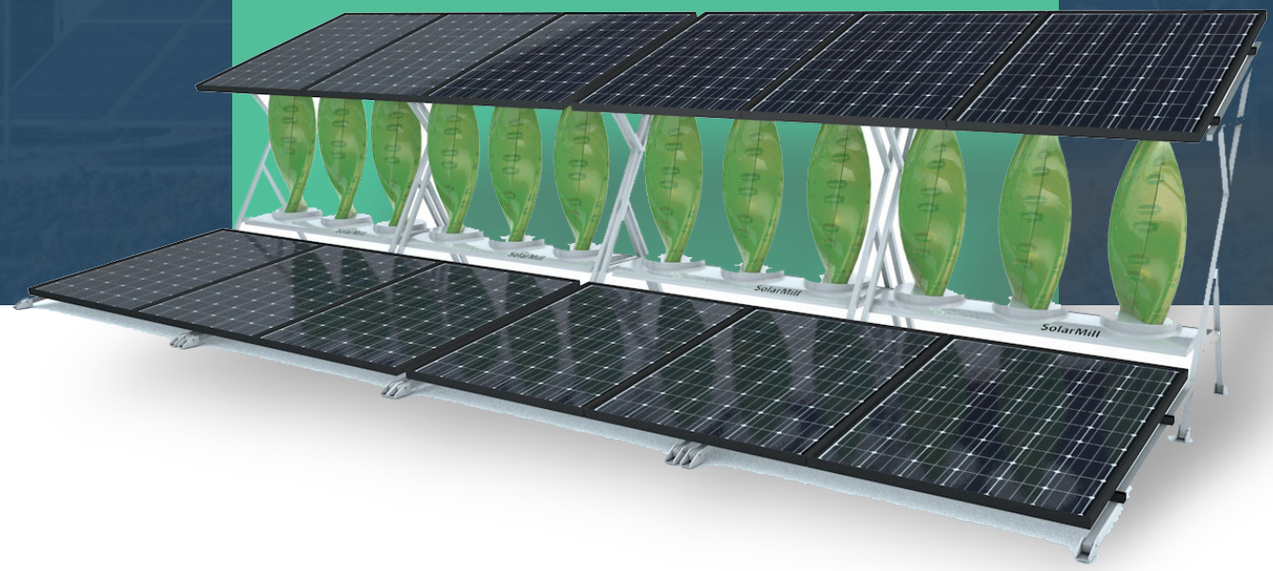
PRESHENT

WINDSTREAM

Technical Specifications



HOW OUR SYSTEM WORKS

The Windstream Hybrid Renewable system is efficiently designed to combine power generation from Wind and Solar within the same footprint, producing a higher energy density (more energy per unit area) than Solar alone.

Scalable, and modular, Windstream is designed for both residential and commercial applications, offering site-specific flexibility and customization, for both On-Grid and Off-Grid solutions.

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Technical Specifications - VAWT (Vertical Axis Wind Turbine)

Vertical Axis Wind Turbines (VAWT), are more appealing and better suited for applications where the wind flow is more than 2.5m/s (5.6mph). This makes VAWTs a much better choice for both on-ground installation and/or mounting onto buildings and rooftops which would otherwise restrict the installation of taller horizontal turbine structures. Also, this type of wind turbine genertor is omnidirectional meaning that it does not require orientation of the blades into the oncoming wind, as by its design, it always does. Another advantage of vertical axis wind turbines is that they can be positioned close to the point of use reducing the load on any existing grid infrastructure, promoting sustainability while reducing any environmental concerns.

Technical Details	
Parameter	**Certification**
Mill Rated Power Output	143 W (Minimum) @ 11 m/s
Wind Component Maximum Power Output	500 W (Minimum) @ 17 m/s
Voltage Range	Suiteable for 48V DC Battery Charging
Cover Material	UV Resistant HDPE / PPE
Mill Mounting Frame	Frame / Pre-Galvanized roll-formed Steel sections
Electronic Enclosure Rating	IP53
Generator	Permanent Magnet Axial Gap
Cut-In Wind Speed	2.5 m/s
Cut-In Wind Speed	18 m/s
Turbine Blade	Shape: Helical Profile; Dimensions: Height - 970mm, Diameter - 330mm; Swept Area: 0.980m2
Turbine Material	Galvanized G-90 Steel/GFRP
Rotor Type	Vertical Axis
Direction of Rotation	Counter-Clockwise
Color of Turbine	Can be Customized
Certification	CE: LVD 2014/35/EU Low Voltage Directive, EMC 2014/30/EU Electromagnetic Compatibility International Standards IEC 61400-2, part 2, "Design Requirements for Small Wind Turbines" and Test plan tested and certified at the National Institute of Wind Energy, India

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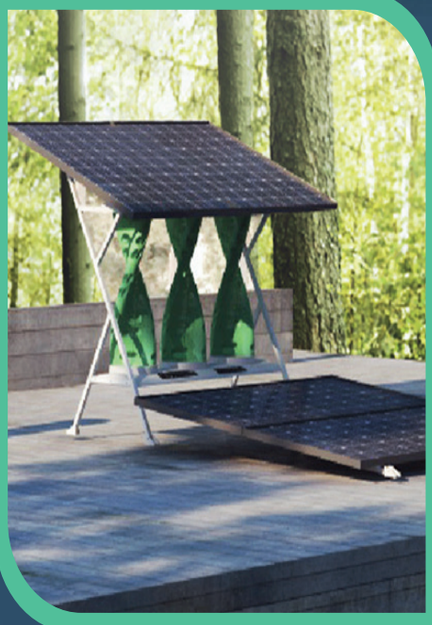
Technical Specifications Solar Photovoltaic Module

Solar Photovoltaic Module High power and/or High-efficiency mono/Poly Crystalline Modules are used in the Solar Photo-Voltaic panels. The module is made of high transitivity glass front surface giving high encapsulation gain and hot butyl rubber edge sealant for module protection and mechanical support. All materials used have a proven history of reliable and stable operation in external applications



Technical Details

Material	Specifications
Peak Power Pmax (Wp)	~ 540 Wp
Maximum Voltage(Vmp)(Volts)	~ 43.88
Open Circuit Voltage(Voc)(Volts)	~ 49.46
Maximum Current(Imp)(Amps)	~ 13.45
Module Efficiency (%)	~ 20.92%
Standards	IEC 61215, IEC 61730, IEC 61215
Warranty	PV Modules used in solar power plants/systems must be warranted for their output peak watt capacity, which should not be less than 90% at the end of 10 years and 80% at the end of 20 years
Length x Width x Height	Standard
Weight	Min 28 kg
Cell Technology	Poly/Mono-Crystalline Silicon-based
Superstrate (top layer)	High Transmission Low Iron Tempered Glass, AR coated
Back Sheet UV-resistant	UV protected reflective back sheet
Cell Encapsulation	Ultra-Clear PID free EVA
Junction Box	IP68, 3 bypass diodes junction box as required
Material of the JB enclosure	Plastic/metal
Terminations (Clamping units, other)	MC4 Connectors

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Technical Specifications – Additional Items

Wind Charger Technical Details

Parameter	Specifications
Charge Controller Technology	MPPT/PWM
Nominal System Voltage	48 VDC
Maximum Battery Current	As per system design
Electronic Protections	Overload, Short Circuit, High Voltage, High Temperature, Lighting and Transient surges
IP Rating	IP20
Certifications	CE & RoHS Compliant, IEC 62109, ISO 9001

Array Junction Boxes Technical Details

Material	Specifications
Material	Thermoplastic, Dust, Vermin & Waterproof
Hardware	SS 304 Grade
Cable Gland	Polyamide material in Required Size
Protection	IP 65 enclosures with transparent covers with Surge Protection (MOV)
DC Fuses	1000V DC

Connectors Technical Details

Parameter	Specifications
Type of Connector	Solar PV Connector
Rated Current	20A
Rated Voltage	1000V
Test Voltage	6000V AC 1 min
Typical Contact Resistance	<5m ohm
Degree of Protection	IP65
Contact Material	Copper
Insulation Material	PPO
Temperature Range	-40 degrees C to 85 degrees C
Suitable Cable Cross-Section	4mm2 (20A)

Inverter Technical Details

Items	Specifications
Max Input Power (kW)	As per System Design
Charge Controller Type	MPPT
Operating Phases	1 Phase / 3 Phase
AC Grid Voltage Range	230V / 415V (+/- 5V)
Nominal Frequency	60 Hz (+/- 3Hz)
Grid Current THD	<5%
Nominal Output	230V / 415V (+/- 1%)
Output Waveform	Pure Sine Wave
Output Power	As per System Design
IP Protection Level	IP20 Indoor
MPPT Efficiency	>99.50%
Built In Protection	DC reverse polarity, short circuit, output over voltage, output over current, insulation resistance monitoring, surge protection, temperature protection, islanding protection
Designed Life	>20 yrs
Operating Temperature Range	0-70 degrees C
Operating Surrounding Humidity	0-100%
	FEATURES
DC Connection	MC4-Connection
AC Connection	IC67 rated plug
Display	LCD 2 x 20z
	CERTIFICATE
Anti-Islanding Protection	EC62116
Environmental Testing	IEC 60068-2 (1-2-14-30)
Inverter Testing	IEC 62040 part III
Efficiency Measurement	IEC 61683