

Appendix E – VERTICAL WIND TURBINE TECHNOLOGIES

Whirlwind® Turbines



Our range of Whirlwind® Turbines are suitable for a variety of applications, ranging from factory premises, shopping centres, filling stations, agricultural premises, to railway stations, hospitals, government buildings, schools, private houses & workshops – in fact anywhere where power is required.

VAWT FEATURES

- Narrow profile design, developed & manufactured in the UK
- Blend better into the environment – making it less visible than horizontal turbine props.
- Friendly to Wildlife such as birds & bats
- Silent running & operating
- Gearless direct drive, means only one moving part
- 3 phase power output
- Operates at low RPMs
- Low mechanical energy loss – means more efficient power generation
- Operates in variable wind directions
- Safe at high wind speeds
- CE certified

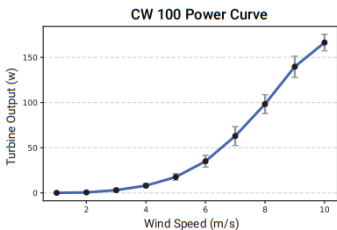
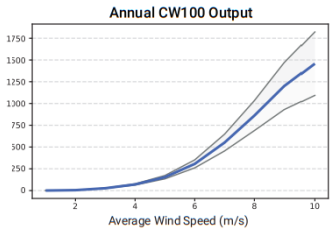
IceWind Energy



IceWind designs and manufactures robust micro vertical-axis wind turbines and other hybrid energy solutions to power telecom towers, weather and seismic stations, and on-grid and off-grid lodgings. All products are designed and tested in Iceland, one of the windiest places on earth.

CW series vertical-axis wind turbines are built to power off-grid cabins, offset grid dependency, and perform in any custom wind energy application striving to benefit from increased energy independence and minimized maintenance costs. CW turbines are designed to deliver long lasting performance, with little or no maintenance for over 20 years. They are able to withstand wind speeds up to 130 mph (Category 4 Hurricane wind speeds) and will consistently deliver power, even in the harshest conditions.

CW100		
Survival speed	130 mph	60 m/s
Startup wind speed	4.5 mph	2 m/s
Cut in wind speed	5.5 mph	2.5 m/s
Rated power	160 W	
Max power	600W	
Rated wind speed	22 mph	10 m/s
Noise level	< 30 dB	
Height	5 ft	1.5 m
Diameter	4.5 ft	1.4 m
Weight	143 lbs	65 kg
Generator	500 W AFPMG	
Number of blades	3 Inner, 3 Outer	



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Halcium Power Pod



Meet PowerPod

The PowerPod is a prototype small-scale wind turbine designed specifically to work in towns and cities. Its design is intended to collect incoming air from 360 degrees and focuses it into an internal blade.

The blade is contained entirely within the stationary shell, making it safe for kids, pets, and wildlife.

The effect is safe wind energy specifically for cities and towns.

The PowerPod is still in its very early stages of development and is still yet to hit proof of concept.

No External Moving Parts

Airflow is intended to be collected by the exterior of the pod and focused on a circular blade. The **blade is contained entirely within the pod**, making it safe for nearby people and wildlife.

The external shell does not move - it is fixed in place. Because of its shape, it can take wind from any direction, changing directions, or even multiple directions at once.

When regular turbines are in such conditions they can shatter - throwing blades at high speeds.

Standalone or Part of a System

The PowerPod's intent is to give a viable wind energy option to those looking for a complete renewable energy system in cities and towns, or those who are unsatisfied with open bladed designs. The alternator inside can hook into a building's power grid with the same equipment needed for any other wind turbine.

It can also be added to a solar and/or energy storage system with the same equipment used to integrate other wind/solar/storage systems.

A Global Solution

The PowerPod is not yet in manufacturing as it is still a concept and not a market-ready product. However, once in production our goal is to produce PowerPods locally, with **local manufacturing and materials**, wherever possible.

European PowerPods will be made in the EU, American PowerPods will be made in the USA, Indian PowerPods in India, and so on.

Our goal is to use the PowerPod to **support the local markets and jobs** of the people who are using them to help us make the world a better place.

Still In Development

The PowerPod is still in development and we have not yet reached minimum viable product.

Our team is raising funds to continue research into the PowerPod's viability as a small-scale wind turbine. Our plan is to start with a comprehensive analysis done by our technical adviser, Dr. Meredith Metzger of the University of Utah's engineering department.