

The **Magenn Air Rotor System (MARS)** is the next generation of wind turbines with cost and performance advantages over existing systems.

MARS is a lighter-than-air tethered wind turbine that rotates about a horizontal axis in response to wind, generating electrical energy. This electrical energy is transferred down the tether for consumption, or to a set of batteries or the power grid. Helium sustains the Magenn Air Rotor System, which ascends to an altitude as selected by the operator for the best winds. Its rotation also generates the “Magnus” effect. This aerodynamic phenomenon provides additional lift, keeps the MARS device stabilized, positions MARS within a very controlled and restricted location, and finally, causes MARS to pull up overhead to maximize altitude rather than drift downwind on its tether.



**The Advantages of MARS over Conventional Wind Turbines are:** (1) low cost electricity - under 10 cents per kWh; (2) bird and bat friendly; (3) lower noise; (4) wide range of wind speeds - 2 to more than 28 meters/second; (5) higher altitudes - from 200 to 800 feet above ground level are possible without expensive towers or cranes; (6) fewer limits on placement location - coast line placement is not necessary; (7) ability to install closer to the power grid; (8) mobile and; (9) ideal for off grid applications or where power is not reliable.

**Initial MARS Target Markets include:** (1) off grid for cottages and remote uses such as cell towers and exploration equipment); (2) developing nations where infrastructure is limited or non existent; (3) rapid deployment (to include airdrop) to disaster areas for power to emergency and medical equipment, water pumps, and relief efforts (ex. Katrina, Tsunami); (4) and military applications.



## MARS 4kW (Estimated) Performance Specifications

<b>Magenn Power Product</b>	<b>Model 4kW</b>
<b>Size (Diameter x Length)</b>	<b>13 feet x 40 feet</b>
<b>Shipping Weight</b>	<b>Under 350 lbs - depending on tether length</b>
<b>Volume of Helium</b>	<b>6025 cubic feet</b>
<b>Tether Height</b>	<b>200 ft standard - up to 800 ft optional tether length, in increments of 100 feet</b>
<b>Start-up Wind Speed</b>	<b>1 m/sec - 2.25 mph</b>
<b>Cut-in Wind Speed</b>	<b>2 m/sec - 4.5 mph</b>
<b>Rated Wind Speed</b>	<b>12.5 m/sec - 28 mph</b>
<b>Rated Power</b>	<b>4000 Watts</b>
<b>Cut-out Wind Speed</b>	<b>32 m/sec - 71.5 mph</b>
<b>Maximum Wind Speed</b>	<b>40 m/sec - 89.5 mph</b>
<b>Temperature Range</b>	<b>-40°C /-40°F to +60°C/+140°F</b>
<b>Generators</b>	<b>2 x 2 kW</b>
<b>Output Form</b>	<b>Various Options Available: 120 VAC 60Hz - 240 VAC 50 Hz - Regulated DC 12-120V</b>
<b>Warranty</b>	<b>5 Years</b>
<b>Life Cycle</b>	<b>15 Years</b>
<b>Price (USD) (Estimated)</b>	<b>Starting @ \$9,999</b>
<b>Availability</b>	<b>Late 2006</b>

*Availability, Pricing and Specifications are subject to change*

### MARS 4kW Performance

Estimated performance data is shown in the two graphs below. The Annual Energy Output range accounts for various non-standard wind distributions.

