

xperience

INDEPENDENT SERVICES FOR WIND AND SOLAR FARMS

IIIIIIIIIII

WIND AND SOLAR FARM MANAGEMENT | TECHNICAL INSPECTIONS PROJEKT PLANNING | FINANCING



BERTOLT BRECHT (1898-1956)







OUR COMPANY

20 YEARS OF EXPERIENCE IN WIND AND SOLAR ENERGY

DAS GRÜNE EMISSIONSHAUS is part of the German DGE group with domicile in Freiburg on the edge of the Black Forest. DGE has more than 20 years of experience in planning, construction, financing and operation of renewable energy projects.

DGE is focused on the European and South American markets and supports wind and solar farms as well as international joint ventures in Germany, France, Brazil and Chile. More than half a billion euro was invested into approximately 300 megawatt of wind power and solar energy through funds managed by DGE. The group was, and currently is, involved in the development of wind projects at all scales in Germany, Chile and France.











Bernhard Wieland (left), Heinrich Röder (right), managing partner, DGE Group



Das Grüne Emissionshaus offers its customers a wide range of services, including

- the development of wind and solar farms to construction readiness,
- the provision of all contracts for the construction, sale and financing of a project,
- wind and solar farm management (technical and commercial management),
- technical inspections.

The portfolio managed by us includes wind energy plants of all renowned manufacturers and solar parks. As a result, Das Grüne Emissionshaus is well-familiar with the special features of all machine types in the wind energy sector and the challenges posed by the use of solar energy.





WHAT IS IMPORTANT TO US WITH ENERGY INTO THE FUTURE

RENEWABLE ENERGIES are our passion, a decentralized energy production in the hands of as many players as possible is our vision. Our work is meant as a contribution to make this vision come true fast. To this end we work result driven, dynamically and responsibly-minded. We have long-lasting relations with our business partners and customers characterized by respect and a cooperative interaction. Flat hierarchies and lean structures in our company minimize frictional losses and lead to the best solutions fast.

In this way we can offer our customers excellent services along the entire valueadded chain of a wind or solar farm. In the event that we are unable to handle tasks ourselves we will quickly find the right expert in our far-reaching network. You too can benefit from our passion for renewable energies.

We do our best for you!





CONTENT AT A GLANCE

AN INTERNATIONAL NETWORK OF COMPETENCE

Das Grüne Emissionshaus is one of the pioneers in the German wind and solar industry. Since its foundation in 1996 DGE has internationalized itself and continuously expanded its partner network. Presently the DGE group is active in four countries. → 12

14

THE FUTURE BELONGS TO RENEWABLE ENERGIES

Today wind and solar farms are modern large-scale power plants. What you need to operate them safely and economically is professional management and extensive know-how along the entire value-added chain. →

THE DEVELOPMENT OF WIND AND SOLAR FARMS

As your experienced partner we recognize the special challenges of a new project and provide support to you until it is ready for construction. \rightarrow

CONSTRUCTION, PURCHASE AND FINANCING

Good contracts with the suppliers of trades and a solid financing help to protect you against unpleasant surprises in the construction and operating phase. \Rightarrow

22

25

28

WIND AND SOLAR FARM MANAGEMENT

Only a permanent performance monitoring and control of the wind or solar farm will ensure you maximum energy yields. We take care of a trouble-free plant operation and ensure the profitability of your wind or solar farm. →

TECHNICAL INSPECTIONS

Our experienced engineers identify problems or defects at an early stage and as a result help to avoid costly consequential damage. In the event of damage, they are at your side with their analyses \Rightarrow

WHY US?

Our offer and the added value of our work at a glance. \Rightarrow



REFERENCES

AN INTERNATIONAL NETWORK OF COMPETENCE

THE DGE GROUP operates in Europe and South America and has many years of experience in the construction and operation of wind and solar farms. The group currently supervises 230 wind power plants from different manufacturers and several large solar farms with a total capacity of approximately 300 megawatts. Today wind farms of all scales are under development.





THREE EXAMPLES OF WIND AND SOLAR FARMS SUPPORTED BY US:

GERMANY



Plant type: Senvion MD 70/77 Installed capacity: 61.5 MW Annual average electricity generation: approximately 110 million KWh



FRANCE

Plant type: Enercon E70, Installed capacity: 23.5 MW Annual average electricity generation: approximately 50 million KWh



CHILE

Plant type: JA Solar 260 Wp Capacity: 1,007 kWp Annual average electricity generation: approximately 2 million kWh

In the last few years the companies of the DGE group have tied an extensive network of technical service providers, plant manufacturers, banks, as well as business consultants and legal advisors.

You too can benefit from this international network of competence for renewable energies!

Companies of the DGE Group

OGETECHNIK







ENERGY MARKET

THE FUTURE BELONGS TO RENEWABLE ENERGIES

RENEWABLE ENERGIES have been on the road to success from the beginning. Today they are making a considerable contribution to the energy production worldwide and therefore help to protect our planet. They are the energy of the future.

Germany has decided to cover 100 % of its energy supply by renewable energies. The restructuring of energy supply is in full swing in Germany. At the latest since the Paris Climate Agreement in late 2015 energy generation from fossil fuels is no longer an option even on a worldwide scale. The same applies to the use of nuclear energy: It fails due to its high costs and risks.

The rapid growth of renewable energies requires a professionalization along the entire value-added chain. Whereas idealism dominated the beginnings of the history of renewable energies in the 1980s, qualified specialists are the order of the day.

RAPID GROWTH OF WIND ENERGY TECHNOLOGY

The development of modern wind energy began in the 1980s in Germany. Meanwhile an international industrial sector has established itself which also includes such global players as Siemens and General Electric. Today's machines can generate 100 times as much electricity as the earliest wind power plants.







As performance increased the demands on man and technology also rose. Today the planning, realization and management of wind power plants require extensive knowhow both in the area of mechanical and electrical engineering, a lot of experience and appropriate tools. In view of the high performance of modern renewable-energy power plants malfunctioning results in substantial financial losses.

HIGH PERFORMANCE LARGE-SCALE SOLAR POWER PLANTS

Even in the photovoltaics segment today's plants can in terms of dimension and design hardly be compared to those in the 1990s when the first solar plants with just a few kilowatt output were built in Germany. Today, both rooftop and ground-mounted plants are built in megawatt size. Some ground-mounted solar parks even reach an output of several hundred megawatts. The electricity yield of a single solar farm is correspondingly large - and also the financial loss if components break down. For this reason, even solar farms require good planning and implementation as well as continuous performance monitoring.

THIS IS IMPORTANT

Today wind and solar farms are important and in the future the decisive power plants for our energy supply. A professional management along the entire value-added chain is therefore indispensable





OUR SERVICES

THE DEVELOPMENT OF WIND AND SOLAR FARMS

THE PATH to construction readiness is a multi-year process full of pitfalls. No project is like the other and requires individual support.

OUR OFFER

We offer services along the entire process of a project's development – from the project idea all the way to construction maturity, also of course in the context of a repowering. So we take care of the complete site rehabilitation, and accompany you until you obtain approval in accordance with the German Immission Control Act. If necessary, we also negotiate all supply contracts. Legal issues are handled by experienced lawyers that cooperate with us at your request.

OUR SERVICES IN DETAIL:

- Identification of suitable sites for your project
- Securing of the area under planning by tried and tested lease agreements
- Selection of suitable experts
- Securing of the grid connection
- Selection of suitable types of machines

In cooperation with experienced attorneys:

- Negotiation of delivery contracts
- Conclusion of land development plan contracts
- Implementation of the entire licensing procedure

WE ALSO DEVELOP PROJECTS AT OUR OWN RISK

DGE Wind is an affiliated company of Das Grüne Emissionshaus and develops wind projects at its own risk until construction readiness. If you do not want to develop your project at your own risk, or if you are looking for a partner who is willing to share the project development risk with you, do not hesitate to contact us!



A PRACTICAL EXAMPLE PERSERVERANCE LEADS TO SUCCESS

INITIAL SITUATION

A wind farm is to be repowered. The existing wind farm was erected on very low towers because it is located close to a military airport. For a repowering significantly higher towers are necessary. The German military opposes any repowering because it would disturb their radar system and the landing approach to the airport.

OUR APPROACH

Das Grüne Emissionshaus has analyzed the concerns of the German military and has worked with experts on a space assignment plan that meet the requirements of the German military. In the process the advantages of the new wind farm as opposed to the existing one were also explained to the German military.

RESULT

After a multi-year process of negotiation, the German military agrees to the repowering concept of DGE.





OUR SERVICES

CONSTRUCTION, PURCHASE AND FINANCING OF A PROJECT

THE FINANCING of your wind or solar farm by an experienced bank adds solidity to the project. Good contracts with suppliers – in particular with the manufacturers of wind power plants – often decide on the weal and woe of a project.

OUR OFFER

We procure the financing for your project and negotiate all supply and maintenance contracts for you. We take responsibility for the required commercial expertise. We find experienced lawyers for legal issues that arise and at your request conduct contract negotiations with them. We are also at your disposal if you want to acquire an existing wind or solar farm.

OUR SERVICES IN DETAIL

- Preparation of profitability calculations
- Selection of a suitable bank and provision of all securities
- Construction supervision
- Selection of a suitable manufacturer of wind energy or solar plants

In cooperation with experienced attorneys:

- Negotiation of the financing contract
- Negotiations of all contracts for work and services, as well as supply contracts
- Negotiation of the maintenance contract







A PRACTICAL EXAMPLE

WELL-NEGOTIATED CONTRACT DETAILS PAY OFF IN THE LONG RUN

INITIAL SITUATION

A wind power plant manufacturer offers a 20-year full maintenance contract. His draft contract stipulates that in case of damage the manufacturer can choose between the repair of the wind power plant and a financial compensation for the operator. The compensation payment takes the revenues into account that are produced over 20 years of operation and that would be lost to the operator if the plant was decommissioned prematurely.

OUR APPROACH

Modern wind power plants can have a service life that exceeds 20 years. For this reason, DGE insisted on a solution in negotiations with the manufacturer that also takes account of service lives of more than 20 years. Compensation payments that only take a service life of 20 years into account are not acceptable.

RESULT

The manufacturer has cancelled the compensation scheme and will in each and every case repair the plant within the 20 years of service life. The only condition was that a maintenance contract of any kind (no matter which scope) would be concluded after the 20-year service life.







WIND AND SOLAR FARM MANAGEMENT

A HIGH PLANT AVAILABILITY and an excellent plant performance form the basis for optimal energy yields and the economic success of a wind or solar energy project.

OUR OFFER

We always keep an eye on your plant, find the best possible solutions for maintenance issues and take care of a trouble-free operation. Profit from our know-how when we represent your interests vis-a-vis manufacturers and service companies. Our regular reporting keeps you always up to date on your energy yields, the condition of your energy farm and the work quality of your service provider.

OUR SERVICES IN DETAIL

- Remote monitoring of your wind farm including on-call service to faults
- Coordination and supervision of defects removals and fault clearances
- Reporting according to your requirements
- Collection and continuous analysis of operating data
- Performance analyses (availability and power curve evaluations)
- Monitoring of requirements from building permit and operating authorization
- Representation of interests vis-a-vis manufacturers or maintenance companies
- Monitoring of labor, health and environment protection requirements (HSE)
- All business services (controlling, reporting e.g. to banks)
- Implementation of reasonable innovations during service life

DGE SUPPORT

Our offers are custom-tailored to fit your needs and ambitions. If you plan to take over the wind or solar farm management yourself, we will offer you individual concepts and support you to set up your own operations management unit.



A PRACTICAL EXAMPLE

PERFORMANCE CONTROL LEADS **TO COST SAVINGS**

INITIAL SITUATION

The manufacturer of a wind farm with 18 plants supported by DGE intends to sell a performance upgrade designed to increase the power curve of the existing plants. The manufacturer guarantees a yield increase of five per cent.

OUR APPOROACH

In order to check the efficiency, the entire wind farm with the exception of two plants is furnished with the upgrade. The operator commissions an accompanying analysis of the yield data both with and without the upgrade. The comparison shows that the upgrade measures of the manufacturer did not result in any yield increase whatsoever. DGE rejects the performance upgrade and works towards a commercial solution which is attractive for the operator.

RESULT

The result of renegotiations by DGE were better price conditions for the full maintenance contract. In addition, the term of the contract is longer than intended. The savings amount to approximately 15 per cent of the overall cost to be expected for maintenance and repair.



COST ADVANTAGE BY CONSCIENTIOUS MONITORINGS





OUR SERVICES

WIND POWER PLANTS are subject to extreme strain. Identifying defects at an early stage helps to prevent expensive consequential damage and avoids unplanned downtimes.

OUR OFFER

As independent experts we will present you with a realistic picture of the condition of your plants and draw your attention to defects and damages in time. Thanks to our diverse experience with machine types of different manufacturers we know what really matters in a plant inspection. In our examinations we do of course follow the principles of the German Federal Wind Energy Association (BWE) and maintain the relevant DIN standards, as well as the guidelines of the German Institute for Construction Technology (DIBt).



UNSERE LEISTUNGEN IM EINZELNEN

- Quality control during production process
- Assistance in the construction phase
- Technical inspections of wind turbines
- Blade angle measurements
- Damage appraisal and damage analysis



A PRACTICAL EXAMPLE

SUCCESSFUL HAND IN HAND: INSPECTIONS AND WIND FARM MANAGEMENT

INITIAL SITUATION

A large wind farm with an investment volume of about 50 million euro has a full maintenance contract with a remaining term of only a few months. At the end of the contract all claims for rectification of defects by the manufacturer would have been forfeited.

OUR APPROACH

The wind farm management commissions inspections to determine the condition of the plant. This is to ensure that complaints for defects can be filed before the end of the contract.

RESULT

- Considerable rotor blade damages were found in almost all plants. The manufacturer removes the damages which would otherwise have to be repaired fully at the expense of the operator. Savings in repair and maintenance costs amounted to 700 thousand euro.
- A new maintenance contract with better terms is negotiated on the basis of the inspection results which leads to savings of 1.4 million euro.
- Thanks to the inspections and the negotiations led by the wind farm management overall savings to the amount of 2 million euro could be made.



COST ADVANTAGE OF INSPECTIONS

WHY US?



INDEPENDENT SERVICES FOR YOUR ADVANTAGE

DAS GRÜNE EMISSIONSHAUS is part of the DGE group, which has 20 years of experience in the planning, financing and operation of renewable energies projects. We help you to master the challenges of wind and solar power use – no matter whether your plants are still in the planning stage, under construction, or already in operation.

We are independent and have extensive experience with plants of all renowned manufacturers. At DGE, we stand for reliability and customer orientation. We do not shun challenges and always look for the best solutions to make your investment as profitable as possible. Through the years we have maintained long-term business relationships with our customers, service providers and business partners based on a respectful partnership.

We do our best for you!



DAS GRÜNE EMISSIONSHAUS GMBH GOETHESTR. 4 79100 FREIBURG GERMANY T: +49 761 29656-0 F: +49 761 29656-55 EMAIL: INFO@DGEMAIL.DE WWW.DAS-GRUENE-EMISSIONSHAUS.DE

