

# ABSTRACT

Crosswind kite power is power derived from a class of airborne wind-energy conversion systems (AWECS, aka AWES) or crosswind kite power systems (CWKPS) characterized by a kite system that has energy-harvesting parts that fly transverse to the direction of the ambient wind, i.e., to crosswind mode; sometimes the entire wing set and tether set is flown in crosswind mode. These systems at many scales from toy to power-grid-feeding sizes may be used as high-altitude wind power (HAWP) devices or low-altitude wind power (LAWP) devices without having to use towers. Flexible wings or rigid wings may be used in the kite system. A tethered wing, flying in crosswind at many times wind speed, harvests wind power from an area that is many times exceeding the wing's own area. Crosswind kite power systems have some advantages over conventional wind turbines: access to more powerful and stable wind resource, high capacity factor, capability for deployment on and offshore at comparable costs, and no need for a tower. Additionally, the wings of the CWKPS may vary in aerodynamic efficiency; the movement of crosswind in tethered wings is sometimes compared with the outer parts of conventional wind turbine blades. However, a conventional traverse-to-wind rotating blade set carried aloft in a kite-power system has the blade set cutting to crosswind and is a form of crosswind kite power. **The scope of the project would be to simulate the crosswind conditions and find the drag force on the turbine blades and calculate the possible electricity output for a kite having a certain initial wing span (s-planform area) in openFOAM. Also finding the scalability of this application with increasing wingspan.**

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