

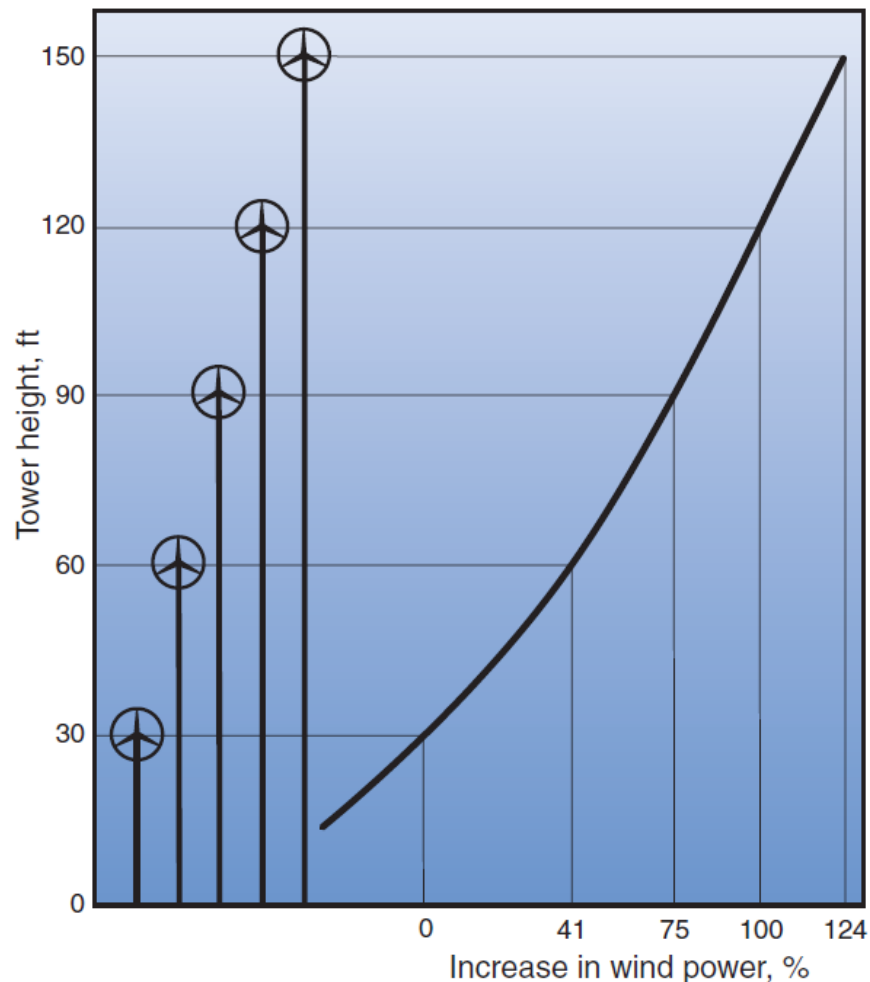
WIND TURBINE INSTALLATION

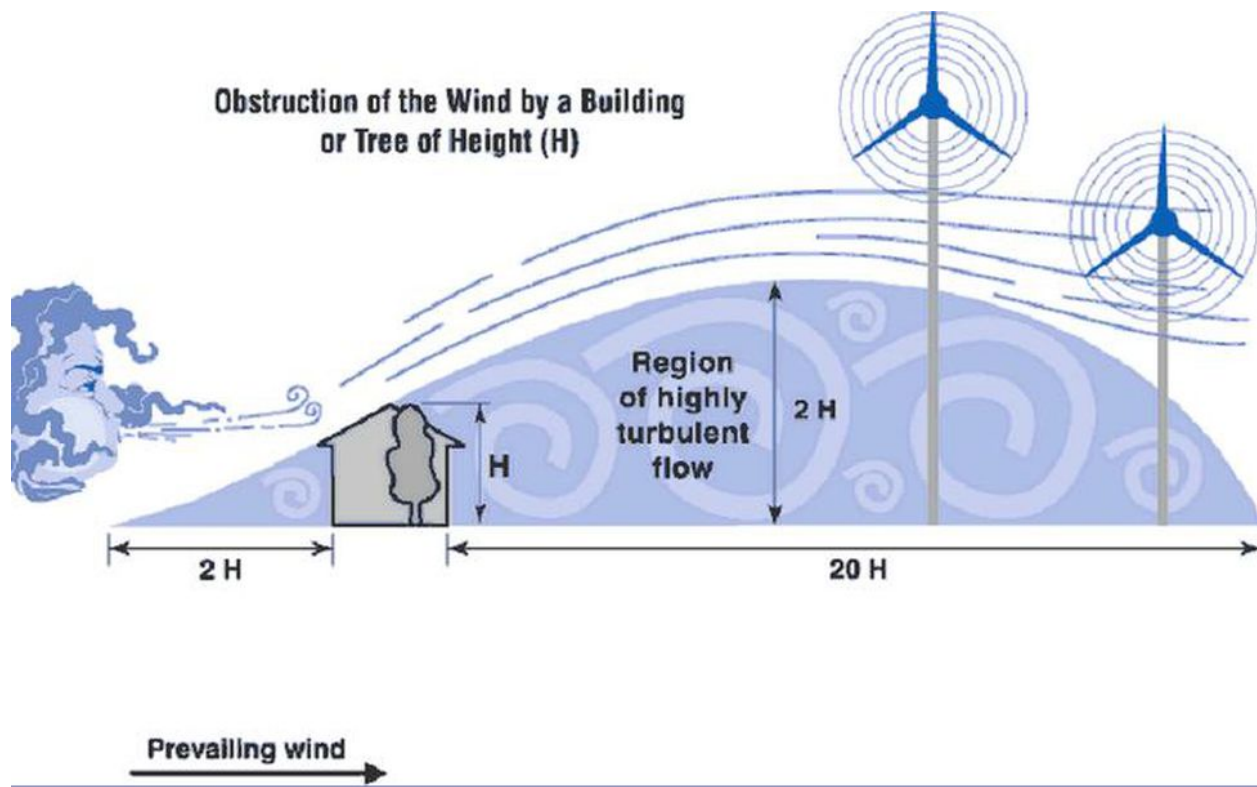
PREPARING FOR A WIND TURBINE INSTALLATION

SITING

One of the most important considerations is siting. General industry standard is 30 ft. above obstacles within 300 ft. Obstacles in the primary wind energy direction have an increased impact on the production of a wind turbine by altering the resource or increasing turbulence. There are multiple ways to help avoid this potential conflict, including siting the turbine in a more open area, locating the turbine upwind of obstacle(s) to the prevailing wind direction, or increasing the tower height. Poor siting not only affects production and wear and tear on the turbine, but also the experience and overall satisfaction of wind as a viable power generating source.

Wind Speeds Increase with Height



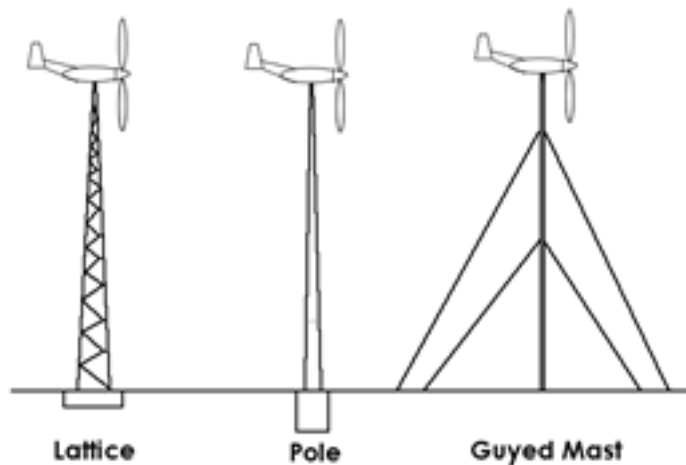


The distance from the tower to the battery bank needs to be taken into consideration. This will dictate the size, length, and therefore the cost of wire. Locating the turbine and tower should be thoroughly thought out with attention to: the ease of access between the two for possible trenching, potential traffic, direct burial cable or conduit, junctions or splices, and safety. The proximity to property lines and surrounding area to accommodate access to the turbine, whether the tower is tilted down, or serviced by a lift will also affect tower location.

TOWER OPTIONS

There are different types of towers onto which a wind turbine can be mounted. These include: lattice or truss type towers, stand-alone towers (monopole), guyed towers, and homemade. There are pros and cons associated with each as well as applications. Some considerations are:

- Lattice or truss type towers generally are climbable, can be assembled onsite, require concrete, a larger base footprint, and possibly guy wires.
- Stand-alone (pole) towers are generally more attractive, no guy wires, have height limitations, and require extensive foundation and concrete work prior to installation.
- Guyed towers are relatively inexpensive, easily raised and lowered, can be assembled onsite, but require a larger foot print.

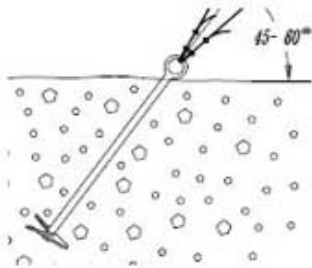


TOWER ANCHORS

Towers that use guy wires and some lattice type towers will need to have anchors for guy wire attachment. The type of anchors that can be used will be dependent upon soil type –some installations may require a soil analysis. Types of anchors include:

- Augers – these are “screwed” into the ground
- arrow head with wire cable– these are driven into the ground and “set” so arrowheads are parallel with the surface
- concrete – set into the ground with augers, rebar, or eye bolts protruding for guy wire attachment
- pins – these are set, anchored, or driven into rock (similar to rock climbing anchors)

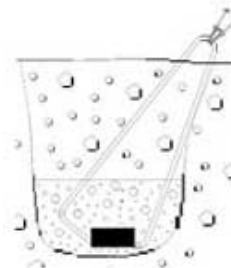
Soil Type	Recommended Anchor	Alternatives
Sand	Buried Concrete	None
Loose Gravel	Buried Concrete	None
Loam	Auger	Duckbill
Clay	Duckbill	Buried Concrete
Rocky Soil	Duckbill	Auger, Buried Concrete
Gravelly Soil	Auger or Duckbill	Buried Concrete
Solid (Soft) Rock	Large, Long Expansion Bolt	Buried Concrete
Solid (Hard) Rock	Smaller Expansion Bolt	Large Eye Bolt + Cement



AUGER



DUCKBILL



BURIED CONCRETE



EYE BOLT + CEMENT

USING THE POWER

The Air turbine exports direct current (DC) and through its own unique internal microprocessor – based smart controller, will monitor battery voltage for proper battery voltage regulation. This means your system can be as simple as the Air turbine, a breaker/fuse, a battery, and DC loads. A stop switch for the turbine is highly recommended while an ammeter is optional. DC loads can be readily found at alternative energy retailers, RV stores, truck stops, etc.

The Air turbine can also easily be used in conjunction with other battery charging sources (i.e. solar, hydro, diesel/gas generator, etc.) to provide added power for more extensive and demanding battery based systems.

In the case of AIR, the wind components are typically wired independently and in parallel to the PV components. The output from the turbine is wired directly to the battery terminals. This enables existing solar-only systems to be easily retrofitted with an AIR system.