

# SMALL WIND POWER GENERATION SYSTEMS TO PROVIDE CLEAN ENERGY IN PERU

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One of the technologies promoted by [Soluciones Practicas Peru](#) is the Small Wind Power Generation System.

The system was designed and implemented to electrify an entire rural community including a school and a medical centre in the village of Alumbre. The project started with a socio-economic survey to establish the levels of demand for energy within the community and the current spend on energy by the population.

During the project 35 wind generators were installed in the community, which had a low electrification coefficient of less than 40%. The structure of the windmills was specially designed so that the technicians could easily climb to the top. Users and potential local technicians/administrators were trained to take over control of the operation, maintenance and financial management of the systems. The community and local authorities chose one of the potential technicians to be responsible for managing the system as a one-person micro enterprise.

The District Municipality has legally owned the system and the trained technician has been in charge of the technical and administrative operations. Together with the Community Electrification Committee, the users and the Control Unit, the technician and the District Municipality also belong to the group of five stakeholders. This local management model ensures the sustainability of the system.

The wind power system is composed by small installations each providing electricity for one unit (household, school or medical centre). The small 100W wind power generators are 10m tall and the 500W ones are 12m tall. The system consist of different components that ensure their operation; a 100W/500W micro wind power generator, a 35 Amp wind power controller, a 130 AH battery, a 12 VDC/220 VAC inverter and a control panel were used for the construction. The system works independently, so the user does not have to operate or regulate the power generator.



The estimated cost for the individual wind turbines was as high as US\$600 (for the 100W turbines) and US\$ 1800 (for the two 500W turbines at the school and the medical centre). The families now spend less on average on energy than they did prior to the project. They used to spend more than US\$5 a month for energy from kerosene or candles; now, each family pays US\$3 a month for a better quality service and for greater periods of light. With a family income of between US\$28 and US\$148 per month, this represents a significant saving.

The use of the wind power generating systems has replaced the former use of conventional energy such as kerosene, candles and batteries. In order to save energy, efficient light bulbs have been installed in most houses and in the school. The total volume of power used in the village now amounts to 2737 kW/year, which is a reduction of 38.32 kg CO<sub>2</sub>/year. The consumption is 43% less than estimated upfront, as the families consume less electricity than the predicted amount of 400W/day/family. In future, the energy consumption is expected to increase - but only to a limited extent.

As a result of the access to electricity, several small businesses such as two radio broadcasting stations, a sweater-making business and a cheese factory have been established. Furthermore, access to electricity has enabled the local population to use modern information and communication technologies. As an example, the percentage of the local population using mobile phones has increased from 5% to 95%, due to the access to electricity

Wind power is not very widespread in Peru and the project was the first to electrify a whole community with the use of wind power in order to serve as an example for further wind energy systems. To ensure the sustainability of the systems, a training program and a manual were created to increase the knowledge of the local population in the efficient use of energy. The manual represents a useful instrument to use these technologies in other contexts and countries.

**To know more**

[Soluciones Prácticas Manual](#)

[Article in Wision of Sustainability](#)

<https://www.greenempowerment.org/countries/peru/wind-and-solar-in-alto-peru/>

<http://ecolocalizer.com/2008/06/17/wind-power-blows-into-peru-and-brightens-future/>



- COMPONENTS OF THE SYSTEM**
1. Wind turbine
  2. Diodes
  3. Wind controller
  4. Thermo magnetic keys
  5. Resistor
  6. Battery
  7. Inverter
  8. Charges

