



Fueling the Future

► Maximizing fuel conservation with the Integrated Cooking System.

By Patricia McArdle, Member, Board of Directors, Solar Cooker International

EVERY 40 MINUTES, ENOUGH solar radiation hits our planet to meet all of Earth's energy needs for a full year. Despite this abundance of free energy pouring down from the heavens, respiratory diseases from smoky kitchens still cause the premature deaths of almost 2 million women and children every year. The development community can no longer ignore the power of the sun to perform the simple task of cooking food and heating water for the 1 billion people who live in sun-drenched and fuel-starved parts of the world.

The UN Foundation and the Shell Foundation have recently announced plans to spend more than \$100 million over the next five years on the Global Alliance for Clean Cookstoves. The goal of this project is to bring clean cooking solutions to the 500 million households still cooking over wood, dung and charcoal by supporting the development and distribution of fuel-efficient biomass stoves. The project as currently conceived does not include solar cookers or retained heat cooking containers, which can extend the cooking power of both solar cookers and fuel-efficient stoves.

The inclusion of integrated cooking systems would dramatically increase the ability of this

initiative to reduce biomass fuel consumption and pollution from indoor cooking smoke. An integrated cooking system (ICS) offers the most complete and efficient use of three simple devices to minimize the consumption of combustible fuel.

The first principle of ICS is to always use free solar thermal energy when the sun is shining by employing one of the many solar cooking devices available to bake, boil or fry food. The second is to use scarce combustibles in fuel-efficient stoves only after dark and on cloudy days. The third is to enhance the efficiency of both cooking devices with the use of retained heat cooking containers (boxes or baskets stuffed with straw, grass, leaves, crumpled newspaper, cotton or wool, which surround and insulate the hot pot of food and continue the cooking process for several more hours using no fuel at all).

Wilfred Pimintel, a California Rotarian, pioneered the integrated cooking concept. He has organized and led integrated cooking workshops around the world in partnership with prominent fuel-efficient stove experts like Ken Goyer and Larry Winiarski. The use of ICS can reduce by half again the already

substantial fuel savings accomplished by energy-efficient biomass stoves. Its promotion puts an end to the often-heard refrain that "solar cooking isn't viable because you can't cook when there is no sun." With ICS people can cook anything, any time of the day or night using the least possible amount of fuel.

In the 1980s Barbara Kerr of Arizona and her neighbor Sherry Cole designed a cardboard box cooker "kit" that could be built at home. In the late 1990s, French scientist Roger Bernard built the first collapsible, low cost, solar panel cooker (made of cardboard and aluminum foil). Kerr and members of California-based Solar Cookers International refined Bernard's design and the Cookit was born. This inexpensive device weighs less than one pound, folds into a 12 x 12 inch square for easy storage and transport and cooks at 250 degrees F. Tens of thousands of Cookits are being used along with fuel-efficient stoves and retained heat cooking baskets in Chad, where the world's largest privately funded solar cooker project run by Tchad Solaire employs ICS to dramatically reduce trips by Darfur refugee women outside their camps to search for firewood.

In Bolivia, the Centro de Desarrollo en Energia Solar (CEDESOL) teaches campesina women how to build solar box cookers and use them as part of an integrated cooking system. The Barli Development Institute for Rural Woman in Indore, India, uses a large-scale version of integrated cooking to feed the several hundred female students living at the institute. Meals are prepared in clean, smoke-free kitchens using concentrated sunlight from several large Scheffler reflectors on a terrace outside. On rainy days the girls cook over large fuel-efficient wood stoves.

All cooking at the Institute is done during the day with solar cooked food kept hot for evening consumption in large, wooden, retained heat containers. Using this system, the Institute is saving thousands of dollars each year on cooking fuel. They no longer need to cut down trees on their property since they can obtain sufficient wood by collecting only dead and fallen branches. Best of all, these students, who work in their clean, smoke-free school kitchen, will some day take the integrated cooking concept back to their villages. **MD**

The author's novel, Farishta, about a female diplomat who introduces solar cooking to refugees and nomads in northern Afghanistan, will be published in August 2011 by Penguin Books.