

# start up

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



An excerpt of the  
BWE Industry Report  
'Wind Industry in  
Germany 2026'



# ANNEA – Optimize Wind Turbines with AI

ANNEA optimizes wind turbines with AI, digital twins, and automated data processing – for greater efficiency, reduced downtime, and maximum energy yield across global operations.



**W**ind energy is a key pillar of the global energy transition. Yet even state-of-the-art wind turbines often fall short of their full potential: excessive downtime, inefficient operation, and delayed maintenance regularly lead to production losses. This is where ANNEA comes in.

The Hamburg-based cleantech company develops AI-powered software solutions for data-driven monitoring and optimization of wind turbines. By combining real-time data, digital twins, and automated analytics,

ANNEA enables predictive maintenance and performance optimization for individual assets as well as entire wind farms.

The result: operators, asset managers, and OEMs receive early and precise maintenance recommendations. Unplanned failures are prevented, operational costs are reduced, and energy production is sustainably increased. ANNEA's platform enables a reduction in downtime of up to 80 %, a decrease in maintenance costs by 15–50 %, and a production boost of 5–15 %.

ANNEA's technology is fully software-based – no additional sensors or specialized hardware are required. Existing SCADA and CMS data can be used alongside external sources: integrated image processing algorithms allow automated analysis of drone images (e.g., rotor blades) and maintenance reports in PDF format, which are directly evaluated within the ANNEA platform. All relevant information is consolidated in one place – enabling a holistic overview and data-driven decisions in real time.



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Founding year 2019

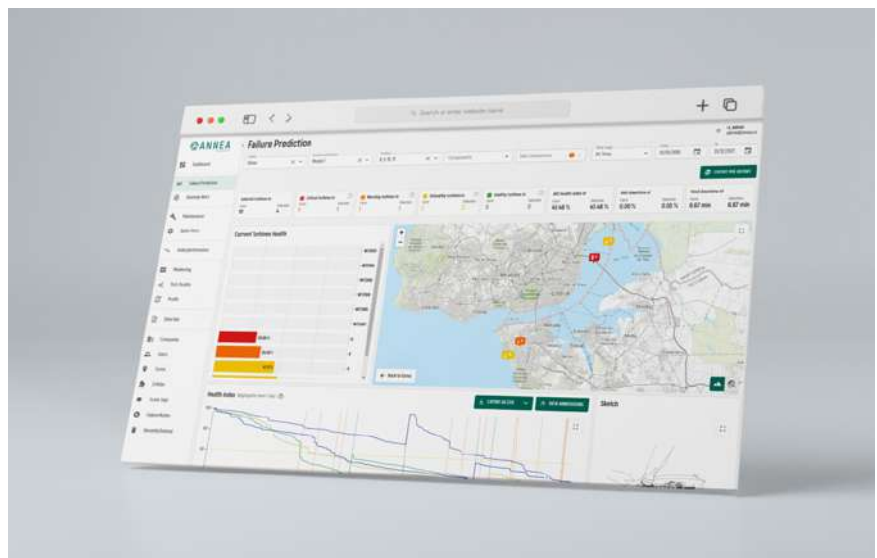
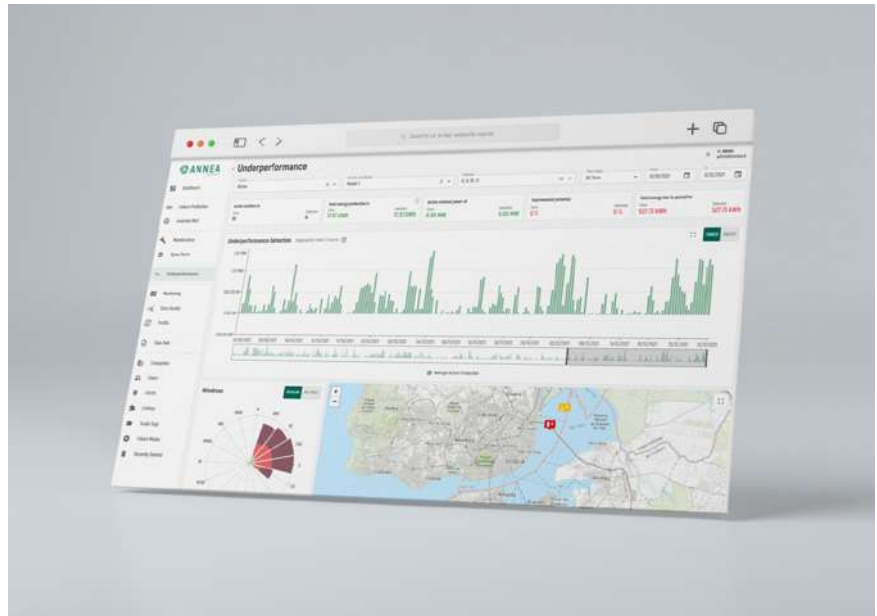
Focus AI-powered software platform

- We offer
- Predictive maintenance and performance optimization
  - Integration of existing SCADA, CMS, and maintenance data (e.g. drone images, PDFs)
  - No additional hardware required; manufacturer-independent
  - 15–50 % lower maintenance costs with 5–15 % higher energy production

- We are looking for
- Partnerships with asset operators, component manufacturers, and service/maintenance providers
  - Access to new markets and international pilot projects
  - Cooperation to further develop intelligent wind farm strategies

ANNEA’s solutions are deployed globally and can be adapted to a wide range of turbine types and configurations – whether offshore or onshore. Clients already include leading wind energy companies from Germany, Europe, and Asia.

To further expand its platform, ANNEA is actively seeking project partners across the wind industry – particularly in the fields of maintenance services, asset operations, and component manufacturing. The shared goal: to improve the efficiency and reliability of wind power – technologically, economically, and sustainably.



**“With ANNEA’s AI platform, operators reduce maintenance costs by 15–50 %, while boosting energy production by 5–15 % – all without additional sensors or hardware.”**

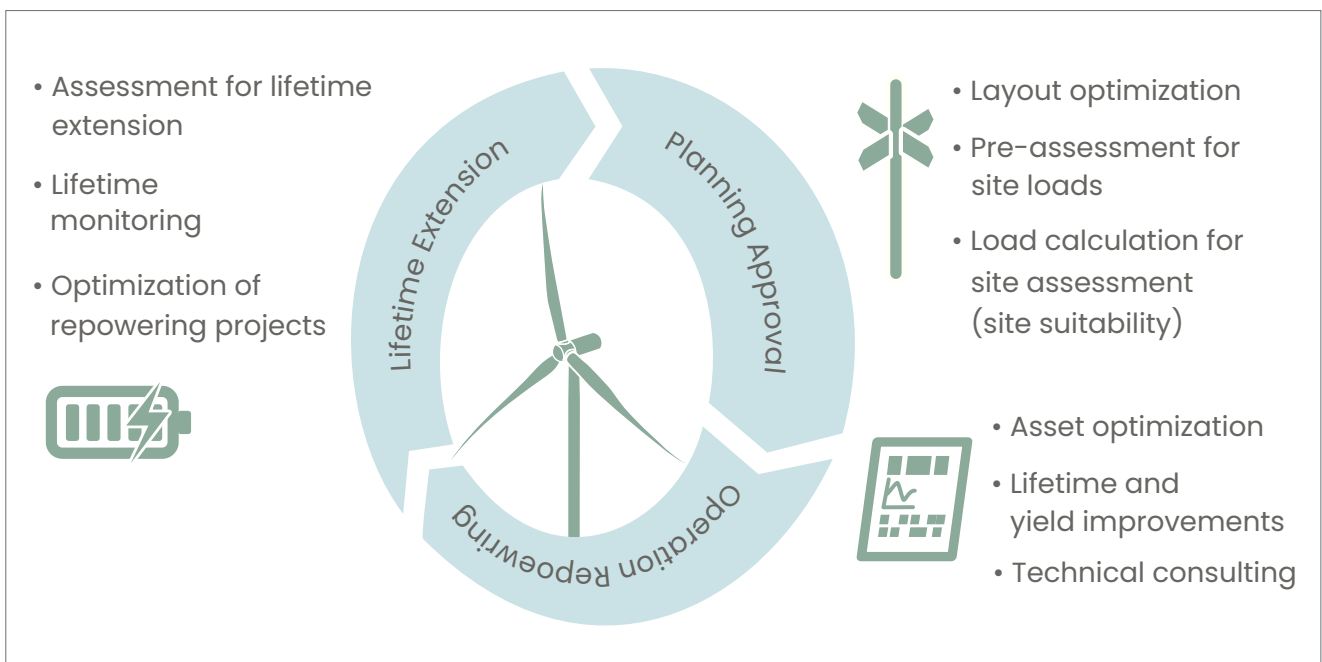
*Dr. Maik Reder, CEO*

## Conclusion

**ANNEA is driving the digital transformation of the wind energy sector. With AI, automated analytics, and actionable maintenance recommendations, the company helps increase the availability and performance of wind turbines – enabling customers to unlock the full potential of their assets.**

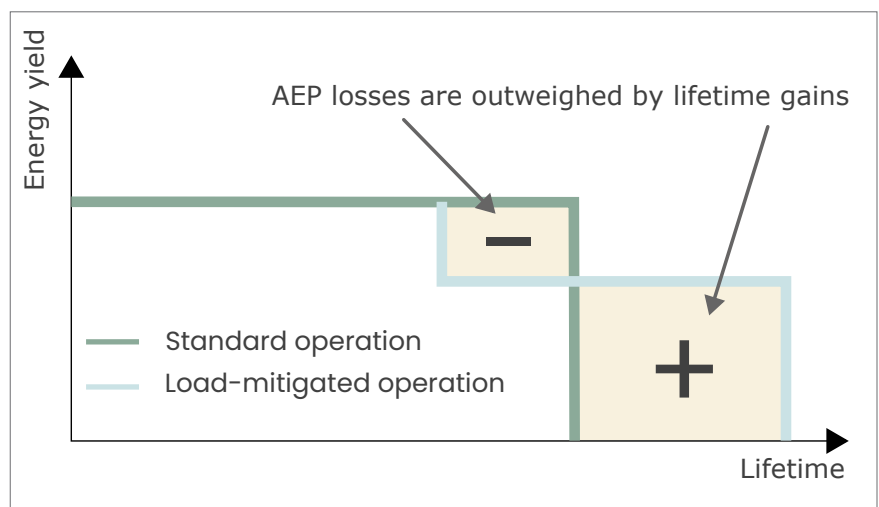
# apera engineers – Maximizing yield through lifetime assessments

The question of the lifetime of wind turbines is relevant throughout their entire life cycle. From project pre-planning and approval to operational optimization or lifetime extension, lifetime calculations provide valuable information to maximize the yield from a turbine.

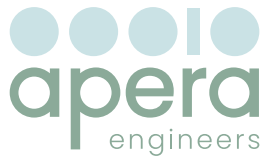


Lifetime calculations can help throughout the lifecycle of a turbine to increase yields

**D**uring site suitability assessments, design limits for newly planned or existing wind turbines are often exceeded. As a result, operational restrictions become necessary, which can lead to significant yield losses. Through load calculations, we analyze the impact of all wind conditions in combination with turbine behavior and determine the stresses on individual components. This allows us to account for structural reserves of turbine components in the verification of structural integrity. Load calculations regularly help to reduce or even completely avoid operational restrictions as part of site suitability assessments. We conduct these



Simple example for increasing total yield over the lifetime



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Founding year **2025**

- Focus
- Load calculations for site suitability assessments
  - Lifetime extension assessments
  - Optimization of farm layouts and existing wind farms

- We are looking for
- Challenging projects
  - Clients: Project developers, operators, asset managers, consultants
  - Cooperation partners, especially those active abroad and/or in offshore projects



We aim to maximize the performance of turbines even at challenging sites

**“Our solutions are often seen as a means to an end – a report required to check off a milestone – and that’s completely fine. However, lifetime calculations can unlock huge potential when we understand the goals and expectations of our clients.”**

*Matthias Saathoff, CEO*



calculations independently of manufacturers and can evaluate any turbine type that has already undergone type certification.

At the end of the design lifetime of a turbine, it is essential to determine the often substantial structural reserves to enable lifetime extension. We prepare the so-called „analytical part“ of the lifetime extension assessment, which includes determining wind conditions and calculating the remaining useful life. Our solutions are tailored to fit the specific asset strategy. If repowering is planned, only a limited period needs to be bridged before an older turbine is decommissioned. For such cases, we offer straightforward solutions. In other instances, turbines are intended to remain operational for as long as possible. In these cases, we

apply high-precision calculations. For instance, together with our partners, we use measurement-based solutions to refine our calculation models, achieving significantly better computational results compared to conventional methods.

Our expertise in lifespan assessments and their impact on potential yields also supports project pre-planning by helping to better identify opportunities and avoid unexpected issues in later project phases.

Additionally, existing wind farms can be reassessed for profitability after repowering. It is often economically beneficial to critically review technical conditions, such as sector management. By redistributing loads within the wind farm, overall farm performance can often be improved. We also assist in establishing decision-making foundations between different stakeholders, helping to reach agreements that benefit all parties involved.

## Conclusion

**apera engineers was founded as a spin-off of P. E. Concepts GmbH. With a team of five experienced colleagues from meteorology and mechanical engineering, we develop innovative solutions at our Hamburg office to contribute to the energy transition.**

# Arvensis Umweltplanung – Assisting the expansion of wind energy with expertise in all 16 states

Specializing in advice to the renewable energy sector, we support your project from the planning stage to its commission and beyond. We cover everything from A to Z: from a preliminary assessment to the accompanying environmental monitoring, from sand lizards to sea eagles, from field surveys to environmental impact statements. We advise your business in all matters relating to nature conservation and species protection.



Founder and team leader Avifauna – Robin Lietz – watching some migratory birds.  
Photo: Fabian Fischer



Two young buzzards (*Buteo buteo*) in their nest. Photo: Robin Lietz

**T**he energy transition in Germany still needs support and a strong foundation – which is exactly where Arvensis Umweltplanung has found its place. Since our foundation in September of 2022, we have established ourselves as a reliable partner for project developers in the renewable energy sector. Founded by three experienced biologists, Arvensis pursues the goal of supporting the regulatory approval processes for wind energy projects with the utmost professional care.

We take care of all steps from data collection on site to the preparation of the

required environmental impact statements for the approval process as well as environmental monitoring during the construction and operational phases. We ensure the highest possible data quality through meticulous data collection to draft accurate environmental impact statements to the best of our abilities.

Arvensis is committed to ensuring that species protection is not misused as a means of exerting political pressure but is integrated into planning on a scientifically sound basis.

We are following the development of new technologies with great interest,



Founder and team leader chiroptera – Dr. Claudius Kerth – with a caught Common noctule (*Nyctalus noctula*)  
Photo: Fabian Fischer



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Founding year	2022
Focus	Services for species conservation assessments for wind energy projects
We offer	<ul style="list-style-type: none"> <li>• Surveys of all taxa relevant to wind energy</li> <li>• Mediation as an expert between project developers and authorities</li> <li>• Preparation of all required impact statements and reports (e.g. environmental impact assessment)</li> </ul>
We are looking for	<ul style="list-style-type: none"> <li>• Project developers</li> <li>• Motivated new team members</li> </ul>



Grey partridge (*Perdix perdix*) in a field. Photo: Robin Lietz

particularly in the field of automated detection systems. Such systems could help to promote species protection in the future without hindering the expansion of renewable energies.

Arvensis has successfully accompanied renewable energy projects through the approval process in most federal states. While our team continues to grow, we

remain true to our mission: to enable an energy transition that goes hand in hand with well-considered and sustainable species protection. After all, the expansion of renewable energies can only be successful in the long term if nature conservation and climate protection are considered together.



Net setup for bat survey. Photo: Fabian Fischer



Red Kite (*Milvus milvus*) in search for food. Photo: Robin Lietz

## Conclusion

As a company with a fresh approach to environmental planning, we have specialized in the renewable energy sector. We offer you our expertise in nature and species conservation surveys as well as the preparation of all required impact statements and reports for the approval process. We work according to the latest guidelines incorporating the newest scientific findings. We are characterized by reliable communication with all parties involved, the utmost care and efficiency in data collection and report preparation. Partner with us for your peace of mind.

# AVALY – Empowering acceptance with AI & psychology

Our AI-supported software provides project developers with automated and scientifically sound data-based insights into the local sentiment of the population – for better decisions, less workload and less resistance.

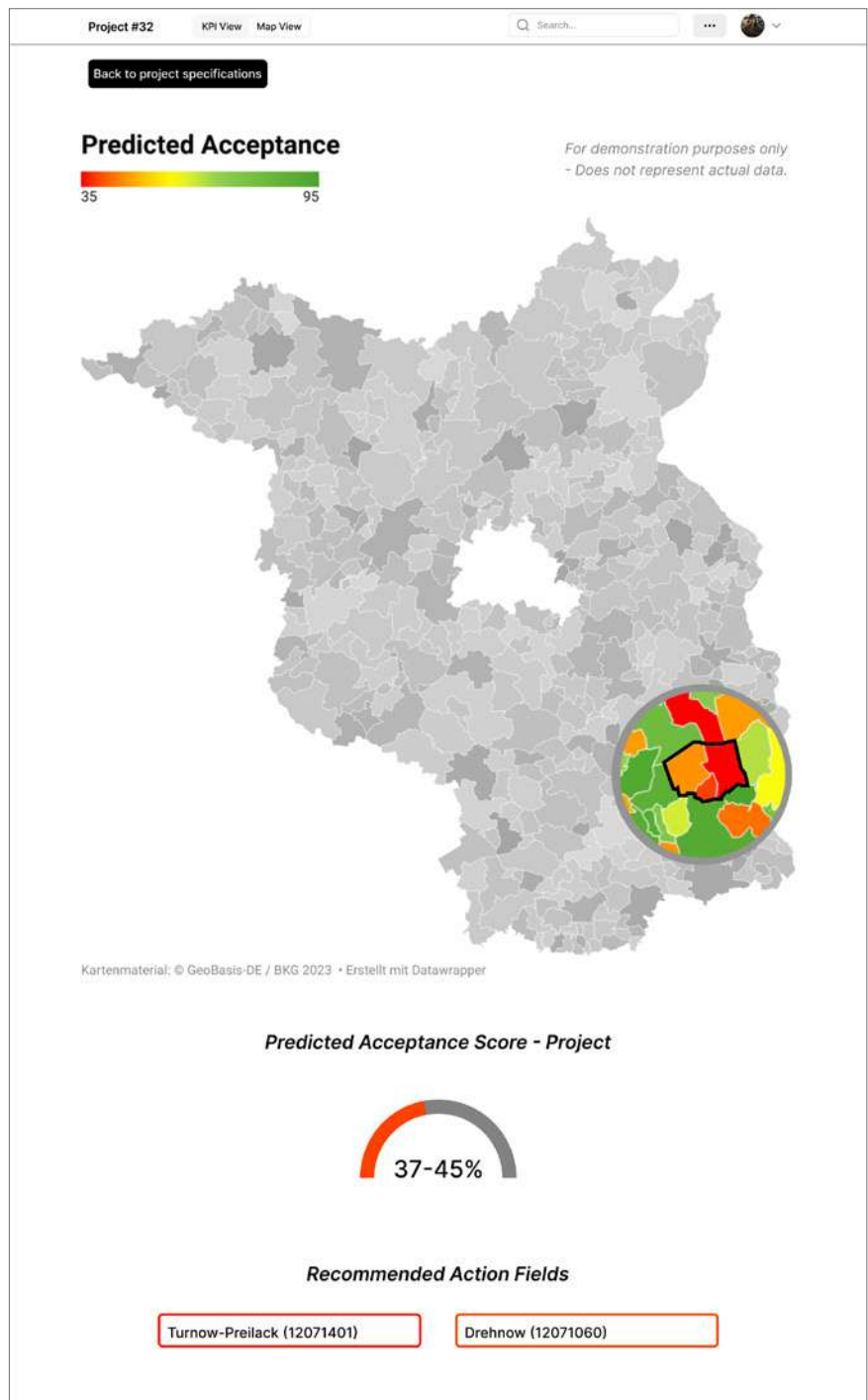
**A** lack of local acceptance slows down projects – and therefore the energy transition. Our discussions with over 20 project developers show that almost 60 % of all projects encounter acceptance problems, which lead to delays of nine months on average. This costs time and ties up resources.

But how can you increase acceptance? The first step is to understand what really matters to residents.

Many project developers rely on discussions with the municipal administration or mayor, invest time in manual research or rely on experiences from past projects. This is either time-consuming or only provides subjective assessments that usually offer an incomplete, distorted picture.



The AVALY team.



The map shows the predicted acceptance of the affected municipalities in the project region.



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Founding year **2025**

Focus **Software for acceptance management**

- We offer
- Acceptance analyses for wind, solar and grid expansion
  - Identification of regional concerns and acceptance factors
  - Identification of project-relevant target groups
  - Recommendations for measures on a scientific basis

- We are looking for
- Project developers who are interested in pilot projects and test applications
  - Early adopters who accompany us in the further development of our software
  - Cooperation partners
  - Investors

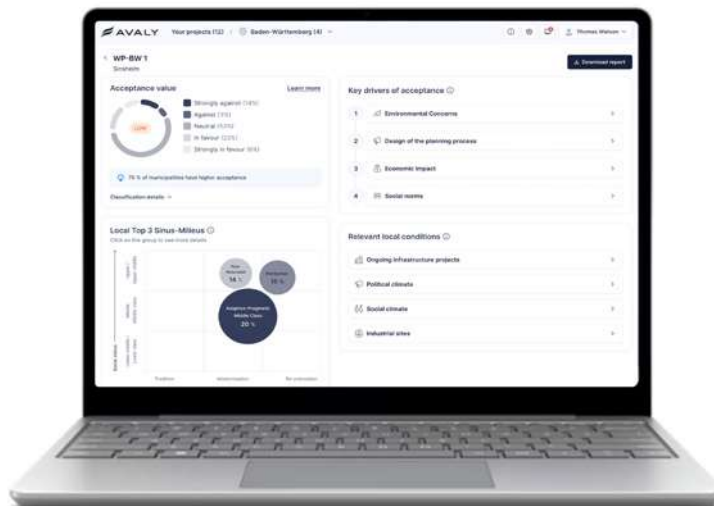
**“If you understand what people care about, you can implement projects with more momentum. AVALY helps to support this understanding based on data and making visible what otherwise often remains hidden.”**

*Sophie Apel, CEO & Managing Director AVALY*

What’s more, every project area is different. What is the central issue in one municipality may look completely different in a neighboring municipality.

This is exactly where AVALY comes in. Our software makes local acceptance tangible by automatically providing an overview of the sentiment in the region and showing where the problems lay – before conflicts arise. Our work is locally specific, scientifically sound and data-driven.

We process numerous data sources: scientific studies, surveys, social media,



Dashboard view of a municipality in AVALY with an overview of the predicted acceptance and the key influencing factors and topics.

regional press and regional context data such as land use and development plans, official bulletins and past reactions of the population to comparable infrastructure projects.

With the help of an AI-supported model, this results in a holistic acceptance analysis that answers key questions:

- What is the likely level of acceptance in the region?
- Which topics move local people and influence acceptance?
- Which groups of people are particularly opinionated, and which channels can be used to reach them?

This enables project developers to determine which measures are most effective locally and intervene in a targeted manner – with tailored communication strategies, participation formats or information offerings.

Our aim is not only to analyze projects, but also to support them throughout their entire life cycle – from the initial site assessment to evaluating the impact of implemented measures and changes in acceptance.

For project developers, this means better information, less work and a clear competitive advantage. Our tool replaces time-consuming research and helps to

avoid expensive communication loops – saving valuable time. At the same time, it enables a proactive and targeted dialog with municipalities and citizens – and thus prevents project delays.

We are currently accompanying several pilot projects in the areas of grid expansion and wind energy. We will start the beta test phase in the fall – and are currently still offering limited places for this. If you would like to be part of the next stage of development: Get in touch with us and experience how acceptance management can be data-based and digital.

## Conclusion

**AVALY is the first software solution for measuring, managing and monitoring local acceptance of energy infrastructure projects. We offer tailored, location-specific insights into local sentiment of affected communities and strategic guidance to proactively address community concerns. In doing so, we combine findings from acceptance research with the analytical capabilities of AI – and thus make the unpredictable “human factor” tangible.**

# CarbonFreed – Accelerated grid connection thanks to AI

With its AI platform “gridcert”, the Schleswig-Holstein-based greentech CarbonFreed is ensuring that renewable energy systems can be integrated into the German power grid much more quickly, easily and transparently.



Photovoltaic project in Monsheim – implemented with the “gridcert” AI platform. Photo: Wirsol

The grid connection procedure for large renewable energy systems is established by law so that grid stability and security of supply in Germany and Europe are not jeopardized. However, the procedure is far too complex, manual and time-consuming for all market participants (certification bodies, grid operators, project developers, installation companies, system operators). As a result, the systems can only be integrated into the electricity grid with significant delay.

To speed up this process, CarbonFreed brings all those involved together on the AI-supported online platform “gridcert”. There, the documents required for the

grid connection process can be digitally collected, analyzed and then evaluated so that the systems can be integrated into the grid much faster.

Communication between the various market participants also takes place exclusively in “gridcert”. This means that the tedious writing of emails back and forth is no longer necessary. The engineers in charge of certification can therefore concentrate on their core tasks.

As things stand, there is no other software in the world like “gridcert” that brings together all relevant market participants in the grid connection process for large

renewable energy systems on a single platform and uses artificial intelligence software to analyze and evaluate the data.

AI systems are predestined to optimize processes that still require a lot of manual work, such as the grid connection process. The “gridcert” AI algorithm uses models that have been trained on millions of data points. During development, the AI team fed the software with additional data points from the specific area of application.

The AI platform handles the search work for the required information so that the EE project can then be assessed against the



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Founding year	2021
Focus	Accelerating the grid integration of renewable energy systems
We offer	Self-developed AI tool makes grid connection procedures for renewable energy systems faster, simpler and more transparent
We are looking for	Installation companies, project planners, grid operators and certification bodies to join us in driving forward the digital grid integration of renewable energy systems

requirements of the specific grid operator. By processing the information and carrying out a preparatory assessment, the engineers at the certification bodies have more time for the important final certification decisions.

In addition, our AI platform also provides environmental and social added value: the European Union has committed to reducing net greenhouse gas emissions by at least 55 % by 2030 compared to 1990 levels. In Germany, more than 80 % of electricity generation is to come from renewable energies (RE) by the end of the decade.

In order to achieve these targets, decentralized generation plants must be significantly expanded – and quickly and safely integrated into the power grid with the

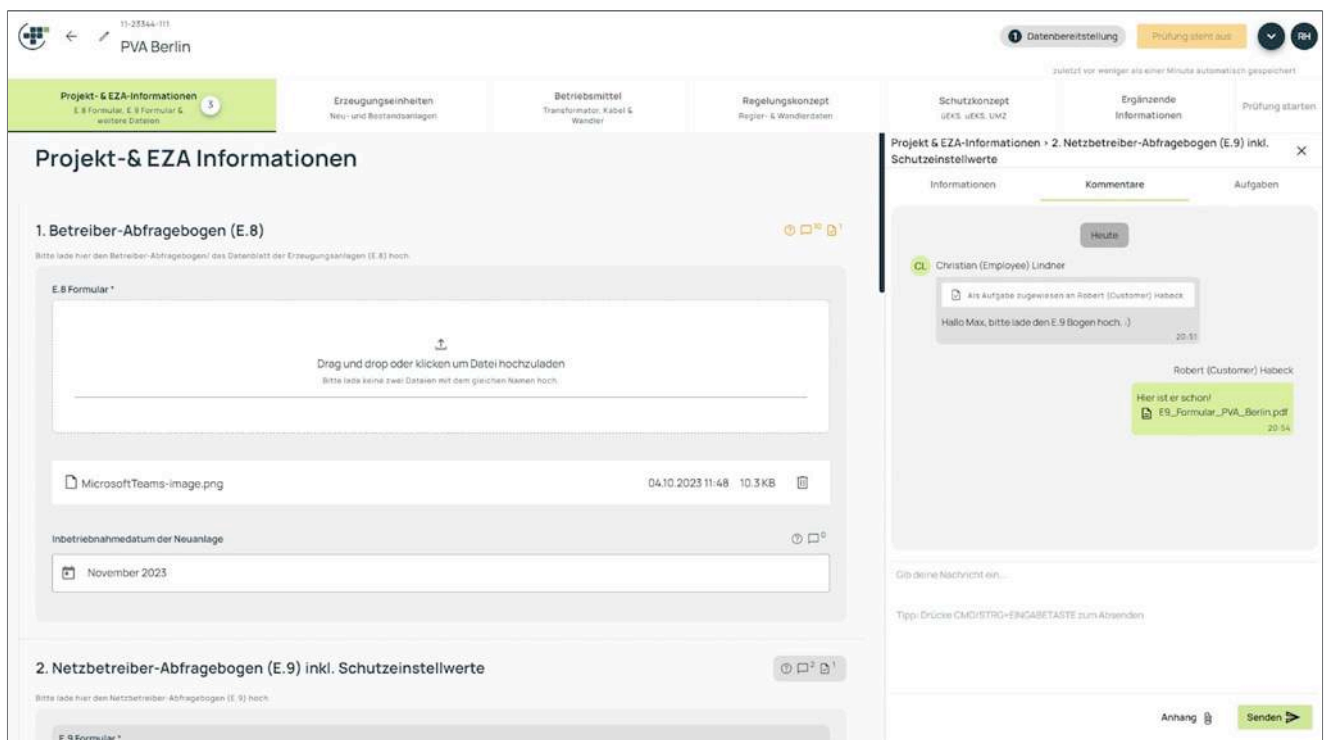
help of intelligent technologies such as “gridcert”. With “gridcert”, CarbonFreed is thus making a direct, positive contribution to greater climate protection in Germany and throughout Europe.

## Conclusion

**If we want to achieve our climate targets in Germany and Europe, we must finally rely more on digital solutions such as artificial intelligence – as we are demonstrating in the area of the grid connection process. CarbonFreed is shortening the grid connection process for large photovoltaic systems and battery storage systems from several months to just a few weeks with its proprietary AI-supported digital platform “gridcert”, thereby decisively advancing the energy transition.**

**“The use of artificial intelligence is becoming a decisive factor in the energy transition, as we see at gridcert, for example. We use AI to quickly sift through large amounts of data – artificial intelligence is perfect for this.”**

*Marko Ibsch, Founder & CEO CarbonFreed*



Screenshot AI plattform “gridcert”

# Cell Mind – Smart Utility Battery Storage from the Allgäu Region

Cell Mind develops and operates battery storage solutions – from site assessment to full implementation. Our goal: to combine economic profitability with the sustainable integration of renewable energy in the best possible way.



Visualization of a battery storage project

## Holistic Energy Storage Solutions for the Energy Transition

Ensuring grid stability is one of the central challenges of the electricity market, which is increasingly shaped by volatile renewable energy sources. Fluctuations in energy production can lead to grid overloads or undersupply – a challenge that battery storage systems can efficiently address. Alongside this volatility, the continuous growth of decentralized power generation – the construction of many small, independent energy sources like solar or wind – and the rise of e-mobility lead to an increasing demand for battery storage systems.



Visualization of Stand Alone Battery Storage



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Founding year **2024**

Focus **Planning and implementation of innovative battery storage solutions**

We offer

- Site analysis
- Land assessment
- Grid connection planning
- Permitting management
- Technical consulting
- Installation, maintenance, and operation

We are looking for

- Landowners near substations (within approx. 1 km) for battery storage installations
- Owners of existing PV-system areas for additional storage solutions
- Owners of priority-use land
- Companies interested in installing large-scale battery storage for in-house use



Visualization of Co-Location Battery Storage

### Energy Storage Elevated

Cell Mind’s solutions directly address these challenges. Our storage systems help to balance short-term fluctuations, provide reactive power, and support intraday trading. They enable peak shaving, optimize load flows, and contribute to black start capability, ensuring power supply even after grid outages.

Implementing large-scale storage projects can involve complex challenges. That’s why we offer our stakeholders a comprehensive range of services: from consulting and identifying suitable sites to profitability analysis, coordination of grid connections, permitting, technical implementation, and maintenance of the storage systems. Our commitment goes beyond just supplying hardware – we create solutions that benefit not only those involved today but also future generations. Our mission: to elevate energy management to the next level.

### Who can benefit from our solutions?

Our battery storage systems offer advantages for various stakeholders in the energy sector. Landowners can generate long-term income by leasing their land for storage projects. Companies improve their energy efficiency and reduce operating costs. Farmers benefit from more efficient and harmonized energy management for their operations. Operators of large PV systems can increase value creation through battery storage instead of relying solely on traditional feed-in tariffs.

**„We understand that every business decision has an economic dimension. That’s why we’ve developed smart solutions that are not only profitable for our stakeholders but also make a significant contribution to expanding renewable energy.“**

*Roger Köhler, CEO Cell Mind GmbH*

### Conclusion

**Cell Mind GmbH is setting new standards as a pioneer in modern energy storage solutions and shaping the future of renewable energy with its innovative approach. As a strong partner, we offer various stakeholders optimal opportunities to invest in sustainable and profitable technologies with smart, customized concepts – enabling both economic gain and active support of the green transition.**

# Planhof – Your Project Partner for Successful Permit Management

We bring together expertise in permit management, offer practical training, and develop innovative software solutions.



Offshore Wind Farm. Photo: Chirapriya, stock.adobe.com

## Planhof Permit Management

Planhof stands for quality in the field of permit management. With our team of experts from various disciplines, we provide comprehensive expertise for every energy sector project in all phases – from initial concepts and planning to filing permit applications, successful commissioning, and ongoing support. Our strength lies in our interdisciplinary approach and ability to efficiently man-



**„For us, permits are a shaping factor in project success.“**

*Marco Franz,  
Managing Director of Planhof*

age complex processes while effectively engaging a diverse range of stakeholders. Our consulting services cover all projects in the electricity and gas sectors. This includes expanding and maintaining pipeline infrastructure as well as building and operating energy facilities.

## Training and Continuing Education

Through our Planhof Academy, we offer a wide range of training and



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Founding year **2023**

Focus **Permit Management**

We offer

- Comprehensive support in permit management
- Tailored project consulting for complex endeavors
- Practical training programs
- Innovative software solutions

We are looking for

- Projects
- Cooperation partners for software development
- Software Development Partner

professional development programs tailored to specialists and project managers in the energy sector. Our events are designed for employees working on challenging and complex

projects, focusing on permit management, specialist planning law, project management, and interpersonal skills.

### Digital Solutions for Modern Permit Management

We are developing a specialized software solution for managing complex permitting processes. Our goal is to provide an innovative, user-friendly platform that helps energy companies efficiently organize and streamline their permitting workflows. Key priorities include intuitive usability, modular adaptability, and practical support for daily tasks.

### Conclusion

**Planhof provides comprehensive support in permit management. Through consulting, practical training, and digital solutions, we enable efficient, secure, and successful project processes.**



Offshore Substation  
 Photo: halberg, stock.adobe.com



Onshore Wind Farm Construction. Photo: TimSiegert, stock.adobe.com

# Poliscope – German Regional Planning in a single Dashboard

Planning authorities publish relevant news in a disorganized manner – Poliscope bundles this data. Through AI analysis, our customers receive the most important information for land acquisition on a daily basis.

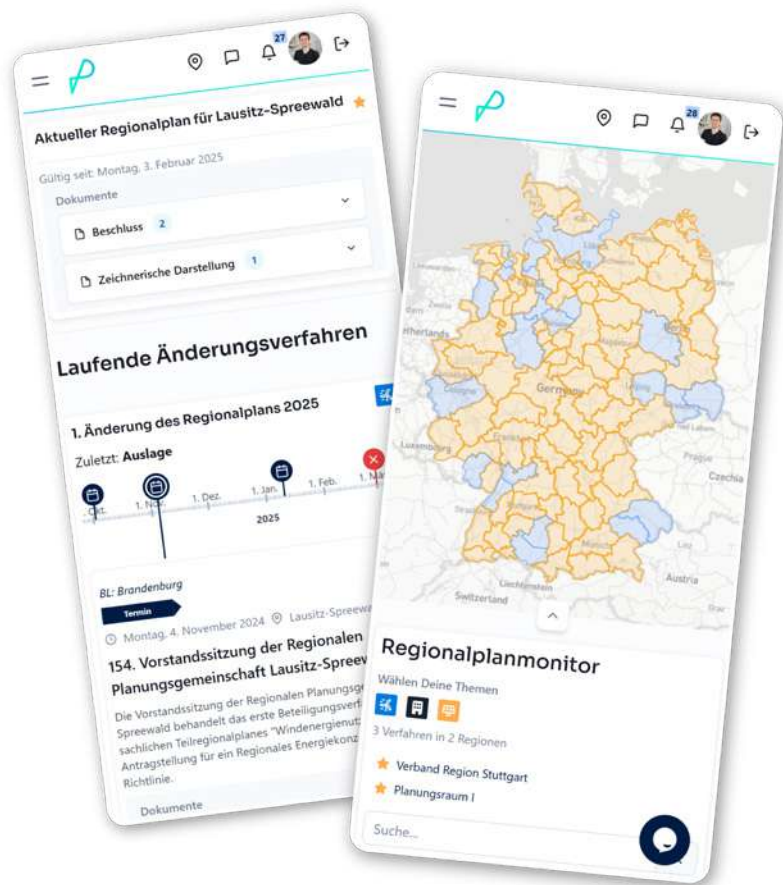
Confusing websites or hidden decision documents – anyone looking for current information on spatial planning projects from municipalities, districts, or planning regions usually faces difficulties. In Germany, there are over 11,000 municipalities, many of which do not provide their planning information online in a standardized way. As a land acquisition specialist, Poliscope co-founder Mark Baron can tell you about the difficulties of heterogeneous information access: “Before we developed Poliscope, researching public information portals was a Sisyphean task: once you finally found the needed meeting information in one place, there was already an update in another council information system that you had missed.”

The Lüneburg-based company, founded in 2024, has made it its mission to bring order to this chaos: Using AI tools and a sophisticated crawling system, Poliscope captures data from all German council information systems and can thus provide its customers with meeting information from more than 90 % of planning authorities. Poliscope is therefore the starting point for research in council information systems. Customers not only save valuable personnel resources but also avoid the risk of overlooking important time-critical information during manual research.

Since the beginning of 2025, Poliscope has been offering the Regional Planning Monitor, a comprehensive monitoring option for regional plans. The company is thus responding to the increasing

importance of planning regions in the designation of new wind potential areas. A dashboard shows all ongoing amendment procedures in a planning region, including important meetings and deadlines for participation procedures, as well as all available documents of the regional plan for download. Where digital information is insufficient or technical automation reaches its limits, Poliscope’s Quality

Assurance team helps manually: “Precisely because planning regions have become so important, our main focus is on the data quality of the Regional Planning Monitor. Our customers can be sure that at Poliscope they will always find complete and up-to-date information about amendment procedures,” says Kolja Martens, the mind behind Poliscope’s technology.



The Regional Planning Monitor and Municipal Planning Monitor can be used on any device and provides digital access to spatial planning by municipalities, districts, and planning regions.



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Founding year	2024
Focus	Provision and analysis of public spatial planning data
We offer	<ul style="list-style-type: none"> <li>Professional monitoring of all regional plans and their amendment procedures</li> <li>Detailed monitoring of municipal planning</li> <li>AI-enabled information gathering and relevance assessment</li> </ul>
We are looking for	<ul style="list-style-type: none"> <li>Project developers</li> <li>Cooperation partners</li> </ul>



The founding team (from left): Kolja Martens, Lisa Baron, Mark Baron

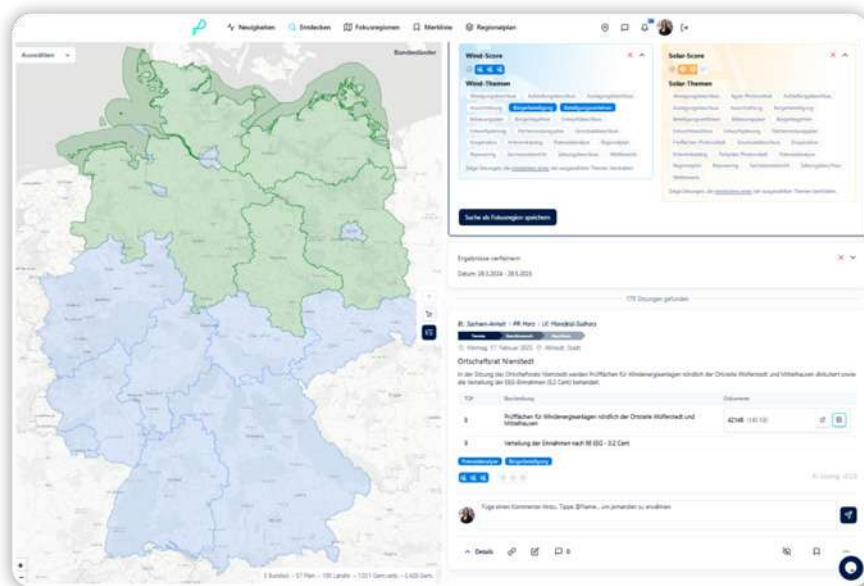
**“Information is the key to keeping pace in the wind market. In one application, our customers find the spatial planning basis for successful land acquisition.”**

*Lisa Baron, Managing Director*

Both the monitoring of municipal planning projects and the Regional Planning Monitor is accessible from any device, providing the foundation for successful land acquisition. Working with the

platform is greatly simplified through GIS plugins, high user-friendliness, and direct integration into communication tools like Teams. This means that employees of project developers do not have to first go

through the trouble of learning a new tool, but instead directly receive the information they need to identify land potential early and lay the foundation for new wind projects.



The search interface for regional and municipal meeting information including scoring and topic filters

## Conclusion

With the Regional Planning Monitor and the Municipal Monitoring, Poliscope offers effective solutions to automate the monitoring of public planning information. This means that time-consuming research, data chaos, and missed deadlines are finally a thing of the past – Poliscope’s professional monitoring enables project developers to approach land acquisition more efficiently and in a more structured way, thus contributing to accelerating the expansion of renewable energy.

# RE.SQUARE – Partnership-Based Project Development

RE.SQUARE combines collaborative project development for wind, solar and battery storage projects with many years of expertise in project and asset management — and also offers individual freelance solutions for companies in the sector.

## Working Together for the Energy Transition

The expansion and further development of the energy sector constantly requires innovative solutions.

The current shortage of skilled professionals makes it increasingly difficult for companies to attract the right engineering talent.

## This Is Where RE.SQUARE Comes In

By leveraging our expert network, clients can optimize their operational processes and develop sustainable growth strategies. With many years of experience in asset management and wind turbine performance optimization, RE.SQUARE offers individual consulting services and project management throughout the entire lifecycle of renewable energy projects.

## A Model That Adds Value

RE.SQUARE helps clients increase efficiencies, reduce operating costs, and stay competitive in the long term – without additional personnel risks or compromising on quality.

We identify hidden potential in your investment portfolio and point it out to you.



Our team to solve your specific challenges

**“Our asset-management-as-a-service approach across the entire value chain is so far unique in the German-speaking market and enables companies to quickly and flexibly access experienced project and management expertise.”**

*Phillip Elflein, Founder of RE.SQUARE*





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Founding year **2024**

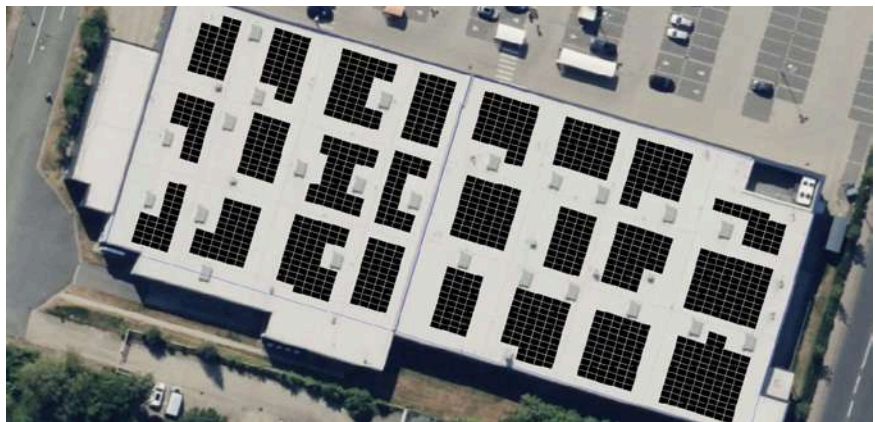
- Focus
- Asset Management
  - Project Management
  - Land Acquisition
  - Project Development

- We offer
- Flexible & collaborative project planning/execution
  - Operations & asset optimization for renewable energy companies
  - Strategic partnerships

- We are looking for
- Owners of large rooftop or ground-mounted sites
  - Companies with short-term demand for asset management expertise
  - Investors seeking to support future-oriented energy projects
  - Municipalities open for sustainable energy initiatives



An area full of potential



A bird's eye view of the shopping center roof

### Current Projects

#### → Utilizing Existing Infrastructure

In one of our hybrid PV projects, we are developing a ground-mounted photovoltaic farm adjacent to an existing biogas plant. By sharing the existing grid connection point, we ensure optimal and cost-efficient grid usage. This enables maximum feed-in of renewable energies without the need for additional grid expansion.

Once the funding for the biogas plant has expired, refining the biogas with the help of the energy generated from renewable sources will also open up new economic marketing opportunities. As a result, the project not only contributes to sustainable energy production but also secures long-term perspectives for the location.

#### → Unlocking Potential – More Than Just a Supermarket Roof

Together with the property owner, we are implementing a large-scale photovoltaic system on the shed roof of a shopping center.

The sustainably generated electricity is primarily consumed on-site by the tenants. Through an efficient tenant electricity model, a smart metering concept, and the integration of battery storage, self-consumption is maximized – creating benefits for both the owner and the tenants.

RE.SQUARE offers similar turnkey solutions tailored to individual needs, taking on all tasks from conceptual design to implementation and commissioning.

### Conclusion

**RE.SQUARE stands for collaborative project development – flexible, reliable, and backed by solid experience. Whether as a freelance partner for established energy companies or in site development for our cooperation partners and clients, we bring expertise, execution strength, and an open mindset for all types of collaboration. We're always happy to discuss new project opportunities, connect with municipalities, and engage in professional exchange – please feel free to contact us at any time.**



Our work, summarised in a short video

# sowento – Innovative experts in the fields of lidar, control, dynamics and design

When the founding team took the step into self-employment in 2016 after years of research at the University of Stuttgart, they had a clear vision: “We want to fill the gap between theoretical research and practical application in wind energy.” With advanced controllers, customized and efficient simulation software and innovative methods, sowento has since been helping to make wind energy more efficient, reliable and economical, both classically onshore and offshore as well as floating on a platform with anchor lines attached to the seabed.



Photo of a wind lidar system on a floating wind turbine. As part of the VAMOS project, the influence of motions on the power curve was analyzed and corrected in real time. Photo: SWE, Universität Stuttgart

## Independent consultancy and in-house software: what drives our clients

We work with a wide range of companies in the wind energy sector – from project developers and turbine operators to wind turbine manufacturers and specialized suppliers such as lidar manufacturers and certification bodies. Each of these stakeholders has its own challenges, but all share common goals: They need to reduce costs, increase yields and at the same time extend the lifetime of their turbines.

Wind turbine manufacturers benefit from our advanced control algorithms that make their turbines more competitive,

project developers appreciate our simulation studies that identify optimization potential and risks at an early stage, turbine operators operate their turbines in an optimized manner by using Lidar-assisted controllers and certifiers rely on our in-depth technical analyses and expertise for their assessments.

## Cooperation as partners – our approach

What sets sowento apart is the way in which we work with our clients. We see ourselves not just as an external service provider, but as a partner. This approach runs through every project and characterizes the cooperation with our clients.

“What impresses us about working with sowento is their openness and expertise. They actively integrated us into the project in order to achieve the best results for us. As a result, we were very well involved in decision-making processes within the project and were always aware of the next steps and the current status,” reports the project manager of one client.

## sowento’s fields of activity

With our commitment to excellence, we provide comprehensive engineering services, strategic technology consulting and customized software solutions that are carefully tailored to the individual



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LinkedIn: www.linkedin.com/company/sowento	
Founding year	2016
Focus	Engineering services in the field of lidar, control, dynamics, simulation and design of wind turbines
We offer	<ul style="list-style-type: none"> <li>Specialized software solutions</li> <li>Workshop and trainings</li> </ul>
We are looking for	<ul style="list-style-type: none"> <li>Partners</li> <li>Projects</li> <li>Interested parties for prototype tests</li> </ul>

needs of our clients. With the goal of advancing wind energy and technological innovation, we translate research results into practical industrial applications.

sowento offers engineering services and products in the field of wind lidar applications and floating wind turbines. These include

- Integrated load analysis and simulation studies with in-house SLOW software and other established software tools
- Controller development for onshore and offshore, as well as floating wind turbines
- Load and lifetime monitoring of floating wind turbines with Ozea (www.ozea-monitoring.com)
- Lidar-assisted control of wind turbines
- Wind field reconstruction from wind lidar measurement data for power curve assessment and load verification
- Integrated development, optimization and design of (floating) wind turbines
- Training and workshops in the field of load simulations, dynamics and control of (floating) wind turbines and wind lidar applications
- Individual software solutions in wind energy

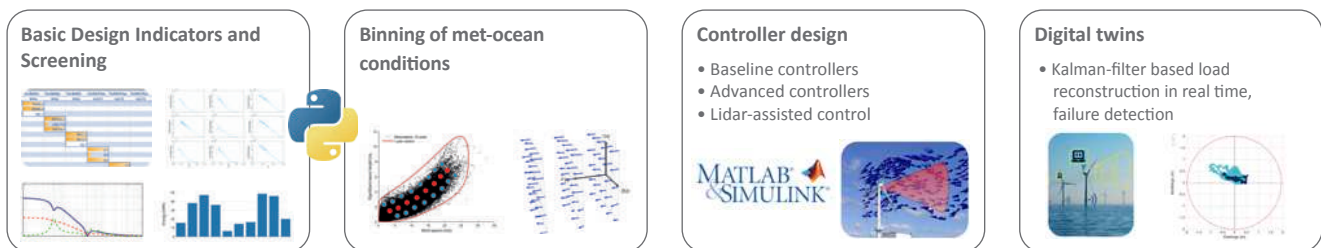
## Conclusion

Through research and advance developments as well as the successful implementation of over 80 client projects, sowento has developed into a renowned engineering company with a team of experienced experts specializing in the control and dynamics of wind turbines, lidar applications and floating wind turbines.

**“We strengthen the wind energy industry through lidar-assisted control, lidar applications and our projects on floating wind turbines. We work closely with our clients to make their projects and products more successful and to enable new developments.”**

*Steffen Raach, Managing Director*

## Design and Optimization of Offshore (Floating) Wind Turbines



## Wind Turbine Simulation Process



The figure illustrates a development process for offshore wind turbines at sowento: design optimization and simulation process. The upper part shows four core elements of the design process, while the lower part shows the three-stage simulation process from the concept phase (SLOW) through FEED-level simulations (OrcaFlex, OpenFAST) to detailed analyses with tools such as Ansys.

# uSens Energy – Think Global, Act Local

uSens is an engineering company specialising in Data Analytics. The company’s mission is to enhance the value of RES assets by collecting data with minimal uncertainty and leveraging cutting-edge analysis methodologies.



Installation of a wind met mast in difficult terrain with helicopter support

In 2023, uSens Energy Solutions GmbH was founded by uSens Energy A.S. in Frankfurt, which has 11 years of experience in the wind industry. It includes a strong management team with a total of 30 years in renewables.

Both companies were founded by entrepreneur Ufuk Yaman, who is an Electrical Electronics engineer with an ambition to create value for a sustainable future.

As an accredited laboratory and independent technical advisor, uSens is uniquely positioned to offer a comprehensive suite of services for both wind, solar, hybrid and BESS projects, including

- The design and implementation of bankable wind measurement campaigns,
- (Anemometry and remote sensing) across Europe.
- Micro-siting and energy yield assessment,
- Site suitability reviews,
- Power curve verifications,
- Asset performance reviews and improvements through SCADA data analysis.
  - Evaluation of WTG performance
  - Predictive Maintenance

uSens is confident in offering valuable insights and tailored solutions for RES projects.

These include site, wind, and energy assessment, site suitability analysis, technical due diligence (TDD), hybridization studies (PV, wind, and BESS), and performance analysis of operational wind farms.

Services are available to state and investment agencies, ministries, financial institutions, developers, investors, utility companies and turbine manufacturers.

With a presence in 17 countries, the company adheres to ISO/IEC 17025 and OHSAS 18001:2007 standards.



Wind measurement site with Lidar



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Founding year	2023
Focus	Wind data analysis and wind technology and technical advice
We offer	<ul style="list-style-type: none"> <li>• The design and implementation of bankable wind measurement campaigns, (anemometry and remote sensing) across Europe.</li> <li>• Wind and yield studies</li> <li>• SCADA data analysis</li> </ul>
We are looking for	Technical advice to developers, investors and lenders in the wind industry



Wind measurement with Lidar and uSens designed trailer

uSens' growing team of currently 2 people in Germany is supported by 20 experts with vast experience in wind and solar resource measurement and assessment.

Thinking globally, the company has experience in complex sites, providing reliable, flexible services. uSens has served more than 10 GW projects in the EU and non-EU markets.

Acting locally directed uSens to have reliable and mobilised local teams, which provide flexibility to be competitive and assertive in the supply, installation, operation and analysis of lidar systems.

Nowadays, uSens is gaining experience in offshore wind measurement campaigns with floating and dual scanning lidar solutions.



Installation of wind met mast

## Conclusion

**uSens' s design Lidar Trailer and Power Pack solutions are becoming more popular within the German market, with a short lead time and fast operational action time, with a proven track record in Latvia, Romania, Albania, and Bulgaria. With an energetic and diverse team, uSens stands for "Your sustainable energy solutions strengthening their place in the market".**



Installation of wind met mast

# Voodin Blade Technology – Wood Instead of Composite: Sustainable Wind Turbine Blades

Voodin Blade Technology produces rotor blades from wood – sustainable, efficient, and automated.



Rotor blade in the milling machine. Photo: Oliver Maier



**Voodin Blade  
Technology**

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www.voodin-blades.com  
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Founding year **2021**

Focus

- Development of sustainable rotor blades made of wood
- Recyclable materials for the wind industry
- Efficient and scalable production processes
- Automation of rotor blade production

We offer

- Development and production of sustainable rotor blades
- Automated production processes for the wind industry

We are looking for

- Cooperation partners
- Investors



Rotor blade during milling. Photo: Oliver Maier

The use of wind energy is a key pillar of the energy transition, but conventional wind turbine blades made from composite materials pose a major recycling challenge. Voodin Blade Technology GmbH develops and manufactures sustainable wind turbine blades from Laminated Veneer Lumber (LVL), an innovative and high-performance wood material that reduces the environmental impact of conventional blades during production and recycling while enabling cost-effective mass production.

Voodin Blades aims to revolutionize the wind energy sector with a resource-efficient alternative. Our blades are not only fully recyclable, but we also focus on extensive automation of the production process. By using state-of-the-art manufacturing technologies, we strive to make production more efficient, faster, and cost-effective.

We are currently working with several OEMs to develop blades for multi-megawatt wind turbines. Together with our partners, we are optimizing designs for scalability, efficiency, and seamless integration into existing wind energy systems.

**„Our mission is to take the wind industry to the next level with sustainable materials and automated processes.“**

*Gustavo Lasierra, Co-Founder Voodin Blade Technology*

## Conclusion

**Voodin Blade Technology represents sustainable innovation in the wind industry. Our wooden wind turbine blades address the industry's growing recycling challenges. Through automated manufacturing processes, we drive scalability and production efficiency. Together with strong partners, we are working on a future-proof solution for the energy transition.**