

2012 Nicaragua Trip

2012 Trip to El Centro Solar in Sabana Grande, Nicaragua

Xochitl Cruz, Jocie Kluger, Emma Lejeune, Meghan Hilbert, Alex Huang and Tim Bond (Tim writing) of the CEE3090 Solar Cooker Project visited with our collaborators at [Las Mujeres...](#) and [Grupo Fenix](#) this spring in Sabana Grande during spring break (March 16 through 25). Lee Fritz and Jenna Morse of [Ca Im Dog Productions](#) documented the projects on film. We left Ithaca on Friday night driving to JFK to catch a 6am flight to San Jose, Costa Rica followed by a flight to Managua. [Karen Holway](#), a skilled furniture maker, joined the team in Managua for the third year, lending her considerable skill and talent. The primary intent of the project for this year was to design and build versions of cookers designed for prefabrication and easy shipment. The standard cooker design is 30 inches square (exterior), 12 inches high and weighs roughly 60 pounds. It is an effective cooker, but is not easy to ship, especially with its heavy and brittle double glazed top. Click [here](#) for pictures from our trip.



Our team brought 2 new designs. A major point of the designs was to use materials readily available in Nicaragua and methods the Solar Women already understand. The first cooker used wooden framing, fiberglass insulation and sheet metal typical of the cookers produced at the Centro Solar. This cooker weighed about 50 pounds and used Reynolds cooking bags stretched on thin metal frames instead of glass for the top glazing. Both metal cases were hinged to allow easy folding. The cooker was partially disassembled and packed in a cardboard box which was checked onto the airplane for the trip, to prove its transportability. We reassembled the cooker after arrival in Sabana Grande. The second cooker used interior and exterior sheet metal boxes framed with light aluminum angle stock. The boxes were separated by a layer of fiberglass board insulation. The tops of the two metal cases were tied together by screw connection to a rectangular wooden frame which supported the door/top. The door/top also used cooking bags stretched on thin metal frames as glazing. This cooker weighed approximately 30 pounds and was brought with us inside a suitcase.

[Dr. Lynn Schlager, PE](#), a Professor of Mechanical Engineering at the University of Wisconsin Platteville, who is a collaborator with the Solar Women and has been working with them this spring while on sabbatical leave. He has worked with the Solar women to implement a design by Dr. Richard Komp, a long term collaborator with the Solar Women and Grupo Fenix. Prof. Schlager also built an oven of his own design. These two ovens were designed to use polyisocyanurate insulation board to be light weight and easily fold-able for shipment. They are also easily unfolded or assembled for use.



The Solar women's construction team included Nimia, Alejandra, RamulDAH, Reyna, Yelba and Maria Magdalena. This team is very experienced, having built more than 50 cookers.

The first part of each of our visits is a technical exchange in which all the designs under consideration for the solution of the particular problems being considered are explained in adequate detail for all the team members to understand. Prof. Schlager and Nimia presented the two designs finished or under construction at the Solar Center. We decided to build two new cookers during the week, one essentially implementing the fold-able design with all the materials being readily available in Nicaragua and the second using the lighter of the Cornell designs with lower sides than our design and the door on the top. There were enough workers to allow construction of a solar dryer as well. We split into 3 construction teams mixing members of the various source teams to include people with relevant expertise on each team with members from all groups so as much learning was transferred as possible.

The fold-able cooker was built by Reyna, Yelba, Maghan, Jocie and Tim. The cooker with the door on the top was built by Lynn, Alex, Nimia and Maria Magdalena. The dryer was built by RamulDAH, Alejandra, Emma, Xichotl and Karen. All three were finished by Friday and all included some experimental features that will need observation during the first few months of use.



Muchas gracias from all of us to Lyndsey Chapman of Grupo Fenix who organized our visit and took incredibly good care of us.

Muchas gracias to Susan Kinne for her incredible vision and energy which she has put to effective work with Las Mujeres Solares de Totogalpa, Grupo Fenix and La Montaña Solar.