

Proposal Submitted by:

Quijote De La Mancha Wind Systems

Wind Poland NCA&T Proposal Team 1

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Table of Contents

1	Cover Page
2	Table of Contents
3	Introduction
5	Executive Summary
6	Technology
9	Specifications

Introduction

Quijote De La Mancha Wind Systems (QDLM) is the worlds only fully integrated wind power company. Market driven, our products and services are designed to create value and opportunity for your business.

We do this by offering customers a full range of wind power capabilities, including global wind turbine manufacturing from our *ISO 9000/14001* certified plants in the United States, Germany and Spain; skilled project development services; creative financing options; accomplished power plant design and engineering; and experienced and responsive customer support services. These products and services are flexible and cater to each of the various wind power markets around the world to provide customers with the specific resources they need to compete today.

We're experienced and proven. Over the past two decades we have developed and/or sold more than 4,500 wind turbines and 1,600 megawatts of capacity around the globe. In our industry, we've been the first to do things that had never been done before. Like developing and constructing the first 100 megawatt or larger wind power projects when the norm was half the capacity. Like designing and manufacturing the first megawatt-class wind turbines to be available to the global market. Like concurrently building 300 megawatts of wind power projects on time and on budget. Like developing patented wind technology that provides support to local grid voltage, improves transmission efficiencies and provides the utility grid with reactive power. Like designing, developing and building the world's first offshore wind power facility utilizing megawatt technology. Our team consists of more than 1,400 people at 12 offices around the globe -- all-working together -- putting their experience and innovation to work for you.



Our specialty is offshore wind farms. It's hard not to be infected by the excitement generated by new offshore projects. That's because the potential—for the world and for the wind industry—is so vast. Here at QDLM, we believe that the potential of offshore wind energy is almost unlimited. We realized early on that we needed to build up a knowledge center so we could gather all our offshore expertise in one—impact assessments, seabed studies, foundation building, micro-sitting, installation methods, and all the other technical data

we need pertaining to offshore projects.

Which is why we've invested considerable resources, time, and energy to develop our organization to meet the challenge and to develop viable solutions that make offshore wind power a reality to the world as soon as possible. That is also why being selected to supply the 80 turbines for Horns Rev—the world's first genuine offshore power plant—is such an exciting development for QDLM.

The QDLM offshore team is geared to work with the different types of customers who are interested in offshore wind installations. Either we find ourselves

Offshore wind farms all situated in Northern Europe

Location/site	Number of units	Install. MW	Year of install.	Country
<i>Past generation of pilot projects - Turbine sizes 220-600 kW:</i>				
Norgersund	1	0.22	1990	Sweden
Vindeby	11	4.95	1991	Denmark
Lely (Ijsselmeer)	4	2	1994	Netherlands
Tunø Knob, Samsø	10	5	1995	Denmark
Irene Vorrink (Ijsselmeer)	28	16.8	1996-1997	Netherlands
Bockstigen	5	2.5	1997	Sweden
<i>Recent projects - state of the art - tomorrow's commercial turbines:</i>				
Utgrunden	7	10.5	2000	Sweden
Middelgrunden	20	40	2000	Denmark
Blyth	2	4	2000	UK
Total by end 2000	88	86.0		

working with people who are already offshore experts, for example the oil companies. Sometimes we are dealing with customers who have no experience whatsoever with offshore wind energy. Considering the varied backgrounds of their customers, the QDLM team is geared to building a relationship with its customer partners that is based on and determined by the customer's QDLM' basic philosophy is to enter into a working relationship that matches

the level of involvement required. If the customer wants us to deliver a turnkey project, in other words, manage an offshore installation from start to finish, there is no better than the QDLM Offshore Team.

Every day we strive to find new and better ways to assure our customers' success. We know that renewable energy will be an integral part of the world energy mix throughout the 21st century, and we are committed to helping our partners and customers design and implement energy solutions for their unique energy needs. Every relationship we pursue bears our uncompromising commitment to quality and innovation.

Executive Summary

Quijote De La Mancha Wind Systems (QDLM) is prepared to enter in a joint venture with JELB Power Associates Inc. QDLM will build a turnkey 15 MW capacity facility wind farm in the most appropriate section of northern Poland. The projected time frame to design, build and have fully operational is 5 years.

QDLM is willing to negotiate finance options for the this project.

QDLM will provide a training/educational program to prepare native people to assume daily operations and basic maintenance of the power facility. The training program will consist of 2 months classroom and 6 months of on the job training. Co-Op positions for college students of Polish citizenry will be established during the first year of the project. This project will employ nearly 700 highly skilled individuals during the project time frame.

QDLM is prepared to commit our best talent to the management of the joint venture. **JAMARIS PITTS**, QDLM's resident expert and co-founder, has been in the alternate energy field for over ten years, learning every facet of the industry--sales, technical, shipping, purchasing--and decided to start a new business in order to provide quality components engineered for site specific applications while maintaining GREAT customer service. Jamaris will head-up the QDLM management team to work jointly with JELB to insure success. **Keith Bryant**, QDLM's senior project manager for the Offshore Team has extensive experience with offshore drilling with several oil companies. His focus is safety and efficiency.

Michael Jones, QDLM's CFO, has been instrumental in securing private and government financial investment in renewable energy for the past decade. Jamaris, Keith and Michael will lead a team of our best to fill the following position on the joint operations management team:

- CFO
- 1 Technical Expert
- Marketing Strategist
- Environmental Consultant
- Operational Consultant
- *ISO 9000/14000 – Consultant*
- *Senior Project Manager*

QDLM is prepared to provide an ISO consultant to ensure the new facility is certified within a reasonable amount of time.

QDLM expect that, following a 2-3 year period of consultation and planning the wind farm (on or off shore) would be completed by 2005 when it will generate up to 15 MW of electricity into Poland's national grid network:

Fact Sheet

- 8-10 wind turbines of between 1.5 MW & 2.0 MW capacity each
- Wind farm of 3 square kilometers, located in the northern section of Poland
- Off-shore wind-farms (if selected) located out of main shipping lanes
- Distance from shore: Nearest - 5 miles / 8 km; Furthest - 8 miles / 13 km
- Undersea cable to shore and onward by underground cable to inland sub-station
- Construction period: 2004-2005, subject to planning consent
- Estimated capital investment: Up to \$200 million U.S. - approx.

The Technology

QUIJOTE DE LA MANCHA is world renowned for the ability to build turnkey wind farms on and offshore. Our wind farms feature two of the most advanced 2 MW turbines in the industry, the V66 and the V80.



The QDLM V80-2.0 MW turbine is a pitch-regulated turbine with three blades and an 80-metre rotor diameter. The revolution speed of the rotor varies between 9 and 19 rpm, and it is this flexibility that makes it ideal for placement in areas with modest wind speeds.

The V80 is a choice but we've chosen to highlight the V66 because it is best suited for your needs.

Introducing the QDLM V66 Wind Turbine

Offshore and onshore



but not least, the unique MaxSpeed system.

There are two versions of the V66 turbine: a 2.0 MW model for offshore sites, and a 1.75 MW model for inland locations. Both versions feature a rotor diameter of 66 meters, hub heights of 60—78 meters, and, last

Optimal pitch with OptiTip

Just like all other QDLM turbines, the V66 is equipped with microprocessor-controlled OptiTip pitch regulation, which ensures continuous and optimal adjustment of the angles of the blades in relation to the prevailing wind. The OptiTip and MaxSpeed systems make it possible to optimize the solution to the often-contradictory requirements for high output and low sound levels, depending on the location. On the V66 turbine, the pitch mechanism is fitted in the blade hub itself and contains a separate hydraulic pitch cylinder for each blade. These separate pitch cylinders also ensure triple braking safety, because one feathered blade is sufficient to stop the turbine.

QDLM MaxSpeed

The V66 turbine is equipped with MaxSpeed, a system that allows the turbine blades to rotate at variable speeds. MaxSpeed is a further development of the OptiSlip system, which allowed the revolution speed of both the rotor and the generator to vary by as much as 10%. With MaxSpeed, the revolution speed can now vary by up to approx. 60%. MaxSpeed is an efficient solution because the converter only transforms the energy from the generator rotor, which is only a small part of the total energy generated by the system. The energy generated by the generator rotor is converted back into electricity suitable for the grid by the converter.

Thanks to the converter, the standard setting of the turbine prevents it from receiving reactive output from the electricity grid. However, it is possible to set the turbine to supply or receive reactive output, if required. In short: MaxSpeed optimizes energy production, especially in modest winds, and makes it easy to adapt the operation of the turbine to suit the parameters of the electricity grid, no matter how much the requirements from the electricity companies may vary.

Lower sound level

Sound levels are still of crucial importance when deciding on the placement of wind turbines in populous inland areas — often in places where wind speeds are not strong. Thanks to the low revolution speed of the V66 turbine in modest wind speeds, QDLM has taken yet another important step towards fulfilling requirements for a wind power solution with a low sound level. The V66 turbine also makes it possible to program the turbine sound levels before installation, so the operation of the turbine is tailor-made for the specific requirements of the chosen location.

Lightning protection

Naturally, the new turbines are equipped with QDLM Lightning Protection, which protects the entire turbine from the tips of the blades to the foundations. The system conducts almost all lightning strikes harmlessly past the sensitive parts of the nacelle and down into the earth. As an extra safety measure, the delicate control units and processors in the nacelle are also protected by an efficient shielding system. The lightning protection system is an improvement of the system used on earlier QDLM turbines. Naturally, it has been thoroughly tested and conforms to both the DEFU recommendation and the applicable IEC standards.



Profitable and flexible

To increase the performance of a wind turbine, simply increase its dimensions. That, at least, is the conventional way of thinking. And it must be said that it works, more or less. However, it is not enough simply to increase output — it is also a matter of building turbines that are better able to adapt to their surroundings, whether natural or man-made. Using the unique QDLM MaxSpeed system, we have succeeded in designing a flexible turbine that adapts to its surroundings and exploits them to the full. MaxSpeed

extends the number of potential sites for a wind turbine. For example, the sound level can be optimized to suit local conditions, and areas with modest wind are now becoming more attractive. The external dimensions of the V66- 1.75 MW and V66-2.0 MW turbines are the same as those of their predecessor, the V66-1.65 MW.

All the changes that have been made are inside the nacelle – and these are important changes. Thanks to

the MaxSpeed system, we have managed to increase the turbine's production, improve areas such as power quality and sound level, and, at the same time, have increased its efficiency in modest wind conditions. At wind speeds as low as 4 m/s, the V66 turbines can exploit as much of the wind energy as at 8 m/s. This is something of an innovation. If you value profitability and the ability to adapt, then you are sure to appreciate MaxSpeed, and, of course, the V66.



Specifications:

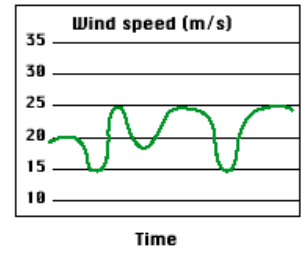
QDLM V66 - 1,75 MW and 2,0 MW (offshore)

Actual measurements of QDLM V66-1.75 MW & V66-2.0 MW turbine with MaxSpeed

Rotor

V66 - 1,75 MW
 Diameter: 66 m
 Swept area: 3.421 m²
 Speed revolution: 21.3 rpm
 Operational interval: 10.5 - 24.5 rpm
 Number of blades: 3
 Power regulation: Pitch/MaxSpeed
 Air brake: Feathered

V66 - 2,0 MW
 Diameter: 66 m
 Swept area: 3.421 m²
 Speed revolution: 21.3 rpm
 Operational interval: 10.5 - 24.5 rpm
 Number of blades: 3
 Power regulation: Pitch/MaxSpeed
 Air brake: Feathered



Tower

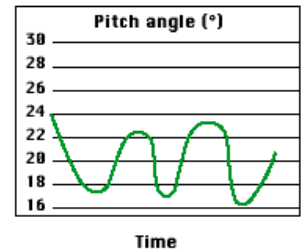
Hub height (approx.): 60 - 67 - 78 m

60 - 67 - 78 m

Operational data

Cut-in wind speed: 4 m/s
 Nominal wind speed: 16 m/s
 Stop wind speed: 25 m/s

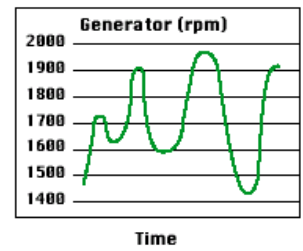
4 m/s
 16 m/s
 25 m/s



Generator

Type: Asynchronous with MaxSpeed
 Nominal output: 1750 kW
 Operational data: 50/60 Hz
 690 V

Asynchronous with MaxSpeed
 1750 kW
 50/60 Hz
 690 V



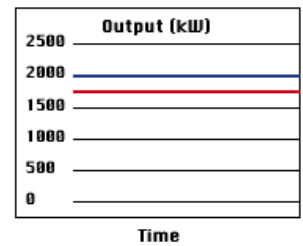
Gearbox

Type: 1 planet step
 2-step parallel axle gears

1 planet step
 2-step parallel axle gears

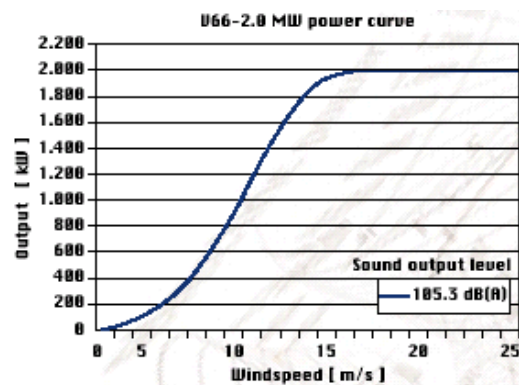
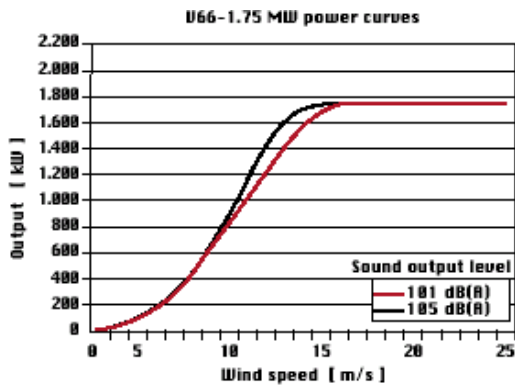
Control

Type: Microprocessor - based monitoring of all turbine functions with the option of remote monitoring.
 Output regulation and optimization via MaxSpeed and OptiTip pitch regulation.



Weight

	60 m	67 m	78 m
Tower:	100 t	117 t	159 t
Nacelle:	57 t	57 t	57 t
Rotor:	23 t	23 t	23 t
Total:	180 t	197 t	239 t



QDLM V80 - 2,0 MW

Rotor

	V80 - 2,0 MW
Diameter:	80 m
Swept area:	5.027 m ²
Speed revolution:	16.7 rpm
Operational interval:	9 - 19 rpm
Number of blades:	3
Power regulation:	Pitch/MaxSpeed
Air brake:	Three separate pitch cylinders

Tower

Hub height (approx.):	60 - 67 - 78 - 100 m
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Operational data

Cut-in wind speed:	4 m/s
Nominal wind speed:	15 m/s
Stop wind speed:	25 m/s

Generator

Type:	Asynchronous with MaxSpeed	
Nominal output:	2000 kW	2000 kW
Operational data:	50 Hz	60 Hz
	690 V	690 V
	905 - 1,915 rpm	1,090 - 2,300 rpm

Gearbox

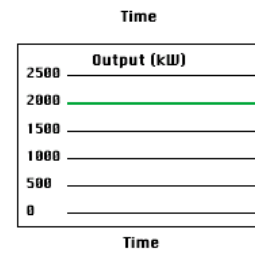
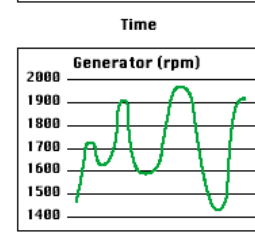
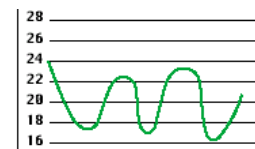
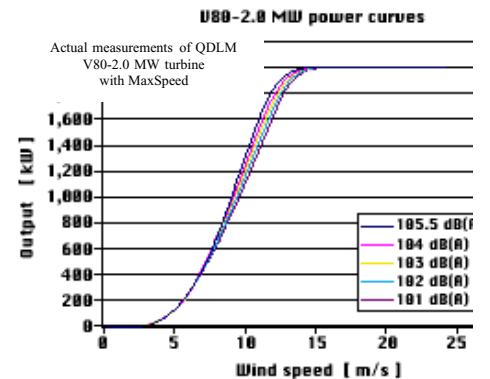
Type:	Planet/parallel axles
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Control

Type:	Microprocessor - based monitoring of all turbine functions with the option of remote monitoring. Output regulation and optimization via MaxSpeed and OptiTip pitch regulation.
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Weight

	60 m	67 m	78 m	100 m
Tower:	110 t	130 t	170 t	220 t
Nacelle:	61 t	61 t		
Rotor:	34 t	34 t		
Total:	205 t	225 t		



Efficient in modest winds

When establishing wind power plants, the first sites considered are usually coastal areas, deserted stretches of land and the sea. Quite naturally, as it is in these locations that wind conditions are most favorable. However, there is an art to generating energy where it is needed, and this often involves inland areas with modest wind conditions and short distances to built-up areas. That is why we are launching a new QDLM turbine, the V80-2.0 MW.

This new turbine can generate wind energy in areas with modest wind conditions, areas that were previously considered not economically viable or were not chosen due to concerns about sound levels. Not only is the new turbine extremely efficient in modest winds, but its sound level can also be adapted to match local requirements. All these advantages are due to the new QDLM MaxSpeed system, which allows the revolution speed to vary by up to approx. 60%.

The V80-2.0 MW is the largest QDLM turbine to date, irrespective of whether it is measured by production or size. It is a turbine that, in its own efficient and considerate way, generates environment friendly energy where people need it.