

The logo for colite, with 'colite' in a bold, sans-serif font. The 'c' is green and the 'olite' is blue. A vertical green line is positioned to the right of the text.

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# Turbine Technologies

Street & Pedestrian Lighting Options

2017

## Problems with Traditional Outdoor Lighting

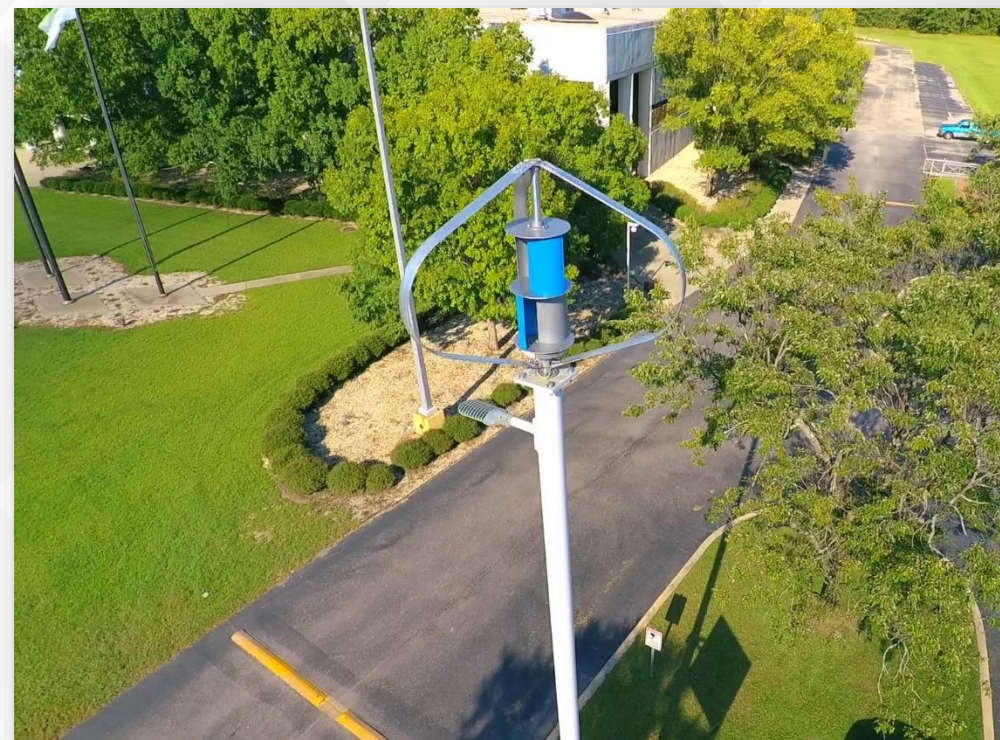
- Estimated 26 million+ outdoor “parking lot-style” lights costing more than \$2 billion annually in the United States alone
- Needlessly wastes energy and money when illuminated during the daytime
- Results in an unsafe environment when not properly illuminated at night

*Traditional metal halide or similar bulbs are not only inefficient but provide inadequate light coverage*



## Colite's Wind-Solar Solution

- Hybrid Wind-Solar Lighting
- 100% renewable, green-energy powered, off-grid lighting solution
- Combines a Vertical Axis Wind Turbine (VAWT), Solar Photovoltaic (PV) panel, and high-output LED light fixture into an aesthetically pleasing and functional package
- Highly efficient wind turbine, solar panel, light fixture and control module ensure there is always light *WHENEVER* and *WHEREVER* it is needed
- Takes advantage of current and future renewable energy incentives
- Customizable, inventive designs draw positive attention to your property or venue



[See our Wind-Solar Light in Action!](#)



## About our Vertical Axis Wind Turbines (VAWTs)

- Features an internal 2-blade Savonius design and external 3-blade Darrieus design for maximum efficiency in all wind conditions
- Constructed of high-strength anodized aluminum for strength and longevity
- Control Module harnesses energy produced by the turbine to charge the batteries which power the LED light
- Control Module allows for monitoring, adjustments, and circuit braking of the turbine
- Braking mechanism, similar to regenerative braking systems used in hybrid cars, allows for easy slowing and stopping of the turbine for control and maintenance



## Why use VAWTs over traditional turbines?

- Operates with wind from **ANY** direction
- Begins to operate at lower minimum wind speeds
- Operates at a lower RPM
- Lower vibration levels
- Very low (<10 db) noise levels
- Simpler maintenance – no frictional drums or pads to wear out rotor bearings
- Smaller operating footprint



## Do I need both Wind & Solar?

- Colite utilizes both wind and solar power to provide consistent power generation
- Solar panel takes advantage of calm, sunny days
- VAWT takes advantage of cloudy, windy, and stormy days
- Together, wind and solar ensure that the battery is always charged, no matter what the weather conditions have been like
- The result is consistent and reliable lighting that you can count on



## Why use an Off-Grid system?

- Having an off-grid lighting solution offers a number of advantages:
- Completely eliminates ALL utility costs
- No need to wire underground infrastructure to the grid – saves a significant amount of time and money during both install and future maintenance
- Remote install capability – can be installed far away from traditional grid systems
- Provides year-round reliability in locations where the existing grid may not be reliable

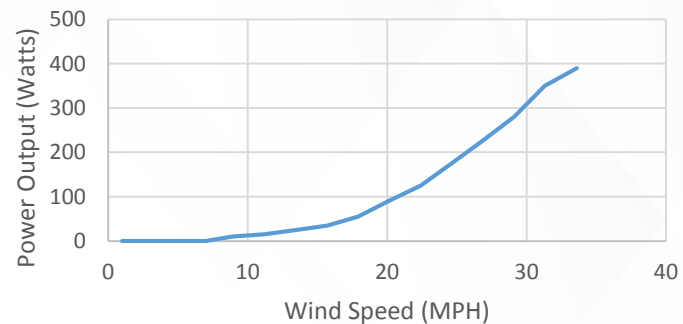




## DS-300 Product Specifications

Rotor Diameter	4.1 ft
Rotor Height	3.5 ft
Mast Height	13.1 ft
Total Height	16.6 ft
Total Weight Not including mast	57.3 lbs
Blade Material	Anodized Aluminum
Rated Power	300W

DS-300 Power Curve





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## DS-300(W) Hybrid Street Light

Wind Turbine	DS300 x 1	set	Street Lamp	50W x1 or 2	pcs
PV Panel	250W		12V Battery	200Ah~ 1 or 2	ea
Controller	MAX630	set	Control Cabinet	Outdoor type x1	pcs
Pole	Custom	set			

## Wind Turbine

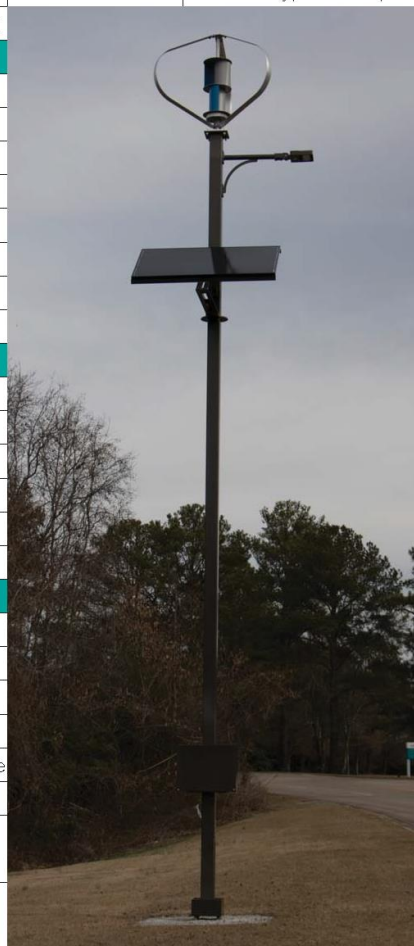
Darrieus blades	3
Savonius blades	2 layer
Blades material	Anodized Aluminum
Axis material	Anodized Aluminum
Dimension	1.25m x 1.06m
Weight	25kg/56lbs
Generator	3 phases PMG
Rated power	300W

## Solar Panel

Material	Mono Crystalline
Open circuit V	37.50 Vdc
Max. power V	600 Vdc
Efficiency	18.9%
Panel size	1640 x 992 x 40mm
Weight	18kg/40lbs

## Charge Controller

Wind Charging	MPPT
PV Charging	PWM
Rated power	300W (Wind)/250W (PV)
Battery Voltage	12-24V or 48V
Auto braking	Over speed/temperature
Discharge ways	2 ways
Startup lighting	PV Voltage level detection
Lighting up duration	Could be set by user



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## DS-300(W) Hybrid Street Light

Street Lamp	
Power	12/24V
IP Level	IP65
Color temp.	5000k
Illumination Angle	120°

## Battery

Voltage	12V/24V/48V
Ah	200Ah
Type AGM	Lead-acid deep-cycling
Warranty	5 year

## Street Lamp Options

Input Power	48 watts
Total Lumens	5250 lumens
Replaces	MH/HPS up to 125 watts
Input Power	80 watts
Total Lumens	8800 lumens
Replaces	MH/HPS up to 250 watts



## Customization

- Overall design of pole
  - Height
  - Color
  - Material
  - Aesthetic additions
  - Etc.
- Mounting height of PV panel
- Signage additions
- Site-specific engineering needs



## Brand Applications – Parking Lot Directionals

Wind Turbine - Option 1



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Wind Turbine - Option 2



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Wind Turbine - Option 3



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## Brand Applications – Parking Lot Directionals

Wind Turbine - Option 4

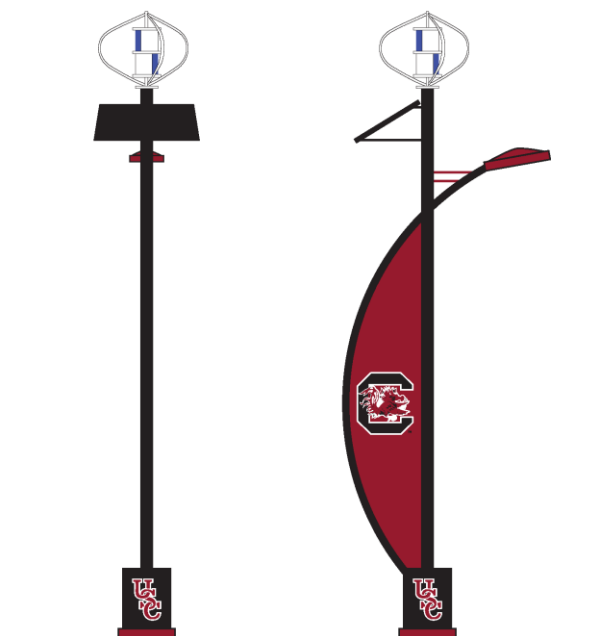


Wind Turbine - Option 5



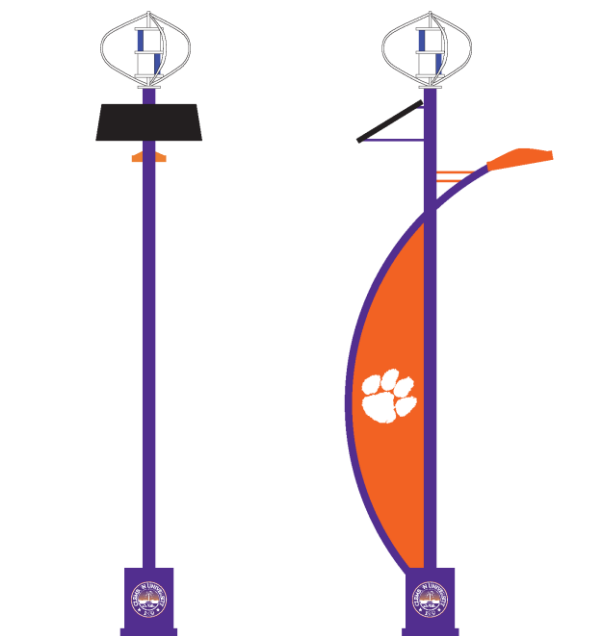
## Brand Applications – Colleges & Universities

Wind Turbine - Option 5 USC



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Wind Turbine - Option 5 Clemson



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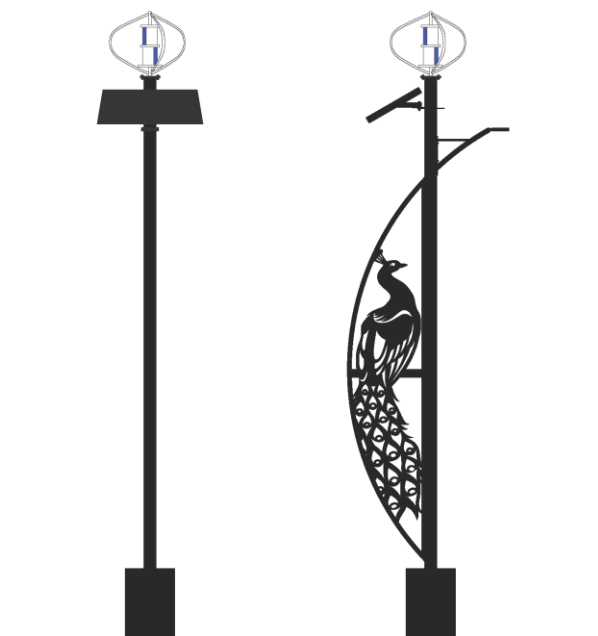
Wind Turbine - Option 5 Georgia



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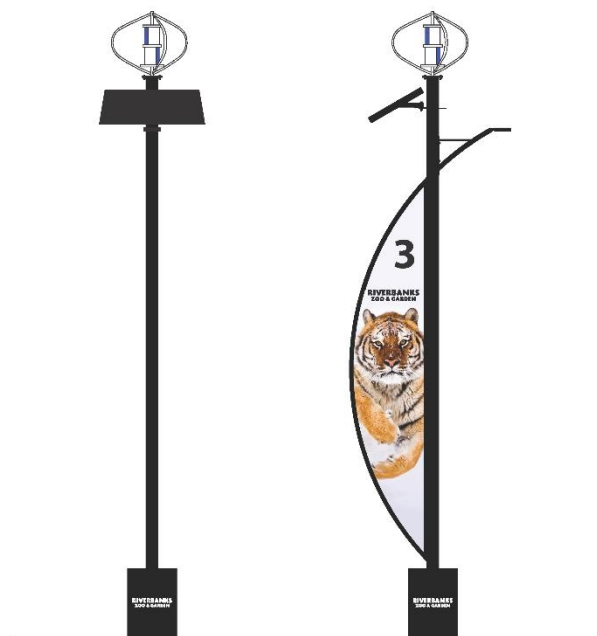
## Brand Applications – Entertainment & Shopping

Wind Turbine - Peacock Design



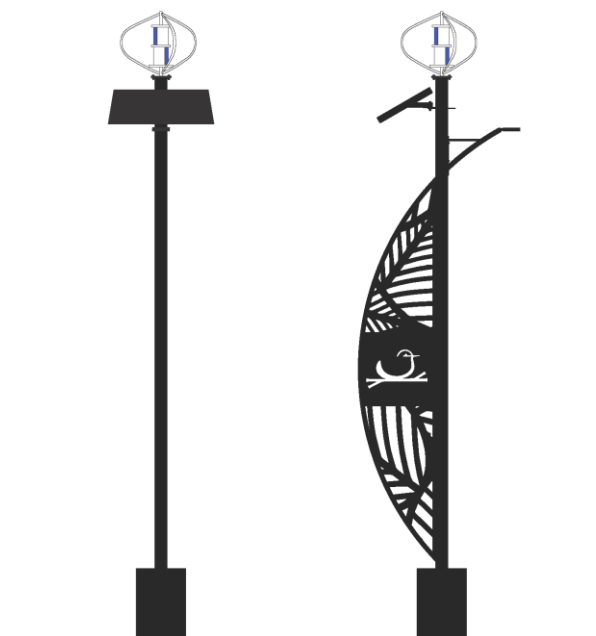
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Wind Turbine - Riverbanks Zoo



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Wind Turbine - North Creek Option 2

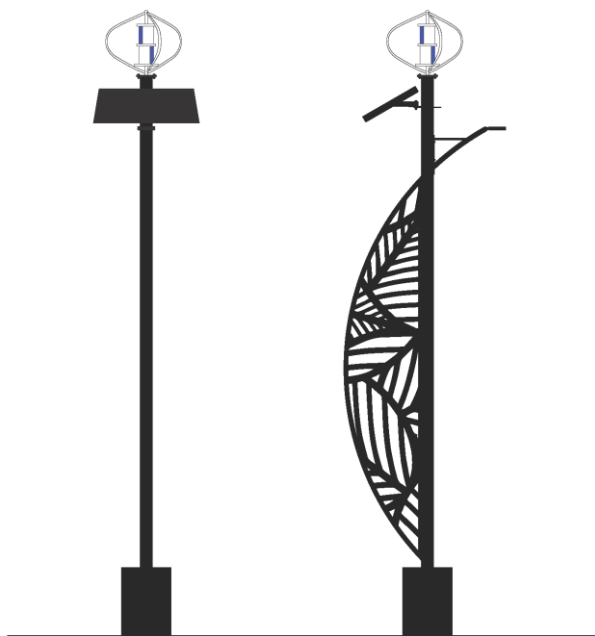


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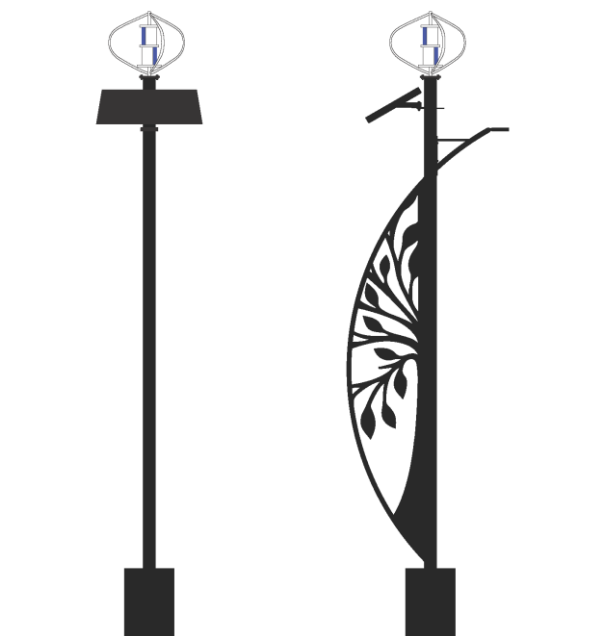
## Brand Applications – Stylized Options

Wind Turbine - Leaf Design



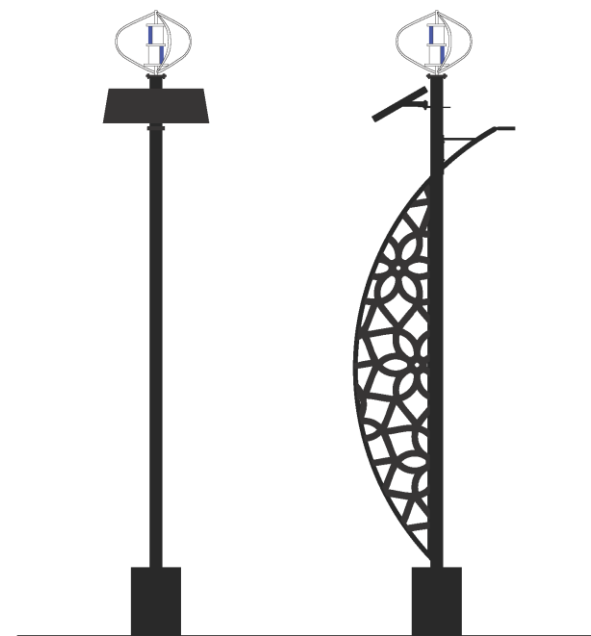
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Wind Turbine - Tree Design



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Wind Turbine - Flower Pattern Design



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## Brand Applications – Convention Signage



FRONT & BACK

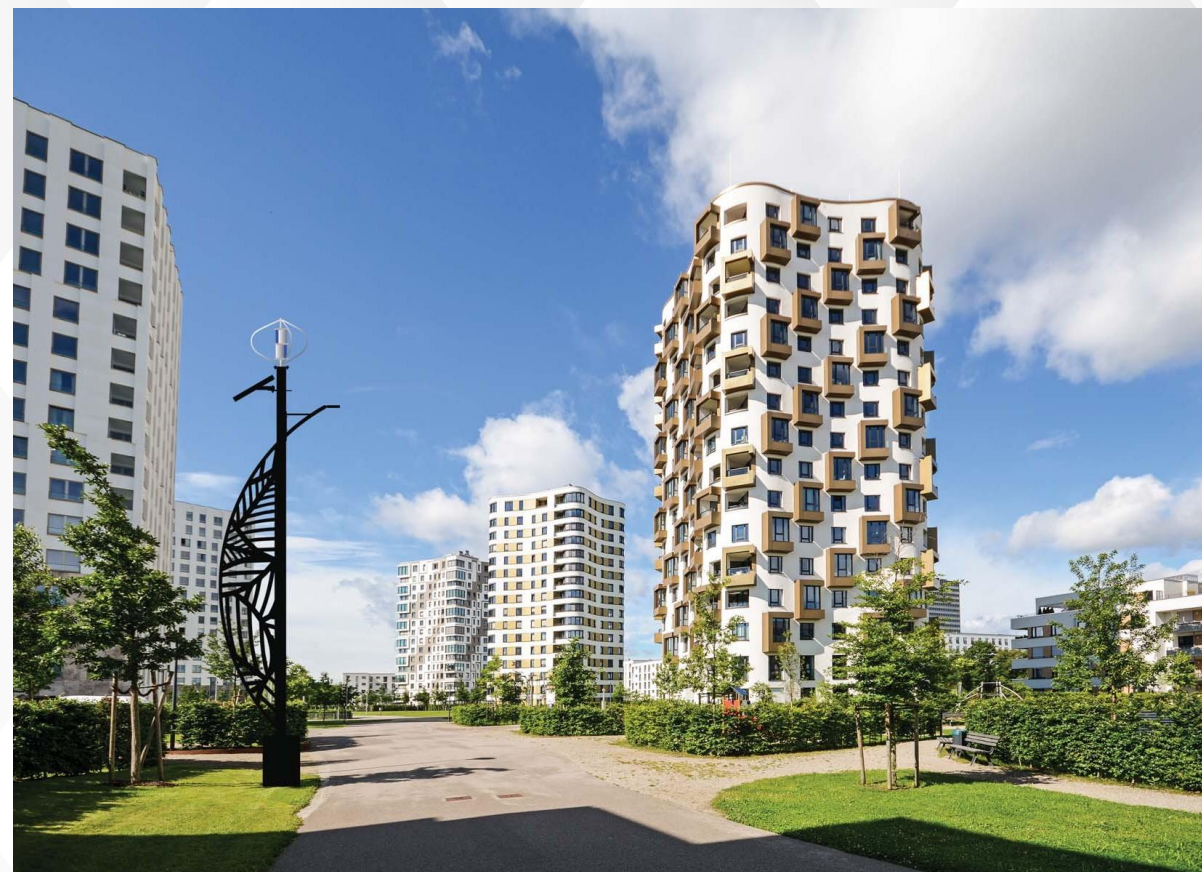


Side (Single)



Side (Double)

## Urban Applications





## Industrial Applications





## Other Applications







## Certifications - HiVAWT

- ISO 9001: 2008
- ETL Mark of Generator Safety Certification
  - United States & Canada
- European Conformity
- Patents
  - Taiwan, China, & UK
- BWEA: 2008
  - British Wind Energy Association
  - Performance, noise, & duration standards
- Meets National Standards for small wind turbines
  - US, Canada, Korea, China, & Japan



## Technical Questions (DS-300)

1. The unit is not connected to the grid.
2. The unit is not designed to sell power back to the grid.
3. The unit charges a battery power source during the day and/or night depending on solar/wind availability.
4. The solar panel is the back up power source to the wind turbine.
5. The controller will keep the battery from "overcharging".
6. The light will be powered by the battery source and the light on - off switch is controlled by the PV panel and the controller.

## Application Questions

1. The unit is only designed to power one or two light fixtures that are mounted to the pole.
2. The design is for each unit to be a free standing - off the grid - light unit.
3. The unit is designed for parking lots or pedestrian areas.
4. The typical distance between poles is determined by each site and light.

## Installation Questions

1. Installation can be purchased from Colite.
2. The solar panel should always face south - the adjustable bracket allows for this.
3. The unit will be sold as a kit including - pole, turbine, PV panels, anchor bolts, light kit, and controller.

## Permit & Tax Incentive Questions

1. All permits and code research is by the owner, architect, or general contractor.
2. There are available state and federal tax incentives – these are the responsibility of the buyer.
3. Visit [dsireusa.org](https://dsireusa.org) for more details.

## Potential Energy Savings Calculations

	(1) 250w Light	Small Site (25 Lights)	Large Site (100 Lights)
Annual Usage	1095 kwh / year	27,375 kwh / year	109,500 kwh / year
Annual Footprint	1335.9 lbs CO2 / year	33,392.5 lbs CO2 / year	133,590 lbs CO2 / year
Annual Savings	\$109.5 / year	\$2,737.50 / year	\$10,590 / year

Based on:

- 250watt Light, run 12 hrs./day
- 365 days / year
- 1.22 lbs CO2 / kwh of electricity
- \$0.10 / kwh of electricity





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