

S.T.E.V.E.N.

Sustainable Technology and Energy for Vital Economic Needs

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N E W S L E T T E R 2 0 1 1

WARM GREETINGS and welcome to the 2011 newsletter of the STEVEN Foundation, Ithaca, New York, USA. Since non-profit incorporation in 1986 we have been working on Sustainable Technologies and Energy for Vital Economic Needs—hence our name.

WORK ON HOUSEHOLD-SIZE WINDMILLS

The Steven Foundation “in-house” activities – as distinguished from Francis Vanek’s activities abroad, are somewhat limited, perhaps affected by the advancing age of one “domestic” worker. Nonetheless, there was enough to do and there are some future expectations or hopes to be mentioned. The principal design and testing activities continued to concern a simple household-size windmill, which could be produced either as a self-help project, or with the assistance of a worker cooperative which could produce and install the mill.

The smaller prototype of some 100 watts – or approximately 3.0 meter rotor diameter -- has been run and tested in winds up to ten miles per hour, with satisfactory power output. We can show some photographs and video of such a small windmill based on the detachable “safety” design which protects the construction from very high winds. But we feel that at this stage it is necessary to produce and test the “real thing”, with a power capacity corresponding to a reasonable household monthly requirement, on the order of up to 200 kilowatt hours. See the accompanying photograph for advances since the 2010 version.

Aiming at this objective, we decided not to double the dimensions of the rotor but increase it only to 1.5 times, that is, a rotor of some five-meter diameter – or exposure to wind of 2.5 m^2 times π , or nearly 20 square meters. With an average wind velocity of slightly over seven MPH, tabulations available from North Dakota State University (Source: http://www.ndsu.edu/ndsu/klemen/Perfect_Turbine.htm) indicate an output of around seven kilowatt-hours per square meter, and for our twenty square meter exposure, a monthly output of around seven times twenty kilowatts, or some 140 kilowatt hours, which is a reasonable approximation of a “modest” household need.

Most of the parts for the 20 square meter exposure are ready or purchasable, including the heavy central rotation and power transmission unit excellently welded by Steven Vanek. The cost of materials –especially when using discarded sails donated by sailing friends – is expected to fall to well under \$1000.

The construction can be handled by the in-house staff of the STEVEN Foundation, except for transportation to and erection at a testing site where assistance of “stronger muscles” is required. But even here we are fortunate to have access to a person who also has the skill of launching a worker cooperative, which could potentially handle the commercial side of the project.



ONGOING ACTIVITIES IN CENTRAL AMERICA

Through work with the Engineers for a Sustainable World organization at Cornell, we continue to have contact with the deployment of solar ovens in Central America, partly with a new project in Costa Rica and partly with a continuing project in Nicaragua.

In the case of Costa Rica, we have started working with a new organization called Cirenas, or “Centro de Investigacion de Recursos Naturales y Sociales” (“Center for the Investigation of Natural and Cultural Resources”), which is located in the Nicoya Peninsula on the Pacific Coast of the country. The goal of Cirenas is to create and sustain a nature preserve on the coast by creating an education center that teaches both Costa Rican and international students about preservation of biodiversity, and also about sustainable development in the surrounding communities of the Nicoya region. Our role is to bring solar ovens and solar cooking to Cirenas, both in teaching how to cook with the sun and how to build solar ovens. We are planning a visit in February 2012 to conduct a workshop on site with Cirenas staff and with a group of students who will be resident at the time.



In Nicaragua, we continue to work with the “Mujeres Solares de Totogalpa” (“Solar Women of Totogalpa”) cooperative and the Grupo Fenix organization from the National Engineering University of Nicaragua, which is based in Managua. The accompanying photo shows two members of the cooperative working on the base of a solar oven. Mujeres Solares is already well established in their center on the Pan-American highway near Ocotal, Nicaragua, so we continue to support them with research on changing the size of the solar ovens to adapt it to different needs, improving the durability of certain components, such as “prop

rods” that support the reflector, and with a collapsible design that will improve portability. This project is now involving between 5 and 15 Cornell engineering students each semester, so it is providing ever broader exposure to the issues of developing renewable energy resources, preventing deforestation, and supporting rural communities. We are grateful to Mr. Tim Bond, director of the structural engineering laboratory in the School of Civil & Environmental Engineering at Cornell University, for his steadfast support for the student research.

As part of our continuing efforts to support Mujeres Solares in 2012, we are conducting a fundraiser – see the enclosed explanation with the paper version or email description sent to recipients of the electronic newsletter for more information.

NOTICES FROM THE FOUNDATION

Aluminized Mylar plastic is still available in moderate quantities, priced at \$1.00 per sq.ft., for reflectors on a solar collector or solar oven. Contact us giving the quantity needed for your project. We will hope to supply it to you.

Documents on technologies developed by STEVEN Foundation are available in two forms: 1: on our website (see the web address above), and 2: by mail inquiry to our Ithaca address. Queries may be sent by email to jv19@cornell.edu, or to our postal address above.