RESPONSE TO PROPOSAL FOR WIND POWER GENERATION

BY

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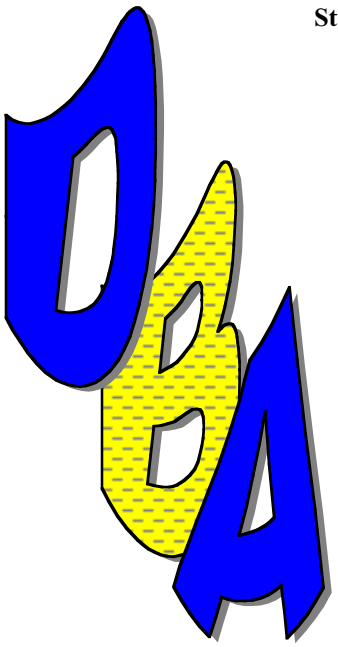

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DESIGN-BUILD ASSOCIATES PROPOSAL FOR WIND POWER GENERATION IN POLAND.

- **Joint Venture**
- **Company background**
- **Project scope and location**
- **Design and Construction of the wind power farm**
- **Program of works**
- **Cost Estimate**
- **Financial and Economic Analysis**
- **Conclusion**

JOINT VENTURE

The joint venture will be formed through the participation of JELB Power Associates Incorporated and Design-Build Associates.

1. Objectives of Joint Venture:

- Establish long-lasting international partnership with JELB
- The design, construction, operation, and electric energy marketing of the 18MW capacity wind-powered farm in Northern Poland.
- Increase supply of energy to meet the future increase in demand for energy while meeting all environmental specifications.
- Contribute to the economic growth of Poland by creating employment opportunities.
- Contribute positively to the wind power industry in Poland.
- To create further business opportunities with JELB Power in Poland.
- Future collaboration with government of Poland and other surrounding countries.
- To encourage technology transfer
- To encourage more research and development practices in Poland.

2. Input of Partners:

- **JELB** - JELB Power will offer their knowledge of current local laws and customs, financial expertise, and any supportive engineering, construction, and management services required to assist the partner DBA. They will also contribute initial capital and the marketing of product.
- **DBA** - DBA will provide capital, expertise, and technology transfer required to construct, operate and market the electrical energy.

3. **Financial Structure of Joint Venture**

The capital for the start-up for the joint venture will be raised in two forms:

Original Financial Plan

- **Equity**- 40% of the initial capital will be raised by the two partners. 60% of the equity will be provided by DBA and 40% by JELB Power.
- **Debt**- The balance of required capital, that is 60% will be borrowed from various international banks and private investors.

DBA proposes an initial start up capital of 500,000 dollars for the joint venture. The initial spending elements include start-up taxes and permits, operating costs etc.

4. Profit Sharing:

- Profit sharing will be in proportion to the initial capital contribution from both partners.

5. Managerial Structure of Joint Venture:

Board of Directors (BOD) - There will be eleven members on the BOD. Five of them will be from DBA and six from JELB.

Responsibilities of the BOD

- To satisfy the stockholders of the partnership
- Represent and up hold the interest and concerns of stockholders to the best of their abilities.
- To ensure corporate social performance, that is the good corporate citizen concept.
- To encourage good business practices.

6. Technology Transfer:

Technology transfer will be a major part of this joint venture.

- Recruitment and employment of Polish engineers, managers, supervisors, and skilled laborers.
- Training and development of employees.
- Introduction of certification training programs.
- Exchange programs between Poland and the United States.
- Paid employment of student interns, co-ops etc
- Scholarships and grants available to qualified students
- Affiliation with other universities and other research organizations in Poland.
- Application of strict safety management.
- Introduction and application of new and enabling technology.

DESIGN-BUILD ASSOCIATES

1. Company Background

Design Build Associates (DBA) started in 1980 and is based in Greensboro, North Carolina. After attending an Entrepreneurial and Leadership seminar, four friends with various backgrounds in engineering and construction decided to form their own construction company. They began with residential projects in the Piedmont Triad area, and then moved on to larger commercial and industrial projects in the southeastern region of the United States.

In the past decade, DBA has taken on international projects in Europe, Asia, and Africa. Currently, DBA has a team of specialists with various expertise, background, and experience in the design, construction and marketing of a wide variety of projects.

Since 1990, DBA has focused primarily on the design/build approach (negotiated contract / comprehensive services) to its projects , as opposed to the traditional approach of (competitive-bid / limited services) in the industry. The result has been a more stable level of growth in revenues, greater profitability and a far more secure market position.

In order to maintain this positive direction, we emphasize that our primary purpose is to deliver high quality construction and marketing services on progressively large projects and make the client's satisfaction our ultimate goal.

DBA has had the opportunity to successfully design, manage, and construct three wind-powered farms in the US, Russia, and Africa. All three projects were completed within the established budget and project time schedule, while meeting all quality and safety standards.

Awards of Excellence

At the 2001 National Association of State Energy Officials (NASEO) Energy Outlook Conference, DBA received an award for its outstanding contribution to wind energy through its construction and design alternatives.

Strengths

- Highly qualified personnel
- Excellent quality control in the field
- Experience with both local, national and international projects
- Excellent service to customers
- Strong local image and associated business contacts
- High employee morale and productivity

- Excellent cash flow
- Strong internal control system
- Efficiency in dealing with complex regulatory standards

2. Relevant Experience — Projects with wind farms

Project Name	Client	Estimated Duration	Actual Duration	Estimated Cost	Actual Cost
Design-Build Contract for a 30MW capacity wind power farm in South Dakota	State of South Dakota	8 months	7.5 months	$35.3M	$34.6M
Turn-key Contract for 10MW capacity wind power farm in Russia	Republic of Russia	6.5 months	6 months	$17.5M	$17M
Joint venture with Taylor Woodrow Construction Ltd. for the construction, operation and marketing of 20MW wind power farm in Ghana, West Africa	Republic of Ghana	7 months	6 months	$27.8M	$27.2M

Pictures of existing wind farm projects that DBA have designed, constructed, operated, maintained and marketed in the past two decades.

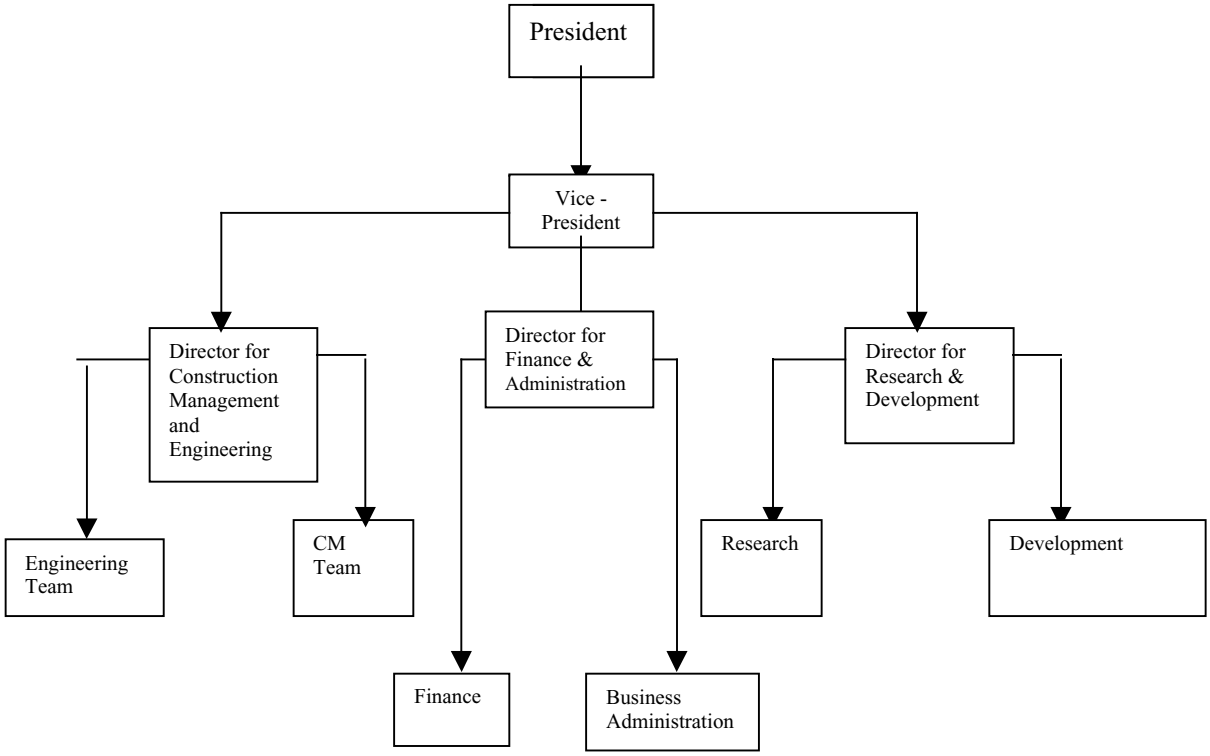
1. Wind farm - South Dakota

2. Wind farm - Russia

3. Wind farm substructure - Ghana, West Africa

3. Managerial Structure

Organizational Structure



a. Engineering Team

- 2 Mechanical engineers
- 2 Architectural engineers
- 4 Civil engineers
- 2 Electrical engineers
  - All engineers have masters degrees in their disciplines
  - All team members have professional licenses in their related areas
  - They have a minimum of ten years experience in the construction industry
  - All team members have been involved in special value engineering and safety training courses

b. Construction Management Team

- 5 Project Managers
- 3 Cost Engineers
- 10 Superintendents

- All team members have masters degrees in their disciplines
- All team members have professional licenses in their related areas
- They have a minimum of fifteen years experience in the construction industry
- All team members have been involved in special quality and safety training courses

c. Finance and Administration team

- 2 Financial Managers
- 2 Human Resource Managers
- 2 Marketing Managers

- All team members have masters degrees in their disciplines
- All team members have professional licenses in their related areas
- They have a minimum of fifteen years experience in the construction industry
- All team members have been involved in special quality and safety training courses

d. Research and Development Team

- 2 Research directors
- 2 Research assistants

- Both directors have doctoral degrees
- They are also part-time lecturers in universities
- They have received several awards for their contribution to technology.
- Research assistants have masters degrees
- Team members have a minimum of five years experience in research

- Students are employed during their internship year to work with our research department on part-time basis

- Research is conducted in various areas in the design and construction industry. This includes maintenance, business and marketing.

This is a brief overview of our full time staff. Other experts are employed by the company on short-term contracts, when the need arises. The company also has a policy which ensures the paid employment of student interns.

4. Plant and equipment holding

DBA has a wide variety of construction plant and equipment. These range from cranes, bulldozers, excavators, backhoes, road graders, small and large power tools, welding machines etc

We also have a policy of leasing and renting any equipment that we need on short- term basis.

DBA also has a highly skilled and experienced maintenance and servicing team.

5. Design and Construction of a Wind Farm In Poland

a. Project Location:

The location of the site will be in one of the three proposed favorable locations near the Baltic Sea:

- 9km west of Keba.
- 15km West of Dartowo
- 12km East of Kotobzeg

Kotobzeg is probably our favorite location because it has the highest average wind speed.

Reasons for choosing these project locations

- Average wind speed can generate required energy
- Easily accessible to the electrical power system which is part of the CENTREL system
- Access to various utilities and facilities like water, telephone
- Land is situated an average of 10 to 15m above sea level
- Area around the location is sparsely populated
- It bears no national or local designation for nature conservation
- No significant hazard to any endangered species
- Not located on a bird migration route
- Availability of local skilled labor

b. Project Size:

The wind farm covers an area of 5 acres, but the turbines themselves only take up 1% of that land. The Polish wind power development will require twelve 1500kW wind turbines in order to generate 18MW of wind power.

DBA will also propose that a small warehouse be built at the site to house workers and equipment required for the daily operating and maintenance of the wind farm.

c. Preliminary design Analysis

- **Quality**

The guidelines for the design of the wind turbines will be in accordance European wind and turbine standards. DBA has a gained a lot of valuable experience with wind farms from their previous projects, hence are familiar with most design and specification codes. Our expertise and experience with diverse methods and technology required for approval within major wind energy markets is excellent. We also place a lot of emphasis on the international standards for wind turbines given by the International Electrotechnical Commission, IEC.

- **Loads:**

DBA has a design policy of calculating design loads according to different design methods specified. We have both simplified and advanced tools for the calculation of extreme and fatigue wind loads are described. Special emphasis is paid to a practical approach to aeroelastic modeling.

- **External Conditions:**

The environmental impact wind, temperature, earthquakes and sea-waves will be critically studied. Guidelines for dealing with special stability issues, e.g. wind shear and transient wind conditions will be considered and used in our design approach.

- **Safety**

DBA places a lot of emphasis on safety issues. The whole design and construction approach will be in accordance to the United States Occupational Safety and Health Administration (OSHA) standards.

- **Environment**
  The design will ensure minimal pollution levels and high safety standards will be enforced on project sites. The site chosen is not in the path of bird migration. In addition, this site will not be hazardous to any endangered species.

Environmental Data°

The combined annual electrical output of this wind farm is enough to supply 9,200 homes. In addition this output would save 47,000 tons of carbon dioxide, 420 tons of Sulphur Dioxide and 140 tons of Nitrous Oxides from entering the atmosphere.

- **Aesthetics**

The wind farm will be aesthetically appealing. DBA will encourage during the operation of the turbines special days for touring of the facility by students, the general public, future employees, etc.

Main data sheet for the proposed turbine

Axis	Horizontal
Rated power	1500 kW
Max power	1500 kW
Hub Height	60 m
Rotor Diameter	60 m
No. of blades	3
Rotor speed	Fixed 19,2 rpm
Cut-in wind speed	4 m/s
Rated wind speed	16 m/s
Cut-out wind speed	25 m/s
Power control	Stall
Generators	2 x 750 kW Induction
Mechanical brake	Spring activated, located on high speed shaft
Aerodynamic brake	Spring activated tip brakes
Tower head weight	98.000 kg
Tilt	4 deg.

d. Construction of the wind farm

The erection of wind turbines is an impressive sight, but prior to this there are a number of stages, which must be completed in order to allow the turbines to be installed. These can be separated into the following key activities:

- **Installation of new site access tracks -** The first construction activity at the wind farm site is the installation of new tracks where these are necessary in order to allow access to the turbine locations. The tracks have the added advantage of allowing the land-owner improved access across the site.˚
  The tracks will typically be of loose stone construction, and must be of sufficient strength to support the heavy vehicles, which will deliver the wind turbines, as well as the cranes for erecting the turbines, which usually have an axle weight of 12 tons. Depending on the bearing capacity of the ground it may be necessary to float the road on geo-textile mats.

- **Excavation and construction of turbine foundations**;
  Although there are a number of methods of founding a wind turbine, the most common and that which has been used at all of PowerGen Renewables wind farms, is to construct a reinforced concrete slab into which the tower base is cast or bolted.

- **Installation of electrical infrastructure, including transformers**; The wind turbine transformer is either installed within the base of the tower or in an adjacent cubicle. Underground cables are laid between the turbines in order to

connect them all to the wind farm sub-station. The sub-station contains the metering equipment and the high voltage switchgear, which is required in order to operate the electrical infrastructure. Electricity is then exported to the electricity distribution system from the wind farm via an overhead line or underground cable, depending on the proximity of the wind farm to an appropriate connection point in the local distribution system.

- **Erection of wind turbines;** The wind turbine towers are erected in stages using two cranes, the larger crane undertaking the main lifting work and the second lifting the base to prevent it from digging into the ground. The towers are usually erected in two sections, with the first section erected directly onto the foundations and then the second section being lifted by crane and then carefully positioned on top of the first section by the crane driver. The two sections are then bolted together while the weight of the second section is held by the crane. The nacelle is then lifted on top of the second tower section, to which it is bolted.˚

  Once all wind turbines have been erected and connected into the site electrical network, the wind farm is energized and each turbine is commissioned, after which it enters service and commences generation.

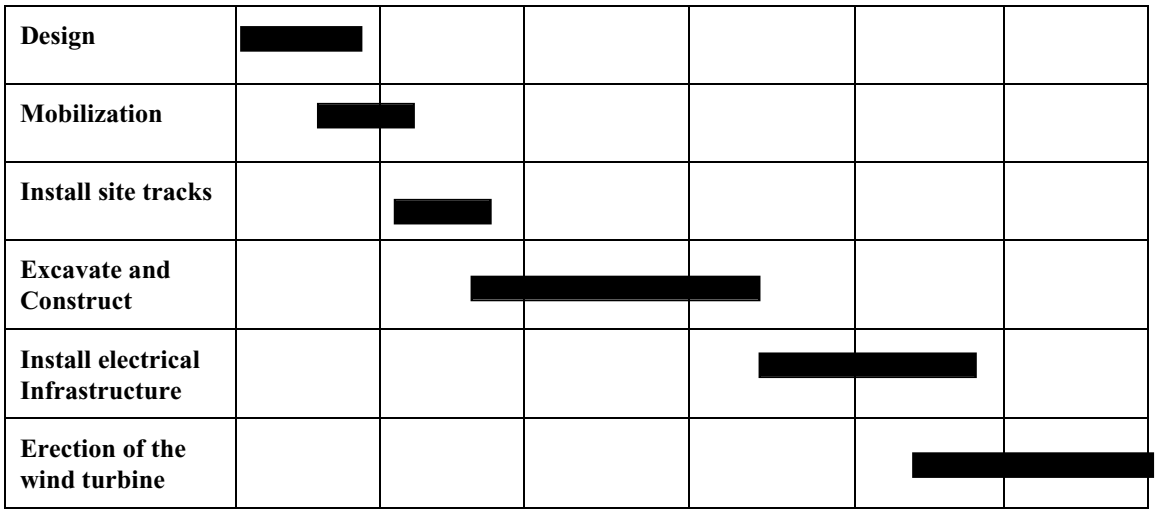
  The duration of the construction period will vary depending on the scale and nature of the site, but is typically 6 — 8 months.

e. Reasons for choosing this specific approach

- Reduction and possible elimination of the use of coal land fossil fuels in the generation of energy.
- High standard of quality assurance. Conformance to ISO 9001
- It is environmentally efficient
- Effective life span of twenty five years
- It is cheap in the long run
- It also meets the Danish Standard DS 472: Loads and safety of wind turbine construction
- Can be easily dismantled and relocated
- It requires minimal maintenance and repairs
- DBA used this approach in Russia and Africa successfully
- DBA has a good business relationship with the manufacturers

f. Program Of Works

Activity	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6



g. Estimate For The Design And Construction Of The Wind Farm

Item	Amount (USD)
Design	700,000
Mobilize resources	120,000
Install site tracks	480,000
Excavate and construct	2,400,000
Install electrical infrastructure	5,300,000
Erect turbine	15,000,000
Total	**24,000,000**

h. Special Packages to motivate workers

- Personal and professional training
- Medical insurance
- Scholarships and grants available to qualified employees for further studies
- Free transportation to and from site on a daily basis
- Free lunch on Fridays
- "Worker of the month" award
- Low interest loans

- Safety gear, that is, boots, helmets etc available to each worker
- Good workers will be employed in the next contract

i. Economic Analysis

Projected Expenditure

Item		**First year's Cost (USD)**
Initial Joint venture costs	-	500,000
Design-build contract	-	24,000,000
Annual Operation and Maintenance	-	1,000,000
Annual Marketing cost	-	500,000
Annual overhead cost	-	500,000
TOTAL		**26,500,000**

Projected Income

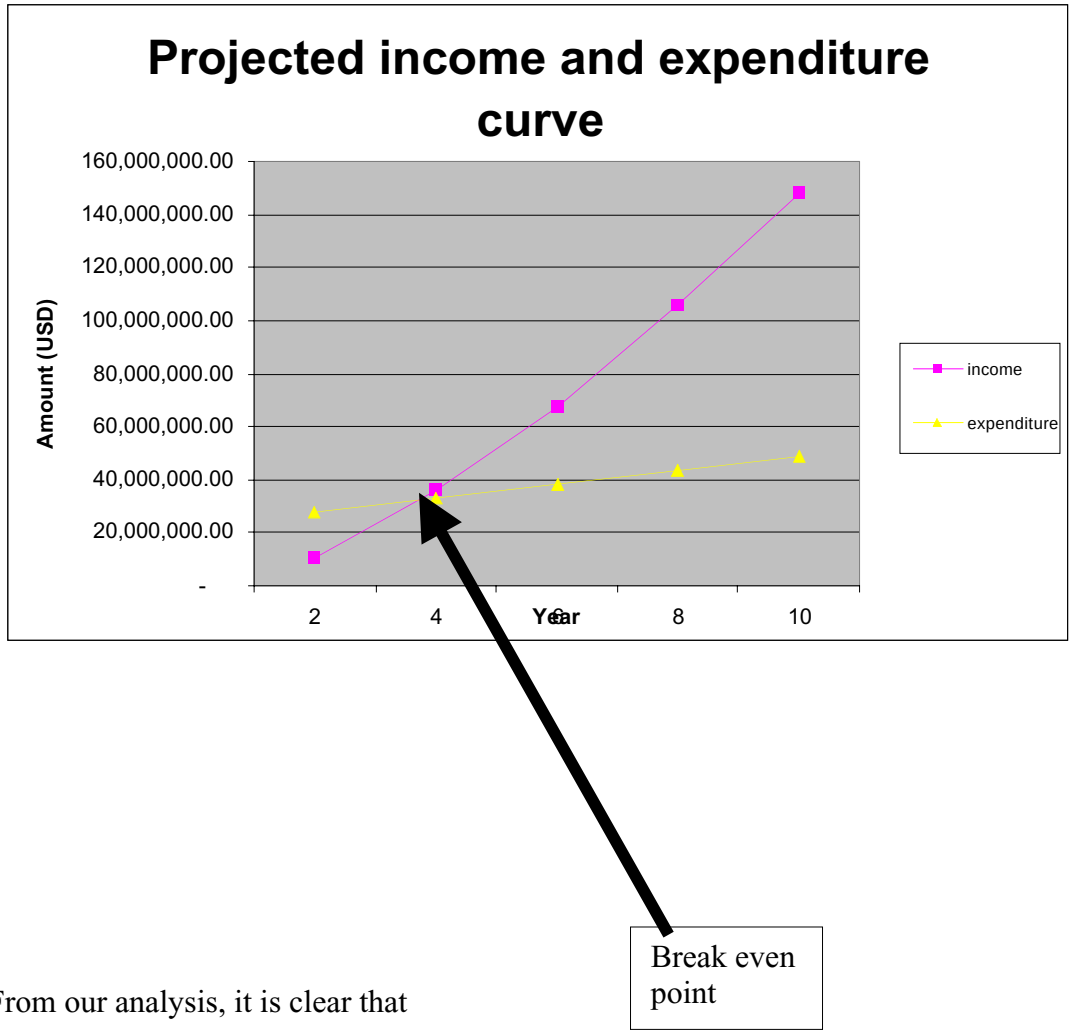
Energy generated in one year - 180,000,000 kWh

Electricity selling price - .08USD / kWh

% of targeted market share by end of first year - 40%

Total income in first year - 5,760,000 USD

Year ending	**2**	**4**	**6**	**8**	**10**
Income	**10,800,000**	**25,344,000**	**31,363,200**	**38,332,800**	**42,166,080**
Cumulative Income	**10,800,000**	**36,144,000**	**67,507,200**	**105,840,000**	**148,006,080**
Cumulative Expenditure	**27,500,000**	**32,780,000**	**38,060,000**	**43,340,000**	**48,620,000**
Cumulative Profit	**-16,700,000**	**3,364,000**	**29,447,200**	**62,500,000**	**99,386,080**



From our analysis, it is clear that

by the fourth year, we will be making

profit.

Assumptions used in the economic analysis.

- Operation and maintenance costs are constant
- Annual inflation - 5%
- Gain 60% of the targeted market share by the second year, and 100% of the targeted market share by the sixth year.
- All estimates include profit and overheads.

Net Present Value Analysis

Assumptions:

- Rate of return - 5%
- Used NPV factors

Period	**Net Cash flow (income - expense)**	**Present Value Factor**	**Present Value**
2	-16,700,000	.90703	-15,147,401
4	20,944,000	.82270	17,230,629
6	26,963,200	.74622	20,120,479
8	33,932,800	.67684	22,967,076
10	37,766,080	.61391	23,184,974
Total			**68,355,757**

The net present value of the total profits we will make over 10 years is $68,355,757. This project is economically viable, and we propose that it be started as soon as possible.

Conclusion:

DBA is obviously the internationally recognized, qualified and established partner with the capabilities that JELB Power Associates is seeking to enter into a joint venture with in order to construct, operate and market an 18 MW capacity wind power farm in the north of Poland.