



DIPARTIMENTO DI ECONOMIA E INGEGNERIA AGRARIA, FORESTALE E AMBIENTALE

UNIVERSITÀ DEGLI STUDI DI TORINO

Sezione di Meccanica Via Leonardo da Vinci 44 Grugliasco 10095 (TO)
Tel. +39 011 6708590 - fax 6708591
Posta elettronica: stefano.bechis@unito.it

Proposal for a poster to be presented at the 2nd European PV-Hybrid and Mini-Grid Conference of Kassel, 25 and 26 September 2003

TOPIC: n. 6 SIMULATION

FULL TITLE: ALPIWATT 2.0: the innovative solution for the stand alone integrated energy system design

NAME AND ADDRESS: Stefano Bechis, Remigio Berruto, Matteo Robutti - Dipartimento di Economia e Ingegneria agraria, forestale e ambientale, sezione di Meccanica - via Leonardo da Vinci 44 10095 Grugliasco (TO) – ITALY

TELEPHONE: +39 011 6708589 FAX: +39 011 6708591 e-mail: stefano.bechis@unito.it

KIND OF PRESENTATION: POSTER

PURPOSE OF THE WORK: Alpiwatt is a software that helps the design of an independent energy system simulating its behaviour and calculating some economic indexes in a simple and complete way.

APPROACH: This proposed is the second version of Alpiwatt, released in March 2003; the first version was built in the framework of an Italy – France Interreg project in 1996. The software is downloadable from internet (<http://www.regione.piemonte.it/agri/ita/agrienergia/software/index.htm>) in short time thanks to the small dimensions of the installation package, together with the user's manual, and is totally free. It works in all Windows versions, from 3.11 to XP, and is available in three languages: Italian, French, English (French and English via email for the moment, a German version will be ready in May, all the four versions will be downloadable from the web before summer).

METHODS: The operator inputs the forecasted energy requirement of the site under the form of user points and hours of their use, then inputs the available energy sources: solar, as geographically data (latitude, longitude, meters asl) and orientation of captating surface (inclination, orientation); hydraulic, as average waterflow and head, if available. The software calculates the simulated solar radiation on the oriented surface day by day. The operator then inputs the data about the desired RE production plant, integrated if necessary with a motor generator set. Storages, as batteries and a small water storage, if necessary, are inputted. Inverters too. After having inputted all the data, the program starts a simulation. By means of this simulation Alpiwatt checks hour by hour the behaviour of the whole energy system.

RESULTS: Alpiwatt gives as output both energetic and economical results (NPV, IRR), organised in tables or graphs. The results of the simulation and the parameters of the simulated system can be exported to Microsoft Excel. On the basis of Alpiwatt results, the operator can decide whether the designed system is satisfactory or if, on the contrary, some components should be modified. Then the operator can do modifications and start another simulation.

CONCLUSIONS: The new Alpiwatt is the evolution of a software that had already proven effective. It can help in designing independent energy system based on RES in the alpine area as well as elsewhere, like for example an energy supply for water pumping in Africa: in all the cases it has performed its simulations in a precise and reliable way.

