

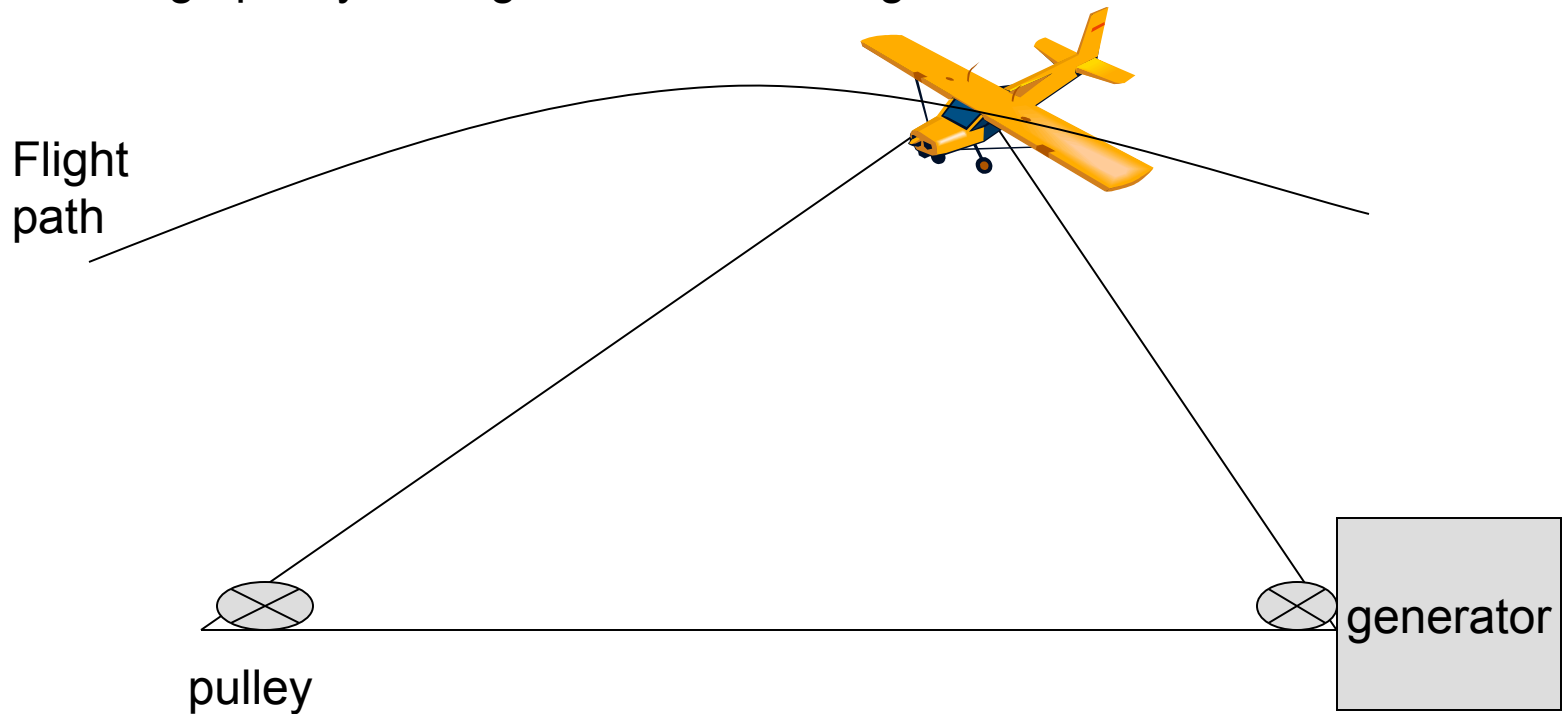
Nonaxial Wind Turbines

A New Class of Wind Turbines

By Mike Fallwell

Nonaxial Wind Turbine

The glider crosses the wind and drags the loop of cable through pulleys and generators on the ground.



The low mass structure couples to a large air mass economically.

HAWT vs. NAWT

- Horizontal Axis Wind Turbines (HAWT) can generate 1 watt/ lb. and cost \$50/lb.
- Because Nonaxial wind turbines are largely tensile structures they can generate about 100 watts/lb. at lower wind speeds

Low Wind Speed Turbines

For a wind of 12 mph the glider speed is 100 mph with a L/D of 8.

- For a 20 ft span, the lift is 4000 lbs and thrust is about 400 lbs, giving an output of about 50 KW.
- The combined length of the Kevlar cable is 1/2 mile and for a strength of 10,000 lbs, the weight of the cable would be approximately 300 lbs.
- The many degrees of freedom opened by the design allow it to be built more economically.

Advantages of a Nonaxial wind turbine

- Operate at higher altitude
- Not exposed to storms
- Ground maintenance and safety
- Less vibration (100x)
- Low tech (metal or fabric)
- Much less expensive gear box (100x)
- Vast increase in the number of productive wind sites
- Low visual impact
- Short lead time installation

Development

- Many mechanical problems still need to be resolved
- If capital cost of this system proves out to \$200,000/MW at the high capacity factors predicted, this technique will need little pump priming to achieve market penetration