

GWL 225 KW



Southern Wind Farms Ltd.





Profile

Southern Wind Farms Limited (SWL) is a company promoted by group of very reputed investors namely Morgan Stanley, Enam Securities Limited, Quantum M and Reliance Capital Limited, as a special purpose vehicle to develop a commercially viable Wind Energy facility capable of delivering renewable energy to the power grid. Reliance Capital Limited is part of the Reliance conglomerate.

Group business factoids:

- Among top 3 private-sector business houses
- Net worth of US\$ 6 billion
- Market capitalisation of US\$ 22 billion
- Net assets in excess of US\$ 7 billion
- Largest customer base in India (50 million strong across the board)
- Shareholder base ranks among the worlds largest (8 Million plus)

Through its products and services the group touches the lives of 1 in 10 Indians every single day with a business presence extending to over 4,500 towns and 300,000 villages in India, and 5 continents worldwide.

Group interests range from Communications (Reliance Communications) and Financial Services (Reliance Capital Ltd); to Generation, Transmission and Distribution of Power (Reliance Energy), Infrastructure and Entertainment.

SWL was incorporated on February 23, 2005 and has the tested technology to manufacture, market and install (Complete EPC/Turnkey as project) 225 KW- Wind Electric Generators.

Our key competency is the installation of wind farms on a turnkey basis for clients ranging from individuals to large corporate. The company has installed over 2500 Wind Electric Generators, powering over 500MW at present, in the states of Tamil Nadu, Karnataka, Andhra Pradesh, Rajasthan, Maharashtra, Madhya Pradesh and Gujarat. Building on the present strength and market requirements SWL is co-developing 750 KW and 1500 KW generators, incorporating state-of-the-art technology wind turbines, which will be in the market soon.

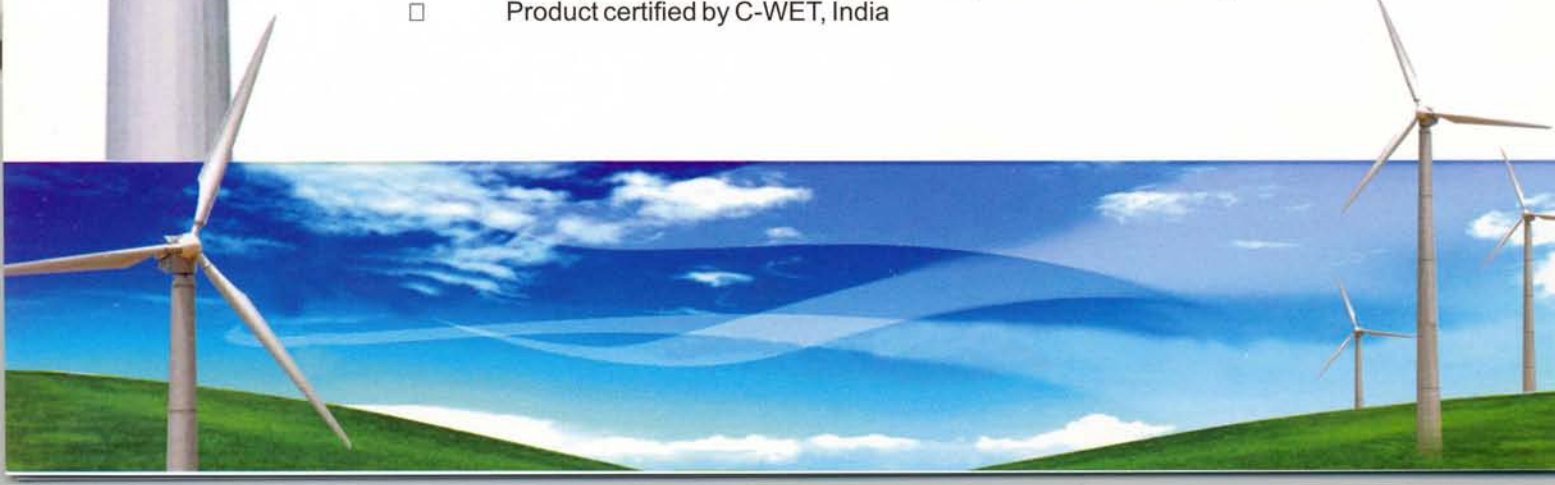
Wind energy has come-of-age in India with a phenomenal growth, particularly in the last couple of years with the installation of nearly 4000 MW. Lead by Germany, Spain and U.S.A., India is ranked fourth among the wind power generating nations. With a decade of experience under her belt, India is poised for a big leap, not only accelerating the creation capacity in India, but foraying into foreign countries.

Thanks to the munificence of MNES and the infrastructure provided by the State Government, the wind power sector envisages playing a key role in not only supplementing conventional power generation in the country, but also abating greenhouse gas emissions. The Government of India is clear that renewable energy should surmount to 10% of the total energy consumed by 2010 (up 5% on current figures).

Southern Wind Farms Ltd has propelled this evolution of a professionally managed team of highly qualified technical personnel, providing high quality, competitively priced machines with low maintenance costs, has expedited the demand of repeat orders from satisfied clients

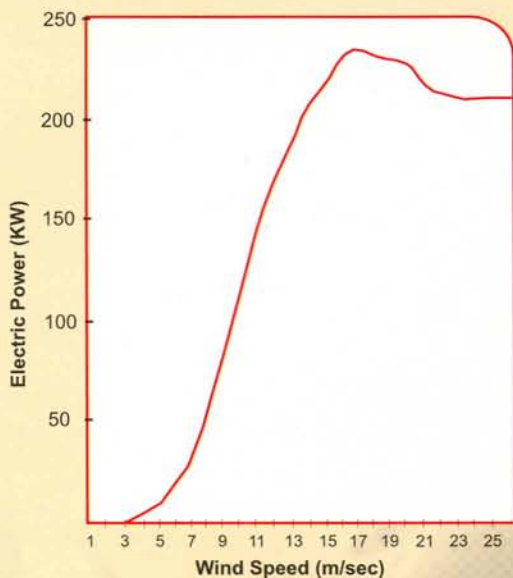
The company manufactures a full range of 225 KW Wind Energy equipment :

- Robust, simple design
- Economical operation and Maintenance
- 98% Indigenized
- Industry leading price/performance
- Dual speed generator gives optimum output for both low and high wind
- Product certified by C-WET, India



GWL 225 KW

Power Curve



Wind Speed m/s	EL Power KW
3	4.00
4	9.00
5	19.50
6	32.80
7	58.80
8	87.60
9	118.70
10	149.60
11	171.40
12	189.30
13	206.00
14	217.00
15	230.00
16	234.00
17	230.00
18	229.00
19	225.00
20	215.00
21	212.00
22	210.00
23	210.00
24	210.00
25	210.00
>25	0.00

TECHNICAL SPECIFICATIONS

Type - GWL 225/40 KW

Overall Data

Cut in wind speed	Approx. 4 m/s
Cut out wind speed	Approx. 25 m/s
Rated wind speed	15 m/s
Survival wind speed	60 m/s at 2 sec gust
Tip speed	58/39 m/s
Rotor revolutions	37.5/25 rpm
Hub height	45 m
Nacelle tilt angle	5 Degrees
Regulation	Stall

Gear Box

Type	Helical
Gear Ratio	1 : 40
No. of steps	2

Generator

Rated power output	225/40 KW
Type	Asynchronous, 3 phase
Voltage	400 V
Revolutions	1500/1000 rpm
Frequency	50 Hz

Tower

Type	Tubular
Height	43.7 m
Material	Steel plate
Sections	6
Ladder	Inside the tower
Nacelle frame	Hot sprayed galvanised welded steel plate frame

Rotor

No. of blades	3
Diameter	29.8m
Swept area	698 sq.m
Material	Polyester reinforced Fibreglass
Pitch	Fixed
Power regulation	Stall

Brake Systems

Aerodynamics	Leading tip spoiler
Mechanical	Failsafe disc brake
Yaw system	Slewing system with gearmotors yawing

Controls

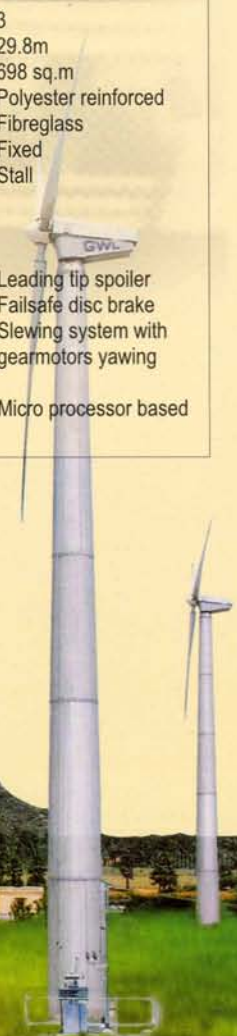
Micro processor based

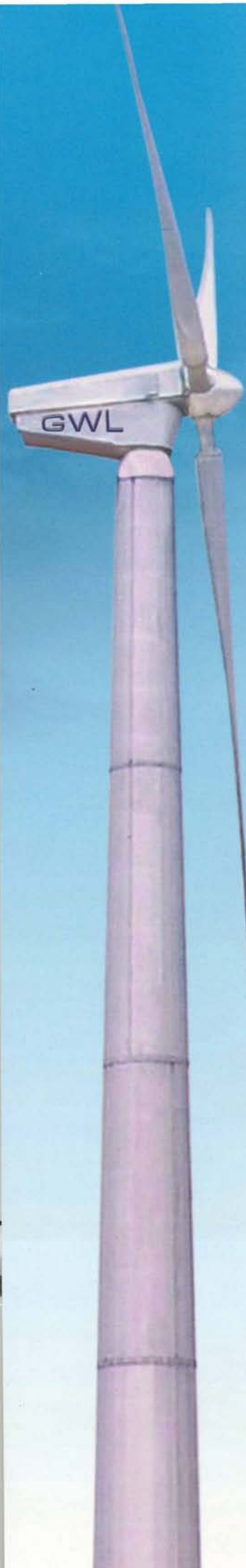
Safety Systems

1. Hydraulic activated blade-tip brakes
2. Electro-mechanical "fail-safe" disc brake
3. Grid control of:
 - a. Voltage 400+ 13%
 - b. Frequency 50 Hz + 1-3 Hz
 - c. Phase equality control
4. Over-speed control on rotor that activates disc brake
5. Thermo-detector in generator
6. Vibration control switch
7. Automatic untwisting of cables
8. Thermo relay for yaw-gear motor
9. 90° yaw of Nacelle, in case of malfunction
10. Automatic stop for worn-out brake pads
11. Automatic start-up in the event of grid failure
12. Self-diagnostic in case of failure. Display indicates failure code
13. Ready to be linked via modem with Computer Management System
14. Built in data processor
15. Automatic stop at wind speeds above 25 m/s
16. Effective Power factor control

Salient Features

1. 80% Accelerated depreciation in the first year of operation
2. 10 Consecutive years income tax holiday on generation revenue from wind mill
3. Power generated can be sold to SEBs / Captive use / Third party sale (in some states)
4. Lowest gestation period
5. The cost of power generation is very low





Indian Register Quality Systems
(A Department of Indian Register of Shipping)

ACCREDITED BY NABCB

Certificate Of Approval

This is to certify that the Quality Management System of
Southern Windfarms Limited
15, Soundara Pandiyam Street, Ashok Nagar,
Chennai - 600 083

has been assessed and approved
in accordance with the requirements of
ISO 9001 : 2000
with respect to the following scope:
**Manufacture and Supply of
Wind Turbine Generators**

This approval is subject to continued satisfactory maintenance of the
Quality Management System of the Organisation to the above Standard
which will be monitored by IRQS.

Certificate No.: **IRQS/0710009** issued at Mumbai on: 10th January 2007

Original Approval Date : 6th January 2007
Current Certificate Expiry: 6th January 2010

S. Nanthan
Managing Director

CENTRE FOR WIND ENERGY TECHNOLOGY
(An Autonomous Institution of Government of India)

C-WET

PROVISIONAL TYPE CERTIFICATE

Certificate No.: **PTC III-004-R3**

This certificate is issued to

Company : **MA. SOUTHERN WIND FARMS LIMITED.**
Address : **No. 15, Soundarapandian Street, Ashok Nagar,
Chennai - 600 083, India**

For the wind turbine: **GWL 125**

The certificate attests compliance with "Type Approval - Provisional Scheme - 2009 (TAPS-2009) (amended) - Provisional Type Certification Scheme for WT in India, Category-III, concerning the design and manufacturing system. It is based on the following reference documents:

DE- (PTC III-004-2003-CS1)	Design Evaluation Conformity Statement
Date:	25-11-2003
MC- (PTC III-004-R3-CS2)	Manufacturing Conformity Statement
Date:	27-02-2007
FTT- (PTC III-004-2003-CS3)	Provisional Type Test Conformity Statement
Date:	30-09-2003
TC- (PTC III-004-CS4)	Type Characteristics Measurements Conformity Statement
Date:	03-12-2002
ER- (PTC III-004-R3-FER)	Final Evaluation Report
Date:	28-02-2007

The conformity evaluation was carried out according to TAPS - 2009 (amended) - Provisional Type Certification Scheme for WT in India. The WT type is specified on page 2 of this certificate. Changes in the wind turbine design or the manufacturer's quality system are to be approved by C-WET. If any changes are carried out without approval, the Certificate loses its validity.

This Provisional Type Certificate is valid until 27.02.2009.

Place : Chennai
Date : 28-02-2007

(S. Siva Kumar)
Scientist
Standards and Certification

(A. Senthil Kumar)
Unit Chief (WT)
Standards and Certification

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