

PROJECT BRIEF

Household Wind/PV Hybrid Systems for Inner Mongolia, China

by Dennis Barley 7/98

Background

In 1996, the government of the Inner Mongolia Autonomous Region of China and the U.S. Department of Energy (DOE) embarked upon a plan to use renewable energy systems in electrifying remote areas of China. The first part of the project involved a policy and case study analysis of existing household and village power systems, and was completed in early 1996. The second part of the plan consists of pilot projects for the Autonomous Region of Inner Mongolia. The Inner Mongolian government, the Chinese Academy of Sciences, the University of Delaware's Center for Energy and Environmental Policy (CEEP), and the National Renewable Energy Laboratory (NREL) have joined forces to design and implement these demonstration projects.

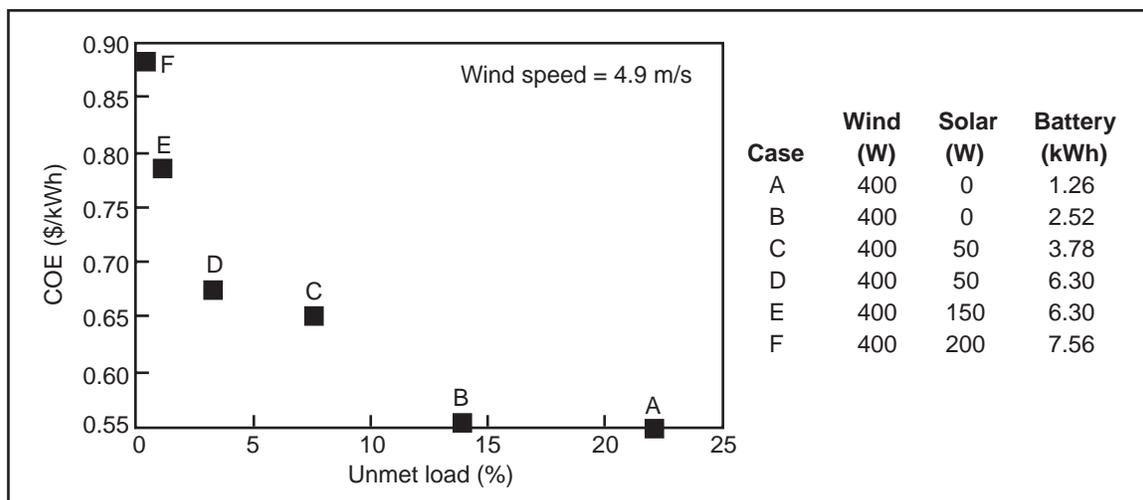
Scope

Phase I of the implementation will involve the distribution of 240 small wind/photovoltaic (PV) systems for household use. The systems will be located in two counties that are rich in wind and solar resources: Suniteyou (Xisu) and Dongwu Zhumuqin. Both counties will be equipped with resource monitoring stations, and several of the household systems will be monitored and analyzed for technical performance.

The project will be cost shared by DOE and the Chinese State Science and Technology Commission (SSTC). The systems, which cost about \$2,000 each, will be paid for by the villagers or through a revolving loan fund administered by the Inner Mongolian government. Systems composed of U.S. equipment, Chinese equipment, and combinations of the two will be featured in the pilot project.

Status

Analyses were conducted at CEEP and at NREL to identify the most cost-effective household system designs for each of the two counties. Components of the analyses included identifying load profiles, assessing the wind and solar resources, collecting price and performance specifications for U.S. and Chinese components, running sophisticated computer models, and evaluating system designs for cost of energy (the system cost per kWh of energy delivered to the load) and percentage of unmet loads. The analyses showed that combinations of wind and PV are the most cost-effective designs for the household systems because the seasonal profiles of wind speed and solar radiation are complementary for the locations. Further analysis is underway to determine cost-effective designs for entire village power systems in Inner Mongolia.



Several possible designs are compared on the basis of unmet load and cost of energy.

Planned Activities

In 1998, a pilot wind/photovoltaic hybrid system project will be initiated with the installation of at least 240 remote household systems. In addition, resource data will be collected in several additional counties in Inner Mongolia. The data will be used to assess the potential of wind, PV and hybrid systems for serving remote household and village power needs on a larger scale.

Team/Partners

- NREL/DOE
- The Inner Mongolian government
- Chinese Academy of Sciences
- University of Delaware's CEEP

NREL Contact

Web site: <http://www.rsvp.nrel.gov>

Bill Wallace
phone: (303) 384-6476
fax: (303) 384-6490
e-mail: bill_wallace@nrel.gov

Produced by the National Renewable Energy Laboratory, a U.S. Department of Energy national laboratory.

Printed with renewable source ink on paper containing at least 50% wastepaper, including 20% postconsumer waste.

NREL/FS-520-24636