

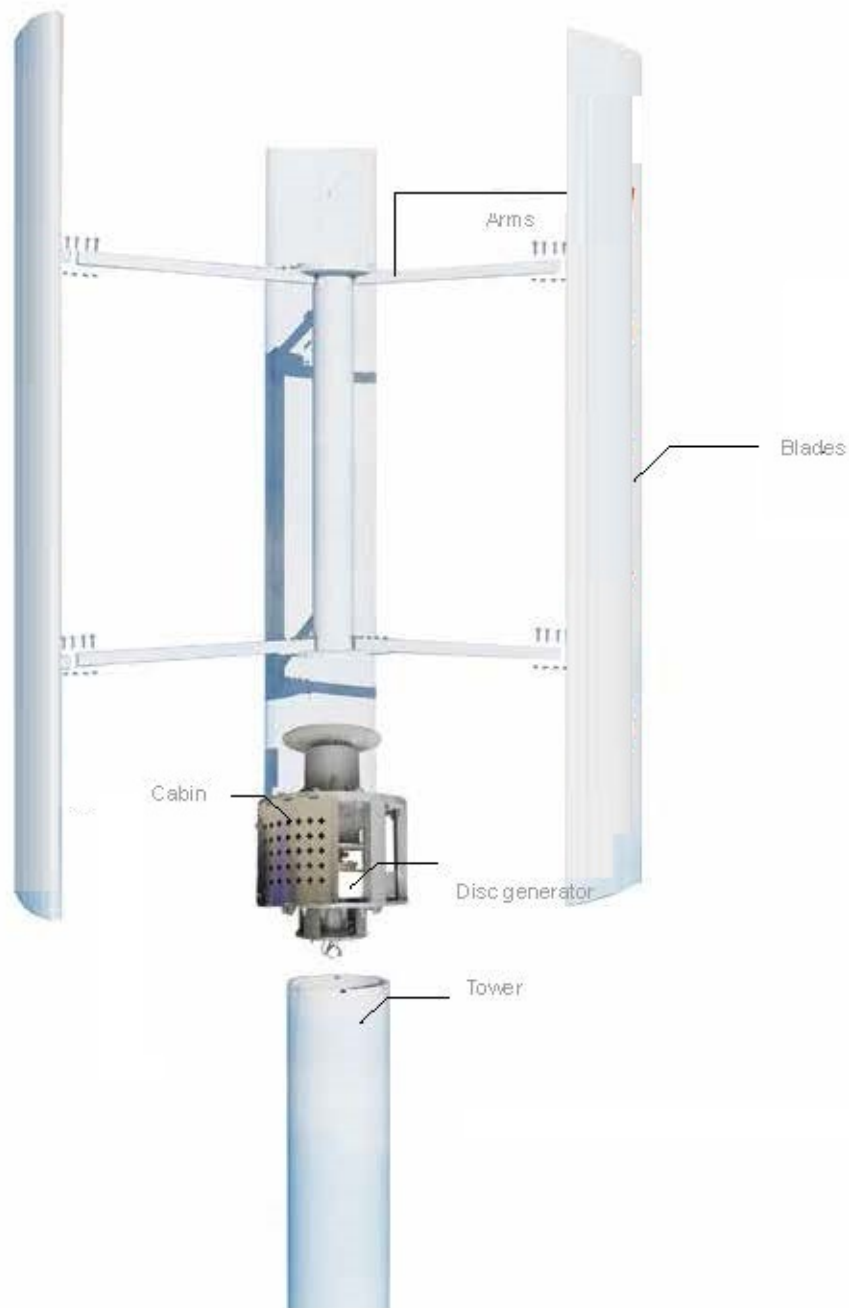


Vertical Axis Wind Power



CE ISO 9001 14000

A New Generation of Vertical Axis Wind Turbines





10 Features -- Series Wind Power Generators

Start-up at 1m/s

Survival wind speed 60m/s

Catch the wind by 360 degree

Rated output at 100-300 RPM

Streamline shape as wings of aero plane

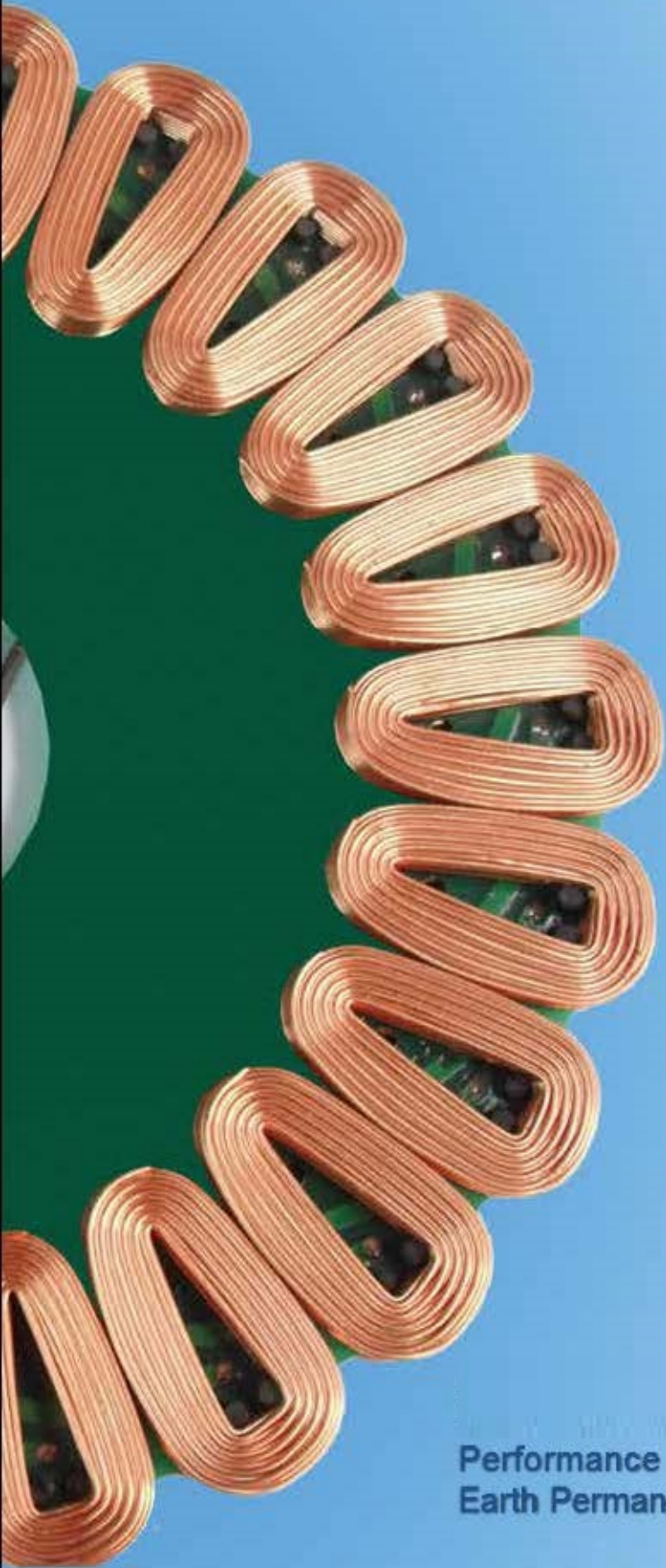
Outer rotor, multi-pole, core-less structure

All aluminum structure, high strength, recyclable

Unique power management system

Long lifespan, maintenance free

Unique product appearance

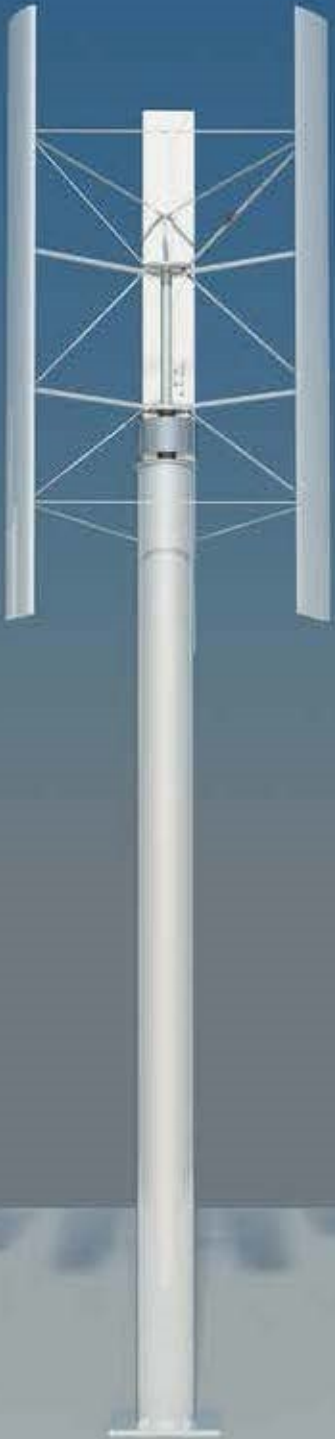


Performance Parameter — Disc Core-less Rare
Earth Permanent Magnet Wind Generator

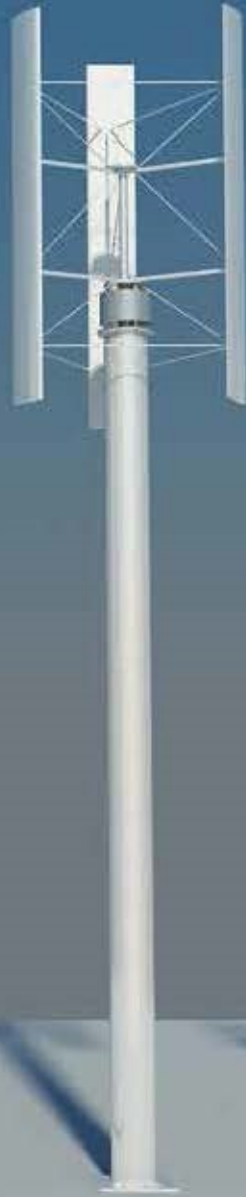


型号 Model	TYD-WT-300	TYD-WT-600	TYD-WT-1000	TYD-WT-2000	TYD-WT-3000	TYD-WT-5000	TYD-WT-10000
启动风速m/s Start-up wind speed (m/s)	1.0	1.0	1.5	1.5	1.5	1.5	2.0
切入风速m/s Cut-in wind speed (m/s)	1.5	1.0	2.0	2.0	2.5	2.5	3.0
额定风速m/s Rated wind speed (m/s)	12.0	12.0	12.0	12.0	12.0	12.0	12.0
额定转速rpm Rated Rotation Speed(RPM)	300	300	230	180	180	100	100
额定功率w Rated Power	300	600	1000	2000	3000	5000	10000
风轮直径m Diameter of windmill(m)	1.0	1.0	1.5	2.0	2.5	3.5	4.5
风叶数量pcs Blade quantity (pcs)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
叶片长度m Length of blade (m)	2.0	2.4	3.0	4.0	5	5.5	7.5
最大风速m/s Maximum wind speed (m/s)	60	60	60	60	60	60	60
叶片宽度m	0.3	0.3	0.3	0.5	0.5	0.7	0.7
重量kg	45.5	109.7	136.8	351.1	372.4	679.4	742.6

Performance Parameter—VAWT Unit



-WT-10000



-WT-5000



-WT-1000



-WT-300



Wind & Solar Hybrid Power Supply Lighting System



Street light system

Wind & solar hybrid street light system is perfectly combined changeability of wind & solar energy with complementarity of time & space. With wind energy as complement, hybrid street light is more reliable. Also the wind and solar energy goes complementary timely and seasonally, which makes the usage of hybrid street light more widely. Wind & solar hybrid street light system takes full advantage of natural resources to guarantee lighting time of lamps. Especially when there is wake solar but strong wind in winter, wind & solar hybrid system is a obvious advantage because of long lighting time at night.

Wind & solar hybrid street light system is an ideal independent street lighting system. Wind and solar hybrid system utilizes wind and solar energy to generate electricity. They could be complementary and improve the stability of generating system. Compared with traditional street lights, wind & solar hybrid street light has following advantages:

Environmental adaptability

Construction cost comparison benefits

Environmental benefits

Environmental adaptability / Construction cost comparison / Performance comparison analysis between wind & solar hybrid street light and common street light / Environmental benefit / wind & solar hybrid street light project



Environmental adaptability

Wind & solar hybrid street light which embodies concepts of beautifying and protecting environment is high-tech environmentally friendly product. To install the wind & solar hybrid street light is not only in line with the government environmental philosophy, but also supply one way to publicize the knowledge of using new energy and eco-friendly to the citizens. Whirling windmills are dynamic embellishments on the roads, stand out people's idea of advocating environmental protection, energy conservation and track concept of on high-tech. Promotion of wind & solar hybrid street light has a very positive meaning for beautifying the local environment.

There are following advantages:

Planning and construction costs are same (or even lower than traditional street light on some road).

Low operating costs (Do not consume electricity, just need maintenance cost).

Reliable security measure. Safety performance is better than ordinary lights.

Construction cost comparison

The main cost of traditional street light is transmission and distribution facilities (Cost of transformers which should be installed one every two kilometers and main cable is high). And there are much other costs like installation, maintenance, management, operation, security, etc. The overall construction of traditional street light thereupon increase. Wind & solar hybrid street light takes the inexhaustible natural wind and solar energy, and self-powered, zero emission, zero operation. So it contains a huge economic benefit.

Comparison Between Wind & Solar Hybrid Street Light And Common Street Light

Example: Conventional 250W high-pressure sodium lamps (100wLED luminous efficiency equivalent to 250W sodium lamp) construction cost comparison

序号 No.	名称 Name	常规路灯 Conventional street light	风光互补路灯 Wind and solar hybrid street light	风光互补路灯与常规路灯对比 Comparison between wind & solar hybrid street light
1	风力发电机 Wind turbine	/	300W	增设风机组和太阳能池板 Add wind turbine and solar panel
2	太阳能板组件 Solar panel	/	230W	
3	光源 Light source	250W钠灯 250W sodium lamp	100WLED光源 100WLED light	价格相当 Same cost
4	蓄电池 Battery	/	24V · 200AH	增设蓄电池 Add batteries
5	电力扩容、箱式变电站 Power enlarger, box-type substation	20KVA	/	不需要配套设备 Without accessories
6	管槽管道、电缆、钢筋、水泥 Pipeline, cable, steel, cement	需要Must	/	
7	人工 Labour cost	挖掘、铺设、吊装 Digging, paving, lifting	吊装 Lifting	只有吊装的人工成本 Only lifting labour cost
8	灯杆 Pole	10m*4mm/1根	11m*4mm/1根	价格相当 Same cost
9	基础 Foundation	1400*700*700 1个	1200*1200*1200 1个	地基增加1立方米 1.0m ³ foundation enlarge
10	控制器 Controller	开关、保险等 Switch, safety equipment		价格相当 Same cost
11	电费 Electricity cost	多 High	无 No	节省电费 Save electricity cost
12	按使用寿命15年计算, 风光互补路灯比常规路灯节省费用20% To calculate on the base lifespan 15 years, wind & solar hybrid street light save 20% cost.			

Environmental benefits

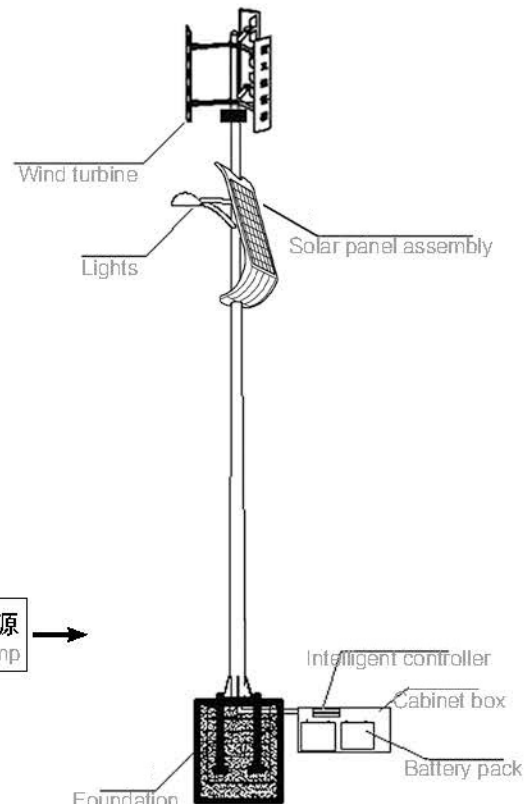
Traditional normal street light uses grid power, which is often thermal power produced by coal and the main components of the waste gas are carbon dioxide and sulfur dioxide. The standard consumption of coal for thermal power is 0.33kg/kwh, which produces carbon dioxide 0.893kg, sulfur dioxide 0.065kg/kwh.

Partial table on environmental benefit of traditional street light and wind&solar street light

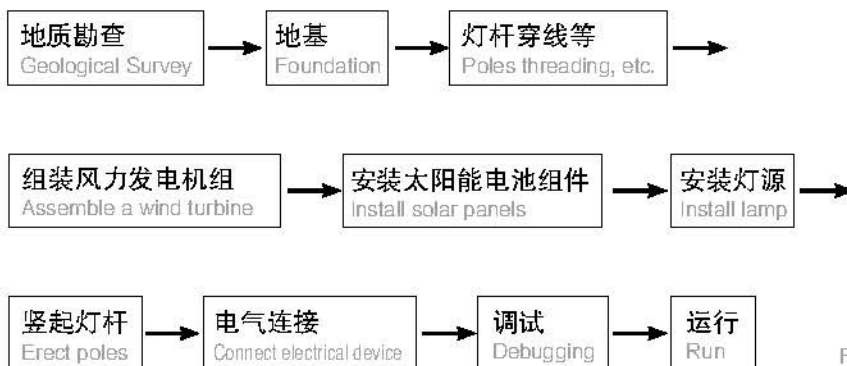
项目 Project	常规路灯 (高压钠灯) Traditional street light (HPS)	风光互补路灯 (LED) Wind and solar hybrid street light(LED)
灯源功率 Power of light	250W (10小时/天) 250W (10 hours / day)	100W (10小时/天) 100W (10 hours / day)
年耗电量 Annual power consumption	1095KWH	0
燃烧煤 Coal burning	361.35kg	0
CO ₂ 排放 CO ₂ emissions	977.8kg	0
SO ₂ 排放 SO ₂ emissions	7.1kg	0
总废气排放 Total emissions	984.9kg	0

Design principles and composition of wind&solar hybrid street light system

Wind&Solar hybrid street light system consists of wind turbines, solar modules, intelligent controller (controller / inverter), batteries, lamps, light poles, electrical box and other components.



Installation Flow



Street Light

双向八车道 (2x12m)			
	功率Power	风力 1000W+太阳能 480W Wind 1000W+ Solar 480W	备注
风机性能 Wind Turbine Performance	启动风速 Start-Up Wind Speed	1.0m/s	1 Year Warranty
	切入风速 Cut-In Wind Speed	1.5m/s	
	额定风速 Rated Wind Speed	12m/s	
	安全风速 Subsistence Wind Speed	60m/s	
叶片 Blades	长度 Length	2.4m	
	风轮直径 Diameter	1.5m	
	叶片枚数 Number Of Blades	3pcs	
	材质 Material	耐腐蚀铝合金 Erosion Resistant Aluminum	
发电机 Generator	规格 Type	盘式无铁芯稀土永磁交流 Disk Type Ironless Rare Earth Permanent Magnet AC Generator	
	驱动方式 Driving Mode	直驱 Direct	
	额定转速 Rated Rotating Speed	300rpm	
	额定输出 Rated Output	1000w	
	外壳材料 Casing Material	耐腐蚀铝合金 Erosion Resistant Aluminum	
灯杆 Pole	高度 Height	9m	
	直径 Diameter	215mm	
	材质 Material	STK碳素钢管 Carbon Steel Pipe	
	涂装 Coat	静电喷涂、镀锌 Powder Spraying, Melted Galvanizing	
太阳能 Solar Panel	电池组件 Solar Module	多晶硅太阳能组件 240W/24V, 2件并联 Polycrystalline Silicon Solar Module 240W/24V/2pcs	
光源 Lamp	LED	主灯 180W+副灯80W Main 180W+Auxiliary 80W	
	灯高 Height	主灯 8m, 副灯 6m Main 10m, Auxiliary 6-8m	
	照明时间 Working Time	1天 12小时 (365天) 12 Hours/Day (365 Days)	
蓄电池 Battery	规格 Type	胶体蓄电池 Gel Battery	
	数量 Quantity	200AH/12V*4PCS	
	不发电状态 Backup Storage Battery Time	连续照明 3-5天 (放电深度 70%) Continuous 3 To 5 Days, 70% Depth Of Discharge	
控制器 Controller	智能控制器 Intelligent Controller	风机1000W、太阳能480w/24v 1000w/Wind Turbine, 480w/24v Solar Module	

System Description

Environmental parameters:

Annual average wind speed is not less than 2.0m / s.
Solar energy resource class III region.

Function:

Lighting time and control:

Controlled by brightness, controlled by time;

Other functions: Adjust the Led lamp power;

Lamp distribution: Symmetry on two sides, the distance between two street lights is 25m-35m.



Solar and wind hybrid street light



FL-01



FL-02



FL-03



FL-04



FL-05



FL-06



TL01



TL02



TL03



TL04



TL05



Main advantage of thin film solar panel:

- 1.High efficiency and stable power output.
- 2.Prominent performance at high temperature, weak sunlight.
- 3.High cost performance and short energy payback period.
- 4.Fast, convenient and flexible installation
- 5.In the shading conditions,higher performance than crystalline silicon ones.
- 6.High light transmittance



The controller:

- 1.The controller and constant current in same body, no need another constant current one.
- 2.High voltage input, the highest input voltage DC150V.
- 3.Output voltage DC12V, MPPT control.
- 4.The LED power can be regulated more paragraphs.

Customization by our designers is available.





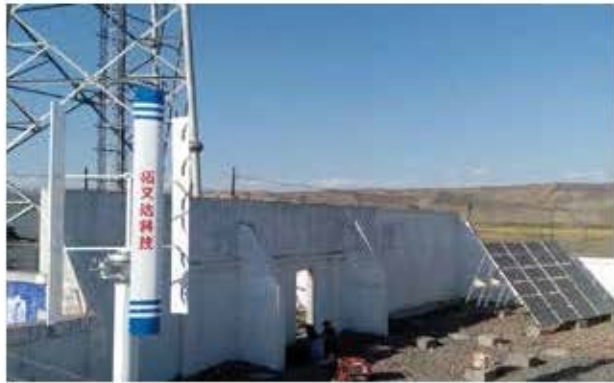
Wind & Solar Hybrid Power Supply System For Monitoring



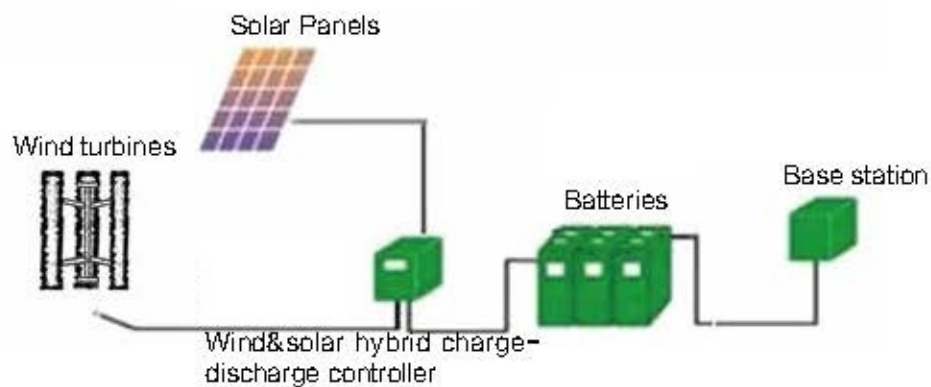
Communication base station system

Wind&solar hybrid off-grid power supply system can provide reliable and stable electricity to satisfy the requirement of communication equipment where state grid can not cover, wind&solar can be used to solve single discontinuous generating problem and to guarantee almost stably supplying power. In recent years, people begin to use wind&solar hybrid system to supply power for the construction of the mobile communication which is a new choice of generating . Through effective combination of solar panels, wind turbines, batteries supplying power for equipments, wind&solar complementary generating technology is being used widely.

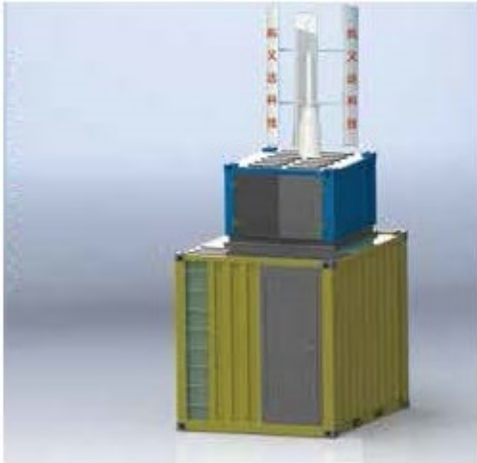
To solve discontinuities problem of single generating method and ensure stable power supply.



名称 Name	型号 Model
风力发电机 Wind Turbine	TYD-WT-1000—TYD-WT-100000
太阳能板功率 Solar panel	230W
蓄电池容量 Battery	200AH/12V
风光互补控制逆变柜 Box for wind&solar hybrid controller and inverter	定制 customized
电缆 cable	根据实际配置 Provide as required
适合太阳能资源 Suitable for solar energy resources	Ⅲ类以上 Class Ⅲ above
参考安装形式 Installation Style for reference	地面式太阳能支架 Ground-installed solar panel frame
	拉索塔架 Guy cable tower
	风机自立式杆 Independent wind turbine standing-pole
	基站塔上安装 Install on base station tower



wind power equipment applied in the area of Low temperature, low pressure, low wind speed.



In December 2014, we reached an agreement to cooperate with Nanjing purple mountain observatory, Chinese academy of sciences, which agreed on taking full advantage of TUOYOUNDA independent intellectual property rights of core technology to make the vertical axis wind turbines could work well under the condition of lower temperature, lower pressure and lower wind speed in Antarctica. Just for the purpose of solving power supply problems under the bad environment condition where the altitude is more than 4700m and the temperature is between below 70 - 100 degree. After TUOYOUNDA wind turbines installed at Chinese observatory in South Pole, it will become true to use wind power equipment in the area of low temperature, low pressure, low wind speed; and will fill in the blank in this field.

The transformation module lamp

- 1.Solve the problem of interior Led light radiating of traditional chinese design street light.
2. Solve the problem of time-consuming and difficulty during install interior Led lights.
- 3.The LED lamp could be adjusted of direction to improve the uniformity of illumination
- 4.IP65 protection grade,the LED lamp have hydrostatic testing,putting whole LED lamp into the water,there is no have any affect for usage.
- 5.No need cover glass.(solve the problem of fragile duiring delivery)
- 6.Enhance light efficiency to 10%,the structure of LED lamp reduce the transmittance glass than traditional LED lamp.It will be much more efficiency and energy saving.It could be use 30w LED lamp to instead of 33w-35w LED lamp after improving the light efficiency.
- 7.The LED lamp using convection heat dissipation,with the using of air-condition heat sink,larger square and better performance of heat dissipation.It will be prolong droop time of LED lamp and increase its lifetime.After using 1000hours,the droop time of LED lamp will be 0.



The reconstruction project of Jianshe Road light



Projects



Wind & solar hybrid power supply lighting system on street



Wind & solar hybrid power supply lighting system in Haigang Factory



Wind & Solar hybrid power supply lighting system on Shangjin Road, Haigang



Wind & solar hybrid Chinese Style street light installed in Haigang industrial zone



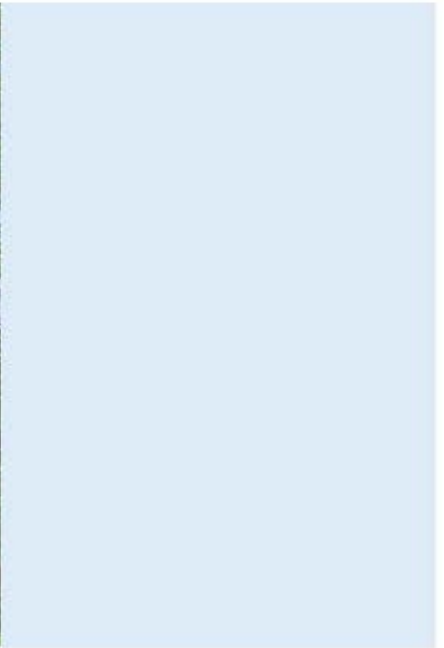
Wind power supply system used in house



Wind & solar hybrid power supply lighting system installed in Construction site



Wind & solar hybrid power supply lighting system in park



Wind & solar hybrid power supply lighting system in Qinhuangdao





Wind & solar hybrid power supply lighting system in State Road



Wind & solar hybrid power supply lighting system in Haerbin



Wind & solar hybrid power supply lighting system installed at the sides of expressway in the 6-lane



Wind & solar hybrid power supply lighting system installed in industrial zone



Wind & solar hybrid power supply lighting system installed in industrial zone



Wind & solar hybrid power supply lighting installed in Shougang Group wharf



Wind & solar hybrid power supply lighting system installed in Zhongguancun in Beijing



Wind & solar hybrid power supply lighting system installed in campus.



Wind & solar hybrid power supply lighting system installed in Tangshan automobile town



Wind & solar hybrid power supply lighting system installed in Dazhao Li Memorial Hall



Thin film solar street lamp



Thin film solar street lamp



solar street lamp at village of Lubei



Solar lighting system installed in suburb



Solar street lamp at Town Fengrun



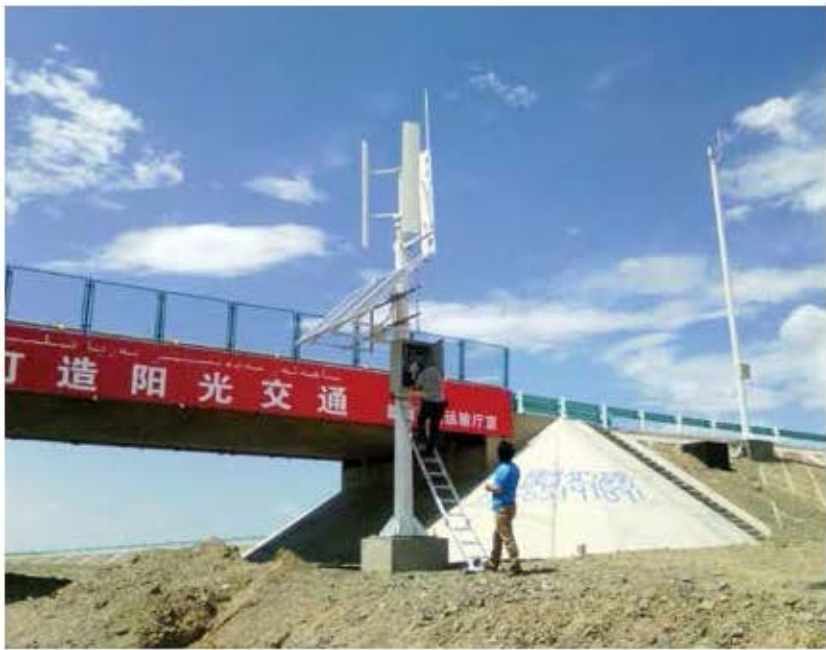
Solar street light installed in Yutian Town



Solar street lamp intalled at Town Laoting



Wind & solar hybrid power supply system on Expressway in Gansu Province



Wind & solar hybrid power supply monitoring system on Expressway in Xinjiang Province



Wind & solar hybrid power supply monitoring system installed on Expressway in LongNan City



Wind & solar hybrid power supply system for monitoring installed in viewing tower in Dalian City



Wind and solar power system for monitoring in Sinkiang





Wind & solar hybrid power supply system
Installed on roof in Beijing



Wind & solar hybrid electrical car power supply system in
Hebei United University



Wind & solar hybrid power supply system experimental platform in Hebei College of Industry and Technology



Wind & solar hybrid power supply system installed in Mariculture base



Wind & solar hybrid power supply system installed in Mountain Landscape

Wind power project in Anhui power plant





Wind solar hybrid system
equipment in Xinjiang



Wind & solar hybrid power supply equipment
for mobile communication base station



Xinjiang wind power equipment



America wind power equipment



The wind solar hybrid system equipment in high speed way of Qinhuangdao



The wind turbine test-bed in Tianjin University





Small micro-grid power supply system in Binhai New District



Wind & solar hybrid power supply equipment



Small micro-grid power supply system at expressway exit



Solar power supply system installed in Langfang City, Hebei Province



The Shanxi Office of small and micro power supply equipment



Small micro-grid power supply system in Beijing Logistics Park

Wind Generator Experiment Center



Wind-solar-electricity experiment bed



Generator manufacturing equipment



Generator manufacturing equipment



Wind power experiment field



Independent research and development equipment--- Generator installation equipment