



Mechanical/Environmental Sustainability Project

Wind Power for Herat, Afghanistan

Mission Statement

The mission was to research self-sustaining energy wind turbines and propose an implementation plan for the people of Herat, Afghanistan.

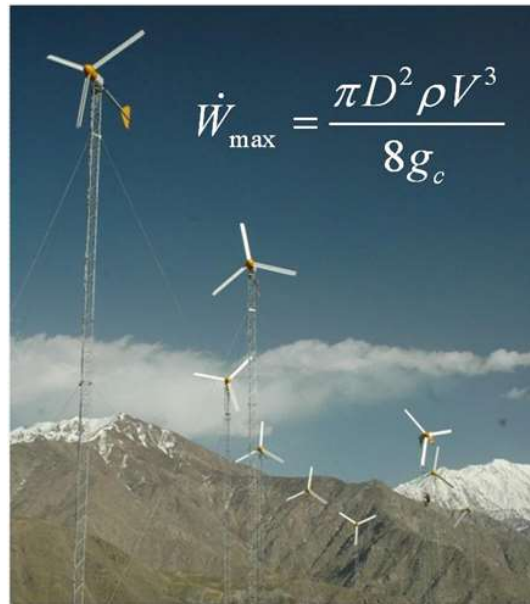
Synopsis

Herat, one of the biggest cities in western Afghanistan, with a population of 350,000, is unable to maintain a constant supply of power. They must rely on imported power from Iran and use diesel generators. The reconstruction of this city will require a local and reliable source of power generation.

The team's wind studies revealed that western Afghanistan has ideal conditions for the operation of wind turbines. The power grid layout of Herat would allow for the installation of wind turbines on the outskirts of the city without having to dramatically affecting the current electrical infrastructure. There are already wind turbine farms in other parts of Afghanistan.

There are a few companies which offer low cost, low maintenance wind turbines specifically for use in third world countries. The team discovered that the French built Vergnet turbine would meet the team's specifications. These relatively inexpensive turbines are shipped in one case, assembled on-site and raised using a hydraulic winch. The company has installed these wind turbines in portions of northern Africa with conditions very similar to that of Afghanistan.

After doing a demand analysis the team concluded that the installation of 945 of the 275-kW rated Vergnet wind turbines would be sufficient to replace the power imported to Herat. Operation of these turbines only half of the time, over one year, would be enough to make up for the initial cost and the cost of maintenance for the first year.



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