National Electric Power Regulatory Authority

Islamic Republic of Pakistan

2nd Floor, OPF Building, G-5/2, Islamabad.
Ph: 9206500, 9207200 Fax : 9210215
E-mail: office@nepra.org.pk

Registrar

No. NEPRA/R/LAG-86/ 8195-96

December 29, 2006

Chief Executive
Win Power (Pvt.) Limited
1500-A, Saima Trade Towers,
I.I. Chundrigar Road,
Karachi-74000

Subject: **Generation Licence No. WPGL/05/2006**
Licence Application No. LAG-86
Win Power (Pvt.) Limited (WPPL)

Please refer to you letter no. PVCL/WP/12, dated July 26, 2006 to NEPRA for a Generation Licence.

2. Enclosed here is Generation Licence No. WPGL/05/2006 granted by the Authority to Win Power (Pvt.) Limited. The Licence is granted to you pursuant to Section 15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997).

3. Please quote above mentioned Generation Licence No. for your future correspondence with the Authority.

DA/as above

29.12.06
(Mahjoob Ahmad Mirza)

Copy for information to Director General, Pakistan Environmental Protection Agency, House No. 311, Main Margalla Road, F-11/3, Islamabad.

National Electric Power Regulatory Authority
(NEPRA)
Islamabad – Pakistan

GENERATION LICENCE

No. WPGL/05/2006

In exercise of the Powers conferred upon the National Electric Power Regulatory Authority (NEPRA) under Section 15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (XL of 1997), the Authority hereby grants a Generation Licence to:

WIN POWER (PRIVATE) LIMITED
(Installed Capacity: 50 MW ISO Gross)

For its Plant at Bhambhore-Port Qasim Gharo, District Thatta, Sindh

Incorporated under the Companies Ordinance, 1984
Under Certificate of Incorporation

No. 00000010601/20041207, Dated December 28, 2004

to engage in generation business subject to and in accordance with the Articles of this Licence.

Given under my hand this 29th day of DECEMBER, Two Thousand & Six, and expires on 29th day of JUNE, Two Thousand & TWENTY EIGHT

Registrar

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

Article-1
Definitions

1.1 In this Licence

(a) "Act" means the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (XL of 1997).

(b) "Authority" means the National Electric Power Regulatory Authority constituted under section 3 of the Act.

(c) "Licensee" means Win Power (Private) Limited.

(d) "NTDC" means National Transmission and Dispatch Company.

(e) "Rules" mean the National Electric Power Regulatory Authority Licensing (Generation) Rules, 2000.

(f) "Wind Farm" means a collection of wind turbines in the same location and used for the generation of wind power electricity.

(g) Wind Power" means electricity produced by using wind turbines collectively in a Wind Farm.

1.2 Words and expressions used but not defined herein bear the meaning given thereto in the Act or in the Rules.

Article-2
Application of Rules

This Licence is issued subject to the provisions of the Rules, as amended from time to time.

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Article-3
Generation Facilities

3.1 The location, size (capacity in MW), technology, interconnection arrangements, technical limits, technical functional specifications and other details specific to the wind power generation facilities of the Licensee are set out in Schedule-I to this Licence.

3.2 The net capacity of the Licensee's generation facilities is set out in Schedule-II hereto.

3.3 The Licensee shall provide the final arrangement, technical and financial specifications and other details specific to the wind generation facilities before commissioning of the generation facilities.

Article-4
Term

4.1 The Licence is granted for a term of twenty (20) years after the commercial Operation date.

4.2 Unless revoked earlier, the Licensee may, ninety (90) days prior to the expiry of the term of the Licence, apply for renewal of the Licence under the Licensing (Application and Modification Procedures) Regulation, 1999.

Article-5
Licence fee

After the grant of the Generation Licence, the Licensee shall pay to the Authority the Licence fee, in the amount and manner and at the time set out in National Electric Power Regulatory Authority (Fees) Rules, 2002.

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REGISTRAR
NEPRA

Article-6
Tariff

The Licensee shall charge consumers or purchasers only such tariff which has been approved by the Authority.

Article-7
Competitive Trading Arrangement

7.1 The Licensee shall participate in such measures as may be directed by the Authority from time to time for development of a Competitive Trading Arrangement. The Licensee shall in good faith work towards implementation and operation of the aforesaid Competitive Trading Arrangement in the manner and time period specified by the Authority. Provided that, any such participation shall be subject to any contract entered between the Licensee and another party with the approval of the Authority.

7.2 Any variation or modification in the above-mentioned contracts for allowing the parties thereto to participate wholly or partially in the Competitive Trading Arrangement shall be subject to mutual agreement of the parties thereto and such terms and conditions as may be approved by the Authority.

Article-8
Maintenance of Records

For the purpose of sub-rule (1) of Rule 19 of the Rules, copies of records and data shall be retained in standards and electronic form and all such records and data shall, subject to just claims of confidentiality, be accessible by authorized officers of the Authority.

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Article-9
Compliance with Performance Standards

The Licensee shall conform to the relevant NEPRA rules on Performance Standards as may be prescribed by the Authority from time to time.

Article-10
Compliance with Environmental Standards

The Licensee shall conform to the environmental standards as may be prescribed by the relevant competent authority from time to time.

Article-11
Power off take Point and Voltage

The Licensee shall deliver power to the power purchaser or procurer (on behalf of purchaser(s)) at the outgoing bus of 132 KV grid station. Up-gradation (step up) of generation voltage up to 132 KV will be the responsibility of the Licensee.

Article-12
Wind Power Plant's Performance Data

The Licensee shall install monitoring mast with properly calibrated automatic computerized wind speed recording meters at the same height as that of the wind turbine generators and a compatible communication/SCADA system both at the Wind Farm and power purchaser's control room for transmission of wind speed and power output data to the Power Purchaser's or Procurer's control room for record of data.

Article-13
Provision of Information

13.1 The obligation of the Licensee to provide information to the Authority shall be in accordance with Section 44 of the Act.

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13.2 The Licensee shall in addition to 13.1 above, supply information to NTDC regarding Wind data specific to the Licensee's site and other related information on a regular basis and in a manner required by NTDC.

13.3 The Licensee shall be subject to such penalties as may be specified in the relevant rules made by the Authority for failure to furnish such information as may be required from time to time by the Authority and which is or ought to be or have been in the control or possession of the Licensee.

Article-14
Emissions Trading /Carbon Credits

The Licensee will process and obtain emissions/Carbon Credits expeditiously and credit the proceeds to the Power Purchaser/Procurer on behalf of purchaser(s) on actual basis.

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SCHEDULE-I

The location, size (capacity in MW) technology, interconnection arrangements, technical limits, technical functional specifications and other details specific to the generation facilities of the Licensee.

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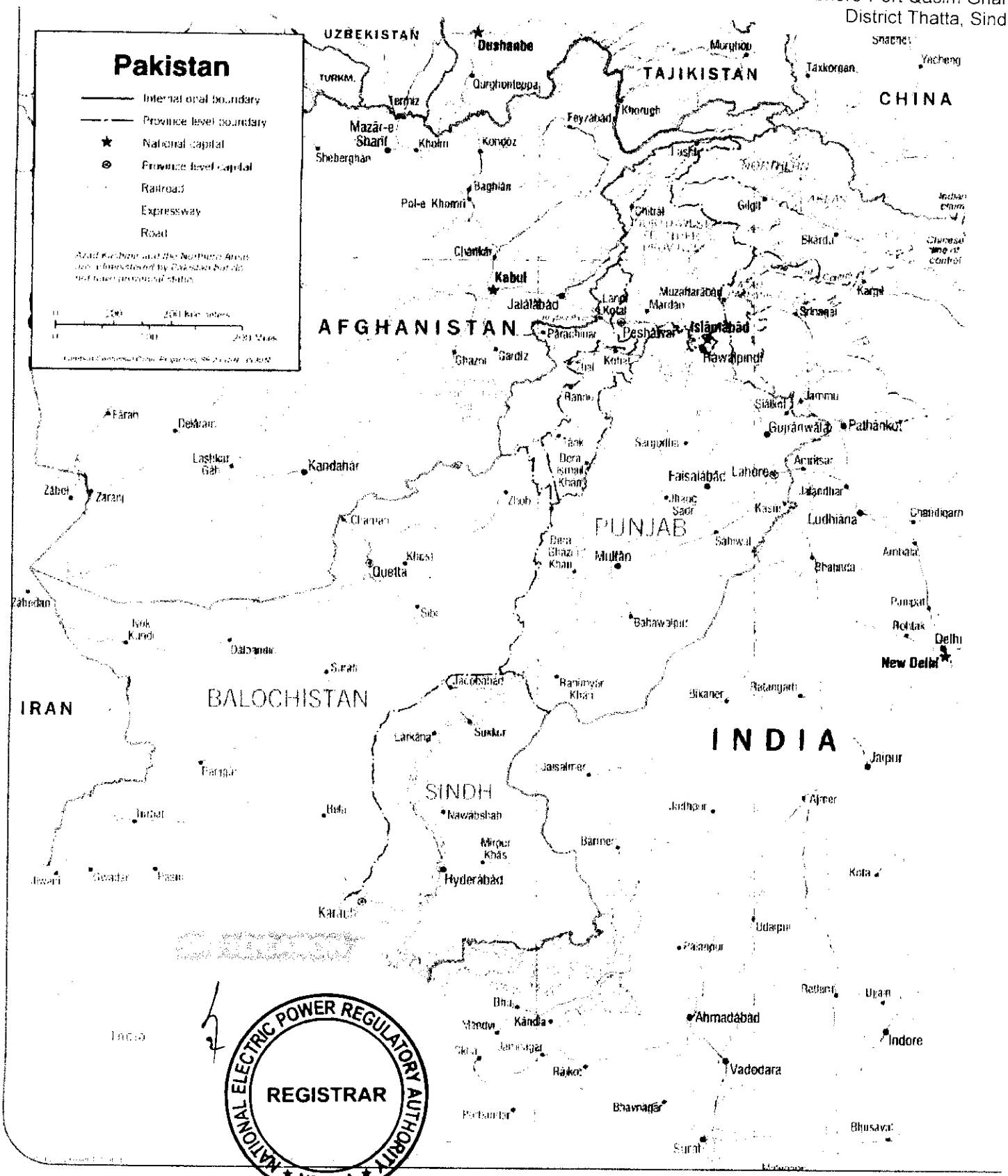


803-005-067 / SEPTEMBER 2005

AXOR

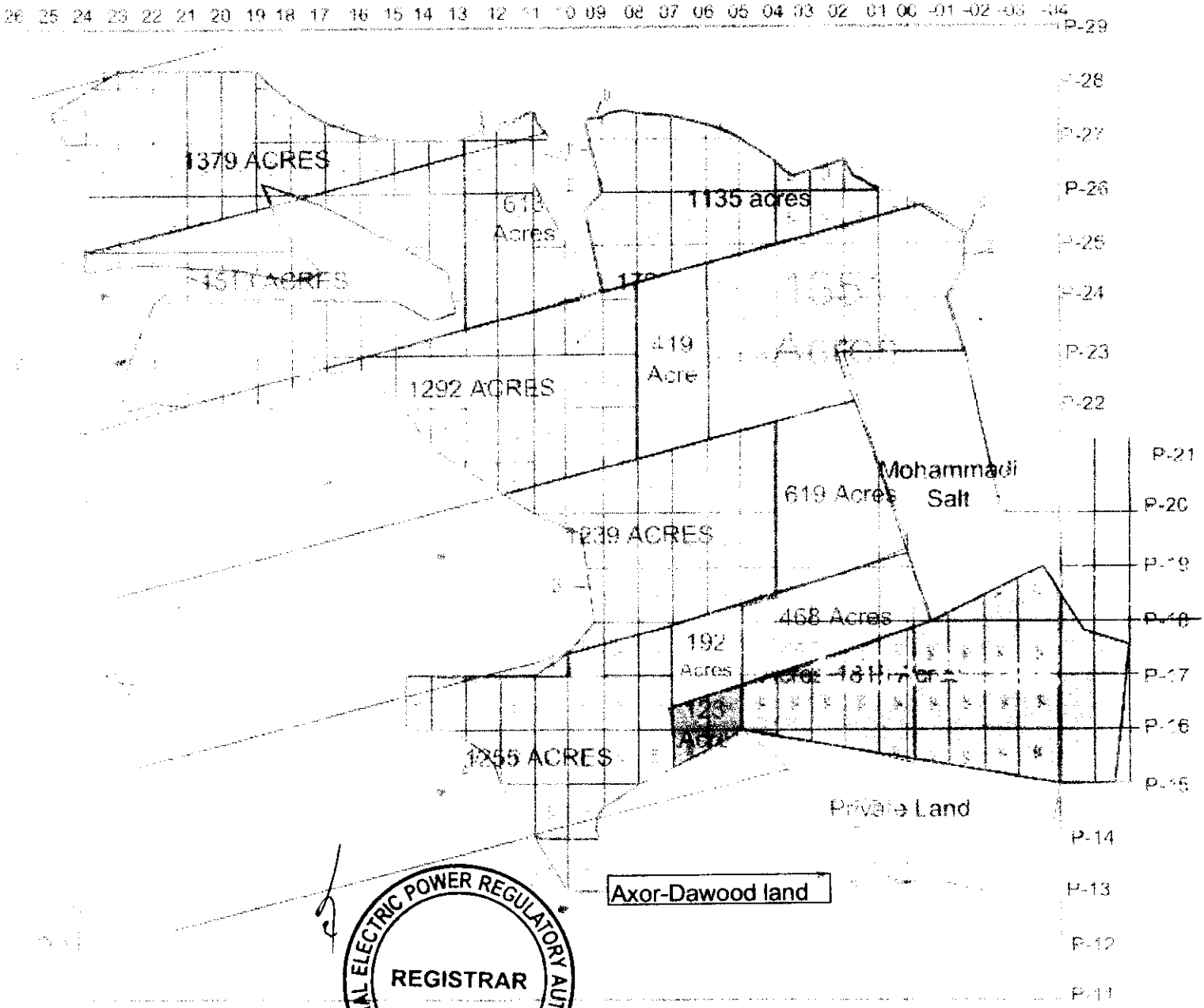
SITE LOCATION — PAKISTAN

SITE LOCATION

REGISTRAR

NATIONAL ★ NEPRA ★ AUTHORITY

BHANBHORE-PORT QASIMLAND



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Map prepared by: Wind Rose Consultancy

Scale	Total Land	Signed by Arshad Lal Junejo

SEE GPS COORDINATES ON ATTACHED SHEET

R D LAND COORDINATES

Border Line

	Lat.	Long.
1	2440221	6728203
2	2440247	6728256
3	2440272	6728308
4	2440296	6728361
5	2440322	6728414
6	2440347	6728466
7	2440372	6728519
8	2440397	6728571
9	2440422	6728623
10	2440448	6728676
11	2440472	6728728
12	2440498	6728781
13	2440523	6728833
14	2440548	6728886
15	2440573	6728939
16	2440598	6728991
17	2440624	6729044
18	2440638	6729075
19	2440683	6729128
20	2440714	6729233
21	2440764	6729338
22	2440814	6729443
23	2440865	6729548
24	2440965	6729758
25	2440965	6729758

Eastern Line

	Lat.	Long.
1	2439508	6730368
2	2439574	6730340
3	2439700	6730287
4	2439827	6730234
5	2439953	6730182
6	2440080	6730129
7	2440206	6730076
8	2440333	6730023
9	2440459	6729970
10	2440586	6729917
11	2440712	6729864
12	2440839	6729811
13	2440965	6729758

WIN POWER (PVT) LTD.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
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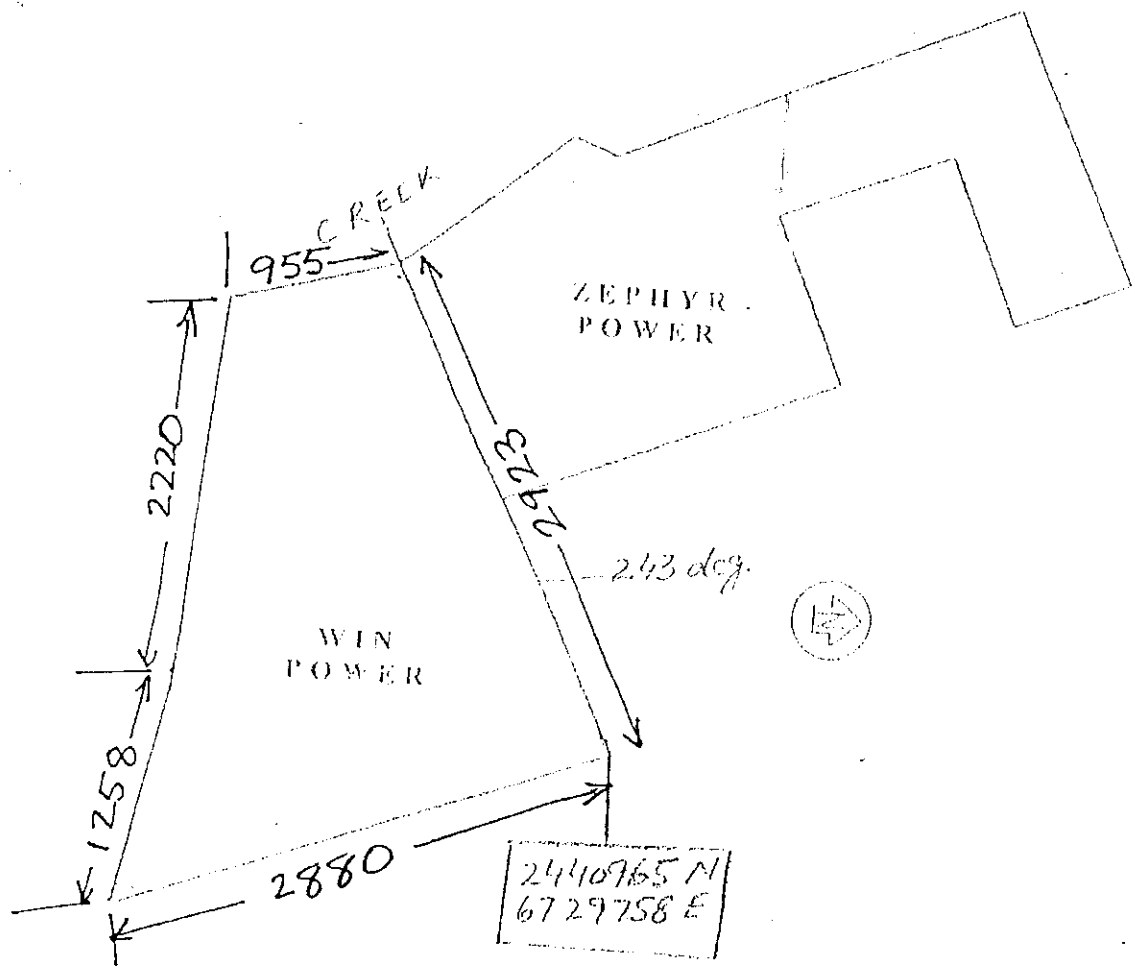
AGREED BOUNDARY BETWEEN WIN POWER & ZEPHYR POWER AT GHARO, SINDH

OUTER BOUNDARY DIMENSIONS IN METERS.



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For Zephyr Power
2nd March 2006

For Win Power
2/3/06

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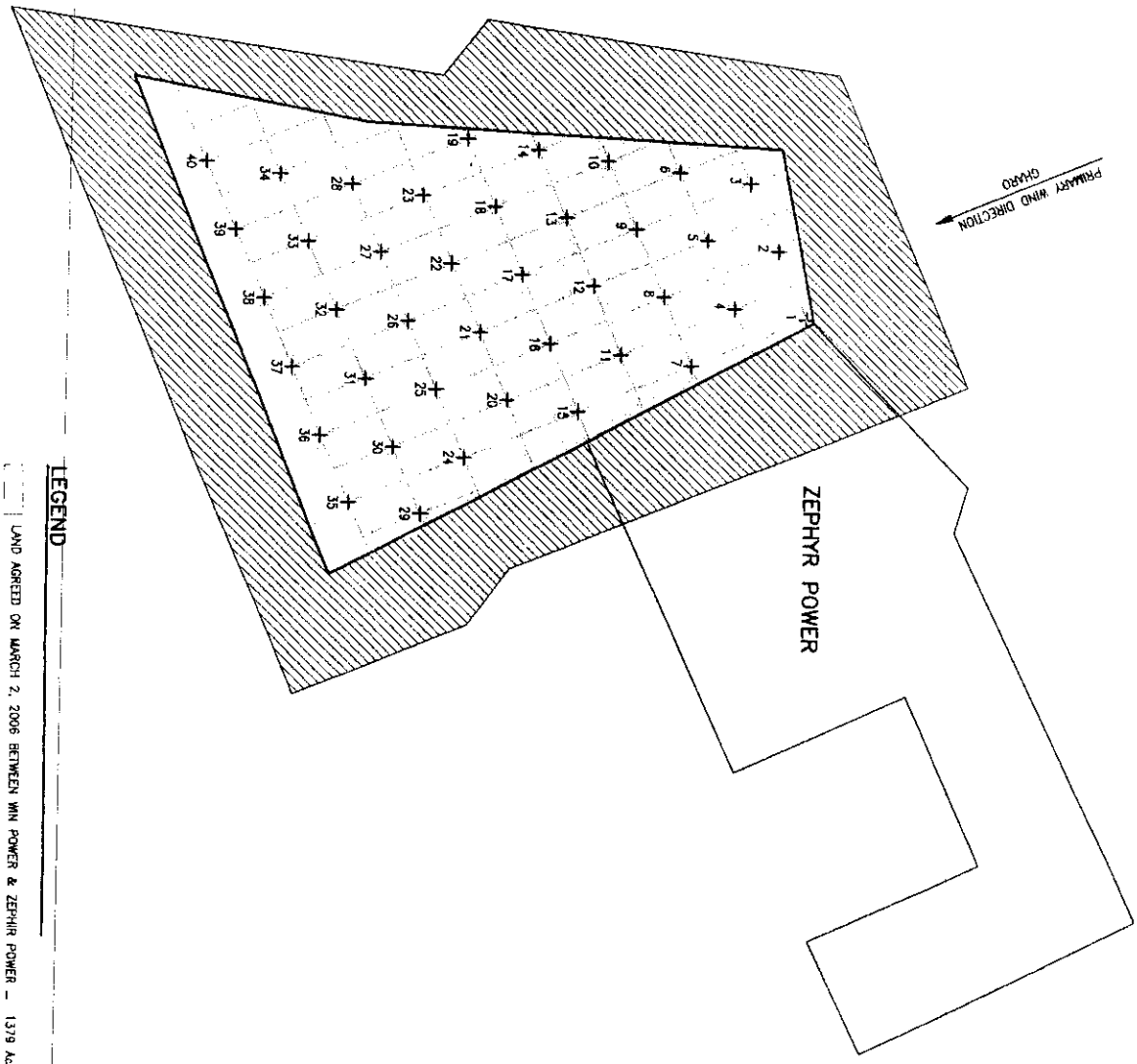

LEGEND

LAND AGREED ON MARCH 2, 2006 BETWEEN WIN POWER & ZEPHIR POWER – 1379 Acres

PROTECTION ZONE (DOMINANT WIND DIRECTION) —— 1416 Acres

AXOR

PAKISTAN WIND DEVELOPMENT
NEAR GHARO

50 MW (±) WIND FARM LAYOUT
(SUZLON – 1.25 MW)

MARCH 06, 2006

SCALE: 1:25000

P-13

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
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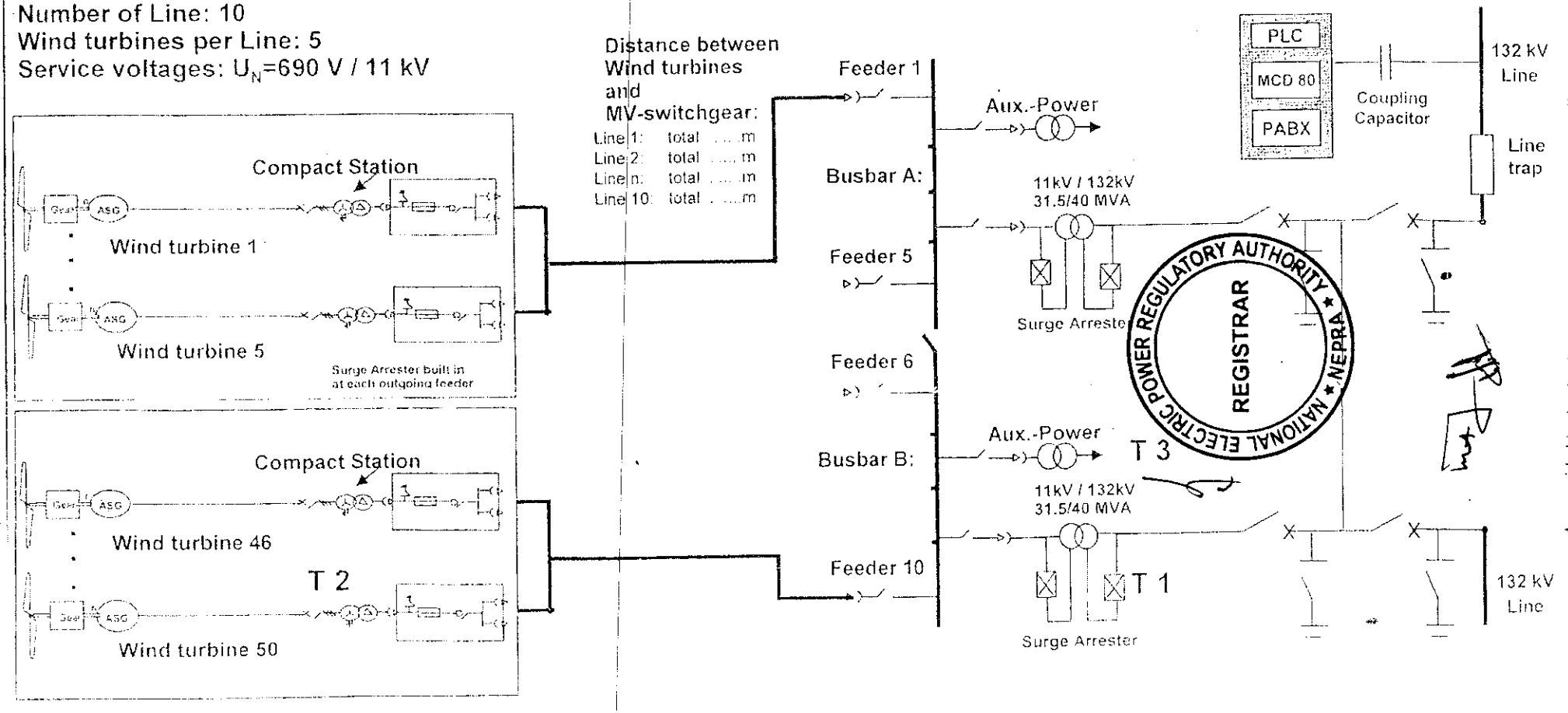
As provided in the feasibility study submitted by the applicant.

Principal Overview Concept (Line Feeder Arrangement) defining scope of Siemens Pakistan (Excluding Wind Turbines)

50 Wind turbines 1 MW / ∑ =50 MW
Wind turbine Type:
Number of Line: 10
Wind turbines per Line: 5
Service voltages: U_N=690 V / 11 kV

Wind park-11kV Cable Network

132kV Main Station



Plant Details*

1. General Information

i.	Name of Applicant/Company	Win Power (Pvt.) LTD
ii.	Registered Office	1500-A, Saima Trade Towers, I I Chundrigar Road, Karachi-74000.
iii.	Plant Location	Near Port Qasim – Bhambore, Gharo Creek Area District Thatta, Sindh.
iv.	Type of Generation Facility	Wind Power

2. Plant System Description

i.	Unit Size (MW)	1.25 (Max)
ii.	No. of Units	40
iii.	Plant Size (MW)	50 (Max)

3. Turbine Data

i.	Make/Model/ Type	Suzlon/1250		
ii.	Wind Turbine Capacity (MW)		Power (MW)	Velocity (m/s)
		Max	1.25 MW	14 m/s
		Min	0.035 MW	4 m/s
		(Range attached as per manufacturer data)		
iii.	No. of Blades	Three		

* As provided by the applicant

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iv.	Hub Height	65 Meter
v.	Rotor Diameter	66 Meter
vi.	Swept Area	3421m^2
vii.	Rated Turbine Speed	13.9 – 20.8 r.p.m
viii.	Wind Speed	
	• rated (m/s)	12 m/s
	• cut in (m/s)	3 m/s
	• cut out (m/s)	25 m/s

4. **Generator Data**

i.	Generator Type	4/6 poles Asynchronous
ii.	Generator Rating	250/1250 KW
iii.	Rated Voltage	3 phase 690 V AC

5. **Design & Manufacturing Standards**

Wind turbine generation system shall be designed, manufactured and tested according to the latest IEC standards or other equivalent standards. All plant and equipment shall be new, un-used and of the latest model.

6. **Power Curve**

The collective power curve of the Wind Farm shall be verified as part of the commissioning tests according to the latest IEC standards and shall be used to measure the performance of the wind turbines.

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7.	Project Commissioning date (Anticipated)	June 2008
8.	Expected Life of the Project from Commercial Operation date (COD)	20 Years

9. **Plant Characteristics (at interconnection point)**

i.	Generation Voltage (Volts)	132 KV at Outgoing Bus Bar
ii.	Frequency	50 HZ
iii.	Power Factor	Cos Ø = 1 or 0.95 (over excited or under excited)
iv.	Automatic Generation Control	Yes

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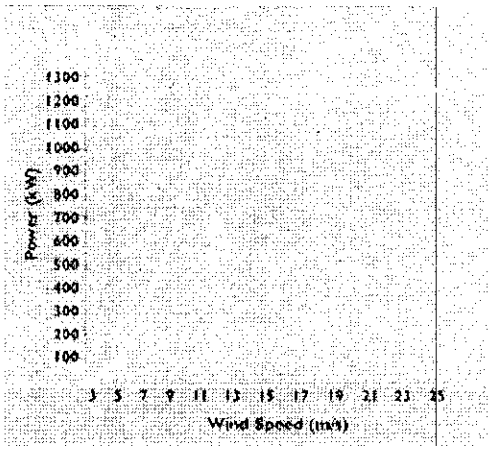
Us Wind Power Solutions & You

Wind Turbines 1.25 MW Power Curve

Search

[illegible]	[illegible]	Wind Speed (m/s)	Power Output (kW)
3	0	15	1250
4	35	16	1250
5	89	17	1250
6	148	18	1250
7	275	19	1250
8	446	20	1250
9	621	21	1250
10	811	22	1250
11	990	23	1250
12	1127	24	1250
13	1198	25	1250
14	1250		

Air density :1.225 kg/m³

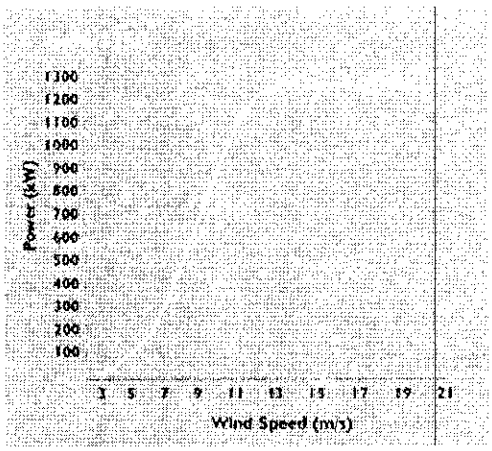


1.25 MW

System Design
Technical Description
Salient Features
Technical Data
Power Curve

[illegible]	[illegible]	Wind Speed (m/s)	Power Output (kW)
3	5	13	1241
4	35	14	1250
5	93	15	1250
6	151	16	1250
7	285	17	1250
8	454	18	1250
9	639	19	1250
10	832	20	1250
11	1008	21	1250
12	1152	22	1250

Air density :1.225 kg/m³



WIN POWER (PVT) LTD.

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SCHEDULE-II

The Net Capacity of the Licensee's Generation Facilities

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SCHEDULE-II*

1.	Total Installed Capacity (MW) for the plant (Gross ISO)	50.00 MW
2.	De-rated Capacity (MW) at Site Conditions (on account of Air density, humidity, temperature, Wake effect, wind direction, rain etc)	48.75 MW
3.	Auxiliary Consumption (MW)	1.00 MW
4.	Total Net Capacity (MW) of the Plant at Site Conditions	47.75 MW

Note

All the above figures are indicative as provided by the Licensee. The Net Capacity available to NTDC for dispatch and provision to purchasers will be determined through procedures contained in the Agreements or Grid Code.

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* As provided by the applicant

INTERCONNECTION ARRANGEMENT FOR THE POWER DISPERSAL OF THE WIND FARM

The power generated by the Licensee from the Wind Farm shall be dispersed to the Load Center/Ring of HESCO, at 132 KV voltage level by constructing a new 132 KV Transmission Line from 132 KV Grid station at the Wind Farm to 132 KV Mirpur Sakro or Thatta Grid Stations.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
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December 29, 2006

Case No.LAG-86

Determination of the Authority in the Matter of Grant of Generation Licence to Win Power (Private) Limited (WPPL)

1. Win Power (Private) Limited is a Private Limited Company incorporated under the Companies Ordinance Act, 1984 on December 28, 2004, with the objective of setting up and operating electric power projects using renewable sources for power generation purposes. As per information provided by WPPL:

   i. WPPL intends to setup a Wind Farm with a total installed capacity of 50.0 MW. The proposed Wind Farm is located at Bhambore-Port Qasim Gharo, District Thatta, Sindh located at $24^{0}40'$N to $67^{0}29'$E. Alterative Energy Development Board (AEDB) has allocated 1720 Acres of land to WPPL acquired from Government of Sindh.

   ii. The proposed Wind Farm will comprise of forty (40) Turbines each having a capacity of 1.25 MW. The electricity generated by the Wind Farm will be supplied to National Transmission and Dispatch Company (NTDC) for which WPPL has obtained consent from NTDC; and it shall finalize interconnection arrangement with NTDC.

   iii. The Project will be commissioned in June 2008.

2. WPPL applied for grant of Generation Licence, in accordance with Section 15 of the NEPRA Generation, Transmission and Distribution Act, 1997 (Act), on July 26, 2006. The Authority admitted the application for consideration on October 10, 2006. Brief Prospectus and Notices of Admission of Application was published in daily newspapers on October 14, 2006.

3. Various comments from stakeholders were received in response to the advertisement; salient relevant points of the comments received are summarized below:-

Hyderabad Electric Supply Company (HESCO) & NTDC

- 100% of the Generation from the Wind Mill Project of M/S Win Power Pvt. Ltd. (WPPL) will be supplied to the NTDC.
- Power supplied to NTDC system at Thatta can be supplied to HESCO from NTDC system, but on the rates not more than charged from other DISCOs.

- HESCO will not be involved to spend on construction of any Transmission Line required for the Project.
- The power quality will be acceptable if it conforms to the Standard IEC 61400-21.
- A project cost of 1794 US $ per KW is very high (Relates to tariff).
- Reliability of output power depends upon successful make of WTGs: For this Company may submit details of worldwide installations of the Models under discussion.
- Plant Performance Standards: Plant Performance will be acceptable when it meets the relevant IEC International Standards.

Planning and Development Division, Government of Pakistan

- Generation licences should be awarded to the firms, which have the experience of dealing with international manufacturers, installation and commissioning/ operation of Wind Farms.

Win Power (Private) Limited

- **Article 14**
  This article is not agreed to as written. Latest Draft PPA provided by AEDB puts the responsibility of processing the Credits on Purchaser, and describes the profits to be shared between Seller and Purchaser as 30% and 70% respectively. However, this issue is still under discussion and review at AEDB. We suggest that for the Carbon Credits, suffice will be to say that government policy in vogue will be followed.

Pakistan Environmental Protection Agency (EPA), Government of Pakistan

- This agency is of the view that NEPRA may ensure for the compliance of Article 10 of the draft generation licence.

State Engineering Corporation (Pvt.) Ltd.

- It is desired that the project sponsors be advised to develop at lease 30% of the plant equipment, such as steel towers, overhead cranes, rotors, nacelle etc. through local engineering organizations. This will help reduce cost of the project and also ensure availability of spares as and when required for maintenance.

Planning and Development Division (Energy Wing)

- Suzlon is one of the leading wind turbine manufacturers in the world. Suzlon has the largest market share in Asia and features amongst the top ten in the world. Suzlon has developed some of the largest wind parks in Asia. Suzlon is today building what will be among the world's largest wind parks of its kinds at 1000 MW capacity.
- Wind Turbines are usually mounted on towers from 100 feet to 300 feet tall because wind speed increases with height.

Karachi Electric Supply Corporation (KESC)

- The risk of wind should be shared equally by Wind Producer & Purchaser.
- **Interconnection**
  Wind Power Plant Connects through M.P.Sakro Sub-Station in the area of NTDC. The M.P.Sakro Sub-Station is weak from the view point of system reliability, does not satisfy N-1 criterion regarding a single line contingency because it connects to

NTDC's power system via only one circuit of transmission line so it is not reliable. In case if only 50 MW wind power plant is commissioned a lot of investment will be required for reinforcement to meet N-1 criteria.

EnerCon's Comments

- Suitability of use of Multiple Technology will depend on technology related data and its cost effectiveness as compared to other technologies; and an analysis may be asked from the sponsors for review.

4. The comments were considered by the Authority and the following relevant issues arising out of the proceedings were discussed in the hearing held on November, 08, 2006 on the subject as summarized below: -

- Reliability and Quality of Wind Power and Need of Alternative Power Sources.
- Type / Technology of Wind Turbines.
- Interconnection of Power Generation facility at 132 KV.
- Location of Wind Power Plants/ Farms.
- Compliance with Performance and Environment Standards.

5. Hearing in the case was held on November 08, 2006 which was attended by the applicant, stakeholders, and experts including the following:-

- Alternate Energy Development Board (AEDB).
- Hyderabad Electricity Supply Company (HESCO).
- National Transmission and Dispatch Company (NTDC).
- Karachi Electric Supply Company (KESC).
- Environmental Protection Agency, Sindh.
- EnerCon Private Limited
- Site Association
- Habib Energy
- Lucky Energy Limited
- Zypher Power
- PMTF
- Australian Trade Commission
- Professional Experts

The applicant presented its case. Other participants were also given an opportunity to present their point of view for or against the application. During the hearing it was revealed that:-

i. WPPL had still not finalized its selection of the Wind Turbine Make. The Authority directed WPPL to indicate its final selection for incorporating the information in the Licence.

ii. Win Power stated that the plant would not be needing power from NTDC at any stage of operation of the Wind Farm.

6. Draft Generation Licence proposed to be granted to WPPL was circulated to all stakeholders. No objections were received earlier or proffered during the hearing with respect to the terms and conditions of the draft Generation Licence. The grant of Generation Licence was supported by NTDC, HESCO, KESC, Ministry of Water and Power, AEDB, EnerCon, EPA-Sindh, P & D and PEPA of GoP, and State Engineering Corporation.

7. The final feasibility study vetted by AEDB was received on 9th October, 2006 by NEPRA. The review of the feasibility study showed that the points raised by NEPRA and other stakeholders with respect to feasibility study (FS) had been adequately addressed as the required information was provided in the feasibility study report. The FS Report was therefore accepted. Additional information required with respect to Schedule-I and II of the licence was also subsequently provided by the Company.

8. As regards issues of reasonable outage optimization allowance in generation, and concerns that risk covered by the Government of Pakistan or procurer be limited to only "Wind Risk" are expected to be addressed in the Standardized Power Purchase Agreement being finalized by the Federal Government in consultation with stakeholders.

9. WPPL intends to deliver its generated power and carry out interconnection with NTDC through a 132 kV link. NTDC has agreed to procure entire power generated from WPPL and provide interconnection for off-take from Wind Farms at 132 kV voltage. WPPL shall be responsible to provide delivery of power to NTDC at 132 kV level.

10. Having considered the pleadings of the applicant, the comments and point of view of different stakeholders including AEDB, the 2006 Policy of the Federal Government to encourage Alternative/Renewable Energy, the Authority's determination is set out in the following paragraphs.

11. Moving in tandem with the Federal Government's initiative and endeavors through the AEDB to induct Wind Power into the National Power Generation Portfolio, the Authority considers that Wind Power generation will significantly contribute towards optimum utilization of indigenous energy resources. By reducing dependence on import of traditional fossil fuels in the background of depleting fossil fuel reserves and increasing trend in price of oil, Wind Power based electricity generation is a step in the right direction to achieve sustainable development. Therefore, electricity generation through Wind Power as an Alternate/ Renewable energy source need to be explored and its development be encouraged. Since the technology is new to Pakistan, its initial induction phase needs particular attention and patronage so that a credible data is developed and made available to concerned stakeholders to confidently decide on the long term prospects and optimum contribution of wind-based power generation in the overall national power generation basket that is conducive to sustainable and affordable development of the country.

12. In the case under consideration, the Project is expected to be one of the first few commercial wind-based electric power generation projects on a large scale providing power to an operational utility (NTDC/KESC/DISCO). The Project is intended to be beneficial to the consumers and the public by producing electricity using a clean and renewable energy resource. Such projects will contribute in enhancing energy security of the country by reducing dependence on fossil fuels in the long run.

13. Wind Power generation is also expected to promote a cleaner environment and air quality by displacing oil and coal based electric power generation. No concrete evidence is available before the Authority to establish any adverse impact on the environment such as harm to birds or increase in noise pollution due to the Wind Power Projects. The Project on the whole is, therefore, expected to be conducive in improving the environment and air quality. The Licensee is also required to comply with the environmental standards prescribed by the relevant competent Authority.

14. Wind power generation technology differs from other traditional fuel based generation primarily because the generation capacity in the case of wind power is dependent upon the local wind speed and rotor-swept area. Optimization of annual energy output and economic efficiency requires that the installed power be in accordance with the wind speed available at site. We have been provided data by the applicant and other sponsors of Wind Power, which is primarily based on data of Gharo Mast having a height of 30 Meters complied by MET Department of Pakistan in last three years. The available

data has been extrapolated for application to higher mast or hub heights or to different locations in the vicinity in specific proposals for the wind projects. The MET Data as well as specific Case Data has been supported/confirmed by AEDB and LOIs have been issued. However, uncertainty in the estimates of assessment of Wind Speed accrues on account of (a) short period of historical data available, (b) extrapolation of available data on wind speed for higher hub heights, and (c) application of available data for one location to wind speed realization for a Wind Farm located in another area several kilometers away.

15. As in the cases of four (04) earlier applications for Wind Power based generation projects to whom licences have already been issued by NEPRA, we are constrained to rely on the data provided to us by the applicant and supported by AEDB; for the purposes of allowing the installation of individual wind turbine units as proposed by the applicant with an assurance that the wind data supports the installation of the proposed capacity wind turbines (1.25 MW in this case) at the proposed hub height of 65 Meters as the optimum capacity of individual wind turbine. The micro-siting of plants and optimization of energy output is primarily the responsibility of the sponsor/applicant. WPPL has requested for and **accepted** Upfront Tariff specified by NEPRA, a net kWh delivered based tariff, therefore it would be in its own interest to ensure that the installed capacity/micro-sitting of the Wind Turbines is such that utilization of best wind potential is achieved, and redundant higher capacity/ concentration is not installed. Based on the wind availability in Keti Bander, Mirpur Sakro/Gharo coastal area of Sindh and contiguous inland area according to the data provided by various sponsors and AEDB, it is prudent to explore and allow installation of Wind Power based electric power generation projects in the area as proposed in the instant case.

16. Furthermore, the applicant has been assigned, the responsibility of installing its own monitoring Mast of the height equal to the hub height of its Wind Turbines (65 Meters) at its Wind Farm location to start collecting the wind speed data to provide assessment of correlation with the MET Data.

17. In accordance with the GoP Policy the Licensee shall process and obtain Emissions/Carbon Credits expeditiously and credit the proceeds to the power purchaser/procurer on behalf of purchaser(s) on actual basis.

18. As recommended in the GoP Guidelines for Wind Energy, it is appropriate for all Wind Farms in the area to collectively generate and step-up the generation voltage to 132 KV so that it can be purchased/procured by distribution companies or NTDC on their behalf at the 132 KV level, and then distribute according to the requirements for most optimum utilization.

19. In view of above considerations, the Authority decides to grant a Licence for generation of electricity by means of Wind Power to Win Power (Private) Limited (WPPL), in accordance with the Articles and Schedules as set out in the form attached herewith.

Authority

Zafar Ali Khan
Member

10/1/07

Nasiruddin Ahmed
Member

10/1/07.

Abdul Rahim Khan
Member

Lt. Gen (R) Saeed-uz-Zafar
Chairman

December 29, 2006

Case No.LAG-86

Determination of the Authority in the Matter of Grant of Generation Licence to Win Power (Private) Limited (WPPL)

1. Win Power (Private) Limited is a Private Limited Company incorporated under the Companies Ordinance Act, 1984 on December 28, 2004, with the objective of setting up and operating electric power projects using renewable sources for power generation purposes. As per information provided by WPPL:

   i. WPPL intends to setup a Wind Farm with a total installed capacity of 50.0 MW. The proposed Wind Farm is located at Bhambore-Port Qasim Gharo, District Thatta, Sindh located at $24^{0}40'$N to $67^{0}29'$E. Alterative Energy Development Board (AEDB) has allocated 1720 Acres of land to WPPL acquired from Government of Sindh.

   ii. The proposed Wind Farm will comprise of forty (40) Turbines each having a capacity of 1.25 MW. The electricity generated by the Wind Farm will be supplied to National Transmission and Dispatch Company (NTDC) for which WPPL has obtained consent from NTDC; and it shall finalize interconnection arrangement with NTDC.

   iii. The Project will be commissioned in June 2008.

2. WPPL applied for grant of Generation Licence, in accordance with Section 15 of the NEPRA Generation, Transmission and Distribution Act, 1997 (Act), on July 26, 2006. The Authority admitted the application for consideration on October 10, 2006. Brief Prospectus and Notices of Admission of Application was published in daily newspapers on October 14, 2006.

3. Various comments from stakeholders were received in response to the advertisement; salient relevant points of the comments received are summarized below:-

Hyderabad Electric Supply Company (HESCO) & NTDC

- 100% of the Generation from the Wind Mill Project of M/S Win Power Pvt. Ltd. (WPPL) will be supplied to the NTDC.
- Power supplied to NTDC system at Thatta can be supplied to HESCO from NTDC system, but on the rates not more than charged from other DISCOs.

- HESCO will not be involved to spend on construction of any Transmission Line required for the Project.
- The power quality will be acceptable if it conforms to the Standard IEC 61400-21.
- A project cost of 1794 US $ per KW is very high (Relates to tariff).
- Reliability of output power depends upon successful make of WTGs: For this Company may submit details of worldwide installations of the Models under discussion.
- Plant Performance Standards: Plant Performance will be acceptable when it meets the relevant IEC International Standards.

Planning and Development Division, Government of Pakistan

- Generation licences should be awarded to the firms, which have the experience of dealing with international manufacturers, installation and commissioning/ operation of Wind Farms.

Win Power (Private) Limited

- **Article 14**
  This article is not agreed to as written. Latest Draft PPA provided by AEDB puts the responsibility of processing the Credits on Purchaser, and describes the profits to be shared between Seller and Purchaser as 30% and 70% respectively. However, this issue is still under discussion and review at AEDB. We suggest that for the Carbon Credits, suffice will be to say that government policy in vogue will be followed.

Pakistan Environmental Protection Agency (EPA), Government of Pakistan

- This agency is of the view that NEPRA may ensure for the compliance of Article 10 of the draft generation licence.

State Engineering Corporation (Pvt.) Ltd.

- It is desired that the project sponsors be advised to develop at lease 30% of the plant equipment, such as steel towers, overhead cranes, rotors, nacelle etc. through local engineering organizations. This will help reduce cost of the project and also ensure availability of spares as and when required for maintenance.

Planning and Development Division (Energy Wing)

- Suzlon is one of the leading wind turbine manufacturers in the world. Suzlon has the largest market share in Asia and features amongst the top ten in the world. Suzlon has developed some of the largest wind parks in Asia. Suzlon is today building what will be among the world's largest wind parks of its kinds at 1000 MW capacity.
- Wind Turbines are usually mounted on towers from 100 feet to 300 feet tall because wind speed increases with height.

Karachi Electric Supply Corporation (KESC)

- The risk of wind should be shared equally by Wind Producer & Purchaser.
- **Interconnection**
  Wind Power Plant Connects through M.P.Sakro Sub-Station in the area of NTDC. The M.P.Sakro Sub-Station is weak from the view point of system reliability, does not satisfy N-1 criterion regarding a single line contingency because it connects to

NTDC's power system via only one circuit of transmission line so it is not reliable. In case if only 50 MW wind power plant is commissioned a lot of investment will be required for reinforcement to meet N-1 criteria.

EnerCon's Comments

- Suitability of use of Multiple Technology will depend on technology related data and its cost effectiveness as compared to other technologies; and an analysis may be asked from the sponsors for review.

4. The comments were considered by the Authority and the following relevant issues arising out of the proceedings were discussed in the hearing held on November, 08, 2006 on the subject as summarized below: -

- Reliability and Quality of Wind Power and Need of Alternative Power Sources.
- Type / Technology of Wind Turbines.
- Interconnection of Power Generation facility at 132 KV.
- Location of Wind Power Plants/ Farms.
- Compliance with Performance and Environment Standards.

5. Hearing in the case was held on November 08, 2006 which was attended by the applicant, stakeholders, and experts including the following:-

- Alternate Energy Development Board (AEDB).
- Hyderabad Electricity Supply Company (HESCO).
- National Transmission and Dispatch Company (NTDC).
- Karachi Electric Supply Company (KESC).
- Environmental Protection Agency, Sindh.
- EnerCon Private Limited
- Site Association
- Habib Energy
- Lucky Energy Limited
- Zypher Power
- PMTF
- Australian Trade Commission
- Professional Experts

The applicant presented its case. Other participants were also given an opportunity to present their point of view for or against the application. During the hearing it was revealed that:-

i. WPPL had still not finalized its selection of the Wind Turbine Make. The Authority directed WPPL to indicate its final selection for incorporating the information in the Licence.

ii. Win Power stated that the plant would not be needing power from NTDC at any stage of operation of the Wind Farm.

6. Draft Generation Licence proposed to be granted to WPPL was circulated to all stakeholders. No objections were received earlier or proffered during the hearing with respect to the terms and conditions of the draft Generation Licence. The grant of Generation Licence was supported by NTDC, HESCO, KESC, Ministry of Water and Power, AEDB, EnerCon, EPA-Sindh, P & D and PEPA of GoP, and State Engineering Corporation.

7. The final feasibility study vetted by AEDB was received on 9th October, 2006 by NEPRA. The review of the feasibility study showed that the points raised by NEPRA and other stakeholders with respect to feasibility study (FS) had been adequately addressed as the required information was provided in the feasibility study report. The FS Report was therefore accepted. Additional information required with respect to Schedule-I and II of the licence was also subsequently provided by the Company.

8. As regards issues of reasonable outage optimization allowance in generation, and concerns that risk covered by the Government of Pakistan or procurer be limited to only "Wind Risk" are expected to be addressed in the Standardized Power Purchase Agreement being finalized by the Federal Government in consultation with stakeholders.

9. WPPL intends to deliver its generated power and carry out interconnection with NTDC through a 132 kV link. NTDC has agreed to procure entire power generated from WPPL and provide interconnection for off-take from Wind Farms at 132 kV voltage. WPPL shall be responsible to provide delivery of power to NTDC at 132 kV level.

10. Having considered the pleadings of the applicant, the comments and point of view of different stakeholders including AEDB, the 2006 Policy of the Federal Government to encourage Alternative/Renewable Energy, the Authority's determination is set out in the following paragraphs.

11. Moving in tandem with the Federal Government's initiative and endeavors through the AEDB to induct Wind Power into the National Power Generation Portfolio, the Authority considers that Wind Power generation will significantly contribute towards optimum utilization of indigenous energy resources. By reducing dependence on import of traditional fossil fuels in the background of depleting fossil fuel reserves and increasing trend in price of oil, Wind Power based electricity generation is a step in the right direction to achieve sustainable development. Therefore, electricity generation through Wind Power as an Alternate/ Renewable energy source need to be explored and its development be encouraged. Since the technology is new to Pakistan, its initial induction phase needs particular attention and patronage so that a credible data is developed and made available to concerned stakeholders to confidently decide on the long term prospects and optimum contribution of wind-based power generation in the overall national power generation basket that is conducive to sustainable and affordable development of the country.

12. In the case under consideration, the Project is expected to be one of the first few commercial wind-based electric power generation projects on a large scale providing power to an operational utility (NTDC/KESC/DISCO). The Project is intended to be beneficial to the consumers and the public by producing electricity using a clean and renewable energy resource. Such projects will contribute in enhancing energy security of the country by reducing dependence on fossil fuels in the long run.

13. Wind Power generation is also expected to promote a cleaner environment and air quality by displacing oil and coal based electric power generation. No concrete evidence is available before the Authority to establish any adverse impact on the environment such as harm to birds or increase in noise pollution due to the Wind Power Projects. The Project on the whole is, therefore, expected to be conducive in improving the environment and air quality. The Licensee is also required to comply with the environmental standards prescribed by the relevant competent Authority.

14. Wind power generation technology differs from other traditional fuel based generation primarily because the generation capacity in the case of wind power is dependent upon the local wind speed and rotor-swept area. Optimization of annual energy output and economic efficiency requires that the installed power be in accordance with the wind speed available at site. We have been provided data by the applicant and other sponsors of Wind Power, which is primarily based on data of Gharo Mast having a height of 30 Meters complied by MET Department of Pakistan in last three years. The available

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