Mariah Power

Manufacturer of the Windspire Vertical Wind Turbine

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- Manufacturer of the Windspire vertical wind turbine - launched June 2008
- First vertical wind turbine manufacturer to go through third party, independent testing of product before market launch
- First vertical wind turbine to make competitive power with propeller turbines - for less cost
- In mass production since April 2009
- Being manufactured in re-tooled auto-parts factory in Michigan

Wind power is site specific

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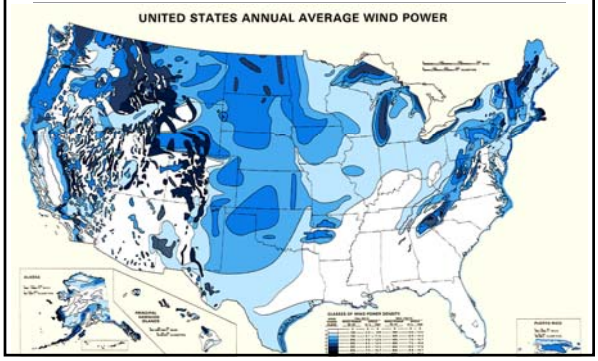

Wind power is site specific

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How do you evaluate wind?

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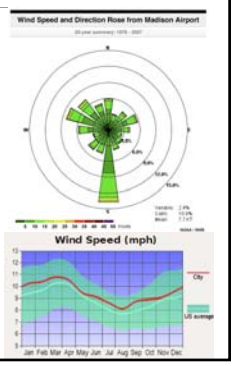
- First, you need wind
- Very little power in the wind below 6-8 mph
- 10 mph + average annual wind speed is optimal
- Wind power has an exponential relationship to wind speed
- 10% higher wind speed means 33% more power available
- Wind maps and wind roses are available to help evaluate your wind resource
- Wind power fluctuates - power is measured over a year



Traditional limitations of wind power

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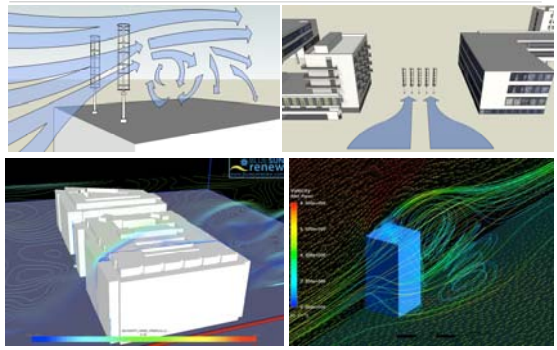
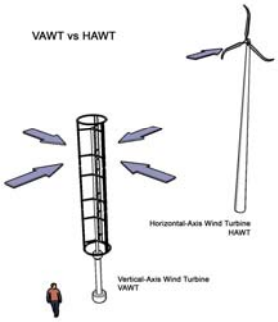
- Propeller turbines are difficult to site in more urban areas
- Height and clear air are a must for optimum efficiency
- Noise
- Propeller systems result in installing as high and as large as possible within a given budget
- Polarizing to the public
- Installation costs

Siting wind power in urban areas



HAWT and VAWT comparison

- Vertical turbine
  - Functions in turbulent or gusty winds
  - Instantly captures wind from any direction
- Horizontal turbine
  - Must have smooth clear wind from a single direction
  - Will not achieve optimum efficiency in turbulence

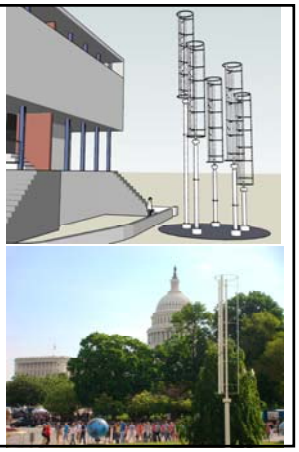


Emerging "Small Wind" technologies

Windspire

SITING ADVANTAGES

- 30 foot height fits within zoning guidelines
- Sculptural design blends well with landscape and architecture
- Appropriate for locations near people – human-scaled and quiet
- Slower speed and rotor design make it less intimidating than propeller "blades"



Windspire

PERFORMANCE ADVANTAGES

- Scale installation size to meet power needs
- Systems integration means higher efficiencies
- Power is plug and produce - completely grid intertie
- Reduced installation costs
- 2200 kWh/yr @ 12 mph
- 1.5 tons CO2/yr

New Applications

Wind turbines can be a visual symbol of "Green"

- A wind turbine can be a low cost investment in on-site power generation, one within view of guests.
- Other green building practices may not be visible to public (i.e., can't see energy efficient systems, even solar panels on roof)
- Some wind turbines can become part of building or site design.
- Few hotels using wind energy to date. Some have purchased RECs for wind energy generated in other locations
- Powerful message if guests can see clean energy being made within view

LEED-certified building with wind garden in front – Windspires are now a landmark to area