



Traffic Wind Turbine

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Natural Wind Turbine

PRESENTATION

ON

ALTERNATE (WIND) ENERGY

DEVELOPMENT OF INDIGENOUS VERTICAL AXIAL WIND TURBINE

BY

“ECONOMIA”

PRESENTED BY

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TOPIC OF PRESENTATION ON VERTICAL AXIAL WIND TURBINE

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Natural Wind Turbine

- ❖ Introduction of Company.
- ❖ Briefing of Indigenous Development of Vertical Axial Wind Turbine
- ❖ How is it Indigenous ?
- ❖ Utility Arrangement.
 - a. Traffic Wind.
 - b. Natural Wind.
- ❖ Manufacturing Range and Specification.
- ❖ Alternator Design.
- ❖ Estimated Cost and Performance Comparison with Solar.
- ❖ Operation Maintenance.
- ❖ Future Awareness Plan.



**THE PIONEER OF
RISKLESS & ENERGY SAVING
CENTRAL HEATING SYSTEM**

INTRODUCTION OF COMPANY

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Natural Wind Turbine

- ❖ The company was established with the name of “**AGECO**” in 1980.
- ❖ In 1988 it was changed to **AGECO (Pvt.) Ltd.**
- ❖ We have completed **50 HVAC Projects** in Government and Semi Government sectors all over the country.
- ❖ We are The Pioneers in Introducing Designing and Manufacturing of “**ECONOMIA**” Riskless & Energy Saving Central Heating System in Pakistan **Since 1997** and to adopt same pattern of heating which has been used in Europe and other Countries in the World.
- ❖ We have since installed this system successfully more than **25000** Locations including **Defence Offices, Hospitals, Commercial Buildings, Guest Houses, Hotels & Residences** all over the country where ambient temp is up to (-)25 °C and altitude up to 14000ft.
- ❖ In 2004 we have introduced “Central Air Conditioning” (Cooling/Heating) attachable with existing Central Heating System.
- ❖ We have added “ECONOMIA” Clean Room HVAC System for Pharmaceuticals in January 2006
- ❖ We are in Partial production of “ECONOMIA” Pre Fabricated Insulated Ducting & Pipes
- ❖ In 2007 we have Introduced Air Cooled Water Based Chiller Capacity 3 to 30TR to save up to 40% Running cost.
- ❖ **Currently we have completed P.C Peshawar, Marriott Islamabad, P.C Gwadar, P.C Bhurban in progress and NUST Campus H-12, Islamabad)**
- ❖ **Now we have added “ECONOMIA” Alternate (Solar) Energy in 2009 and Wind Energy in 2011.**

BRIEFING OF INDIGENOUS DEVELOPMENT OF VERTICAL AXIAL WIND TURBINE

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I have been called by EDB to support in saving of foreign exchange on wind turbine being import and installed by various companies in Pakistan to meet the energy crises and get green energy which are designed to operate at 4.5 m/s.

The basic idea was under discussion in several meetings that to save foreign exchange by manufacturing some non critical parts of turbine locally by which 30% to 40% can be save like tower, blades etc. with design collaboration of foreign manufacturers which is the heavy cost to pay in freight.

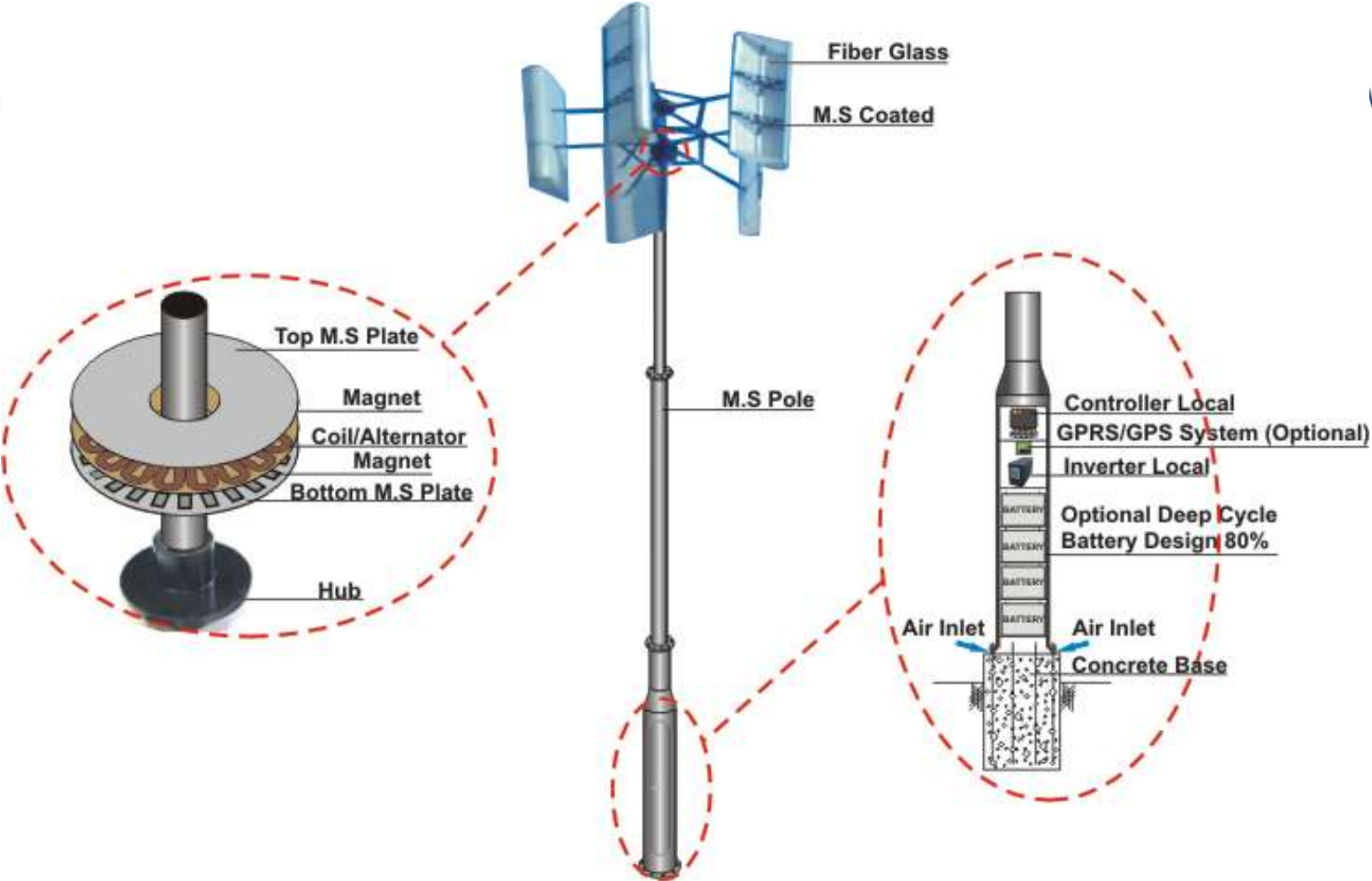
During these conversations an idea was established by me if we introduce small capacity turbine like 10 KW its cost can be equivalent to proposed saving cost and it can operate from 1.5 m/s and can install other then specified corridor of wind where wind is at low velocity.

So, the idea was welcome and very encouraging then we developed low velocity vertical axial wind turbine having cut off up to 0.8 m/s and operate from 2.5 to 25 m/s and the capacity range from 1 KW to 10 KW which can be used for residential/office area as individual unit OR can couple numbers to get Mega Watts.

HOW IS IT INDIGENOUS ?

Traffic Wind Turbine

Wind Turbine



Utility Arrangement
a. Traffic Wind

Traffic Wind Turbine



Stand Alone Light

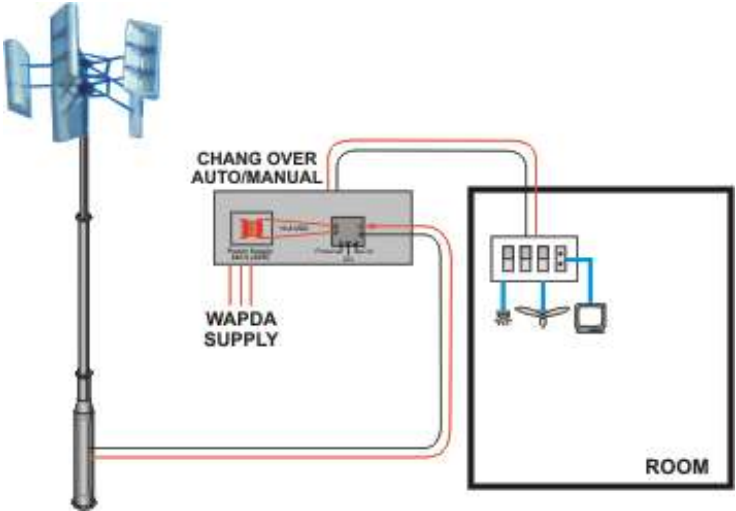
Natural Wind Turbine



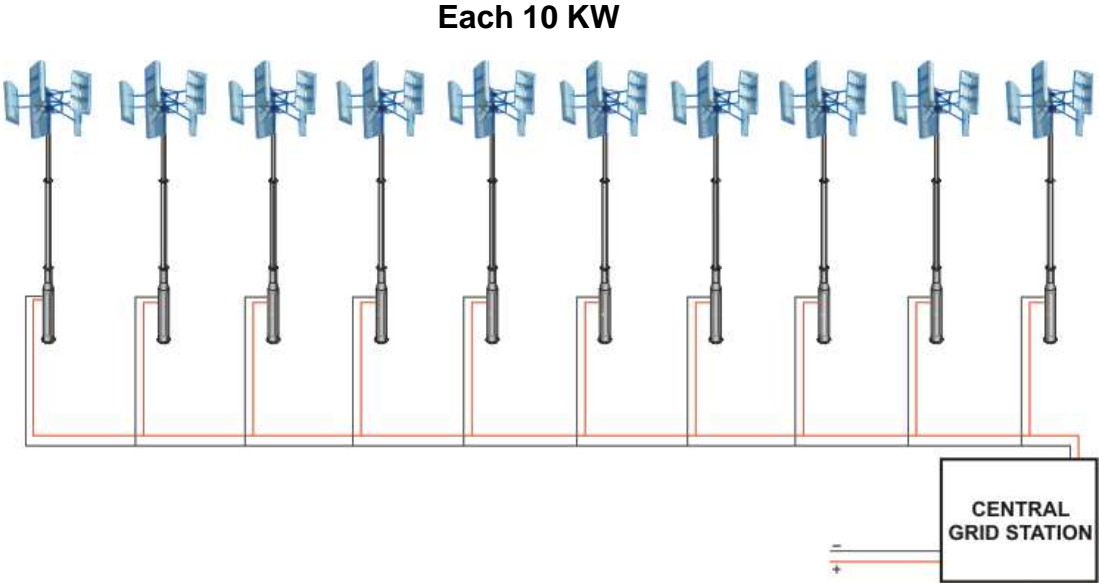
Coupled to Produce Mega Watts

Utility Arrangement
b. Natural Wind

Traffic Wind Turbine



Natural Wind Turbine



Single for Home / Office

Coupled to produce Mega Watts



Manufacturing Range and Specification

Traffic Wind Turbine

Natural Wind Turbine

Model	225 Watts	2 KW	5 KW	10 KW
Rotor Diameter	1.0m	2.5m	3.0m	4.26m
Blade Quantity	3 Pcs	5 Pcs	7 Pcs	9 Pcs
Blade Material	FRP(glass fiber reinforced plastic)	FRP(glass fiber reinforced plastic)	FRP(glass fiber reinforced plastic)	FRP(glass fiber reinforced plastic)
Blade Length	1200mm	1200mm	1200mm	1200mm
Rated Output	225W	2000W	5000W	10000W
Maximum Output	250W	2500W	7500W	15000W
Output Voltage (DC)	12V	12V	12V/24V	12V/24V/48V
Rated Wind Speed	10m/s	10m/s	10m/s	10m/s
Cut-in-Speed	1.5m/s Power Producing at 3.0m/s	1.5m/s Power Producing at 3.0m/s	1.5m/s Power Producing at 3.0m/s	1.5m/s Power Producing at 3.0m/s
Working Wind Speed	3-25m/s	3-25m/s	2.5-25m/s	2.5-25m/s
Security Wind Speed	50m/s	50m/s	50m/s	50m/s
Wind Turbine Type	PMG (on constant magnets)	PMG (on constant magnets)	PMG (on constant magnets)	PMG (on constant magnets)
Rated Rotate Speed	50r/min	40r/min	35r/min	30r/min
Recommended Battery	12V 40AH x 2 Pcs	12V 40AH x 2 Pcs	12V 40AH x 4 Pcs	12V 40AH x 10 Pcs
Tower Height	7m	7m	7-9m	9-12m
Alternate Pole	12 Nos	16 Nos	20 Nos	24 Nos
GPRS/GPS Monitoring	Optional	Inbuilt	Inbuilt	Inbuilt



VAWT 1 KW Power Curve

Traffic Wind Turbine

Natural Wind Turbine

RPM	Magnetic Pole	Wind Velocity Required	
		Generation	Cut Off
90	12	4.5 m/s	3 m/s
60	16	3.5 m/s	2.5 m/s
40	20	2.5 m/s	1.5 m/s
30	24	1.75 m/s	1 m/s
20	32	1.5 m/s	0.8 m/s

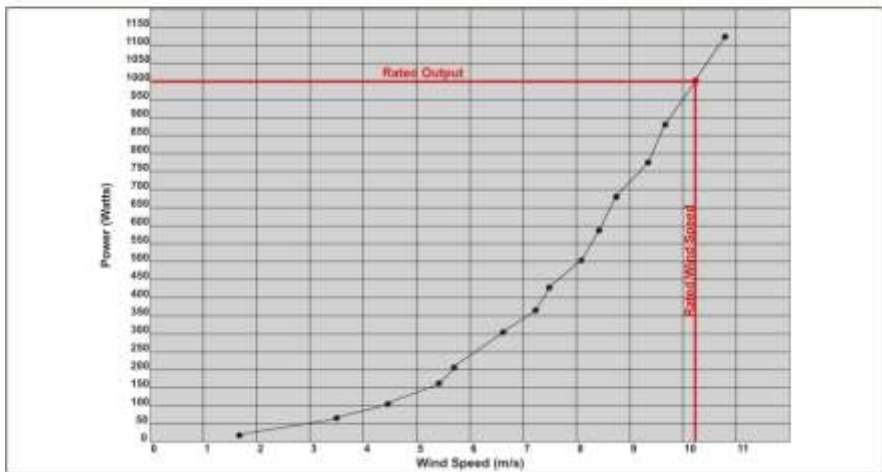
Estimated Cost and Performance Comparison with Solar

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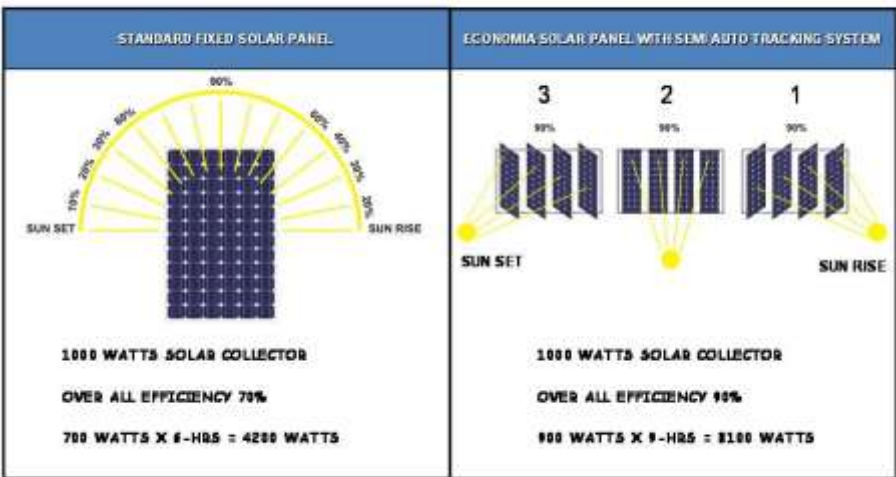
Natural Wind Turbine

Energy Source	System Capacity	Output/Day	Costing/KW
Vertical Axial Wind Turbine (16% to 125%)	1KW	4KW to 30KW	Rs.200,000/-
Solar Panel (Based on Fixed & Tracking Panel)	1KW	3KW to 8KW	Rs.400,000/- to Rs.650,000/-

VAWT 1 KW Power Curve



HOW TO GET MAXIMUM OUTPUT



Operation Maintenance

GPRS/GPS Monitoring System

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- INTRODUCTION**

Call Centre is being established for system monitoring of Performance and fault indication to help customers and improve our services and quick response for maintenance/awareness.

- CALL CENTRE LOCATION**

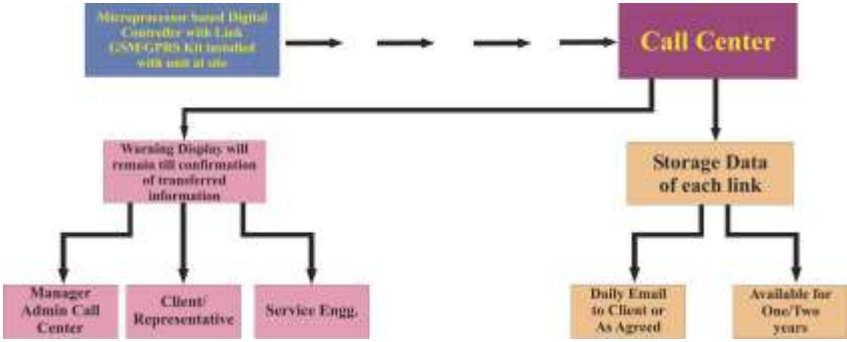
The Call Centre is located in Islamabad for System Monitoring through GPRS/SMS and this GPRS/SMS Kit can be installed with any supplied AHU/Chiller based on Microprocessor Digital Controller.

MONITORING SYSTEM

A GPRS/SMS Kit is being installed with Microprocessor Digital Controller for supplied "ECONOMIA" system and new product after 2009/Upon operation of Call Centre in-built will be supplied with each AHU/Chiller, which will record the data on hourly basis and send Information to Call Centre every 12/24 hours. However, in case of warning information immediately send within 5 seconds and same will be transferred in next 3-5 seconds to concerned area for action.

CALL CENTRE OPERATIONS

The Call Centre gets data from any part of the world wherever system is configured and keep the records for last 2 years and update every 12/24 Hours basis and same record can be sent to client, Maintenance Engineer, Security Incharge or can be Printed as hard Copy for any use.



FUTURE AWARENESS PLAN

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We have future awareness plan to setup awareness center at Gwadar, Karachi and Islamabad to trained skill labour for erection and maintenance at site where demo wind turbine are being installed.



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Thank You!