This is outlined in the EU emergency regulation. As a result, Germany has introduced new regulations in the Federal Immission Control Act (BImSchG), the Federal Nature Conservation Act (BNatSchG), and the Building Code (BauGB).

“Especially the new regulation of § 16b BImSchG, introduced with this year’s amendment to the BImSchG, is to be welcomed,” says Dana Kupke, a specialist lawyer for administrative law at Prometheus Law Firm in Leipzig. This regulation extends the period within which the repowering installation must be built after the dismantling of the old installation from 24 to 48 months. Additionally, the BImSchG now allows a distance between the repowered and the new installation that corresponds to five times (5H) the height of the new installation. Previously, the distance could not exceed twice (2H) the height of the installation. As a result, the installations may be located closer to the neighborhood.

“In terms of acoustics, I do not anticipate any disadvantages for the neighborhood, either because the repowered installation will comply with the emission guidelines according to the Technical Instructions on Noise Abatement (TA Lärm) or because, under § 16b Abs. 3 BImSchG, it must at least be quieter than the old installation,” Kupke explains. Although the new installation may move closer to residential areas and become more visually prominent, it must comply with the legislative requirements to avoid “an overwhelming visual impact” (§ 249 Abs. 10 BauGB) and must also observe existing state minimum distance regulations from settlements outside wind energy areas.

Further work needed

Another significant innovation in the BImSchG is the so-called Delta Assessment, which – except for a few exceptions – must generally be carried out for all approval requirements: only the difference between the new and the previous, pre-existing state impacted by the old wind turbine will be examined. However, according to Kupke, the species protection assessment associated with this (§ 45c BNatSchG) has so far not led to the desired acceleration of repowering. “In fact, the Delta Assessment is precisely what leads to considerable uncertainties in the legal application during approval processes because there are largely no technical guidelines or standards for conducting the Delta Assessment.” Therefore, in cases of species protection conflicts, there are often significant delays. “It is all the more regrettable that the ministerial guidelines promised in the draft law introducing § 45c BNatSchG to clarify the assessment procedures are still pending.”

Kupke also sees a drawback in the amendments to the BauGB. In theory, repowering projects should remain privileged under certain circumstances, even after reaching the land contribution values until the end of 2030. Furthermore, under § 245e Abs. 3 BauGB, the exclusion effect of existing concentration planning should be lifted under the conditions mentioned there. However, the new regulations refer to an outdated and no longer valid version of the BImSchG since the latest amendment, says Kupke. “As a result, they are ineffective.” The fact that the legislator did not adapt the BauGB accordingly is currently slowing down the planning and approval implementation of many repowering projects.

Ready to Repower?

Join Our Webinar Series
Starting January 17, 2025



Are you considering the next steps for your wind turbines as they approach the end of their initial lifespan? Continue, decommission, or repower?

Our webinar series gives you the practical tools to plan and execute a successful repowering project. Find out what makes the most sense financially, how to streamline the decommissioning and recycle process, and how to clear regulatory hurdles. With insights from leading legal and industry experts, you'll be set to take the right steps toward repowering success.

For details and registration, visit
www.bwe-seminare.de/repowering

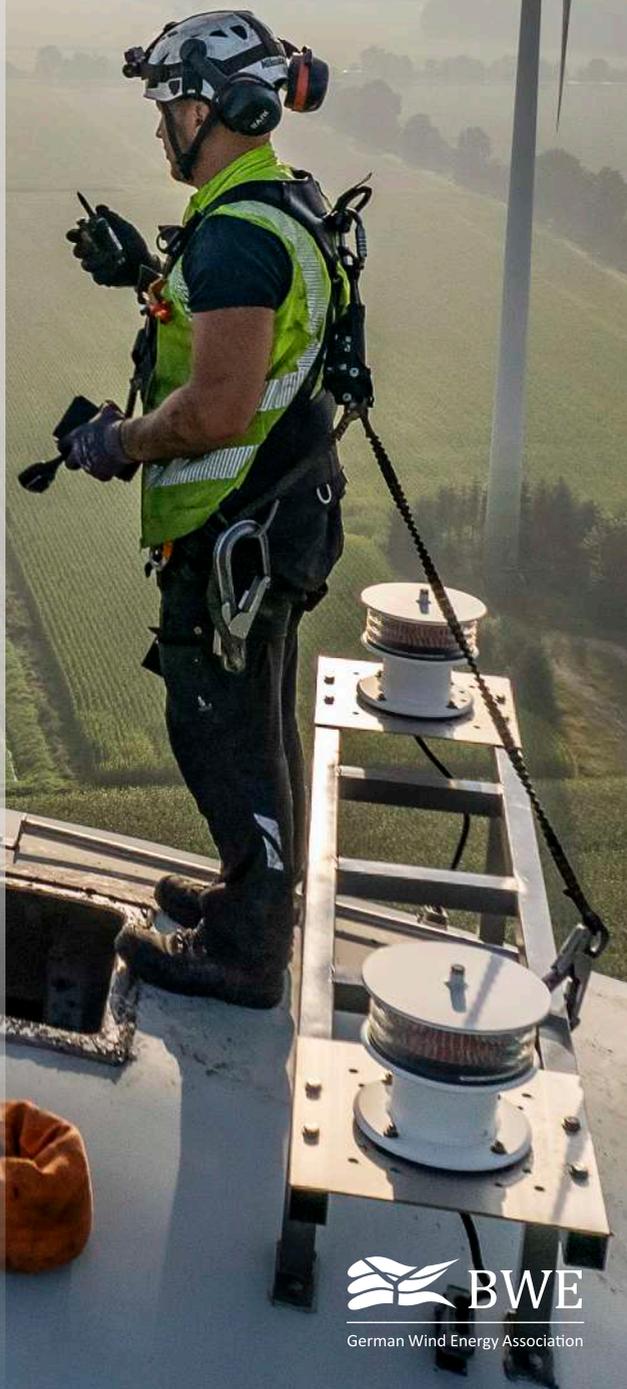
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January 24, 2025	Practical Approaches to Decommissioning and Wind Turbine Recycling
January 31, 2025	Key Considerations in Land Securement
February 7, 2025	Regulatory Streamlining and the Super-Privilege in the Building Code
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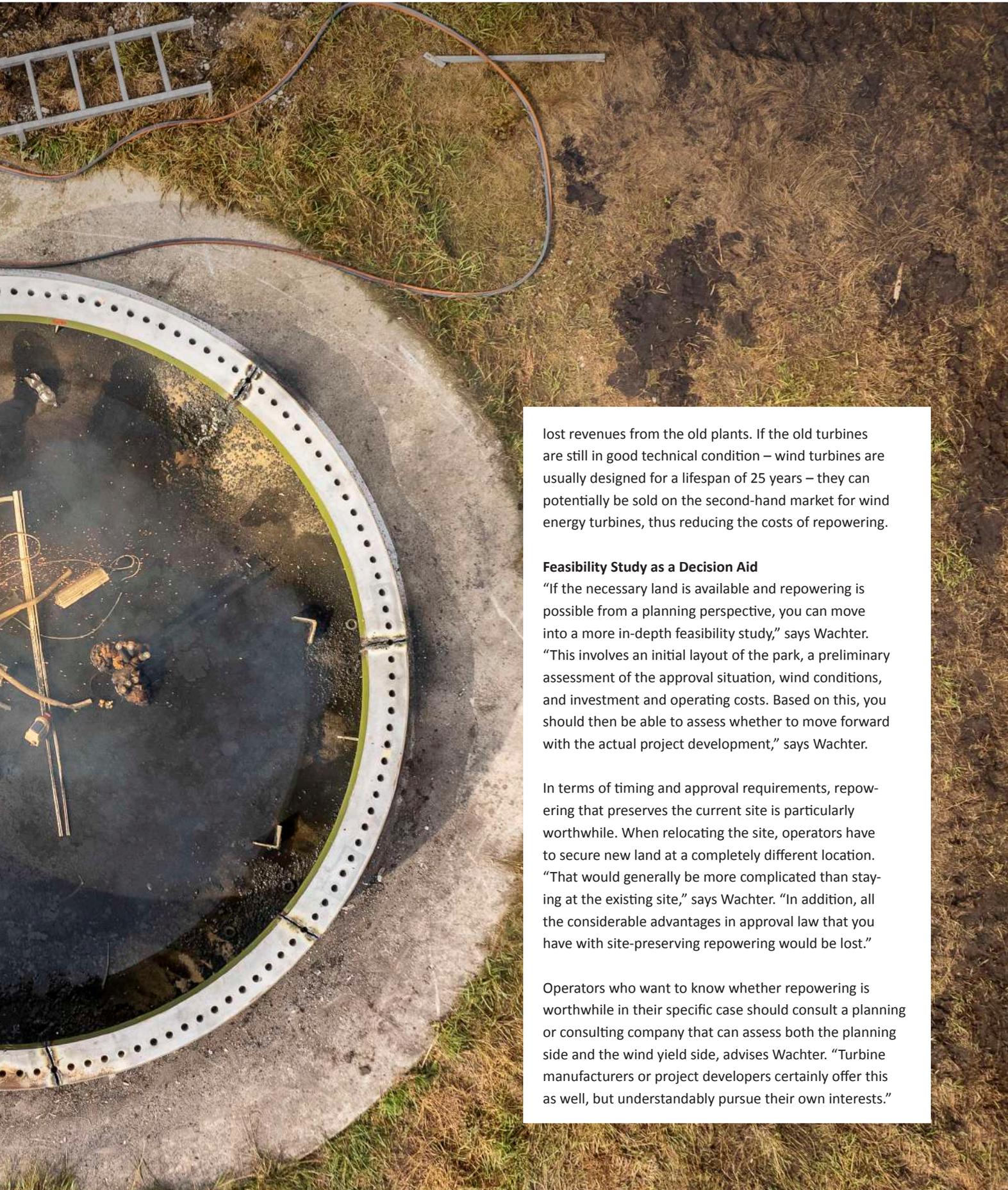
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Timing: A Matter of Costs and Benefits

Repowering is often worthwhile several years before the end of the EEG subsidy. However, many factors play a role in determining the right time.

After 20 years, the statutory EEG remuneration for wind turbines comes to an end. However, operators should not wait until then to decide whether to replace old turbines with significantly more powerful new ones. "From an economic point of view, repowering is worthwhile as soon as the net present value of the existing plant falls below that of a new project," says Tilo Wachter, Managing Director of renerco plan consult. The Munich-based company specializes in technical consulting and planning services for renewable energy. At most locations, repowering after 15 years of EEG operation is likely the more economical option, estimates Wachter. "In individual cases, of course, a more detailed examination of all factors that affect the project's approval and profitability is required."

Such factors include planning law and planning costs, the competitive situation, the investment and construction costs of the new plants, the costs of dismantling the old plant, the current electricity price development (the higher the electricity prices, the more worthwhile new, more powerful plants are), operating costs, insurance for the new plants, as well as the technical condition, possible repair and maintenance costs, and



lost revenues from the old plants. If the old turbines are still in good technical condition – wind turbines are usually designed for a lifespan of 25 years – they can potentially be sold on the second-hand market for wind energy turbines, thus reducing the costs of repowering.

Feasibility Study as a Decision Aid

“If the necessary land is available and repowering is possible from a planning perspective, you can move into a more in-depth feasibility study,” says Wachter. “This involves an initial layout of the park, a preliminary assessment of the approval situation, wind conditions, and investment and operating costs. Based on this, you should then be able to assess whether to move forward with the actual project development,” says Wachter.

In terms of timing and approval requirements, repowering that preserves the current site is particularly worthwhile. When relocating the site, operators have to secure new land at a completely different location. “That would generally be more complicated than staying at the existing site,” says Wachter. “In addition, all the considerable advantages in approval law that you have with site-preserving repowering would be lost.”

Operators who want to know whether repowering is worthwhile in their specific case should consult a planning or consulting company that can assess both the planning side and the wind yield side, advises Wachter. “Turbine manufacturers or project developers certainly offer this as well, but understandably pursue their own interests.”

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Question: “How do you implement the topic of sustainability in your own company?”



“Sustainability has been enshrined in our corporate strategy for many years. Tackling and overcoming the challenges of climate change and corporate citizenship remains important. Within the DZ BANK Group, we recognize the ongoing need for change and firmly believe that the financial industry plays a vital role in supporting this transformation. With the financing of wind power plants, we are making an important contribution to the energy transition.”

ALEXANDRA POHL, Group Head Renewable Energies Germany, DZ Bank



“At wpd, we work with great teams on the energy transition, one of the biggest and most exciting challenges of our time. Sustainability is a key goal for our employees – both in their day-to-day work and in their private lives. To this end, we work together on our “wpd green board” to develop a wide range of measures that we implement for ourselves and our environment. Become part of wpd. Don't just do anything. Do something for the climate!”

ANNIKA SCHULTE, Senior Project Manager, wpd onshore



“We are in the middle of another sustainability offensive. This is of great interest to us as a company and to our employees. Not least because of the regulations, we also need to become more transparent in this area.”

MATTHIAS BRANDT, Director, Deutsche Windtechnik



“Here is one of our internal initiatives: Two of our working students have recently carried out a climate protection study. They determined the GHG balance (greenhouse gas reduction rate) of the entire greenwind Group. Based on this data, they drew up a climate protection concept with a catalogue of measures for avoiding, reducing and offsetting GHG emissions. The proposals are now being implemented. As a result, the greenwind team is not only cutting emissions, but also reducing energy consumption and adapting everyday work processes in the interests of sustainability. On the basis of this study, greenwind can continuously tweak large and small adjustments and constantly monitor itself. An instructive project for students and a valuable contribution for greenwind.”

KILIAN FROMM, Director, Green Wind Innovation GmbH & Co. KG



“As a partner of many innovative sectors such as wind power, photovoltaics, and e-mobility, our company is a leader in all matters of sustainability. We also take continual measures to keep our own environmental footprint as minimal as possible. This includes introducing energy-efficient machines and building technology, installing our own solar panels, and implementing sophisticated closed-loop recycling concepts.”

UWE SCHENK, Senior Industry Manager Renewables, HELUKABEL GmbH

Question: “How has your company's strategy in searching for skilled workers evolved?”



“It is both a duty and a pleasure for us that we have positioned ourselves in such a forward-looking way by bundling and strengthening all our activities relating to training, further education and qualifications in our Deutsche Windtechnik Campus.”

MATTHIAS BRANDT, Director, Deutsche Windtechnik



“With a newly designed employer brand, JUWI is positioning itself as a future-active employer in the competition for the best talent and skilled workers. For the employer promise “Our We works. Sustainable. Together. Strong.” employees stand as authentic brand ambassadors. They know from your own experience that, in addition to meaningful tasks, it is the values-oriented corporate culture that is attractive both internally and externally.”

CARSTEN BOVENSCHEN, CEO, JUWI



“Wanted: Wind Energy Enthusiasts! At Wölfel, we understand that knowledge means nothing without the people who apply it. As an employer, we are distinguished not only by our expertise, but particularly by our extraordinary friendliness and open, appreciative interaction with each other. Join our team and shape the future of the wind industry with us!”

DR.-ING. CARSTEN EBERT, CTO, Wölfel Wind Systems



“With our part-time master's program, which is one of the few specialized in wind energy worldwide, companies engage and motivate their professionals for a future-oriented career.”

PROF. DR.-ING. HABIL. DETLEF KUHL, Academic Director of the Master's program Wind Energy Systems, University of Kassel

Question: “Which external factors hamper your company the most, and what could remove these obstacles?”



“Now that the backlog of approvals for wind farms is clearing, there is a lack of available grid connections. Grid expansion absolutely needs to be a priority on the economic and energy policy agenda.”

HENNING VON STECHOW, CEO, Prokon eG

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The Ideal Path for Wind Energy Expansion

The example of six wind farms across Germany shows: If possible, repowering is truly the ideal path for wind energy expansion. Quick approvals, easier municipal approvals, and up to six times the previous capacity. Such consensus is rare.

MANSFELDER LAND

RETHINKING COMMUNITY PARTICIPATION

Amid the distinct pyramid-shaped spoil heaps of the Mansfelder Land stands the Wansleben wind farm. Mining has shaped the region for centuries. A visible legacy of this tradition are the spoil heaps where miners piled up unusable rock. Because of their distinctive shape, they are called the “Pyramids of Mansfelder Land.”

Today, the region is reinventing itself. More than twenty years ago, wind energy companies built the Wansleben wind farm here, which Ørsted has now modernized for the future. The company replaced eight old Südwind S70 turbines with five more powerful Vestas turbines. This modernization has doubled the overall capacity of the wind farm.

Mining history remains significant for this wind energy region. Deep shafts were dug into the ground for lignite mining, and they still exist today. Because of this, special foundations were required for the new wind turbines, anchored up to 30 meters deep into the ground using so-called vibro-compaction columns, which are unusually wide.

Ørsted also developed a unique form of community participation for the Wansleben wind farm. Through mailings, announcements in the community bulletin, and conversations with project developers on-site, Ørsted used the full range of community engagement. The company took a new approach with an eco-electricity bonus: every resident of Wansleben who uses a green electricity tariff receives an annual payment of € 50, providing an additional incentive to switch to renewable energy.

Mansfelder Land

Wansleben Repowering I and II	Old	New
Number of turbines	8	5
Turbine models	8 × Südwind S70	2 × Vestas V136 + 3 × Vestas V150
Capacity	12 MW	24 MW
Operation	2002	2023



WINDPARK ELSTER

SIX TIMES THE OUTPUT WITH A THIRD OF THE TURBINES

The repowering of the Elster wind farm in the district of Lutherstadt-Wittenberg is impressive in scale: 50 wind turbines will be dismantled, and 16 new ones will be built. Despite this reduction, electricity production will increase sixfold – thanks to modern Siemens Gamesa turbines (SG 6.6-155) with a hub height of 165 meters and a rated output of 6.6 MW. In comparison, the old Enercon E-40 had a rated output of 600 kilowatts. At the same time, the park's footprint will shrink by one-third.

The concrete towers of the new turbines are already in place, and by the end of the year, they will be topped off with steel tower sections. Afterward, rotors and nacelles will follow. The rotor blades are 77.5 meters long, made in Portugal, and shipped to Rostock. Commissioning is planned for spring 2025.

Significant efforts are also being made to protect nature. Approximately 1,000 sand lizards were temporarily relocated by hand. To prevent them from returning during construction, the

project developer VSB erected ten kilometers of knee-high fences. Additionally, a harvesting shutdown ensures that wind turbines are switched off when nearby fields are being cultivated, as freshly tilled fields attract birds of prey, particularly during the breeding season. The shutdown allows them to hunt undisturbed – a highly effective measure to protect wildlife.

Lutherstadt-Wittenberg

Windpark Elster	Old	New
Number of turbines	50	16
Turbine models	Enercon E-40	Siemens Gamesa SG 6.6-155
Capacity	30 MW	105,6 MW
Operation	2000–2002	2025

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LINDENBERG NEAR BERLIN REPOWERING AT A HIGHWAY JUNCTION

It’s actually the perfect location: between hardware stores, a shipping business, and the Barnim highway intersection, the Teut Group has been operating six wind turbines on the northern Berlin Ring for 13 years. Several high-voltage power lines run nearby, and just a few kilometers away is the Malchow substation.

This should be a great spot for wind energy – if the Brandenburg state parliament hadn’t passed a law in 2022 requiring wind turbines to be at least 1,000 meters away from the nearest settlement. This regulation is being implemented through the future Uckermark-Barnim regional plan, which designates priority areas for wind energy and decides where wind turbines can be built in the future. Because the regional planning community has also set a minimum size of 25 hectares for Priority areas, this location will no longer be available for wind energy production. Under these conditions, obtaining a permit for repowering would be hopeless.

As a result, the owner has decided to repower four of the six wind turbines prematurely – an unusual move after operating for only 12 to 15 years. Despite the reduced number of turbines, the wind farm's capacity will more than double, and green electricity will continue to be produced for the capital between the industrial zone and the highway.

Lindenberg in Ahrensfelde near Berlin

Windpark Lindenberg	Old	New
Number of turbines	4	3
Turbine models	3 × Senvion MM92 + 1 × Senvion 3.4M114	3 × Nordex N163/6.X
Capacity	9,4 MW	20,4 MW
Operation	2009–2012	2024 / 2025

WINDPARK UETERSEN BECOME A WIND POWER OPERATOR STARTING AT € 250

In the northwest of Hamburg, Green Planet Energy has been operating the Uetersen wind farm for over 20 years. Along with partners, this wind farm is now set to be repowered. In September 2024, the cooperative celebrated the groundbreaking for the new project. The six existing wind turbines will be replaced with four new Nordex turbines, nearly tripling the wind farm’s capacity. With an estimated future output of 50 million kWh, an additional 11,000 households will be supplied with green electricity.

What makes the Uetersen wind farm special is the form of community participation. In the “New Energy Region Uetersen” (NERU) cooperative, 159 residents have come together to jointly invest in the new turbines. They now own 8.2 percent of the business shares. A share can be purchased for as little as € 250, making it easy for as many people as possible to participate in the energy transition.

Construction of access roads and crane pads began in August this year, with foundation work starting in September. The erection of new turbines will begin in spring 2025, and the old turbines will be dismantled. Commissioning is expected in mid-2025.

Uetersen

Windpark Uetersen	Old	New
Number of turbines	6	4
Turbine models	AN Bonus 1300/68	Nordex N149
Capacity	7,8 MW	22,8 MW
Operation	2001	2025

BAD GANDERSHEIM FROM FOUR TO ONE

On the edge of the Harz mountains in Lower Saxony, Energiequelle GmbH has replaced four aging wind turbines with a single, more powerful turbine. The result: despite reducing the number of turbines, the annual electricity yield has increased fivefold.

In mid-February, Energiequelle commissioned the E-160 wind turbine with a capacity of 5.56 MW in Bad Gandersheim (Lower Saxony). Drivers on the A7 highway from Hildesheim to Göttingen can already see the new turbine from a distance, thanks to its hub height of 166 meters. Construction began in February 2023 with the dismantling of the four over 20-year-old turbines.

Repowering in Bad Gandersheim brings economic benefits to the operator and reduces the impact on communities and residents:

despite higher capacity, fewer turbines are needed, and the slower-rotating blades improve the visual impact on the landscape.

Dannhausen

Bad Gandersheim	Old	New
Number of turbines	4	1
Turbine models	2 × Enercon E-40 + 2 × Enercon E-66	1 × Enercon E-160
Capacity	4,8 MW	5,56 MW
Operation	2000–2002	2024

WINDPARK BÜTOW A THIRD OF THE ELECTRICITY COSTS COVERED

The Bütow wind farm is located directly on the A19 highway in Mecklenburg-Vorpommern – familiar to many travelers heading to the Baltic Sea. The 29 old wind turbines date back to 1999 and were built as a citizen-owned wind farm. Many of the original investors are still involved today.

In the first phase of the repowering project, nine of the 25-year-old DeWind D4-48 turbines with a hub height of 70 meters and a capacity of 600 kW each will be dismantled. The plan is to gradually replace all 29 old turbines. Initially, six new Nordex N163 turbines, each with a hub height of 164 meters and a capacity of 7 MW, will be installed. This will more than sevenfold the wind farm's capacity, and the energy output is expected to increase thirteenfold: from 7.65 million kWh to 102 million kWh.

Despite the higher capacity, the number of turbines will be significantly reduced. Access roads, grid connections, and other parts of the existing infrastructure will continue to be used after modifications. One particular challenge is dismantling the old DeWind turbines, as the manufacturer is no longer in business.

Repowering is being carried out step by step: part of the old turbines will be dismantled while the others continue to operate

– a complex task, which the operator compares to performing open-heart surgery. The municipalities involved are actively supporting the project. Enertrag, which has been active in the area for many years, is offering residents an attractive wind power bonus in collaboration with the local utility company Malchow. Every resident who is a customer of the regional Enertrag partner will receive an end-of-year bonus payment. The exact amount is still uncertain, but according to company estimates, it will cover about one-third of their annual electricity costs.

Landkreis Mecklenburgische Seenplatte

Windpark Bütow	Old	New
Number of turbines	9	6
Turbine models	9 × DeWind D4-48	6 × Nordex N163
Capacity	5,4 MW	42 MW
Operation	1999	under construction

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Become an expert

www.windindustry-in-germany.com

Read free technical articles,
current studies and company news,
event dates and much more.

Question: “Where do you see your company in five years?”



“We are continuing to make an ambitious contribution to the energy transition and want to have more than tripled our current portfolio in five years. The goal is to have a total of 3.5 GW of wind and PV capacity connected to the grid by 2030. We are also continuing to expand our battery storage portfolio and are focussing on efficiency opportunities through flexibility.”

RALF NIETIET, Management (Chair),
enercity Erneuerbare GmbH



“The expansion and restructuring of energy generation will require considerable effort over the next few years. The move away from coal, gas and oil towards electricity from renewable sources such as wind energy will lead to the rapid expansion of many decentralised generation plants. Rittal and its sister company Eplan offer the right solutions along the entire process chain, from engineering to construction and operation. In addition, we accelerate project planning and the expansion and conversion of energy applications with the help of our Industry Standard Projects. Pre-conceived and pre-configured solutions for our customers to accelerate the expansion of renewable energies.”

RAPHAEL GÖRNER, Executive Vice President Business
Unit Energy & Power Solutions, Rittal GmbH & Co. KG



“As the Reinhausen Group, we offer the technology and services to ensure that the grid works just as reliably at sea as it does on land.”

WILFRIED BREUER, CEO, Reinhausen



“In the future, Rewitec will be the global partner of OEMs, operators and service companies when it comes to efficiency and service life optimization of gearboxes and bearings.”

STEFAN BILL, DIPL.-ING., Managing Director,
REWITEC GmbH



“The unabated acceptance of BIL as a central point of contact for pipeline infrastructure shows: Over the next few years, the portal will position itself as the standard for the efficient planning and smooth implementation of almost every construction project in Germany. On this basis, further services will be offered that take account of infrastructure security and the expansion of renewable energies.”

INGO REINIGER, Director, BIL eG



“Statkraft is – and will remain – a key player in the energy transition in Germany. With strength and flexibility in power generation and trading, as well as being an advocate for a fair market, we contribute to the transformation of the energy system. Our commitment along the entire value chain secures our position as a key company for a sustainable energy supply.”

STEFAN-JÖRG GÖBEL, CEO, Statkraft Germany

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Full Repower ahead!

Replacing an old system with new, more powerful models brings many advantages. At the end of the chapter, you will find a summary of the strengths of repowering.

More information at

www.windindustrie-in-deutschland.de/repowering



Repowering rule of thumb:

halve the number of turbines,
double the capacity,
triple the power output

Older installations are up to
80 % recyclable.

Taller turbines = more consistent output
and lower collision risk for flying animals

Municipalities benefit:
increased revenue
thanks to higher yields

**One new
installation
replaces
3 old ones.**

You can
also order this
graphic in German
as a poster [here](#):



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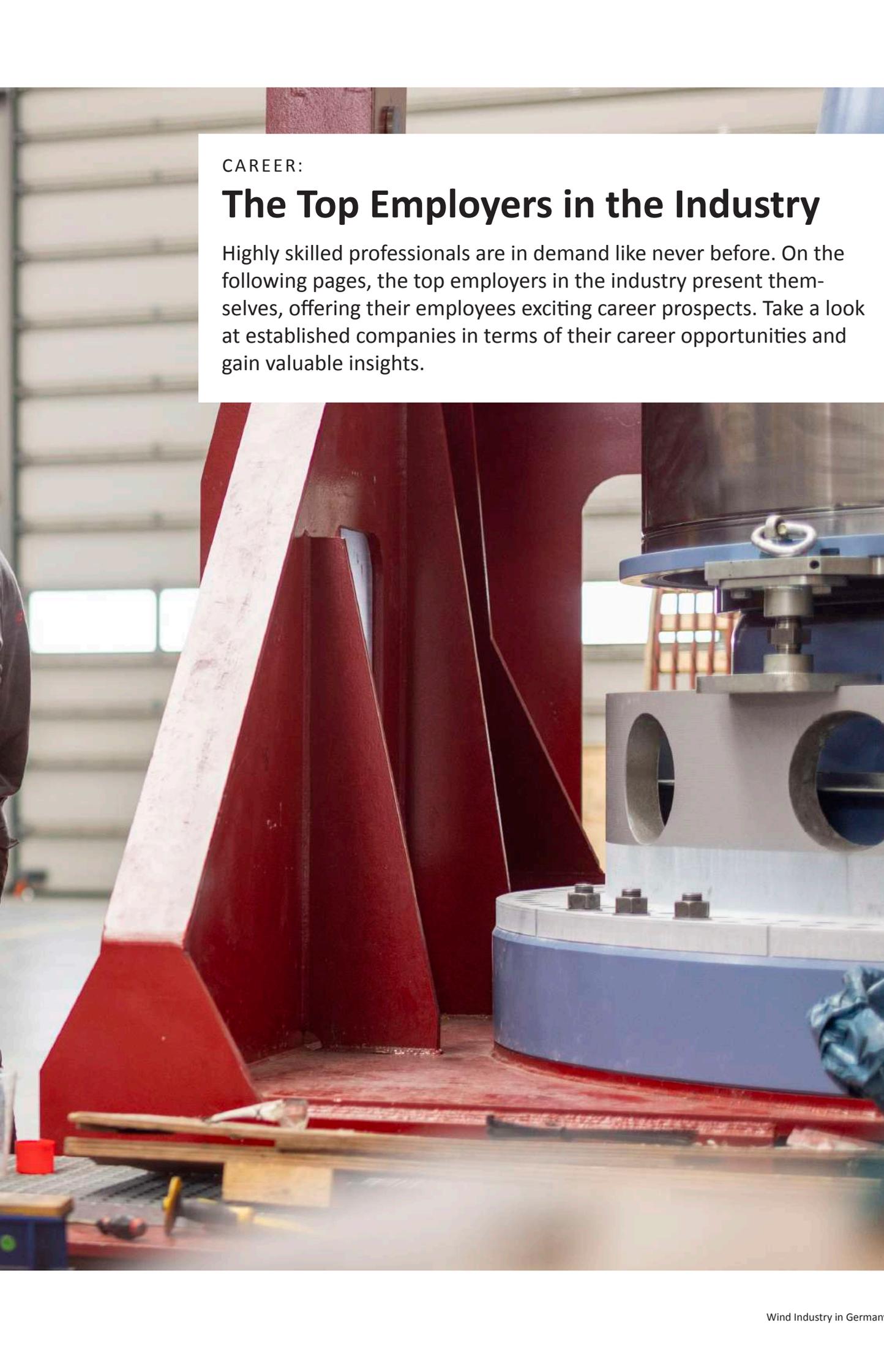
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Wind turbine manufacturer eno energy: Production in Rostock Hinrichsdorf
Photo: Silke Reents



CAREER:

The Top Employers in the Industry

Highly skilled professionals are in demand like never before. On the following pages, the top employers in the industry present themselves, offering their employees exciting career prospects. Take a look at established companies in terms of their career opportunities and gain valuable insights.

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Alterric GmbH

Alterric is one of the largest producers of green electricity in Europe. We are shaping a sustainable energy system with the power of the elements. We offer meaningful jobs and a strong community, united across all departments, locations and countries – as Alterric People.



► **Together for a green future**

Our mission is to advance renewable energies across Europe as an essential contribution to climate protection and sustainability. Our commitment: a comprehensive project pipeline for wind and solar energy, including our own onshore energy parks with over 2,400 megawatts. Our team: Over 500 experts develop and operate our green energy projects in Germany and Europe. As Alterric People, we work together with great dedication, extensive experience, and team spirit for a green energy future. If you want fresh wind for your career, become part of our strong team.

► **You're in the right place at Alterric ...**

... as a person (m/f/d) with the ambition to contribute to a meaningful work environment where you are valued. We welcome experienced specialists, career changers, and beginners, experts in technical or commercial areas, skilled workers, academics, and leaders. For future professionals of the

energy transition, we offer internships and working student contracts.

► **We are looking for committed support (m/f/d) for our teams (selection):**

- Project Development Wind & PV: (Junior) Project Developers, Wind Park Planners, Landscape Planners
- Engineering & Construction: Site Managers, Project Managers, Electrical Engineers, Civil Work Experts
- Generation: Technical Operations Managers, Technical Staff, Field Service (Junior) Portfolio Managers
- Commercial Energy Park Management: Staff, Commercial Operations Management

► **Interested?**

Contact us now!
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- 🌐 www.alterric.com
- 📖 You can also find us on page 148



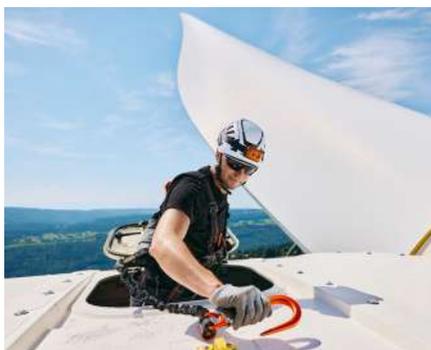
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► **Our benefits**

 <p>Work-Life-Balance Flexible working hours & mobile working</p>	 <p>Strong community Summer festival & team events</p>	 <p>Participation In an Alterric wind energy plant</p>	 <p>Permanent collective agreement A solid place on the team from the start</p>
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Arowya

Arowya is more than just a service company; we are a driving force in the energy transition. We enable impact investing in renewable energy systems, make an active contribution to meeting the growing demand for green energy, and are convinced that every step towards a more sustainable energy supply counts. We are part of BKW Energy and have a large network across the entire energy value chain.



► **Who we are and what makes us unique**

As part of the Swiss BKW Energie AG, Arowya ensures the smooth operation of the group's wind farms in Germany, Italy, France, Norway, and Switzerland. Cutting-edge predictive maintenance techniques, optimized synergies, and quick response times help minimize disruptions and production downtimes while achieving high energy availability.

► **Who are we looking for?**

Qualified and experienced professionals, preferably from the (wind) energy sector, in the following areas:

- O&M (Service Technicians)
- Operations Management (Technical and Commercial Managers)
- Trainees (Industrial Clerks)

► **Our benefits**



Job security
at an established energy company



Further training
Tailored or through LinkedIn Learning licenses



Work-life balance
Balancing work and family



Other benefits
30 days of vacation, private accident insurance, bike leasing, discounts, employee referral program, discounted stock options

If you are interested in joining our team and contributing to shaping a sustainable energy future, visit our career page on our website to find current job postings and apply. We look forward to welcoming you to our team and working together for a green future.

► **Working at Arowya**

At Arowya, we look after the wind farms owned by the Swiss BKW Energie AG. In addition to a fair salary, 30 days' vacation and generous special leave arrangements, we also offer other attractive benefits such as employee discounts, an employee referral program, accident insurance, LinkedIn learning and BKW shares at a preferential price.

Arowya Green energy services

- 152 employees
- Berlin & Brandenburg
- Bern, Milan, Paris, Oslo
- www.arowya.com

► **Interested? Contact us now!**

HR Generalist
Franziska Schnuhr
+49 (0)160 983 887 57
franziska.schnuhr@bkw.de

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Bundesverband WindEnergie e.V. (BWE)

The BWE is committed to the sustainable expansion of wind energy in Germany. Positioned at the intersection of association work and sustainability, it stands for active networking. **Wind connects. Help us determine its direction.**



► **What We Do**

On our Berlin campus, the staff at the national office coordinate the association's work, focusing primarily on supporting our members. The departments for politics and communication, as well as the legal department, are also located here. Additionally, the editorial team for the member magazine *neue energie* works from this location. The staff of BWE Service GmbH provides practical knowledge through seminars, conferences, and publications.

“Here, you meet a great team and definitely won’t be working solo.”

Recent review on kununu

► **Who Works With Us**

The national office is a contact point for various disciplines. Specialists in politics, public relations, technology, law, and procedural issues collaborate closely here. Our experts in communication and editorial work can exchange insights on the current topics in the wind sector, sharing outcomes efficiently across the association. Publicly, the BWE appears on its online platform, in brochures, and publications.

► **Who We Are Looking For**

- Lawyers
- Political scientists
- Public relations and editorial staff
- And many more



German Wind Energy Association

- 👤 Approx. 55 employees
- 📍 Berlin (Office)
- 🌐 www.wind-energie.de/en
- 📖 You can also find us on page 230

► **Interested?**
Contact us now!

HR
Sabine Siebert
✉ bewerbungen@wind-energie.de



► **Our benefits**

 Mobile working 80 % home office and 20 % on-site	 Working hours flexible hours every day	 Lunch subsidy for meals on our campus	 Deutschlandticket almost full reimbursement of costs
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BWE-Service GmbH

With over 1 million contacts in the industry each year, BWE-Service GmbH communicates with the people who drive the energy transition forward daily. The channels for this are information events, events and publications. **Wind lights the way. We walk it willingly.**

“I am part of the energy transition every day. Together with committed colleagues from the renewable energy sector, I am driving this forward in order to save our source of life.”

*Gregor Weber,
Head of Events*



► What We Do

BWE-Service GmbH is a subsidiary of the Bundesverband WindEnergie e. V. and offers seminars and conferences on wind energy, photovoltaics, and other renewable energies.

As a leading provider of training in the wind energy sector, we connect around 20,000 participants each year through our online events and in-person gatherings.



► Who Works With Us

Service GmbH sees itself as a service provider and partner for politics, business, and society. We train skilled professionals, inform about innovative solutions, and help companies establish themselves sustainably. Our experts come from fields such as event management, communication, and sales.

► Who We Are Looking For

- Project and event management staff
- Editorial, design, marketing, and PR staff
- Media designers for image and sound
- Sales representatives and key account managers
- And many more



- 👤 Approx. 50 employees
- 📍 Berlin (Office)
- 🌐 www.bwe-seminare.de
- 📖 You can also find us on page 232 and 234

► Interested? Contact us now!

HR
Sabine Siebert
✉ jobs@wind-energie.de



► Our benefits

Mobile working
80 % home office and
20 % on-site

Working hours
flexible hours every day

Lunch
subsidy for meals on
our campus

Deutschlandticket
almost full reimburse-
ment of costs

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DZ BANK AG

Play an active role in the expansion of the renewable energies business segment in Germany. In the acquisition, structuring and arranging of new business at DZ BANK, Germany's second largest commercial bank.



► **Welcome to DZ BANK!**

Work at a bank where you can successfully shape your future and the future of the cooperative banks. DZ BANK is Germany's second largest commercial bank, the central institution of the Volksbanken Raiffeisenbanken Cooperative Financial Network and the central bank for the approximately 700 Volksbanken Raiffeisenbanken, which own the majority of DZ BANK.

We are a reliable and capable employer that offers you exciting new challenges. One that values your experience, demands commitment and encourages personal responsibility. Who combines customer-orientated action with sustainable solutions and thinks and works in a spirit of partnership – because we like to shape success together, gladly with you.

► **What awaits you**

- An exciting task in the expansion of the Renewable Energies business segment
- A wide range of tasks relating to the project finance business
- The focus is on acquiring, structuring and arranging new business in agile deal teams

► **What you bring with you**

- Successful studies: business administration, law, graduate engineer (m/f/d) or a comparable specialisation (e.g. renewable energies)
- Analytical vision, strong negotiating skills
- Good written and spoken English



- Approx. 5,560 employees
- Frankfurt am Main, Hamburg, Munich, Stuttgart, Münster, Oldenburg, Nuremberg, Hanover, Leipzig, Koblenz, Karlsruhe, Dresden, Berlin, Düsseldorf
- www.dzbank.com
- You can also find us on page 161

► **Interested?**

Contact us now!

Group Leader
Renewable Energies
Germany

Alexandra Pohl

+49 (0)40 35900-496

alexandra.pohl@dzbank.de



► **Our benefits**



Mobile working
100 % home office



Lunch
subsidy at all locations



Deutschlandticket
Full cost coverage



Social benefits
Job bike, occupational pension scheme, childcare

EnBW Energie Baden-Württemberg AG

We are investing in the expansion of renewable energies: By 2025, we aim to generate 50 % of our production capacity exclusively from renewable energies. Our goal is to be completely climate neutral by 2035. This also means: plenty of exciting jobs that make a difference.



► **Shape the future with us**

We supply the entire country with sustainable green electricity from wind energy – for example, from the largest offshore wind farms in Germany in the North Sea and Baltic Sea. In the field of wind energy, we face great challenges: With us, you will not only successfully implement ongoing projects but also work as a project manager, project developer, or service technician in the areas of offshore and onshore, contributing to a sustainable energy transition.

► **Advance the energy transition – and your career!**

Apply your energy for a climate-neutral future. We offer you meaningful jobs in the field of renewable energy. If you want to make a difference in the world, you are in the right place with us.

We are happy to welcome both young talents and experienced professionals to our team.

Join us and make a major contribution to a climate-friendly future. Energy for change. Are you in?

“I was looking for an adventurous job. One that not everyone can do. As a mechatronics technician at EnBW, I not only have to face extreme heights on the wind turbine every day, but also new, exciting tasks with which I can make my contribution to the energy transition.”

Simon, Mechatronics technician in maintenance

► **Our benefits**



Diverse offers

Vacation & Christmas bonuses, flexible working hours & home office



Inspiring work environment

Team-oriented and equipped with the latest methods & tools



Innovative work

Development opportunities & support offers



- 28,000 employees
- Karlsruhe, Stuttgart, Trier, Erfurt, Cottbus, Hamburg, Berlin (and many more)
- www.enbw.com
- You can also find us on page 164

► **Interested?**

Contact us now!

Focus: Offshore

Martina Neumann

✉ Martina.neumann@enbw.com



Focus: Onshore

Jan Czaykowski

✉ j.czaykowski@enbw.com



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Energiequelle GmbH

Drive the energy transition forward with us! We develop, construct, and operate wind energy and photovoltaic systems across Europe and South Africa, realize grid connections, and take care of innovative energy supply solutions – passionately, boldly, and humanely.

► **Shaping the future together**

Since 1997, Energiequelle GmbH has been active in the renewable energy market. With more than 25 locations in six countries, we are a leading company in the industry. Our employees are the most important factor in our corporate success. Team spirit and a human approach are our focus. We use informal language with one another, maintain flat hierarchies, and our management embodies appreciation, down-to-earthness, and a drive for innovation.



► **Ready for our team?**

For our planned growth, we are looking for specialists, executives, career changers, and apprentices throughout Germany (m/f/d):

- Project developers and managers
- Acquisition specialists
- Technicians
- Bank clerks and financial accountants
- Contract managers or notary assistants
- Bank clerks
- Lawyers
- And much more.

► **Not the right time yet? No problem.**

Follow us on [LinkedIn](#), [Xing](#), [Facebook](#) and [Instagram](#).

► **Interested?**

Contact us now!

Head of HR
Kristin Herrmann
✉ jobs@energiequelle.de



Recruiting Specialist
Christian Rosner
☎ +49 (0)33769 871 237



- 👤 600 employees
- 📍 Kallinchen, Berlin, Bremen, Oldenburg, Hanover, Putlitz, Penzing, Erfurt, Dresden, Rostock, Magdeburg, Wiesbaden, Leipzig, Guntersblum, Spremberg, Luckenwalde, Kiel, Stuttgart, Münster (Germany)
- 📍+ Rennes, Dijon, and Bordeaux (France), Helsinki and Vaasa (Finland), Athens (Greece), Poznań (Poland), Cape Town (South Africa)
- 🌐 www.energiequelle.de/en
- 📖 You can also find us on page 166

► **Our benefits**

 <p>Flexible working hours Time tracking, no core hours</p>	 <p>Individual health promotion Health budget, company bike & fresh fruit</p>	 <p>Regular events Beach volleyball, summer festival, health day</p>	 <p>Family atmosphere Owner-managed company, informal culture, personal interaction</p>
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ENERTRAG SE

100 per cent renewable – that’s the goal we have been working towards for the past 25 years, pushing ahead with projects that others deem impossible. Joining us means driving the energy transition forward with determination. We have approximately 1,000 individuals across four continents working diligently towards this. Now we need you. Be part of the action.

We generate, store and distribute energy sourced from wind, solar and green hydrogen.

Our goal is simple: we want to work together to completely replace fossil fuels.

► **Who we are**

For more than two decades, we have been a driving force in the expansion of renewable energies. We provide our services across the entire value chain. Our 1,000 employees at locations worldwide pursue the same mission: to generate renewable energy in a modern and sustainable way for a livable earth.

► **What matters to us**

100 % fossil-free: At ENERTRAG, we don’t just dream of a sustainable and livable world – we actively shape it. We have a clear goal in mind: by 2040, we want to completely replace fossil fuels. We are committed to this together with great passion.

► **Who we are looking for**

We are looking for people who share our vision of an emission-free world. People who – like us – are always one step ahead. People who want to continue developing and expanding their potential. For this, we



offer a generous training budget. And we are looking for people who want to use their wide scope for creativity to help create a sustainable and livable future together. If this description resonates with you, then we should definitely get to know each other.

► **Interested? Contact us now!**

✉ karriere@enertrag.com



- 👤 1,000 employees
- 📍 Dauerthal (Headquarter), Berlin, Rostock, Dortmund, Lübeck, Edemissen, Hamburg, Prenzlau, Cottbus, Kiel, Potsdam, Neubrandenburg
- 📍+ Poland, France (3 locations), Spain, Vietnam, Ghana, South Africa (3 locations), Namibia, Uruguay
- 🌐 www.enertrag.com
- 📖 You can also find us on page 168

“For me, it is very important to have a meaningful job. You only have your lifetime once, and you should dedicate it to something that is sustainable and serves the common good.”

Christian Fischer, Investment Manager

► **Our benefits**

<p>Work environment Flexible & mobile options; 30 vacation days</p>	<p>Well-being Health management, accident insurance</p>	<p>Subsidies Pension plan & day-care; company bicycle</p>	<p>Creative freedom Plenty of it for a more sustainable world!</p>
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ENGIE Group in Germany

Be at the forefront of renewable energies – with ENGIE

ENGIE is one of the leading companies in renewable energy worldwide. Our goal: to grow from today’s 41.4 GW of installed renewable capacity to 50 GW in 2025 and 80 GW by 2030. To achieve this objective, we are specifically investing in the expansion of onshore wind and solar power in Germany.



In renewable energies, ENGIE Germany covers the entire value chain. We invest in onshore wind projects and have a continuously growing project pipeline. We handle project development and planning ourselves, and in collaboration with partners. We operate 18 wind farms with approximately 300 MW. For efficient maintenance and operation, we leverage the expertise of the ENGIE Group, which has thousands of wind turbines and its own research centers.

Through the repowering of existing wind farms, we can further multiply electricity generation at our sites. Via direct marketing and Power-Purchase-Agreements our trading experts ensure that the

green electricity advances the climate objectives of companies. We offer driven individuals with a passion for renewable energy a variety of development opportunities and the chance to lead the way in shaping the energy transition.

► **Interested?**
Contact us now!

Talent Acquisition Partner
at ENGIE Deutschland
Karolin Knobbe
☎ +49 (0)221 46905 066
✉ karolin.knobbe@engie.com




-  Approx. 5,900 employees
-  Over 50 locations across Germany
-  International career opportunities
-  www.engie-deutschland.de
-  You can also find us on page 170



► **Our benefits**



Green commuting
public transportation allowance, company bike



Maximize your energy
Urban Sports Club allowance, corporate benefits, ENGIE Academy



Future? Secured!
Company pension plan, employee shares, ENGIE Care – bereavement insurance



Work-Life-Balance
Mobile working, daycare allowance, special leave

eno energy GmbH

Since 1999, the name eno energy has stood for premium quality and innovative system technology in international wind farm projects.

Engineering Design and Technology – by eno energy.

► **What matters to us**

Eno energy is proud to be a family-friendly company where a pleasant working environment and flexible working hours are a given. Our employees have very diverse development opportunities and are always encouraged to develop their personal skills as well as their professional expertise. We promote an open and cooperative corporate culture where teamwork and mutual support are at the forefront. Eno energy places great importance on the satisfaction and well-being of its employees.



► **Do you want to be part of a green future?**

The eno energy group is evolving into a technology company for wind energy and is expanding its activities in the fields of R&D, sales, and service. On this path, we always need fresh wind! If you stand behind your ideas, want to drive innovation forward, and are ready to help shape the future, you are in the right place! Whether you are a career starter, a leader, or an academic, we are looking for creative and committed employees who want to support and drive our efforts with courage and passion. If you are just beginning your career, we offer internships, apprenticeships, or dual-study programs.

► **We regularly offer positions in these areas:**

- Service Technician (m/f/d)
- Service Technician for wind and/or photovoltaic systems (m/f/d)
- Employee for rotor blade service onshore (m/f/d)
- Grid Planner/Network Connection Planner (m/f/d)
- Technical Product Designer (m/f/d)
- Finance Employee (m/f/d)
- Commercial Employee (m/f/d)
- Accounting Employee (m/f/d)
- Field Service Representative (m/f/d) for wind farm projects

300 employees

Rostock, Ostseebad Rerik, Dresden, Leipzig

Paris (France), Vara (Sweden)

www.eno-energy.com

You can also find us on page 108

► **Our benefits**

<p>Flexible working hours family-friendliness including home office</p>	<p>Monetary benefits Job bike, public transport participation, Pluxee card</p>	<p>Corporate culture Flat hierarchies, open to ideas</p>	<p>Further qualifications Professional & personal development</p>
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ENOVA Power GmbH

Since 1989, the ENOVA Power GmbH has been developing, implementing and managing wind farms in Germany. In our three business areas, we have positioned ourselves broadly and cover the entire spectrum of wind energy services. As a family business, we are characterized by mutual respect and appreciation for each other.



► **Who we are**

Renewable energies have been our passion for over 35 years. As a family business with a headquarters in East Frisia and another office in Hamburg, we are specialized in the development, management and maintenance of wind farms as well as investing in renewable energy projects.

► **What to expect**

We are an agile team of over 100 employees with an open mindset and a great deal of passion. Together, we are driving the energy transition in Germany. We are living a start-up mentality with quick decision-making and flat hierarchies.

► **Bring new energy to your career**

In our three business areas – Project Development, Investment & Asset

Management and Wind Farm Management – there are many opportunities to get involved in various forms due to our wide range of services.

► **We regularly fill positions in the following areas:**

- Intern for Onshore Project Development (m/f/d)
- Intern for Investment Management (m/f/d) in renewable energy projects
- Project Manager (m/f/d) for renewable energy projects
- Project Leader Wind Onshore (m/f/d)
- Project Developer Wind Onshore (m/f/d)
- Junior/Senior Investment Manager (m/f/d) for renewable energy projects



- 👤 100 employees
- 📍 Hamburg, Bunde
- 🌐 www.enova.de

► **Interested?**

Contact us now!

HR Business Partner
Lars-Henning Brinkema
✉ jobs@enova.de



► **Our benefits**



Further development

Individual internal and external training opportunities



Secured into the future

Company pension plan



Fitness

Benefit from Hansefit, EGYM, or Job bike

FGH – Research Association for Electrical Installations and Power Industry

FGH has been a recognized pioneer and implementer of future energy technologies topics in close cooperation with its member companies, customers, and partners – and has been doing so for over 100 years.



► **Who we are**

We are approximately 130 permanent employees, primarily engineers, computer scientists, mathematicians, and physicists, providing energy and electrical engineering services worth around €17 million annually at our locations in Mannheim, Aachen, and Hamburg. We are supported by around 30 students, including those studying electrical engineering and computer science.

► **What is important to us**

In our interactions with each other, we are committed to the values of honesty, openness, and appreciation. We solve challenges in a goal-oriented manner as a team, adhering to realism, logic, and objectivity. FGH stands for the high quality of its services, outstanding expertise, and depth in all technical questions regarding electrical energy supply systems. FGH invests in and promotes the ongoing personal

and professional development of every individual. We actively care for, preserve, and promote our physical and mental health. Our success is based on the commitment and development of all our employees.

► **Who we are looking for**

We are looking for you to help shape the future of electrical energy supply. You can start your career with us, complete internships, gain initial work experience alongside your studies, or write your application-oriented energy or electrical engineering thesis.

► **We regularly offer positions in the following areas (selection):**

- Project Engineer (m/f/d)
- Software Developer (m/f/d)
- Software Engineer (m/f/d)
- Test Engineer (m/f/d)
- Technical Consulting (m/f/d)
- Research Assistant (m/f/d)



- 👤 130 employees
- 📍 Mannheim, Aachen, Hamburg
- 🌐 www.fgh-ma.de
- 📖 You can also find us on page 172

► **Interested?**

Contact us now!

- HR Administration
- Marietta Wunder
- ☎ +49 (0)621 976807-32
- ✉ personalwesen@fgh-ma.de

► **Our benefits**

Flexible working hours	Further training opportunities	Appreciative working atmosphere	Unique team events
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GAIA mbH

Join our team and help shape the energy transition with us! Since 1999, we have been developing, building, and operating wind and solar power plants, primarily in Rhineland-Palatinate. Together with our team of over 70 dedicated employees, we are shaping the energy supply of tomorrow – for a green and independent future.

► **What we stand for**

HOLISTIC We bundle all processes required for wind and solar energy projects: From initiation to turnkey handover of the systems to the operators, we take care of the entire project process.

ECOLOGICAL Since every site and project is different, we always start with a thorough analysis by our experts. From the insights gained, we derive specific requirements, always considering all criteria of sustainability.

FLEXIBLE Depending on the requirements, we can also take care of individual project elements or subprojects. Once a project is successfully completed and the systems are in operation, we offer a wide range of services for wind energy systems, wind parks, and photovoltaic systems. This also applies to projects by other planners and operators.

► **We lead the way**

The **GAIA team** of over 70 highly qualified employees makes an important contribution to sustainable energy generation every day, and thus to climate protection and the preservation of our planet. Our employees come from the fields of business administration, electronics, renewable energies, geography, crafts, engineering, law, communication sciences, technology, and environmental planning.

Since we operate in a relatively young, complex, and dynamic industry, we place great importance on staying up to date with the latest developments. This makes our work diverse and highly interesting. A cross-functional communication culture, teamwork, and short decision-making paths help us achieve this.

► **Everything from a single source**

WIND ENERGY We analyze and plan wind energy projects, accompanying them from the idea through the approval phase to complete implementation.

SOLAR ENERGY We implement PV ground-mounted projects. Additionally, we are a competent partner for energy storage and other service offerings.

OPERATIONAL MANAGEMENT After the construction and commissioning of wind and solar energy systems, GAIA offers its customers a comprehensive range of services in the areas of commercial and technical operational management.

► **Do you have as much energy as we do?**

We are continuously growing. Therefore, we invite young talents and experienced professionals alike to strengthen our team. The path to the future leads through www.gaia-mbh.de/karriere or our profiles on LinkedIn, Xing, Instagram, and Facebook.




-  75 employees
-  Lamsheim, Rhineland-Palatinate
-  www.gaia-mbh.de
-  You can also find us on page 173

► **Interested? Contact us now!**

Head of Human Resources
Claudia Voßmann
☎ +49 (0)6233 3044-522
✉ bewerbungen@gaia-mbh.de

Assistant to the HR Management
Katharina Dörner
☎ +49 (0)6233 3044-523
✉ bewerbungen@gaia-mbh.de

► **Our benefits**

 <p>Flexible & mobile working Flex time account, mobile working</p>	 <p>Unlimited electric vehicle charging During working hours on our company premises</p>	 <p>More vacation days 30 days of vacation + additional vacation days depending on company tenure</p>	 <p>Further qualification Individual professional and personal development opportunities</p>
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in.power Group

We are pioneers in direct marketing and we are fully committed and passionate about a sustainable and future-proof energy system. **Become part of our small, powerful team!**



► What defines us

The in.power group, based in Mainz, has been involved in the direct marketing of renewable and environmentally friendly energy since 2006, making it one of the first companies in Germany to do so. in.power is part of the Second Foundation group based in Prague, which supports in.power's energy trading with its innovative trading system. With several subsidiaries, in.power offers a comprehensive range of services related to direct marketing and is also a competitive metering point operator. The subsidiary grün.power GmbH also provides green electricity regionally and nationwide and has won several awards. We want to achieve great things and drive the energy transition forward. We need you to help us reach this goal!

► Your benefits with us

- You will work with us to implement the energy transition

► Our benefits

 **Working hours**
Individual options

 **Informal culture**
Friendly atmosphere

 **Room for ideas**
Many opportunities for creativity

 **And other perks**
Free drinks & parking

- With flexible working hours, you can organize your workday as individually as necessary and possible, including partial home office
- Small, dedicated team in a dynamic market and work environment
- Flat hierarchies, informal culture, friendly work atmosphere
- Opportunities for creativity and space for your own ideas
- Free drinks and parking in the underground garage

► We are regularly looking for (m/f/d):

- Professionals or newcomers for sales and back-office roles in direct marketing, including new business fields like flexibility marketing or green balancing groups for industrial electricity decarbonization
- Project and process managers in the energy sector

in.power

-  Approx. 15 employees
-  Mainz
-  www.inpower.de/karriere
-  You can also find us on page 179

- IT developers and programmers
- We also welcome applications for internships, theses, and working student positions.

► Interested?

Contact us now!

Marina Hinsch
+49 (0)6131 696 57 13
marina.hinsch@inpower.de



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JUWI

We initiate change in a sustainable way and work towards the energy transition together. Let's turn passion into sustainability.
The Power of Our Unity. Sustainable. Together. Strong.

**You have the spirit.
We shape the team.**

Turn passion into sustainability with us.



The Power of Our Unity.
Sustainable.
Together.
Strong.



► **Actively shape the energy transition**
We are always looking for individuals ready to be part of our projects. At JUWI your commitment and contribution to climate protection forms part of an international organization in an impactful industry worldwide. At JUWI, we believe that the most valuable energy comes from our employees. That's why we offer a healthy work-life-balance, a wide range of development opportunities and much more.

► **Values lived**
Shaping the energy transition requires the collaboration of many forces, and we are deeply committed to fostering a workplace where everyone feels comfortable and valued. Our open corporate culture,

where we live our values every day, ensures that new team members quickly feel at home. We embrace a friendly and approachable atmosphere across all hierarchy levels. Are you ready to join us and be part of something powerful?

► **Interested?**
Contact us now!
HR Managerin Recruiting
Catharina Domann
✉ karriere@juwi.de



HR Manager Recruiting
Christian Spörle
✉ karriere@juwi.de



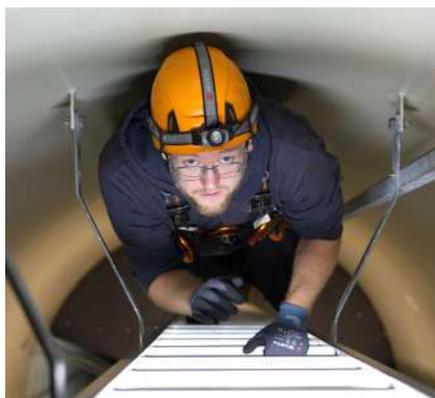
- 1,350 employees
- Wörrstadt (Headquarter), Ansbach near Nuremberg, Bochum, Brandis near Leipzig, Hanover, Melle near Osnabrück, Stuttgart, Rostock
- Greece, India, Italy, Philippines, Singapore, South Africa, Thailand, USA
- karriere.juwi.de
Career.juwi.com
- You can also find us on page 181

► **Our benefits**

 <p>Flexible working models Wherever and whenever possible, you can work flexibly in terms of location and time.</p>	 <p>Sabbatical With the JUWI value account, you save time credits for example to use for a sabbatical.</p>	 <p>Benefit card Look forward to a monthly credit of 50 euros for local stores.</p>	 <p>Business Bike Full of energy on the go – you can finance one or two bikes of your choice at a reduced cost.</p>
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Prokon Regenerative Energien eG

Prokon eG is Germany's largest energy cooperative and, for around 30 years, has been making a real contribution to the energy transition as a project developer and operator of renewable energy systems.



► **What you should know about us**

Founded in 1995, we were among the pioneers in the renewable energy industry and have successfully established ourselves. Today, our core competencies include the development, planning, and realization of onshore wind farms, as well as their subsequent technical and commercial operations management. We also supply private household customers nationwide with green electricity.

► **What drives us every day**

We want to protect the foundation of life on Earth – active climate protection is indispensable for this. Together with our 40,000 members, we are laying the foundation for a sustainable and secure energy supply based 100 % on renewable energies. With the cooperative as our economic foundation, every individual is at the center of what we do – and we live this every day.

► **What to expect from us**

We offer a working relationship on equal footing, where every employee has the opportunity to contribute their ideas. Flexible working hours and mobile working provide freedom and flexibility in the workday. A corresponding salary with a fixed 13th-month salary is, of course, part of the package.

► **Where we need your support**

- Project development plans and builds wind farms across Germany. As a project developer (Projektentwickler m/f/d), you can expect many exciting tasks here.
- Service and operation of wind energy systems (Service und Betrieb von Windenergieanlagen, SBW) ensure the technical integrity of wind energy systems. You can contribute as a service technician (Servicetechniker m/f/d) with an electrical or mechanical focus (career changers are always welcome!).



- 👤 400 employees
- 📍 Itzehoe, other locations across Germany
- 📍 Finland, Poland, Spain
- 🌐 www.prokon.energy
- 📖 You can also find us on page 192

► **Interested?**

Contact us now!

- Torge Gelard
- ☎ +49 (0)4821 6855-165
- ✉ t.gelard@prokon.net



► **Our benefits**

<p>Mobile working Up to 3 out of 5 days working from home possible</p>	<p>Working hours Flexibly adjustable working hours</p>	<p>Job bike Support for e-bike leasing</p>	<p>Bonus payments Fixed 13th salary and additional bonuses</p>
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Rotor Control

DAMN GOOD PROSPECTS

With a full range of services and smart solutions for wind energy and photovoltaic systems, Rotor Control has been a market leader since 2006.

► **We offer services at the highest level**

Reliable solutions, well-thought-out processes and high safety standards all from one source: At Rotor Control, we have a passion for renewable energies and their smart use. We rely on professional know-how, strong employees and high-tech solutions. Our customers rely on fast and solution-oriented services for their wind energy systems. From rotor blade repair, lift maintenance to the inspection of electrical equipment, we are always a reliable partner. We turn off the lights and install Aircraft Detection Lighting Systems (Bedarfsgesteuerte Nachtkennzeichnung, BNK). We take care of retrofitting, installation, commissioning and maintenance of systems from renowned manufacturers. And with our wide portfolio for PV systems, including inspection, maintenance and testing of technical components, we are also well-prepared in this area.

► **Damn good prospects**

Are you looking for a cool, future-proof job where you can fully contribute and be part of a strong team? Heights don't faze you, you enjoy hanging out and you're in the best physical shape of your life? You appreciate a workplace with a family structure, attractive pay, training opportunities plus various benefits? Then apply to us! We all share the same drive: absolute

passion for our job! Whether on the tower or on the ground – we are the specialists who are where we are needed and keep everything running. You can be part of our mission. Nationwide. Every day.

► **Service Technicians & Career Changers Wanted**

Do you want to ensure that our renewable energy flows reliably? Ideally, you have training in electrical or mechatronic fields? Experience in service/maintenance? Or are you just skilful with your hands, not afraid of heights, physically fit and highly motivated for a green job? You work best in pairs with your desired service partner? No problem. Apply as a team and soon start with your own service van from home to our customers in your region.

► **Performance with quality and safety**

We strive for continuous improvement. That's why we operate according to the DIN EN ISO 9001:2015 quality management system. It ensures monitored processes in all relevant areas. Our company has been awarded the BG seal of approval 'Systematic safety'. Our claim and standard is that every assembly worker is trained according to the specifications of the Global Wind Organisation and equipped with the prescribed safety equipment.



- 20 employees
- Struckum (Schleswig-Holstein), Bremen
- www.rotor-control.de
- You can also find us on page 200

► **Interested? Contact us now!**

Quality and Human Resources
Birgit Fogel
☎ +49 (0)4671 9334400
✉ bfogel@rotor-control.de



► **Our benefits**

Attractive pay plus overtime allowances	Independent work with your own service van at your doorstep	30 days of vacation plus compensatory time off	Monthly non-cash voucher Vouchers for shopping in over 100 stores
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The Who's Who of the German wind industry

Your company is not listed in the publication?
You'd like to be included again next year?
Then don't hesitate!



Specification:

Company profile and/or Address entry

- in the German print publication
- as pdf (German and English)
- and in the online database

Free distribution around the world at trade fairs and conferences

Free copies for your own marketing

We'll be glad to advise you:

Klaus Barkeling:
k.barkeling@wind-energie.de

Nikos Fucicis:
n.fucicis@wind-energie.de



Published in German and English.

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Siemens Gamesa Renewable Energy

Siemens Gamesa has been a pioneer in the wind industry for more than 40 years. Today, more than 28,000 colleagues work to harness the power of the wind to tackle one of the greatest challenges of our generation – the climate crisis. **We make real what matters – Clean Energy for generations to come.**

► **A world-leading company in the wind industry**

Siemens Gamesa is a subsidiary of Siemens Energy and an international company with a strong European manufacturing network. We produce both onshore and offshore wind turbines and offer a wide range of maintenance and service solutions. Our main locations in Germany are Hamburg and Cuxhaven. Hamburg, as our office location, is the headquarters for global offshore activities. Here, we develop new turbines, sell projects, and manage installation and service operations at sea. At the same time, our Hamburg office oversees onshore projects in Germany and Northern Europe, including their maintenance services. In Cuxhaven, more than 1,000 colleagues are involved in the production of offshore nacelles.



► **Green technology and diversity**

Sustainability is at the heart of what we do. All of our facilities are powered 100% by electricity from renewable sources. Our goal is to achieve climate neutrality across our entire supply chain by 2040 without relying on carbon offsets. At the same time, we aim to make our turbines 100% recyclable by 2040. With the world's first RecyclableBlade and the GreenerTower, we offer our customers innovative and environmentally friendly products, leading the way in building a circular economy in the wind industry. We also place great emphasis on diversity and inclusion. We believe that diverse teams foster innovation, creativity, and collaboration. In Germany, colleagues from more than 60 nations work together successfully, and we support our employees in gaining international experience.

► **Ready to drive the energy transition?**

We are looking for motivated individuals who want to push the energy transition forward as part of a strong team, while also advancing their own careers. At Siemens Gamesa, we work every day to transform the energy industry step by step. There are many ways to become part of our team. For career starters, we are looking for apprentices in operational electronics for our plant in Cuxhaven, as well as for our offshore and onshore



SIEMENS Gamesa RENEWABLE ENERGY

- 28,000 employees
- Headquarter in Germany: Hamburg
- Various locations
- www.siemensgamesa.com
- You can also find us on page 112

service and commissioning teams. We also offer commercial apprenticeships and dual study programs. University graduates, those with technical training, or individuals with extensive professional experience can find current job openings on our website.

► **Our benefits**

	Flexible working Mobile working & flexible working hours		Employee offers Meal subsidies and more		Deutschlandticket Partial cost coverage		Bonus payments Christmas and vacation pay
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UKA – Umweltgerechte Kraftanlagen GmbH & Co. KG

UKA, as a full-service provider, delivers all services up to the operational handover of wind and solar parks. Afterward, the subsidiary UKB ensures optimal technical and economic performance of the systems for decades.

Become part of the energy transition!



► **The energy park developer**

The UKA Group has more than 980 employees and operates in Europe, North and South America. As a full developer, UKA covers the entire value chain and also operates wind and solar parks. Founded in 1999, the company is one of Germany's leading project developers. Internationally, UKA has also grown significantly in recent years. The current project pipeline of the UKA Group for wind and solar projects now exceeds 19 gigawatts.

► **Who we are looking for (among others):**

- Project Developers for Wind and PV (m/f/d)
- Approval Planners (m/f/d)
- Acquisition Specialists (m/f/d)
- Lawyers (m/f/d)
- Team Assistants (m/f/d)

► **Let's shape the energy of tomorrow**

At UKA, geographers, industrial engineers, surveyors, foresters, business administrators, lawyers, and many other specialists work together at the highest technical and economic level. To thrive in the future industry of renewable energies, your dedication and expertise are essential. UKA offers demanding and future-oriented jobs.

► **Interested?**

Contact us now!

Teamlead Recruiting
Toni Freude
✉ personal@uka-gruppe.de



Der Energieparkentwickler

- 👤 980 employees
- 📍 Bielefeld, Cottbus, Dresden, Erfurt, Essen, Hanover, Heilbronn, Kiel, Lohmen, Lübeck, Magdeburg, Mainz, Meißen, Oldenburg, Rostock, Straubing
- 🌐+ Chile, Italy, North America, Poland, Spain
- 🌐 karriere.uka-gruppe.de
- 📖 You can also find us on page 212

► **Our benefits**



Mobility
Support for bicycle, public transport, or car



Well-being
Fitness and health offers



Flexibility
Work-life balance



Talent management
Targeted support

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Wölfel Wind Systems GmbH

From structural health monitoring, including ice detection, to dampers for tonalities and vibrations – we offer proven solutions to increase yield and optimize continued operational life. We want to continuously develop these in our great team. Interested in being part of it?

► **WIND ENERGY@WÖLFEL**

We are experts in vibration and signal analysis, providing insights into structural damage, lifetime consumption, and the associated potential for continued operation. We monitor material fatigue, develop dampers for vibration or tonality reduction, and help fulfill legal requirements regarding noise emissions.

► **HEART AND SOUL@WÖLFEL**

Knowledge is nothing without people to apply it. We firmly believe this, and this principle is connected to our core values: Humanity, a friendly, family-like atmosphere, respect, and appreciation are indispensable parts of our daily interactions and successful collaboration.

► **FUTURE@WÖLFEL**

“People want to live in a safe future, pleasantly and as undisturbed as possible, while conserving the planet’s resources. In all these areas, our core competencies in vibrations, structural mechanics, and acoustics play a significant role in the success of future solutions.”
Dr.-Ing. Steffen Pankoke, CEO



► **YOU@WÖLFEL**

Whether in a permanent position, a working student role, an internship, or through a thesis – at Wölfel, anyone who wants to actively contribute their innovative ideas in a challenging environment is welcome.

We are frequently looking for:

- Engineers (m/f/d) with a focus on wind energy and/or sensor technology/IIoT
- Data Scientists (m/f/d)

An unsolicited application is also worthwhile: we have often adapted the roles of new colleagues based on their individual strengths and needs in the past.

One thing we can promise in advance: There’s always a lot of laughter in Wölfel interviews – just like in everyday work.



Developing people. Engineering the future.

- 160 employees
- Höchberg near Würzburg, Berlin, Hamburg, Leipzig, Ulm/Kempton
- www.woelfel.de
- You can also find us on page 222

► **Interested?**

Contact us now!

HR Specialist
Lena Schmitt
+49 (0)4845 79168 148
Lena.Schmitt@woelfel.de



► **Our benefits**

 <p>Strength-based development Individual support and tailored roles</p>	 <p>Future-oriented and family-like work environment Where innovation and team spirit come together</p>	 <p>Flexibility Individual home office options</p>	 <p>Company health promotion Your health is important to us</p>
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wpd GmbH

In 1996, the two founders of wpd started with just the two of them – today, around 1,200 employees work on wind and solar energy projects with us.



And we are continuing to grow – at all locations and in all teams. New employees are constantly joining us: from young talents to those looking to continue their careers with prior experience. Together, we are shaping the energy supply of the future.

► **wpd as an employer**

wpd creates space for a work environment characterized by respect, appreciation, and collaboration. We are happy to share our experience in the field of wind and solar

energy with new colleagues. Many of these colleagues grow into new exciting positions with project responsibilities or into specialized areas of corporate organization. This is an essential prerequisite for the positive development of our company. Additionally, we take on social responsibility together with our employees by supporting charitable projects and committing to environmental protection. Together, we want to drive positive change. For us. For wpd. For the energy transition in Germany and worldwide. Don't just do anything – do something for the climate!



► **Interested?**

Contact us now!

Head of Human Resources

Cornelia Schank

✉ human-resources@wpd.de



- 👤 1,200 employees
- 📍 See map
- 🌐 www.wpd.de/en
- 📖 You can also find us on page 223



► **Our benefits**

Welcome culture
Onboarding app & introduction days

Mobile working
40 % can be worked remotely

Deutschlandticket
20 EUR subsidy

Health promotion
Corporate fitness & bike leasing

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wpd windmanager GmbH & Co. KG

More than just a job. We want to make a difference. Every day, our 570 employees working for a sustainable energy supply. And we do it worldwide. Are you looking for a new challenge? **Then join the windmanager team.**



► **Who we are**

We are a globally operating and steadily growing company specializing in the commercial and technical management of wind and solar parks. We are now responsible for over 6.5 gigawatts of total capacity.

► **What to expect? A job that suits you.**

We want to offer our employees an environment where they enjoy coming to work and feel comfortable. That's why we emphasize flat hierarchies, flexibility, and work-life balance. For example, we have defined core working hours so that you can organize your workday in a way that suits you. Additionally, you can choose freely on which days you work in the office or remotely – 40 percent of your working time is available for this. We also care deeply about the well-being of our employees, which is why we partner with

Likeminded, where our windmanagers can proactively take care of their mental health. And the best part: You can use the Likeminded offering during your working hours.

► **Work hard, play hard**

We don't just work together excellently; we also know how to celebrate together. Every year, our colleagues from all locations come together for the big windmanager united party in Bremen to meet, exchange ideas, and celebrate. But there are, of course, many more benefits, like corporate fitness, company bike leasing, and our corporate benefits portal. Sounds good? Then become a windmanager.



- 570 employees
- Bremen, Hamburg, Rostock, Erkelenz, Egel, Bremerhaven, Stralsund
- Oulu (Finland), Piteå (Sweden), Poznań (Poland), Arras & Vertou (France), Dubrovnik & Šibenik (Croatia), Valladolid (Spain), Los Ángeles (Chile), Taichung (Taiwan)
- www.windmanager.de
- You can also find us on page 224

► **Interested?**

Contact us now!

Head of Human Resources
Lea Hesse
✉ hr-wm@wpd.de



► **Our benefits**

 <p>Office or remote? Your choice for 40 % of your time</p>	 <p>Good work-life balance with flexible working hours</p>	 <p>Mental health Access to Likeminded offerings</p>	 <p>Other benefits Fitness, bike, corporate benefits, and more</p>
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WT Energiesysteme

We shape the energy transition – under this motto, our team has been making a valuable contribution to reducing CO₂ footprints for more than 20 years.

Energy conversion – this is the focus of WT Energiesysteme GmbH. We are an owner-managed medium-sized company with over 20 years of experience at locations in Riesa, Dresden, and Meißen. Our core competence lies in the planning, construction, and modernization of substations and grid connections in the range of 10 to 380 kV. Since 2002, more than 240 substations have been built for our customers in Germany.



► **Great work with a great team for great customers**

At WT Energiesysteme, we create an individually supportive work environment through modern workplace design and flexible structures. Our employees benefit from an open corporate culture where trust and collaboration are at the center. We place great value on commitment, team spirit, and a family-like working atmosphere. With us, you have the opportunity to help shape, decide, and experience how the company grows.

WT Energiesysteme has a future vision of a clean planet, and we hope that you will become part of the energy transition in our team.

We offer you a secure and interesting job within a future-oriented industry in the energy sector.

► **Do you want to be part of our team? – Your energy is needed!**

Our success is largely based on the competence and commitment of our employees. If you value an innovative and solution-oriented working style and are looking for an exciting professional challenge in the commercial, construction, or electrical fields, then you are in the right place with us. We are currently looking for talented and ambitious professionals to strengthen our team and help us shape the future. Open positions include:

- Construction Planner/Construction Engineer
- Construction Manager
- Commissioning Technician
- Electrician/Mechatronics Engineer for Control Cabinet Construction
- Project Manager
- Electrical Technician

Didn't find the right position? Feel free to apply proactively.



- 130 employees
- Riesa, Dresden, Meißen
- wt-energiesysteme.de
- You can also find us on page 226



► **Interested? Contact us now!**

HR Specialist
Kristina Bürger
+49 (0)151 17913205
bewerbung@wt-energiesysteme.de



► **Our benefits**

<p>Flexible working models Flexible working hours and flexitime models</p>	<p>Attractive remuneration Above-average salary and annual bonus</p>	<p>Further training Numerous further training opportunities</p>	<p>A secure future Company pension scheme</p>
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A robot welding two steel parts together.
Photo: © BAM

DRIVERS OF INNOVATION:

Companies with innovative projects

The following pages are dedicated to companies and institutes whose new products, processes or methods ensure the continued development of the wind industry. Use the opportunity to get in touch with them and benefit from their innovation.

NEW: With reports from German research institutes (from p. 68).

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Automated performance analysis for wind projects

4cast Horizon offers automated, precise performance analysis that accompanies your projects efficiently and successfully from planning to implementation.

The successful planning of wind farms depends largely on the ability to accurately predict the potential yield of a site in the early stages. With 4cast Horizon, our innovative solution for automated performance analysis, we ensure that planners and developers have the tools to make informed decisions quickly and efficiently.

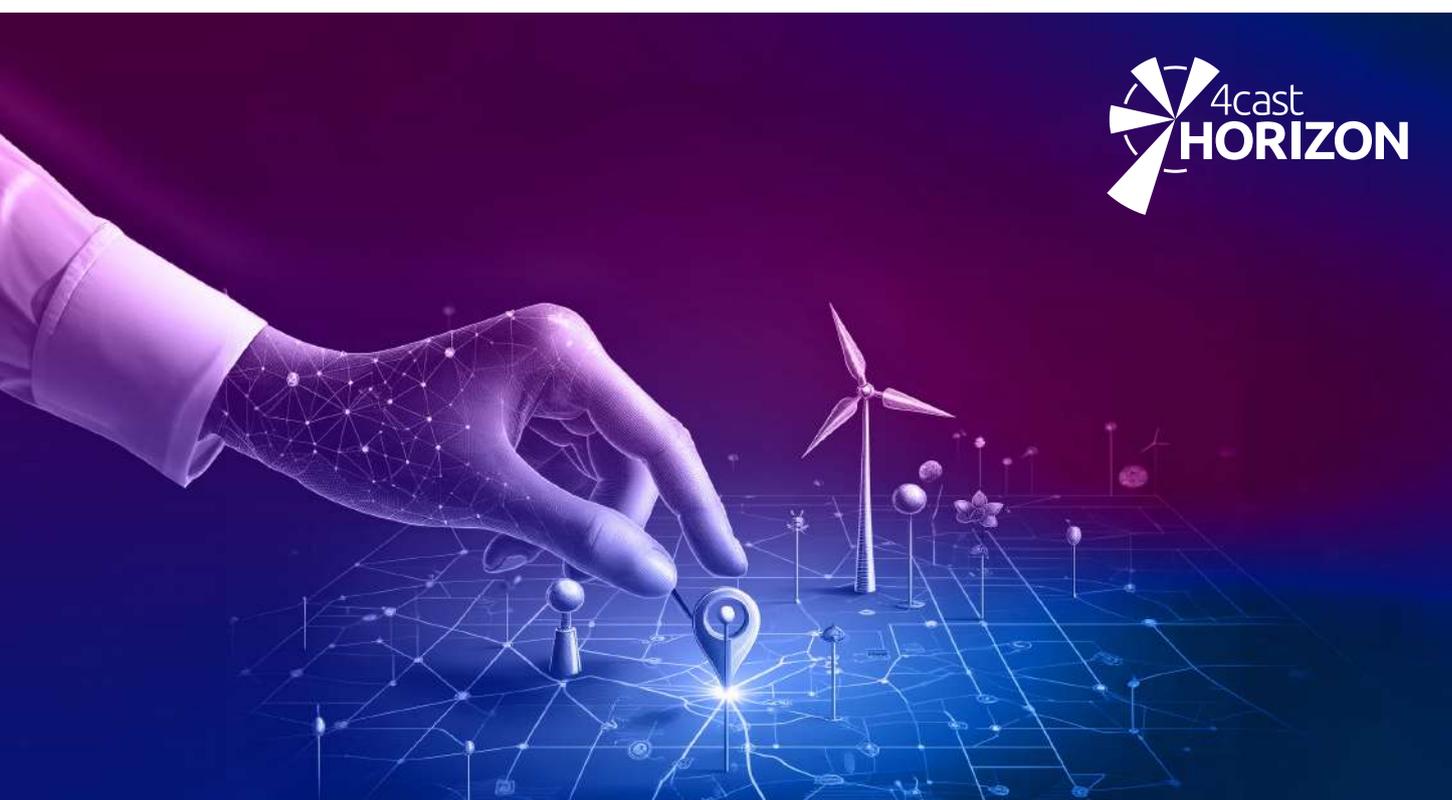
4cast Horizon uses proprietary analytics software built on a highly scalable, cloud-based infrastructure. This solution makes it possible to process extensive data sources such as turbine specifications, park layouts and meteorological data

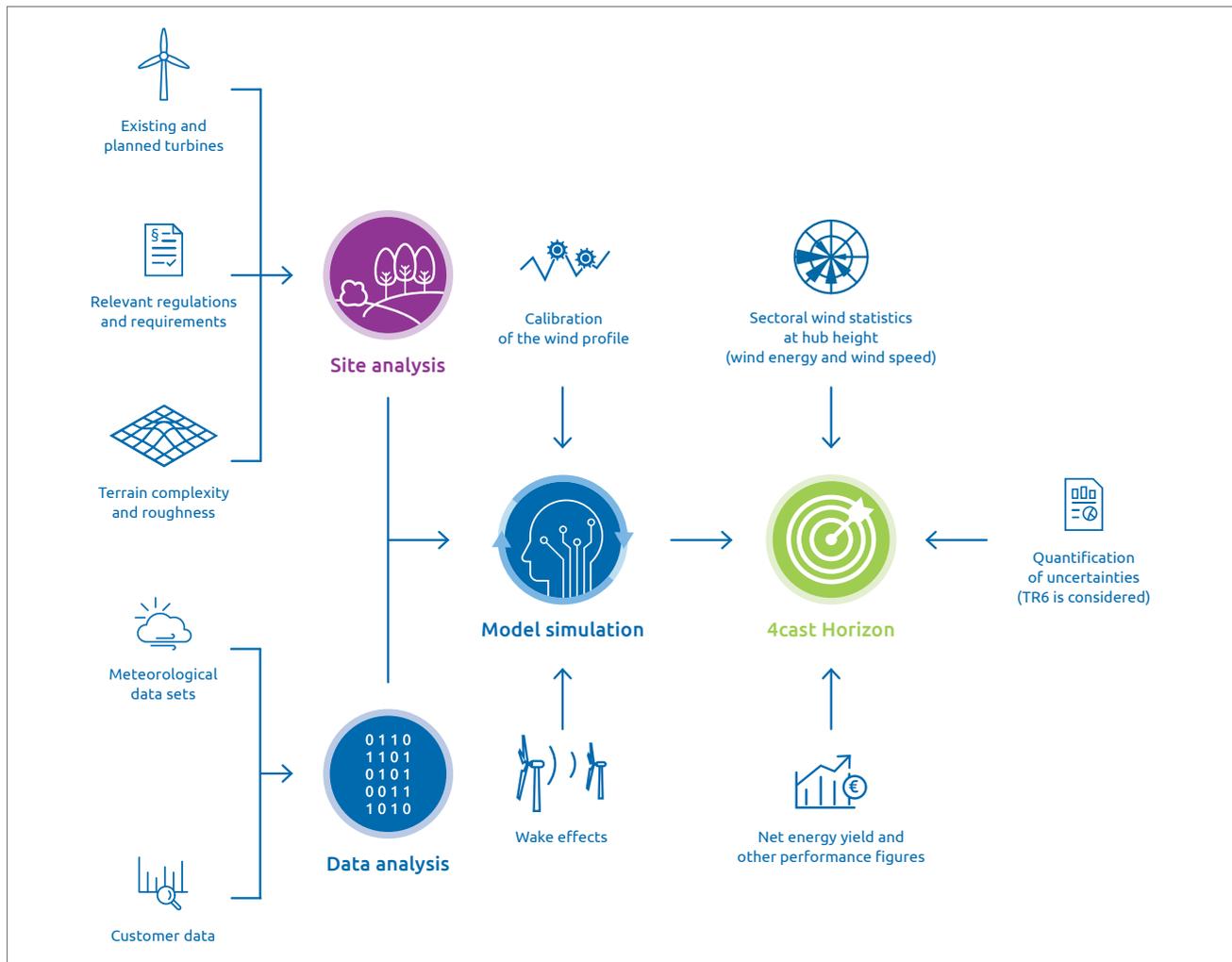
sets and create precise yield forecasts. By automating individual process steps, you not only save time and resources, but also receive reliable results that help you plan your projects with maximum efficiency.

A particular advantage of 4cast Horizon is its ability to calculate and compare a variety of scenarios. This is extremely useful when it comes to evaluating different site options or analyzing the impact of changes in project constraints. Our forecasts take into account not only the layout of the farm and wake effects, but also the roughness of the terrain and the mutual influences of the wind turbines. This en-

ables us to provide you with detailed net energy yields that take into account technical losses and environmental constraints.

In addition to providing yield forecasts, we also offer historical time series of energy yields and wind data. This information enables you to better understand the wind patterns and fluctuations at a location and to plan your projects even more precisely. We also offer combined yield forecasts for the simultaneous use of photovoltaic and wind energy, which is particularly beneficial for optimal grid utilization.





Process flow with 4cast Horizon

Project status and goals:

4cast Horizon is already being used successfully by planners and developers and is undergoing continuous development. Our goal is to further expand the service and integrate additional functionalities to offer our customers even more flexibility and precision. Drastically reducing processing time is our biggest focus and is constantly being improved by driving forward automation.

Contact and networking opportunities:

We invite interested companies and professionals to network with us and work together to optimize 4cast Horizon. For a conversation write to us at hello@4-cast.de or scan this QR code directly:



Project overview

Initiator	4Cast GmbH & Co. KG
Status	start of the project May 2024, continuous development
Location	Worldwide
Phone	+49 (0)331 98223830
E-Mail	hello@4-cast.de
Web	4-cast.de



Are you interested in the project and want to know how your community or your business can benefit from it? Contact us. Our contact can be found in the **business directory on page 146.** ▶

Conclusion:

4cast Horizon offers you fast and precise yield forecasts that ensure the success of your wind projects. With our solution, you can make informed decisions and optimize your investments for maximum yields.

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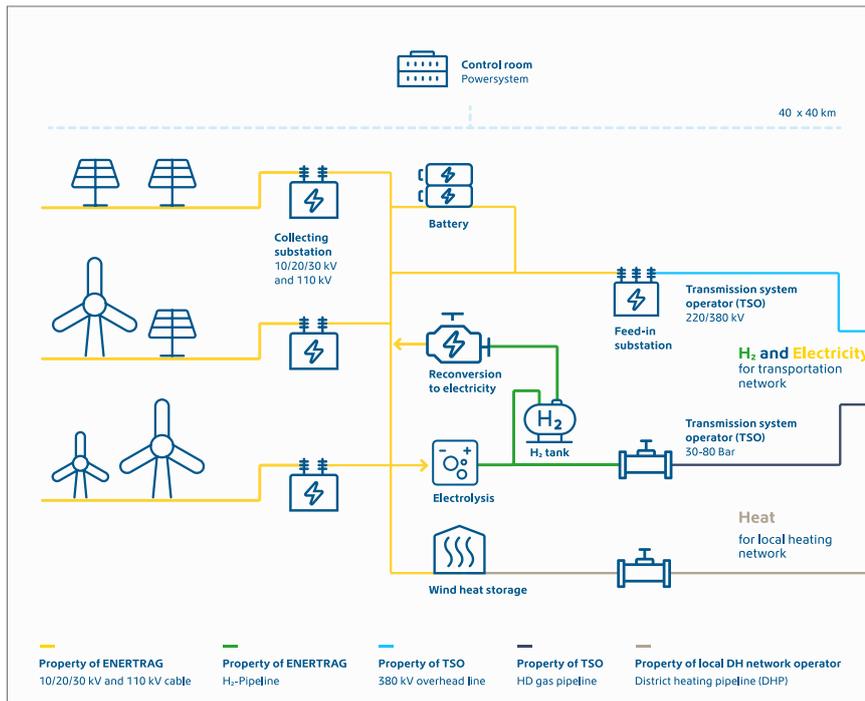
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The ENERTRAG Verbundkraftwerk® – The Prototype for Clean Energy Supply

The ENERTRAG Verbundkraftwerk® provides energy as reliably as conventional power plants – only cleaner and more sustainable.



The energy flow in the ENERTRAG Verbundkraftwerk®

→ Conversion and storage

Surplus energy is stored, for example in batteries, with the help of an electrolyzer as green hydrogen or in wind heat storage systems. In contrast to other energy producers, ENERTRAG does not shut down its wind power and photovoltaic systems during periods of darkness. In the event of bottlenecks in the electricity grid, the stored green hydrogen can be converted back into electricity.

→ Control centre

The control centre is the central monitoring and control unit of the ENERTRAG Verbundkraftwerk®. All systems are directly connected to it via control lines. From the control room, a team continuously monitors the operation of the entire combined power plant and its components. This includes energy generation, conversion, distribution and grid connection.

Principle

ENERTRAG Verbundkraftwerk® are directly connected energy plants, i.e. without a public grid. These produce electricity from wind and solar energy, which flows primarily into the transmission grid. The surplus electricity is stored, for example in a battery, as green hydrogen or in the ENERTRAG Verbundkraftwerk®. The storage units supply the electricity sector when too little wind and solar power can be produced.

Components

→ Primary energy from wind and sun

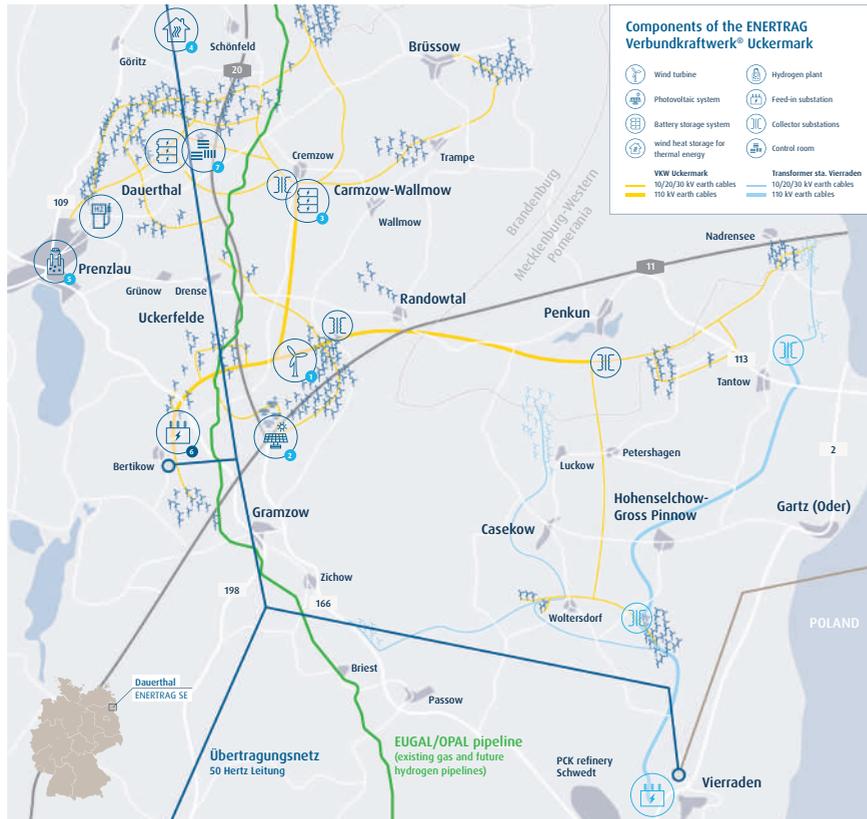
The ENERTRAG Verbundkraftwerk® generates large quantities of sustainable electricity from wind and solar energy.

→ Network infrastructure

The electricity is collected in hybrid form in local grids, forwarded to the central substation via substations within the area of the ENERTRAG Verbundkraftwerk® and fed into the transmission grid there as a priority. Hydrogen pipelines and heat pipes can also be part of the local interconnected power plant grid infrastructure.

→ Utilization

The electricity is fed into transmission grid as scheduled electricity via a single large substation so that households and industry can utilize it. The ENERTRAG Verbundkraftwerk® also guarantees all the necessary system services, such as black start capability, peak load coverage and the provision of balancing energy. The surplus electricity is stored as green hydrogen, for example, flows into the future hydrogen grid and can also be used by industry. Green hydrogen can also be further refined into hydrogen derivatives such as ammonia or methanol. Further, surplus electricity can be used for local heat supply.



The ENERTRAG Integrated Power Plant® Uckermark at a glance: Already a reality, the Uckermark plant generates clean electricity, green hydrogen, and heat over an area of 40 x 40 kilometres.

Important to know

The different and fluctuating generation patterns of wind energy and photovoltaic systems balance each other out in the ENERTRAG Verbundkraftwerk®. This enables a constant, predictable and demand-oriented power supply.

Conclusion

The ENERTRAG Verbundkraftwerk® can fully replace conventional power plants.

Under Construction: The Hydrogen Analysis Laboratory of ENERTRAG Operation



Preparations are in full swing for a state-of-the-art hydrogen analysis laboratory in Prenzlau, located next to the existing hydrogen filling station. The lab is scheduled to launch in early 2025. Initially, it will serve the hydrogen projects “Heidekrautbahn” and “Industriepark Osterweddingen” and will gradually expand to serve other customers. The lab’s goal is to certify hydrogen purity in line with the strict requirements of DIN ISO 14687, ensuring the best possible product quality. Hydrogen sample bottles will be rinsed with hydrogen 6.0 and provided by ENERTRAG Operation, filled by the customer, and returned for analysis. Customers will receive an analysis report. The lab has the capacity to conduct several hundred analyses per year. ENERTRAG, which has been producing green hydrogen since 2011, aims to integrate the analysis process into its own value chain.

From top to bottom:
Wind turbine General Electric (GE)
5.5/158/5500 (Windfeld Falkenwalde),
PV plants Kreuz Uckermark,
Alkaline Electrolyzer (AEL) Wittenhof



Project overview

Initiator	ENERTRAG SE
Key Figures	<ul style="list-style-type: none"> 622 MW wind power capacity 600 km of ENERTRAG owned earth cables 560 kW electrolysis 22 MW battery storage 24 MW solar power capacity
Location	Uckermark



Are you interested in the project and want to know how your community or your business can benefit from it? Contact us. Our contact can be found in the **business directory on page 168.** ▶

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Software for the Energy Transition

The Landwind Group and node.energy are joining forces to optimize municipal participation in renewable energy and are relying on innovative software solutions.

At a time when the energy transition is more than just a buzzword, innovative solutions are needed to meet the challenges of the green transformation. The Landwind Group, an established company in the renewable energy sector, and node.energy, a pioneer in software development for the energy transition, have teamed up to improve the efficiency and management of renewable energy installations.

Landwind, a family-run company with a history spanning over 250 years, is not only a pioneer in implementing the energy transition but also a model for sustainability, regionality, and citizen

participation. Operating renewable energy installations comes with great responsibility, but it also demands high efficiency in management and compliance with regulatory requirements.

This is where node.energy comes in. As a leading provider of software solutions for renewable energy, node.energy offers a SaaS solution called opti.node, a digital platform for professional operators and commercial managers of energy facilities. With opti.node, projects can be comprehensively evaluated, optimized, and managed efficiently, enabling the development of profitable business models from renewable energy sources.

A key concern for Landwind was managing the § 6 EEG contracts for municipal participation, including the generation of credit notes for municipalities and the reimbursement process with grid operators. This complex task required a legally compliant and automated solution to stay on top of energy industry and contractual obligations while reducing administrative effort.

By implementing the opti.node module for the automated execution of § 6 EEG, this challenge was successfully addressed. The module covers all tasks related to municipal participation and gives Landwind a comprehensive overview of the necessary credit notes and reimbursement applications.



Commercial operations management with the opti.node Cockpit



Construction site assembly at Windpark Gevensleben

Evi Wehr-Paulus from Landwind summarizes: “The significant effort caused by regulatory requirements would have been nearly impossible to manage without the solution from node.energy. Manually evaluating all the required data would have consumed too much labor and potential errors cannot be overlooked. With the § 6 EEG solution, we can work more efficiently and get all billing-related data at the push of a button.”

Phillip Micke, Customer Success Manager at node.energy, also highlights the importance of this partnership: “After our discussion, Landwind shared that without our solution, managing the workload due to the massive regulatory requirements might have been too overwhelming. The appreciation for our solution makes us really proud.”

The partnership between Landwind and node.energy shows how the intelligent integration of technology and industry expertise can successfully tackle the challenges of the energy transition. By utilizing opti.node, professional operators of renewable energy installations, such as Landwind, not only benefit from efficiency gains but also contribute to the energy transition and develop profitable business models. Moreover, municipal participation increases regional acceptance as it supports the expansion of schools, kindergartens, and other local projects.



Rotor blade assembly

Conclusion

The collaboration between Landwind and node.energy demonstrates how innovative software solutions can improve the efficiency of managing renewable energy installations. This not only contributes to the energy transition but also promotes regional acceptance through municipal participation.



Machine house assembly

“The collaboration with node.energy enables us to efficiently manage regulatory requirements and make optimal use of our resources.”

Evi Wehr-Paulus, Landwind

Project overview

Initiator	Landwind Group • node.energy
Implementation	11/2023
Key Figures:	500 GWh of electricity generation per year
Status	Operational



Are you interested in the project and want to know how your community or your business can benefit from it? Contact us. Our contact can be found in the business directory on page 190 (node.energy) and on page 257 (Landwind-Gruppe). ▶

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With innovation against corrosion

Rain, waves, salty spray – nature takes its toll on wind turbines at sea and on land. Sooner or later, corrosion also creeps in, literally eating away at the metal structures. But an innovative approach promises to overcome this challenge with corrosion in the long term.



It's a common sight on the coast: grey sky stretches across rough sea, in the distance, the huge blades of offshore wind turbines seemingly do their work in silence. If you were to drive out to them, you could feel the harsh environment up close: sea air, salt water, strong wind and UV radiation – a combination that has a merciless effect on the turbine components and their painted surfaces. This results in fine cracks and flaking of the paint,

especially on the metal surface of the wind turbines. The exposed areas quickly become the victim of corrosion.

A battle against time begins: due to the favourable environment, corrosion eats into the material structures and spreads. Planned and unplanned downtimes are inevitable – to the detriment of economic efficiency. Conventional solutions may provide some assistance, but they quickly

reach their limits. Painting work at sea is sometimes like a game of chance with the weather conditions: Humidity, temperature and wind must harmonize ideally – even during the drying phases. A change in the weather can result in days of unbudgeted delays, costs and loss of earnings.

But where there are challenges, innovation is not far away – and with it a promising corrosion protection technology that is

Transparent PMMA (Acrylate) layer
UV stability

PVC functional film
Color: RAL 7035 (light grey) or RAL 1023 (traffic yellow)

Adhesive
with corrosion protection property

Protective liner
will be released when applied

Can be applied directly to the surface without primer

RENOLIT CP Advanced
Corrosion Protection Film - Onshore & Offshore
Certified and tested according to
BAW standard (DIN EN ISO 12944-9 C4)
2kg x 4



currently being used in a pilot project on a North Sea transformer platform. It is a high-performance film called RENOLIT CP Advanced that fundamentally changes the fight against corrosion. The innovation lies in its ingenious structure: a high adhesive layer thickness ensures reliable adhesion, even on rough, uneven surfaces. After cleaning and removing corrosion, the film can be applied directly – without primer, as this is already integrated, as is the anti-corrosion effect.

But innovation also means efficiency: as a one-step solution, the film provides immediate protection without drying times. Therefore, this concept significantly reduces the dependency not only on the weather, but also on the amount of work involved: under normal conditions, it takes just ten minutes to protect 1 m² of surface with the film – a potential saving of 1–4 hours/m² compared to conventional painting work. And the constant thickness of the film also means a much more even and more effective corrosion protection as a result. The ecological benefits also speak in favour of this innovation: no volatile organic compounds (VOCs) as with conventional paintwork – no paint or other substances that could drip off into the sea.

The durability is also outstanding: several years of field tests in Helgoland demonstrate the film's resistance to UV radiation and extreme weather conditions. Underlining this benefit are a Xenon test of over 15,000 hours in accordance with ISO 4892-2, and the long-term corrosion protection of over 10 years which is certified according to BAW standard (tested in accordance with DIN EN ISO 12944-9 CX, the highest corrosivity category).

Conclusion

The RENOLIT CP Advanced corrosion protection film has been specially developed for application on onshore and offshore wind turbines. For an industry whose success depends largely on the longevity and reliability of its wind turbines, this innovation is a significant step towards more efficient and cost-effective maintenance strategies. Nature may show its harsh side, but technological progress will enable the wind industry to face it even better in the future.

Project overview

Initiator	RENOLIT SE
Implementation	RENOLIT SE and WP Energy GmbH
Figures, data, facts	RENOLIT SE has been on the market for more than 75 years and employs around 5,000 people at more than 30 production sites and sales units in over 20 countries.
Status	completed



Rely on it.

Are you interested in the project and want to know how your community or your business can benefit from it? Contact us. Our contact can be found in the **business directory on page 136.** ▶

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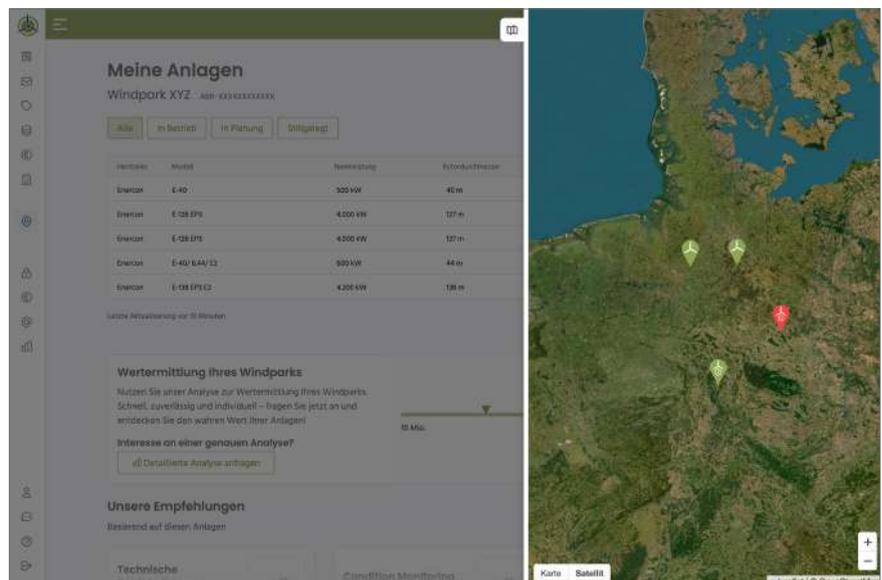
Windpark Cockpit: Digitalizing Wind Farm Management and Marketing

The Windpark Cockpit on wind-turbine.com enables innovative management, evaluation, and marketing of wind farm assets—digitally and efficiently.

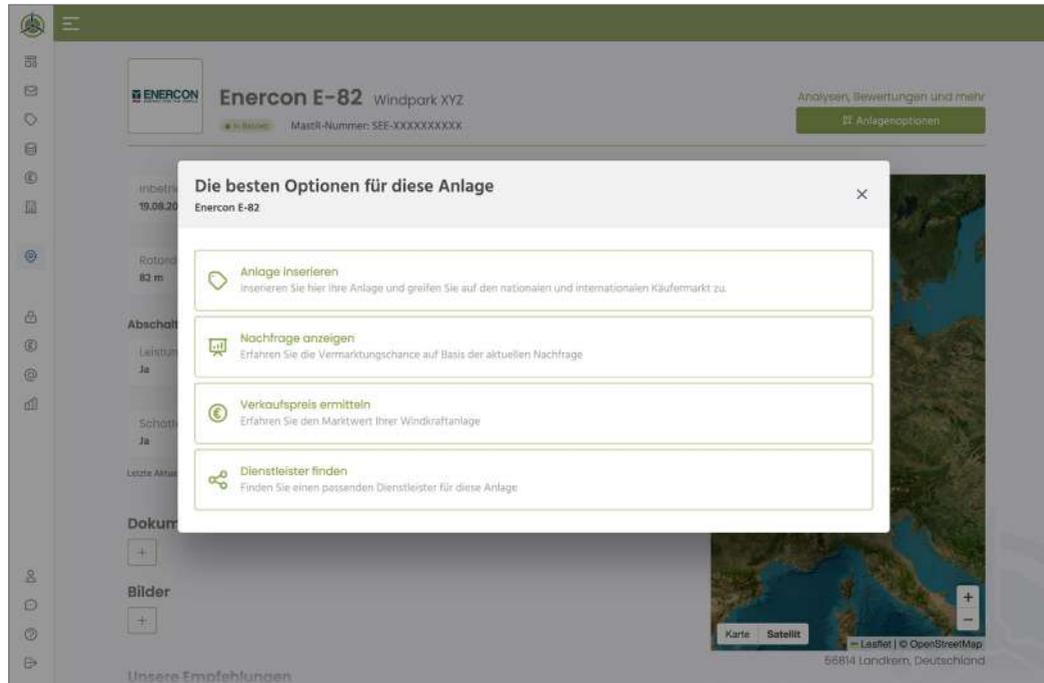


The Windpark Cockpit

The Windpark Cockpit is a specialised application within the global marketplace wind-turbine.com for existing and new wind farms. It is designed to streamline the management of wind energy assets for operators, managers and service providers, offering a centralised and digital platform. The tool leverages comprehensive market movement data and expert knowledge to enable effective commercialisation of one's own portfolio. The platform's core features include a marketing assessment, ongoing operational forecasts at the new location, potential lease income projections, and a matchmaking service that directly connects users with an international, verified market of buyers and service providers.



Overview of Wind Turbines



Tools and Applications

DMS – the foundation for secure and transparent transactions

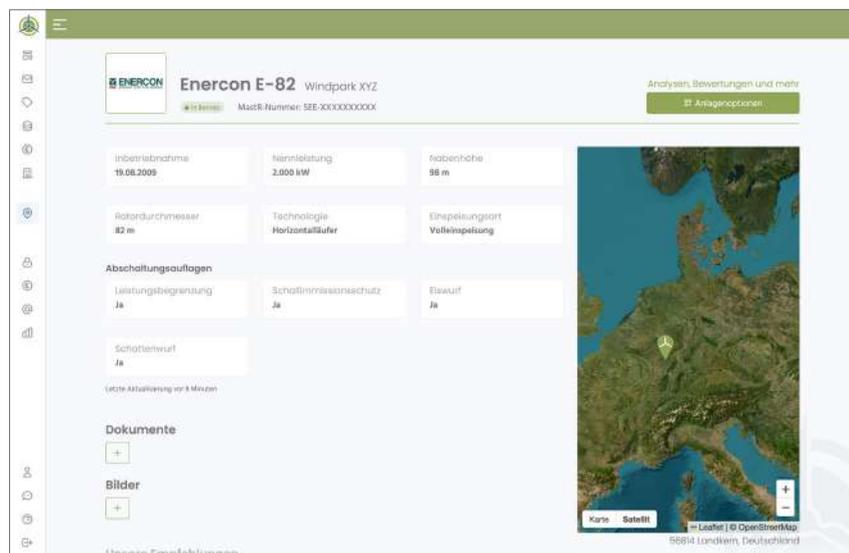
In addition to these existing features, wind-turbine.com plans to introduce a data document management system (DMS). This system will guarantee the secure transmission and storage of data, while also providing a transparent and efficient basis for the transaction process when selling assets to buyers and sellers.

The Windpark Cockpit is currently in its beta version and invites users to actively participate. Input from industry professionals is vital to ensure the tool is continually improved and meets the needs of the sector. The input of industry experts and organisations, such as the German Wind Energy Association, is invaluable in this regard.

Conclusion

The Windpark Cockpit provides an efficient, transparent and secure sales process for wind assets on a digital and independent platform in collaboration with innovative partners.

Overview of Turbine Types



Project overview

Initiator	wind-turbine.com GmbH
Figures, data, facts	Marketplace: 11 billion in trading volume since 2011, 16,000 registered users from over 190 countries
Status	Windpark Cockpit: BETA phase



Are you interested in the project and want to know how your community or your business can benefit from it? Contact us. Our contact can be found in the **business directory on page 221**. ▶

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RESEARCH IN GERMANY

Insight into the industry of tomorrow

Germany occupies an outstanding position in international wind energy research. The following pages present some research results of industry-related science, which can provide you with valuable insights into the latest technology trends.

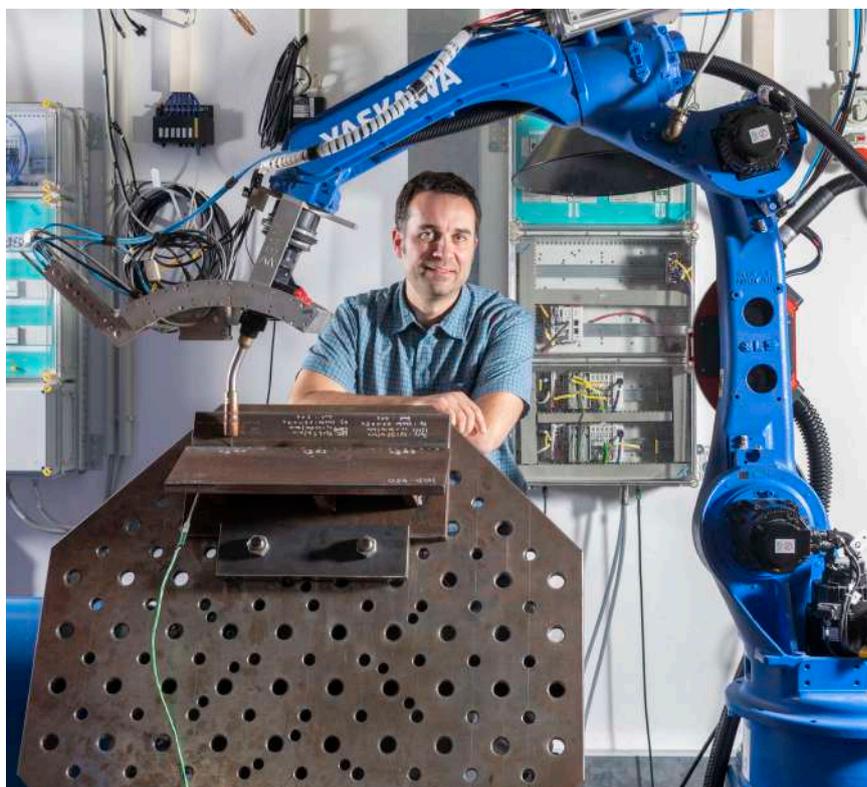
Smart Welding Technology Saves CO₂ in Offshore Wind Construction

The Federal Institute for Materials Research and Testing (BAM) is developing automated welding techniques to reduce CO₂ emissions during the construction of wind turbines.

For offshore wind turbines, a large steel pile, known as a monopile, is typically used as the support structure. These monopiles require up to 2,000 tons of steel to be welded together, resulting in a substantial CO₂ footprint. In contrast, the more light-weight „jacket“ foundations have a significantly lower carbon footprint since they require much less steel. However, welding these structures presents a challenge.

Potential Savings of 100,000 Tons of CO₂

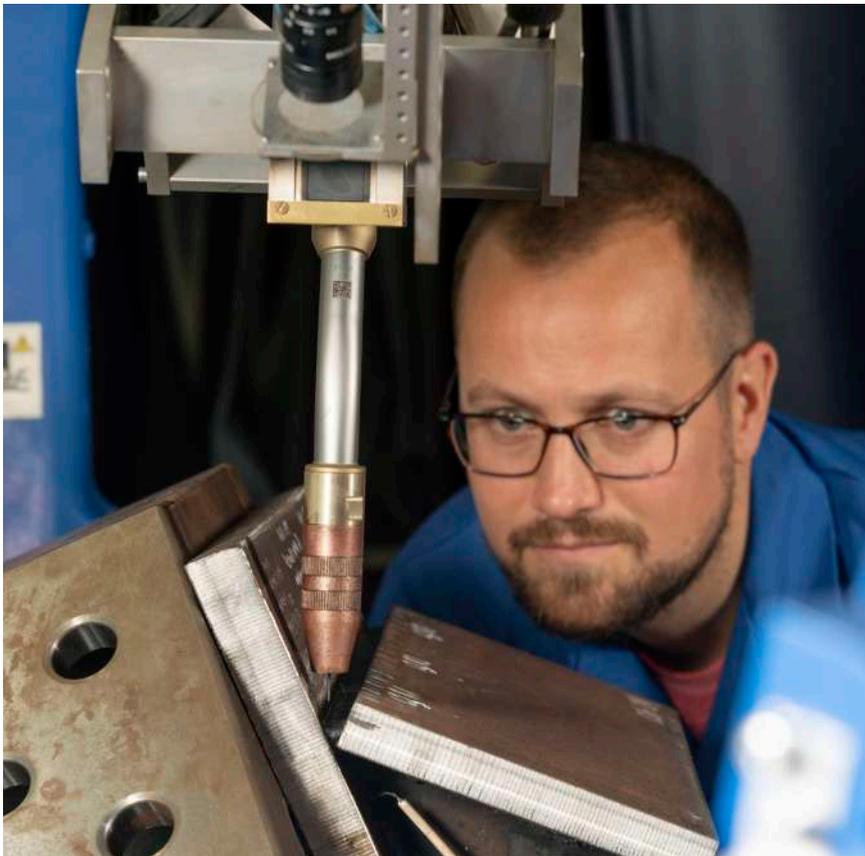
The main difficulty lies in the complex welds required. For safety reasons, jacket foundations use very thick steel plates. According to Andreas Pittner from BAM, „Automated welding processes, which produce weld with higher fatigue resistance, could improve the strength of jackets. As a result, pipes with thinner walls could be used, significantly reducing the amount of steel needed.“ For a wind farm with 100 turbines, this would mean a reduction of over 100,000 tons of CO₂ compared to monopile foundations.



Andreas Pittner aims to enable CO₂ savings in wind turbine construction through smart welding techniques.

“Through automated welding processes, the construction of a wind farm with 100 turbines offers the potential to reduce CO₂ emissions by over 100,000 tons.”

Dr.-Ing. Andreas Pittner (BAM)



The robot creates more precise welds than a human ever could, allowing for steel savings – and thus CO₂ reductions.

Fast Technology Transfer to Industry

Currently, the welds for jacket foundations still pose a challenge for automated manufacturing. The collaborative project „SmartWeld,“ led by Andreas Pittner, is addressing these issues. „We aim to enable the use of lightweight construction techniques through the full digitization of the entire production and inspection process,“ said Pittner. „We are intentionally working under industry-like conditions to ensure a fast technology transfer to the economy.“

Conclusion

The rapid expansion of offshore wind energy is crucial for Germany and the EU to meet their climate targets. Many tons of CO₂ could be saved during the construction of wind turbines. BAM is researching how to intelligently combine lightweight design principles with digitized quality control to achieve these savings.

Project overview

Status	Ongoing
Location	Berlin
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Related content: welding in offshore lightweight construction, see also next page.

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New Welding Alloys for Gigantic Wind Turbines

The Federal Institute for Materials Research and Testing (BAM) is paving the way for lightweight construction in offshore installations with innovative welding alloys.



Precise manufacturing of the samples on a 5-axis portal.

To make offshore wind turbines even more powerful, they must be equipped with longer rotor blades, which in turn requires taller towers. To economically and technically realize these gigantic structures, switching to lightweight construction with modern high-strength steels is essential – otherwise, their weight would be too great. This switch could also save up to 20 % of the steel used.

Welds as a Weak Point

So far, welds have been considered a weak point in the transition to lightweight construction. Offshore wind towers are subjected to immense loads, causing cyclic, oscillating stresses on the material. Unfortunately, the fatigue strength of modern high-strength steels is compromised by the welding process.

Special Alloys Strengthen Welds

BAM, in collaboration with the Fraunhofer Institute for Mechanics of Materials (IWM), is testing special alloys that are designed to reinforce welds. „These special alloys form a structure during cooling that reduces residual stresses in the material, stabilizes the weld, and increases its fatigue strength,“ explains Arne Kromm, welding technology expert at BAM and head of the project. The goal is to enable the industry to safely process these welding consumables, while also integrating these findings into industry standards.

“The innovative use of special alloys allows the lifespan of welded high-strength steels to be extended.”

*Dr.-Ing. Arne Kromm,
BAM welding technology expert.*

Top: Welded sample with test seam.
Bottom: Fatigue fracture at the weld seam transition; the dot pattern is used for deformation measurement.



Project overview

Status	Ongoing
Location	Berlin

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The project is funded by the Federal Ministry for Economic Affairs and Climate Action based on a decision of the German Bundestag.



Conclusion

The results are not only relevant for the wind industry but also for mechanical engineering, automotive, and steel construction sectors, helping to fully exploit the lightweight potential of high-strength steels. Moreover, the findings impact the design of the large specialized cranes needed to erect these even more massive wind turbines.

Life Extension through Monitoring

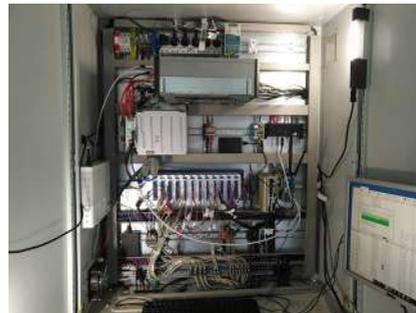
The Federal Institute for Materials Research and Testing (BAM) aims to make a monitoring system ready for practical use to optimize the operation of wind turbines.



Recording the stresses of the steel tower by measuring the strains using strain gauges



Measuring the vibrations of the tower induced by wind loading using biaxial acceleration sensors



Central measuring station at tower base for recording and transmitting of all monitoring data

As wind energy continues to expand, the focus is increasingly on extending the operational lifespan of existing turbines. BAM is developing a new monitoring system in a collaborative project that aims to ensure existing wind turbines can be safely used beyond their originally planned lifespan, allowing them to contribute more to the energy transition.

Vibrations Can Lead to Cracks

Wind turbines are currently designed for a lifespan of about 20 years. The towers, particularly those made of prestressed

concrete in onshore installations, are constantly subjected to vibrations. These stresses can lead to fatigue and cracks. BAM has extensively researched how such damage can be detected using ultrasound and acoustic emission measurements. In collaboration with partners from academia and industry, these methods are now being further developed so that wind turbines can be more efficiently monitored on-site.

Using Turbines Beyond 20 Years

The goal is to develop a monitoring concept based on a pilot plant in Brandenburg, which can later be applied efficiently and economically in wind farms. The project, funded by the Federal Ministry for Economic Affairs and Climate Action, also includes participation from the Technical University of Dresden, Leibniz University Hannover, RWTH Aachen University, and several industry partners.

Conclusion

BAM is developing a new monitoring system in a collaborative project to make it practical for use, enabling the continuous monitoring of existing wind turbines and allowing them to be safely operated beyond their originally planned lifespan of 20 years.

“Our goal is to continuously monitor the condition of the towers. This allows for better maintenance planning and ensures that the potential of existing wind turbines is fully utilized – ideally even beyond their intended lifespan of 20 years.”

Dr.-Ing. Marc Thiele (BAM), expert in concrete fatigue

Project overview

Status	Ongoing
Location	Berlin
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NearWake and SysDamp

Research impulses from DLR for wind energy

Since 2023, the German Aerospace Center (DLR) operated the Krummendeich Research Wind Farm, known as WiValdi, a unique testing infrastructure developed in collaboration with partners from the Wind Energy Research Alliance (DLR, ForWind, Fraunhofer Institute IWES) with funding from the federal government and the state of Lower Saxony. Currently, groundbreaking projects are underway to advance the wind energy sector.

NearWake

Under the leadership of Enercon / WRD, DLR is working together with the University of Oldenburg (ForWind), the Technical University of Munich, and the Center for Solar Energy and Hydrogen Research Baden-Württemberg (ZSW). The project is developing innovative wake models to provide a more accurate representation of the near wake of wind turbines. This allows turbines to be positioned more closely and designed more efficiently. The optimized



Drone fleet measuring the wake in front of the wind turbine OPUS 2

arrangement also enables an increase in the energy production of wind farms. Extensive measurement campaigns have recorded the wake using a specially designed setup consisting of three measuring masts and a gondola-based lidar on the first wind turbine, OPUS 1. Additionally, a fleet of small drones, flying between 50 and 200 meters from the rotor blades of the second wind turbine, OPUS 2, measured the near wake. The collected data serves as a basis to validate these wake models and compare them to the complex conditions on-site.



Gondola-mounted lidar on the wind turbine OPUS 1

SysDamp

Led by DLR, the SysDamp project is developing innovative methods for determining damping, in collaboration with WRD, SPEKTRA, and Leibniz University Hannover (ForWind). Accurate determination of damping allows for better estimation of loads on the turbines, thus extending their lifespan.

Conclusion

The projects NearWake and SysDamp, funded by the Federal Ministry for Economic Affairs and Climate Action (BMWK), demonstrate the importance of research and development in the wind energy sector. With new models and methods, wind farms can be operated more efficiently, reducing the cost of energy generation.

Project overview

Status	Ongoing
Location	Krummendeich, Braunschweig, Göttingen

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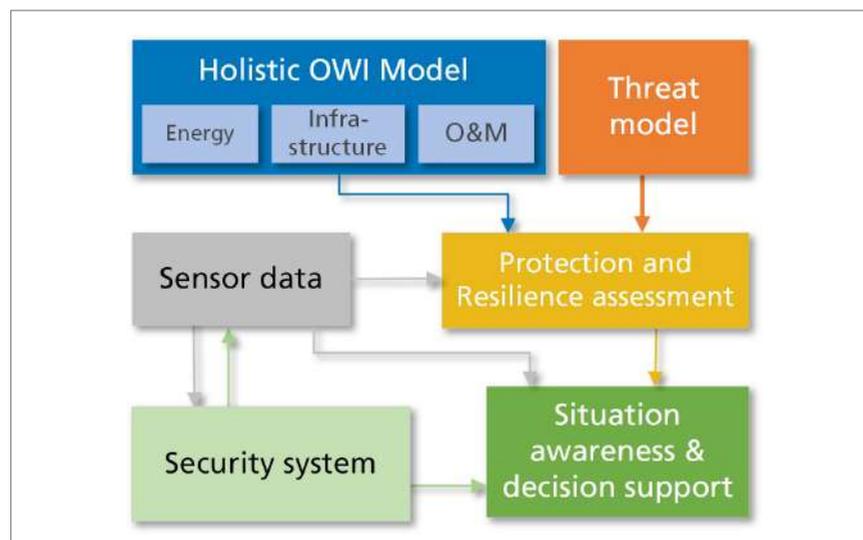
Secure and Resilient Offshore Wind Energy

The German Aerospace Center (DLR) is researching solutions for the physical protection of offshore wind energy infrastructures.

Offshore wind energy is becoming increasingly important for energy supply security, with many offshore wind farms now classified as critical infrastructure. Recent events indicate that hybrid threats are also on the rise in maritime environments. These threats involve the coordinated use of methods such as sabotage and disinformation, aiming to destabilize states and organizations without escalating into open conflict.

Protection and Resilience

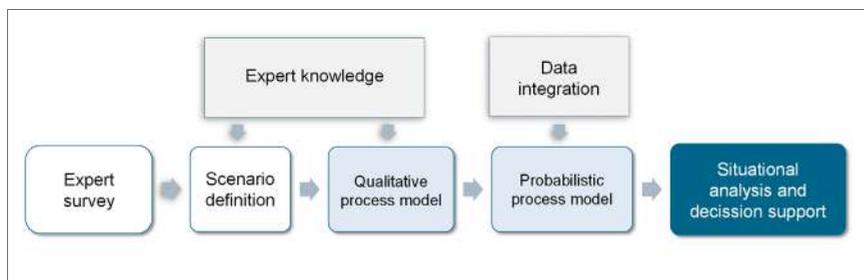
In the „ARROWS“ project, the DLR Institute for the Protection of Maritime Infrastructures is investigating how to enhance the physical protection and resilience of offshore wind energy infrastructures (OWI). The institute is developing a holistic simulation model that considers the electrical system, maintenance and operational processes, as well as the infrastructure components. In parallel, probabilistic models of physical threats are being created, incorporating expert knowledge.



Model-based design of a protection system for offshore wind infrastructures (OWI).
Source: DLR

Based on these models, DLR is exploring methods to assess the protection and resilience of OWI against physical threats. The analysis also takes into account the influence of surveillance sensors. These methods not only help develop effective

security systems to protect OWI but also enable the evaluation of current security levels and support informed decision-making for operational management.



Methodological approach to data-driven risk and threat analysis, incorporating expert knowledge. Source: DLR

Conclusion

The ARROWS project addresses hybrid threats to offshore wind farms, which are increasingly targeted as critical infrastructure. By using a holistic simulation model and probabilistic threat analyses, effective methods to enhance the protection and resilience of these infrastructures are being developed.

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Project overview

Status	To be completed in 2025
Location	Bremerhaven

German Aerospace Center (DLR)
Institute for the Protection of Maritime Infrastructures

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ADVENTURE: Anomaly Detection for Wind Turbine Efficiency

The goal of the ADVENTURE project was to further develop an early fault detection system for monitoring the operation of wind turbines to reduce downtimes and increase efficiency.

As wind turbines continue to expand in the context of the energy transition, maintaining these systems becomes increasingly complex and labor-intensive. Offshore wind turbines in particular present optimization potential due to their challenging accessibility and the complexity of potential failures. Early detection of impending issues before they become critical can significantly improve maintenance efficiency. Many failures are signaled by abnormal behavior, often well before they lead to a downtime.

In the BMWK-funded [ADVENTURE](#) project, a software architecture was developed to implement an early fault detection system. Building on prior work from the ModernWindABS project, the system uses advanced autoencoder methods to detect anomalies. These methods learn the normal behavior of wind turbines based on historical data and identify deviations from this normal behavior during operation as anomalies. As anomalies occur more frequently within short intervals, the 'criticality' of the wind turbine rises.

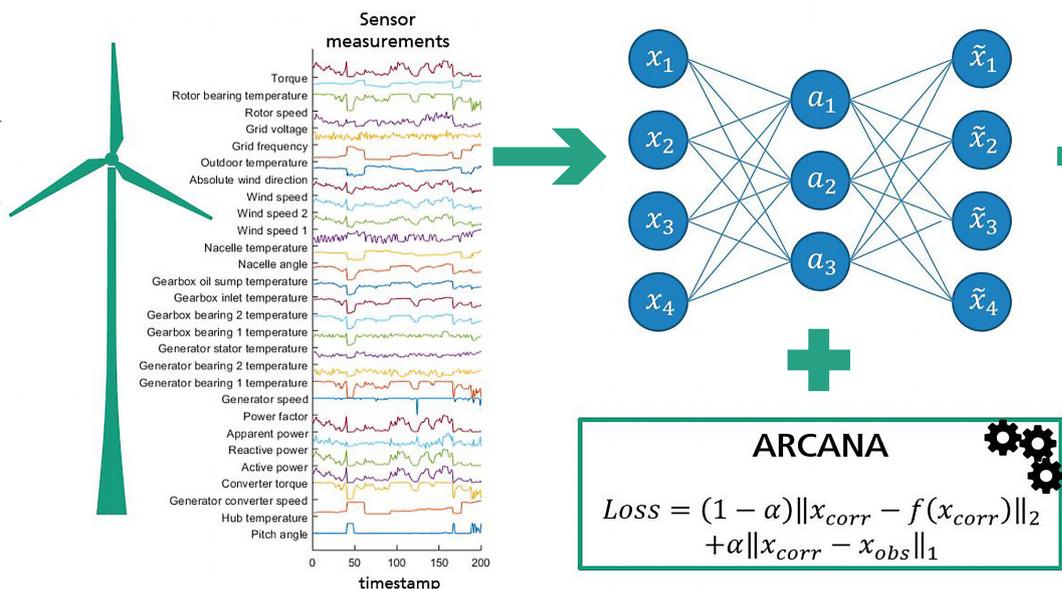
A high criticality indicates the potential for operationally relevant faults. Because anomalies are characterized by devia-

tions from normal behavior, the system can detect a wide variety of fault types.

The system was further enhanced by integrating ARCANA, a root cause analysis method that allows for a more [in-depth investigation](#) of identified anomalies and helps pinpoint potential causes. For ease of access and understanding by wind farm operators, the results are displayed through a prototype web interface.

The system was iteratively evaluated and validated in close collaboration with the project partners. Insights gained from real wind turbine data provided a foundation for further research in

Schematic representation of the anomaly detection system developed in the ADVENTURE project. The sensor data from a wind turbine are fed into the model (depicted as a neural network). The ARCANA method enables the identification of the cause of a detected anomaly. Without this method, all sensor values are classified as abnormal, although in this case only one sensor value deviates from normal behavior.



ADVENTURE

“Automated early fault detection systems can enhance the efficiency of renewable energies.”

Cyriana Roelofs, Project Lead

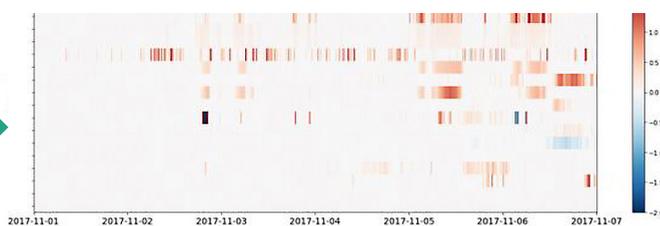
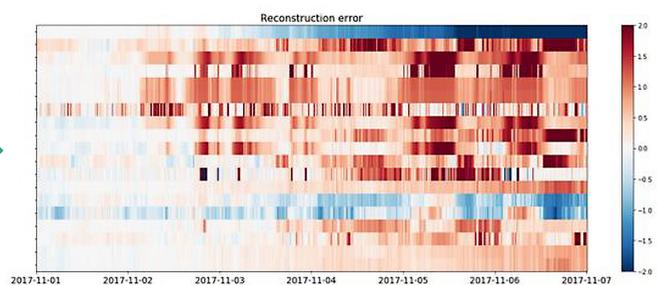
areas such as model robustness, transparency, and transferability. [Transfer learning](#), for example, enables already trained machine learning models to be applied to new, similar tasks. This approach proved particularly useful in addressing issues such as limited data availability for new or long-idle turbines, potentially reducing the computational costs for model training and reducing data storage and collection costs.

A groundbreaking result of the ADVENTURE project is the release of a benchmark dataset that includes examples of wind turbine faults and different forms of normal behavior.

This dataset is the most comprehensive and detailed public resource for comparing early fault detection systems for wind turbines for wind turbines and is available on Zenodo.org under the search term ‚Care2Compare.’

Conclusion

The software architecture developed in the ADVENTURE project provides a solid foundation for the operational and continuous automated monitoring of wind turbines. Its scalability and adaptability make it well-positioned for future commercialization.



Project overview

Status	Completed
Location	Kassel

Fraunhofer IEE

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Optimized Yield in Offshore Wind Farms

In the C²-Wakes project, Fraunhofer IWES, RWE, ForWind and Helmholtz-Zentrum Hereon are investigating reduction options of large-scale wake effects.

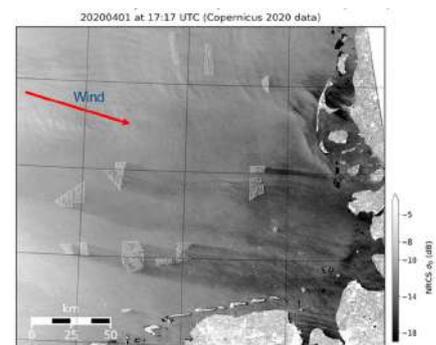


Scanning Lidar device on the nacelle of a wind turbine at RWE's offshore wind farm Amrumbank West. © Jörg Schneemann [2024]

Improved methods for optimized wind farm yields

In large wind farm clusters wakes with lower wind speeds and higher turbulence can develop downstream of the turbines. Improved modeling and measurement of the wakes allows optimized site selection and resource planning for future offshore wind farms. Thus, the project team is collecting data via a comprehensive scanning lidar measurement campaign in RWE's Amrumbank West offshore wind farm. The devices installed on the nacelles measure the flow fields downstream of the wind turbines. Using the acquired data, the scientists analyze how the wind speeds within the wind farm and large-scale wake effects behind the wind farm evolve and whether and how these can be influenced.

As the areas available for offshore wind farm development in the German Bight are limited, efficient utilization of this space is required to maximize the benefit of offshore wind. Therefore, offshore wind farms are often installed in groups known as clusters. In the Controlled Cluster Wakes research project, "C²-Wakes" for short, the Fraunhofer Institute for Wind Energy Systems IWES investigates together with its project partners RWE, ForWind (University of Oldenburg – Institute of Physics), and Helmholtz-Zentrum Hereon how the planning and operation of large offshore wind farms and wind farm clusters can be improved to increase the overall yield by the reduction of wake losses.



Radar image showing wakes behind offshore wind farms in the German Bight. © Copernicus Sentinel data [2020]

Project overview

Status	May 2023 – April 2026
Location	German Bight

Fraunhofer Institute for
Wind Energy Systems IWES

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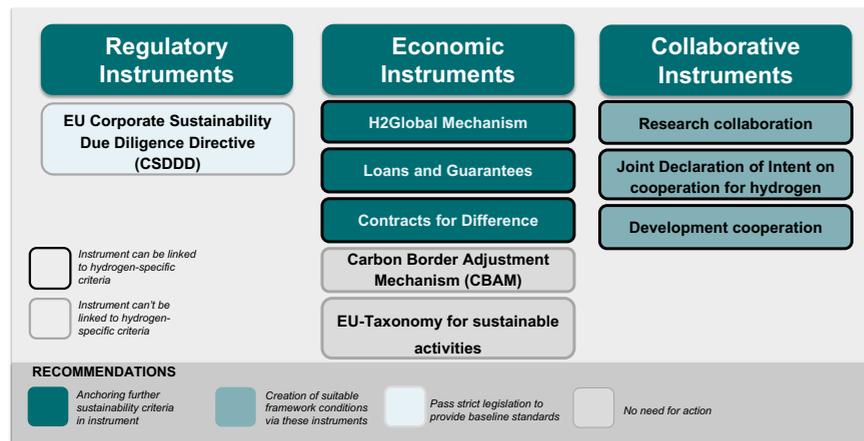


Conclusion

In addition to scientific publications, the results of the C²-Wakes project will also be made available to industry and planning authorities in the form of recommendations for action and open-source software tools such as the FOXES wind farm planning software.

Green Hydrogen Needs Sustainability Criteria

A short study by the Wuppertal Institute outlines sustainability goals, criteria, and possible political instruments for hydrogen imports.



Green hydrogen is considered a key element for a climate-neutral future. To achieve climate protection goals, Germany will rely heavily on importing green hydrogen. But how can environmental and social standards be maintained during production abroad? And what can policymakers do about it? The short study “Political Instruments to Ensure the Sustainability of Hydrogen Imports” by the Wuppertal Institute provides answers. Researchers examined which policy instruments are suitable for embedding various sustainability criteria for hydrogen imports, as outlined in the hydrogen import strategy released in July 2024.

However, the sustainability of imports cannot be guaranteed by a single policy instrument. Therefore, the short study, published in March 2024, recommends to establish a unified framework for sustainable hydrogen imports as soon as possible to ensure that market players adhere to sustainability criteria and avoid investment uncertainties. Sustainability goals for hydrogen imports must be translated into measurable criteria and verification processes. Although Germany’s Supply Chain Due Diligence Act and the EU’s supply chain directive provide important safeguards, they are not sufficient. International cooperation can play a key role in

developing sustainability criteria for hydrogen projects together with local partners. Economic instruments are suitable for embedding sustainability criteria early on and for using the German and European markets to set global standards.

Source: Wuppertal Institute.

Project overview

Status	Completed
Location	Wuppertal
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Project planning: the drone flight route is planned in advance using satellite data and the drone control software.
Photo: © ASDRO



NEWCOMERS:

Start-ups

Start-ups are entering the market with new ideas. A selection is presented on the following pages. Be inspired by their innovative power.

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ASDRO – Revolutionary drone technology for the wind industry

ASDRO offers a complete cross-industry solution in the field of surface and subsurface surveying through data acquisition by drone and cloud-based data transfer.



Drone geophysics can be used to reliably detect pipelines and explosive ordnance

ASDRO is revolutionizing the wind industry with its innovative drone-based geomagnetics, delivering exceptional data quality through advanced software and hardware. A geophysical sensor mounted on the drone measures the magnetic field during flight, allowing for the precise detection of metallic objects underground, such as unexploded ordnance (UXO), pipes, or contaminants. This precise detection facilitates a detailed analysis of wind turbine sites, supported by the specialized MagSurv software, which offers the highest accuracy in geomagnetic measurements.

“Thanks to ASDRO’s advanced exploratory methods, project developers can achieve results, while minimizing land disturbance and increasing the acceptance of land owners and managers for their projects.”

Julian Beauteemps, CEO of ASDRO

Traditional geophysical methods are often time-consuming and costly, particularly for large areas or hard-to-reach locations such as lakes or nature reserves. Drones provide a fast and cost-effective alternative, performing surveys up to ten times quicker without disturbing the natural environment.

Additionally, ASDRO combines drone technology with high-resolution cameras to capture detailed images of wind turbine sites from various angles. These images are used to create georeferenced orthophotos, 3D, and digital elevation models, which are essential for planning, inspections, and cost estimations.



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 LinkedIn: www.linkedin.com/company/asdro

Founding year **2019**

Focus

- Geophysical exploration
- Drone technology
- Geoinformation

We offer

- Explosive ordnance detection
- Line location
- Subsoil exploration
- Surveying

We are looking for

- Projects
- Cooperation partners
- Investors

ASDRO's drone systems are versatile and have proven effective in numerous projects. They are especially useful for pre-construction site surveys, where drones can identify and clear disturbances such as UXO or pipes before construction begins. This ensures a safe and efficient execution of construction activities.

All data and reports are available to clients via the modern cloud platform, asdro.cloud. Data can be visualized, downloaded, and integrated into other software in various formats to ensure comprehensive and accurate analysis of wind turbine sites.

Some of our current projects include

- Wind Farm Scheid: Non-destructive and automated surveying of 5 wind turbine locations, discovering 3 anti-aircraft positions and detecting 5 unknown cables.
- Solar Park Xanten: Installation of 10,000 solar panels on a former missile launch site after ASDRO conducted an aerial survey to detect 50 disruptive objects and 2 bunker facilities, and took over the specialist planning.



Overview of the Solar Park Xanten

Conclusion

With ASDRO's advanced technology, project developers can use a comprehensive solution for subsurface exploration with just one drone flight. The major advantage is that the measurement can be carried out non-destructively thanks to the overflight height of approx. 1.5 m and no access permission from the owner is required. This significantly reduces coordination times and ensures a good and modern image.



The founders Julian Beautemps (CEO) and Alexander Weyer (CTO) during a test run

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Biome Renewables FeatherEdge® technology, a revolution in noise reduction

Biome’s FeatherEdge® serration technology has industry proven, field-validated noise reductions that go far beyond what a turbine manufacturer can deliver – with reductions of 6 – 8 dB(A) above and beyond a standard OEM serration at a receptor.



If you own a windpark that operates in noise modes during the day/night, you understand the financial implication of noise. Biome’s FeatherEdge technology is inspired by the silent flight of the owl and also works on the same physics of noise-cancelling headphones. FeatherEdge is turbine type and rotor size agnostic and is applied to the rotor in as little as 3 days. In addition to noise, the technology also improves the aerodynamics of the rotor, enabling additional performance uplift. Current IEC power curve testing is in process to independently quantify the specific uplift values and wake benefits. With independent validation and accreditation, our commercially deployed technology is carefully designed to every candidate rotor to make sure you get the most out of every revolution. Working with companies like Schierloh Engineering GmbH, Biome is deploying its technology on the latest wind turbines in Germany. For developers, Biome can enable more turbines on the same land area, with significantly higher capacity factors and improved project economics. Independent noise analysis from Hoare Lea in the UK found that, “depending on the turbine layout configuration and location, this level of noise reduction would mean equivalent

Biome’s FeatherEdge® serration on a 3MW turbine in Europe. (Photo: R. Church)



“Our technology will play a significant role in countries like Germany, and their ability to practically deploy wind assets on the scale that is envisioned in the energy transition.”

Ryan Church, Founder and CEO

Biome Renewables B.V.

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LinkedIn: www.linkedin.com/company/
biomernewables

Founding year **2015**

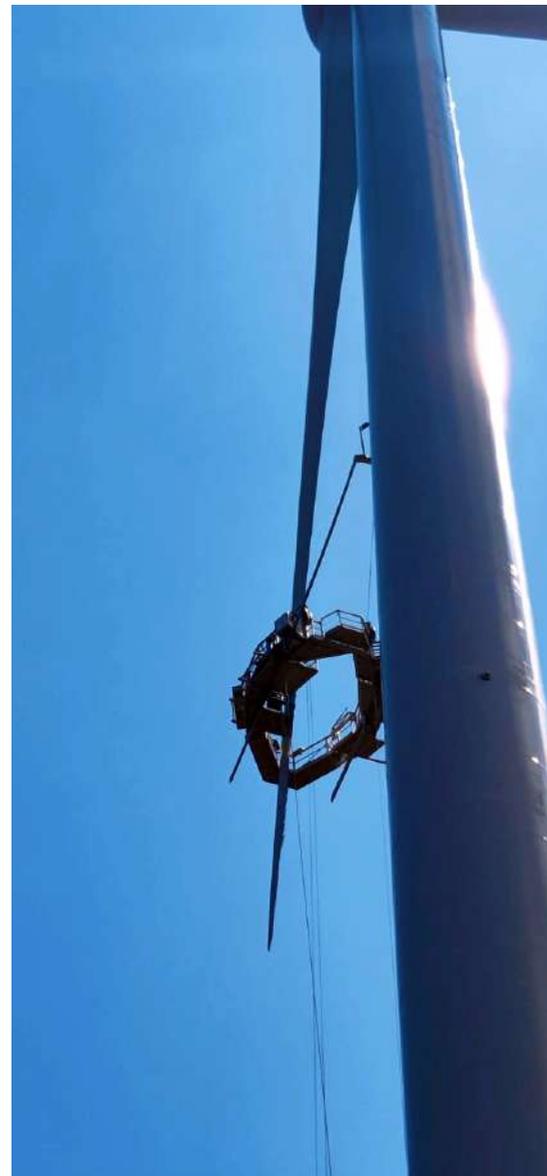
Focus **Advanced aerodynamic and acoustic technologies**

We offer **Certified industry-leading rotor technologies tailored to your specific wind turbine as a retrofit.**

- We are looking for
- Wind Park owners that operate wind turbines in noise modes (we can help you!).
 - Wind Park developers that are looking to develop projects in noise impacted areas.
 - Wind Park owners/developers who would like additional aerodynamic performance (AEP) from their wind turbines without detrimental load increases.



FeatherEdge® installation on a Senvion MM92 turbine in Canada. (Photo: C. Godreau)



FeatherEdge® installation on the latest turbine technology in Europe (Photo: R. Church)

levels would be obtained with a separation distance from turbine to receiver reduced by **400 to 800 m**. To obtain a similar level of noise reduction with noise-optimised operational modes would be possible but with estimated peak power generation losses of **more than 50 %**. This innovation has the potential to transform the wind industry.” Biome is in process working with numerous leading turbine manufacturers to deploy FeatherEdge in different stages

of the market, having had the technology internally validated by several. Biome works directly with windpark owners to assess the level of impact that FeatherEdge can have for their projects before embarking on an implementation plan. With accreditation in-process from TUV Nord GmbH and a rigorous lifetime testing program nearing completion, windpark owners can have peace of mind deploying FeatherEdge on their turbines.

Conclusion

From development, to operation and repowering, FeatherEdge is a disruptive technology that will alter the potential of what’s possible for your wind portfolio. Whether you are a larger corporate power producer, or a community-owned wind project, get in touch to discover the technical and financial impact of innovation inspired by nature.

ECONOMIC REPORT

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COMPANIES

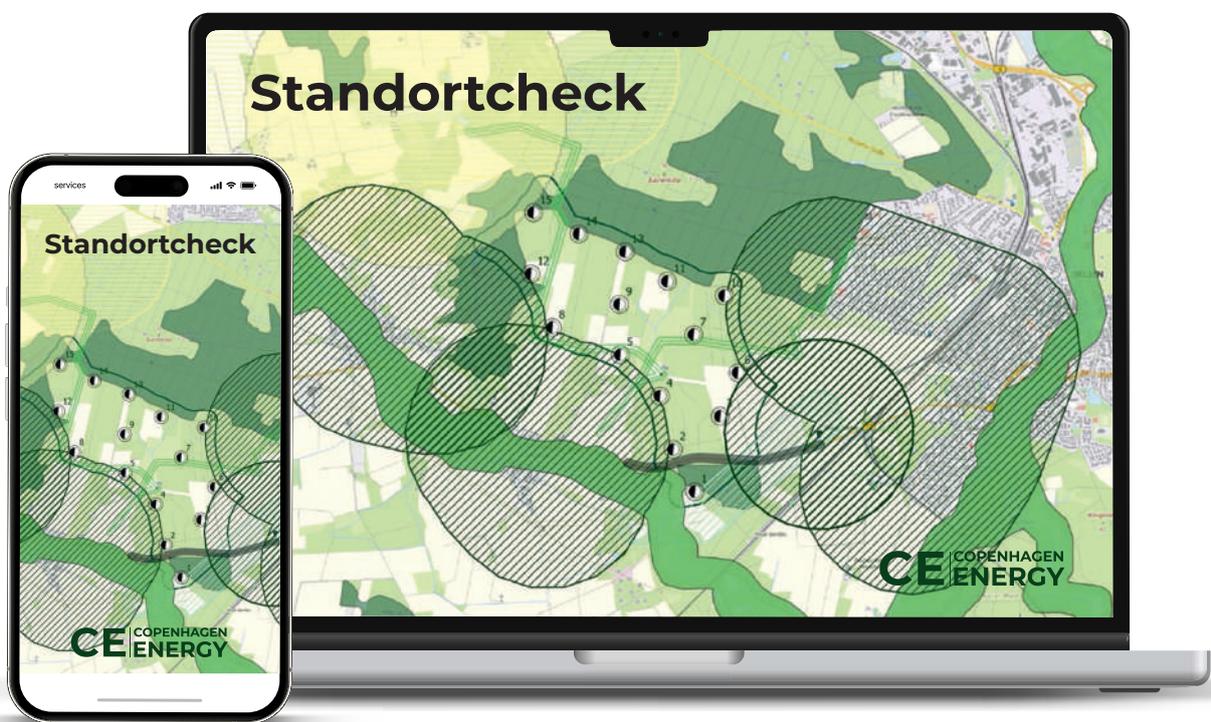
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Copenhagen Energy: Developing the energy transition in partnership

We bring a breath of fresh air to the market. Land acquisition, wind and PV project development, storage technologies and energy trading: we cover all stages of the value chain and create sustainable added value.



Site check: just a few clicks for the analysis of sites and post-EEG-plants

When Jasmin Bejdic and Andreas von Rosen founded Copenhagen Energy in 2021, they had a clear goal in mind: an innovative and holistic renewable energy company that covers all stages of the value chain. As a passionate engineer, Bejdic brought along a great deal of technical expertise; von Rosen – coming from an agricultural background – contributed the perspective of plant operators and land owners. Moreover, at

“Our range of services extends from generation with onshore and offshore wind and photovoltaics to storage technologies such as large-scale batteries and power-to-x and to electricity trading.”

Daniel Seybold, Managing Director Copenhagen Energy Germany GmbH

a time when renewables are increasingly supposed to run without subsidies, energy trading also played a special role. This is why Jasmin’s brother Zlatan co-founded the sister company Copenhagen Energy

Trading. The approach was completed when Daniel Seybold became Managing Director of Copenhagen Energy in Germany.

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Founding year	2021
Focus	Project development wind onshore and offshore, repowering, photovoltaic, large-scale batteries, power-to-x, energy trading
We offer	<ul style="list-style-type: none"> • Integral development of renewable energy projects • All technologies • The whole value chain including energy trading • Development, planning and realisation with all stakeholders and at eye level
We are looking for	<ul style="list-style-type: none"> • Owners and operators of old wind turbines who are interested in repowering • Land owners for wind, PV and battery project development • Great, motivated new colleagues

Wind, PV and battery projects in Germany

As a result, entering the German market in 2023 was fairly easy: our pipeline is well filled and most projects are already secured with signed contracts, reserved grid capacities and installation decisions. In order to prove that we cannot only plan but also implement, we are replacing two old 750 kW wind turbines with a 4.3 MW turbine in the coming year. Afterwards, the site’s production will be six times higher than today. A major project in Lower Saxony with up to 15 new turbines and an output of 105 MW is also developing well and is scheduled to go into operation by 2028 at the latest.

“Our site check is not a marketplace for sites. We provide an authentic assessment of potential and invite partners to a joint project development.”

Daniel Seybold, Managing Director Copenhagen Energy Germany GmbH



The first projects in the photovoltaic sector will also be implemented quite quickly. The planning decision for a 37 MWp ground-mounted plant in Schleswig-Holstein has been made and the project will be built in 2025. Throughout the development, we paid close attention to biodiversity and planned larger distances between the module rows as well as higher elevations so that sheep can graze there.

The special feature: we will rehabilitate an abandoned part of the farm and build a battery storage system which can temporarily store the electricity produced and balance the grid load. For us, flexibility and trading are an integral part of our holistic approach: Within just a few months, we have built up a battery storage pipeline of around three gigawatts in Germany. And the trend is rising.

What sets Copenhagen Energy apart is that we develop and optimise the potential of the various technologies across the entire value chain. This makes us a reliable partner – from the initial project idea to selling the first kilowatt hour.

Free site check for wind, PV and repowering

Based on this holistic and cooperative approach we developed an online site check called “Standortcheck”. The tool

helps land owners to check whether their land is suitable for wind, PV or battery projects, as well as for wind operators who want to know whether it makes sense to repower old turbines.

All it takes is a few clicks and a few data – and we can give you an initial assessment. If we figure out that there is potential, land owners and operators can specify the request in a second step. The following assessment goes into detail: here, we already indicate how many and which plants could be suitable, which emissions are to be expected – and what financial aspects and yields could look like.

Conclusion

We are a young company that can already look back on a wealth of experience. Our advantage: we offer the entire value chain and all relevant technologies – from land acquisition and project development with wind, PV and storage technologies through to energy trading. We are transparent and approachable. Innovative, sustainable solutions for a cleaner and healthier planet.

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ENREGO Energy – Fostering Innovation and Unleashing Potential

ENREGO Energy is an innovative company in the renewable energy sector that supports startups and established enterprises in market entry and business development. Furthermore, our focus is on the development and realization of sustainable projects.



The key to economically and ecologically successful integrated energy systems lies in the consideration and creation of holistic solutions utilizing existing innovative technologies.

Our Focus:

→ Support for Start-ups and Enterprises

ENREGO Energy has established itself as an active promoter of young, innovative startups in the renewable energy sector. We believe that the solutions developed by emerging companies are crucial for the transformation towards a more sustainable energy future. Therefore, we offer comprehensive support in various areas:

1. Investor Connections: ENREGO Energy assists startups in identifying suitable investors for sustainable technologies and projects. Our goal is to connect them with appropriate funding sources to accelerate technology transfer and drive innovation.
2. Consulting and Mentoring: In addition to providing financial resources, we offer extensive consulting and mentoring from experienced professionals and executives to support startups during

their founding and growth phases, as well as in project management and funding strategies.

3. Access to Networks and Partnerships:

Our extensive network allows us to connect startups with key players, potential customers, suppliers, and other stakeholders, thereby facilitating the development of valuable business relationships.

→ Support for Market Entry and Business Development

ENREGO Energy actively supports companies in entering the markets in Asia and Europe, including business establishment and the development of corporate structures. We assist with network building, as well as the acquisition of contracts and projects, and we are also available as a joint venture partner.

→ Partners for Business Development

As strategic advisors, we assist established companies in expanding their business activities in the renewable energy sector. Our expertise enables these companies to establish connections with key players and identify potential cooperation opportunities.



ENREGO: Partner for Market Entry and Business Development



ENREGO Energy GmbH

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Founding year **2023**

Focus

- Start-up-Companies
- Business Development
- Market Entry Strategies
- RE Project Development

We offer

- Access to Networks and Partnerships
- Investor Connections
- intern. Market Entry
- Consulting and Mentoring
- RE Project Development

We are looking for **innovative and forward-looking partners and projects**

→ Competence and Trust as Cornerstones in Project Business

We place great emphasis on our extensive expertise in project development and implementation. Our knowledge encompasses all phases of the value chain, from evaluation to successful execution. Our top priority is to build trust through quality and to collaborate in partnership with clients, suppliers, municipalities, and financial institutions.

→ Commitment to the Energy Transition

ENREGO makes a significant contribution to achieving global climate goals and offers attractive participation opportunities for citizens and businesses. We enable interested parties to actively engage in the energy transition. Additionally, we develop concepts for integrated energy systems that ensure a continuous supply of regionally generated green electricity.



The founding team of ENREGO Energy (Wolfgang Juilfs, Hans-Dieter Kettwig, Dr. PKC Bose, v.l.)

“The vision of ENREGO is to drive the global transition to infinite renewable energies. We envision a world where clean, sustainable, and innovative energy solutions power our cities, communities, and businesses, protect our environment, and create a better future for generations to come.”

Hans-Dieter Kettwig, Founder & Chairman ENREGO ENERGY



ENREGO's Focus: Start-ups and Project Business

Conclusion

ENREGO Energy is proud to be a valued partner for both startups and established companies. Through targeted support in the areas of market entry, business development, and investor sourcing, we help organizations expand their impact and maximize their contribution to the energy transition. Let's work together towards a sustainable and innovative future!



Learn more at:
www.enrego.de

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FUCHS.Hybridtower: Concrete, Steel, Know-how

The rapid expansion of wind energy requires systems that ensure a reliable and long-term function of modern turbines – in terms of availability and technology. Reliable and sustainable solution: The FUCHS hybrid tower.



The FUCHS.Hybridtower received the innovation award for start-ups at the WindEurope fair in Bilbao in March and was selected as one of the 3 most outstanding product innovations of 2024 for the Renewable Energy Award.

Ten gigawatts expansion target in Germany per year: That is around 1,500 onshore wind turbines, of which up to 70 % are erected with hybrid towers due to the increasing hub heights and modern turbine technologies. At the same time, tower systems are reaching their technological limits due to the growing demands on support structures in terms of height and load transfer. FUCHS Eurocoles Wind GmbH has therefore developed a hybrid tower that solves technological challenges and increases capacity to up to 275 concrete towers per year for the German market. The market needs a reliable technology that meets the requirements of modern and future turbine technologies and an economical production process that produces high-quality concrete segments in a serial, process-optimised way. says Jürgen Joos. He has been working in the wind industry for more than 10 years and

built up the start-up FUCHS Eurocoles Wind together with owner Conrad Fuchs.

The new company combines knowledge from Pfeleiderer's roots (towers), the experience of wind experts and

from the FUCHS family of companies (1,700 employees). "Deep value creation: We develop, engineer, plan, produce and assemble," is how Joos describes the FUCHS group of companies, which, among many other products, manufactures mobile phone towers for the German market made of spun concrete.

For several years now, FUCHS has been heavily involved in the energy transition - also in the area of overhead line construction (only solid steel mast production in Germany, transformer stations, components for substations). The FUCHS.Hybridtower now completes the value chain for renewable energies.

The FUCHS team plans to produce and assemble up to 275 towers per year. "Wind power needs at least double the sourcing and fresh, innovative solutions," says Joos. That is why his team of experienced wind specialists has rethought proven technology - to ensure that its tower system meets the durability, stability and quality requirements of modern turbine classes.



The basis for the production of the FUCHS.Hybridtower is the high-precision formwork technology, which ensures the tolerance accuracy of the concrete segments without mechanical treatment.



FUCHS.Wind

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www.fuchs-wind.de
LinkedIn: www.linkedin.com/company/fuchs-eurocoles

Founding year	2023
Focus	Hybrid towers for wind energy onshore
We offer	<ul style="list-style-type: none"> • Modular and scalable tower types according to wind norms and standards • High-precision and standardized production in a modern production plant • Simple and weather-independent installation process • Concrete hybrid towers, designed for quality and stability
We are looking for	<ul style="list-style-type: none"> • Project opportunities for FUCHS.hybrid towers • Employees in the field of construction and statics



“The heart of our concept is the connection between the concrete and the steel part. With a lot of engineering skills, we have significantly optimized the load transfer of the different forces.”

Jürgen Joos, Managing Director FUCHS Eurocoles Wind GmbH



“If you look at the forces acting on a wind turbine, the concrete-steel hybrid tower is technically an ideal solution,” says Joos, who has been closely involved in the development of the new tower system. “We use the material properties of concrete and steel in an ideal way. The core of our concept is the connection between the concrete and the steel part. With a lot of engineering skill, we have significantly optimised the load transfer of the different forces by decoupling the interface into several components”.

The design of the FUCHS tower and its component sizes enable economical transport on standard trucks and easy erection. In March, the new tower system was awarded the Innovation Prize at the WindEurope trade fair in Bilbao and has also been nominated as Product Innovation of the Year for the German Renewable Energy Award 2024. “Now that we have completed the tower development phase, we are concentrat-

ing on the intensive validation of the tower system and the realisation of our first pilot projects in 2025,” says Joos.

The quality-focused manufacturing process is designed for efficiency and high precision. Modular tower types are ideally suited to the turbine-specific and regional requirements of future sites. “If we look at the technical requirements of wind power and the needs of the market on the one hand, and the technological quality and economic balance of our solution on the other, we have a perfect match,” says Joos.

Conclusion

Quickly more hybrid towers for wind power in Europe: FUCHS Eurocoles 2023 has founded the Wind Startup for this purpose. Managing Director Jürgen Joos and his team have developed a new design. The FUCHS.Hybrid tower meets the requirements of modern turbine systems through the ideal use of concrete and steel as well as the newly designed transition area. The new plant in Neumarkt produces modular components optimised for standard transport and simple assembly. www.fuchs-wind.de



Top: It took FUCHS only a few months to build the first production plant for the FUCHS.Hybridtower.
Bottom: In September 2024 the first prototype of the transition area of the FUCHS.Hybridtower was successfully built.

ECONOMIC REPORT

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COMPANIES

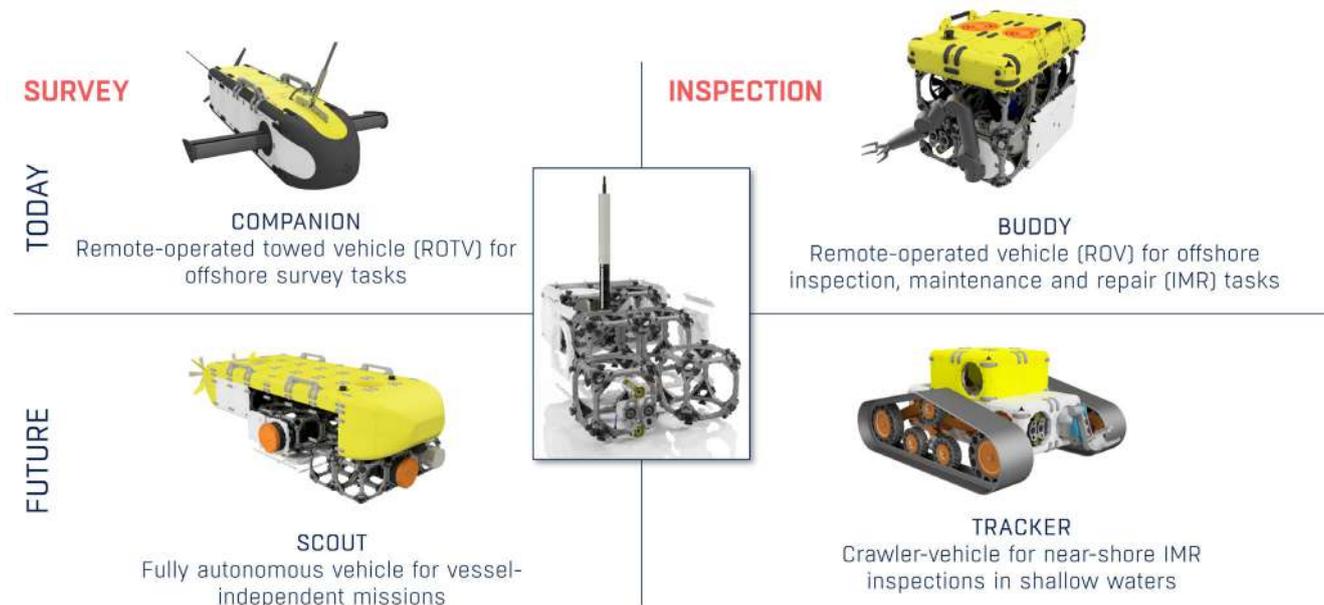
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Framework Robotics – platform-based underwater robotics

With the expansion of offshore wind capacity, downstream service requirements are growing. With its underwater robotics platform, Framework Robotics offers a flexible solution for applications ranging from survey to inspection and repair.



Based on the modular platform of hardware and software, vehicles can be provided for various offshore applications.

Limited resources – from the appropriate vessels to the required personnel – ensure high automation pressure in the offshore service sector.

Supporting or replacing underwater missions carried out by divers with robotics has proven to be an effective solution. This applies equally to the exploration of large areas (survey), for example as part of preliminary soil investigations, as well as the inspection, maintenance and repair of underwater structures.

The future of the offshore wind industry will be significantly shaped by the development and integration of advanced robotics solutions. These technologies play a central role in the development and expansion of an efficient service industry,

“With the most powerful platform in its class, we want to make underwater robotics accessible, thus contributing to meeting the growing service requirements of the offshore wind industry in the future.”

Nico Günzel, co-founder and managing director

which is essential for the long-term operation and maintenance of offshore wind farms.

In this, the platform developed by Framework Robotics addresses three key issues:

1. Complexity reduction

Conventional underwater robots are usually designed for a single application.

This requires personnel to have expertise in various systems to provide a comprehensive range of services.

With the platform solution developed by Framework Robotics, different configurations can be put together based on standardized hardware modules and the corresponding adaptable software, which require platform expertise instead of system expertise.

This not only reduces personnel requirements, but also simplifies maintenance and inspection of the systems and minimizes costly downtime thanks to the modular structure.

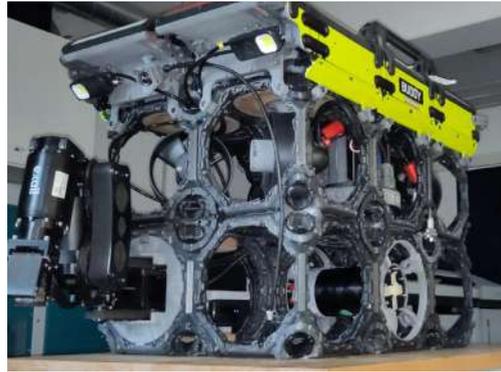
2. Data validation

The collection of valid data is at the heart

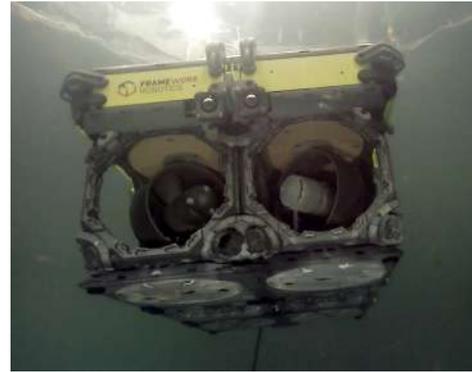


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 LinkedIn: de.linkedin.com/company/fw-robotics

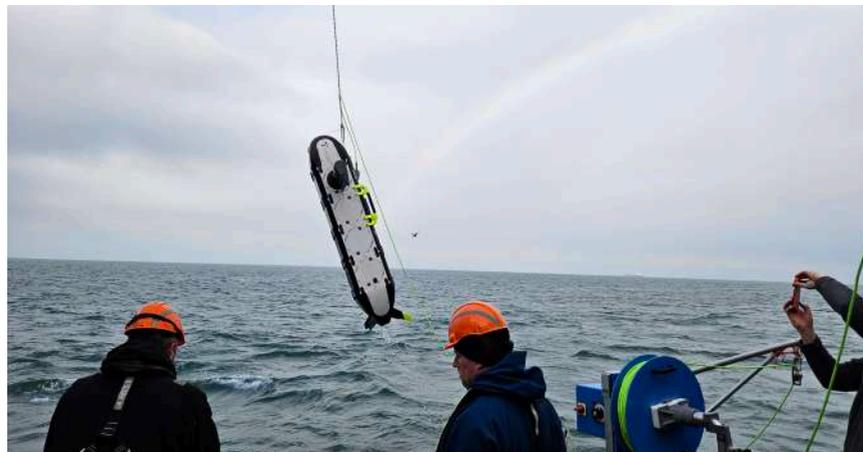
Founding year	2020
Focus	Platform-based underwater robotics
We offer	<ul style="list-style-type: none"> Platform-based underwater robotics Customized underwater vehicles Pay-per-Use solutions, e.g. for testing innovative sensor technology Strong network into marine technology research and access to an offshore test field
We are looking for	<ul style="list-style-type: none"> Pioneers who want to trial new underwater robotics for their application Customers with specific challenges for which we can find solutions within our network Investors



ROV in Light-Work-Class-Configuration with manipulator and additional payload-level



ROV in the minimum version, large power reserves for operations even in difficult conditions



Recovery of towfish COMPANION after survey mission in the Baltic sea

of robot-assisted missions. In addition to the integration of innovative sensors, this requires the most accurate positioning possible for georeferencing.

Not only can all standard positioning systems be integrated into the open platform solution, but their data can also be merged in such a way that the position can be determined as precisely as possible. In future, for example, it should be possible to determine a cable defect as precisely as possible.

3. Pressure to innovate

Embedded in the research landscape of the Ocean Technology Cluster Rostock, Framework Robotics is working on innovative solutions for challenges in the offshore wind industry. For example, a

joint research project with the “Smart Ocean Technologies” working group of the Fraunhofer Society is looking into the inspection and renewal of the coating of foundation structures in the splash water zone. Crucially, the proximity to the Digital Ocean Lab, the approved test field in the Baltic Sea, means that innovations can not only be designed but also validated in a real environment.

Framework Robotics is also focusing on autonomy as a future technology. By using advanced, autonomous control systems, their robots will be able to work with minimal human intervention, reducing operational costs and increasing efficiency.

Conclusion

Automation and cost pressure continue to increase in the offshore wind industry. The integration of advanced robotics solutions is proving to be a decisive factor for the future development of the industry. With its platform solution, Framework Robotics addresses key issues such as complexity reduction, data collection and validation as well as the integration of innovative solutions. Feel free to contact us – together with our strong network, we will find the ideal solution for your application.

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Second Life – First Choice

The NAEXT battery storage system

Are you looking for a sustainable energy storage concept? Do you need a compact system that can be customized to your needs? Then we can offer a solution with our QUADRAGON and HEXAGON products.



Thanks to our engineers’ many years of design experience, we know how products should be – and how they shouldn’t be. Predetermined breaking points and limited options for adapting to new challenges often lead to short product lifetimes and therefore jeopardize sustainability. In order to maximize the life cycle, products must be robust and adaptable, and our HEXAGON and QUADRAGON energy storage systems offer solutions for many tasks despite their specialized features. The components used and the software we have developed are fit for the future and orientated towards the challenges of tomorrow.

The Hexagon battery storage system was developed to enable private individuals and small businesses to achieve a high level of energy self-sufficiency. Integrated

functions such as stand-alone capability, EV charging or zero feed-in open up a wide range of possible applications.

The Quadragon storage system was specially developed for night-time power compensation of energy generation



In front of a bakery a HEXAGON serves to optimize self-consumption / Photo Naext



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 www.naext.de

Founding year 2019

Focus Development and production sustainable storage solutions for industry and commerce

We offer Efficient energy storage from High quality Second Life batteries from well-known OEMs for night-time power compensation and self-consumption optimization and battery-supported fast charging infrastructure

We are looking for Partner in the areas of sales, research and development as well as project sponsors and local authorities for future development projects

systems such as wind turbines, solar parks or combined heat and power plants. The optional EV fast charging station enables our customers to provide 100 % self-generated electricity for their own service fleets or as a public charging point for the public charging infrastructure.

The core of our battery storage systems is – how could it be otherwise – the battery. It accounts for a large proportion of the materials used. At the same time, the extraction of the resources it holds is critical and has a massive impact on our ecosystem. For this reason, we almost exclusively use used high-voltage batteries from electric vehicles. After a brief overhaul in our laboratory and equipped with new technology, we use these in the HEXAGON and QUADRAGON energy storage systems. As these are high-performance batteries, they are up to the demands of our storage systems in every

aspect. We continue to utilize the special features, such as internal liquid temperature control.

Off the shelf or customized?

The best thing about our storages: They are delivered to you fully assembled and tested! This means that even the large QUADRAGON can be installed quickly within one day.

At the same time, we at NAEXT see ourselves as product developers. If we are unable to cover a requirement with our existing solutions, we can call on our team of experienced engineers to realize it. Simply ask for it!



The high-voltage batteries used in a module rack for the QUADRAGON

Conclusion

The production of storage batteries consumes enormous amounts of resources and emits harmful greenhouse gases. The second-life concept and the reuse of batteries that have already been produced are therefore immensely important. The batteries from used electric vehicles have great potential to meet the global demand for storage batteries.

With our 2nd-life energy storage systems, we offer the opportunity to make a contribution to sustainability in the energy transition.



A QUADRAGON on an Enerparc AG solar park takes care of night-time power compensation / Photo Enerparc

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NeXtWind – The New Way of Green IPP

NeXtWind – founded in 2020 with a focus on repowering – now owns 25 wind farms, has a 1 GW+ repowering pipeline and is increasingly targeting greenfield development. Goal: a leader in optimized distributed climate infrastructure.

Germany is currently the largest onshore wind market in Europe with 61 gigawatts of installed capacity. Approximately 47 % of these turbines are 15 years old or older and offer enormous potential for repowering. NeXtWind wants to build on this potential and optimize these sites to produce green electricity. Older wind farms usually have the best locations, but the worst efficiency. Repowering is the best solution to quickly increase capacity. NeXtWind therefore focuses on acquiring existing wind energy sites with outdated turbines, replacing the turbines with more efficient ones and expanding the sites through constructive and trustful cooperation with local communities to allow additional turbines on the sites. Energy output can be further increased using highly efficient

“We are just getting started – our goal is to help shape the energy transition of the coming decades. We want to triple our generation potential to 3,000 megawatts by 2028.”

Ewald Woste, Co-Founder and Executive Chairman

modern technologies. The consistent addition of solar PV and battery storage to the wind farms will further improve the quality of our offering.

Within the last two years, NeXtWind has increased its optimized repowering capacity from 250 megawatts to 1,000 megawatts (1 GW). The regional focus is on Northern and Eastern Germany. This success has been made possible by the acquisition of additional wind farms, the

optimization of existing sites and advances in the latest turbine technology. NeXtWind currently (August 2024) operates 161 wind turbines in 25 wind farms. Over 150 new large wind turbines will be installed in these wind farms by 2026 through repowering.

NeXtWind has raised \$750 million in its second round of financing from reputable international investors to further expand its green power production. As a result,



50 people are currently working at NeXtWind on the next generation of energy infrastructure.

NEXTWIND

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 nextwind-group

Founding year **2020**

Focus **Revitalization**

We offer

- Efficient repowering
- Sustainable energy supply
- Strong local partnerships

We are looking for

- Regional project partners
- Operators of older wind turbines
- Strategic partners

“NeXtWind is building the next generation of energy infrastructure. We are driving the transition to a decarbonized, decentralized and digitalized energy system that meets the growing demand for clean electricity from energy-hungry applications such as AI, as well as the electrification of mobility and the heating sector.”

Lars Meyer, Co-Founder and Co-CEO



More than 150 new large wind turbines will be installed in NeXtWind wind farms by 2026.



Milestone reached: a portfolio of more than 1 GW of German generation capacity.

“In addition to our core business of repowering, we are increasingly focusing on greenfield development to ultimately build a green energy supplier. We are particularly pleased that a number of developers are already interested in working with us. The challenges and risks in the market are increasing, so partnerships are important.”

Werner Süß, Co-Founder and Co-CEO

NeXtWind is already the leading provider of optimized decentralized climate infrastructure for renewable energy in Germany.

NeXtWind combines decades of experience in the wind and energy industry, specialized green finance and transaction expertise, and the commitment of leading investors to sustainability. The company aims to become a leading provider of optimized distributed climate infrastructure in Europe.

Conclusion

NeXtWind specializes in the optimization and repowering of energy sites such as older wind farms. The company was founded in 2020 and has offices in Berlin and London. The fast-growing company currently employs more than 50 people. With a strong funding base of USD 750 million (investors: Sandbrook Capital and the large Canadian pension funds PSP Investments and IMCO), NeXtWind is well positioned to meet the challenges of the energy transition.

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ProTecBird: Protecting Species – Increasing Energy Yields

ProTecBird is a technology startup specializing in species and environmental protection related to birds, offering innovative AI-based solutions to accelerate the expansion of renewable energy on land and at sea.



AVES Wind anti-collision system: Representation of bird detection by AVES Wind with species recognition AI, indicating the probability

Founded with the vision of using cutting-edge technologies to protect wind-sensitive bird species, ProTecBird has quickly become a pioneer in the industry. The recipe for success lies in a unique combination of ornithological expertise, know-how in developing AI-based systems, and strong partnerships with the industry. In 2024, ProTecBird successfully transitioned from a startup to a scale-up company. Under the leadership of CEO Thorsten Heinzen, the company has laid the foundation for rapid growth with a rapidly expanding team of now 20 highly qualified full-time employees and 30 freelancers. In addition to highly sought-after, market-ready product innovations, an efficient industrial organization has been established, and expansion into international markets has been successfully initiated.

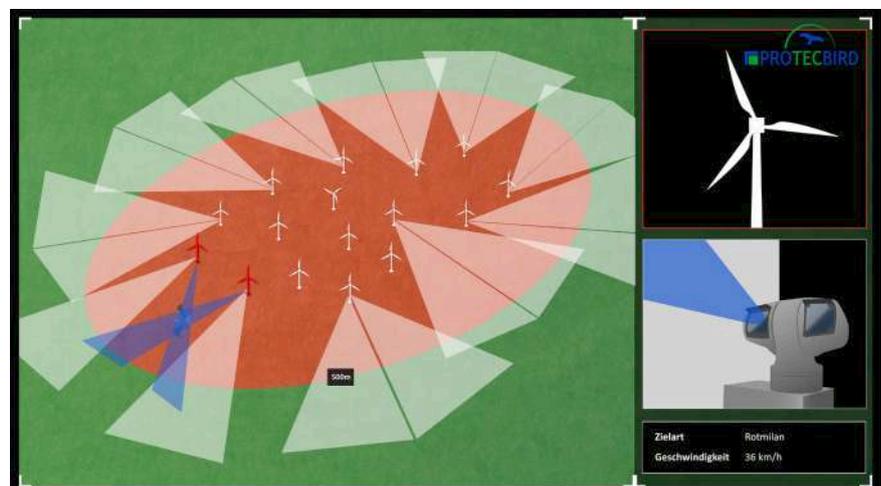
Successful Deployment on Land and at Sea

ProTecBird's anti-collision systems are already in use in Germany and Italy and have proven particularly effective with land-based wind turbines. However, the

company is not resting on its laurels. By extending its expertise to the offshore wind sector, ProTecBird has developed innovative solutions that accurately track bird migrations and enable the counting of individual birds passing through offshore wind farms. These systems have already been installed on initial wind energy installations (WEIs) and support operators in optimizing the operation of their installations while ensuring the protection of avian biodiversity.

The Future of Onshore Wind Farm Technology

ProTecBird's flagship product is the fully automated, AI-based anti-collision system (AKS) AVES Wind. This state-of-the-art system ensures the unrestricted operation of wind farms and offers an alternative to blanket shutdown requirements by providing a tailored solution for wind farm operators through species- and situation-specific brief shutdowns. This not only



AVES wind anti-collision system: Schematic representation of the triangulation of a red kite with two wind turbines



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Founding year **2021**

- Focus
- Anti-collision systems for onshore wind farms
 - Monitoring, High Precision Counter, and Analytics for offshore wind farms
 - Maintenance and service

- We offer
- Onshore**
- Continuous operation of wind farms without shutdown requirements
 - Low installation costs by utilizing the wind park's existing infrastructure
 - High species-specific detection accuracy and low false positive rate
 - Government-recognized and future-proof data collection for creating risk models to meet regulatory requirements
 - AI-based, fully automated, autonomous avian data collection
 - Analysis and visualization of large datasets
 - Report generation

Offshore

- Data collection for creating risk models to meet regulatory requirements
- AI-based, fully automated, autonomous avian data collection
- Analysis and visualization of large datasets
- Report generation

We are looking for We are seeking wind farms with significant bat populations to validate our system for real-time bat detection.



AVES Monitoring Offshore enables detailed monitoring and evaluation of bird migration

maximizes energy production but also enhances the overall efficiency of the wind farm while protecting native bird species. AVES Wind can be cost-effectively integrated into existing infrastructure, reducing installation time and significantly lowering overall costs. The system's recognition by authorities in Schleswig-Holstein and the anticipated approval in other federal states underline its future security and regulatory advantage.

Comprehensive Solutions for Data Collection and Analysis in the Offshore Sector

Specifically developed for use in offshore wind farms, AVES Monitoring is a powerful tool for the collection and analysis of avian data. This comprehensive data collection enables the creation of precise risk models, allowing regulatory requirements to be met efficiently. This significantly increases the accuracy and acceptance of wind farm projects during the approval process.

The portfolio is complemented by the AVES Wind High Precision Counter. This system utilizes state-of-the-art AI



AVES High Precision Counter for precise counting of flocks and individual birds on offshore wind turbines

technologies to accurately detect and count bird migrations within the rotor area, efficiently supporting compliance with regulatory requirements.

AVES Analytics, a platform for analyzing and visualizing large datasets, assists operators in efficiently consolidating and evaluating data collected by various AVES products.

Conclusion

ProTecBird is setting new standards in the wind energy sector with its innovative technologies. The company impressively demonstrates how species protection and economic interests can be combined. Through the targeted use of AI and comprehensive data collection, ProTecBird contributes to shaping the future of renewable energy in a sustainable and efficient manner.



“Currently, we are working intensively on expanding our technology to other species, such as the real-time detection of bats, to ensure a more comprehensive protection of wildlife. Additionally, we are focusing on expanding our partnerships to promote the use of renewable energy not only in Germany but also worldwide.”

Thorsten Heinzen, CEO of ProTecBird

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REventoGIS offers an effective software solution for wind farm project planning

The start-up REventoGIS has developed comprehensive geoinformation software for the calculation of all necessary steps from area and installation planning to emission calculation and construction planning. The company is part of the Aurich-based REvento Group.



The QGIS-based design planning and potential analysis is also part of the REventoGIS software solution.

Here is an example of application and implementation planning as part of a repowering project.

“Our software solution automates all the necessary calculations throughout the entire planning and implementation process,” says Andre Kotze, Managing Director of REventoGIS. This is largely unparalleled in the industry. “We rely on open source platforms for our geodata solutions,” Kotze explains. REventoGIS has developed proprietary plug-ins that integrate geospatial information with other crucial data. The software then automatically and quickly calculates a large number of scenarios and offers a significant increase in efficiency. “With our degree of automation, we’re approaching AI, even if the system is not yet self-learning,” says Andre Kotze.

Specifically, the QGIS-based system from REventoGIS quickly and cost-effectively

creates a potential area map and a layout plan with several hundred scenarios. “Something like this used to take two weeks,” says Andre Kotze. Users only need to enter a few basic parameters such as the size, type and manufacturer of the planned wind turbines and the parcels of land to be included.

In addition, the REventoGIS system calculates economic factors such as lease distribution and subsidies to the surrounding municipalities in accordance with Section 6 of the Renewable Energy Sources Act (EEG). It can also estimate noise emissions. “The individual system components provide a comprehensive template for the initial planning, economic viability, approval and construction of wind farm projects,” says Stefan Lütkemeyer, Managing Director of REvento. “To achieve the 10 GW of wind

power output targeted by politicians, we need to rely on the speed of automated systems like ours,” Lütkemeyer emphasizes.

This is because the REventoGIS system is faster, more consistent and more secure than any previous approaches. “We offer area calculations, utilization analyses and documentation all within one system,” says Hermann Bohlen, also Managing Director at REvento.

The REvento Group currently uses the new REventoGIS software primarily for its own project planning and as part of project planning for third parties. “However, we may also offer services from our GIS system to other project planners in the future,” says Bohlen.

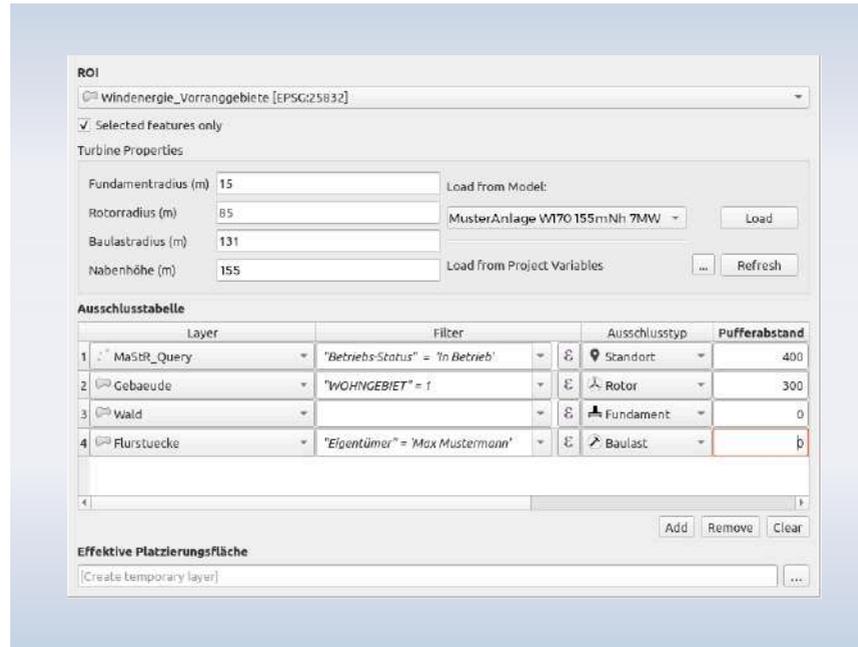
REvento GmbH
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Phone: +49 (0)4941 98665 11
www.revento.eu

Founding year **2022**

Focus **services from project planning to project implementation**

We offer **services along the entire process chain of RE planning; software-based automation tools; extensive industry knowledge and an outstanding network.**

We are looking for **wind enthusiasts who want to join us in driving forward the energy transition with a lot of idealism and a lot of enthusiasm.**



The screenshot shows the REventoGIS software interface. At the top, there's a dropdown menu for 'Windenergie_Vorranggebiete [EP5G2583Z]'. Below it, a checkbox 'Selected Features only' is checked. The 'Turbine Properties' section includes input fields for 'Fundamentradius (m)' (15), 'Rotorradius (m)' (85), 'Baulastradius (m)' (131), and 'Nabenhöhe (m)' (155). There are also buttons for 'Load From Model' (with a dropdown menu 'MusterAnlage W170 155mNh 7MW') and 'Load From Project Variables' (with a 'Refresh' button). Below this is the 'Ausschlusstabelle' (Exclusion Table) with columns for Layer, Filter, Ausschlusstyp, and Pufferabstand. The table contains four rows of exclusion criteria. At the bottom, there's a section for 'Effektive Platzierungsfläche' (Effective Placement Area) with a 'Create temporary layer' button.

Layer	Filter	Ausschlusstyp	Pufferabstand
1 MaStr_Query	"Betriebs-Status" = 'In Betrieb'	Standort	400
2 Gebäude	"WOHNGEBIET" = 1	Rotor	300
3 Wald		Fundament	0
4 Flurstuecke	"Eigentümer" = 'Max Mustermann'	Baulast	0

After entering the basic data, the system calculates distribution keys according to §6 and leased areas.



In a network with Pommer & Schwarz, the REvento Group team takes care of the planning, implementation, approval and operation of wind farm projects. Managing Director Holger Schwarz from Pommer & Schwarz and the management and owners of REvento Hermann Bohlen, Stefan Lütkemeyer and Karsten Kirchhof (from left to right)

Together with the group companies and network partner P&S, the REvento Group thus offers all the necessary services along the process chain for the planning, realizing, approving and operating wind farm projects. REvento GmbH is primarily responsible for planning, REvento Operations for operations management and network partner Pommer & Schwarz for construction. "With REventoGIS, we now also have a software specialist within the group from which all other process

participants can benefit and become even more efficient," says Lütkemeyer. REventoGIS will continue to develop the software solution on an ongoing basis. The next step for the current three-person development team will be the integration of data for yield planning and turbulence calculations. "Self-learning AI functions are also on our development roadmap," Kotze reveals.



Andre Kotze is Managing Director of the newest Group company REventoGIS.

Conclusion

Since its foundation in 2022, REvento GmbH, based in Aurich, Lower Saxony, has been successfully engaged in the planning of new wind farms and repowering projects. Today, with its group companies REvento Operations GmbH and REventoGIS GmbH, along with its partner Pommer & Schwarz, the company manages all aspects of wind farm projects – from planning and approval to construction and operational management. The new REventoGIS software further enhances the efficiency, speed, and reliability of the entire project workflow.

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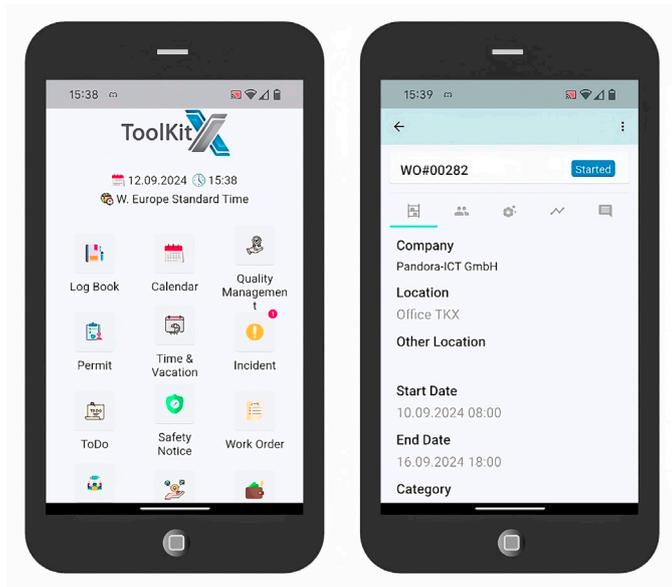
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Onshore and Offshore – Digital Workflow Support with ToolKitX

As a wind farm operator or EPC contractor, you are aware of the challenges of coordinating complex processes with workforce members and subcontractors, as well as meeting the requirements for occupational safety, quality, schedules, documentation and reporting.

ToolKitX offers a modular cloud-based software solution that flexibly adapts to a wind energy project in terms of scope and functionality. Our customers digitize their workflows, work processes and communication between project partners in the areas of HSEQ, operations and administration. ToolKitX incorporates solution experience from real projects spanning more than a decade.

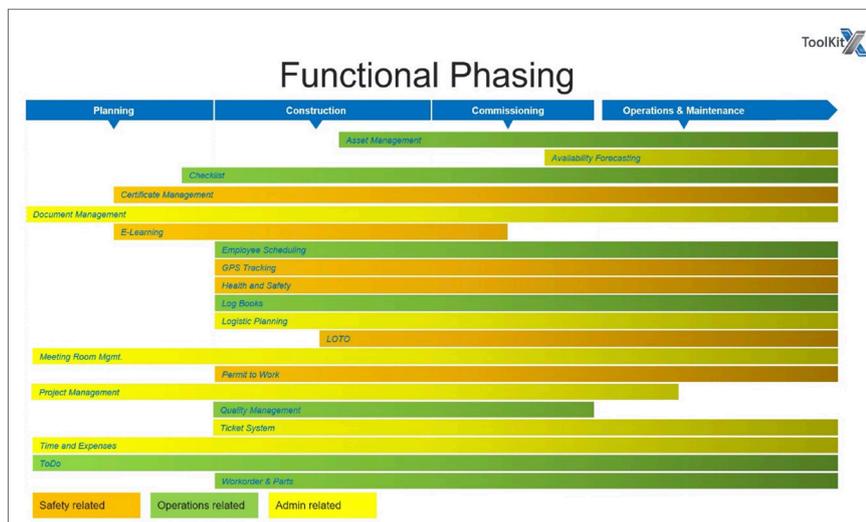
From online training (e.g. site induction) to certificate management, permit to work, lock out/tag out and HSE management, all operational safety aspects can be accurately addressed with significant time savings. In addition to shift and material planning, operational planning also allows for the generation of work orders (for maintenance also fully automated from asset management) and relevant reporting on project progress.



ToolKitX – Mobile App

A free mobile app with offline functionality is available for mobile data collection from field workforce members.

For the offshore sector, modules for maritime surveillance (IALA compliant) and logistics planning complement the offering. Aside from Germany, our solution is used internationally supporting 18 languages.



ToolKitX Modules for work safety, operations and maintenance, and administration

The implementation of ToolKitX is straightforward: through customization, the default processes in the system are adapted to customer requirements and the solution is handed over ready to use. Employees are trained at user level or as administrators so that future adjustments can be made independently from ToolKitX support. Integration with incumbent systems is the standard for us, especially with ERP systems. Our solution is hosted in Germany and meets the requirements for cyber security and GDPR.



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Founding year	2019
Focus	Digital Workforce-Management in the energy sector. Work safety, O&M, asset management
We offer	Modular Cloud-software solution to digitally manage all processes and workflows, as well as HSEQ and Reporting
We are looking for	First time customers and project partners for international markets and systems integrators.

The solution is scalable and can be used from 25 users upwards. ToolKitX is offered in the Software as a Service (SaaS) model with a monthly license fee. This depends on the subscribed modules and the number of users. A one-time fee is charged for setup, training and customizing.

Some of our customer projects include:

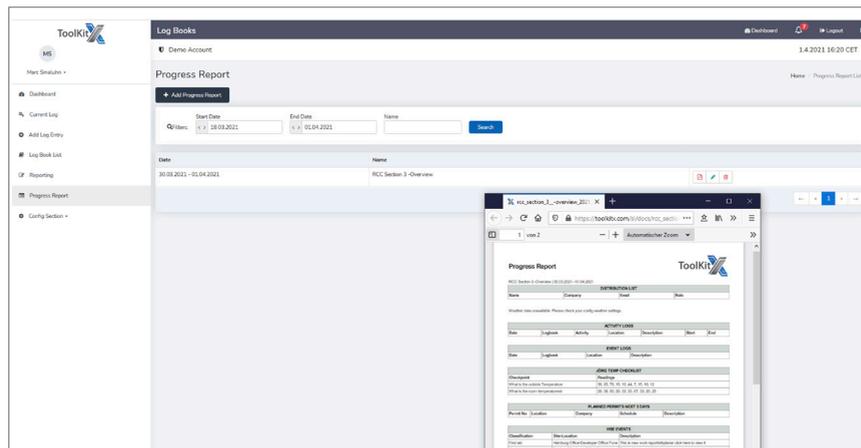
- VejaMate Offshore Windfarm, Hamburg
 Investitionssumme des Projekts beträgt 1,9 Mrd. Euro, 402MW.
- Baltic Eagle Windfarm, Sassnitz
 Investitionssumme des Projekts beträgt 1,6 Mrd. Euro, 476MW.
- St. Brieuc Windfarm, Frankreich
 Investitionssumme des Projekts beträgt 2,4 Mrd. Euro, 496MW.
- Vineyard 1 Windfarm, USA
 Investitionssumme des Projekts beträgt 2,7 Mrd. Euro, 806MW.
- Sofia Windpark EPS GE Vernova), Großbritannien
 Investitionssumme des Projekts beträgt 3,4 Mrd. Euro, 1.400MW.



Avgriid Vineyard Wind 1 Project

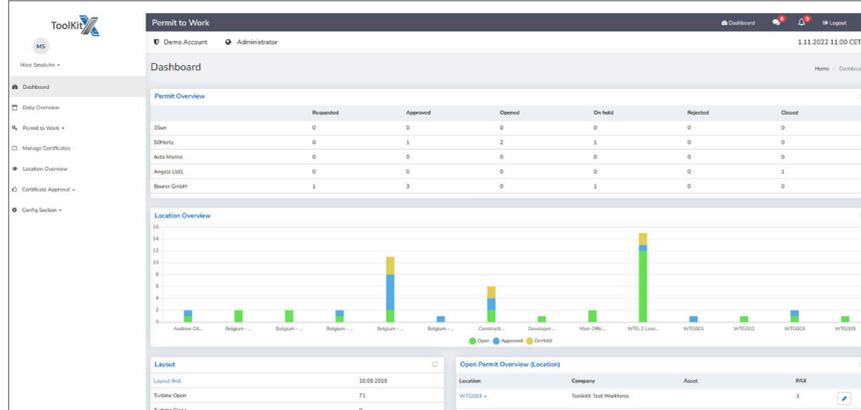
“Beyond our software capabilities, customer feedback shows that our customers particularly value our flexibility and ability to listen. If your company still uses in full or partially, paper, fax, spreadsheets or central file servers in its wind farm projects, this would be a good starting point for a conversation.”

Marc Smaluhn, CEO, ToolKitX GmbH



↑ ToolKitX – Project reporting

↓ ToolKitX – Permit to Work



Conclusion

ToolKitX is the digital partner for wind farm operators from construction through commissioning to operation and maintenance. The solution ensures compliance with defined processes and regulations, legally compliant documentation and significant time savings while avoiding errors.

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WeldNova GmbH – highly efficient welding technology for the wind industry

WeldNova GmbH has developed an approach that revolutionises the welding process in the manufacture of steel towers for wind turbines. The new technology can secure competitive advantages for manufacturers in the wind industry.



Laser hybrid welding using WeldMagnet from WeldNova GmbH during the process at 20kW laser power. © BAM

In a modern 120 metre high steel wind tower, the weld seams add up to a length of around 700 metres. Steel sheets up to 30 millimetres thick have to be joined together in several layers over this length using the so-called submerged arc welding process. At present, this requires a total of around 100 hours of pure welding time. This limits the capacity of the remaining German production sites to around 520 steel towers per year – just over half of what the German government’s expansion targets for onshore wind energy envisage. Additional turbines are being purchased from abroad, particularly from Asia.

Up to 700 metres of weld seam can be found in a typical on-shore wind tower.

The turbines could be manufactured much faster – and at the same time more cost-effectively – using the laser hybrid welding process. It only requires a single welding layer. However, this process has so far only been suitable for sheet metal up to 12 millimetres thick for industrial use. The reason: when welding thicker sheets, the liquefied metal forms droplets under-

neath the weld seam due to gravity. This jeopardises the stability of the subsequent system and is not permitted.

WeldNova GmbH, a BAM spin-off supported by the German Federal Ministry for Economic Affairs and Climate Protection and the European Social Fund, has now found a smart solution to this long-known problem: A patented system consisting of an electromagnet that is attached below the welding zone. The magnet releases the so-called Lorentz force, which counteracts gravity. This prevents any droplet formation on the



WeldNova GmbH

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 LinkedIn: de.linkedin.com/company/weldnova

Founding year **2023**

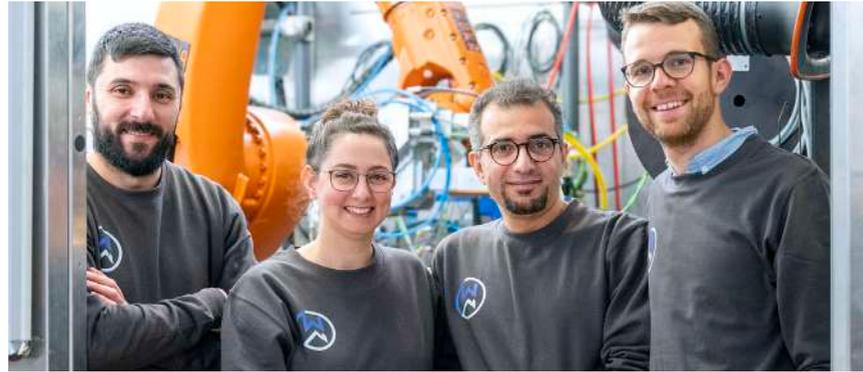
Focus **Welding technology**

We offer

- Technologies that make the welding process in your production significantly more productive
- Customised solutions, adapted to your production processes and welding procedures

We are looking for

- Customers and projects in the field of tower construction, foundation structures (off-shore), floating platforms, non-floating platforms, etc.
- Cooperation partners from large turbine manufacturers who have an interest in making their local suppliers more productive and reliable
- Motivated employees



Founding team Dr Ömer Üstündağ, Fatma Akyel, Dr Nasim Bakir, Dr Christian Brunner-Schwer from left to right. © BAM



WeldNova technology makes laser hybrid welding a reliable and extremely efficient welding process for the wind industry. © BAM

weld seam. The system works completely contact-free. This innovation for the first time makes it possible to use the faster laser hybrid welding process for thick steel sheets for wind turbines without compromising on safety.

The time and cost savings potential of the innovation is enormous for a modern 120 metre wind tower: by using laser welding, which is made possible by the magnet system, the welding time can be reduced from 96 to just under 12 hours – an acceleration by a factor of 8. At the same time, only 900 kilowatt hours of energy are

required instead of the previous 4000 kilowatt hours. Welding costs can be reduced by 90 per cent overall. CO2 emissions from the welding of a wind tower are even reduced by 93 per cent.

As well as being used for laser hybrid welding, the developed system can also be used for conventional submerged arc welding. This allows productivity boosts of up to a third to be achieved with the existing welding process.

Conclusion

Thanks to its innovative technology, WeldNova enables tower and foundation structure manufacturers to significantly increase their competitiveness. For example, 90 % of welding costs can be reduced and production capacities increased by up to 8 times.

ECONOMIC REPORT

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Onshore meets offshore: The almost 86 m long rotor blade for a Nordex N175/6.X meets Siemens Offshore rotor blades and nacelles in the port of Esbjerg.
Photo: © Ulrich Mertens, Atelier für Kunst und Fotografie

COMPANIES:

Manufacturers of wind turbines

German manufacturers have a high share of the world market, reaching an export rate of 60 to 70 percent. The technology and efficiency of their turbines set standards and are sought-after globally.



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ENERCON

ENERCON – ENERGY FOR THE WORLD

ENERCON's product portfolio includes wind energy converters with nominal power outputs ranging from 2,000 to 7,000 kilowatts and readily provide models for a wide variety of wind sites.



01

As a pioneer of wind energy technology and a partner of the energy transition, ENERCON specialises in the turbine and technology development, production, sales and servicing of onshore wind energy converters. Pursuing its mission of 'Energy for the world', ENERCON has driven sustainable energy generation from onshore wind since 1984. Thanks to its innovative wind energy converter technology, high quality standards and a total installed power of more than 61 GW, it is one of the world's leading manufacturers.

Products and services

ENERCON's product portfolio includes wind energy converters with nominal power outputs ranging from 2,000 to 5,560 kilowatts. This allows ENERCON to readily provide models for a wide variety of wind sites. For 2024, ENERCON has announced its latest wind turbine model: The E-175 EP5 turbine has a nominal power of more than 6 MW and 175 metres of rotor diameters. The E-nacelle is also used for this type of turbine with electrical systems built into the machine house. For

2026 ENERCON announced an E-175 with a nominal power of 7 MW thanks to advanced two-parted generator technology.

In addition, project planners and operators can draw on a wealth of consultation and planning knowledge at ENERCON. From wind turbine selection, site layout and approval to project financing and energy marketing, the company works together with external partners to support its customers at all steps on their path to more renewable energy. ENERCON also implements turnkey projects at the customer's request. The company also offers tailor-made solutions for the maintenance and repair of wind turbines during ongoing operation, as well as innovative repowering and end-of-life concepts. More than 350 Service stations worldwide ensure quick and trouble-free technical support of ENERCON wind energy converters.

Research, development and production

Characterised by the inventive talent of founder Dr Aloys Wobben, ENERCON is still setting new standards in technology, quality and cost-efficiency of wind turbines today. ENERCON was the first of all the manufacturers to make use of a gearless drive concept, and with its effectivity and compact design this is still a distinguishing feature of ENERCON wind energy converters all these years later.

Due to a grid feed system certified in accordance with the latest grid codes, ENERCON wind turbines can be integrated into all supply and distribution network structures without any issues.



- 01 | E-138 EP3 E3 Staphorst
- 02 | E-175 EP5 E1
- 03 | E-175 EP5 E2
- 04 | E-160 EP5 E3 Albringhausen
- 05 | E-160 EP5 E3 Hämelhausen

Intelligent control means they make a significant contribution to maintaining and improving grid stability. With its own research and development unit, ENERCON guarantees the high demands made by its stakeholders are included in new, ever more powerful and efficient wind energy converter models.

By having its own production network, wind energy technology trailblazer ENERCON is in possession of sound knowledge along the entire value creation chain. Today, ENERCON also brings this valuable production knowledge to its

suppliers and partners the whole world over. This helps to ensure that all components meet the strict ENERCON quality standards and are optimally adapted to the end product. As a result, ENERCON wind turbines are particularly reliable, low-maintenance, long-lasting and cost-effective. In conjunction with the ENERCON maintenance service, the company guarantees operators and owners a technical availability of 97 per cent.



ENERCON Global GmbH

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Web	www.enercon.de
Category	Manufacturers
Profile	Manufacturers
Employees	14,000
Founding year	1984

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eno energy GmbH

Eno energy – Success with wind

The name eno energy has been known for premium quality and innovative plant technology in international wind farm projects since 1999.

As an established specialist for individual energy solutions, eno energy provides independent and quality-conscious engineering services for every technical challenge and offers their customers holistic solutions. At six locations in Germany, nearly 300 dedicated employees work on the most efficient customer solutions and regionally produce, durable and powerful onshore wind turbines (WTGs) in the 4.0 to 7.0 MW range, thus making a significant contribution to designing the future of sustainable energy production.

The new eno175 represents the top class of 7 MW plants and guarantees highest efficiency and power yields. With this 7 MW variant, based on the proven ENO VENTUM platform, eno energy is expanding its broad machine portfolio and thus rounding off its comprehensive product range, also for locations with weak as well as medium-strong wind conditions.

With more than 25 years of expertise in the wind energy segment, the eno energy group offers its customers incomparable service around the topic of wind energy. The ongoing development of our own machine range allows us to offer competitive and durable WTGs at all times.

No other wind turbine manufacturer is able to offer the planning of customized wind turbines along with planning turnkey wind farms, planning and approval services as well as the complete handling of customer-specific projects from a single source. In addition to the full service for WTGs by eno energy, the eno energy





02



03

Group also offers a multi-brand service for third-party WTGs. The eno energy Group's range of services is complemented by a wide range of development services in the field of component and assembly development. Furthermore, our specialties include the development and marketing of our own inverters, the offer of intelligent energy storage solutions for the optimization of existing or newly planned wind farms and the innovative licensing concepts, which enable a global production of wind turbines by eno energy.

The eno energy Group will continue to evolve as a technology company in the wind energy sector and strengthen its activities in the areas of R&D, sales, and service portfolio.

- 01 | construction eno turbine
- 02 | wind turbine in Willerswalde
- 03 | wind turbine
- 04 | construction eno turbine in Falkenhagen
- 05 | eno 160 in Franzburg



04



05



eno energy Gruppe

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Fax	+49 (0)381 203 792 101
E-Mail	info@eno-energy.com
Web	www.eno-energy.com
Category	Manufacturers
Profile	Manufacturers
Turnover	ca. € 46 million
Employees	nearly 300
Founding year	1999

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Nordex Group

The Nordex Group offers high-performance wind turbines for almost all geographical regions of the world.



01

The development, manufacture, project management and servicing of wind turbines in the onshore segment has been the core competence of the Nordex Group and its more than 10,000 employees worldwide since 1985. The focus is on turbines in the 4 to 6 MW+ class. The comprehensive product portfolio offers customised solutions both for markets with limited space and for regions with limited grid capacities. The Nordex Group realises wind farms in various scopes: from pure delivery (clean sell) to turnkey installation (turnkey projects). A global service network with around 230 service points in 30 countries ensures smooth operation. In September 2017, the Nordex Group launched the N149/4.X, the first product in the current Delta4000 product series. This is based on the proven technology of the Generation Delta turbines that have been successfully installed since 2013 for locations with strong, medium and light wind speeds.



02

The turbines in the Delta4000 series have a variable output within the 4-, 5- and 6-MW class and can be optimally adapted to the individual specifications of the grid operator, local wind conditions, noise requirements and customer needs. The world's first installed +4MW turbine was honoured as "Turbine of the Year 2018" by the trade magazine "Windpower Monthly". Today, the Nordex Group offers the variable turbines in the 5MW+ class with the N149/5.X and the N163/5.X. With the N163/6.X, the step into the 6 MW class took place in 2021, followed by the N175/6.X in 2022, which specialises



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in low wind speeds and was installed for the first time in summer 2024. For Germany, a tower with a hub height of 179 metres is also on offer for this turbine.

As with the first N149/4.X, flexibility is a key factor in the design philosophy and operating strategy of the turbines. The turbines cover a wide range of power modes and optimise adaptability in regions with low and medium wind speeds. Depending on the investment criteria of the respec-

tive projects, the turbines can be operated flexibly in terms of capacity factor, rating, service life and noise requirements and thus also optimised for the customer's respective business model. The sister turbine N133/4800 for strong wind regions is the only exception and is not variable. The Nordex Group's turbines supply more than 52 GW of sustainable energy worldwide and are present in over 85 % of the global energy market (excluding China).

The management holding company is headquartered in Rostock, with the Management Board and administration based in Hamburg. The Nordex Group produces its own nacelles, rotor blades and concrete towers at production facilities in Germany, Spain, Brazil, the USA, Mexico and India. The Nordex Group has offices and branches in more than 40 countries worldwide.

01–06 | Delta4000
© u.mertens/Nordex SE



06



Nordex Group

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E-Mail	info@nordex-online.com
Web	www.nordex-online.com/de
Category	Manufacturers
Profile	Manufacturers
Turnover	> € 5,7 billion (2022) (Wind energy: 100 %)
Employees	> 9,000 (Wind energy: 100 %)
Founding year	1985

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Siemens Gamesa Renewable Energy GmbH & Co. KG

A market leader in renewable energy

Siemens Gamesa Renewable Energy is a global leader in the wind energy industry. We produce and install onshore and offshore wind turbines. We also offer a wide range of services.



Siemens Gamesa unlocks the power of wind. For more than 40 years, our team of more than 28,000 colleagues has been working at the center of the global energy revolution to tackle the most significant challenge of our generation – the climate crisis.

We've been a subsidiary of Siemens Energy since 2023. Together we are working with customers and partners on the energy systems of the future, covering almost the entire energy value chain and thus supporting the transition to a more sustainable world. The technologies created in our research departments

and factories drive the energy transition and provide the base for one sixth of the world's electricity generation.

Onshore portfolio

In Germany, we want to set standards with low LCOE and high annual energy production with the Siemens Gamesa 5.X platform. The turbines have a rotor diameter of 155 or 170 meters and a flexible output of up to 7.0 MW. At locations with high and medium wind speeds, we also offer the SWT-DD-130 with direct drive technology and a rated output of up to 4.3 MW. Together with our customers and partners, we can master any

challenge and find individual solutions for all wind classes and site conditions.

With our 185m hybrid tower for the SG 7.0-170, projects can benefit from the high wind speeds at many locations at this height. In addition to the RecycableBlade, the GreenerTower is now also available as an environmentally friendly option. With the same product quality, the new towers achieve a CO₂ footprint reduction of at least 63 percent.

Always on site: our Service for every wind park

Our service teams are on standby at 20 locations across Germany wherever the wind blows, servicing a fleet of around 1,500 onshore wind turbines.

To reduce downtime due to maintenance calls, we rely on digital solutions: Thanks to remote diagnostics and algorithm-based operational optimization, our services offer you the decisive advantage in profitability.

With the EnergyUp™ series, Siemens Gamesa offers a range of innovative upgrades that improve annual energy production and can be flexibly adapted to site conditions. The products are available individually or bundled, for Siemens, Gamesa, Siemens Gamesa and Senvion technologies.

We are continuously working to improve our service offering. In doing so, we benefit from our many years of experience in servicing Bonus, Siemens Wind Power,



02



03



04

- 01 | The Siemens Gamesa 5.X platform scores with low LCOE and a high annual energy production.
- 02 | At locations with high and medium wind speeds, we offer the SWT-DD-130 with direct drive technology and a rated output of up to 4.3 MW.
- 03 | Series production of the nacelles for the SG 14-222 DD and SG 14-236 DD has begun in Cuxhaven. The first turbines were installed at the Moray West offshore wind farm in Scotland.
- 04 | In the Hunsrück region, three SG 6.6-155s were installed on 165-meter-high hybrid towers as part of the Berglicht 2024 project. © GVO MEDIA/Gregor Ott

Adwen, Gamesa and Senvion turbines. In the growth market of Multibrand, we are building on this heritage to constantly expand our services to competently and reliably serve every service request, regardless of the turbine manufacturer. Your satisfaction and the availability of your wind farms are our daily motivation.

The energy transition as a team effort

At Siemens Gamesa in Germany, around 3,000 motivated and qualified employees are helping to transform our energy system. Around a third of them produce our offshore nacelles for the SG 14-236 DD in

Cuxhaven, which can supply a household with clean energy for three days with a single rotor revolution. Siemens Gamesa is focusing on young talent and is intensifying its apprenticeship program in the areas of service, commissioning and production.

SIEMENS Gamesa
RENEWABLE ENERGY

Siemens Gamesa Renewable Energy GmbH & Co. KG

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Web	www.siemensgamesa.com
Category	Manufacturers
Profile	Manufacturers
Turnover	€ 9.1 billion (End of Fiscal Year 2023)
Employees	more than 28,000
Founding year	1976

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Wind turbine manufacturer eno energy:
Production in Rostock Hinrichsdorf
Photo: © Silke Reents

COMPANIES:

Suppliers

Manufacturers of wind turbines from all over the world buy systems and components in Germany. Years of experience of the operational side together with specific research and development projects to reduce manufacturing and operating costs and prolong service life are much in demand everywhere.

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August Friedberg GmbH

Focus on Stability

It is because of our technically well-engineered and high-quality fastening technology that the wind turbines are able to withstand even the most extreme conditions and the enormous forces of wind and weather. Major wind OEMs rely on products from FRIEDBERG – the global player for wind fasteners.



01 | HV sets

02 | Double-ended fastener with collar nut

withstand wind and weather and enormous forces. It is a tradition of trust that sustains us. It is people in companies who translate this trust into dynamic performance and enthusiastically develop intelligent products and systems that are manufactured using state-of-the-art technology.

We don't just produce fasteners and bolts, we produce stability, safety, quality and trust! These are our strengths.

Our know-how in this is certified, documented and comprehensively quality assured. We are very proud to be one of the leading producers of safety and fastening elements, especially in the wind industry, in addition to a comprehensive production program for many industrial sectors.

- Fasteners for wind turbines (onshore and offshore)
- HV-towerbolt sets up to M80
- double ends
- Rotor blade fastening systems
- Drawing parts
- Technical application consulting and development partner



August Friedberg GmbH

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Web	www.august-friedberg.com
Category	Suppliers of mechanical components
Profile	Bolts & fasteners
Turnover	€ 135 million
Founding year	1884

For more than 140 years, many companies have relied on **products from Friedberg**. Our past is not simply tradition, but grown and bundled expertise in a technology that is used today worldwide and in many areas. **Friedberg** connections can be found in steel and building construction, in the entire automotive industry, in machine and industrial engineering.

Today, **Friedberg** is one of the leading companies in fastening technology for wind energy. Here in particular, the company's lead becomes clear: **extreme resilience, lasting stability** that has to

Become an expert

www.windindustry-in-germany.com

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event dates and much more.

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Bachmann electronic GmbH

Secure the future of your wind farm

Bachmann electronic offers sophisticated automation solutions for the onshore and offshore sectors. With over 150,000 installations worldwide, Bachmann is the global market leader in wind automation.



Bachmann delivers future-proof technologies, maximum availability, and the highest quality from a single source. Above all, Bachmann's customers benefit from 50 years of experience; Bachmann develops tailor-made solutions to solve the most demanding challenges in automation.

Automation solutions in every area of wind power

From controller systems and condition monitoring to Wind Power SCADA and grid connection technology; Bachmann offers complete solutions for the wind industry. The systems stand for extraordinary robustness, high performance, and open, standardized interfaces. With intelligent sensors and power management algorithms, wind farms are open, flexible, and future-proof – even under the most extreme conditions.

Innovative, comprehensive system solutions allow for the efficient development of wind turbines and integrated predictive maintenance, increasing the overall productivity of wind parks. For retrofit solutions, Bachmann offers state-of-the-art technologies and competent implementation, thereby extending the life cycle of the equipment.



- 01 | Smart Turbine Automation: To be future-proof, wind turbines must do their part to provide complex data. Bachmann creates an alliance of control, SCADA, park control, condition monitoring and data.
- 02 | From ROI to Profitability.
- 03 | Offshore – Bachmann generates competence on site.

Smart turbine automation / operations management

- Modular hardware / software architecture
- Model-based engineering in PLC, C / C ++, Matlab / Simulink®
- Integrated safety technology
- Configurable access protection and logging
- Configurable, scalable turbine software templates according to the IEC standard
- Grid measurement / monitoring and grid protection
- Certified, integrated condition monitoring system

Smart grid / park controller

- Smart Power Plant Controller (SPPC) certified according to the new VDE-AR-N-4110/4120
- Scalable, configurable hardware / software
- Energy / telecontrol protocols IEC60870, IEC61850, IEC61400-25, Modbus, etc.
- Web-based user / diagnostic interface

SCADA / visualization

- Modular, flexible, web-based SCADA system (atvise®)
- “Ready-to-use”: wind-specific, configurable widgets, dashboards, and reports
- OPC UA interface and IEC61400-25 based data structures
- Integrated, configurable access management
- Cascadable server structure



Lifetime Extension

- Remote monitoring software and service
- Turbines: Tower vibration / structure monitoring
- Rotor blade monitoring (load, structure)
- Retrofit solutions for turbine control, CMS, SCADA and park controllers

Maintenance / service / diagnosis

- Comprehensive service and diagnostic tools
- “ServiceCenter” for convenient, efficient software updates
- Data recorder for network monitoring and analysis
- Comprehensive support and training program

bachmann.

Bachmann electronic GmbH

Address	Kreuzäckerweg 33 A-6800 Feldkirch
Phone	+43 (0)5522 3497 0
Fax	+43 (0)5522 3497 1102
E-Mail	info@bachmann.info
Web	www.bachmann.info
Category	Suppliers of electrical and electronic components
Profile	Controls, cables & switchgear cabinets
Turnover	€ 105 million
Employees	> 500
Founding year	1970

ECONOMIC REPORT

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- 56 | Companies with innovative projects ↗
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Bachmann Monitoring GmbH

Condition Monitoring Systems for the Wind Industry

Condition monitoring is the domain of Bachmann Monitoring – from system-integrated solutions for SHM and LTE, through sensor technology and remote monitoring, to consulting and training in vibration analysis.



01

The measurement and analysis of vibrations – the core competencies of Bachmann Monitoring – enables a detailed monitoring approach for both onshore and offshore wind turbines.

Focus on the customer

Whether it is blade health monitoring, drive train monitoring or structural health monitoring, Bachmann delivers specific monitoring solutions that our customers actually need, making use of our holistic knowledge and extensive expertise.

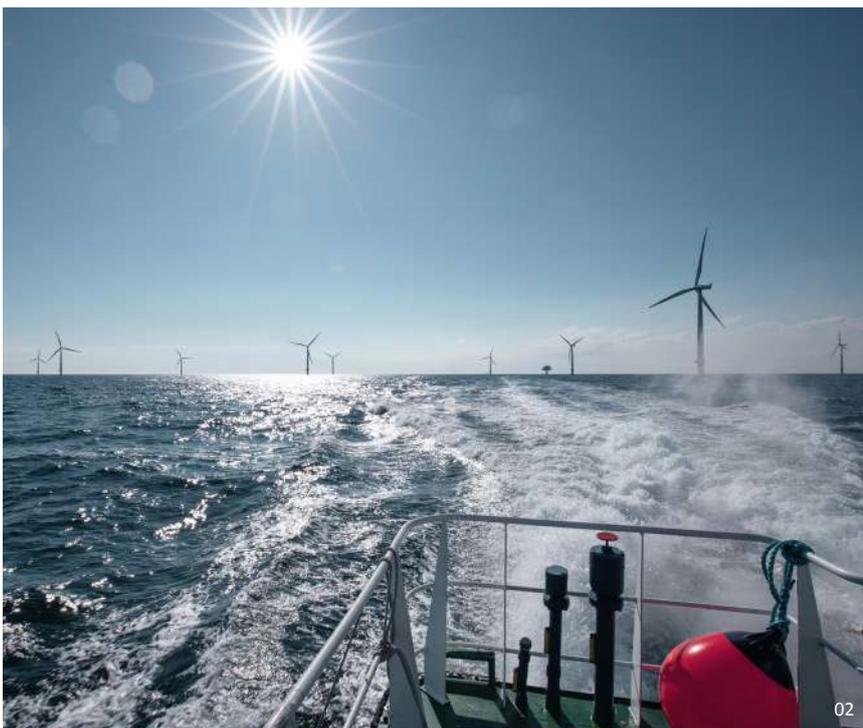
One for all

The individual CMS services can also be combined into a customized monitoring solution. Bachmann call it HUMS. The Health & Usage Monitoring System is a combination of Bachmann's condition monitoring and structural health monitoring expertise, delivering a holistic monitoring approach for the wind turbine and entire park.

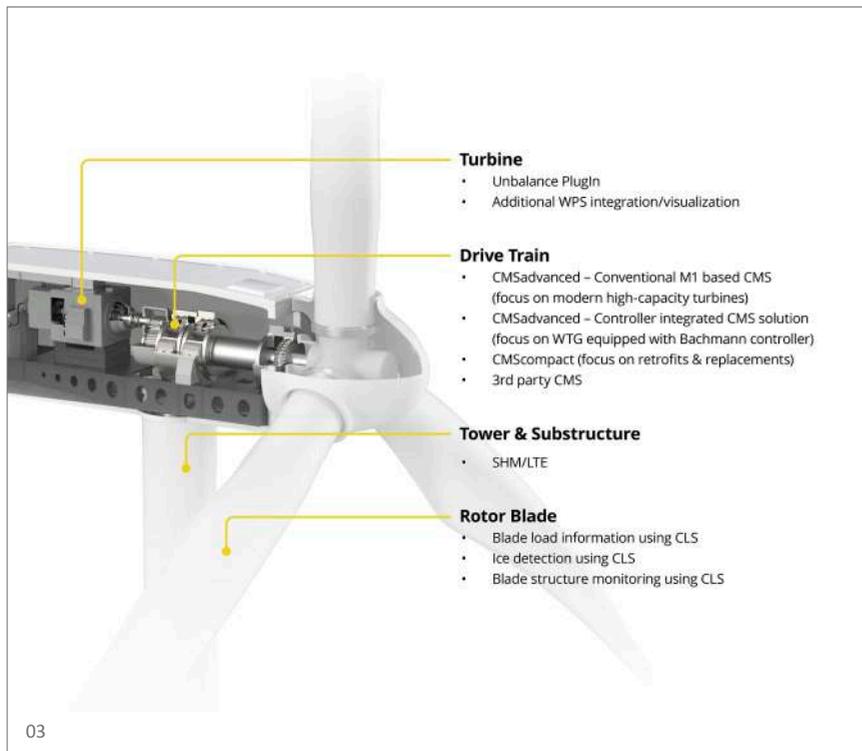
Remote monitoring:

close-up and uncomplicated

The ISOCAT II and III certified remote monitoring team consists of more than 20 dedicated analysts who ensure that all diagnostic data is clearly communicated to the customer's team. The early detection and localization of any potential weaknesses make operations more secure and sustainably increase revenues. Customers choose the best service level to be installed: full service, data pre-screening, data hosting from Bachmann, or they host the data themselves and Bachmann lends the necessary support.



02



From A to Z – the CMS process in a single hand

Condition monitoring with Bachmann is more than just vibration measurement.

Bachmann offers:

- Modern hardware solutions
- Innovative, web-based analysis software
- On-site installation, commissioning and support with project management
- Certified, flexible remote monitoring services, even for diverse fleets
- Advanced training and education for independent monitoring
- BINDT-accredited training center for vibration analysis qualification CAT I-III

The modular approach allows the customer to select the appropriate measurement technologies for its business and combine them with the right software solutions and plug-ins to monitor the specific characteristics of its machines.

In good hands – Condition Monitoring Consultancy

A strategic approach to condition monitoring identifies potential cost savings and helps to avoid unforeseen operational downtime. The Bachmann CM consultants transform predictive maintenance, lifetime extension (LTE) and leveled cost of energy (LCOE) into tangible benefits and realistic impact on the bottom line.

- 01 | Expert knowledge and high-quality diagnostics promote the safe monitoring of foundations, tower, drivetrain, rotor blades and inbalance. Operator-focused. Independent. Reliable.
- 02 | Bachmann is on site – because competence cannot be conferred.
- 03 | The turbine, the drive train, the tower and the foundation, as well as the rotor – Bachmann serves these four areas with its condition monitoring solutions.
- 04 | SHM – Set for surveillance from head to toe.

bachmann.

Bachmann Monitoring GmbH

Address	Fritz-Bolland-Strasse 7 07407 Rudolstadt
Phone	+49 (0)3672 3186-0
Fax	+49 (0)3672 3186-200
E-Mail	vertrieb-monitoring@ bachmann.info
Web	www.bachmann.info
Category	Suppliers of electrical and electronic components
Profile	Condition monitoring systems
Employees	> 60
Founding year	1998

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Beckhoff Automation GmbH & Co. KG

Beckhoff know-how from over 120,000 wind turbines

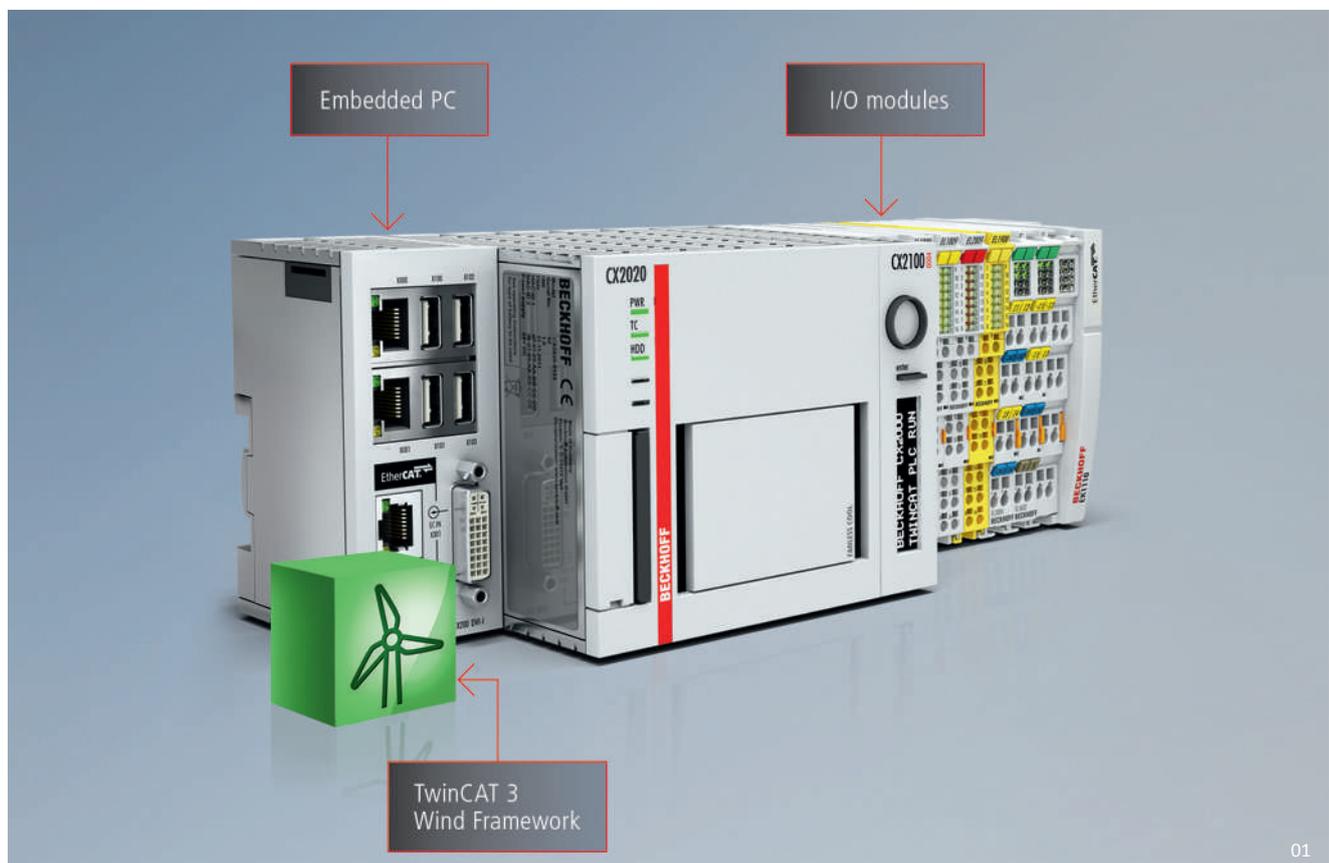
On the basis of the PC-based control and EtherCAT technology, Beckhoff makes system solutions available for wind turbines that have been tried and tested worldwide: more than 120,000 wind turbines all over the world up to a size of 16 MW have been automated using Beckhoff technology.

In this respect, our control architecture is perfectly suited to the requirement profile of the industry: openness and scalability, flexibility in the design of the controller and a high degree of integration.

PC-based control: the universal control platform for wind turbines

All processes, from the operational management and control of pitch, converter, gearbox and brakes through to wind farm networking, are executed in software on an Industrial PC. Safety technology and condition monitoring are integrated seamlessly into the terminal segment via corresponding I/O modules. A separate CPU can thus be dispensed with. The real-time Ethernet system EtherCAT offers

full Ethernet compatibility and outstanding real-time characteristics. Beyond that, it is characterized by flexible topology and simple handling. In the new TwinCAT 3 Wind Framework, the turbine manufacturer has a software tool at its disposal that gives it optimum assistance in the programming of its facilities and ports the Industrie 4.0 approach to wind energy.



Another advantage: Lower-level fieldbuses such as CANopen, PROFIBUS and Ethernet TCP/IP can be relocated to the field via fieldbus master or slave terminals for the control of subsystems. Software libraries and hardware components specially developed for the wind power industry round out Beckhoff's wide range of solutions.

The expertise acquired over more than 20 years of collaboration with turbine manufacturers in the wind energy industry makes Beckhoff a reliable partner with high solution competence. Together with the international Beckhoff subsidiaries, our expertise team in Lübeck offers worldwide support for all areas of wind turbine control: The services offered range from developing application-specific software libraries to support during the commissioning phase and control cabinet construction.

With PC-based control, you benefit from:

- a universal control platform for operational management, pitch control, farm networking and condition monitoring
- high flexibility when it comes to controller design
- performance-related scalability
- modular expandability
- reduced hardware and engineering costs
- increased efficiency and cost-effectiveness
- improved competitiveness

According to the customer's specifications, the Beckhoff engineering department takes on the complete control cabinet construction, starting with wiring diagram design through to prototype or serial production.

BECKHOFF

New Automation Technology

Beckhoff Automation GmbH & Co. KG

Address	Wahmstrasse 56 23552 Lübeck
Phone	+49 (0)451 203988-0
Fax	+49 (0)451 203988-20
E-Mail	wind@beckhoff.com
Web	www.beckhoff.com/wind
Category	Suppliers of electrical and electronic components
Profile	Controls, cables & switchgear cabinets
Turnover	€ 1.75 billion (2023)
Employees	5,500
Founding year	1980

01 | A Beckhoff Embedded PC with line-connected I/O modules, EtherCAT as the universal communication system and TwinCAT automation software functions as the central control platform for wind turbines. Sturdy, modular and scalable hardware components as well as the utilization of industrial communication standards give turbine operators optimum protection of their investment and maximum flexibility in controller design.

ECONOMIC REPORT

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ESM Energie- und Schwingungstechnik Mitsch GmbH

ESM – your specialist for vibration technology.

We offer products, systems and solutions for the isolation, damping and reduction of vibrations in wind turbines. Our solutions are used both onshore and offshore.



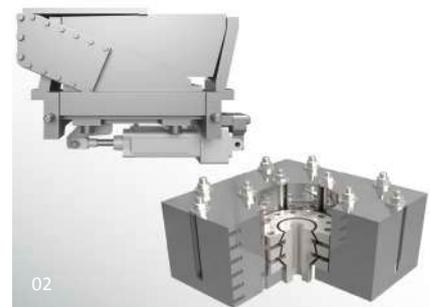
01 | Product portfolio in application from left: decoupling elements, cover mounts, yaw brakes, gearbox supports, TMDs, generator mounts, rolling mass absorbers

© ESM, Grande Media

02 | Product portfolio from left: adaptive TMD, passive TMD

03 | Vibration measurement

© Ulrich Mertens



Our passion for wind energy, technology and innovation drives us every day to develop cost-effective and efficient technologies for you. This is an important part of our company philosophy. We work closely with our customers and produce components, find individual solutions, build prototypes and produce series. Our customers are supported by experienced experts for their vibration technology challenges.

We test some of our new developments in our own wind turbines under real conditions.

Passive noise tuned mass dampers

Passive tuned mass dampers (TMD) are damped spring-mass systems that are connected to the system to be calmed (e.g. gearbox). ESM has developed three-dimensionally adjustable TMDs, available as standard, which reduce interference vibrations in all directions with just one TMD.

Adaptive tuned mass dampers

ESM's adaptive tuned mass dampers (ATMD), which adjust to the frequency of interference, consist of a spring-mass system in which an actuator unit adjusts the spring in such a way that speed-dependent structural vibrations are calmed.

Vibration measurement

If required, our experts will carry out vibration measurements and modal analyses on your system. This enables us to determine interference frequencies and validate the effect of the products we use. Among other things, frequency analyzers and highly sensitive microphones are used.



ESM Energie- und Schwingungstechnik Mitsch GmbH

Address	Energiestrasse 1 64646 Heppenheim
Phone	+49 (0)6252 6893-0
Fax	+49 (0)6252 6893-100
E-Mail	info@esm-gmbh.de
Web	esm-gmbh.de
Category	Suppliers of mechanical components
Profile	Seals & vibration control
Founding year	1996



Gustav Klauke GmbH

140 years of experience in connection technology and tools

“Made by Klauke” stands for highest quality. We develop, produce and supply products for the electrical industry and ensure through our own and independent test centers that our system meets the highest standards. Thereby our products are certified and tested according to ISO 17025.

Klauke as part of Emerson has the European headquarters in Remscheid (Germany) and subsidiaries in various countries with about 1,400 employees who are working for the customer every day. In addition to Klauke, Emerson carries a comprehensive range for the plumbing trade with the RIDGID brand – from hydraulic press tools and mechanical threading machines to preparation equipment to install, inspect and maintain underground pipes networks.

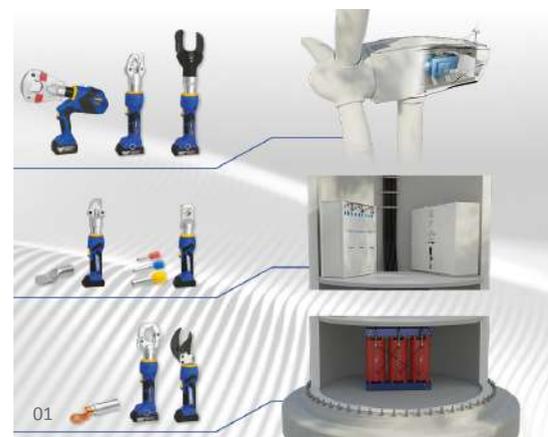
Wind turbines play a crucial role in the generation of “green” electricity. High safety requirements apply to the installation. Therefore, compliance with appropriate quality criteria is essential, both for the material and for the electrical connections.

For the various electrotechnical components in a wind turbine, we offer the appropriate tools as well as the corresponding connection material. Regardless of whether you are connecting the generator, the control cabinet or the transformer: Klauke Systemtechnik will help you achieve the optimum installation result safely and reliably.

In terms of safety, ease of use and robustness, Klauke products meet the highest requirements and perform better than standards demand – feel free to contact us.

Klauke offers a wide range of services such as on-site Klauke System training: Hundreds of companies have already received training from Klauke – from medium-sized companies to DAX corporations. In addition, Klauke is on the road with the Klauke Mobil for technical consulting for customers to present tools on site.

Klauke tools are in use all over the world and should be regularly maintained and checked for function in order to meet safety requirements and this is done in Klauke's own service centers.



01 | Connection Materials and Tools for Wind Turbines

02 | Klauke-Service

03 | Perfectly Coordinated System

Klauke

Gustav Klauke GmbH

Address	Auf dem Knapp 46 42855 Remscheid
Phone	+49 (0)2191 907 1070
Fax	+49 (0)2191 907 2010
E-Mail	klauke-anfragen@emerson.com
Web	www.klauke.com
Category	Suppliers of electrical and electronic components
Profile	Energy & data transmission
Turnover	€ 156.7 million
Employees	ca. 600
Founding year	1879



ECONOMIC REPORT

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HELUKABEL GmbH

Channeling Power

HELUKABEL supplies electrical connection technology to manufacturers and suppliers of wind turbines. Users benefit from complete solutions supplied quickly and reliably, all from a single source.



01

The HELUKABEL Group, headquartered in Hemmingen, Baden-Württemberg, Germany, is a leading international manufacturer and supplier of cables, wires and cable accessories. Founded in 1978, the family-owned company has developed broad expertise and deep knowledge of many industries and key technologies over the years. Today, HELUKABEL products and solutions are found in application areas including mechanical and plant

engineering, industrial automation, oil and gas, building technology, infrastructure, mobility and renewable energy.

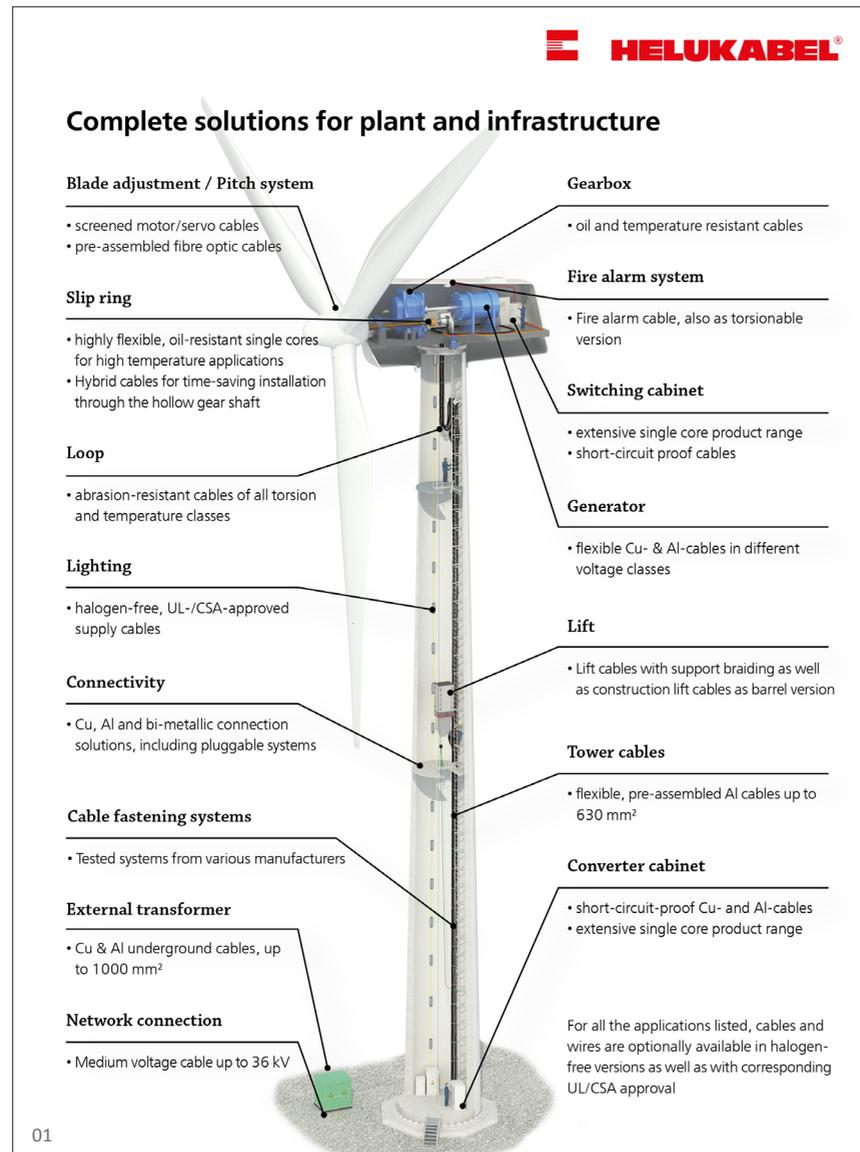
With 69 locations and more than 2,500 employees in 40 countries, the company is a reliable and responsive partner to its customers worldwide. They benefit from expertise in the development of customised solutions, a comprehensive range of more than 33,000 stock items

and a state-of-the-art logistics concept. HELUKABEL's operations include manufacturing and testing facilities, where maintaining the highest standards of quality is a top priority. Altogether, HELUKABEL offers its end-users complete solutions for electrical connection technology, all from a single source.

For the wind industry, HELUKABEL's portfolio includes a wide variety of cables

and wires that are applied to the main components of wind turbines. The product range includes, for example, lightweight and flexible aluminium cables that can be pulled into the tower in one piece, eliminating unnecessary cost-intensive connections, and pre-assembled class 2 aluminium conductors that can be pre-installed in the individual tower segments. Torsion-capable cables with a wide variety of insulation materials and voltage levels and cross sections from 0.5 to 400 mm² are also part of the range. These are tested in HELUKABEL's test tower to ensure that they are ready for series production. Heat-resistant cables for generator connections and slip ring applications, Ethernet cables and bus technology for data communication, and pre-assembled fibre optic cables in a wide variety of designs and as plug-and-play solutions for quick on-site installation complete HELUKABEL's range for the wind energy sector.

With this comprehensive product portfolio, HELUKABEL provides optimal solutions for onshore and offshore wind turbines as well as for the infrastructure cabling of entire wind farms. The company has been supporting customers in the wind power industry for decades and, as a development partner to leading manufacturers, is very familiar with different application scenarios and requirements. Cables and conductors can be made resistant to seawater, oil, ozone or UV radiation, among other things. At its development and manufacturing sites, HELUKABEL not only designs customised solutions from scratch, but also tests them in its own



- 01 | The HELUKABEL Group is a leading international manufacturer and supplier of cables, wires and cable accessories.
- 02 | For the wind industry, HELUKABEL's portfolio includes a wide variety of cables and wires that are applied to the main components of wind turbines.

laboratories. Many products are certified according to UL, VDE or other standards, so that the right products can be found within the range for every target market.

All the above makes HELUKABEL a reliable supplier of cables, wires and connection technology for the wind industry.



HELUKABEL GmbH

Address	Schloßhaldenstrasse 10 71282 Hemmingen
Phone	+49 (0)7150 9209-0
Fax	+49 (0)7150 81786
E-Mail	info@helukabel.de
Web	www.helukabel.de
Category	Suppliers of electrical and electronic components
Profile	Controls, cables & switchgear cabinets
Turnover	€ 1,076 million
Employees	2,500
Founding year	1978

ECONOMIC REPORT

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HYTORC (Barbarino & Kilp GmbH)

HYTORC – Mobile Industrial Bolting Technologies

HYTORC develops ever more powerful new tools, fasteners and bolting processes to increase efficiency, profitability, safety and quality for its customers all over the world.



01



02

- 01 | Digital, battery-operated torque / angle screwdrivers
- 02 | XLCT trolley: tool set for safe, convenient and digitalised tower bolting
- 03 | NEW: MXT-Plus: multifunctional hydraulic screwdriver series
- 04 | Digitised, reliable bolting processes in the wind industry

HYTORC

HYTORC (Barbarino & Kilp GmbH)

Address	Justus-von-Liebig-Ring 17 82152 Krailling
Phone	+49 (0)89 230 999 0
Fax	+49 (0)89 230 999 14
E-Mail	info@hytorc.de
Web	www.hytorc.de/digitales-ver-schrauben
Category	Suppliers of mechanical components
Profile	Tools & machine tools

Battery-Tools 18V or 36V from 30Nm to 6.799Nm: The digital, battery-operated torque / angle Torque-Wrenches. The first battery-wrench series with TorcSense-Technology for documentation and monitoring of the most important bolting-parameters. Intuitive User Interface, Bluetooth Wireless Technology; Configuration directly via Display. The HYTORC Battery-Tools can also be operated via an App. Hydraulic bolting from 60 Nm to 80.000 Nm with Eco2TOUCH-Pump: Digitized, mobile and process-reliable bolting of safety-critical bolt joints in the wind power industry, even coated components can be fastened in a process-reliable way. Automated bolting, assessment, documentation and statistics for all bolted joints with these methods:

- DGA: Torque-controlled tightening
- DGD: Torque-controlled/angle-monitored tightening
- DGS: Torque-controlled/yield point-monitored tightening
- DDW: Torque-angle-controlled tightening
- DDW: Torque-angle controlled tightening
- SGA: Yield point-controlled tightening
- SGD: Yield point-controlled/angle-monitored tightening
- EXT: Externally controlled tightening w/ random measuring sensors w/ standard industry interface 0...10V / 0...20mA / 4...20mA



03

Mobile intuitive operation and control via a TOUCH display on the pump. Optionally operable with a Scanner or via an App. Process-reliable bolting with automated documentation as texts, statistics and graphic-charts with all process-parameters for stability considerations. This ensures safe bolting processes through perfect monitoring, system transparency, system analysis, bolt administration and visualization of process data based on manipulation-proof documentation, especially for high-risk bolted joints.

More information at:

www.hytorc.de/anziehverfahren



04

Ready to Repower?

Join Our Webinar Series
Starting January 17, 2025



Are you considering the next steps for your wind turbines as they approach the end of their initial lifespan? Continue, decommission, or repower?

Our webinar series gives you the practical tools to plan and execute a successful repowering project. Find out what makes the most sense financially, how to streamline the decommissioning and recycle process, and how to clear regulatory hurdles. With insights from leading legal and industry experts, you'll be set to take the right steps toward repowering success.

For details and registration, visit
www.bwe-seminare.de/repowering

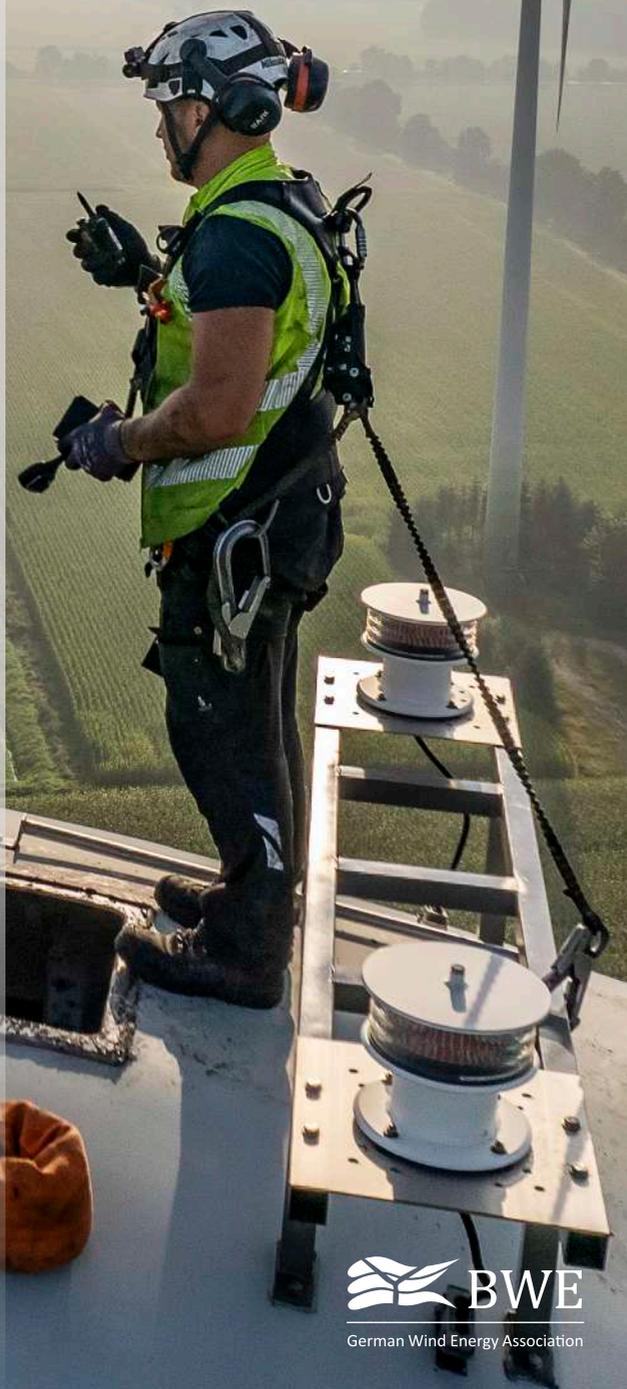
Join us for these webinars:

January 17, 2025	Core Strategies for Planners and Operators – Success Factors and Profitability
January 24, 2025	Practical Approaches to Decommissioning and Wind Turbine Recycling
January 31, 2025	Key Considerations in Land Securement
February 7, 2025	Regulatory Streamlining and the Super-Privilege in the Building Code
February 11, 2025	Delta Review – Swift and easy?

Stay ahead with the latest insights!



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îd-Technik GmbH

Safe – Durable – Maintenance-free: îd-Technik Cable Clamps 100 % MADE in GERMANY

As a pioneer and global market leader in the development and technical advice on the use of universally applicable Cable Clamps, îd-Technik has been ensuring the secure fastening of power cables for more than 40 years. An essential factor for the safety, quality and durability of wind turbines



îd-Technik Cable Clamps are 100 % Made in Germany, both the production of the material and the Cable Clamps. As an owner-operated company, the thoughts and actions are geared towards the long-term satisfaction of their customers: When it comes to technical perfection and quality, îd-Technik does not compromise.

îd-Technik Cable Clamps – Quality starts with the Design

The secure fastening and protection of power cables in on- and offshore wind turbines is a complex process that requires careful planning and high-quality materials. The efficiency and safety of this important energy source can be maximized by using suitable fastening solutions. In particular, the axial retention of the cables,

the minimization of surface pressure on the cables and the short-circuit resistance of the Cable Clamps play a central role.

The Aim of îd-Technik Cable Clamps:

- Protection of the cables
- Minimization of downtimes
- Extending the service life of on- and offshore wind turbines

Greater operational Safety thanks to Elastic Inlays

The special Elastic Inlays from îd-Technik are efficient and proven inserts for compensating the changes in cable diameters. By increasing the axial retention, they enable precise and, above all, permanently secure fastening of the cables (from 120° to -60°C) and absorption of

the weight forces, particularly in the area of vertical runs. They also compensate vibrations, as they occur in wind towers, without reducing the retention forces.

World Market Leader for Polyamide Cable Clamps for Power Cables

The more than 4000 customers of îd-Technik around the world include wind turbine manufacturers, who together account for a global market share of more than 30 % onshore and offshore. Together with these manufacturers, îd-Technik develops, plans and tests new innovative solutions. This is how îd-Technik successfully masters the ever-changing challenges of the wind industry. Certificates, continuous testing and approvals confirm this unique, successful îd-Technik quality.

Simple Assembly

The different Cable Clamp series fasten cables with an outer diameter of 12 mm – 250 mm in all voltage ranges in different formations. Together with the overlapping clamping areas, this prevents installation problems if the cable diameter deviates. Thanks to the versatile fastening options, the installation of the Clamps can be adapted to all local conditions.

Safety with Certified Quality

îd-Technik Cable Clamps have been tested by accredited testing institutes to the highest classification in accordance with international standards IEC 61914 and UL 94. Since 1998, the quality management system has been regularly audited and certified in accordance with DIN EN ISO 9001.

ECONOMIC REPORT

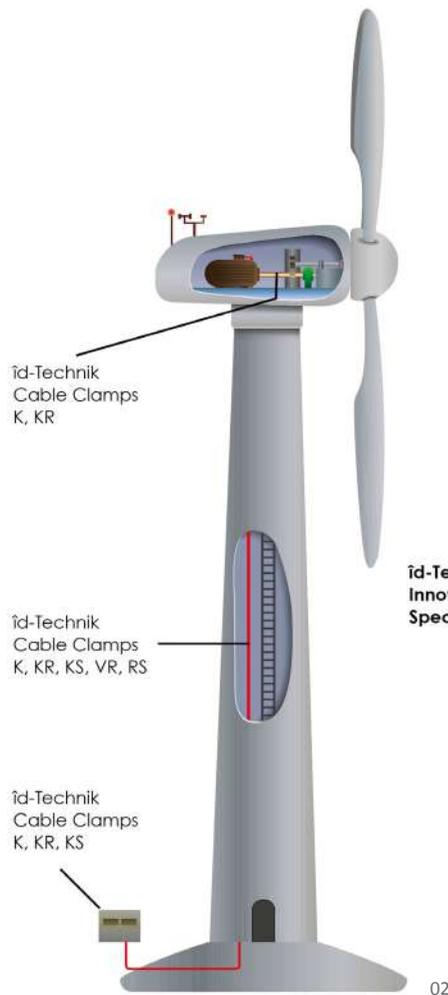
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 56 | Companies with innovative projects ↗
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02



03



04

- 01 | Variety of Applications with id-Technik Cable Clamps – An innovative Solution with Certainty – 0 Failures in > 40 Years
 02 | Secure fastening of Power Cables with id-Technik Cable Clamps
 03 | Application example with id-Technik Cable Clamps, fastening in wind turbines
 04 | id-Technik supplies more than 4000 Customers in more than 120 Countries
 05 + 06 | Product example id-Technik Cable Clamps, KR series
 id-Technik Cable Clamps are produced and manufactured in Germany

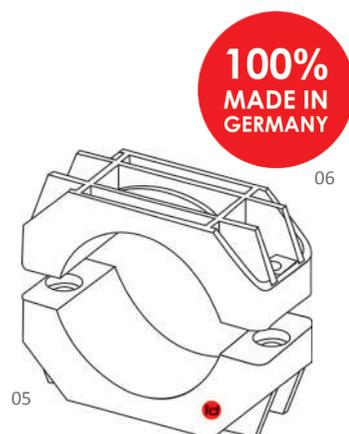
Sustainability and Environmental Protection

The excellent material of id-Technik Clamps is non-toxic, non-hazardous to health, fully recyclable, LSZH (low smoke, zero halogen) self-extinguishing, low smoke and halogen-free. It is RoHS and REACH compliant. In addition, it is non-metallic, non-magnetic and corrosion-resistant. It does not develop any interaction with the electromagnetic field of the cables.

Electricity always takes the Shortest Route – and so do id-Technik Products

Delivery capability is therefore at the top of the list of priorities. id-Technik pulls out all the stops to ensure that you receive your delivery quickly and directly – on the day promised, at the

location you specify, in more than 120 countries worldwide. When it comes to safety-relevant components, improvising or postponing important assembly steps can have fatal consequences.



06

05

id-Technik®

id-Technik GmbH

Address	Hohe Strasse 34–36 68526 Ladenburg
Phone	+49 (0)6203 4015160
E-Mail	info@id-technik.com
Web	www.id-technik.com
Category	Suppliers of electrical and electronic components
Profile	Energy & data transmission
Founding year	1977

Maschinenfabrik Reinhausen GmbH

THE POWER BEHIND POWER

Find out here how MR can help you meet the special challenges in the wind energy sector with a specially tailored portfolio of sensors, components and services.



50 % of the electricity generated worldwide is regulated with our products

With our 150-year company history in the field of energy technology, we are regarded as an innovative pioneer. With a presence in 45 countries, we contribute to a secure, economical and resilient power supply. Our global customers include energy producers, grid operators, transformer and cable manufacturers.

Our portfolio – answers to your challenges

Transformers regulate wherever we find connection points in our grids – on land and at sea. Cables ensure that electricity flows from one point to another.

With sensors and products for ongoing operation, services and systems for monitoring and maintenance, we offer a broad portfolio around the crucial points in the grid – where voltages are transformed and currents are transported. Tailored to your challenges and the special environmental influences of your industry. Our references in “Wind” speak for themselves.

Sensors – safety and performance based on real-time data

Difficult accessibility, unpredictable environmental and weather influences and uncertainty about the condition of your plants and systems prevent you from managing your transformers efficiently? Our maintenance-free, cost-effective sensors enable you to continuously monitor and analyze your wind turbines, converter stations and substations to detect failure risks at an early stage. They are suitable for remote data transmission and have robust, certified housings.

Devices and systems – increase your productivity

Compatibility problems due to different manufacturers and inconsistent monitoring systems that are difficult to integrate are general conditions that you encounter in your daily operations onshore and off-shore? They drive inefficiencies, complexity and downtime. Intuitive voltage regulators, a central control and monitoring system, durable on-load tap-changers and integrated, maintenance-free dehumidification systems make them manageable.

Services – Smooth operation

From installation and commissioning to maintenance and inspection of your transformers, are you struggling with a lack of qualified personnel, limited access and high complexity? With our global network of more than 200 service technicians, we offer a wide range of professional services. We take care of installation, commissioning, maintenance and repairs. With routine services, remote solutions or advanced diagnostic technologies and methods, we support you in maximizing the service life of your assets, among other things. With expert knowledge and fast response times, we help you to counteract cost explosions – 24/7 if required.

Monitoring – process optimization, risk minimization and compliance

Unexpected breakdowns, high maintenance costs and a lack of transparency regarding the current status of your systems are part of your everyday work? We offer you a solution for 24/7 monitoring, for predictive maintenance with automatic data analysis.

SENSORS	Dissolved Gas Analysis	Vibro-acoustics Monitoring	Bushings Monitoring	Temperature measurement	Pressure relief device for transformer & OLTC
	MSENSE® DGA 3/9 ECOSENSE Active PART	MSENSE® VAM	MSENSE® BM	MSENSE® FO MESSKO® MTO	MESSKO® MPREC®
OPERATIONS	Central control and monitoring system for transformers	Next-Generation Voltage Regulators	Integrated Dehumidification & Monitoring system	De-energized tap-changer for maximum power	On-load tap-changer
	ETOS®	TAPCON® 230/250/ISM	MESSKO® MTRAB®	DEETAP® DU/SPT	VACUTAP® VVS®/VV®/ VR®/VRL®/VT®...

SERVICES	Transformer Services	OLTC Services
	Condition Assessment TESSA FLEETSCAN 2D Installation & Commissioning Performance: Contracts Routine Services	Maintenance & Inspection Remote Solutions Retrofit & Modernization- Training Center Performance: Contracts VAM Analysis Service
SUPERVISION	Asset Performance Management Software	Modular Measuring and Condition Assessment System for HV Cables
	TESSA® APM	HIMON®

As a wind turbine operator, you are plagued by cable failures. Our subsidiary HIGHVOLT offers solutions with which you can accurately record the associated data, analyze it quickly and reliably and precisely locate the sources of faults.

With durable products, innovative solutions and sustainable services, the REINHAUSEN Group is equipped to meet the challenges it faces as an operator of wind turbines, converter and transformer stations and the associated grid infrastructure. Contact us so that we can shape the future of energy generation and distribution together.

- 01 | MR service technician at work
- 02 | View of an offshore installation
- 03 | MR portfolio for application wind – 1
- 04 | MR portfolio for application wind – 2



Maschinenfabrik Reinhausen GmbH

Address	Falkensteinstrasse 8 93059 Regensburg
Phone	+49 (0)941 4090 0
E-Mail	info@reinhausen.com
Web	www.reinhausen.com
Category	Suppliers of electrical and electronic components
Profile	Energy & data transmission
Turnover	€ 1 billion (2023)
Employees	4,000
Founding year	1868

ECONOMIC REPORT

8 | FOCUS REPOWERING ↗

COMPANIES

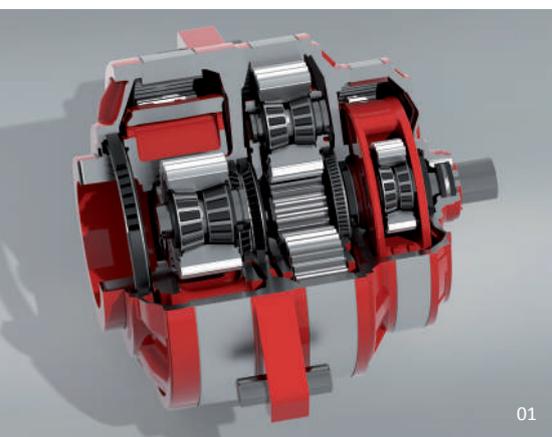
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NSK Deutschland GmbH

For two decades NSK has been a partner of the wind industry and one of the main suppliers of roller bearings for wind energy gearboxes and bearings for main rotor shafts and generators.



Combined know-how

Skills from sales and application technology are combined in the wind energy team – and also include the latest research results from our technology centres. Bearings are specifically designed using highly developed calculation and simulation tools. Our experienced engineers take account of load cycles, lubrication, deformation, thermal response and also extreme and maximum conditions. This is the only way to produce a construction with cost-optimised components that also reliably function under maximum loads and have a long service life.

NSK wind standard

As the first manufacturer, NSK defined the pioneering wind standard U303 for roller bearings back in 2008 – including a one hundred percent traceability of the components of every single bearing and all essential processes. NDT methods (non destructive testing) are also available to avoid grinding burn, fractures in material and structural breakdowns.

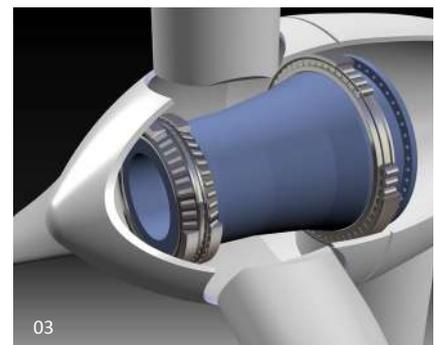
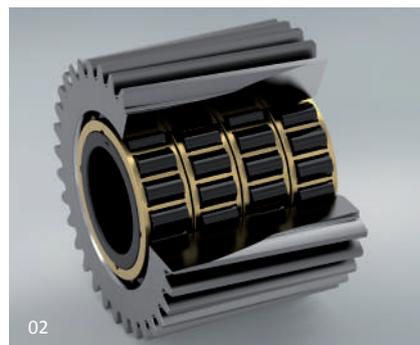
Long service life with BOC (black oxide coating) and patented materials

BOC treatment of bearings prevents untimely bearing failures caused by white etching cracks (WEC). The patented special material AWS-TF (anti white structure-tough) is also available for high-level requirements and reliably prevents damage caused by WEC. Our STF material (super-tough) has proved ideal when it comes to increasing the load rating and service life, especially for contaminated lubricants. Certification by DNV GL confirms: Using Super-TF material means that the basic dynamic load rating can be improved by 23 % in roller bearings, and 26 % in ball bearings. This is equivalent to a doubling of bearing fatigue life.



NSK Deutschland GmbH

Address	Harkortstrasse 15 40880 Ratingen
Phone	+49 (0)2102 481-0
Fax	+49 (0)2102 481 2151
E-Mail	info-de@nsk.com
Web	www.nsk.com/eu-en/
Category	Suppliers of mechanical components
Profile	Bearings
Turnover	Global: ca. € 4.8 bn (as per March 2024)
Employees	Global: ca. 26,000 (as per March 2024)
Founding year	1916



01 | Main gearbox for wind turbines
02 | Planet wheel gear and bearing
03 | Main rotor shaft bearing

Prysmian Kabel und Systeme GmbH

Harnessing the wind of change.

Prysmian is the world's leading manufacturer for cables and systems for the segments energy, telecom, data and industrial.

To meet an ever-growing need for power, the world is increasingly turning to renewable and sustainably-sourced energy. In response to this demand, Prysmian's cables are helping wind turbine manufacturers around the globe to harness the true potential of this natural power source.

As a world leader in special cables for wind turbines, we are able to manufacture products for the wind industry for all voltages or, if required, fully assembled cable sets in our German and international production sites:

Nacelle & Loop

Special cables (optional halogen-free / flame retardant) with increased oil, heat and ozone resistance, as well as optimized torsion properties, up to 155 kV. **Our high-voltage cables are now available as lead-free version!**



02



03

Tower

Special cables (optional halogen free / flame retardant) for fixed installation with copper or aluminium conductors with excellent installation properties, up to 155 kV. **Our high-voltage cables are now available as lead-free version!**

Wind farm cabling

From the low- and medium-voltage cables for the wind farm infrastructure, through to the high-voltage grid, we supply all cables for onshore and offshore applications.

In addition, we are able to supply cables as pre-assembled cable sets, as well as a service for fitting / commissioning or maintenance / turbine monitoring.

Our certified quality management with a worldwide focus ensures that product quality is always at the highest level, from the procurement and production processes, right through to the delivery process. With a focus on sustainable and environmentally friendly production processes, the Prysmian Group ensures that the fundamental principles of sustainable energy concepts are also implemented in its own company.



04



01

- 01 | Moveable, free hanging or fixed. Prysmian cables can be used in many areas.
- 02 | Prysmian Group's product portfolio covers all your needs
- 03 | New Cable laying vessel "Leonardo da Vinci" of the Prysmian Group
- 04 | Harnessing according to customer requirements



Prysmian Kabel und Systeme GmbH

Address	Alt-Moabit 91 D 10559 Berlin
Phone	+49 (0)30 3675 40
Fax	+49 (0)30 3675 4571
E-Mail	kontakt@prysmian.com
Web	www.prysmian.de
Category	Suppliers of electrical and electronic components
Profile	Controls, cables & switchgear cabinets
Turnover	€ 16 billion
Employees	32,000
Founding year	1879

ECONOMIC REPORT

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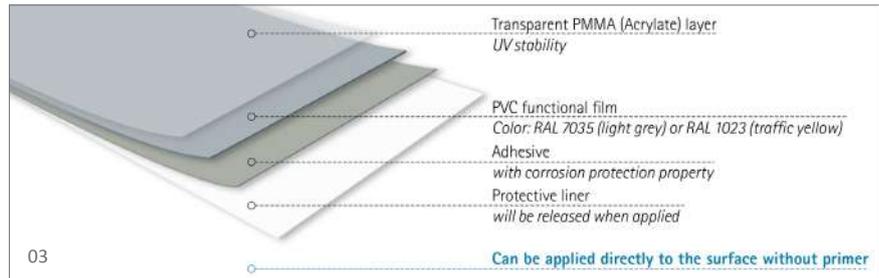
Renolit SE

RENOLIT – The expert for high-performance films

The **RENOLIT** Group stands for partnership-based service, an international focus and innovative, high-quality, reliable products. Our aim is to offer the very best quality on a consistent basis, thereby giving benefit to our customers with the over 75 years of our company's expertise.



01



03



02

01 + 02 | RENOLIT Headquarter
03 | RENOLIT CP Advanced film structure
04 | Film application

RENOLIT products enhance surfaces, waterproof, protect, stabilise and offer many other additional benefits. Always developed with our customer requirements in mind and manufactured to the highest quality, our products can often make a vital difference.

As a driver of innovation, **RENOLIT** develops sustainable products and new business models. In doing so, we think beyond borders and are willing to adopt new ideas and approaches

One example of this is **RENOLIT CP Advanced**: an innovative corrosion protection film for onshore and offshore wind turbines that were developed particularly for the application in extreme environments. The film is quick and easy to apply and requires no time-consuming preparatory work or primer drying times.

For you, this means less downtime, lower costs, greater efficiency and more reliable corrosion protection, because **RENOLIT CP Advanced** is certified according to BAW standard (DIN EN ISO 12944-9 CX).

RENOLIT has developed the corrosion protection film **RENOLIT CP Advanced**

with the aim of providing the wind industry with an efficient tool to protect its wind turbines better. The film helps the wind energy industry to operate more efficiently and profitably, thereby contributing to renewable energy production.

As a plastics processing company, **RENOLIT** has a particular responsibility towards the environment. Through continuous process optimization and the sustainable use of energy and raw materials, **RENOLIT** makes an important contribution to climate and environmental protection.

RENOLIT can be relied on, in line with our brand promise: "Rely on it." This is ensured by more than 5,000 employees, at more than 30 production sites and sales units spreading over 20 countries in 4 continents.



Rely on it.

Renolit SE

Address	Horchheimer Strasse 50 67547 Worms
Phone	+49 (0)6241 303 393
E-Mail	wind@renolit.com
Web	renolit-cp-advanced.com
Category	Suppliers of mechanical components
Profile	Surface technology
Turnover	€ 1.168 billion in fiscal year 2023
Employees	5,000
Founding year	1946



04

REWITEC GmbH

Longer life and higher efficiency for your wind turbines

Our innovative REWITEC technology protects and repairs the surfaces of gears and bearings in wind turbines.

REWITEC GmbH, which was founded in 2003 is a medium-sized company based in Lahnau, Hesse. REWITEC has developed a patented and innovative surface-treatment technology for the protection and repair of gears and bearings, which uses silicate nano- and microparticles via a lubricant carrier. The effectiveness of the treatment has been proven scientifically.

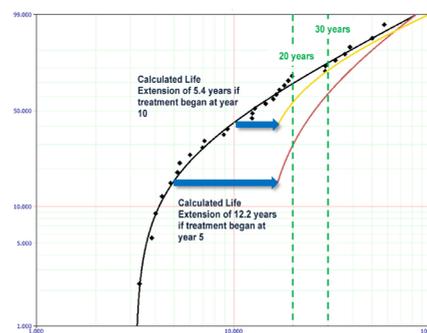
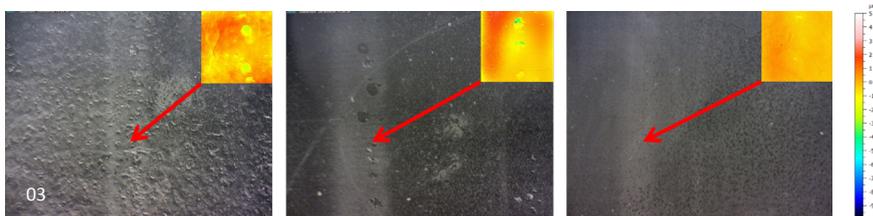
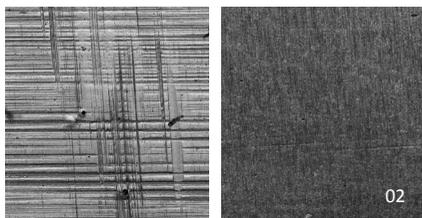
Based on our 15-year experience in the wind industry and having treated several thousand wind turbines, we provide assistance to our customers around the world to address such issues as surface pittings, spalling, WECS and other damages, and many other risk factors that could result in wind turbine outages. We offer our clients bespoke solutions, on-site application, and pre- and post-application surface analyses.

Our technology

Our technology utilises lubricants and bearing grease as media to form a self-repairing silicate layer of particles on the metal surfaces of gears and bearings. This ensures greater reliability, improved energy efficiency and a long service life in drive system components by significantly reducing surface roughness, friction, and temperature, which results, among other things, in a more even load distribution on the tooth flanks and in the bearing components. The technology can be used in both oil and grease lubricated systems.

REWITEC Key Facts

- Repairs damaged gear and bearing surfaces
- Significantly extends the service life of drive components
- Reduces wear and increases operational smoothness
- Scientifically proven friction reduction and efficiency increase
- Suitable for use in old and new wind turbines
- Significant reduction in maintenance costs



01

01 | The calculated service life extension of an SKF main bearing (1.5 MW Acciona WTG) through the use of REWITEC is up to 12 years— A study carried out in collaboration with Sentient Science.

02 | The development of lateral wear on a gear cog tooth (GE 1.5 SL WTG) over a two-year period. Surface impression without REWITEC application (left) and development after REWITEC application after two years (right).

03 | Analysis of the main bearing (outer ring) of a GE 1.5 MW wind turbine, left: before REWITEC application, centre: 5 months and right: 12 months after application



REWITEC GmbH

Address	Dr.-Hans-Wilhelmi-Weg 1 35633 Lahnau
Phone	+49 (0)6441 44599-0
E-Mail	stefan_bill@cargill.com
Web	www.rewitec.com
Category	Suppliers of mechanical components
Profile	Lubricants & lubrication systems
Employees	10
Founding year	2003

ECONOMIC REPORT

8 | FOCUS REPOWERING ↗

COMPANIES

- 30 | The top employers in the industry ↗
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Rittal GmbH & Co. KG

Electrify your System

Rittal and Eplan offer efficient solutions that significantly accelerate planning and production processes in industry and thus significantly reduce costs.



01 | From inverter systems and automation to wind farm management and grid connection— Rittal offers the standard for all conditions

02 | Rittal is a leading global system provider for enclosures, power distribution, climate control, IT infrastructure and software & service.



„We supply all wind turbine manufacturers worldwide, directly or indirectly via control and switchgear manufacturing, and tap into significant cost-cutting potential through automation solutions and digital integration of processes along the entire value chain,” says Dr René Umlauf, Managing Director Sales at Rittal.

Together with the software solutions from Eplan, previously manual processes in enclosure planning, production and integration are being digitalised and automated. This results in efficiency advantages for investments and (CAPEX, OPEX) of wind turbines.

Rittal's product solutions fulfil the high requirements for stability, vibration resistance and corrosion protection, thus ensuring reliable operation of the wind turbine. The highly robust System AX compact enclosures, for example, ensure the reliable operation of the pitch system in the hub. Rittal offers modular solutions based on the new VX25 large enclosure system for the protected enclosure of

frequency inverters, control and safety technology in the nacelle or the tower.

The world's most efficient cooling units from the Blue e+ series ensure optimum climate control in the enclosures. Thanks to the devices' IoT capability, maintenance work can be organised more intelligently.

With VX25 Ri4Power, Rittal offers a modular system for the standard-compliant design of low-voltage switchgear. The solutions for energy storage systems range from individual enclosure systems to complete container solutions.

Finally, with modular data centre solutions from Micro Data Centres to containers, Rittal offers short latency times and maximum security for data processing directly on site.



Rittal GmbH & Co. KG

Address	Auf dem Stützelberg 35745 Herborn
Phone	+49 (0)2772 505-2219
E-Mail	goerner.r@rittal.de
Web	www.rittal.de
Category	Suppliers of electrical and electronic components
Profile	Controls, cables & switchgear cabinets
Turnover	€ 3 billion (2022, Friedhelm Loh Group)
Employees	More than 9.200 worldwide (Rittal); more than 12.000 (Friedhelm Loh Group)
Founding year	1961

Schraubenwerk Zerbst GmbH

Fasteners for wind turbines

We fasten your wind turbine components safely and reliably. Wind turbine and component manufacturers around the world rely on Zerbst screws and fasteners.

The Zerbst plant has been manufacturing high-quality screws and fasteners for 100 years.

Schraubenwerk Zerbst has been supplying screws made of high-quality steel to the automotive industry as early as the 1920s. At that time, 30 % of overall production was exported to the US, UK, India and the Netherlands.

Nowadays the plant in Zerbst is a highly sophisticated production plant for fasteners. In addition to an extensive product range for rail track technology, Zerbst supplies industrial screws and screw fasteners to many industries. Customers around the world from the crane industry, automotive engineering, mechanical and plant engineering trust the Zerbst brand.

Sustainable production and sustainable business management are among the corporate principles of Schraubenwerk Zerbst GmbH. Products in the field of renewable energy and wind turbines are ideally suited to this philosophy and are a dynamically growing business segment for the company.

Tower construction: HV sets up to M72 and stud sets up to M100

Offshore: Screw fasteners joining wind turbines to the seabed foundation up to M100



Rotor blade: Specially designed combinations of cross bolts and thermo bolts, from smaller rotor blades to rotor blades over 100m long for offshore wind turbines

Nacelle and components: Standard screws, specially designed screws and bolts in strength categories 8.8, 10.9 and 12.9

Services and logistics: From warehousing to punctual delivery to building sites around the world.

Coatings: Galvanised and lamellar zinc coated fasteners can be supplied as standard. In addition, customers can order whatever type of coating they require.



Schraubenwerk Zerbst GmbH

Address	Altbuchsland 22 39261 Zerbst/Anhalt
Phone	+49 (0)3923 713-102
Fax	+49 (0)3923 713-200
E-Mail	info@schraubenwerk.de
Web	www.schraubenwerk.de/ index_en.html
Category	Suppliers of mechanical components
Profile	Bolts & fasteners
Turnover	€ 104 million
Employees	310
Founding year	1919

ECONOMIC REPORT

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COMPANIES

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- 236 | All addresses of leading companies ↗
- 238 | Direct marketing ↗
- 239 | Education & training ↗
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- 275 | Category overview ↗

Stucke Elektronik GmbH

Power Solutions. Worldwide. Made in Germany. Since 1968.

SYMAP®Compact+ – digital protection and control system for energy generation and distribution systems for low, medium and high voltage applications



01

Reliable availability of energy on land and at sea and safe energy supply through control and protection of energy supply systems – this is what stuckeGROUP's products and solutions offer.

Made in Germany – we design and manufacture our products, for which we also develop the software ourselves, exclusively in Hamburg. Our multifunctional protection and control systems offer motor control, generator protection, motor protection, transformer protection, feeder protection, distance protection, line differential protection, grid protection, reactive power undervoltage protection (QU), network decoupling and power plant controller (EZA) for low, medium and high voltage systems. Our devices stand for high reliability and longevity and we have spare parts available for all product generations.

The SYMAP®Compact+ is a multifunctional protection device for low, medium and high voltage systems. Thanks to a touchscreen, comprehensive protection functions, sophisticated software and flexible hardware, up to 18 measuring points, a high number of binary inputs and outputs and high-speed GOOSE with all important communication protocols, the SYMAP®Compact+ can be used for almost all applications.

01 | Solutions for renewables
02 | Head Office of stuckeGROUP
03 | At home in Hamburg
04 | SYMAP Compact+



03

General features:

- maximum protection functionality according to U/I measurement inputs
- small form factor
- type-certified according to VDE 4110 and 4120
- colour touchscreen
- multi-lingual HMI
- expandable with additional I/O boards
- reactive power undervoltage protection (QU)
- power plant controller (EZA) (SYMAP®Compact+)

Grid code compliance:

- VDE-AR-N 4110:2018-11 / medium voltage (FGH certified)
- VDE-AR-N 4120:2018-11 / high voltage (FGH certified)
- G99



04



02



Stucke Elektronik GmbH

Address	Merkurring 26 22143 Hamburg
Phone	+49 (0)40 2274 68 0
E-Mail	mail@stuckegroup.de
Web	www.stuckegroup.com
Category	Suppliers of electrical and electronic components
Profile	Controls, cables & switchgear cabinets
Employees	120
Founding year	1968

TECHNO-PARTS GmbH

Innovative sealing systems and moulded parts for modern technology.

In sealing technology, the smallest details are critical for reliable functioning. Our products have been doing their job reliably for years, from the tried-and-tested to the innovative component.

Over 50 years of experience in the sealing field for hydraulics, pneumatics, chemicals and plant engineering have made us a high-performance company. We cover almost all applications – from miniature pneumatics to heavy-duty hydraulics, from chemicals and plant construction to offshore wind turbines. We continuously put our experience to work in the development and optimisation of our growing product range.

Our staff's wide-ranging expertise ensures a comprehensive service – from technical advice to our customers on-site to flexible order handling and on-time delivery.

A warehouse with well over 20,000 different items and flexible production for machined and injection-moulded products, combined with in-house tool-making, enable us to meet most customer requests in the shortest possible time.

A well-equipped laboratory for physical and chemical testing, comprehensive experiments and certification in accordance with DIN EN ISO 9001 make a significant contribution to our high quality standards and the further development of our products.

Individual packaging is just as much a part of our services as our own eKanban system and a quick service for urgent repairs and prototypes.

For the special requirements of wind turbines, we also supply radial shaft seals with high-strength, fabric-reinforced elastomer backs and excellent sliding properties. The shaft seals are available for internal and external sealing, also in split design with diameters up to 4,000 mm. This facilitates repairs and alleviates difficult installation conditions.



- 01 | Shaft seals for wind turbines and for heavy machine construction
- 02 | Headquarter in Essen
- 03 | Most modern storage technology and more than 20,000 different articles in stock

TECHNO PARTS
Dichtungs- und Kunststofftechnik
 Sealing and Plastics Technology

TECHNO-PARTS GmbH

Address	Alte Bottroper Strasse 81 45356 Essen
Phone	+49 (0)201 86606-0
Fax	+49 (0)201 86606-68
E-Mail	vk@techno-parts.de
Web	www.techno-parts.de
Category	Suppliers of mechanical components
Profile	Seals & vibration control
Founding year	1981



ECONOMIC REPORT

8 | FOCUS REPOWERING ↗

COMPANIES

- 30 | The top employers in the industry ↗
- 56 | Companies with innovative projects ↗
- 68 | Research in Germany ↗
- 78 | Start-ups ↗
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- 114 | Suppliers ↗
 - 116 | A to H ↗
 - 130 | I to P ↗
 - 136 | Q to Z ↗
- 144 | Service and logistics ↗
 - 146 | A to H ↗
 - 178 | I to P ↗
 - 192 | Q to Z ↗
- 228 | Associations ↗

INDUSTRY DIRECTORY

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- 240 | Finance & law ↗
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- 252 | Organisations & public institutions ↗
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- 254 | Planning ↗
- 259 | Rotor blades ↗
- 259 | Sector Coupling ↗
- 259 | Suppliers of electrical and electronic components ↗
- 262 | Suppliers of mechanical components ↗
- 265 | Transport & logistics ↗
- 268 | Companies A-Z ↗
- 275 | Category overview ↗

WIWA Wilhelm Wagner GmbH & Co.KG

Your project deserves it.

Based in Lahnau, WIWA builds gear for surface treatments, e.g. painting/glueing, aimed at the vehicle/machining sectors. Our inventions help defend seaside constructions from decay and flames.



- 01 | Corrosion protection of a wind turbine
 02 | Wind turbine coating
 03 | WIWA DOSYS XL
 04 | WIWA 2K GLASSFLAKE-ANLAGE GX



WIWA Wilhelm Wagner GmbH & Co.KG

Address	Gewerbestr. 1-3 35633 Lahnau
Phone	+49 (0)6441 609 0
Fax	+49 (0)6441 609 2150
E-Mail	sales@wiwa.de
Web	www.wiwa.de
Category	Suppliers of mechanical components
Profile	Surface technology
Employees	155
Founding year	1950



As with other steel structures, corrosion protection is at the top of the priority list in wind turbine construction. As a partner of many system suppliers and plant constructors from this industry sector, WIWA attaches great importance to continuous new and further developments. In addition to coating equipment for corrosion protection materials, WIWA supplies state-of-the-art pump technology for conveying epoxy resins and adhesives that are used, for example, in the manufacture of rotor blades in sandwich construction. From basic protection against weathering and defense against mechanical stress to passive and active flame and fire protection— together with international market partners, WIWA develops and implements industry-leading solutions worldwide.

From our European core market, we are successfully expanding into growth markets all over the world. With over 140 qualified employees in Lahnau, our own subsidiary in the USA and

global trading partners, we focus on the targeted implementation of future requirements and pioneering solutions.

German engineering is capitalized at WIWA and means the consistent effort for highest quality and innovative solutions. Despite growing cost pressure and increasing competition, our customers can rely on the seal “Made in Germany”. When asked how much “Made in Germany” is actually still in a WIWA system, we answer not entirely without pride: Almost 100 %!

Trust in the potential of all specialist departments of our company— from design and manufacturing to final assembly, the dispatch department and our service team— and use it for one big goal: your daily success!



The Who's Who of the German wind industry

Your company is not listed in the publication?
You'd like to be included again next year?
Then don't hesitate!



Print & Online



Specification:

Company profile and/or Address entry

- in the German print publication
- as pdf (German and English)
- and in the online database

Free distribution around the world at trade fairs and conferences

Free copies for your own marketing

We'll be glad to advise you:

Klaus Barkeling:
k.barkeling@wind-energie.de

Nikos Fucicis:
n.fucicis@wind-energie.de



Published in German and English.

ECONOMIC REPORT

8 | FOCUS REPOWERING ↗

COMPANIES

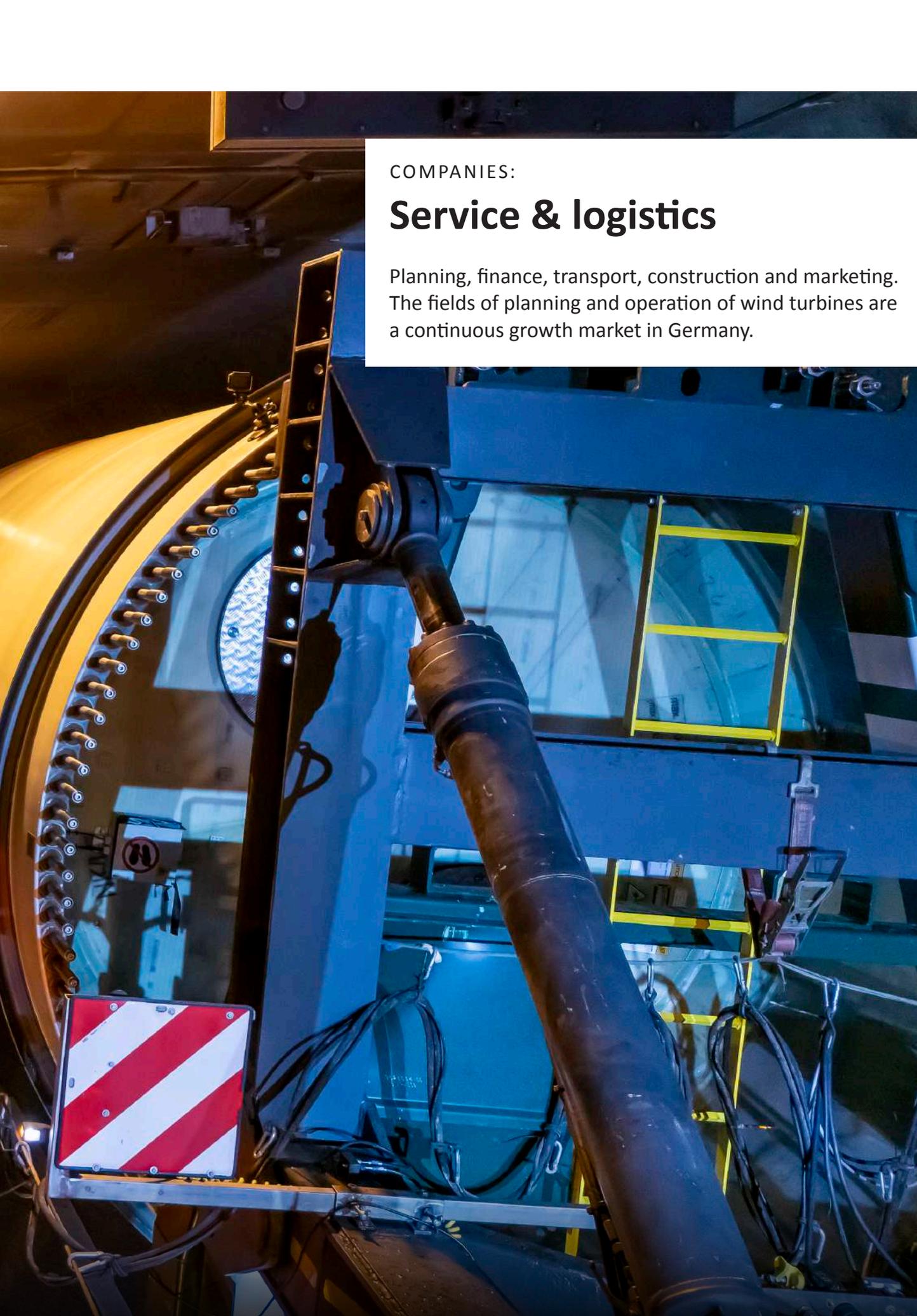
- 30 | The top employers in the industry ↗
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That was a close call: in a pilot test, a 98 m long Nordex rotor blade was transported through the Elbe tunnel. At the narrowest point (in the picture) there was still 29.7 cm of space to the tunnel ceiling. One truck driver and one female driver steered the heavy transport at the front and rear axle. Photo: © Ulrich Mertens, Atelier für Kunst und Fotografie



COMPANIES:

Service & logistics

Planning, finance, transport, construction and marketing. The fields of planning and operation of wind turbines are a continuous growth market in Germany.

ECONOMIC REPORT

8 | FOCUS REPOWERING ↗

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- 268 | Companies A-Z ↗

- 275 | Category overview ↗

4Cast GmbH & Co. KG

heartbeat of renewables

4cast is a leading provider of precise, automated performance analysis for wind and PV projects. We have been driving machine learning-based forecasting methods for the energy market since 2016.



- 01 | On Point with Wind and Solar Projects
- 02 | Focus on Yield
- 03 | Intraday & Day-Ahead Approach
- 04 | Methodological Approach for long-term Performances Analysis



4Cast GmbH & Co. KG

Address	Friedrich-Ebert-Strasse 8 14467 Potsdam
Phone	+49 (0)331 982 238 30
E-Mail	hello@4-cast.de
Web	4-cast.de
Category	Direct marketing
Profile	Forecasting services providers
Employees	35
Founding year	2016

4cast has developed its own models to provide unrivalled accuracy and speed. Our solutions enable planners to efficiently and accurately evaluate the energy production at potential sites. We offer both long-term and short-term forecasts based on the latest scientific methods & technologies.

Services

→ Automated Performance Analysis

- Efficiency: Automation of process steps saves time and resources, delivering reliable results for informed decisions.
- Speed: Our cloud-based analysis software rapidly provides long-term performance analysis.
- Precision: Data analyses and physical models account for factors such as park layout and shading effects, in line with TR6 standard
- Uncertainty Assessment: Forecasts include uncertainties and provide accuracy information for yields.
- Optimization: Yield knowledge enhances investment planning and portfolio optimization.



Standortanalyse
Site analysis



Nettoenergieertrag
Net energy yield

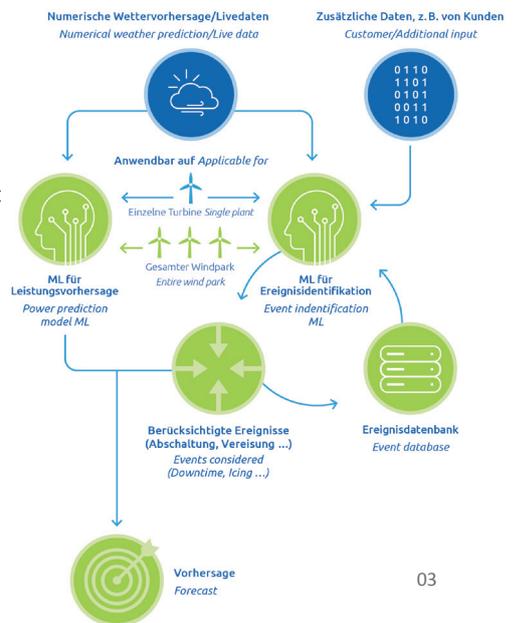


Datenanalyse
Data analysis



Modellerstellung
Model creation

04



03

→ Intraday and Day-Ahead Forecasts

- Machine Learning and Deep Learning: Short-term forecasts rely on advanced models using weather data and historical and live production data.
- Fast and Accurate Predictions: Meteorological parameters like air pressure, temperature, solar radiation, and wind speed are considered.
- Adaptability: Forecasts can be made for entire portfolios, parks, or individual turbines and solar modules.

Technological Innovation

Our performance analysis uses advanced automation techniques to streamline the entire process from data collection to results evaluation. For intraday and day-ahead forecasts, we utilize cutting-edge machine learning and deep learning models that are continuously updated to ensure the highest precision.

ABO Energy GmbH & Co. KGaA.

New name, same quality: ABO Wind becomes ABO Energy

ABO Energy acquires, plans, finances and builds turnkey wind energy projects. In addition, ABO Energy sells project rights or collaborates with other developers to help their projects succeed.

More than 25 years of wind energy expertise

Since 1996 ABO Energy has implemented renewable energy projects amounting to about 5,000 MW; about half of this was constructed in-house. 500 million euros are invested annually. Currently, over 1.200 employees in 16 countries and on four continents work on the development of new wind farms, solar parks and storage systems with a total capacity of more than 23 gigawatts. In addition there are green hydrogen projects with a capacity of 20 gigawatts in the pipeline.

Project development and repowering

ABO Energy initiates wind energy, solar and storage projects, acquires land or existing projects, carries out all technical and commercial planning and engineering, prepares international bank financing and builds the plants on a turnkey basis. Among municipalities, landowners and energy cooperatives, ABO Energy is known as a fair and reliable partner.

Operational management and service

Whether it is remote monitoring, managing legal requirements, or contract management and accounting: The flexible ABO Energy operational management modules offer the perfect fit for every wind farm. In addition, engineers develop smart solutions such as the access control "ABO Lock", which allows operators to control and log access to their wind farms without a key. The manufacturer-independent ABO Wind Service offers full and partial service, maintenance, repair, safety checks, inspections and troubleshooting from a single source.



Expert assessments and large components

BWE-listed experts inspect and assess all large components, such as foundations, towers, drive trains or rotor blades. Our experienced technicians exchange and repair gearboxes, generators and main bearings and install expertly repaired components where required.



- 01 | ABO Energy plans and builds wind farms as well as battery storage and PV systems
- 02 | ABO Energy service technician maintaining a system
- 03 | Plant operation is monitored from the control room of operational management.



ABO Energy GmbH & Co. KGaA.

Address	Unter den Eichen 7 65195 Wiesbaden
Phone	+49 (0)611 267 65-0
Fax	+49 (0)611 267 65-599
E-Mail	kontakt@aboenergy.com
Web	www.aboenergy.com
Category	Planning
Profile	Planers & project developers
Turnover	€ 500 million (project volume)
Employees	more than 1.200
Founding year	1996

ECONOMIC REPORT

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- 144 | Service and logistics ↗
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 - 192 | Q to Z ↗
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Alterric Deutschland GmbH

Alterric – committed to a 100 per cent energy transition

Alterric plans and operates onshore parks in Germany and Europe.

Our asset: 2,400 megawatts of capacity, plus a project pipeline of over 11,000 megawatts.



01



03



02

With Alterric, everything runs smoothly

The opportunities for productive collaboration are diverse; they range from land acquisition, tendering procedures or repowering to individual participation models. Thanks to our wind farm experience, we can also successfully realise projects in challenging locations – 120 of our turbines generate green electricity in commercial forests and on mountain ranges.

In addition, Alterric can also carry the project development risks in co-operations. Since renewable energies need acceptance, Alterric relies on dialogue: Our wind and photovoltaic parks convince project participants and regional committees as well as citizens in the neighbourhood of our wind farms.

Strong teams for a climate-neutral energy future

Alterric sees itself as an energy partner for generations and has the best prerequisites for a successful energy transition: three decades of experience in planning, construction and operation of wind turbines, a rock-solid credit rating, high technical standards and energy industry expertise.

Our maxim is consistency: We come to stay. This means that we are not only reliably available as an operator on site, we also keep an eye on the potential of the energy park areas for decades, e.g. for suitable repowering plans. Alterric plans and builds its energy projects independently of manufacturers to optimise the energy harvest at each location.



Alterric Deutschland GmbH

Address	Holzweg 87 26605 Aurich
Phone	+49 (0)4941 9363300
E-Mail	kontakt@alterric.com
Web	www.alterric.com
Category	Planning
Profile	Planers & project developers
Employees	500
Founding year	2021

One of Alterric's added values is its extensive interdisciplinary experience. Whether wind or solar, whether technical innovation, grid connection, energy trading, electricity storage or the expanded green energy applications through sector coupling – at Alterric you will meet experts who take a holistic approach to the renewable energy future.

- 01 | Alterric Windfarm Dietrichsfeld, Lower Saxony
- 02 | Successful even in challenging conditions: Wind power in the forest.
- 03 | We are committed to a 100 per cent energy transition.
© Photo- und Bilderwerk for Alterric

ARGE NETZ

Our energy comes from the north

Our route to becoming an energy supplier involves the intelligent networking of renewable electricity sources, the smart expansion of grids, and consumption that meets people's needs.

ARGE NETZ has been an innovative pioneer of renewable energy supply and market access for sustainable companies to all markets since its foundation in 2009. Our goals are to generate 100 % of electrical power from renewable energy sources, to strengthen small and medium-sized enterprises, citizen participation, and to create value at the local level.

This is why we develop innovative concepts for a successful energy supply at our locations in Husum and Berlin and offer solutions for the storage and conversion of renewable energy. We have already established a firm foothold in innovative and sustainable markets through our investments and are preparing to enter further markets.

ARGE NETZ is a reliable contact partner for businesses, associations, and governing bodies. We ensure that our shareholders are always up to date through frequent communications and the transfer of knowledge and are shaping the energy system of the future. To this end, ARGE NETZ offers bespoke consultancy services in the energy sector, specialist events and participation in pioneering projects, technical innovations, and sustainable business models.



Stephan Frense, CEO: "We are a company with a face! We combine our knowledge of a mature industry and the perfect mix of skills needed for tomorrow's energy system in conjunction with a good team atmosphere and the full commitment of every member of staff."



ARGE NETZ

Address	Otto-Hahn-Strasse 12-16 25813 Husum
Phone	+49 (0)4841 8944665
E-Mail	info@arge-netz.de
Web	www.arge-netz.de
Category	Sector Coupling
Profile	Sector Coupling
Employees	16
Founding year	2009

01 | Stephan Frense, CEO ARGE NETZ
& Ina Kietzmann, Communication & federal policy
© Storyfischer

ECONOMIC REPORT

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COMPANIES

- 30 | The top employers in the industry ↗
- 56 | Companies with innovative projects ↗
- 68 | Research in Germany ↗
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Arowya

entrepreneurial – in partnership – forward-looking

In the world of renewable energy, Arowya has established itself as an international service provider. With years of experience, Arowya offers a wide range of services.



Arowya combines all the service competences of the energy and infrastructure company BKW in the field of renewable energies. This enables targeted and efficient support for customers who operate wind and solar plants. The range of services extends from technical management, maintenance and repairs to commercial management and the marketing of the energy generated.

A key component of Arowya's services is monitoring and analysing the systems in real time. This ensures optimum energy efficiency and maximises the yield of the systems. Using state-of-the-art technology and in-depth expertise, Arowya can identify and resolve potential problems at an early stage, minimising downtime.

Arowya offers customised solutions for the management and operation of wind and solar parks. This also includes support in marketing the energy generated to ensure that customers get the best possible price

for their electricity. With comprehensive administrative, financial and tax advice, Arowya helps wind farm operators to optimise and protect their investments.

With a clear focus on quality and efficiency, Arowya is ideally positioned to play a strong role in the wind and solar sector and to actively shape the energy transition.

For wind turbine owners, this means that they can count on a reliable partner who not only operates, repairs and maintains their turbines, but also optimises their performance and maximises their profitability. Arowya stands for innovative services that pave the way to a sustainable energy future.

Arowya Green energy services

Arowya

Address	Hauptstrasse 65 12159 Berlin
Phone	+49 (0)30 24006010
E-Mail	info@arowya.com
Web	www.arowya.com
Category	Energy services
Profile	Energy services
Employees	152

BIL eG

BIL – Infrastructure Information

Safety in the planning and operating phase of wind farms: With currently 63,000 users, BIL eG is an important pioneer in the expansion of renewable energies.

When it comes to safety, users of the BIL system have every option: The convenient enquiry tool in the planning phase makes it possible to determine the structures of other affected operators and to plan the construction project safely accordingly. During the operating phase, the data stored in the BIL system can be used to obtain information on the company's own infrastructure and thus ensure the safety of the facilities.



Thanks to the cross-sector operator structure of the BIL system and the familiarity of the major infrastructure operators in the high-pressure gas, oil and chemical sectors, an enquiry in the BIL system can also be used to identify operators whose infrastructures or familiarity are not yet developed to the same extent.

Infrastructure operators who use BIL for their pipeline enquiries also benefit from further advantages:

Automatic responsibility check: The BIL system carries out a fully automated responsibility check, which means that operators only receive relevant enquiries.

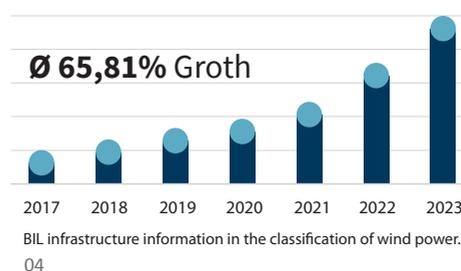
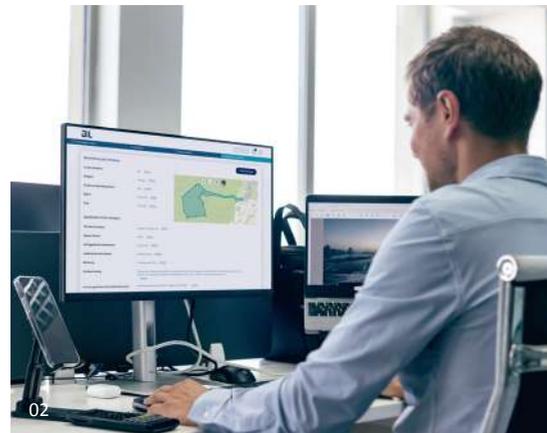
Integration into existing systems: Operators can seamlessly integrate the BIL system into their existing GIS systems.

Legal security and data sovereignty: The BIL system offers a legally secure process in which operators retain sovereignty over their sensitive data.

In contrast to other commercial directory enquiry services, the BIL system is characterised by its cooperative organisational form. New ideas are developed and optimisation proposals are discussed and implemented in workshops, forums and collaborations. This allows synergies to be optimally utilised and the system becomes a security-enhancing asset for all participating operators.

www.bil-leitungsauskunft.de

- 01 | Infrastructure information via the BIL system: legally compliant and convenient
- 02 | Infrastructure. Operators. Forum. An event format by the BIL Cooperative.
- 03 | Growth of Infrastructure inquiries in the BIL system in the wind energy category.
- 04 | Infrastructure. Operators. Forum. – Exchange in Barcamp format



BIL

Die Leitungsauskunft.

BIL eG

Address	Josef-Wirmer Strasse 1–3 53123 Bonn
Phone	+49 (0)228 92 58 52 90
E-Mail	info@bil-leitungsauskunft.de
Web	www.bil-leitungsauskunft.de
Category	Other services
Profile	Software solutions
Turnover	€ 1,4 million
Employees	6
Founding year	2015

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8 | FOCUS REPOWERING ↗

COMPANIES

- 30 | The top employers in the industry ↗
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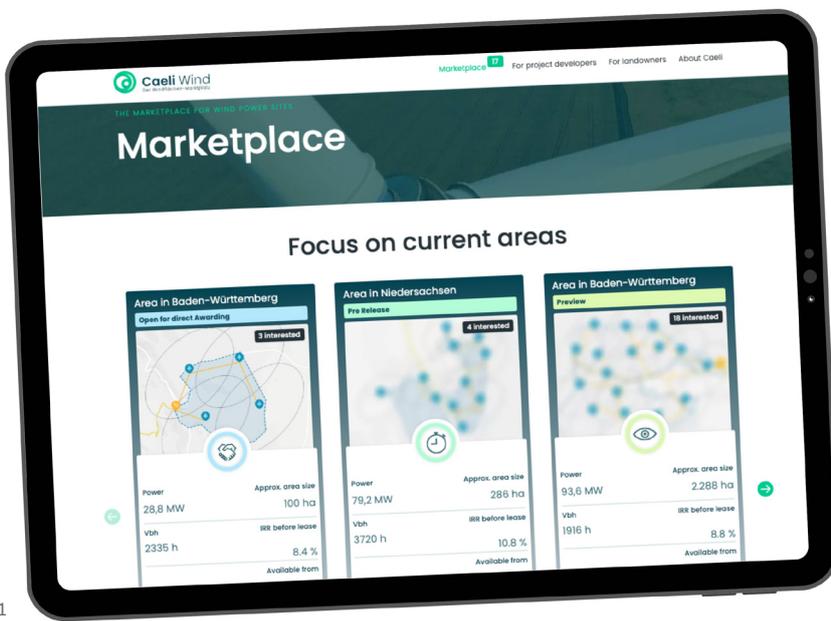
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Caeli Wind GmbH

Caeli Wind – the digital marketplace for wind power sites

Caeli Wind is a digital marketplace that accelerates the assessment, planning & allocation of wind power sites in Germany. Project developers benefit from fast allocation – digital & intelligent.



01

01 | The marketplace for project developers

02 | To the marketplace

02



How project developers benefit

- Access to a nationwide range of verified sites including detailed site information such as planning law, initial faunistic assessment, air traffic control, grid connection and much more.
- Open, non-discriminatory award procedure in the form of qualified tenders or direct awards.
- Standardised, neutral concession agreement.
- Payment only in case of success as a performance-based commission upon signature of the licence agreement, receipt of the permit and entry in the market master data register.

Summarised: With Caeli Wind, project developers **minimise** their acquisition costs and their **project risks** through preliminary checks. Project developers also benefit from **quick awarding and contracting**.

Moving wind power forward together

Achieving the expansion targets for wind energy in Germany requires commitment and intelligent solutions – Caeli Wind wants to be part of this and has therefore developed the first digital marketplace for the assessment, planning and allocation of wind energy sites, which accelerates the **realisation of wind power areas by up to 18 months**. Since 2022, Caeli Wind has been bringing landowners and project developers together on its platform and supporting all key stakeholders in the wind industry with its pioneering software. In 2023, **173 new sites for wind turbines** in Germany were identified via Caeli Wind and successfully awarded to project developers and energy suppliers.



Caeli Wind GmbH

Address	Mollstrasse 32 10249 Berlin
Phone	+49 (0)30 688 30 230 0
Fax	+49 (0)30 6178 533 0
E-Mail	info@caeli-wind.de
Web	www.caeli-wind.de
Category	Other services
Profile	Software solutions
Employees	80 (Wind energy: 80)
Founding year	2021

Centrica Energy

Energy Movers by Nature

Centrica Energy trades renewable energy through eight global offices, moving energy from source to use. Our mission is to drive the green transition while offering sustainable, predictable energy costs.

We trade power, gas, and energy attributes, and provide the route to market for our upstream and power generation operations. Providing our clients with the best route-to-market services available today, we integrate sophisticated software, and trade, structure and optimize exposures all the way from long-term risk management down to physical trading seconds before delivery.

Working alongside some of the world's leading energy investors and businesses, we're looking to reshape the energy future and bridge the future to a carbon-neutral economy.

Our services

Our key competencies in the German market are Direktvermarktung, PPAs with Post-EEG and newly commissioned assets as well as the optimization of standalone

batteries and flexible assets. Centrica Energy has over 15 years of experience in the PPA business in the Nordic countries where deals with complex structures are part of our day-to-day business.

Currently, Centrica Energy manages a power generation portfolio in Europe of more than 16 GW.



01



02



03

- 01 | Turbine field
- 02 | Turbines in nature
- 03 | Turbine
- 04 | Trading setup



04

centrica Energy

Centrica Energy

Address	Esplanade 40 20354 Hamburg
Phone	+49 (0)160 90509308
E-Mail	cet-coordination@centrica.com
Web	www.centricaenergy.com
Category	Direct marketing
Profile	Direct marketers
Employees	500 (Wind energy: 30)
Founding year	1998

ECONOMIC REPORT

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COMPANIES

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 56 | Companies with innovative projects ↗
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 78 | Start-ups ↗
 104 | Manufacturers ↗
 114 | Suppliers ↗
 116 | A to H ↗
 130 | I to P ↗
 136 | Q to Z ↗
 144 | Service and logistics ↗
 146 | A to H ↗
 178 | I to P ↗
 192 | Q to Z ↗
 228 | Associations ↗

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 254 | Planning ↗
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 262 | Suppliers of mechanical components ↗
 265 | Transport & logistics ↗

268 | Companies A-Z ↗

275 | Category overview ↗

Connected Wind Services Deutschland GmbH

Service & Maintenance – Large component exchange – Up-tower repairs – Spare parts
Connected Wind Services – progress and innovation since 1987.

We are propelling your future development. Longevity is the key to advancing sustainable movement – of businesses, society and the world. This is what we believe in.



With over 30 years of experience, Connected Wind Services Deutschland GmbH is a 100 % subsidiary of EnBW and one of the leading independent service providers in the renewable energy sector. We are a top quality single-source provider of everything involved in the maintenance of wind turbines.

Maintenance and servicing are indispensable for the most efficient operation of wind turbines and wind farms. Our core competencies include maintenance and repairs to the base, tower, and rotors as well as the internal components, such as generators and gearboxes, the replacement and provision of spare parts and the refurbishment (repowering) of complete turbines, in addition to retrofitting and fault clearing. In order to minimize downtimes due to complex and expensive repairs, we offer innovative methods such

as condition monitoring and predictive maintenance, e.g. of drive trains in wind turbines. This increases the service life of the individual components and enables long-term economic operation of the turbine.

We always tailor our solutions and service concepts individually to the project in order to ensure maximum profit for the customer and to contribute to conserving resources.

We want to be a driving force for positive change. Having a strong local presence and guided by the principles of trust and transparency, our clients can rely on us. We are your professional partner who continuously monitors the condition and performance of your turbines – to ensure that wind is always our strength.



**Connected Wind Services
Deutschland GmbH**

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Fax	+49 (0)4848 90 128-22
E-Mail	info.de@connectedwind.com
Web	www.connectedwind.de
Category	Operation & Service
Profile	Service, maintenance & repair
Turnover	ca. € 10 million in Germany
Employees	60+ in Germany
Founding year	1987



- 01 | Connected Wind Services – Advancing your future movement
- 02 | Service and maintenance
- 03 | Over fifty service teams will tend to your needs.
- 04 | You can rely on us to maintain the highest level of safety with dedicated technicians certified to the highest GWO training standards.



ConverterTec Service GmbH

EmPOWERing your Solutions

Combining the strengths of SEG and Woodward, ConverterTec Service offers comprehensive expertise and know-how in developing, manufacturing, and operating multi-megawatt frequency converters.

As an independent service company with over 25 years of experience in the wind industry, ConverterTec Service GmbH is a competent partner for the reliable provision of spare parts, maintenance, repair services, field service and optimization of frequency converters in existing wind turbines.

With roots in the renowned companies SEG, Woodward, and IDS, ConverterTec Service GmbH combines experience with innovative technologies for new spare part developments. Our focus is on optimizing your converters to maximize the performance and lifespan of your wind turbines. Benefit from our comprehensive service portfolio, ranging from maintenance to modernization.

Global Presence and Rapid Response: With 7 global branches and a new repair center in Bulgaria, ConverterTec offers a comprehensive range of services, from the supply of spare parts, technical support, and training to the development of retrofit kits and repairs.

The repair of electronic components, especially those that are difficult to obtain on the market, is crucial for maintaining the operational readiness of wind turbines. ConverterTec Service therefore offers tailored solutions, from professional diagnostics to precise repairs, and guarantees efficient processing.

To provide even faster and more reliable service to our customers in North America, ConverterTec has entered into a coopera-



tion with ENA Electronics in Canada. This close collaboration enables both on-site repairs in the shortest possible time and maximizes the availability of wind turbines in the respective market segment.



- 01 | Power Conversion Experts with a long history
- 02 | Know-how and experience
- 03 | Service for customer groups
- 04 | ConverterTec Field Service

Converter | Tec Service GmbH

ConverterTec Service GmbH

Address	Krefelder Weg 47 47906 Kempen
Phone	+49 (0)2152 145 398
E-Mail	kemp.service@convertertec.com
Web	convertertec.com
Category	Operation & Service
Profile	Service, maintenance & repair

ECONOMIC REPORT

8 | FOCUS REPOWERING ↗

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- 30 | The top employers in the industry ↗
- 56 | Companies with innovative projects ↗
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- 144 | Service and logistics ↗
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- 228 | Associations ↗

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- 254 | Planning ↗
- 259 | Rotor blades ↗
- 259 | Sector Coupling ↗
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- 268 | Companies A-Z ↗
- 275 | Category overview ↗

cp.max Rotortechnik GmbH & Co. KG

Maximizing rotor performance has been our goal for over 25 years. During this time, we have played a key role in shaping the service for rotor blades and continuously developed new solutions for repair and optimization.



When the rotor blades of wind turbines were still around 20 meters long, cp.max also started out very small. Right from the start, however, we revitalized the industry with a small revolution: the introduction of rope access technology.

Today it is an integral part of the work on wind turbines. And in the years that followed, we continued to develop our skills. We offer our range of services worldwide. At its core it currently comprises:

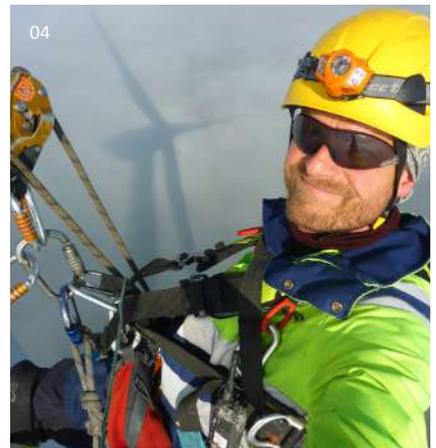
- Inspection and repair of rotor blades of all (blade- and turbine-) types
- Flexible, cost- and time-saving rope access and access using work platforms
- Drone inspections
- Balancing the rotor to prevent damage and increase yield
- Yield increase through individually adapted aerodynamic optimisation
- Noise reduction through the installation of Trailing Edge Serrations
- Customer-oriented planning with a personal contact
- Training courses on the inspection, repair and manufacture of rotor blades

Team player

Thanks to our close and trusting contact with well-known designers, as well as manufacturers of rotor blades and wind turbines, we have background knowledge that goes beyond what is customary in the industry. In this way we can, for example, draw connections between damage, manufacturing errors or problems in the design of rotor blades. This contributes significantly to an optimally adapted repair.

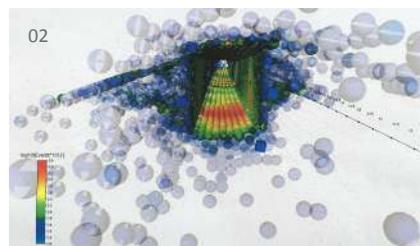
For over 25 years cp.max Rotortechnik has stood for a balanced combination of experience and innovation with consistently excellent quality.

- 01 | With experience, even the biggest damage can be repaired in field
- 02 | We research and develop the most exciting topics in wind energy
- 03 | Rope access is flexible, time-saving and cost effective
- 04 | View from above the clouds



cp.max Rotortechnik GmbH & Co. KG

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Phone	+49 (0)351 85 89 345-0
Fax	+49 (0)351 85 89 345-77
E-Mail	info@cpmax.com
Web	www.cpmax.com
Category	Operation & Service
Profile	Service, maintenance & repair
Employees	60
Founding year	1997



CPC Germania GmbH & Co. KG

The future is in the air.

CPC Germania is ecological and economic progress – planned and realised by pioneers of wind energy. As a medium-sized family business, the Clean Power Company has been building wind energy projects nationally and internationally with passion and expertise since 1993 and PV projects since 2018.



Investment

Our reliable planning and implementation, on-time delivery from site acquisition to commissioning and many years of experience ensure the successful implementation of the joint energy project.

Cooperation

Let us supply the future with green energy in partnership! We use the various competences and resulting synergies to jointly realise even large-scale projects.

Project acquisition

We turn project rights and projects into a lucrative investment at every stage. We are also very interested in existing onshore projects with repowering potential.

Forest, meadow, farmland ...

Our projects are always in the best possible harmony with nature. We take care to minimise land use while maximising revenue for you as the owner and for the project. You can rely on us for fair contracts.

Our own operational management

Our efficient team manages hundreds of megawatts of our existing parks and for third parties, both commercially and technically. Maximum availability and efficiency are a matter of course at CPC.

Careers

It's all about the mix: Young minds and experienced pioneers work together as equals and develop highly efficient projects together. Do you need a breath of fresh air? You are very welcome to join us!

- 01 | Windfarm Lappfjärd in cooperation with Prime Capital (242 MW, 2022-2023)
- 02 | Windfarm Hüseltitz in cooperation with ETE-Windpark (152 MW, 2015-2017)
© orango / Ronny List
- 03 | Photovoltaicfarm Lakari (32 MW, 2024)



CPC Germania GmbH & Co. KG

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Web	www.cpc-germania.com
Category	Planning
Profile	Planers & project developers

ECONOMIC REPORT

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- 56 | Companies with innovative projects ↗
- 68 | Research in Germany ↗
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- 114 | Suppliers ↗
 - 116 | A to H ↗
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268 | Companies A-Z ↗

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Deutsche Windtechnik AG

Independent full scope O&M provider for multibrand WTG technologies on-/offshore

Deutsche Windtechnik is an independent specialist in the technical maintenance of wind turbines. Over 2,200 employees ensure that more than 7,000 wind turbines operate reliably around the clock. Our system technology focusses on Vestas, Siemens, Enercon, Nordex, Senvion, Fuhrländer, Gamesa and GE.



- 01 | Our training courses for system technology take place at the Deutsche Windtechnik Training Center in actual nacelles of wind turbines.
- 02 | More than 650 service teams operate for Deutsche Windtechnik internationally.
- 03 | Deutsche Windtechnik offers the complete service for offshore wind farms as well from foundation, to turbine, to blade, to offshore substation.

Comprehensive expertise, lots of flexibility and more value for lower costs – this and more is what sets apart the quality of our service. With our diverse range of core competencies, we are able to offer the full package of services from a single source. We now service over 7,000 wind turbines as part of permanent maintenance contracts (basic maintenance and full service). Our objectives are to ensure technical systems operation and to carry out our work in the most cost-efficient way possible.

Independent O&M worldwide

Our decentralised service network enables us to move swiftly between the customer, the wind turbine and spare parts warehouses. Our company's head office is based in Bremen, Germany. In addition, Deutsche Windtechnik is also active abroad: locations in Denmark, France, The Netherlands, Poland, Sweden, Taiwan, United Kingdom and the United States provide the foundation for high-quality system maintenance around the world.

Full scope from A to Z

Whether it is the entire wind turbine, the control system, nacelle, rotor or the foundation, from large components to the smallest electronic components, our team of experts understands your wind turbine portfolio and can provide economic benefits from a service point of view. Onshore and offshore.

Our range of services includes:

- Individual, needs-based and modular service offering from the basic service to the full maintenance contract, which also covers external damage including major components.
- Repair and optimization
- Control and power electronics
- Technical engineering, e.g. own development of ADLS system
- Expert appraisals for a range of scenarios
- Offshore operations management
- Repowering
- Development and sale of spare parts

All services are freely combinable.



Deutsche Windtechnik AG

Address	Auf der Muggenburg 2 28217 Bremen
Phone	+49 (0)421 69105 0
Fax	+49 (0)421 69105 499
E-Mail	info@deutsche-windtechnik.com
Web	www.deutsche-windtechnik.com
Category	Operation & Service
Profile	Service, maintenance & repair
Turnover	€ 380 million (in 2023)
Employees	2,200
Founding year	2004



DNV Energy Systems Germany GmbH

Transitioning faster to a deeply decarbonized energy system

As part of the global DNV Group, DNV Energy Systems Germany provides comprehensive expertise and innovative solutions to drive the complex, interdisciplinary transformation of the energy industry.

With 320 highly skilled experts in Germany (5.000 worldwide) in Energy Systems, we support the industry in managing the biggest global transformation of our generation – the transition to sustainable energy.

Our service portfolio

Our services include advisory, monitoring and verification of projects along the entire energy value chain – from planning, generation and production, transmission and distribution to end use.

Operating from our premises in Hamburg, Kaiser-Wilhelm-Koog, Dresden, Oldenburg, Bonn and Berlin-Schönefeld, we are providing expert support in the areas of project development, project engineering and measurement services for onshore and offshore wind turbines, solar energy projects and battery storage systems, covering the entire project life cycle.

Our many years of experience, advanced technical expertise and regulatory understanding enable a unique knowledge transfer which helps our customers to generate energy safely and sustainably:

Feasibility studies

- Market analysis
- Strategic advisory
- Technology evaluation and qualification
- Resource measurements

Planning and development

- Accredited wind measurements with LiDAR according to TR 6



- TR6-compliant calculations of site quality
- Wind and energy yield assessments
- Noise and shadowing assessments
- Measurements on wind turbines (power, loads, acoustics, grid quality)
- LiDAR verification (ground-based, nacelle & scanning)

Engineering

- Project engineering
- Technical due diligence, technical advisory
- Operation and maintenance planning
- Advice and comparison for wind turbine selection
- Verification of grid connection capability
- Compliance with grid connection guidelines

Construction

- Construction optimization
- Project management support
- Construction monitoring
- Owner's engineering
- Lenders' engineering

01 | Transitioning faster to a deeply decarbonized energy system
© Shutterstock

Operation

- Asset management optimization
- Operation and maintenance optimization
- Performance checks (performance curve re-measurement)
- TR6- and TR10-compliant calculations of site quality
- Energy yield assessments
- Due diligence of projects and portfolios
- Life time extension



DNV Energy Systems Germany GmbH

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Phone	+49 (0)40 36149-0
E-Mail	es-germany@dnv.com
Web	www.dnv.com
Category	Finance & Law
Profile	Consulting & business consulting
Employees	320 (Energy Systems Advisory, Germany), ~5.000 (Energy Systems worldwide), ~15.000 (DNV Group)
Founding year	1864 (DNV)

ECONOMIC REPORT

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56 | Companies with innovative projects ↗
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Dolezych GmbH & Co. KG

Simple and safe lifting and transporting.
This is what Dolezych has stood for 90 years.



01

Bigger, more powerful, heavier: the requirements in the wind industry are visibly growing. Dolezych supports the industry with safe solutions for the assembly, transport and maintenance of wind turbines. The wind energy product range includes, for example, textile slings, (special) lifting gear, grabs and lifting points for easy, safe transport and lifting of tower segments, for example. For customer-specific, special challenges, Dolezych offers individualized special designs and load lifting devices.



02

Many heavy-duty products have become significantly lighter thanks to UHMW-PE high-performance fibers. Whether round slings or sling ropes, these high-tech products have other outstanding properties in addition to their lower dead weight. For example, they are low-wear and very compact despite particularly high load capacities.

DoUltra round sling

The UHMW-PE DoUltra round sling has a hard wearing, braided hose. This ensures that it stretches with the load and is therefore less stressed. In addition, the DoUltra hose prevents wrinkling at the suspension point. Together with the smaller support width in the crane hook, both result in a longer service life.

DoTExtreme and DoTExtreme LMT

These textile load slings and grommets, also made of high-performance fibers, achieve weight savings of up to 60 % compared to steel slings or grommets. This ensures easy handling and protects surfaces of sensitive loads.

DoNova® textile chain systems

The back-friendly, feather-light textile chain systems DoNova® (available as sling or lashing chain) enable sensitive loads to be lifted gently and the heaviest transport loads to be secured.

01–04 | Slings and lifting tools for wind energy



03



04

Dolezych
EINFACH SICHER

Dolezych GmbH & Co. KG

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Web	www.dolezych.de
Category	Transport & Logistics
Profile	Construction & Erection
Founding year	1935

DZ BANK AG

Sustainable. Together.

DZ BANK has been a reliable partner for the financing of wind power plants for over 25 years. Together with the companies of the cooperative financial network and the local cooperative banks (Volksbanks Raiffeisenbanks), we offer individual financing solutions.



DZ BANK AG, Frankfurt am Main, is majority-owned by those who work directly with it – the 700 cooperative banks in Germany. As a central bank and central institution, its mandate is to support the business of the many independent cooperative banks in the regions and to strengthen their competitive position. The combination of local customer knowledge and central product expertise has proved to be highly effective.

DZ BANK's range of services extends from traditional and innovative products, structuring, financing and issues, to trading and sales in the equity and bond markets. In addition, as a corporate bank, DZ BANK serves companies and institutions that require a supra-regional banking partner.

DZ BANK also assumes the holding function within the DZ BANK Group. The companies in the DZ BANK Group include R+V Versicherung, Bausparkasse Schwäbisch Hall, Union Investment Group, DZ HYP, DZ PRIVATBANK, TeamBank, VR Smart Finanz and various other specialist institutions.

With its comprehensive range of financial services, the DZ BANK Group supports the cooperative banks in retail banking, corporate banking, capital markets and transaction banking. This enables them to offer their customers a complete range of outstanding financial services.

01 | DZ BANK Renewable Energies



DZ BANK AG

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E-Mail	ee_finanzen@dzbank.de
Web	www.dzbank.com
Category	Finance & Law
Profile	Banks, financial institutions & financial service providers
Employees	5,560

ECONOMIC REPORT

8 | FOCUS REPOWERING ↗

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EDPR Deutschland GmbH

WE CHOOSE EARTH

EDP is a leading global producer of wind and solar energy and provider of innovative technology solutions. We have been active in the sector for more than 16 years and are present in four global regions: Europe, North America, South America and Asia. EDP Renewables (EDPR) is a division of EDP.



01



02



03

- 01 | Cruz de Hierro Hybridpark Spain
- 02 | Monte de Vez hybrid park Portugal
- 03 | Sabugal Hybridpark Portugal

With 16,6 GW deployed across multiple technologies and a € 12 billion investment plan up to 2026, our business encompasses onshore wind, distributed and large-scale solar, offshore wind and complementary technologies to renewables, such as hybridization. In Germany, we have the ambition to install 0.5 GW of Solar until 2026, which represents an investment of around 300M€ and in wind we aim to develop ~100/MW year at the end of the decade.

Onshore: From planning to operation of wind farms

EDPR develops, builds and operates top quality onshore wind farms capable of transforming kinetic energy from the wind into electricity that is sent to the distribution network. As of 2024 first semester, 88 % of our global energy generation (18.9 TWh) and 76 % of our total installed capacity (16.6 GW) came from onshore wind.

Leading the way with offshore wind technology

Offshore farms play an important role in

EDPR's business, through Ocean Winds, a joint-venture developed with Engie to accelerate offshore projects worldwide. In 2024, some of OW's most important projects in development reached important milestones, such as the first power delivered to the British Grid by the Moray West project.

Wind energy optimization through hybrid systems

EDPR boosts efforts to offer sustainable energy solutions that meet customers' increasing needs to balance energy supply with grid demand. By connecting the solar plant to an existing wind farm, EDPR capitalizes on the use of pre-existing infrastructure to maximize clean energy production, addressing one of the key challenges in renewable development across Europe.

EDPR has also become the first company to operate wind-solar hybrid projects in Spain, Portugal, and Poland.



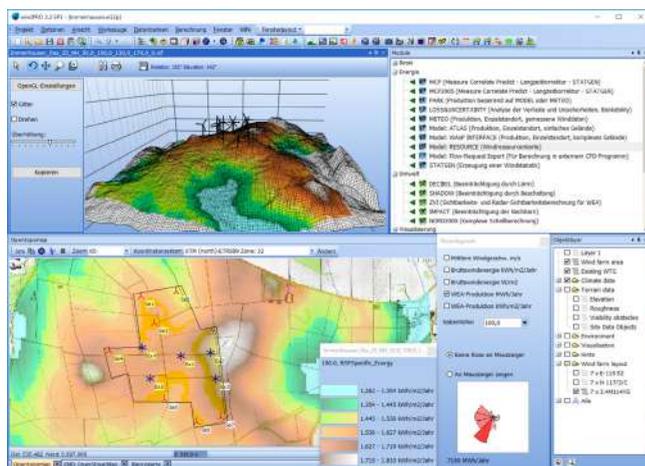
EDPR Deutschland GmbH

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E-Mail	communication_edpr@edpr.com
Web	www.edpr.com
Category	Planning
Profile	Planers & project developers
Founding year	2022

EMD Deutschland GbR

windPRO, energyPRO – Training and Support

EMD Deutschland is the exclusive sales agency and training provider of EMD International A/S for central Europe, the balkan states and the German speaking countries.



02 03



01

windPRO

windPRO – software for wind energy project design and planning

windPRO is a module-based software package suited for project design and planning of wind farms and photovoltaic power plants. windPRO covers different areas, from energy yield calculations via wind data analysis, performance checking and environmental impact calculations to grid connection calculation. With its integrated online data services, a user friendly interface and continuous development to integrate new research and knowledge, it is now the world leading software for wind energy project design. windPRO is used by project developers, independent experts, WTG manufacturers, grid operators, banks, authorities and others.



01

energyPRO

energyPRO – software for the simulation of distributed energy systems

energyPRO is the most advanced and flexible modelling software for combined techno-economic optimisation and analysis of a variety of heat, CHP, process and cooling related energy projects. In energyPRO you can model virtually any type of technologies from well-known, fossil fuel based production units to state-of-the-art renewables.

- 01 | Our software for decentral energy systems, PV plants and wind farms
- 02 | Wind resource mapping in windPRO
- 03 | Photorealistic visualisation for PV plants and wind farms



EMD Deutschland GbR

Address	Breitscheidstrasse 6 34119 Kassel
Phone	+49 (0)561 31059-60
Fax	+49 (0)561 31059-69
E-Mail	sales-de@emd.dk
Web	www.emd.dk
Category	Other services
Profile	Software solutions
Turnover	> € 5 million (EMD Int. A/S)
Employees	10 (EMD Deutschland) (Wind energy: 6)
Founding year	1999

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EnBW Energie Baden-Württemberg AG

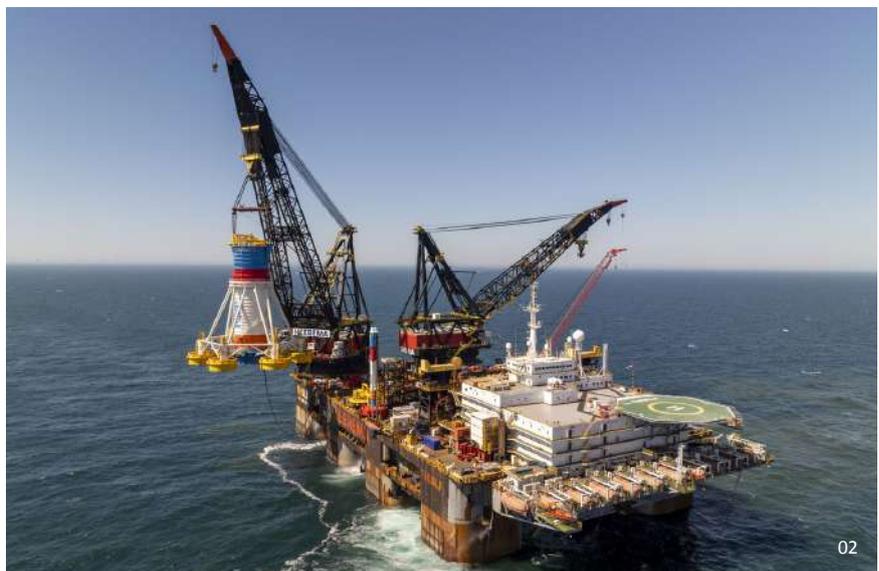
Full wind power ahead.

EnBW Energie Baden-Württemberg AG is driving forward the expansion of renewable energies, particularly in the area of wind power, with the aim of achieving a capacity of 4,000 MW by 2025.



01

01 | With 24 plants, the Buchholz wind farm in Lower Saxony is one of EnBW's largest. © EnBW/Paul Langrock



02

By 2025, EnBW is planning a wind power capacity – offshore and onshore – of 4,000 MW. The offshore wind farm “He Dreiht” with 960 MW is to be connected to the grid without state subsidies by 2025. With the Gundelsheim energy park, EnBW is realising another forward-looking project that generates electricity from solar and wind energy and has a battery storage system. The solar park will generate 60.5 MW and the wind park with two wind turbines 11.2 MW. The battery storage system enables flexible grid feed-in and optimises energy use.

02 | Floating crane Thialf in the construction field of “He Dreiht”: Start of construction for Germany's largest offshore wind farm “He Dreiht” in the North Sea with 960 megawatts © EnBW/Weltenangler

The EnBW – your partner for the expansion of wind power

With around 28,000 employees, EnBW Energie Baden-Württemberg AG is one of the largest energy companies in Germany and Europe. It supplies around 5.5 million customers with electricity, gas, water as well as services and products in the areas of infrastructure and energy. As part of its strategic realignment to become a sustainable infrastructure company, EnBW is investing around € 14 billion in the energy transition between 2023 and 2025 with the aim of sourcing more than half of its generation portfolio from renewable energies by 2025 and phasing out coal by 2028. The aim is to achieve climate neutrality by 2035.



EnBW Energie Baden-Württemberg AG

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Phone	+49 (0)711 289 487 87
E-Mail	windkraft@enbw.com
Web	www.enbw.com/windkraft
Category	Energy services
Profile	Energy supplier
Turnover	€ 44 billion (12.2023)
Employees	28,000 (12.2023)
Founding year	1997

enercity Erneuerbare GmbH

Full wind ahead – for 100 % renewable energy!

It is not renewables that are in short supply, but time. We are driving forward the energy transition by opening up suitable sites for onshore wind and ground-mounted photovoltaics (PV).

We develop and operate large-scale onshore wind projects and free-standing PV installations, implementing also difficult projects at unusual locations, such as the construction of wind farms on disused open-cast mining sites which is one of our specialities. In these projects, partnership-based collaboration is our highest priority.

Project development

From property to yield star! We tap into local potential, always in close cooperation with citizens, landowners and local authorities. When planning energy parks, we attach great importance to cooperation from the outset and focus on transparency and fairness so that all parties involved benefit from the smooth and efficient development of the project.

Operational management

After the energy park has been commissioned, you can expect qualified and personalised support from our technical and commercial operational management team. Our own and operationally managed wind farm portfolio comprises over 443 wind turbines with a nominal output of more than 1,000 MW. Optimise your long-term energy yields with us!



With our 25 years of experience, we are the ideal partner for you. Our services include:

- Site selection, assessment, and acquisition
- Planning and approval
- Construction and commissioning
- Repowering
- Accounting, controlling, finance, and contract management.
- Insurance and claims management.
- Energy management, 24/7 remote monitoring, and on-site service
- Technical management, reporting and monitoring in compliance with the German Federal Immissions Act (BImSchG)

enercity Erneuerbare GmbH is a wholly owned subsidiary of enercity AG.



enercity
erneuerbare

enercity Erneuerbare GmbH

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Web	www.enercity-erneuerbare.de
Category	Planning
Profile	Planers & project developers

ECONOMIC REPORT

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268 | Companies A–Z ↗

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01 | We plan and operate wind power and photovoltaic farms to bring about a rapid energy transition in Germany.

02 | enercity Erneuerbare's wind farm power production control room on a Vestas V117 MK3 at Schipkau wind farm.

03 | Ten Nordex N-149 turbines from the Tiefenriede wind farm went into operation in 2024.

Energiequelle GmbH

Energy transition? We're doing it.

Energiequelle GmbH has been active in the renewable energies market since 1997. We are an industry leading company with over 600 employees in six countries.



An experienced full-service provider

We have been implementing renewable energy projects for more than 25 years. We develop, build, and operate wind energy and photovoltaic plants, transformer stations, and energy storage systems at our 28 locations in Germany, France, Finland, Poland, Greece and South Africa. We also develop innovative energy supply solutions, repower older facilities and supply our customers with sustainably produced green electricity via our subsidiary eqSTROM.

We manage the electrical, technical, and commercial aspects of over 800 power production facilities. Our customers attest

to our excellent customer service performance and praise our high level of customer friendliness, accessibility, and constant reliability.

In terms of funding and sales, we maintain long-term, collaborative relationships with plant manufacturers, credit institutions, and investors, the result of which are innovative and bespoke funding solutions for our domestic and overseas customers.

Collaboration and project purchasing

In addition to maintaining existing project development partnerships, we place great importance on continuously expanding our partner portfolio with a view to

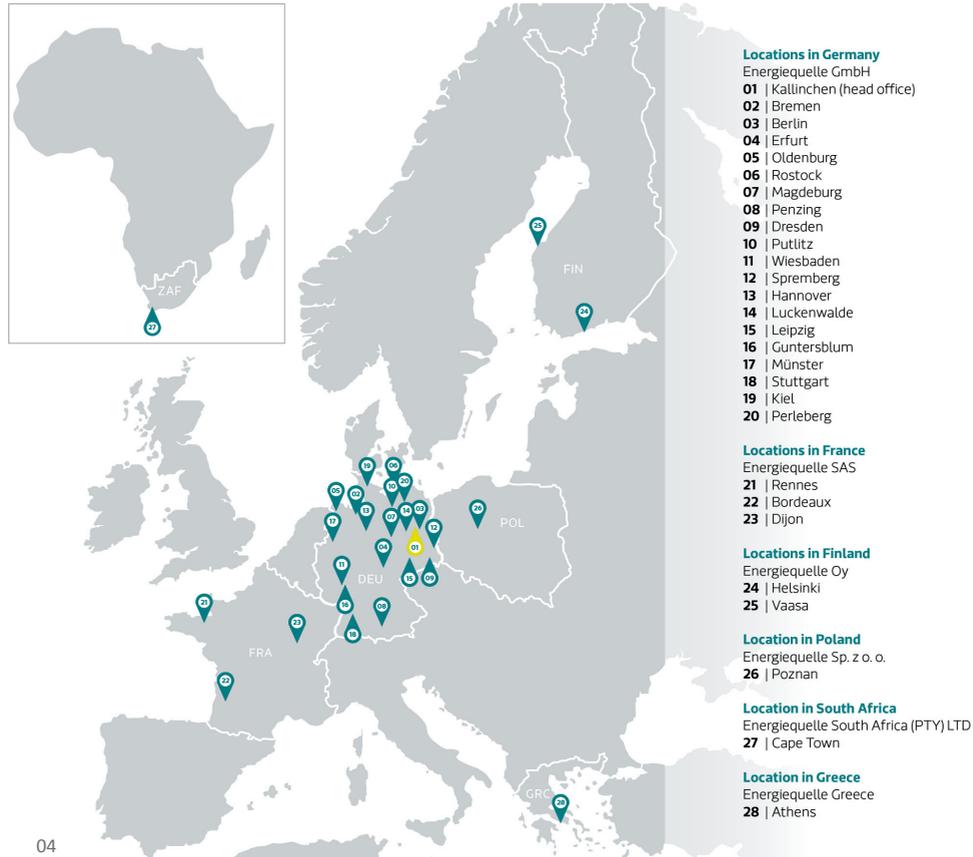
pooling our expertise and collaboratively driving projects forward. We are happy to bid on national projects as well as foreign rights packages at any stage.

New business unit for innovative energy concepts

Our business development team is working on the extension of our energy source portfolio, which includes self-supply solutions for industrial and commercial clients in the electricity, heating, and mobility sectors, as well as the implementation of power-to-X projects.



03



04

References

To date we have installed over 1.700 MW of power generation capacity. We have also built and are operating a 10 MW lithium-ion storage system and a power-to-heat system in Feldheim, an energy self-sufficient village in Germany. We currently have a power plant under construction in Lusatia for the production, utilisation, storage, and reconversion of hydrogen.

Personal, fair, and down-to-earth

Our corporate philosophy has remained unchanged since the company was founded. Notwithstanding the strong growth we have experienced, we remain a family-owned company and cultivate personal interactions both with our partners and among ourselves. It is important to us to work on an equal footing in a mutually honest and fair manner and to be reliable at all times. It is this that binds us together in our shared mission.

- 01 | New wind farm in Lumivaara, Finland
- 02 | Energiequelle employee
- 03 | Installation of a new wind energy plant at Feldheim wind farm
- 04 | Locations of Energiequelle
- 05 | Installation of rotor blades at Feldheim wind farm

Business areas

- Wind power
- Photovoltaics
- Biogas
- Grid connection
- Energy storage
- Electricity sales and distribution
- Innovative energy concepts

Services

- Project development
- Management
- Financing & sales
- Repowering
- Project purchasing & collaborations



05

energiequelle
TOMORROW'S ENERGY.

Energiequelle GmbH

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Category	Planning
Profile	Planers & project developers
Turnover	ca. € 213 million
Employees	450
Founding year	1997

ECONOMIC REPORT

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ENERTRAG SE

One energy ahead

We develop, build and operate energy solutions with wind, photovoltaics and green hydrogen to drive forward the energy transition worldwide – and completely replace fossil fuels in the energy supply. So that the earth remains liveable.



With our own plants, we generate around 2,000 gigawatt hours of electricity from wind and solar power every year and have been producing green hydrogen since 2011. On this basis, we are developing energy projects with a capacity of over 15 gigawatts – in nine countries on four continents. ENERTRAG stands for the global energy supply of the future: sustainable, secure, regionally anchored.

ENERTRAG Verbundkraftwerk®

The ENERTRAG Verbundkraftwerk® can completely replace large, conventional power plants. It produces electricity from wind and solar energy as well as green hydrogen and heat. The electricity produced

is not only fed directly into the European grid, but is also linked to electricity and heat storage facilities as well as plants for hydrogen reconversion. In this way, the ENERTRAG Verbundkraftwerk® supplies renewable energy in line with demand and in a predictable manner. Further information on the ENERTRAG Verbundkraftwerk can be found here in the industry report, in the Innovative Projects section.

ENERTRAG Projects

From the idea to energy generation: As an experienced project developer, operator and technical system optimiser, we have comprehensive knowledge along the entire value chain of a project – for both new

and repowering projects. We take a holistic approach: we combine wind power and photovoltaics with green hydrogen and innovative technologies and utilise them reliably and cost-effectively in the form of electricity, gas and heat. Measures to protect species and nature, broad public participation and fair ownership agreements are also part of our recipe for success.

ENERTRAG Operations

When things need to run like clockwork: ENERTRAG ensures the smooth operation of renewable energy plants. We operate 1,100 wind turbines of various types from six European locations. Technical operations management offers customised service packages for wind energy as well as for photovoltaics, hydrogen, battery storage, substations and P2X projects. Always in view: transparent reporting and ongoing yield optimisation. Based on accredited procedures, the teams also carry out more than 4,150 inspections every year – whether by special drone as part of lightning protection measurements or machine and safety inspections.

ENERTRAG Software

We let data speak for itself: With the ENERTRAG Powersystem, we have developed a platform for networking renewable energy systems and optimising their operational management. Operators, asset managers and direct marketers use the software for precise billing, remote control in real time and the monitoring of authorisation requirements. The software automates recurring processes, identifies weak points and indicates potential for improvement.



02



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01 | ENERTRAG wind turbine in Brandenburg/
Germany

© ENERTRAG/Jewgeni Roppel

02 | ENERTRAG Operation: 2-in-1 drone inspections incl. lightning protection measurement
© ENERTRAG/Silke Reents

03 | ENERTRAG Service: Customized maintenance and servicing
© ENERTRAG/Silke Reents

04 | ENERTRAG Software: The POWERSYSTEM networks systems and optimizes their operational management.
© ENERTRAG/Jewgeni Roppel

05 | Wind and PV systems Brandenburg/Germany
© ENERTRAG/Jewgeni Roppel

06 | ENERTRAG Technology: The transponder system from Dark Sky
© ENERTRAG/Dark Sky



06

ENERTRAG Service

It's moving forward: reliable maintenance and servicing is essential to ensure that the turbines run consistently and profitably. ENERTRAG provides customised, manufacturer-independent support for wind turbines from 16 service stations in Germany and from bases in France and South Africa. We repair and debug, test materials non-destructively, replace spare parts and even large components worldwide and take care of the environmentally friendly dismantling of turbines.

ENERTRAG Technology

Perfect timing: ENERTRAG provides innovative fuelling concepts for wind turbines with "procandela". "DARK SKY®" enables demand-controlled night-time signalling, which is only activated when an aircraft is approaching. This reduces light emissions by up to 95 per cent and increases the acceptance of wind energy.



ENERTRAG SE

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Web	enertrag.com
Category	Planning
Profile	Planers & project developers
Employees	more than 1.000
Founding year	1998

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8 | FOCUS REPOWERING ↗

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ENGIE Deutschland Erneuerbare GmbH

ENGIE – Your reliable and long-term partner for renewable energies

Planning, construction and operation of wind power and photovoltaic systems as well as direct marketing, PPAs and battery storage systems (BESS)



We develop and operate wind power and ground-mounted photovoltaic systems and market the electricity generated. In a partnership, you benefit from the global expertise of the ENGIE Group.

Over 5,100 ENGIE employees in the Renewables division are committed to accelerating the climate transition. The pioneering spirit that we have retained since the company was founded in 1858 to build the SUEZ canal helps us to do this. Today, our mission is to realise the energy transition. To achieve this, we are focussing on photovoltaics, onshore and offshore

wind and hydropower. We are continuously expanding our renewable generation activities and offer green energy solutions for companies and local authorities.

Reliable partner for renewable energies

In Germany, we are an established partner for renewable energies and operate 18 wind farms with around 300 MW, among other things. We combine our experience from decades of partnerships with local energy suppliers with the comprehensive technical and commercial expertise and know-how of the ENGIE Group to optimise the use of each site.

When it comes to renewable projects, we take care of everything, from site acquisition to planning, permits, construction and operation of the plants through to the marketing of the energy generated. By getting involved in projects at an early stage, we can achieve optimised conditions for development and procurement and minimise risks. We are also open to investment partnerships. To increase the acceptance of renewable energies locally, we offer flexibly customisable models for citizen participation.

Direct marketing and PPA

As one of the largest electricity market participants, we at ENGIE in Germany have concluded 2 GW of direct marketing for wind and solar and 1.5 GW of upstream PPAs in 2024. Our central trading platform in Brussels is staffed around the clock and has access to all European electricity markets, from forwards to the intraday market.

We offer individually designed models for plant operators who want to optimise the income from their wind farms, gain long-term planning security and meet the legal requirements:

- Direct marketing
- Short-term PPAs for post-EEG plants
- Long-term PPAs for new plants without subsidisation
- PPAs for subsidised plants

By combining battery energy storage systems (BESS) with renewable energy projects, we help to stabilise the grid



02



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and open up a wide range of benefits for our customers. Investors and developers have the opportunity to fix the level of expected revenues through our marketing models with a fixed price component for more investment security in a dynamic market environment.

Do you have any questions?

Please do not hesitate to contact us:
Nikolaus Kraus for Business Development
 n.kraus@engie.com

Tobias Heyen for PPA and direct marketing
 tobias.heyen@engie.com

Our goals for renewable energies

- 2023 | 41.4 GW of installed renewable capacity, of which 14.3 GW onshore wind
- 2023 | Operation of > 1 GW of battery storage worldwide, marketing together with customer systems.
- 2030 | 80 GW of installed renewable capacity
- 2030 | 10 GW of battery storage capacity
- 2035 | 4 GW of production capacity for green hydrogen

- 01 | Operational management
© ENGIE / Jan Potente
- 02 | Construction site
© ENGIE / Guido Kollmeier
- 03 | Karstädt wind farm
- 04 | ENGIE Trading Floor



04



ENGIE Deutschland Erneuerbare GmbH

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Category	Energy services
Profile	Energy supplier

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FGH – Research Association for Power Systems and Power Economics

Secure grid integration – knowledge, research & network since 1921

The safe and successful grid integration of power generating facilities and their planning, testing and conformity assessment regarding their grid code compliance are among our core competencies.



01 | Accredited certification and type testing
 02 | Experts for grid code compliance
 03 | One FGH – four core competencies
 04 | Reliable grid integration of all technologies
 Photos: stock.adobe.com



Benefit from FGH's many years of experience and expertise in four lines of competence:

1. Power Systems Technologies

We specialize in the standard-compliant design, installation, and testing of power generating facilities and technical equipment. Our customers benefit from services such as grid connection studies, cable dimensioning, control concepts, electrical design planning, due diligence analyses, grid code analyses, simulation models. We also support them in proving grid code compliance – nationally and internationally.

2. Testing & Certification

With our accredited testing laboratory, we offer conformity declarations and type testing for power generating plants and for components of protection and control devices as well as for following certification of power generation units or plants and storage systems in accordance with national and international grid codes, e.g. VDE-AR-N 4110/4120, RfG and EN 50549. Our independent certification body is the world's first accredited and leading institution for grid connection certification.

3. Electrical Grids

We are actively shaping the successful transformation of power grids as part of the energy transition. Through research projects, software tools such as INTEGRAL, InterAss or solutions for redispatch optimization as well as comprehensive grid and system studies, we effectively and efficiently support the work of German and European transmission and distribution grid operators.

4. Academy

With our multifaceted practice-oriented training program, the Academy rounds off our service portfolio.



FGH – Research Association for Power Systems and Power Economics

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Fax	+49 (0)621 976807-70
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Web	www.fgh-ma.de/en
Category	Planning
Profile	Grids & grid connection
Turnover	€ 17,3 million (consolidated)
Employees	135
Founding year	1921



GAIA mbH

Your partner for a sustainable future: 25 years of commitment to the energy transition

Founded in 1999 by Torsten Szielasko and Michael Wahl, GAIA mbH has established itself as a leading planner for wind energy and photovoltaic projects in Rhineland-Palatinate. GAIA currently employs 75 dedicated employees and plans to increase this number further.

The name GAIA, inspired by Greek mythology, reflects our deep connection with the earth and our goal of utilising its resources sustainably.

Our passion and our approach:

GAIA mbH offers a comprehensive range of services for all phases of project development. We support you from site acquisition and planning, through authorisations and component purchasing, to construction and commissioning. Once a project has been completed, we take over the operational management of wind and photovoltaic systems. Our experienced team ensures the realisation of demanding projects with the highest quality and efficiency.

Visions and milestones:

We strive for a world in which energy is 100 % renewable. Since our foundation, we have successfully realised numerous wind energy and photovoltaic projects. We are currently erecting a latest-generation wind turbine in Mainz, a Vestas V162 turbine with 6.2 megawatts and a height of 250 metres. We are also planning three solar parks with a total output of 20 megawatts in the municipality of Leiningerland (Rhineland-Palatinate).

Overarching approach – your benefits:

Our “everything from a single source” approach bundles all processes and services so that we can react flexibly to new requirements. We offer comprehensive project management from concept to handover and develop customised strategies to ensure the success of your project.



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Innovative solutions and individual support:

We use GIS-based analyses to identify project potential and determine the ideal site configuration. Precise project audits help us to identify risks at an early stage and optimise construction costs.

Shaping the energy transition together – our goal:

GAIA mbH continuously strives to drive the energy transition forward. Through innovative technologies, new projects and partnerships, we are committed to making it a reality.

01 | Wind turbine at the Hangen-Weisheim wind farm, Rhineland-Palatinate

02 | Solar park in Obrigheim, Rhineland-Palatinate

03 | Wind turbine at the Alzey-Heimersheim wind farm, Rhineland-Palatinate

04 | Construction of a wind turbine at the Mainz-Hechtsheim wind farm, Rhineland-Palatinate



GAIA mbH

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Web	www.gaia-mbh.de
Category	Planning
Profile	Planners & project developers
Employees	75 (Wind energy: 30)
Founding year	1999

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Goldhofer Aktiengesellschaft

MADE FOR YOUR MISSION.

With a strong tradition and a clear focus on innovation and quality, Goldhofer AG is an indispensable partner for the wind energy industry and ready to meet the challenges of tomorrow.



01

heavy-duty module combinations, which ensure safe transportation of the high-quality and technically sensitive components.

The tower segments of wind turbines pose a particular challenge due to their enormous dimensions. Goldhofer uses self-propelled vehicles for internal journeys and low-loader trailers or heavy-duty module combinations for road transport to keep the overall height as low as possible.



02

- 01 | RA 3 for tower segments
- 02 | "BLADES" self-trailing transport system
- 03 | Goldhofer FTV 850 in action

Goldhofer AG is a leading company in the field of heavy-duty and special transportation. With over 800 employees and a turnover of around 230 million euros, Goldhofer has established itself as a global player.

Goldhofer's FTV 850 takes account of the progressive development of wind turbines. This is capable of accommodating even the largest rotor blades and has already proven itself hundreds of times in practice when transporting the latest generations of rotor blades.

With a strong tradition and a clear focus on innovation and quality, Goldhofer AG is an indispensable partner for the wind energy industry and is ready to master the challenges of tomorrow.

In the wind energy sector, Goldhofer offers innovative transportation solutions for all wind turbine components. The company masters the challenges of transporting extremely long and sensitive rotor blades with extremely flexible transport systems. These are specially designed for difficult passages such as narrow mountain roads, urban journeys or forest sections.

Goldhofer offers various vehicle types for the transportation of hubs, nacelles, generators and transformers. These include variable low-loader trailers and



03



Goldhofer Aktiengesellschaft

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Phone	+49 (0)833 115 0
Fax	+49 (0)833 115 239
E-Mail	info@goldhofer.com
Web	www.goldhofer.com
Category	Transport & Logistics
Profile	Transport companies
Founding year	1999

GP JOULE GmbH

100 % renewable energies for all!

GP JOULE produces and markets wind and solar power, green hydrogen and district heating and uses the energy where it is most effective: in the mobility sector, in domestic households, and in the industrial sector. From its base in Germany, GP JOULE has been shaping Europe's future energy system since 2009.



01



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Using their knowledge and experience with RE projects, two agricultural engineers, Heinrich Gärtner and Ove Petersen, decided to found a company in 2009 and to name it after their initials: GP JOULE.

Their vision is to supply the industrial and transport sectors and the rest of society with energy from 100 % renewable sources. Their approach is based on respect for all partners and a sense of responsibility towards the environment and future generations.

It was with these values in mind that GP JOULE was launched. As early as 2010, they had already installed solar and biogas facilities with a combined capacity in excess of 100 MW. In 2011, the largest solar park in Germany at the time was built on the spoil heap of a former open-cast lignite mine and had a total output of 140 MW, of which GP JOULE was responsible for the installation of 70 MW. New green energy is replacing legacy energy.

GP JOULE entered the green hydrogen business in 2012, the same year in which the first wind farm planned by GP JOULE was connected to the national grid and the first GP JOULE solar farms began operations in Italy and France. And the trend continued: GP JOULE expanded into Canada and the USA, and later into Ireland and Italy, where they also planned, designed, and installed solar parks. The green revolution is everywhere.

And GP JOULE did not stop there: a separate division known as CONNECT was founded to focus on e-mobility and charging solutions, a revolutionary hydrogen project called eFarm was pushed forward (and was awarded the German Mobility Prize in 2022), and GP JOULE is currently involved in one of the largest solar parks in Germany in Klettwitz in the Lusatia region, on another former lignite mining site, but this one will produce an impressive 300 megawatts.



04

01 | GP JOULE SERVICE
02 + 03 | GP JOULE
04 | GP JOULE PROJECTS

GP JOULE
TRUST YOUR ENERGY.

GP JOULE GmbH

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Fax	+49 (0)4671 6074-199
E-Mail	info@gp-joule.de
Web	www.gp-joule.com/en
Category	Planning
Profile	Planers & project developers
Founding year	2009

ECONOMIC REPORT

8 | FOCUS REPOWERING ↗

COMPANIES

30 | The top employers in the industry ↗
56 | Companies with innovative projects ↗
68 | Research in Germany ↗
78 | Start-ups ↗
104 | Manufacturers ↗
114 | Suppliers ↗
116 | A to H ↗
130 | I to P ↗
136 | Q to Z ↗
144 | Service and logistics ↗
146 | A to H ↗
178 | I to P ↗
192 | Q to Z ↗
228 | Associations ↗

INDUSTRY DIRECTORY

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greenwind Group

greenwind Group: From Planning to Power!

From our point of view, everything can happen much faster. The future starts now!
greenwind has set itself up dynamically for the coming years: From Planning to Power!
With the power of the wind and the sun!



01

Project development: guarantor in all phases

In project development, greenwind is on a steep upward trajectory. In the wind sector alone, 15 projects are in the starting blocks for 2025. Partnerships at eye level make us flexible. For example, we have expanded our portfolio in the area of hybrid parks through our cooperation with dHb Solarsysteme. We are planning electrolyzers in the TH2ECO hydrogen project in Thuringia. Our range of services covers all planning and approval phases for wind energy and photovoltaic projects: from site identification, layout planning and the approval process to financing, grid connection and commissioning.

Realisation through to grid connection

The turnkey realisation of renewable energy projects includes construction, commissioning and timely grid connection. Our task is to implement this in accordance with all legal regulations under the Renewable Energy Sources Act (EEG), in line with the requirements of the grid operators, manufacturers and operators, as well as with regard to future grid concepts.

Technical operations management

Smooth and reliable – this is also the credo of our specialists in the field of technical operations management for wind and photovoltaic generation units, substations and storage systems. Our European portfolio comprises an output of around 750 MW and 360 plants from various manufacturers. On request, we



02



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03

can assume responsibility for system operation in accordance with DIN VDE 0105-100.

Speciality: Rotor dynamics

Our engineering services are worthwhile. Investing in professional, periodic balancing of the rotors of onshore and offshore wind turbines over the entire service life saves many times the costs that would otherwise be incurred due to unbalance-related damage and loss of yield. Our focus: balancing, blade angle measurements, customised measurement campaigns, expert reports and consulting.

Sector coupling

Our goal is efficient sector coupling, in which green electricity is made available for other sectors. We plan and build hydrogen (H₂) electrolysis plants as part of an H₂ ecosystem. We create energy supply concepts for the supply of 100% renewables. And we support municipalities and cities in the processing of municipal heat planning.

24/7 monitoring on- and offshore

Our greenwind control room specialises in 24/7 monitoring of wind turbines, substations, cable systems and offshore platforms, certified according to ISO 9001, ISO 45001. We coordinate all necessary logins and logouts, document them seamlessly and identify weak points. We can process a large number of fault and error messages remotely, without the need for an on-site service team.

Financial management

Financial management at greenwind means guaranteeing continuous financial flow and eliminating all disruptive factors and unnecessary costs. We take care of contract management, claim management and liquidity planning and monitoring, among other things, to ensure that your asset is optimally taken care of. greenwind is also a competent partner when it comes to managing the commercial aspects of renewable energy parks.



04

New website

Visit the greenwind universe – all services, attractive jobs, selected projects, direct contacts and more knowledge:

www.greenwindgroup.de



05



greenwind Group

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E-Mail	info@greenwindgroup.de
Web	www.greenwindgroup.de
Category	Operation & Service
Profile	Technical & commercial operational management
Employees	< 100
Founding year	2011

- 01 | The turnkey realisation of wind farms includes turbine selection as well as construction, commissioning and, last but not least, grid connection.
- 02 | Our experienced team is happy to work with proven partners and local companies in the realisation process.
- 03 | Our technical management specialises in wind turbines from various manufacturers – and in transformer stations, storage systems and photovoltaic parks.

- 04 | Wind and sun – a perfect combination. We develop and realise renewable energy systems, including photovoltaic, green hydrogen and heat projects.
- 05 | Co-operation for the benefit of all parties involved – for greenwind, this is the magic formula for successful project development. Fair and transparent.
© Photo: Pablo Castagnola
- 06 | We have been operating independently and owner-managed for the German and European market since 2011. So that an infinite amount of electricity can be generated with the power of the wind and the sun
© Grafik: HELDISCH

ECONOMIC REPORT

8 | FOCUS REPOWERING ↗

COMPANIES

- 30 | The top employers in the industry ↗
- 56 | Companies with innovative projects ↗
- 68 | Research in Germany ↗
- 78 | Start-ups ↗
- 104 | Manufacturers ↗
- 114 | Suppliers ↗
- 116 | A to H ↗
- 130 | I to P ↗
- 136 | Q to Z ↗
- 144 | Service and logistics ↗
- 146 | A to H ↗
- 178 | I to P ↗
- 192 | Q to Z ↗
- 228 | Associations ↗

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- 236 | All addresses of leading companies ↗
- 238 | Direct marketing ↗
- 239 | Education & training ↗
- 240 | Energy services ↗
- 240 | Finance & law ↗
- 243 | Foundations & footings ↗
- 243 | Inspection, measurement, evaluators ↗
- 247 | Manufacturers ↗
- 248 | Operation & service ↗
- 252 | Organisations & public institutions ↗
- 252 | Other services ↗
- 254 | Planning ↗
- 259 | Rotor blades ↗
- 259 | Sector Coupling ↗
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- 265 | Transport & logistics ↗
- 268 | Companies A–Z ↗
- 275 | Category overview ↗

Hamburg Messe und Congress GmbH

The global on & offshore event

WindEnergy Hamburg 2026 is the global meeting point for the wind industry. From September 22 to 25, the sector gathers in Hamburg to showcase innovations and trends.



- 01 | The next WindEnergy Hamburg will take place from September 22 to 25, 2026.
© Hamburg Messe und Congress / Michael Zapf
- 02 | Every two years, the dynamic wind energy industry convenes at the world's leading networking hub
© Hamburg Messe und Congress / Rene Zieger
- 03 | The exhibition offers attendees an excellent opportunity to explore current trends and developments in wind energy
© Hamburg Messe und Congress / Nicolas Maack

Every two years, the dynamic wind energy industry convenes at the world's leading networking hub: WindEnergy Hamburg. In 2024, over 1,500 companies from more than 40 countries presented their latest innovations and solutions across ten exhibition halls. Around 40,000 participants from 100 nations gained a comprehensive overview of the latest developments and trends in the industry, both onshore and offshore.

The event covers the full spectrum of the wind energy industry, from production to operation, and new technologies to services. The program is complemented by inspiring conferences and networking opportunities, fostering exchange among industry experts.

WindEnergy Hamburg 2026 is more than just an exhibition – it's an experience that attracts professionals and enthusiasts alike. Hamburg will once again become the central meeting point for the international wind energy industry from September 22 to 25, 2026.



Hamburg Messe und Congress GmbH

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Fax	+49 (0)40 3569-692263
E-Mail	info@windenergyhamburg.com
Web	www.windenergyhamburg.com
Category	Other services
Profile	Trade fairs & conferences for the wind energy industry
Employees	300+
Founding year	1972

From September 22 to 25, 2026, Hamburg will once again transform into the focal point of the international wind energy community. Companies from around the world will showcase their latest innovations and share their expertise.

The exhibition offers attendees an excellent opportunity to explore current trends and developments in wind energy.

For the latest information, visit windenergyhamburg.com, LinkedIn and Instagram.

in.power Services GmbH

Pioneers of direct marketing – experienced. innovative. independent.

The in.power group provides a wide range of services: direct marketing, continued operation, flexible marketing, green energy balancing, metering point operation, regional green power products etc.

As one of the first companies in Germany, the Mainz-based **in.power** group has been involved in the direct marketing of renewable and environmentally friendly energies since 2006. in.power is part of the Second Foundation Group from Prague, which supports in.power's energy trading with its innovative trading system.

In addition to the traditional **direct marketing** of renewable energy and CHP facilities, in.power offers innovative solutions for the **Ü20 continued operation** of wind power and pv plants. The transparent open-book model enables operators to fully participate in the market, with the option of providing end customers with regional green electricity products wherever possible. Our portfolio also includes fixed-price products.

Other business areas include **flexibility marketing** based on battery storage and **green energy balancing** for the decarbonisation of industrial electricity.



in.power offers numerous services related to direct marketing via its subsidiaries.

in.power metering GmbH, for example, is an independent metering point operator. In addition to online metering and a dedicated Internet portal that enables operators to view all relevant metering and revenue variables for each facility, this service also includes the implementation of remote-control facilities.

Our subsidiary **grün.power GmbH** supplies end users throughout Germany with **regional green electricity** in conjunction with full power supply from solar, wind, and hydro facilities. Large corporations and utilities can also purchase this green electricity via in.power for their procurement portfolios. As a joint venture platform, **in.power network GmbH** can provide partners (from 200 MW onwards) with a comprehensive set of services and direct market access based on a partnership model.

01 | www.inpower.de

02 | Josef Werum (left), Matthias Roth-Oldenbourg (right), Managing Directors and Founders of the in.power-Group

in.power

in.power Services GmbH

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Web	www.inpower.de
Category	Direct marketing
Profile	Direct marketers
Employees	ca. 15
Founding year	2006



ECONOMIC REPORT

8 | FOCUS REPOWERING ↗

COMPANIES

- 30 | The top employers in the industry ↗
- 56 | Companies with innovative projects ↗
- 68 | Research in Germany ↗
- 78 | Start-ups ↗
- 104 | Manufacturers ↗
- 114 | Suppliers ↗
 - 116 | A to H ↗
 - 130 | I to P ↗
 - 136 | Q to Z ↗
- 144 | Service and logistics ↗
 - 146 | A to H ↗
 - 178 | I to P ↗
 - 192 | Q to Z ↗
- 228 | Associations ↗

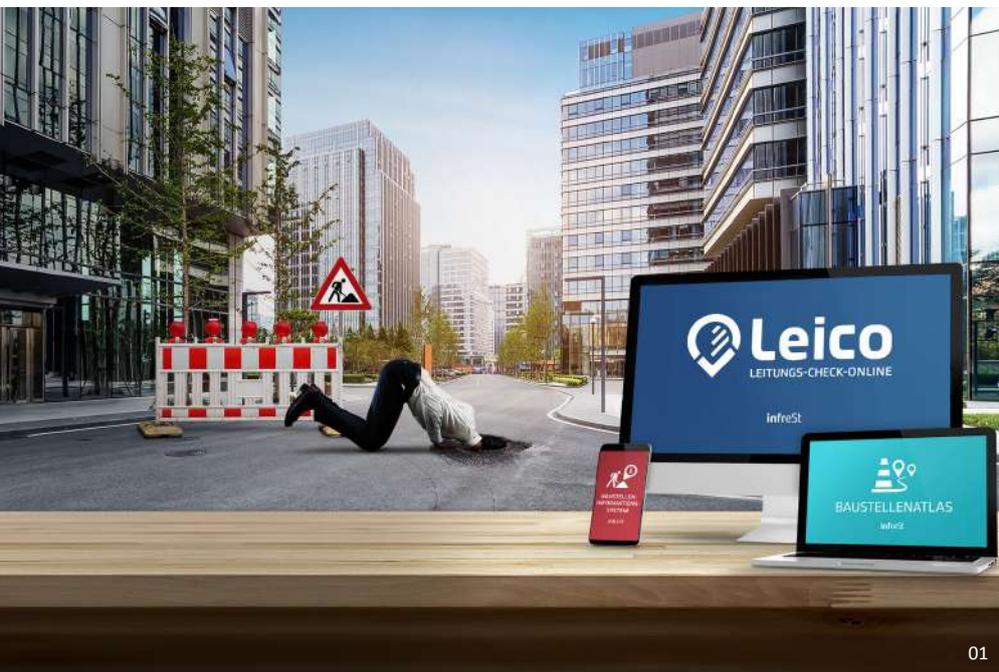
INDUSTRY DIRECTORY

- 236 | All addresses of leading companies ↗
- 238 | Direct marketing ↗
- 239 | Education & training ↗
- 240 | Energy services ↗
- 240 | Finance & law ↗
- 243 | Foundations & footings ↗
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- 259 | Rotor blades ↗
- 259 | Sector Coupling ↗
- 259 | Suppliers of electrical and electronic components ↗
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- 265 | Transport & logistics ↗
- 268 | Companies A-Z ↗
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infrest – Infrastruktur eStrasse GmbH

Line information during construction & operation of wind turbines

Maximum turbine availability is crucial for the economic operation of wind turbines. Infrest is your partner for obtaining and issuing information about buried infrastructure throughout Germany.



Free of charge

To receive enquiries, operators can upload data about their wind turbines and buried infrastructure to the portal free of charge. An automated check then ensures that only relevant requests need to be processed.

Infrest also offers an online solution for processing incoming buried infrastructure enquiries in the form of an enquiries database. It enables simple and cost-effective responses to enquiries thus making it the perfect complement to Leico – Leitungs-check-online portal.

Thanks to standardised processes and preconfigured response letters, online enquiries received via the infrest buried infrastructure information portal can be processed with no media discontinuity. The infrest information database can also be used to manage and process any enquiries received by the operator directly by email or post.

A direct connection to GIS software solutions facilitates the provision of information without the need to install any software.

If required, infrest can manage the entire process of providing information about buried infrastructure for wind farms and wind turbine operators as a service.

01 | Line information during construction & operation of wind turbines with Leico – Leitungs-check-online

With around 16,600 registered infrastructure operators and other public authorities, Leico – Leitungs-check-online portal provides broad coverage throughout Germany. In a single step, all affected network and infrastructure operators are identified, and a central infrastructure request is sent to them. The bundled participation of public authorities saves a significant amount of time and cost compared to having to send out individual letters. The audit-compliant storage of all processes and documents within the portal also reduces administrative effort and increases legal clarity.



infrest – Infrastruktur eStrasse GmbH

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Web	www.infrest.de
Category	Planning
Profile	Grids & grid connection
Employees	ca. 20
Founding year	2010

JUWI GmbH

Energising Sustainability

You can measure our performance in megawatts or in the quality of life for our children. For around thirty years, JUWI has been one of the leading experts in wind energy, now as part of MVV Energie.

What are we passionate about? Photovoltaic, wind, and hybrid projects! Implementing such complex projects requires experience and competence. With us you receive all services from a single source. Our experts take care of everything from site acquisition, to planning, component purchasing, construction, and funding, right through to commercial and technical management and electricity marketing.

We are speeding up the energy transition

To date, JUWI has installed approx. 1,350 wind turbines with a total output of more than 3,000 megawatts at over 250 locations throughout the world. We specialize in both simple and complex sites from open fields to forests in mountainous areas. As experts in repowering, we also optimize plant locations by replacing old wind turbines with state-of-the-art models. In the past few years alone, we have successfully repowered more than 100 wind turbines. In addition to repowering collaboration programs, we also purchase wind farms directly.

We ensure optimal operation 24/7

Our operations management team currently manages wind energy and photovoltaic plants with a capacity of around 5,000 megawatts around the world. To maximize returns, we offer technical and commercial management, 24/7 monitoring and maintenance services.



01

The Power of Our Unity

JUWI employs more than 1,300 people worldwide and is present with projects on all continents. Outside of the headquarters in Wörrstadt, Germany we have subsidiaries in Italy, Greece, South Africa, the USA, India, the Philippines, Thailand, Vietnam and Singapore. We initiate change in a sustainable way and work towards the energy transition together. We are always looking for people who want to join us in turning passion into sustainability. The Power of Our Unity. Sustainable. Together. Strong.

01 | No challenge is too great: we are making the energy transition a reality right now.



JUWI GmbH

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E-Mail	info@juwi.de
Web	www.juwi.de
Category	Planning
Profile	Planers & project developers
Employees	ca. 1,350 (Wind energy: ca. 750)
Founding year	1996

ECONOMIC REPORT

8 | FOCUS REPOWERING ↗

COMPANIES

- 30 | The top employers in the industry ↗
- 56 | Companies with innovative projects ↗
- 68 | Research in Germany ↗
- 78 | Start-ups ↗
- 104 | Manufacturers ↗
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- 228 | Associations ↗

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- 259 | Rotor blades ↗
- 259 | Sector Coupling ↗
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KWS Energy Knowledge eG

Knowledge – Workmanship – Safety

In the area of wind power, we assist you with qualification measures from our basic and advanced training program as well as with client-specific courses and workshops. Benefit from our community!



01 | WPI Training Tower
02 + 03 | Training Center of KWS Energy Knowledge eG



even better professionals. This association gives your business a decisive edge over the competition. Enable your team to reach peak performance with our longtime experience and proven training concepts.

The KWS provides unique safety, operations & maintenance trainings for wind turbines as well as Electrolysers .

Our program encompasses courses, seminars, workshops, and trainings covering the following topics:

- Advanced training for service technician for wind power installation technology (CCI)
- Certification for qualified electrical personnel (EFK)
- Certification for qualified electrical personnel for specified tasks (EFKfft)
- Teaching fundamentals in the field of wind power installations and their technology
- Occupational safety, health and environmental protection, fire protection
- Identification and documentation
- Electrotechnology
- Interdepartmental skills
- Safety trainings according to DGUV and GWO
- Renting the WTT
- Basic skills – Hydrogen
- Hydrogen technician (CCI)

KWS Energy Knowledge eG is a globally renowned leader in basic and advanced training for the power industry. Thanks to our ever-growing lineup of advanced training offerings and bespoke instruction courses, we guarantee a uniformly high training standard for power industry businesses. With our across-the-board training array, we contribute to greater safety, environmental protection, and improved economy.

Energy providers worldwide entrust us with the basic and advanced training of their personnel. Take the opportunity to use our know-how and have a strong, dependable partner by your side. Together, we will qualify your operating, service, and maintenance personnel to make them

Our claim is to be –and to remain– a top service provider in basic and advanced training of the power industry’s expert staff.



KWS Energy Knowledge eG

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Web	www.kws-eg.com
Category	Education & training
Profile	Education & training
Employees	67
Founding year	1957

Landplan OS GmbH

Knowledge of the location determines action!

We are a landscape planning office that advises planning authorities, prepares environmental expert reports and provides AR/VR visualization.



Environmental assessments (regional)

With over 30 years of experience, which includes the entire impact regulation from species protection assessment to LBP and ecological construction monitoring, we are closely associated with the RE topics of wind power and PV.

Expert reports and visualizations (DACH region)

Expert reports on the protection of historical monuments, the visual impact residential buildings or the landscape are instruments that analyze the potential impact of wind energy and PV projects on their surroundings.

We visualize wind turbines and PV parks in three dimensions right from the start and adapt them to the specific needs of the project, which is made possible by our modular workflow. This allows us to provide a general assessment of the visual impact of the planning area at an early stage of the planning process. We also create visualizations for public information



and participation processes. This is possible in the form of both photo documentation and videos.

Our work is based on 3D GIS data and the aratall GmbH's Passage-Plattform, which creates a digital twin of the landscape from GIS data. This can be used to display individually created projects that can be synchronized with GIS and viewed from any point of view. The Passage enables live synchronized use on various platforms. In addition to the fully virtual "walk-through" in video conferences (VR), AR visualizations can be created on site with the Passage.

01 | Virtual representation of a project with a digital twin of the landscape

02 | AR representations on site enable situational adjustments to the visualization location



Landplan OS GmbH

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Web	www.landplan-os.de
Category	Inspection, Measurement, Evaluators
Profile	Evaluators
Turnover	> € 1 million
Employees	10

ECONOMIC REPORT

8 | FOCUS REPOWERING ↗

COMPANIES

30 | The top employers in the industry ↗
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The Liebherr Group

A Strong Partner for the Wind Industry

For more than 70 years, the Liebherr name has stood for excellent, benefit-oriented products and services. The Liebherr Group is one of the world's leading manufacturers of construction machinery and also a major supplier in many other fields of engineering like the wind industry.



01

For the wind industry, Liebherr offers convincing solutions: On the one hand, components are installed directly into wind turbines. On the other hand, mobile, crawler, offshore and tower cranes are used for erecting wind turbines and constructing wind farms.

Offering slewing bearings and drives, Liebherr is the only manufacturer worldwide that provides single components, as well as entire systems for electro-mechanical pitch and yaw adjustment in wind turbines.

To enable the adjustment movements of the wind turbine's pitch and yaw system, Liebherr designs slewing bearings and drives for all megawatt classes of onshore and offshore wind turbines. This includes not only delivery from the broad portfolio,

but also customised adaptations. Moreover, Liebherr has developed and tested a special grease for durable pitch bearing grease and yaw bearings. The product range also includes single and double-row tapered roller bearings or triple-row roller bearings for main bearings. Due to their no-clearance design, these bearings are particularly suitable for the highest requirements on precision and accuracy. The seamless hardened and superfinished raceways of the main bearings ensure longer running times, and thus more efficient electricity production. The in-house, state-of-the-art test bench makes it possible to qualify main bearings with an external diameter of up to six metres.

A major element of cooperation with customers is application-specific engineer-

ing to perfectly adapt each of the components. In the wind industry, Liebherr collaborates with nearly all leading turbine manufacturers, having equipped numerous wind turbines. The product portfolio comprises components for turbines from 800 kW up to solutions for multi-megawatt offshore turbines.

Services include short-term component replacement, refurbishment of damaged or older products, and the development of components that actively address field-related issues, thus extending the lifespan of wind turbines.

Innovative technology, high quality, cost-effectiveness, and long service life have secured mobile and crawler cranes a leading position in the global market. They also prove their worth in the construction



02

- 01 | From single components to final assembly, Liebherr offers the matching solution for different demands of the wind industry.
- 02 | Liebherr LTM 1750-9.1 mobile crane installs the rotor star at a hub height of 80 m.
- 03 | Liebherr tower cranes of the type 1000 EC-B are specially designed to erect wind turbines and work extremely precise with a space-saving design.
- 04 | Heavy duty CAL 64000-1500 Litronic® offshore crane during the installation of rotor stars in the North Sea.

of wind farms. In addition to telescopic mobile cranes, Liebherr offers lattice boom mobile cranes and crawler cranes in various performance classes specifically tailored to the needs of the wind industry. Liebherr addresses the development of more powerful systems and taller towers with performance-optimized cranes and new boom systems with particularly high load capacities. Crawler cranes in a specially designed narrow track version for wind farm construction are used on narrow paths in fully assembled condition – including the boom and at full ballast. This is very cost-effective as the equipment does not need to be assembled and disassembled each time. To erect wind turbines with hub heights of 110 m and above in low-wind areas.



Liebherr offers specially developed tower cranes with load capacities of up to 125 t. These cranes are mounted on the turbine and configured in such a way that the required lifting height can be achieved with just one guyed mast section. Advantages include the crane's small footprint, the ability to work in high wind speeds, and precise load handling with Micromove.

Liebherr provides solutions for loading and erecting offshore wind turbines. Harbor mobile cranes handle the loading of rotor blades, generators, nacelles, and monopiles for onshore and offshore wind turbines. The tandem lift assistance system Sycratronic is often used. In tandem lift, two LHM 800 harbor mobile cranes can lift up to 616 t. Heavy-duty cranes for offshore use have a lifting capacity of up to 5,000 t and a lifting height of up to 180 m above deck. This allows for meeting all requirements: diesel or electric drive units, explosion-protected cranes, and cranes for ambient temperatures between +40 °C and -50 °C. The

cranes are also successfully used in the construction or conversion of oil and gas platforms, as well as for pipe laying and deep-sea operations up to 3,600 m below sea level.

LIEBHERR

The Liebherr Group

Address	Hans-Liebherr-Strasse 45 88400 Biberach an der Riss
Phone	+49 (0)7351 41-0
E-Mail	info.lho@liebherr.com
Web	www.liebherr.com
Category	Transport & Logistics
Profile	Transport companies
Turnover	€ 14,042 million (2023)
Employees	53,659 (2023)
Founding year	1949

ECONOMIC REPORT

8 | FOCUS REPOWERING ↗

COMPANIES

- 30 | The top employers in the industry ↗
- 56 | Companies with innovative projects ↗
- 68 | Research in Germany ↗
- 78 | Start-ups ↗
- 104 | Manufacturers ↗
- 114 | Suppliers ↗
 - 116 | A to H ↗
 - 130 | I to P ↗
 - 136 | Q to Z ↗
- 144 | Service and logistics ↗
 - 146 | A to H ↗
 - 178 | I to P ↗
 - 192 | Q to Z ↗
- 228 | Associations ↗

INDUSTRY DIRECTORY

- 236 | All addresses of leading companies ↗
- 238 | Direct marketing ↗
- 239 | Education & training ↗
- 240 | Energy services ↗
- 240 | Finance & law ↗
- 243 | Foundations & footings ↗
- 243 | Inspection, measurement, evaluators ↗
- 247 | Manufacturers ↗
- 248 | Operation & service ↗
- 252 | Organisations & public institutions ↗
- 252 | Other services ↗
- 254 | Planning ↗
- 259 | Rotor blades ↗
- 259 | Sector Coupling ↗
- 259 | Suppliers of electrical and electronic components ↗
- 262 | Suppliers of mechanical components ↗
- 265 | Transport & logistics ↗
- 268 | Companies A-Z ↗
- 275 | Category overview ↗

Lintas Green Energy GmbH

Lintas – Project Future

Discover sustainable energy solutions with Lintas Green Energy that are both economically and ecologically compelling. Innovative solutions and sustainable projects – for your project future.



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02



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We make your energy sustainably successful.

We view sustainability not just ecologically but economically. As a project developer, partner, and service provider for your energy transformation, we are committed to one of the most important issues of our time: sustainable, renewable energy supply that promises maximum security in uncertain times—supply security, planning security, and location security. Future viability starts with competitiveness, which is why we plan and execute your projects with economic efficiency.

As a developer, partner, and service provider, we offer customized solutions for power and heat generation, process energy, and comprehensive advice on energy efficiency and sustainable energy use. We work closely with all stakeholders, creating synergies for future-proof, high-quality, and sustainable solutions for your company. In short: We make the best out of good energy for you.



Lintas Green Energy GmbH

Address	Alter Stadthafen 3B 26122 Oldenburg
Phone	+49 (0)441 92 51 39-250
Fax	+49 (0)441 92 51 39-29
E-Mail	info@lintas-greenenergy.de
Web	www.lintas-greenenergy.de
Category	Planning
Profile	Planers & project developers

Successful transformation begins with the right energy.

Lintas Green Energy is your partner for comprehensive energy solutions, from project development, planning, and implementation of wind and solar projects to the integration of renewable energies and storage systems and the optimization of your energy infrastructure.

- 01 | Roteberg wind farm
- 02 | Knippen wind farm
- 03 | Brilon wind farm

Messe Husum & Congress GmbH & Co. KG

HUSUM WIND – Transforming Energy

Exhibitors from Germany and abroad will be presenting new products, cutting-edge technology and innovative onshore and offshore solutions for the energy transition at HUSUM WIND.

Renewables can create a climate-friendly energy system – and wind energy is the most important driver for the transformation. HUSUM WIND – the most important industry gathering of the year for the wind industry for over three decades – is now the most important trade fair for renewable energies in the German-speaking market. Over 600 exhibitors from Germany and abroad present new products and cutting-edge technologies over the four days of the trade fair.



01 | Business meets politics: Minister President Daniel Günther visits regional companies at HUSUM WIND 2023
© MarcusDewanger



02 | Established meeting place for the industry: HUSUM Wind attracts trade visitors from all sectors
© MarcusDewanger



03 | HUSUM Spirit: The trade fair is characterised by a personal atmosphere and close networks

04 | Innovative technology in practice
© MarcusDewanger

National and international experts from all areas of the value chain meet at HUSUM WIND. In the heart of Germany's largest wind farm network between the North and Baltic Seas, the trade fair offers a unique contact platform for the wind industry, characterised by practical relevance, networks that have grown over decades and a personal atmosphere – the “Husum Spirit”. This is where OEMs and market leaders, start-ups and tech companies, research institutions, clusters, politicians and trade associations meet to engage in personal dialogue at the trade fair and afterwards. Due to its central importance for Germany as an industrial location, the topic of green hydrogen 2025 will once again be a special focus at HUSUM WIND.

The trade fair location Husum offers companies ideal conditions for presenting themselves in a dynamic innovation environment. An integrated energy system with wind power and green hydrogen is already becoming a reality on the exhibition grounds. The exhibition in the

legendary exhibition halls will be flanked by an exciting programme of forums, panels, cooperation exchanges and matchmaking formats.

Transformation through wind and innovation: HUSUM Wind 2025, 16–19 September 2025
www.husumwind.com



Messe Husum & Congress GmbH & Co. KG

Address	Am Messeplatz 12–18 25813 Husum
Phone	+49 (0)4841 902 0
Fax	+49 (0)4841 902 246
E-Mail	info@messehusum.com
Web	messehusum.com
Category	Other services
Profile	Trade fairs & conferences for the wind energy industry

ECONOMIC REPORT

8 | FOCUS REPOWERING ↗

COMPANIES

30 | The top employers in the industry ↗
56 | Companies with innovative projects ↗
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78 | Start-ups ↗
104 | Manufacturers ↗
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144 | Service and logistics ↗
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178 | I to P ↗
192 | Q to Z ↗
228 | Associations ↗

INDUSTRY DIRECTORY

236 | All addresses of leading companies ↗
238 | Direct marketing ↗
239 | Education & training ↗
240 | Energy services ↗
240 | Finance & law ↗
243 | Foundations & footings ↗
243 | Inspection, measurement, evaluators ↗
247 | Manufacturers ↗
248 | Operation & service ↗
252 | Organisations & public institutions ↗
252 | Other services ↗
254 | Planning ↗
259 | Rotor blades ↗
259 | Sector Coupling ↗
259 | Suppliers of electrical and electronic components ↗
262 | Suppliers of mechanical components ↗
265 | Transport & logistics ↗
268 | Companies A–Z ↗
275 | Category overview ↗

MLK Gruppe

The citizen-centred energy transition

With a regional presence and risk-free participation models for citizens and municipalities, the MLK Group plans and builds wind farms, solar parks and biomass power plants.

MLK is realising the energy transition locally. This means that it does not plan from afar and anonymously place wind farms in the landscape. MLK operates where its projects are. For example, at the Group's main locations – in Erkelenz (NRW), Berlin, Hamburg and Jacobsdorf near Frankfurt/Oder. Or in smaller regional offices such as in Nordwestuckermark, Gräfenhainichen or in the Eifel/Rhineland Palatinate. In this way, MLK makes itself visible and local residents, landowners and municipalities have a contact person in the immediate vicinity.

MLK has now connected 147 wind turbines with a total output of around 500 MW to the grid. This includes one of the largest wind farms in Germany: the Jacobsdorf wind farm, which will now become the Jacobsdorf combined-cycle power plant. MLK's first large-scale solar parks are also going into operation – as in the Oder foreland – and, where possible, will utilise the existing infrastructure and round off the feed-in profile.

Citizens should benefit – without hurdles, without risk

MLK's special feature: It does not only plan and build wind and solar parks. It also operates them itself and retains a long-term stake in them. And the people there should benefit from the renewables in the region. Indirectly, by giving the municipalities a greater financial stake (with § 6 of the EEG) or directly through specially developed citizen participation measures. These include neighbourhood electricity, which gives wind farm neighbours



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Wir bauen die Energiewende

MLK Gruppe

Address	Lichtenberger Weg 4 15236 Jacobsdorf
Phone	+49 (0)33608 179 997
Fax	+49 (0)33608 179 998
E-Mail	projekte@mlk-gruppe.de
Web	www.mlk-gruppe.de
Category	Planning
Profile	Planers & project developers
Employees	75
Founding year	2005



04

exclusive access to discounted green electricity. In other words, risk-free participation without the need to invest first.

As of today, MLK has a project pipeline of around 1 gigawatt in the pipeline. That is roughly twice as many solar and wind parks as it currently has in its portfolio.

- 01 | Among the largest inland wind farms in Germany: the Jacobsdorf wind farm
 - 02 | MLK offered a change of perspective at the open day
 - 03 | With fair participation of citizens and communities
 - 04 | Close to the people and present on site
- Photos: © Jörg Weusthoff

N.T.E.S. GmbH

Maintenance • Repair • Inspection • Optimisation

Service for wind turbines since 2000. Manufacturer-independent maintenance and repair across Germany using the latest technology.

N.T.E.S. GmbH Windkraftservice is a service provider in the wind energy sector.

What drives us: to provide top-level maintenance and repair – manufacturer-independent and across Germany.

Our competencies include MAINTENANCE, OPTIMISATION, INSPECTION, REPAIR, THERMOGRAPHY and MEASUREMENT. We are specialists for AN Bonus and Siemens turbines in the range of 150 kW to 2.3 MW.

More than 20 years of experience in the wind energy sector are an ideal foundation for achieving the best results both in repair and preventatively in maintenance or inspection. Our well-trained teams work across Germany.

Flexibility and fast response times are our key qualities.



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Our services in brief:

- Maintenance
- 24/7 trouble-shooting
- Repair
- Recurring inspections (DGUV V3, crane, arrester and ladder inspections)
- Inspections (blade and transmission inspections, blade assessment and damage analysis)

01 | On the road for you ...



N.T.E.S. GmbH

Address	Handelshof 8 27432 Bremervörde
Phone	+49 (0)4761 926120
Fax	+49 (0)4761 9261299
E-Mail	wkas@ntes-service.de
Web	www.ntes-service.de
Category	Operation & Service
Profile	Service, maintenance & repair
Employees	25
Founding year	2000

ECONOMIC REPORT

8 | FOCUS REPOWERING ↗

COMPANIES

- 30 | The top employers in the industry ↗
- 56 | Companies with innovative projects ↗
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- 259 | Sector Coupling ↗
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- 265 | Transport & logistics ↗
- 268 | Companies A–Z ↗
- 275 | Category overview ↗

node.energy GmbH

Renewable energy the easy way

node.energy's energy data platform opti.node Cockpit automates project management, ensures compliance, and meets reporting deadlines, helping renewable asset managers to profitably manage their systems.



01



02

- 01 | node.energy is the market leader for digital business models in the field of renewable energies in Germany.
- 02 | The node.energy energy data platform opti.node Cockpit digitalizes the commercial management of wind and solar parks.
- 03 | Michael Blichmann, Matthias Karger und Lars Rinn (l.t.r.), Management node.energy

The future of commercial asset management is digital

node.energy presents the opti.node Cockpit for wind and solar parks

The leading energy data platform opti.node Cockpit enables renewable asset managers to complete time-consuming and error-prone commercial management tasks with just a few clicks and to automate and optimize energy management processes. From the centralized management of energy-relevant data to the automatic generation of reports and invoices, the opti.node Cockpit offers operators and plant managers a holistic approach to the professional management of wind and solar plants. Automated processes significantly minimize the effort required for energy management tasks and increase the overall return on investment of the plants.

becoming increasingly important to tap into new revenue opportunities beyond state subsidies to sustainably guarantee and strengthen their competitiveness in the changing market environment.

node.energy is the market leader for digital business models in the field of renewable energies in Germany. Over 33 gigawatts of installed capacity of renewable energy systems are managed with opti.node. Over 13,500 wind and PV systems in Germany are efficiently operated with opti.node. node.energy currently employs around 80 people throughout Germany.



node.energy GmbH

Address	Carl-von-Noorden-Platz 5 60596 Frankfurt am Main
Phone	+49 (0)69 99 99 939-80
Fax	+49 (0)69 99 99 939-81
E-Mail	info@node.energy
Web	www.node.energy
Category	Other services
Profile	Software solutions
Employees	80+
Founding year	2016

With solutions for the realization of commercial tenant electricity and Green PPAs, node.energy also enables operators to supply electricity directly to consumers and thus generate higher revenues than with conventional marketing models. It is



03

NOTUS energy

Power on your side.

As an independent clean energy producer and project initiator, we plan, construct and operate wind farms and solar parks, from the initial idea to the final grid connection.

Since 2001, NOTUS energy has installed wind farms and solar parks with an output of over 1.700 MW. Today we operate 354 megawatts of wind power in-house. Most of the plants we construct in Germany today remain in our ownership.

As an **Independent Power Producer (IPP)**, we are continuously expanding our wind and solar portfolio. This provides us with the **financial independence** we require to be able to invest in new projects and continue to grow the company.

Our ambition is to bring together the best professionals in the field. NOTUS energy is a **flexible and financially strong partner for municipalities, planners, and investors**. We are convinced that renewable energies result in win-win situations: sustainable investment, regional value generation and a future for our children.

Wind Power:
1639 MW installed
2486 MW in development

Solar energy:
1348 MWp in development
354 MW in our portfolio
672 MW in operational management

415 employees, active in 18 countries

GENERAL CONTRACTOR: EVERYTHING FROM A SINGLE SOURCE

As one of Germany's leading general contractors for wind and solar energy we construct turnkey wind farms and solar



01

parks around the world. Fast, flexible, on time and ISO 9001 certified.

ARTIFICIAL INTELLIGENCE: IMPROVED WIND FORECASTS AND POWER LOAD CALCULATIONS

Together with our partners, we are developing intelligent software solutions: for optimised wind forecasts, power load calculations and automated wind or solar power plant inspection using drones.



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ASSET MANAGEMENT: A MODERN TAKE ON OPERATIONAL MANAGEMENT

As asset managers, we not only take on technical and commercial management roles but fully represent the owners in every way by continuously optimising the technology as well as operations.

- 01 | Trebitz Wind Farm
- 02 | Baraize Solar Park (France)
- 03 | NOTUS Headquarters in Potsdam
- 04 | Beckdorf Substation



NOTUS energy

Address	Parkstrasse 1 14469 Potsdam
Phone	+49 (0)331 62043-40
Fax	+49 (0)331 62043-44
E-Mail	windkraft@notus.de
Web	www.notus.de
Category	Planning
Profile	Planers & project developers
Employees	415
Founding year	2001

ECONOMIC REPORT

8 | FOCUS REPOWERING ↗

COMPANIES

- 30 | The top employers in the industry ↗
- 56 | Companies with innovative projects ↗
- 68 | Research in Germany ↗
- 78 | Start-ups ↗
- 104 | Manufacturers ↗
- 114 | Suppliers ↗
 - 116 | A to H ↗
 - 130 | I to P ↗
 - 136 | Q to Z ↗
- 144 | Service and logistics ↗
 - 146 | A to H ↗
 - 178 | I to P ↗
 - 192 | Q to Z ↗
- 228 | Associations ↗

INDUSTRY DIRECTORY

- 236 | All addresses of leading companies ↗
- 238 | Direct marketing ↗
- 239 | Education & training ↗
- 240 | Energy services ↗
- 240 | Finance & law ↗
- 243 | Foundations & footings ↗
- 243 | Inspection, measurement, evaluators ↗
- 247 | Manufacturers ↗
- 248 | Operation & service ↗
- 252 | Organisations & public institutions ↗
- 252 | Other services ↗
- 254 | Planning ↗
- 259 | Rotor blades ↗
- 259 | Sector Coupling ↗
- 259 | Suppliers of electrical and electronic components ↗
- 262 | Suppliers of mechanical components ↗
- 265 | Transport & logistics ↗
- 268 | Companies A-Z ↗
- 275 | Category overview ↗

Prokon Renewable Energy Service GmbH

Pros – Professional Wind Service

Pros (Prokon Renewable Energy Service GmbH) in Itzehoe is an independent service provider for onshore wind energy and a subsidiary of Prokon eG, Germany's largest energy cooperative.



- 01 + 02 | The Pros service team in action
© Prokon/Kjell Kantak
© Prokon/Andreas Burmann
- 03 | Prokon wind farm under construction
© Prokon/Sven Grajek
- 04 | Own warehousing and repair of large components
© Prokon/Arendt Schmolze



Prokon Regenerative Energien eG

Address	Kirchhoffstrasse 3 25524 Itzehoe
Phone	+49 (0)4821 6855-395
Fax	+49 (0)4821 6855-200
E-Mail	pros@prokon.net
Web	www.prokon.net/pros
Category	Operation & Service
Profile	Service, maintenance & repair
Employees	53 (Wind energy: 53)
Founding year	2019

Flexible, competent, fast.

These three words symbolise the new manufacturer-independent service brand for onshore wind energy. The company which was spun off from Prokon eG, comprises two former companies, SH Wind and StiegeWind and combines the collective know-how of these two service specialists with nearly 30 years of experience of Prokon eG of wind turbines from all common manufacturers. Prokon is Germany's largest energy cooperative.

Pros offers the entire range of services for wind turbine operators, from basic maintenance up to full maintenance with major components as well as all repair works, from a single source. Service teams based at more than 10 locations throughout Germany are currently servicing a total of over 500 wind turbines with a total output of almost 800 megawatts, together with Prokon eG's own portfolio, 365 days a year.

Our own warehouse and workshop

In addition to the basic equipment we keep at our service centres which include consumables and spare parts, we also operate a large spare parts warehouse at our headquarters in Itzehoe, which guarantees a delay-free materials supply at all times and minimises wind turbine downtime. We also operate a workshop here in Itzehoe, where we repair major components as well as a warehouse for major components such as gearboxes, generators, and transformers. This not only makes us more independent of service providers and manufacturers, but also has a favourable impact on costs.

Wide range of turbines

Our expertise covers the technology of turbines from Enercon, General Electric, AN-Bonus/Siemens, Vestas, NEG-Micon, Nordex, Senvion, REpower, DeWind, and many more.



Qualitas Energy Deutschland GmbH

POWERING CHANGE TOGETHER.

With today's actions, we are shaping tomorrow's world. As a team, we drive the expansion of renewable energies. Our colleagues work in an interdisciplinary way on unique projects.



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Qualitas Energy is a leading investment and management platform focused on investments in renewable energy, the energy transition and sustainable infrastructure.

Sustainable investments

Since 2006, the Qualitas Energy team has invested more than €12 billion in renewable energy. Globally, Qualitas Energy currently holds a portfolio of more than 5 GW in wind energy, photovoltaics, solar thermal power (CSP), battery storage, biogas (RNG) and hydro run-of-river (RoR). With a development portfolio of more than 3 GW, the focus in Germany is on the expansion of wind energy.

Top performance and professionalism along the entire value chain

As part of the Qualitas Energy Group, Qualitas Energy Deutschland GmbH focuses on the acquisition, development, construction and operation of renewable energy projects. With an experienced team and efficient management, we cover the entire renewable energy value chain.

Our investments focus on repowering as well as greenfield and whitefield projects of all sizes and stages of development. We bring these projects to the finish line, either alone or in cooperation with local project developers.

Innovative project development & consideration of local interests

We are committed to speeding up, innovating and pragmatizing project development. Our experts are pioneers in digital solutions for project management. At the same time, we are leaders in the conceptualisation of tailor-made solutions for a successful and transparent implementation of projects with the integration of all local interests.

Pragmatic, financially strong and passionate, we bring our projects to success.

01 | Qualitas Energy wind farm in Brandenburg
02 | PV park in Mula, Spain
03 | Qualitas Energy wind farm in northern Germany



Qualitas Energy Deutschland GmbH

Address	Unter den Linden 21 10117 Berlin
Phone	+49 (0)30 863 2362 20
E-Mail	info.berlin@qenergy.com
Web	www.qualitasenergy.de
Category	Planning
Profile	Planers & project developers
Employees	700 (Wind energy: 250)
Founding year	2006

ECONOMIC REPORT

8 | FOCUS REPOWERING ↗

COMPANIES

30 | The top employers in the industry ↗
56 | Companies with innovative projects ↗
68 | Research in Germany ↗
78 | Start-ups ↗
104 | Manufacturers ↗
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INDUSTRY DIRECTORY

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265 | Transport & logistics ↗
268 | Companies A-Z ↗
275 | Category overview ↗

R+V Allgemeine Versicherung AG

R+V offers comprehensive insurance cover for wind turbines.

From planning and installation through to the operational phase, wind turbines require comprehensive insurance cover. This is now available all under one roof with R+V's new wind insurance concept.



- 01 | R+V consultant Jan Kehnappel with the customer Mr Petersen
- 02 | First-hand knowledge all under one roof – AgrarKompetenzCenter



R+V Allgemeine Versicherung AG

Address	Raiffeisenplatz 1 65189 Wiesbaden
Phone	+49 (0)611 533 70261
E-Mail	AgrarKompetenzCenter@ruv.de
Web	www.ruv.de/firmenkunden/ erneuerbare-energien/windenergie
Category	Finance & Law
Profile	Insurance companies
Employees	16,500
Founding year	1922

R+V is part of the German cooperative banking group Volksbanken Raiffeisenbanken (VR), making it part of a strong alliance. What we offer our customers, in addition to the latest products and extensive knowledge, is our local presence. Across the 700 VR banks and their 7,500 branches, our customers find a named contact for all their insurance matters. You can be sure that we are always there for you.

First-hand knowledge all under one roof – AgrarKompetenzCenter

As one of the largest insurers for renewable energy plants, R+V has over 30 years experience in this field. To strengthen our position in the rapidly growing renewables market, we have bundled our knowledge and expertise in the so called AgrarKompetenzCenter. Our team of experts imple-

ments new product ideas across all areas and continuously develops the existing product offer.

Our staff are always identifying the latest trends in the fields of wind power, solar energy and biogas in cooperation with leading companies and associations. Helping you make sustainable use of our solutions well into the future.

R+V insurance solutions for your wind turbines

Wind turbine operators are making an important contribution to the success of the energy transition. This way of generating power is especially climate-friendly and particularly lucrative – provided you are sufficiently well insured.

From planning and installation to the operational phase, R+V offers comprehensive cover all under one roof with its new insurance concept especially for wind energy.

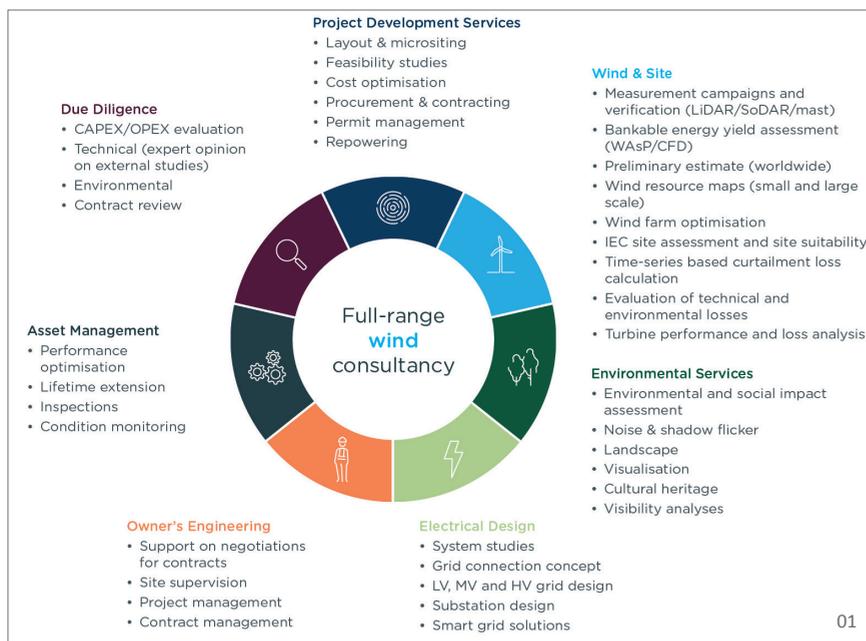
Let us join forces at the early stages of your project so we can offer you the very best support and advice.



Ramboll

World-leading wind consultancy

Ramboll offers comprehensive expertise from wind farm planning and approval to project realisation, preparation of technical as well as economic studies and strategic advice.



Ramboll is a leading international engineering, architecture, and consultancy company. We provide individualized services, supporting our clients in wind energy project development and implementation processes. Ramboll has a strong focus on understanding our clients' needs, and we strive to provide sustainable and long-term technical and commercial solutions to our clients.

In-depth knowledge and experience

With more than 30 years of consultancy experience from onshore and offshore wind projects, Ramboll has built up comprehensive knowledge and competencies within wind energy. We have performed designs for more than 65 offshore wind farms around the world, totaling more than 50 % of all installa-

tions. Within the field of onshore wind, we have provided expert services to wind farms with a nominal output of +60,000 MW in more than 60 countries.

Ramboll has the expertise to support our clients from due diligence and environmental studies over planning and construction to commissioning and operation of the wind farm and can provide assistance at every step of the project.

Access to global knowledge

With 300 offices in 35 countries, we strive to combine our local presence with our global resources and expertise. This means that our clients worldwide can get globally leading consultancy with an in-depth knowledge of local conditions.

01 | Our service portfolio

02 | Planning and implementation of onshore wind farms

03 | Full-service provider for offshore wind energy projects



Ramboll

Address	Jürgen-Töpfer-Strasse 48 22763 Hamburg
Phone	+49 (0)40 302 020 0
E-Mail	info@ramboll.de
Web	ramboll.com/wind
Category	Planning
Profile	Offshore
Turnover	€ 2,3 billion
Employees	18,000 (Wind energy: ca. 700)
Founding year	1945

ECONOMIC REPORT

8 | FOCUS REPOWERING ↗

COMPANIES

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- 275 | Category overview ↗

Regenerative Energien Zernsee GmbH & Co. KG

A little magic

Of course, business management is pure magic. But it's also: checking invoices, drawing up contracts, fulfilling requirements – you can do all of this yourself, but you don't have to.



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02



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- 01 | From the smallest tasks to the whole shebang – it's all in the REZ portfolio and bookable.
- 02 | An aerial view can help at times – a bird's-eye view of the extension to the Odervorland wind farm near Frankfurt (Oder).
- 03 | You can manage everything yourself – but you certainly don't have to. Jacobsdorf wind farm near Frankfurt (Oder) – just one of REZ's various project clusters.
- 04 | REZ offers technical operational and site management services.

Photos: © Jörg Weusthoff

Real life can be fairly mundane: REZ's services include the commercial and technical management of wind farms as well as site management via our dedicated on-site service and, if desired, the assumption of overall responsibility for wind or solar farms, up to and including the preparation of direct marketing contracts and the optimisation of marketing processes. A one stop shop!

Included among our standard services are negotiations with service providers, PPAs, redispatch and demand-based night-time obstruction lighting, as well as project development, engaging in industry training and professional dialogue within the sector. In other words: everything that REZ specialises in can be booked and used.

efficient and high-quality operational management.

We can even give you that in writing, because REZ was once again DIN EN ISO 9001 certified in 2023, which involved a complete reassessment of the company's quality management processes. The result: REZ meets every single one of the extremely high demands. This certification demonstrates to our clients, partners, and employees that the company is focused on high standards, professionalism, and client orientation. Interim audits are carried out every year, and the next full audit is scheduled for 2025.

REZ

Regenerative Energien Zernsee GmbH & Co. KG

Address	Seesener Strasse 10–13 10709 Berlin
Phone	+49 (0)30 22 44 598 30
Fax	+49 (0)30 22 44 598 31
E-Mail	info@rez-windparks.de
Web	www.rez-windparks.de
Category	Operation & Service
Profile	Technical & commercial operational management
Employees	30
Founding year	2004

Efficiency and quality

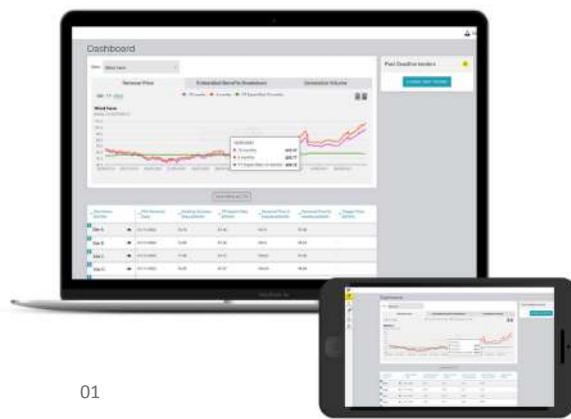
So, we make things easy for you, but not for others. To ensure the safety of would-be burglars, we use alarm systems and cameras to prevent them from exposing themselves to the risk of electrocution in substations or wind turbines. The same cameras also function as a kind of remote maintenance aid, saving unnecessary site visits – another of the many points that characterise our



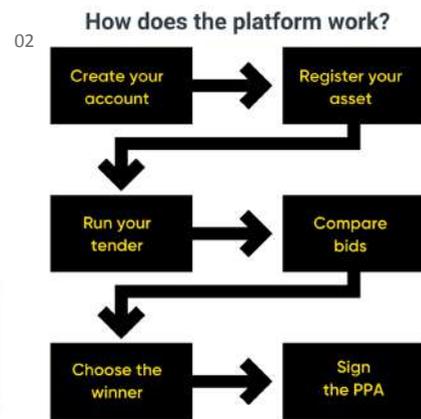
04

Renewable Exchange GmbH

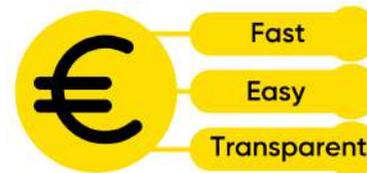
THE SIMPLEST WAY TO THE BEST PPA PRICE FOR YOUR POST-EEG-, EEG- OR NEW ASSETS
Secure your Power Purchase Agreements (PPAs) with full market access in just a few clicks.
Sign up today to receive price forecasts and compare offers.



01



03



The Renewable Exchange PPA platform enables generators of any size to fully optimise and sell their electricity. It is trusted by more than one thousand independent generators, representing over 6.5 GW of installed capacity and 2,150 PPAs have been executed over the platform to date.

What does the platform offer?

PPA execution: Fixed price and pay as produced PPAs provide asset operators with financial visibility and security. Short term PPAs are an attractive option for Post-EEG as well as for EEG assets with low subsidy rates.

Market monitoring: For each site registered on the platform we provide a reliable PPA price forecast based on future base load and regional meteorological data. Price forecasts are updated daily. You can set a target price and be notified when the market price reaches your expectation level.

Tendering: Set your tender conditions like PPA start date, tenor(s), special requirements and bid submission deadline. You can set up various PPA lengths for optimizing your risk mitigation strategy (PPA price versus PPA tenor).

Large access to the market in 1 go: We manage your tender, collect bids from a large pool of buyers, and present them in a clear and transparent overview. Use our rating to select the best bidders.

Contract negotiation: We support with PPA contract analysis, negotiation and facilitate closing. We save you valuable resources during this usually time consuming process.

Reach out to us to discuss your PPA strategy: kontakt@renewable.exchange

01 | The platform
02 | The process
03 | The benefits



Renewable Exchange GmbH

Address	Regus Hamburg Nord Kapstadtring 7/2nd Floor 22297 Hamburg
Phone	+49 (0)162 9720501
E-Mail	kontakt@renewable.exchange
Web	renewable.exchange/de
Category	Direct marketing
Profile	Direct marketers
Employees	15
Founding year	2016

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RES Deutschland GmbH

Your renewable energy systems are in good hands

RES is the world's largest independent renewable energy company. With over 41 years of experience, the company maximises the returns from wind and PV systems in technical and commercial management as well as in maintenance and repair including large components.



01



02

01 | Solar HV O&M
02 | Prechtaler Schanze wind farm in the Black Forest



RES Deutschland GmbH

Address	Reutener Strasse18 79279 Vörstetten
Phone	+49 (0)7666 6189902
E-Mail	resdeutschland.info @res-group.com
Web	www.res-group.com/de
Category	Operation & Service
Profile	Service, maintenance & repair
Employees	+70
Founding year	1981

Asset Management

24/7. RES' service is tailor-made. Technical and commercial operational management includes remote site monitoring, planning of all maintenance work, budget forecasts, data management and transparent evaluation of the operational performance of renewable energy plants. Through 24/7 remote monitoring, RES responds quickly to potential plant malfunctions. This minimises downtime and maximises yields. With success: the plants managed by RES generate at least one percent more than others. This is proven by a comparative study by DNV.

Maintenance & Repair

Up and running. RES focuses on individual solutions, which are available both as part of long-term contracts and individually. Thanks to specially developed analysis tools, maintenance and repair work is planned and implemented in such a way that downtimes are kept as low as possible and the turbines serviced by RES run reliably.

Continued operation, repowering and dismantling

So what comes next? At the end of the regular lifetime of renewable energy plants, operators are faced with the decision of what to do with their plants. Dismantling, continued operation or repowering? RES advises and supports them in developing and implementing the right strategy.

Owner's Engineering

All inclusive. The RES team is at the disposal of owners of wind energy projects with its expertise. Whether in the planning, realisation or expansion of renewable projects: RES' Owner's Engineering offers an all-inclusive package and also provides support with approval processes, expert opinions, technical issues, the coordination and monitoring of service providers and the acceptance of renewable energy plants.

Rosendahl Windtechnik GmbH

Experts for wind energy

As an accredited inspection body for wind turbines, we use our impartial expertise to ensure the longest possible, safe and economical operating life for each and every wind turbine.

Every year, our experts inspect more than 800 wind turbines across Europe from a wide range of manufacturers and power classes according to individually developed inspection plans. Numerous operators rely on our expertise, especially when it comes to inspections of Enercon wind turbines. We are a member of the BWE Expert Advisory Board and an inspection body accredited by the German Accreditation Body (DAkkS) in accordance with DIN EN ISO/IEC 17020 for the scope specified in the certificate annex D-IS-21476-01-00.

Stay on top of things

With our manufacturer-independent expert reports and with our experience as experts, you can keep track of the condition of your wind turbine or wind farm. These inspections form the basis for the longest possible trouble-free operation and high plant availability.

Accredited inspections

- Lifetime extension expert reports (BPW)
- Periodic inspection (WKP)
- Rotor blade inspection incl. lightning protection measurement by rope access technique or by drone
- Condition-oriented inspection (ZOP)
- Commissioning expert reports
- Out of contract/warranty inspections
- Damage expert reports
- Technical due diligence



Supplementary analyses

- Vibration analyses (offline and online)
- Video endoscopies
- Thermographies
- Oil and grease analyses

Lifetime extension

The lifetime extension of wind turbines beyond 20 years is a matter close to our hearts. Therefore, it is our goal to provide our customers with services that enable them to keep their wind turbines in operation for as long as possible. As an accredited inspection body, we carry out the assessment and testing for lifetime extension of wind turbines (BPW) and are available as an independent advisor for all questions.



Rosendahl Windtechnik GmbH

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Phone	+49 (0) 4923 38 39 93 0
Fax	+49 (0) 4923 38 39 93 59
E-Mail	info@rosendahl-windtechnik.de
Web	www.rosendahl-windtechnik.de
Category	Inspection, Measurement, Evaluators
Profile	Technical consultants
Employees	18
Founding year	2006

- 01 | The Rosendahl Windtechnik Team
- 02 | The rotor blade inspection begins
- 03 | Carrying out a vibration analysis
- 04 | Rotor blade inspection via rope access

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Rotor Control GmbH

High Level Support

From rotor blade repairs to lift system maintenance, from testing electronic equipment to visual inspections of foundations – Rotor Control offers all services from a single source.



Rotor Control GmbH was founded in 2006 with a focus on rotor blade services such as repair, maintenance and assembly. Within a short space of time, our company has grown to become one of the leading service providers for wind turbines. Our customers value the fast and solution-orientated services that our teams carry out with precision and expertise.



As a market-leading service company for wind energy and photovoltaics, we rely on the latest technology: our working platforms can be used on all types of systems up to 6 MW. This allows us to carry out repair work at any position on the rotor blade – quickly and cost-effectively. Using rope access technology, we inspect, maintain and repair the blades and prepare detailed damage documentation, regardless of the type of turbine or blade. It goes without saying that we observe the highest safety and quality standards and keep our team up to date with the latest knowledge on an ongoing basis.

Whether solar or wind – at Rotor Control, all work processes are seamlessly inter-linked and perfectly coordinated. With our well thought-out complete solutions, you avoid unnecessary intermediate steps and thus potential sources of error. The result: more efficient processes, maximum transparency and greater safety at lower costs.

As one of Germany's most experienced companies in the wind energy sector, we are committed to continuous development. Breaking new ground? We do every day. Since 2023, also at our second location in Bremen. In the same year, we expanded our service portfolio to include a comprehensive range of services for photovoltaic systems, including the inspection, maintenance and testing of technical components.



Rotor Control GmbH

Address	Kennedy Weg 3 25821 Struckum
Phone	+49 (0)4671 9 33 440-0
Fax	+49 (0)4671 9 33 440-0
E-Mail	info@rotor-control.de
Web	www.rotor-control.de
Category	Operation & Service
Profile	Service, maintenance & repair
Employees	20
Founding year	2006

- 01 | Solar park Netherlands
- 02 | Rope access technology
- 03 | Rotorblade service platform
- 04 | Obstacle lighting

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ECONOMIC REPORT

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SpanSet Axzion GmbH

Lift. Erect. Transport. Secure.

Since 2019, the “double name” SpanSet Axzion has manifested the close interaction of two traditional companies.

Axzion offers products and services in the onshore and offshore sectors.



One part of the company name: Axzion. Founded in 1991, the company specialises in the development of lifting beams, gripper and other load handling equipment for the assembly of wind turbines. The second part: the parent company SpanSet GmbH & Co. KG, a specialist in lifting technology, load securing and personal protective equipment against falls from a height (PPE). Also represented in the group: SpanSet secutex GmbH, market leader in the field of coated lifting straps and protective hoses. Each of the three companies brings individual products for individual tasks to the market. Or even better: as a “trio”, they provide coherent overall solutions for all aspects of transport as well as the assembly and disassembly of wind turbines.

Upending tool erects monopiles

Since 2016, the Upending Tool has proven to be SpanSet Axzion's most impressive lifting device. This is the world's largest grab for raising monopiles weighing up to 2,500 tonnes with a diameter of up to eight metres. The tool with three grippers and six tongs works on jack-up and floating installation vessels. Customers use it on their own or opt for offshore service support from SpanSet Axzion staff. Prominent locations where the Upending Tool has been used: Hornsea 2 and Dogger Bank A in the North Sea, as well as the Yunlin offshore wind farm in western Taiwan.

- 01 | The Upending Tool erects monopiles with a dead weight of up to 2,500 tonnes
- 02 | Application of the PPE from SpanSet on a wind turbine
- 03 | The customisable SBI rotor blade traverse for single blade mounting
- 04 | Round slings of the parent company SpanSet



02

With DNV certificate

Axzion SpanSet simulates the lifting of loads on its own test stand in Neustrelitz (Mecklenburg-Western Pomerania). The facility is designed for up to 3,000 tonnes. DNV (Norway, Hamburg branch) has certified the site as a manufacturer of load lifting equipment for offshore use. SpanSet Axzion 2023 has commissioned another test facility in Großefehn (district of Aurich).

SBI rotor blade lifting beam

For the assembly and disassembly of rotor blades in the air (Single Blade Installation, SBI), SpanSet Axzion has developed a special lifting beam together with a manufacturer of wind turbines. It has a load capacity of 30 tonnes and is controlled via remote. The telescopic design allows the lifting beam, which weighs only 15 tonnes, to be transported to the construction site with a standard truck. This lifting device was designed especially for use in adverse wind conditions, when it is not possible to bring the rotors, which are completely mounted on the ground, safely upwards.

Round slings made from high-performance fibres

The premium products of the parent company SpanSet are in demand for lifting operations in the onshore and offshore sector – above all the Magnum-X round sling with a load capacity of up to 500 tonnes. Its special feature: the fibre core and protective cover contain high-performance fibres, which is why the Magnum-X is significantly lighter and up to 50 percent narrower than comparable round slings. The smaller volume reduces wrinkling during the lifting process and ensures a long service life.

Working safely at height

As a specialist in height safety, SpanSet develops personal protective equipment against falls from a height (PPE). On wind turbines and metrological masts, fitters prefer to use the Clima Tec system. It combines a safety harness and a work positioning harness. SpanSet offers various systems for the rescue and evacuation of casualties.



03



04



SpanSet Axzion GmbH

Address	Winkelsweg 172 40764 Langenfeld
Phone	+49 (0)2173 208920
Fax	+49 (0)217 320 892 28
E-Mail	info@axzion.de
Web	www.axzion.de
Category	Planning
Profile	Offshore
Turnover	> € 100 million (SpanSet Group)
Employees	350 (SpanSet Group)
Founding year	1991

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Statkraft in Germany

Renew the way the world is powered

Together, we create a positive and sustainable future for people, communities, industries, and for businesses like yours.



01

Securing the future of your renewable energy plant

As a leading provider of renewable energy solutions, Statkraft is the right partner for securing the future of your energy plant. We offer long-term support for developers and operators – both via assuring market access or as an off-taker of electricity from subsidised or non-subsidised plants .

With over 125 years of experience working with our own power plants, in project development, and in trading, we bring the expertise to ensure reliable market access for wind farms or solar parks. We purchase

electricity volumes on fixed terms, assume commercial risks, and thus enable the operation of your renewable plants. With fixed prices, we offer the possibility of additional plannable and reliable profits along with standard services such as forecasts, selling electricity on the spot market and balancing. Our support simplifies your everyday energy needs – at all times. Furthermore, our broad service portfolio enables you to generate additional revenue from the flexibility of your wind turbine as well as from storage and e-mobility solutions.

Maximise the potential of your wind farm

Are you operating an older wind farm? Statkraft offers power purchase agreements to ensure the continued and cost-efficient operation of your plant.

In addition to this, we offer the purchase of older wind farms or enter individual cooperations, including decommissioning. Together, we can ensure that clean energy continues to be renewed. Get in touch with our team of experts.

Accelerating renewable energy expansion

For over 20 years, Statkraft has been at the forefront of developing, building, and operating wind farms, and for over 10 years, we have been developing solar parks, too. Germany is a core market for our wind and solar energy projects.

We aim to strengthen our position as a top developer in the sector, focusing on greenfield projects, repowering, partially developed projects or entire portfolios, either independently or in partnerships.

Renewable energy for green hydrogen in Germany

Our commitment to renewable energy extends to the hydrogen sector. By 2032, we aim to have at least 250 megawatts of installed capacity for green hydrogen production in Germany, with up to 200 megawatts at our Emden power plant site. We are planning a 10 MW pilot project, expected to be operational by 2026, provided the necessary permits and funding are in place.

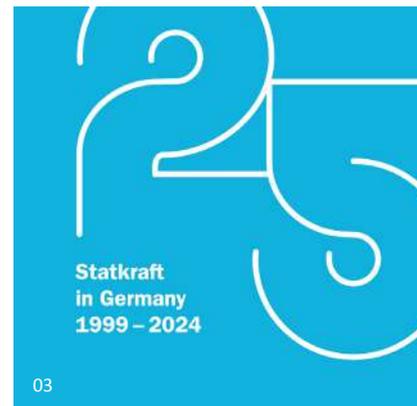


02

Get in touch

Do you have questions about market access or the future of your renewable energy plants? Are you looking for a reliable partner for your wind or solar projects? Or would you like to join us in shaping the green hydrogen ramp-up?

Please don't hesitate to reach out! Connect with us directly, meet us at industry events and trade fairs, or visit our website for more information.



03

- 01 | Renew the way the world is powered
- 02 | Contact us regarding your inquiries about wind energy.
- 03 | For 25 years, we have been shaping the future of energy supply in Germany.
- 04 | Our locations in Germany

ECONOMIC REPORT

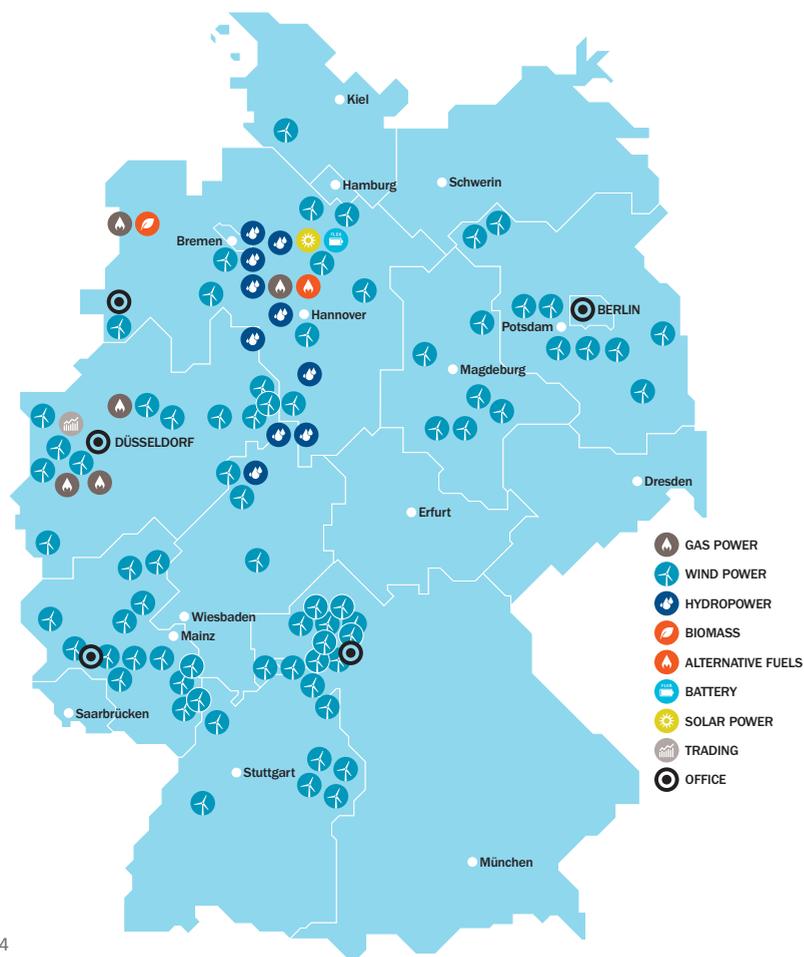
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04



Statkraft Deutschland

Address	Derendorfer Allee 2a 40476 Düsseldorf
Phone	+49 (0)211 60 244-000
Fax	+49 (0)211 60 244-199
E-Mail	info@statkraft.de
Web	www.statkraft.de
Category	Direct marketing
Profile	Direct marketers
Turnover	€ 4.9 billion (Statkraft Markets GmbH)
Employees	750
Founding year	1999

Sterr-Kölln & Partner

Legal experts for wind, PV and thermal energy in Germany and France
 25 years of experience make us one of the leading interdisciplinary advisory companies for renewable energies in Germany and France.



01 | Design Energy Future with us.
 02 | Experts for RE in Germany and France



Sterr-Kölln & Partner mbB

Address	Emmy-Noether-Strasse 2 79110 Freiburg
Phone	+49 (0)761 490540
Fax	+49 (0)761 493468
E-Mail	info@sterr-koelln.com
Web	www.sterr-koelln.com
Category	Finance & Law
Profile	Lawyers
Employees	40
Founding year	1978

Reliability for project developers

We understand the complexities of project development, not least because framework conditions keep changing. As reliable partners we support project developers in dealing with legal and business-related questions both at the development and implementation stage.

Project transactions and financing

Our experts bring together selling parties and investors. Our long years of experience helps us to accurately assess risks, to clearly set out the legal aspects of a transaction and to efficiently manage the transaction. We also successfully implement tailor-made financing for renewable energy projects, providing our customers with sustainable and pragmatic solutions.

Wind, PV and heat for municipalities

Municipalities are increasingly challenged to implement wind and PV projects. We highlight the scope that exists for project design and show how this can be used in

the best interest of the various actors and citizens. We comprehensively support the initial planning process and implementation of municipal heating projects: Working with partner companies where needed, we provide advice on legal, business-related and technical questions from the initial feasibility study through to implementation and operation.

PPAs for wind and solar parks

PPAs generate and secure additional revenue for renewable energy plants in the long term. At the same time, operators are confronted for the first time with terms such as pay-as-produced, REMIT, balancing group management and balancing energy costs as well as the requirement to provide availability guarantees. Careful drafting of contracts is required here to ensure that all energy industry obligations and requirements are met.



TOP seven GmbH & Co. KG

TOPseven – MAKING DRONES SMARTER.

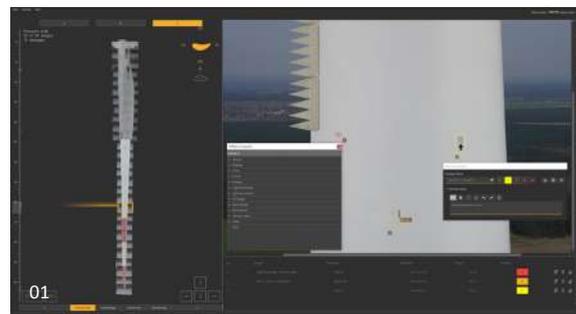
Revolution in rotor blade inspection: TOPseven's drone-based technology with unique lightning protection measurement.

TOPseven is a global leader in the development of integrated hardware and software solutions and has ushered in a new era in the inspection of wind turbines. With our advanced, drone-based rotor blade inspection including an innovative lightning protection measurement, we are setting new standards in efficiency and precision.

Our unique selling point: We offer a patented ECO system that includes automated analysis and reporting. Our approach is based on the integration of state-of-the-art hardware. The DJI drone family, known for its reliability and robustness, is a key component of our system. This is complemented by our ultra-high-resolution 61 MP camera, which enables us to automatically and dynamically capture images of wind turbines.

Our innovations:

- AI-based flight control software
- Globally patented solution for non-contact and non-invasive lightning protection measurement
- Cloud-based application software for highly automated inspections



Benefits for inspection companies:

- Comparable image quality to inspection from the rope: Gapless images with up to 5 px/mm
- Efficiency: Visual inspection in under 30 minutes
- Precision: Exact position detection and sizing of any damage
- Ease of use: Intuitive operation, automated, customisable to individual requirements and weather conditions
- Innovative lightning protection measurement: Non-contact inspection in a few minutes



- 01 | Automated reporting via TOPseven software application
- 02 | Autonomous drone flight – no specialised pilot necessary
- 03 | Contactless lightning protection measurement
- 04 | Drone-based visual inspection

TOP7

MAKING DRONES SMARTER.

TOP seven GmbH & Co. KG

Address	Meglingerstrasse 29 81447 München
Phone	+49 (0)89 515550-300
E-Mail	marketing@TOPseven.com
Web	www.TOPseven.com
Category	Operation & Service
Profile	Service, maintenance & repair
Employees	70
Founding year	2020

ECONOMIC REPORT

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TotalEnergies Renewables Deutschland GmbH

To achieve CO₂ neutrality by 2050, together with society, TotalEnergies plans to increase its renewable electricity production to more than 100 TWh by 2030.



01

TotalEnergies Renewables Deutschland GmbH

As part of its ambition to achieve carbon neutrality by 2050, TotalEnergies is building a competitive portfolio of renewable (solar, onshore and offshore wind) and flexible (CCGT, storage) assets to provide its customers with less and less carbon-intensive electricity available 24/7. TotalEnergies net electricity production target is to produce more than 100 TWh by 2030, making it one of the world's top 5 of renewable electricity (wind and solar). Germany plays an important role in this as a focus market for renewable energies.

The transformation of TotalEnergies into a multi-energy company

TotalEnergies committed to profoundly transforming its production and sales. While continuing to meet the energy

needs of an expanding population, our mission is to provide energy that is ever more affordable, sustainable, and reliable to as many people as possible. Over the last three years, TotalEnergies has invested over 11 billion euros worldwide in low-carbon molecules, an integrated electricity business and the expansion of renewable energies. The company is on track to meet its target of 35 GW of installed wind and solar capacity by 2025.

On the way to becoming an integrated electricity supplier in Germany

In 2023 and 2024, TotalEnergies has been awarded maritime concessions by the German Federal Network Agency to build three wind farms in the North and Baltic Seas with a total capacity of 4.5 GW. The company specializes in the development of large-scale ground-mounted solar

plants, onshore wind power and solar solutions for industrial and commercial customers in Germany. The acquisitions of Quadra Energy, Kyon Energy and Nash Renewables demonstrate TotalEnergies' strategic shift towards becoming an integrated power player in Germany.

Offshore wind power

TotalEnergies is one of the largest developers of offshore wind projects. Our first offshore wind farms are in operation, others are under construction or in development. A good example of our recognized expertise in managing offshore projects is the Scottish wind farm "Seagreen", which has produced electricity for up to 1.6 million households since 2023. The 114 wind turbines are anchored at a depth of 59 meters in the North Sea floor – making "Seagreen" the deepest



fixed-bottom wind farm in the world. TotalEnergies continues to invest and will install 4.5 GW of new wind capacity off the coasts of Schleswig-Holstein and Mecklenburg-Western Pomerania by 2031.

Onshore wind power

In the onshore segment, TotalEnergies, finances develops and operates worldwide large solar and onshore wind plants . Leveraging our longstanding presence and deep roots in different parts of the world, we deliver projects that are both reliable and sustainable over the long term. In Germany onshore wind power plays a pivotal role in driving the energy transition. Through our focused commitment and our activities in this area, we are supporting this development.

Due to the intermittent nature of wind and solar energy, large-scale storage of renewable electricity is critical to ensuring grid stability. That is why TotalEnergies is investing in stationary storage capacities. In Germany, for example, TotalEnergies acquired Kyon Energy, a leading battery storage systems developer. In addition, our affiliate Saft designs, produces and sells high-tech batteries for industry, developing solutions that combine superior energy density, longevity and performance to cater to renewable energy applications.



- 01 | Sorbon 2 wind farm – the Ardenness – France
- 02 + 03 | Seagreen offshore wind farm under construction, Scotland
- 04 | Wind farm project
- 05 | TotalEnergies: Building a multi-energy company



TotalEnergies Renewables Deutschland GmbH

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Web	www.totalenergies.de
Category	Energy services
Profile	Energy supplier

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TÜV NORD EnSys GmbH & Co. KG

Full service provider with over 35 years of Experience in the Wind Industry

TÜV NORD certifies on- and offshore wind turbines to all international standards and regulations, evaluates specific site conditions and supports operation of wind turbines over their entire lifecycle.



distance to overhead lines, site specific load comparison

- TDD
- Geotechnical site investigation and foundation assessment
- Lifetime extension expertise of wind turbines beyond 20 years/design life
- Technical inspections of wind turbines, e.g. end of warranty inspections, periodic inspections and condition-based inspections of wind turbines and components
- Commissioning inspections
- Inspection of approval-related additional subsystems, e.g. ice detection, blade monitoring and aviation lights
- Inspection of cranes and services lifts on- and offshore

With more than 14.000 employees, TÜV NORD GROUP is active in over 70 countries. In the area of wind energy, TÜV NORD offers site and technical assessments, TDD as well as inspection services and is one of the leading certification bodies for on- and offshore wind turbines and projects.

We are accredited according to DIN EN ISO/IEC 17025:2018 by the DAkkS for LiDAR wind measurements, energy yield assessments (TG6) as well as site quality assessment (EEG 2021). Our inspection body wind, type A, is accredited according to DIN EN ISO/IEC 17020:2012 for technical inspections of WTG. Furthermore, we offer inspections, e.g. of lifts and elevators as "Zugelassene Überwachungsstelle (ZÜS)".

We support your wind project from the planning and approval process, during construction and operation and up to lifetime extension. As an experienced partner, we provide comprehensive services throughout the entire lifecycle of your project.



TÜV NORD EnSys GmbH & Co. KG

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E-Mail	windenergy@tuev-nord.de
Web	www.tuev-nord.de
Category	Inspection, Measurement, Evaluators
Profile	Evaluators
Turnover	€ 1,583.3 million
Employees	14,665
Founding year	1869

Our services include amongst others:

- Wind measurements using LiDAR technology
- Site assessment services such as wind potential and energy yield assessment, site quality assessment, site-suitability assessments, noise immission and shadow flicker prognosis, risk assessments and assessment of minimum



The Who's Who of the German wind industry

Your company is not listed in the publication?
You'd like to be included again next year?
Then don't hesitate!



Specification:

Company profile and/or Address entry

- in the German print publication
- as pdf (German and English)
- and in the online database

Free distribution around the world at trade fairs and conferences

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We'll be glad to advise you:

Klaus Barkeling:
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n.fucicis@wind-energie.de



Published in German and English.

ECONOMIC REPORT

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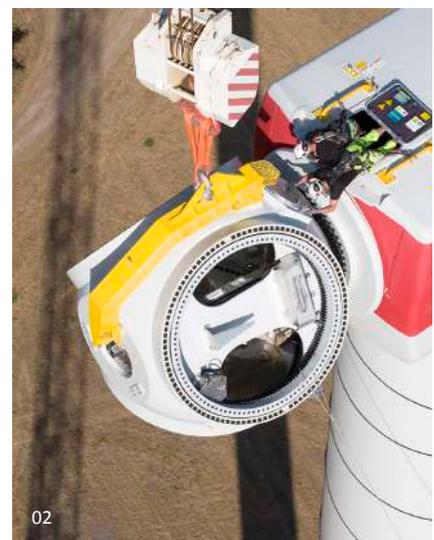
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UKA – Umweltgerechte Kraftanlagen GmbH & Co. KG

The energy park developer

As a full-service developer, the UKA Group plans, builds, operates, and sells wind and photovoltaic (PV) farms. It provides sustainable power supplies in Germany, Europe and America that are independent of fossil energy imports, ensure low electricity generation costs, and are climate-friendly.



The UKA Group is one of the leading project developers for renewable energies in Germany. In addition, the Group's asset management subsidiary UKB handles the technical and commercial management of wind and PV farms in Germany.



UKA is an owner-managed company that has been pursuing a long-term business strategy since its founding in 1999. The company's employees are committed to delivering the best possible project results that meet the highest criteria for quality and economic efficiency. All projects are systematically advanced, even when external circumstances require an extra measure of patience and perseverance.

Independence and an excellent credit rating ensure a long-term perspective

UKA has been owner-managed for 25 years: A committed long-term management team stands behind the Group's success, rather than a publicly listed company or a financial investor. This management continuity and financial independence secure the necessary freedom for entrepreneurial decisions and enable long-term perspectives free from the constraints of quarterly reports. The credit agency "Creditreform" attests UKA's excellent credit rating, one achieved by only 2 % of all companies in Germany.



Complex projects and exemplary solutions

As an expert in wind energy in forested locations, UKA has already commissioned several wind power installations in commercial forests. A specialist agency – Fachagentur Windenergie an Land – has identified the “Göllnitz-Lieskau-Rehain” project as a good-practice example of sustainable wind projects in forest locations. It exemplifies project development in close coordination with citizens.

The Group successfully executes repowering projects. For this purpose, UKA examines whether local conditions such as height or distance regulations, planning law and turbine firing of potentially suitable wind power plants, allow for repowering. In 2021, for example, twelve turbines were modernized and optimized at the wind park Warnsdorf in Brandenburg, Germany. The new wind turbines produce even more green electricity with an increase of the rated output of 3.6 times more than that of the old turbines and they can now supply energy to more than 40,000 households.

UKA effectively leads conservation compensation and replacement measures

in the context of wind energy projects. The project “Schäferwiese” in Mecklenburg-Western Pomerania, Germany, compensates exemplary the wind turbines of the wind farm Parchim, which were projected and built by UKA.

Local partnership and global presence

The energy park developer supports all phases of a project as a financially strong and implementation-oriented partner – regardless of the plant type. Flexible and situation-specific cooperation models enable mutual collaboration and the shaping of the energy transition with joint forces.

The UKA Group is currently expanding its business activities in other European markets like Italy (Rome) and Poland (Szczecin) including UKA Iberia which operates from Madrid. In addition, UKA North America from Florida, Texas and Illinois as well as UKA Chile from Santiago de Chile are driving promising renewable energy projects in North, Central and South America.

- 01 | UKA wind energy park in Leeskow © Flightseeing
- 02 | Planning – construction – management – operation: Full service from a single source © Flightseeing
- 03 | UKA solar energy park in Luechow © Flightseeing
- 04 | Renewable energies in harmony with nature © Jan Gutzeit
- 05 | Compensation and replacement measures “Schäferwiese” in Mecklenburg-Western Pomerania © Flightseeing
- 06 | UKA offices



Der Energieparkentwickler

UKA – Umweltgerechte Kraftanlagen GmbH & Co. KG

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Category	Planning
Profile	Planers & project developers
Founding year	1999

ECONOMIC REPORT

8 | FOCUS REPOWERING ↗

COMPANIES

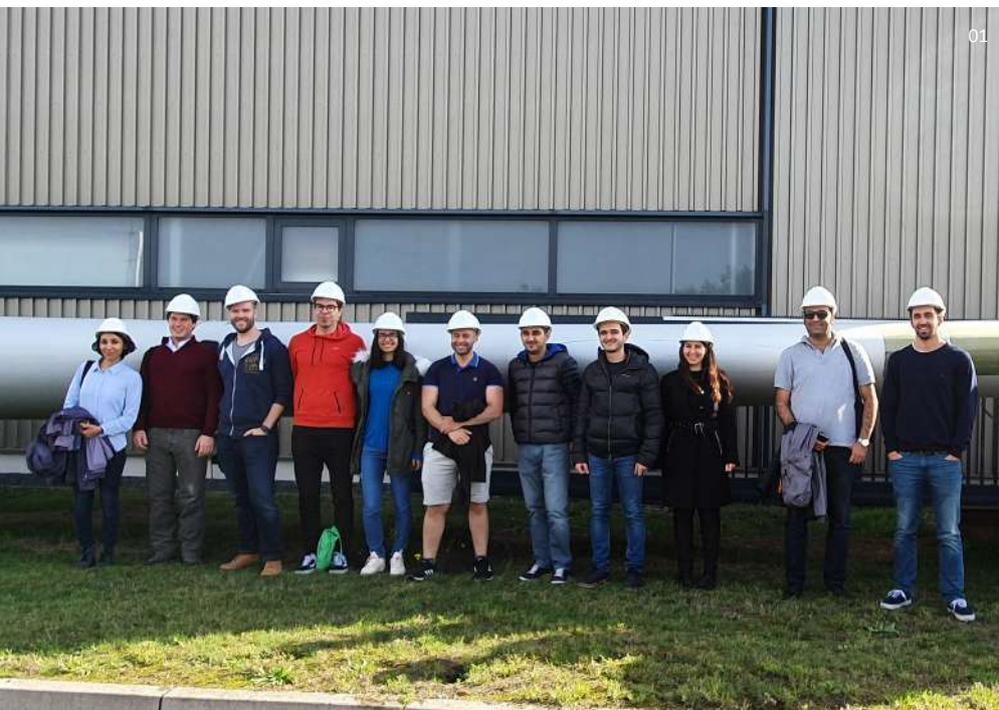
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UNIKIMS GmbH – Universität Kassel

The M. Sc. Wind Energy Systems and the Diploma of Advanced Studies Wind Energy Systems are English-language and 100 % online continuing education programs specifically for working professionals.



01

A particular focus is on teaching management skills, which are essential for management positions in the industry. The close integration of technology and management enables graduates to successfully plan and implement complex projects. Courses take the form of online lectures and e-learning modules. This is particularly advantageous for working professionals, who can optimally combine their studies with their career.

In addition, excursions and specialist lectures are offered by renowned experts who provide insights into current developments and innovations in the wind energy sector. Small study groups and practical training ensure that students are optimally prepared for their professional challenges. Graduates of the Wind Energy Systems master program are ideally equipped to pursue a career in one of the most dynamic and fastest-growing sectors of the energy industry.

Prospective students can find out more about the admission requirements and application deadlines on the UNIKIMS Management School website.

All information can be found at www.unikims.de/wes

UNIKIMS, the Management School of the University of Kassel, offers a unique opportunity to specialise in the promising field of wind energy technology with the Master of Science Wind Energy Systems (WES.online).

The part-time degree program is aimed at engineers and scientists who want to advance their career in the wind energy sector. WES.online is taught entirely in English and combines theoretical principles with practice-oriented applications. Students acquire comprehensive knowledge in all relevant technical and business areas of wind turbines.



UNIKIMS GmbH – Universität Kassel

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Category	Education & training
Profile	Education & training
Employees	20
Founding year	2005

01 | Study group of the Master Wind Energy Systems during a factory tour

Uniper SE

Uniper. The beating heart of energy.

Düsseldorf-based Uniper is an international energy company with activities in more than 40 countries. The company and its 7,000 employees make an important contribution to supply security in Europe, particularly in its core markets of Germany, the United Kingdom, Sweden, and the Netherlands.

Uniper's operations encompass power generation in Europe, global energy trading, and a broad gas portfolio. Uniper procures gas—including liquefied natural gas (LNG)—and other energy sources on global markets. The company owns and operates gas storage facilities with a total capacity of more than 7 billion cubic meters.

Uniper intends to be completely carbon-neutral by 2040. Uniper aims for its installed power generating capacity to be more than 80 % zero-carbon by 2030. To achieve this, the company is transforming its power plants and facilities and investing in flexible, dispatchable power generating units. Uniper is already one of Europe's largest operators of hydropower plants and is helping further expand solar and wind power, which are essential for a more sustainable and secure future. The company is progressively expanding its gas portfolio to include green gases like hydrogen and biomethane and aims to convert to these gases over the long term.

Uniper is a reliable partner for communities, municipal utilities, and industrial enterprises for planning and implementing innovative, lower-carbon solutions on their decarbonization journey. Uniper is a hydrogen pioneer, is active worldwide along the entire hydrogen value chain, and is conducting projects to make hydrogen a mainstay of the energy supply.

In the field of renewable energies, Uniper supports its customers and partners with in-depth expertise in the development, construction and operation of plants. The



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02

01 + 02 | Uniper Renewables

uni per

Uniper SE

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Web	www.uniper.energy
Category	Energy services
Profile	Energy supplier

range of services covers the entire value chain, including the provision of individually tailored green power purchase agreements (PPAs).

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Vattenfall

We're working for fossil freedom
Vattenfall in Germany



01



02



03

Vattenfall has a clear roadmap to reduce its CO₂ emissions by at least 90 percent by 2040 and neutralize the remaining emissions through carbon capture. In line with the Paris climate targets, Vattenfall is thus making its corporate contribution to limiting global warming to 1.5°C. The targets on Vattenfall's path to net zero are based on climate science. The Science Based Target Initiative (SBTi) has endorsed the overarching net zero target and the targets it contains, which cover each of the scopes sufficiently for Vattenfall to achieve net zero.

battery storage facilities are currently in the concrete planning phase.

For example, another large wind farm with the capacity of a nuclear power plant is currently being planned in the North Sea. From 2027/28, the Northern Lights cluster will produce enough wind power to cover the needs of around 1.6 million German households.

Renewable energy through direct electricity procurement – Improve your company's CO₂ balance and benefit from long-term planning security at the same time.

With these ambitious climate targets, Vattenfall is helping society to free itself from dependence on fossil fuels. Vattenfall is committed to a future where everyone can move and live without fossil fuels. Vattenfall wants to continue to play a key role in shaping the energy transition in Germany – wind farms on land and at sea, as well as solar farms and large-scale

- 01 | Photovoltaic plant within Markersbach pumped storage plant
- 02 | DanTysk
- 03 | Generator in combined energy park



Vattenfall

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Category	Direct marketing
Profile	Direct marketers
Employees	20,600

Volkswind GmbH

Making your life a breeze!

With expertise and passion, Volkswind is committed to the energy transition. Our goal is to increase the share of wind energy in the electricity mix and thus create a future worth living.

We plan, construct, and operate onshore wind farms throughout Europe, taking care of everything from the initial concept, development, and operational phases to maintenance.

Volkswind's interdisciplinary and international team has already erected over 90 wind farms with a total output of almost 1,500 MW, a level of power production of which we are justifiably proud and will continue to expand. We are one of the top 10 project developers, especially in our core market in France, where we are the leading tender winner.

Ever since we were taken over by the Swiss energy group Axpo in 2015, Volkswind has been even more strongly positioned to continue expanding its pipeline and diversifying its project portfolio.

Axpo is the European leader when it comes to marketing renewable energies and currently manages a portfolio of 99 TWh. Long-term power purchase agreements (PPAs) will enable Axpo to achieve further growth in the renewable energies sector. Axpo's expertise in the energy sector and its many years of marketing and industry experience make for a strong strategic partnership in the wind energy sector.



In addition to our previous core markets in Germany and France, Axpo, and Volkswind are also focusing on project developments in Romania and Finland and are continuing to expand our technical operations and asset management services.



Volkswind GmbH

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Web	www.volkswind.de
Category	Planning
Profile	Planers & project developers
Employees	150 (Wind energy: 150)
Founding year	1993

01 | A member of the Volkswind service team in action.

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VSB Gruppe

Project development | Planning | Construction | Operational Management | Repowering
 Trust in more than 25 years of experience and more than 1.7 GW of installed capacity.
 We provide profitable solutions throughout the entire value chain of wind energy projects.



01



VSB Gruppe

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E-Mail	info@vsb.energy
Web	www.vsb.energy
Category	Planning
Profile	Planers & project developers
Employees	> 500
Founding year	1996

Wind is our passion and project development is our core competence. As a full-service provider, we accompany every step of the process, from securing land through approval planning to the implementation of wind farms, for which we are also your contact when it comes to operational management. We are also your strong partner in the field of energy services. We develop individual energy concepts for your company, taking into account all consumption sectors, and work out solutions so that you can produce, store and consume energy that is environmentally friendly and conserves resources.

Empathy and Acceptance

The energy transition can only succeed if all stakeholders act in concert. Therefore, our projects are put into practice in close cooperation with residents, municipalities, and local representatives. This results in highly individual solutions regarding turbine locations, windfarm layouts and compensation measures. Above that, scheduled receipts and financial rewards for citizens add to making renewable energies a long-term benefit for local communities.

Tested Quality

VSB has received certification according to the DIN EN ISO 9001:2015. It ensures that responsibilities are clearly assigned, processes are bindingly defined, and knowledge is documented in a systematic manner. Hence, you can put your trust in legal compliance, reliable yield projections and a strict monitoring of project costs.

In Your Vicinity

Climate action does not stop at regional borders. Consequently, our experts work internationally on implementing a sustainable energy supply. With our headquarters in Dresden and five regional German offices as well as numerous locations abroad we are always in reach when accompanying your project from the beginning to the end.

01 | Wipperdorf wind farm (Thuringia, 14.4 MW)
 © VSB Gruppe/flightseeing

wagner GmbH

A passion for repair work

We are specialized in mobile mechanical processing for the repair of wind turbines. With our expertise, we find solutions for any special machining required and implement them professionally. We are your strong partner for wind power: onshore and offshore.

Solutions: local and global

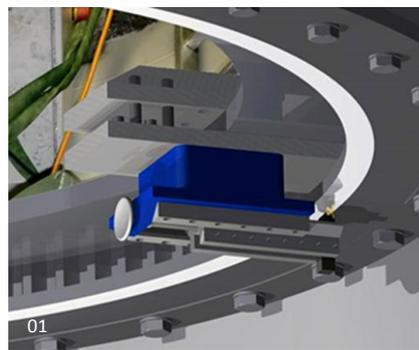
We carry out our work with a high degree of flexibility and competent service using the most advanced methods in the areas of root cause analysis, troubleshooting and repair. Our range of services for on-shore and offshore wind turbines includes the following work, among others:

- Root cause analysis using state-of-the-art laser measurement systems and endoscopy
- Drilling and spindle work to remove defective bolts
- Processing of brake disks in the installed condition
- Milling and turning work on tower and nacelle flanges
- Straightening work on tower and spreading work on flanged connections
- Welding work and crack detection
- Special customized solutions and spare parts production
- Bolting and tensioning

Practical examples

- Drilling and spindle work to remove defective bolts

A homogenous contact pattern is the basis for the safety of flanged connections. This is particularly vital for blade bolt and tower flanged connections. Even isolated, non-load-bearing connections must be replaced. For mobile machining of bolts of any size, we have the appropriate special drilling equipment, even for areas that are difficult to access. Damaged threads are professionally repaired by us.



01 | Principle illustration for machining a brake disc in the installed state



02 | Drilling work on rotor/hub connections



03 | Radial plane milling machine for machining of tower flanges



04 | Conventional drilling work on bolted joints

- Processing of brake disks in the installed condition

Perfect functioning of the different brake systems is essential for the operational safety of a wind power plant. With our individually customized tools and the machining we carry out, we ensure that your brake disks are in optimized condition. Our concept eliminates the need for cost intensive dismantling of the brake discs.

wagner.

wagner GmbH

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Category	Operation & Service
Profile	Service, maintenance & repair
Employees	82
Founding year	1964

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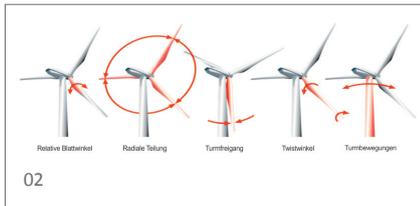
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windcomp GmbH

Optimize and protect your wind turbine with the ROMEG measuring system

windcomp GmbH is specialized in the optimization of wind turbines. We have developed the ROMEG measuring system, with which we can quickly detect both aerodynamic and mass imbalances. It is a dynamic measuring process during normal plant operation.



- 01 | Romeg setup
- 02 | Measurement parameters
- 03 | Profiles with blade angle deviations and without blade angle deviations
- 04 | Tower vibrations with and without blade angle deviation

windcomp develops and produces laser measuring systems for wind turbines and offers as service the measurement of the turbines through our experts. ROMEG is a laser-based measuring system for the dynamic measurement of wind turbines. ROMEG can detect and measure aerodynamic imbalances, caused by blade angle deviations, as well as mass imbalances.

FUNCTIONS OF THE ROMEG SYSTEM

The following parameters and functions are measured by the ROMEG System:

- Relative blade angle – The main function of the ROMEG system is to measure relative blade angle deviations.
- Mass-excited unbalance – Detection of unbalance-generating mass differences in the rotor blades
- Tower vibrations – The oscillation pattern of the axial tower movement is a good indicator for the evaluation of the detected blade angle deviations.
- Vibration analysis of the tower movement (FFT Analysis)
- Measurement of the tower clearance of the blade tips

ADVANTAGES OF THE ROMEG SYSTEM

- The laser measurement takes place on a running turbine under real operating conditions.
- No loss of yield during measurement.
- Fast measuring process – entire wind farms within a short time.
- Results are quickly available on site and can be used immediately to optimize the turbine.
- By comparing the vibration pattern before and after the correction, the success of the optimization is immediately visible and provable.

WHY MEASURE?

In contrast to an imbalanced turbine, a turbine with well-balanced rotor shows the following attributes:

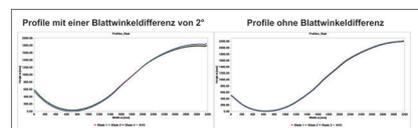
- Better performance/higher yield
- Higher availability
- Longer service life of turbines
- Less tower stress
- Reduced maintenance costs
- Lower noise emission

The ROMEG system is available as ground- and nacelle based measurement system and can therefore also be used for offshore turbines.

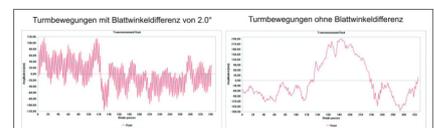


windcomp GmbH

Address	Glogauer Strasse 21 10999 Berlin
Phone	+49 (0)30 319 85 54 75
Fax	+49 (0)30 319 85 54 99
E-Mail	info@windcomp.de
Web	www.windcomp.de
Category	Operation & Service
Profile	Service, maintenance & repair
Founding year	2008



03



04

wind-turbine.com GmbH

World's largest independent marketplace for wind farms

As a globally independent platform, wind-turbine.com has been connecting over 15,000 registered users from over 150 countries for trading in existing or new commercial wind projects since 2011.

The story of wind-turbine.com began in 2011. The two brains behind the portal are Bernd Weidmann, founder and managing director, and Heiko Werner, co-partner and technical developer. The entrepreneurs each bring over 30 years of experience in the digital platform economy, sales, marketing and the development of online marketplaces to the wind-turbine.com project.

Our vision:

We bring together supply and demand for wind projects directly on a central platform, accelerating projects and thus the global energy transition. Over 15,000 (> 5000 companies) registered market participants from more than 150 countries, including operators, investors, manufacturers, project planners, service companies, etc. are already benefiting from the network effects of our B2B platform.

Digital platform strategy: access to international business:

As with B2C platforms, B2B value chains are also increasingly being mapped on platforms. Many German companies suffer from a lack of visibility online, but visibility and reach are crucial for future business – especially internationally! wind-turbine.com not only specialises in mapping the trade and sale of wind farms



on the platform and, as a neutral platform, offers optimal support in marketing these assets – the marketplace also connects the right partners with each other thanks to innovative technology and its network.

The enormous visibility and reach of wind-turbine.com is already being used by countless companies from all over the world to launch and establish their digital sales.



wind-turbine.com GmbH

Address	Barbarossastrasse 61 63571 Gelnhausen
Phone	+49 (0)6051 97110
Fax	info@wind-turbine.com
E-Mail	wind-turbine.com
Web	Other services
Category	Communication & Marketing
Employees	11 (Wind energy: 4)
Founding year	2016

ECONOMIC REPORT

8 | FOCUS REPOWERING ↗

COMPANIES

30 | The top employers in the industry ↗
 56 | Companies with innovative projects ↗
 68 | Research in Germany ↗
 78 | Start-ups ↗
 104 | Manufacturers ↗
 114 | Suppliers ↗
 116 | A to H ↗
 130 | I to P ↗
 136 | Q to Z ↗
 144 | Service and logistics ↗
 146 | A to H ↗
 178 | I to P ↗
 192 | Q to Z ↗
 228 | Associations ↗

INDUSTRY DIRECTORY

236 | All addresses of leading companies ↗
 238 | Direct marketing ↗
 239 | Education & training ↗
 240 | Energy services ↗
 240 | Finance & law ↗
 243 | Foundations & footings ↗
 243 | Inspection, measurement, evaluators ↗
 247 | Manufacturers ↗
 248 | Operation & service ↗
 252 | Organisations & public institutions ↗
 252 | Other services ↗
 254 | Planning ↗
 259 | Rotor blades ↗
 259 | Sector Coupling ↗
 259 | Suppliers of electrical and electronic components ↗
 262 | Suppliers of mechanical components ↗
 265 | Transport & logistics ↗
 268 | Companies A–Z ↗
 275 | Category overview ↗

Wölfel Wind Systems GmbH

How do you make profits with knowledge?

We are experts in vibrations and signal analysis, providing information on structural damage and lifetime consumption, monitoring material fatigue, and offering dampers for tonalities and vibrations.



01



02

01 | Structural monitoring of the entire wind energy installation – offshore and onshore

02 | Long years of expertise in automatic ice detection

Strong vibrations, varying wind speeds, or sound emissions – both onshore and offshore require professional engineering to ensure the safe and efficient operation of wind energy systems (WEA) and to meet regulatory requirements.

Our ice detection system **IDD.Blade®** minimizes WEA downtime through reliable ice detection. We offer comprehensive solutions for monitoring tower and foundation structures, optimally preparing you for continued operation. Thanks to precise information about the condition of the foundation and tower, we enable accurate asset evaluation and maximize operational lifespan. The combined use of engineering expertise and AI significantly improves the detection accuracy of anomalies in the foundation. With customized solutions for tower and foundation monitoring, we provide all the necessary information for condition-based inspections, which are particularly important in the offshore sector.

Low-frequency vibrations of the entire WEA can cause high stress on the tower, significantly reducing the tower structure's lifespan. Excessive vibrations during assembly can make rotor blade installation impossible or only feasible under very limited weather conditions. Resonant vibrations, in particular, can be effectively and cost-efficiently mitigated by our **TMD. Tower damper**.

A noise-reduced operation can significantly reduce your wind park's yields. With **ADD.Sound®**, you minimize tonality and return to normal operating mode. With more than 1000 systems in the market, we rightly consider ourselves technology leaders in active solutions for reducing gearbox tonalities.



Wölfel Wind Systems GmbH

Address	Max-Planck-Strasse 15 97204 Höchberg
Phone	+49 (0)931 49708-0
Fax	+49 (0)931 49708-150
E-Mail	info@woelfel.de
Web	www.woelfel.de
Category	Inspection, Measurement, Evaluators
Profile	Technical consultants
Employees	160
Founding year	1971

wpd GmbH

think energy

With strong pipelines, wpd is successfully on a growth course. wpd is advancing the energy transition worldwide and is constantly expanding its activities, locations and teams.

From its foundation as a two-man operation in 1996 to its current position as one of the national and international market-leading project developers and operators of wind and solar energy parks, wpd has undergone rapid development. The company continues to grow unabated in the central markets for wind and solar energy in Germany and Europe as well as overseas.

Worldwide, wpd is active with over 1,200 employees in 31 countries. New markets are being opened up, so that the number of over 70 branches is being further expanded. The implementation of the extensive project volumes in Germany and abroad are being advanced with reinforcements in all areas of project development, construction and operation. This applies not least to the German domestic market, where wpd is currently contributing to the success of the German energy transition at 18 locations.

Here, the political course set for achieving the expansion targets set is having a noticeable effect and wpd can report a strong increase in the number of permits issued. In total, wpd's pipeline in Germany comprises 6,000 MW. wpd solar GmbH also records a dynamically growing workforce and at the same time continues to expand its strong project pipeline. Currently, the company is active in the solar energy sector in a total of 11 countries and has over 5,015 MW of PV projects in planning. The main focus here is on the markets in the USA, Canada, France, Greece, Italy, Germany, Taiwan, Indonesia and the Philippines.

Thus, the company's history is successfully continued and the company will further advance the global energy transition with a strong combination of projects of wind and solar energy.

01 | wpd wind farm Malleco/Chile
02 | German wpd Headquarter in Bremen

03 | wpd solar park Amstetten/Germany
04 | wpd wind farm Riede/Germany



wpd GmbH

Address	Stephanitorsbollwerk 3 (Haus LUV) 28217 Bremen
Phone	+49 (0)421 16866 10
Fax	+49 (0)421 16866 66
E-Mail	info@wpd.de
Web	www.wpd.de
Category	Planning
Profile	Planers & project developers
Employees	1,210
Founding year	1996

ECONOMIC REPORT

8 | FOCUS REPOWERING ↗

COMPANIES

30 | The top employers in the industry ↗
56 | Companies with innovative projects ↗
68 | Research in Germany ↗
78 | Start-ups ↗
104 | Manufacturers ↗
114 | Suppliers ↗
116 | A to H ↗
130 | I to P ↗
136 | Q to Z ↗
144 | Service and logistics ↗
146 | A to H ↗
178 | I to P ↗
192 | Q to Z ↗
228 | Associations ↗

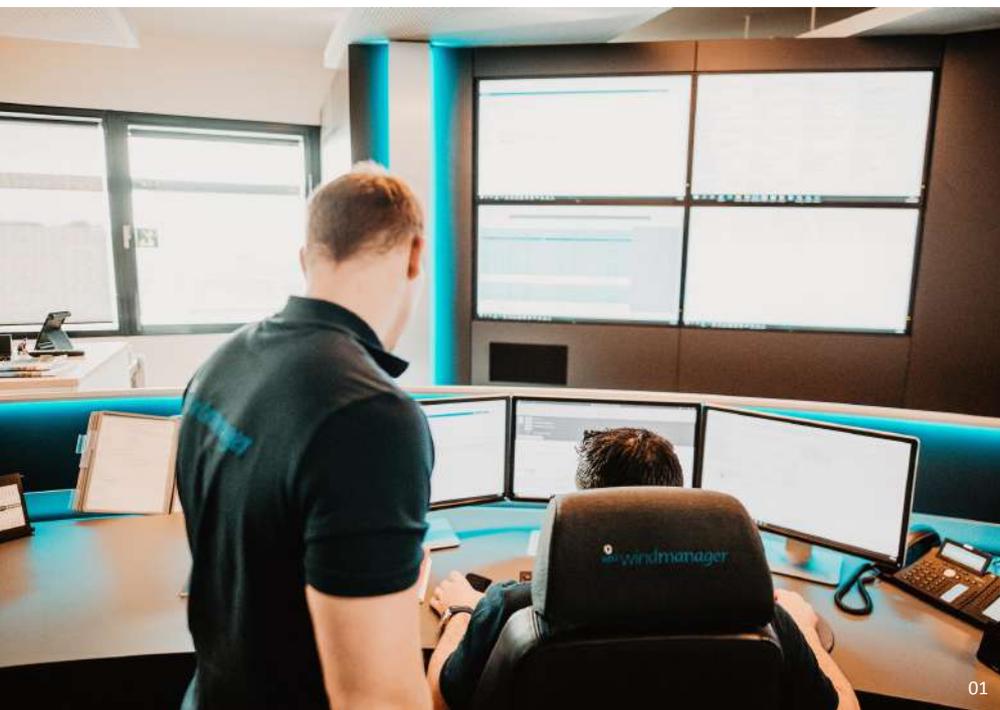
INDUSTRY DIRECTORY

236 | All addresses of leading companies ↗
238 | Direct marketing ↗
239 | Education & training ↗
240 | Energy services ↗
240 | Finance & law ↗
243 | Foundations & footings ↗
243 | Inspection, measurement, evaluators ↗
247 | Manufacturers ↗
248 | Operation & service ↗
252 | Organisations & public institutions ↗
252 | Other services ↗
254 | Planning ↗
259 | Rotor blades ↗
259 | Sector Coupling ↗
259 | Suppliers of electrical and electronic components ↗
262 | Suppliers of mechanical components ↗
265 | Transport & logistics ↗
268 | Companies A-Z ↗
275 | Category overview ↗

wpd windmanager GmbH & Co. KG

Over 6.5 gigawatts in operational management

On course for growth – from Pitea to Taichung. wpd windmanager looks back on successful years. With new wind farms, new locations, new target markets and also new services.



01

We, wpd windmanager, are a globally active and continuously growing company in the commercial and technical management of wind farms and solar projects. In addition to our core market in Germany, we are active in various other European countries, in South America and also in Asia. We now employ over 570 people and manage more than 6.5 gigawatts of total capacity in wind and solar farm management.

“We have grown enormously over the years. We have added a large number of new projects, not only on the German market but also internationally,” says Till Schorer, Director Customer Relations at wpd windmanager. “The 6.5 gigawatts are an important milestone for us. There are not many operators on the market with a comparable volume.”



02

International growth: Over 2.5 gigawatts in operational management

The volume of the international portfolio has now grown to over 2.5 gigawatts. And the trend is rising: further markets and projects will follow in the coming years – both from the wpd GmbH pipeline and through projects from external customers.

“In the future, the international area will grow even more strongly,” emphasises Henning Rüpke, Director International Operations. “On the one hand through new target markets, and on the other through many projects in our existing countries.”

01 | In the 24/7 control room, wpd windmanager monitors the turbines around the clock.

02 | wpd windmanager now has a total output of over 6 gigawatts under operational management.



03

Quality and safety

New challenges are constantly being added to wind farm management. As an operator of critical infrastructures (KRITIS), wpd windmanager is subject to special requirements and relies on the highest quality and safety standards in operational management. Two factors are of crucial importance here: the security of our customers' assets and the quality of our services. This is why we have had our information security management system certified to ISO 27001 and our quality management system certified to ISO 9001.

In many projects, the technical management team is working with a new generation of turbine types such as the Enercon E-138, the Vestas V-150, the Nordex N-149 and the GE 5.5. In addition to Germany, these significantly more powerful turbines are already being operated by us in Finnish, Swedish and Taiwanese wind farms. This new generation of turbines brings with it new challenges. "It is all the more important for us to exchange ideas across locations and countries and to benefit from each other's expertise," explains Henning Rüpke.

New legal regulations are also increasing the requirements. We are constantly developing our service portfolio through issues relating to cyber security, Redispatch 2.0, A&E measures, HSE and demand-driven night-time labelling (BNK) in order to further optimise the operation of our customers' wind farms.

"As an operations manager, the workload is constantly increasing. Our work is no longer limited to traditional operational management. The development of new services is becoming more important and we are increasingly being called upon to solve problems and drive innovation," emphasises Till Schorer.

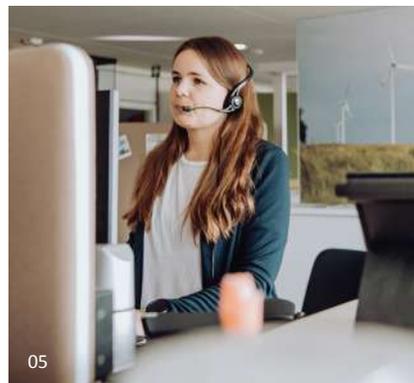
Wind farm and solar farm operators, fund companies, municipal utilities and investors have been relying on wpd windmanager's expertise in commercial and technical operations management for over 25 years. And with great success: 9 out of 10 operators would recommend us as their operations manager. For many customers, we also take care of asset and portfolio management and take over the overall operational management for them worldwide.

We also support the further development of renewable energies and drive new industry standards through cooperation in the area of research and development.

- 03 | 9 out of 10 operators would recommend wpd windmanager as an operations manager.
- 04 | In addition to wind farm management, wpd windmanager is also expanding its solar farm management.
- 05 | Key Account Management takes care of all issues.
- 06 | The Bremen-based company has been providing all services relating to wind farm management since 1998.



04



05



06



wpd windmanager GmbH & Co. KG

Address	Stephanitorsbollwerk 3 28217 Bremen
Phone	+49 (0)421 8976 600
E-Mail	windmanager@wpd.de
Web	www.windmanager.de
Category	Operation & Service
Profile	Technical & commercial operational management
Employees	570
Founding year	1998

ECONOMIC REPORT

8 | FOCUS REPOWERING ↗

COMPANIES

- 30 | The top employers in the industry ↗
- 56 | Companies with innovative projects ↗
- 68 | Research in Germany ↗
- 78 | Start-ups ↗
- 104 | Manufacturers ↗
- 114 | Suppliers ↗
- 116 | A to H ↗
- 130 | I to P ↗
- 136 | Q to Z ↗
- 144 | Service and logistics ↗
- 146 | A to H ↗
- 178 | I to P ↗
- 192 | Q to Z ↗
- 228 | Associations ↗

INDUSTRY DIRECTORY

- 236 | All addresses of leading companies ↗
- 238 | Direct marketing ↗
- 239 | Education & training ↗
- 240 | Energy services ↗
- 240 | Finance & law ↗
- 243 | Foundations & footings ↗
- 243 | Inspection, measurement, evaluators ↗
- 247 | Manufacturers ↗
- 248 | Operation & service ↗
- 252 | Organisations & public institutions ↗
- 252 | Other services ↗
- 254 | Planning ↗
- 259 | Rotor blades ↗
- 259 | Sector Coupling ↗
- 259 | Suppliers of electrical and electronic components ↗
- 262 | Suppliers of mechanical components ↗
- 265 | Transport & logistics ↗
- 268 | Companies A-Z ↗
- 275 | Category overview ↗

WT Energiesysteme GmbH

We are shaping the energy transition

Under this motto, our team has been making a valuable contribution to improving the CO₂ footprint for more than 20 years.

Modern substations for renewable energies are the key to the energy transition – that is our expertise.



01

01 | Wichmannsdorf transformer station
02 | Riesa location



WT Energiesysteme GmbH

Address	Glogauer Strasse 9 01587 Riesa
Phone	+49 (0)3525 513 28 0
Fax	+49 (0)3525 513 28 20
E-Mail	info@wt-energiesysteme.de
Web	wt-energiesysteme.de
Category	Planning
Profile	Grids & grid connection
Employees	130+
Founding year	2002

Energy conversion – that's what WT Energiesysteme GmbH is all about. We are a medium-sized company based in Riesa, Dresden and Meißen. Our core competence lies in the planning, construction and modernisation of substations and grid feeds in the 10 to 380 kV range. With our many years of experience and expertise, we build substations according to the wishes of our customers from the renewable energy sector and energy suppliers.

Since 2002, we have built more than 240 substations with an installed capacity of 16 GW for our customers in Germany. We rely on a high level of in-house expertise with the highest quality standards. We manufacture the switchgear and control systems (control cabinet construction) in-house. In order to further increase the

depth of in-house services, we have now also integrated the planning and realisation of cable connections and electrical installation into our portfolio. Our interdisciplinary team currently consists of over 130 employees, who are highly committed to continuous development.

Our speciality is that we offer our customers turnkey solutions from a single source. From the greenfield to the turnkey system, we carry out every service and guarantee short construction times, innovative control cabinet systems, high-quality components, manufacturer and product independence as well as an experienced team.

Our certificates, such as for creditworthiness, quality, environmental protection and occupational health and safety, give you an overall view of the important company processes – a strong foundation for our modern company.



02

XERVON Wind GmbH

Working for the future

Wind energy has to pay off twice – in terms of sustainability and from an economic point of view. Our services ensure what is necessary for this: the highest possible system availability, operating states with optimal performance values and consistency.

As a partner to the wind energy industry, XERVON Wind offers all relevant technical services competently and independently of the manufacturer. Onshore and offshore, we support you with the construction of the system and smooth commissioning. During operation, our service teams ensure that your systems run efficiently and reliably. In addition to maintenance work and safety checks, maintenance with condition monitoring is part of the service profile.

Mechanics, electricians, sensors: We carry out any repairs for all components, including the rotor, gearbox and large component replacement. Our retrofits open up new, higher performance classes for you – either via standard solutions provided by the manufacturer or with optimization packages that we design individually using engineering. Last but not least, we equip wind turbines with protective coatings. A performance that counts above all for offshore wind farms.

In the cooperation, XERVON Wind convinces with tailor-made service concepts, customer orientation and the high degree of innovation. We operate nationwide and employ around 100 people at our locations in Lingen, Geilenkirchen and Cologne. Organizationally, XERVON Wind is part of the XERVON group and therefore belongs to REMONDIS Maintenance & Services. For you this means: In addition to our own work, we can involve specialists from other trades at any time and open up potential for you that only a strong group of companies can offer.



Our services at a glance:

- Service & maintenance
- Repairs
- Retrofits
- Installation & commissioning
- Safety reviews
- Gear boxes
- Towers
- Main component replacement
- Engineering
- Surface technology

01 | XERVON Wind colleague in front of a wind turbine

XERVON®

WORKING FOR THE FUTURE

XERVON Wind GmbH

Address	Waldstrasse 39 49808 Lingen
Phone	+49 (0)591 610037 0
Fax	+49 (0)221 7177 338
E-Mail	wind-xn@xervon.com
Web	www.xervon-wind.de
Category	Operation & Service
Profile	Service, maintenance & repair
Employees	100 (Wind energy: 100)
Founding year	2021

ECONOMIC REPORT

8 | FOCUS REPOWERING ↗

COMPANIES

- 30 | The top employers in the industry ↗
- 56 | Companies with innovative projects ↗
- 68 | Research in Germany ↗
- 78 | Start-ups ↗
- 104 | Manufacturers ↗
- 114 | Suppliers ↗
- 116 | A to H ↗
- 130 | I to P ↗
- 136 | Q to Z ↗
- 144 | Service and logistics ↗
- 146 | A to H ↗
- 178 | I to P ↗
- 192 | Q to Z ↗
- 228 | Associations ↗

INDUSTRY DIRECTORY

- 236 | All addresses of leading companies ↗
- 238 | Direct marketing ↗
- 239 | Education & training ↗
- 240 | Energy services ↗
- 240 | Finance & law ↗
- 243 | Foundations & footings ↗
- 243 | Inspection, measurement, evaluators ↗
- 247 | Manufacturers ↗
- 248 | Operation & service ↗
- 252 | Organisations & public institutions ↗
- 252 | Other services ↗
- 254 | Planning ↗
- 259 | Rotor blades ↗
- 259 | Sector Coupling ↗
- 259 | Suppliers of electrical and electronic components ↗
- 262 | Suppliers of mechanical components ↗
- 265 | Transport & logistics ↗
- 268 | Companies A-Z ↗
- 275 | Category overview ↗



Wolfram Axthelm
Geschäftsführer BWE



Bärbel Heidebroek
BWE Präsidentin und Geschäftsführerin der Landwind Gruppe



Milan Nitzsche
BWE Vizepräsident und Geschäftsführer SL Naturenergie



Matthias Belitz
Bereichsleitung Nachhaltigkeit, Energie und Klimaschutz beim VCI



Rodenik Hamann
Leiter Energiepolitik bei der Wirtschaftsvereinigung Stahl



Energy Transition Stage at WindEnergy 2024 in Hamburg. Panel on 'Wind energy directly into the plant' with representatives of the BWE, the VCI, the German Steel Federation and SL Naturenergie.
Photo: BWE/Bente Stachowske

ASSOCIATIONS:

German Wind Energy Association (BWE)

The German Wind Energy Association is the voice of the German wind energy sector. The companies of the wind industry meet in its advisory councils and discuss its technical and political orientation. At its events and in its publications, it passes on its knowledge – to newcomers and experts alike.



ECONOMIC REPORT

8 | FOCUS REPOWERING ↗

COMPANIES

30 | The top employers in the industry ↗
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104 | Manufacturers ↗
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136 | Q to Z ↗
144 | Service and logistics ↗
146 | A to H ↗
178 | I to P ↗
192 | Q to Z ↗
→ 228 | Associations ↗

INDUSTRY DIRECTORY

236 | All addresses of leading companies ↗
238 | Direct marketing ↗
239 | Education & training ↗
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252 | Other services ↗
254 | Planning ↗
259 | Rotor blades ↗
259 | Sector Coupling ↗
259 | Suppliers of electrical and electronic components ↗
262 | Suppliers of mechanical components ↗
265 | Transport & logistics ↗

268 | Companies A-Z ↗

275 | Category overview ↗

The expert committees in the German Wind Energy Association e. V.

Various perspectives – one common interest: the accelerated expansion of onshore wind energy. The German Wind Energy Association provides its diverse members with the opportunity to organize themselves both professionally and politically in order to pursue this very goal. Through targeted exchange of expertise and the associated political coordination, the association derives policy recommendations as well as essential information for its members.



01

Thus, the broad expertise of the BWE relies on the diversity of its members. In fact, the association includes a wide range of stakeholders, such as plant operators, operations managers, project developers, experts, lawyers, financiers, investors, and community energy organizations, as well as equipment manufacturers, suppliers, and service providers. The BWE consolidates their expertise and experience in advisory boards and working groups. The largest group within the BWE, the plant operators, also have the opportunity to exchange ideas in operator forums.

In all of these specialist committees, members discuss and address current technical issues in their respective fields, developing both technical and political solutions to all key industry topics. They form the basis of the association's technical and political work, advising the board of directors and the executive committee. The concrete technical work of these experts often results in position papers and

statements. These documents are heard and considered during the frequent regulatory changes at both the European and national levels.

In practice, over 800 individuals serve as voluntary members in the BWE's specialist committees. The committee members typically convene two to four times a year. The departments primarily responsible for the thematic and organizational support of these committees are the Wind Expertise Division, along with the Legal Department and the Policy Division. The collaboration between these policy areas enables well-founded technical work and politically effective association activities. The information papers, statements, and position papers developed are made available to all BWE members.

01 | Expert Advisory Board
(Photo: Weidmüller)

02 | Wind Consultant Advisory Board
(Photo: Christina Hasse)

ADVISORY BOARDS

Operator Advisory Board

In principle, all of the approximately 2200 wind turbine operating companies registered with the BWE are eligible to participate in the Operator Advisory Board. However, the representatives of the six manufacturer-related operator forums, in which operators discuss matters relating to wind turbines from the same manufacturers, form the core of the advisory board's work. The Operator Advisory Board organises an annual survey of all BWE operator companies to determine the service quality of the service providers and manufacturers.

Operational Managers Advisory Board

The Operational Managers Advisory Board deals with all commercial and technical aspects of wind turbine operations and also liaises with other associations to help develop guidelines. Temporary working groups are established to discuss specific subjects and produce reports or recommendations for action, which benefit all stakeholders in the wind energy sector.



02

Citizen's Wind Energy Advisory Board

The Citizen's Wind Energy Advisory Board is a body that brings together citizen's energy associations which it represents within the BWE. It is committed to bringing about the energy transition through citizen's wind energy projects.

Funding Body Advisory Council

The Funding Body Advisory Council is open to all banks and funding bodies operating within the wind energy sector. It is a forum for the inter-company exchange of ideas and deals with the financial ramifications of relevant legislation.

Legal Advisory Board

In the legal advisory board, more than 100 lawyers and legal experts discuss current legal issues related to wind energy. The primary focus is on evaluating numerous ongoing legislative processes, with concrete proposals for changes being formulated in statements. Additionally, information about current legal proceedings and the associated rulings is exchanged. The Legal Advisory Board is overseen by the Legal Department.

Nature conservation

On October 25, 2024, the majority of members of the BWE's Nature Conservation and Wind Energy Working Group voted in favor of transforming the previous working group into an advisory board. The future Nature Conservation Advisory Board will be dedicated to all challenges that arise in the field of wind energy and nature conservation. It is the platform for the exchange and discussion of technical issues and for the development of association positions in the field of nature and species conservation.

Project developers

The Planning Advisory Board is an important platform for the exchange of information between the planning companies organised within the BWE. Discussions about key issues such as planning law at the federal and state levels, the future design of the German Renewable Energy Sources Act and European energy policy are frequently accompanied by specialist lectures. The members support the BWE's positioning on planning issues in collaboration with the relevant specialist committees.

Expert Advisory Board

The Expert Advisory Board discusses and develops guidelines and procedural instructions for the technical inspections of wind turbines. These are widely accepted beyond the association and form the basis for the long-term safe operation of wind turbines in Germany.

Communication Advisory Board

The Communication Advisory Board meets to discuss how to present issues relating to the wind sector in the press and public relations work. The member companies plan campaigns, brochures, and social media activities. The Communication Advisory Board is supervised by the Communications Department.

Wind Consultant Advisory Board

The BWE Wind Consultant Advisory Board's main focus is on improving wind forecasts in inland areas based on a continuous exchange of experiences and regular lectures on the subject, resulting, in particular, in the definition of minimum standards for expert reports.

WORKING GROUPS

They are organized across advisory boards, able to act swiftly, and can involve external experts. In addition to the Energy Policy and Grids advisory boards, there are active on topics such as Direct Marketing, Air Traffic and Radar, Labeling, Continued Operation and Plant Safety, and Participation.

Energy Policy Advisory

The exchange of current political topics takes center stage in the work. Across advisory boards and topics legislative initiatives of the federal government are discussed, and recommendations are developed to assist the Federal Board in forming its positions.

Grids Advisory

The diverse aspects of the grid topic are reflected in the responsibilities. This includes politically-strategic questions such as the future share of conventional energy in the network, grids expansion and redevelopment, grids optimization, flexibility options, and the system transformation towards renewable energy supply.

For more information about the work of various expert committees, please visit www.wind-energie.de/english/association/committees/



German Wind Energy Association

The expert committees at the German Wind Energy Association (BWE)

Address	EUREF-Campus – Haus 16 10829 Berlin
Phone	+49 (0)30 212341-210
E-Mail	info@wind-energie.de
Web	www.wind-energie.de
Category	Organisations & Public institutions
Founding year	1996

ECONOMIC REPORT

8 | FOCUS REPOWERING ↗

COMPANIES

30 | The top employers in the industry ↗
 56 | Companies with innovative projects ↗
 68 | Research in Germany ↗
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 104 | Manufacturers ↗
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 116 | A to H ↗
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 144 | Service and logistics ↗
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German Wind Energy Association (BWE) EVENTS

INFORM. EDUCATE. NETWORK.



01

The German Wind Energy Association – a strong partner

With around 20,000 members it is the world’s largest association for renewable energies. The BWE has been campaigning for a sustainable and efficient expansion of wind energy in Germany for many years.

With its ambitious expansion targets, the wind energy sector is the main driver of the energy transition. Together with its members, the BWE is fully committed to continuing the success story of German wind energy and to ensuring that the vision of “100 percent electricity from renewable energy” in Germany becomes a reality soon.



02

The German Wind Energy Association – knowledge & networking

In addition to political work, knowledge & networking is a central impetus for the German Wind Energy Association. BWE has accompanied the economic and technical progress of the industry for many years with its education events and publications from which everyone, novice and expert alike, can obtain the latest facts about the growing wind industry and beyond.



03

- 01 | The BWE's Green Screen Studio
Photo: BWE
- 02 | Specialist Conference Wind Energy & Species Protection
Photo: BWE/Volker Krahl
- 03 | Energy Transition MAKERS Stage
Photo: BWE/Tim Riediger
- 04 | BEE Summer Festival
Photo: Carsten Koall



04

BWE events

With approximately 50,000 participants at around 250 events per year, BWE is the market leader in the education and training of the wind industry and also offers various topics related to renewable energies. The diverse formats provide professionals and executives in the renewable energy sector with the opportunity to stay informed on current topics and expand their networks.

The Wind Branch Days are an established platform for dialogue among industry professionals and for engaging with policymakers at the regional level. With up to 800 participants, these are the largest events, and numerous politicians from all levels of government attend each year.

During conferences, practical workshops, and seminars, participants stay up to date in their respective fields as selected industry experts share their practical knowledge. It's not uncommon for new business relationships to be established in these settings.

BWE WebAcademy

From 90-minute webinars to three-day web seminars, the BWE WebAcademy provides you with the very latest information and knowledge. As usual, you can ask our experts questions, but from the comfort of your home or office. More than 150 offers are available every year, allowing you to tap into a wide range of topics and stay abreast of developments surrounding the wind energy sector, PV and other renewables without much effort.

An overview of all events can be found here: www.bwe-seminare.de

BWE PolicyBriefing

Several times a year, BWE provides information via live video streams on political developments related to wind energy and answers industry questions in real-time. This allows legislative processes and challenges to be followed and assessed on a daily basis. Through BWE Policy Briefings, BWE offers an interactive and transparent way for member communication with significant reach.



German Wind Energy Association

German Wind Energy Association (BWE) Events

Address	EUREF-Campus – Haus 16 10829 Berlin
Phone	+49 (0)30 20164-222
Fax	+49 (0)30 212341-362
Web	www.bwe-seminare.de
Category	Organisations & Public institutions
Profile	Education & Training
Founding year	1996

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German Wind Energy Association (BWE) CORPORATE PUBLISHING

From ONLINE to PRINT: expert knowledge for the sector, attractively delivered

Under the brand name Wind Industry in Germany, the BWE publishes various products for a specialist audience within the wind energy sector. With these products the BWE provides its readers with comprehensive information on current developments within the sector.

ONLINE FORMATS



windindustry-in-germany.com

The website is the leading portal for specialist information within the wind energy sector. It offers current information on companies, a comprehensive collection of expert interviews and a broad range of further education and job opportunities, while the online company directory presents the who is who in the wind energy sector.

In short: This site invites you to explore its content and to make the most of its information and educational opportunities!

Sector newsletter

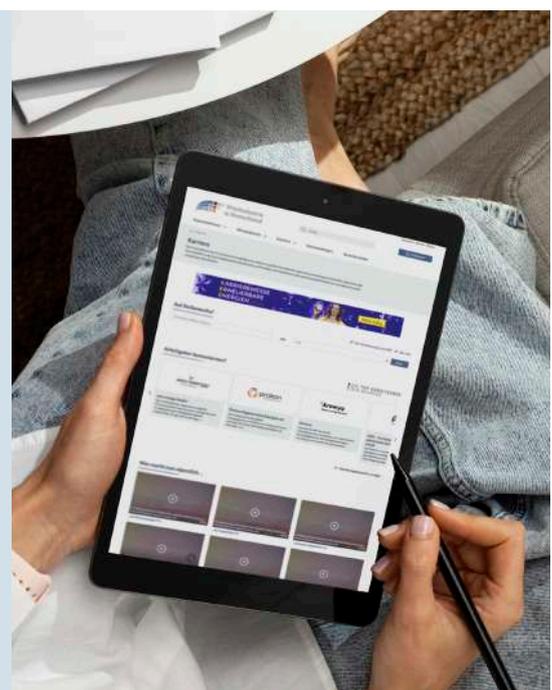
The sector newsletter provides a weekly update of the most important news from the wind energy sector. Reaching about 12,000 recipients it is a press review that draws on the online presence of the sector.

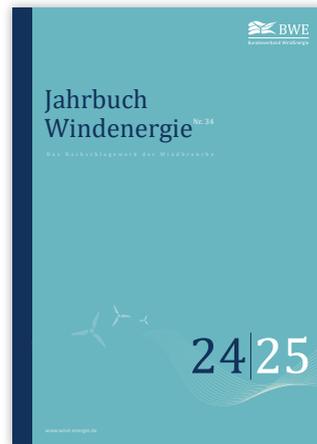
Recruiting

The two departments, **Corporate Publishing** and **Events**, support all companies within the renewable energy sector in their search for new employees.

At the career fair for **renewable energy (KEE)**, held several times a year, companies present themselves to professionals, newcomers, and career changers. Companies benefit from the reduced effort due to the online format.

On the **industry portal** windindustrie-in-deutschland.de/karriere, professionals can find information about employers in the sector, job postings, and job profiles. Job advertisements shared via the **newsletter** reach over 12,000 recipients who are already employed in the industry.





PRINT FORMATS

Wind Industry in Germany

The central aim of the present directory is to build connections within the German wind industry. It is the flagship of the wind energy sector where companies can present their services and products to a broad audience. They also have the opportunity to present themselves as attractive employers. The comprehensive address section makes it a real reference book for anyone looking for partners in the wind industry. The publication also presents innovative projects and start-ups.

BWE Wind Energy Yearbook

For the last 30 years the BWE has published the wind energy yearbook which offers an excellent overview of facts, figures and data and the development of both the market and technology in Germany, Europe and the world. The results of the BWE service survey and an overview of the German service market give insights into developments within this special segment of the industry.

BWE operators' newsletter

The operators' newsletter is a print format that is mailed to around 2,200 operators. It provides this important group with relevant information, covering current issues and forthcoming changes and offering tips for efficient operation.

BWE posters

The posters always reflect current issues, such as the development of wind power in Germany, repowering, continued operation, or nature conservation and species protection. The high print run of 20,000 to 30,000 ensures that the posters are widely distributed within the sector and beyond.

Customised marketing options

The **Wind Industry in Germany** brand is a market leader when it comes to offering a wind energy sector-specific advertising platform for those engaged in marketing. Our range of marketing options includes:

- Online company listings
- Banners
- Newsletter announcements
- Stand-alone newsletters
- Company presentations
- Advertisements
- Event sponsoring
- And much more

Our well-established publications give you direct access to every **sector-relevant target group**. Contact us, we'll be happy to advise you!

Interested in realising your own corporate publishing project?

With our **long publishing expertise in the field of renewable energies** we are more than able to implement your project. We are good at what we do, fast, and affordable. We know the sector better than anyone! We look forward to hearing from you!



German Wind Energy Association (BWE) Corporate Publishing

Address	EUREF-Campus – Haus 16 10829 Berlin
Phone	+49 (0)30 212341-164
Fax	+49 (0)30 212341-410
E-Mail	WID-Redaktion@wind-energie.de
Web	www.windindustry-in-germany.com
Category	Other services
Profile	Media & Communication
Founding year	1996

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A Vestas employee inspects the construction process of a 115.5 meter long V236-15.0MW wind turbine blade at Nakskov, Denmark.
Photo: Vestas/Tristan Stedman

COMPANIES:

Industry directory

More than 350 addresses of leading companies in the wind industry.

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Direct marketing

Direct marketers



BayWa r.e. Energy Trading GmbH

Katharinenstrasse 6, 04109 Leipzig

Phone: +49 (0)341 33967600

E-Mail: energytrading@baywa-re.com

www.baywa-re.de

As a direct marketer, we provide plant operators with a comprehensive, transparent service. Our offer includes direct marketing as well as remuneration models for wind plants with expiring subsidy.



Centrica Energy

Esplanade 40, 20354 Hamburg

Phone: +49 (0)160 90509308

E-Mail: cet-coordination@centrica.com

www.centricaenergy.com

Centrica Energy is a leading European provider of energy management. Our main competencies in Germany are Direct Marketing, Post-EEG contracts, PPAs for renewables, and optimizing flexible assets.



EWE TRADING GmbH

Am Weser-Terminal 1, 28217 Bremen

Phone: +49 (0)421 69625307

Fax: +49 (0)421 69625309

E-Mail: direktvermarktung@ewe.de

www.ewe.com

The company offers operators and project planners of renewable energies individual solutions for PPA and direct marketing contracts.



in.power Services GmbH

An der Fahrt 5, 55124 Mainz

Phone: +49 (0)6131 69657-0

Fax: +49 (0)6131 69657-29

E-Mail: kontakt@inpower.de

www.inpower.de

The in.power group provides a wide range of services: direct marketing, continued operation, flexible marketing, green energy balancing, metering point operation, regional green power products etc.



naturstrom AG

Parsevalstrasse 11, 40468 Düsseldorf

Phone: +49 (0)211 77 900-380

Fax: +49 (0)211 77 900-399

E-Mail: Direktvermarktung@Naturstrom.de

www.naturstrom.de

Benefit from attractive remuneration. We are your partner for electricity sales, have years of experience and are familiar with all the various marketing channels.



Renewable Exchange GmbH

Regus Hamburg Nord, Kapstadtring 7/2nd Floor,

22297 Hamburg

Phone: +49 (0)162 9720501

E-Mail: kontakt@renewable.exchange

renewable.exchange/de

Renewable Exchange is the largest online marketplace connecting renewable energy generators and buyers to ensure a transparent and data-driven power trading process in the UK and Germany.



Statkraft Deutschland

Derendorfer Allee 2a, 40476 Düsseldorf

Phone: +49 (0)211 60 244-000

Fax: +49 (0)211 60 244-199

E-Mail: info@statkraft.de

www.statkraft.de

We have always believed in a better kind of power. Power that renews itself, and in turn, renews the world. For 25 years, we have been shaping the future of energy supply in Germany.



Trailstone Renewables GmbH

Ernst-Reuter Platz 6, 10587 Berlin

Phone: +49 (0)172 8561683

E-Mail: lana.lehmeier@trailstonegroup.com

www.trailstonegroup.com/de

As a direct marketer, Trailstone offers you numerous services such as classic direct marketing, post-EEG PPAs, spot-only contracts, etc. as well as everything related to ancillary services and flexibility.



Vattenfall

Hildegard-Knef-Platz 2, 10829 Berlin

Phone: +49 (0)40 24430 559

E-Mail: info@vattenfall.de

www.vattenfall.com

Vattenfall is one of the largest producers and traders of electricity and heat in Europe. The most important markets are Sweden, Germany, the Netherlands, Denmark and the United Kingdom.

Forecasting services providers



4Cast GmbH & Co. KG

Friedrich-Ebert-Str. 8, 14467 Potsdam

Phone: +49 (0)331 982 238 30

E-Mail: hello@4-cast.de

4-cast.de

4cast is a leading provider of precise, automated performance analysis for wind and PV projects. We have been driving machine learning-based forecasting methods for the energy market since 2016.



Education & training

Education & training



blade care GmbH

Neuenfeld 41, 17291 Schoenfeld
Phone: +49 (0)163 886 00 79
E-Mail: post@bladecare.de
www.bladecare.academy
blade care Academy is a DNG-GL certified training provider for administrators & rotor blade technicians & GWO Blade Repair course, with 25 years experience in rotor blade service by blade care GmbH.



BWE-Service GmbH –

WebAkademie c/o Bundesverband Windenergie e.V.

EUREF-Campus 16, 10829 Berlin
Phone: +49 (0)30 212 341-222
E-Mail: seminare@wind-energie.de
www.bwe-seminare.de
We impart practical knowledge in face-to-face seminars, at conferences, via internet or livestream. Our portfolio covers all areas of renewable energies.



Deutsche Windtechnik Training Center Viöl

Mühlengrund 3, 25884 Viöl
Phone: +49 (0)4843 20448 163
Fax: +49 (0)4845 79168 29
E-Mail: Trainingcenter@deutsche-windtechnik.com
www.deutsche-windtechnik.com
The Training Center Viöl offers a practical training in original turbines of the leading manufacturers. Well-equipped training rooms offer optimal conditions for the theoretical knowledge transfer.



EMD Deutschland GbR

Breitscheidstrasse 6, 34119 Kassel
Phone: +49 (0)561 31059-60
Fax: +49 (0)561 31059-69
E-Mail: sales-de@emd.dk
www.emd.dk
Modular software for the planning, design and simulation of wind energy projects (windPRO) and decentralized energy projects (energyPRO). Online performance monitoring for wind farms (windOPS).



KWS Energy Knowledge eG

Deilbachtal 199, 45257 Essen
Phone: +49 (0)201 8489-121
E-Mail: info@kws-eg.com
www.kws-eg.com
For more than 60 years, KWS has been a service provider and an educational institution with its customized and up-to-date training and consulting offerings for the power industry.



UNIKIMS GmbH – Kassel university

Universitätsplatz 12, 34127 Kassel
Phone: +49 (0)561 804 2913
E-Mail: contact@unikims.de
www.unikims.de/wes
UNIKIMS is the management school of the University of Kassel. Since 2005, it has developed into a strong partner for companies and organisations with in-service training courses.

Safety training



Deutsche WindGuard

An der Weinkaje 4, 26931 Elsfleth
Phone: +49 (0)4404 9875 100
E-Mail: buchung.training@windguard.de
www.windguard-training.de
Safety Training f. onshore & offshore wind industry, GWO basic safety trainings & refresher, Helicopter Underwater Escape Training, trainings acc. to DGUV; Training Centres: Elsfleth, Norden, Borkum.



Deutsche Windtechnik Training Center Bremen

Hüttenstrasse 20a, 28237 Bremen
Phone: +49 (0)421 62677 10
Fax: +49 (0)421 62677 11
E-Mail: Trainingcenter@deutsche-windtechnik.com
www.deutsche-windtechnik.com
The Training Center provides certified safety courses in accordance with GWO, DGUV & FISAT. All relevant safety aspects are trained in a realistic environment with experienced trainers.



OffTEC Base GmbH & Co. KG

Lecker Strasse 7, 25917 Enge-Sande
Phone: +49 (0)4662 89127-0
E-Mail: training@offtec.de
www.offtec.de
OffTEC is a safety and technology training provider, certified according to GWO & DGUV. The Maritime Training Center is one of the most modern of its kind. Overnight stays on-site are possible."



SHE Solution Bergmann GmbH & Co. KG

Im Sundernkamp 2, 32130 Enger
Phone: +49 (0)5224 9393850
Fax: +49 (0)5224 9393852
E-Mail: info@she-solution.de
www.she-solution.de
SHE is your training provider for safety trainings according to GWO and DGUV standards. The trainings are conducted realistically by experienced trainers, if desired also as in-house training.

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Energy services

Energy services



Arowya

Hauptstr. 65, 12159 Berlin
 Phone: +49 (0)30 24006010
 E-Mail: info@arowya.com
 www.arowya.com

As part of the BKW Group, we offer customers, partners and investors a comprehensive range of energy services in addition to the production and procurement of energy.



LandStrom GmbH & Co. KG

Watenstedter Str. 11, 38384 Gevensleben
 Phone: +49 (0)5354 26600-66
 Fax: +49 (0)5354 26600-19
 E-Mail: info@landstrom-landwind.de
 www.landstrom-landwind.de

Climate-neutral electricity and gas from a single source, direct marketing, service and consultancy across the entire spectrum of renewable energies in co-operation with Landwind at competitive prices

Energy supplier



EnBW Energie Baden-Württemberg AG

Schelmenwasenstrasse 15, 70567 Stuttgart
 Phone: +49 (0)711 289 487 87
 E-Mail: windkraft@enbw.com
 www.enbw.com/windkraft

Development, acquisition, construction and operation of wind turbines – EnBW Energie Baden-Württemberg AG is active along the entire value chain.



ENGIE Deutschland Erneuerbare GmbH

Ella-Barowsky-Strasse 44, 10829 Berlin
 Phone: +49 (0)30 91581 0250
 E-Mail: alexa.schroeder@engie.com
 www.engie-erneuerbare.de

ENGIE is a global leader in renewable energies and services. We cover the entire wind and solar PV value chain and co-operate with partners.



TotalEnergies Renewables Deutschland GmbH

Kleine Reichenstrasse 1, 20457 Hamburg
 Phone: +49 (0)30 2027 60
 Fax: +49 (0)30 2027 8833
 E-Mail: renewables-deutschland@totalenergies.com
 www.totalenergies.de

TotalEnergies Renewables Deutschland develops renewable energy projects in Germany.



Uniper SE

Holzstrasse 6, 40221 Düsseldorf
 Phone: +49 (0)211 73275 0
 E-Mail: info@uniper.energy
 www.uniper.energy

Uniper is accelerating the energy transition in Europe with wind and solar energy. In doing so Uniper values long-term partnerships – be it in terms of location, design or the implementation of plants

Finance & law

Banks, financial institutions & financial service providers



COMMERZ REAL

Commerz Real AG

Mercedesstr. 6, 40470 Düsseldorf
 Phone: +49 (0)211 7708-2226
 Fax: +49 (0)211 7708-9226
 E-Mail: institutional@commerzreal.com
 www.institutional.commerzreal.com

Commerz Real AG manages among others structured real assets' investments in real estate, renewable energies and infrastructure for (semi-) professional investors.



DAL Deutsche Anlagen-Leasing GmbH & Co. KG

Emy-Roeder-Strasse 2, 55129 Mainz
 Phone: +49 (0)6131 804-3214
 Fax: +49 (0)6131 804-73214
 E-Mail: info@dal.de
 www.dal.de

DAL supports investments in solar and wind energy projects with tailor-made financing solutions in Germany and abroad in Europe.



DZ BANK AG

Platz der Republik, 60265 Frankfurt
 Phone: +49 (0)69 7447 01
 Fax: +49 (0)69 7447 1685
 E-Mail: ee_finanzierung@dzbank.de
 www.dzbank.com

DZ BANK has been a reliable partner for the financing of wind power plants for over 25 years. Together with R+V Versicherung, solutions for insuring the wind power plants can also be offered.





Hamburg Commercial Bank AG

Gerhart-Hauptmann-Platz 50, 20095 Hamburg
Phone: +49 (0)40 3333-11343
Fax: +49 (0)40 3333-34001
E-Mail: inka.klinger@hcob-bank.com
www.hcob-bank.de

Since 1994, HCOB has stood for long/short-term project financing of renewable energies across the value chain in Europe. The focus is on PE funding, M&A, bridge and construction loans.

Consulting & business consulting



BOEHM-BEZING & CIE.

Boehm-Bezing & Cie. GmbH

Stafflenbergstr. 44, 70184 Stuttgart
Phone: +49 (0)711 722 082-0
Fax: +49 (0)711 722 082-99
E-Mail: boehm-bezing@bbcie.de
www.bbcie.de/index_en.html

Since 1999, Boehm-Bezing & Cie. has been one of the leading independent advisory firms in Germany for Corporate Finance and M&A, with special expertise in renewable energy and infrastructure.



Routing Energy GmbH & Co. KG

Industriestrasse 14, 25813 Husum
Phone: +49 (0)4841 9811-623
E-Mail: info@routingenergy.de
www.routingenergy.de

As a reliable partner for supply and service contracts, we pool individual projects into a strong community and negotiate optimal conditions with wind turbine manufacturers.



Landwirtschaftliche Rentenbank

Theodor-Heuss-Allee 80, 60486 Frankfurt
Phone: +49 (0)69 2107 700
Fax: +49 (0)69 2107 6459
E-Mail: office@rentenbank.de
www.rentenbank.de

As Germany's development bank for agribusiness and rural areas, we offer low-interest financing for the generation, storage and distribution of renewable energies.



DEUTSCHE WINDGUARD

Deutsche WindGuard

Oldenburger Str. 65, 26316 Varel
Phone: +49 (0)4451 9515 0
E-Mail: info@windguard.de
www.windguard.com

Due diligence, tender and contract consulting, wind turbine type and manufacturer assessment, analysis of operational wind farms, policy consulting & studies, market analysis.



Sterr-Koelln & Partner mbB

Emmy-Noether-Strasse 2, 79110 Freiburg
Phone: +49 (0)761 49 05 40
Fax: +49 (0)761 493468
E-Mail: info@sterr-koelln.com
www.sterr-koelln.com

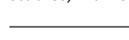
We have been one of the leading interdisciplinary advisory companies for renewable energies for more than 25 years. We are a single-source service for any legal, business and tax-related questions.



NORD/LB

NORD/LB

Friedrichswall 10, 30159 Hannover
Phone: +49 (0)511 361 6696
E-Mail: gerrit.schmidt@nordlb.de
www.nordlb.de
Our bank has been involved in financing renewable energy projects since the mid-1990s. With numerous project financing and advisory mandates for wind farms we are one of the top arrangers.



DNV Energy Systems Germany GmbH

Brooktorkai 18, 20457 Hamburg
Phone: +49 (0)40 36149-0
E-Mail: es-germany@dnv.com
www.dnv.com

DNV Energy Systems Germany (formerly known as GL Garrad Hassan Deutschland) is a leading service provider in the renewable energy sector.



Tractebel Engineering GmbH

Friedberger Str. 173, 61118 Bad Vilbel
Phone: +49 (0)6101 55-1445
Fax: +49 (0)6101 55-1826
E-Mail: info-de@tractebel.engie.com
www.tractebel-engie.com/en/solutions/energy#renewables
Tractebel offers world-wide planning and consulting services for onshore and offshore wind farm projects as well as wind expertises according to ISO 17025.



ÖKORENTA GmbH

Kornkamp 52, 26605 Aurich
Phone: +49 (0)4941 60497-287
E-Mail: ankauf@oekorenta.de
oekorenta.de/ankauf

Through its investment concepts from 1-100 % ÖKORENTA offers developers equal partnerships that provide the necessary equity capital for project implementation while still preserving independence.



EcofinConcept GmbH Renewable Energies

Rheinstr. 7, 41836 Hückelhoven
Phone: +49 (0)2433 970-471
Fax: +49 (0)2433 970-107
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www.windmultiplikator.de
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BIL provides developers and operators of wind turbines with a central enquiry portal for line information.



Caeli Wind GmbH

Mollstr. 32, 10249 Berlin
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www.caeli-wind.de

Caeli Wind is the first digital wind site marketplace that radically accelerates the identification, assessment, planning and allocation of wind power potential sites to project developers.



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messehusum.com
From 16-19 September 2025, the wind industry will meet at HUSUM WIND and present the latest technology for the transformation of tomorrow's energy system in the German wind mecca.

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Planning

Grids & grid connection



FGH – Research Association for Power Systems and Power Economics

Voltastr. 19-21, 68199 Mannheim
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Our portal Leico – Leitungs-check-online is an easy way for planners and construction companies to make enquiries throughout Germany and to answer any queries they may receive.



Moeller & Poeller Engineering GmbH (M.P.E.)

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SpanSet Axzion GmbH, a company within the SpanSet Group Germany with its own production facilities, specialises in load handling attachments for international on- and offshore wind power turbines.



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 E-Mail: windkraft@enbw.com
 www.enbw.com/windkraft

Development, acquisition, construction and operation of wind turbines – EnBW Energie Baden-Württemberg AG is active along the entire value chain.

Tractebel Engineering GmbH

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Fax: +49 (0)641 9446478-29

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Phone: +49 (0)951 9649-777

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E-Mail: info@jadenaturenergie.de

www.jadenaturenergie.de

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E-Mail: info@lintas-greenenergy.de

www.lintas-greenenergy.de

Lintas Green Energy offers comprehensive energy solutions as a project developer and service provider, from planning to implementation.

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planGIS prepares environmental reports (EIA, landscape planning, species conservation, visibility/visual impact analysis), immission control reports (noise/shadow) and restriction analyses.

**MLK Gruppe**

Lichtenberger Weg 4, 15236 Jacobsdorf

Phone: +49 (0)33608 179 997

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**Prowind GmbH**

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Phone: +49 (0)541 600 29-0

Fax: +49 (0)541 600 29-29

E-Mail: info@prowind.com

www.prowind.com

The Prowind GmbH from Osnabrück has been implementing renewable energy projects for 21 years now. The core business lies in the planning, projecting and operation of wind and solar farms.

**NOTUS energy**

Parkstrasse 1, 14469 Potsdam

Phone: +49 (0)331 62043-40

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www.notus.de

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Ramboll

City Tower | Limbecker Platz 1, 45127 Essen
 Phone: +49 (0)201 438 830
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 c.ramboll.com/de-de/onshore-wind
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 www.sabowind.de
 Sabowind plans and erects onshore wind energy turbines and photovoltaic plants as well as substations in Germany and Poland.



Volkswind GmbH

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wpd GmbH

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medias.schaeffler.de/en/lifetime-solutions
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Rittal GmbH & Co. KG
 Auf dem Stützelberg, 35745 Herborn
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Lubricants & lubrication systems



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REWITEC GmbH
 Dr.-Hans-Wilhelmi-Weg 1, 35633 Lahnau
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