A thermosyphon heat transport device for novel solar cooking

November 19 2021, by David Bradley

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Much of the developed world is focused on the conversion of natural resources, such as sunlight, wind, the turning of the tides, waves, and other phenomena into electrical power. However, conversions require

sophisticated equipment to allow a device to harness energy from the sun or the wind, for instance, and generate a usable current that can then be used to power another device or charge a battery. Moreover, any energy conversion comes with inherent losses at each stage of the process, which reduces overall efficiency.

Sometimes, a more effective approach to garnering a sustainable energy supply is simply to tap the energy source directly as is the case with rooftop water-heating systems. Similarly, there is no need to convert sunlight into electricity to power a cooker if the sunlight is bright and strong enough to be focused with a parabolic reflector on any food that is to be cooked.

As such, solar cooking is very much a viable zero-carbon and low-pollution option where gas heating or electricity supply is not necessarily available and burning wood would be the usual option in that place. Unfortunately, in rural India, firewood and liquefied petroleum gas (LPG) cooking are widespread and both can lead to alarming levels of indoor pollution as well as producing large amounts of the greenhouse gas, carbon dioxide. More than three-quarters of households use firewood in rural India and just under one in ten use LPG.

Writing in the *International Journal of Global Warming,* a team from the Renewable Energy Center at Manipal Academy of Higher Education in Manipal, Karnataka, India, explain their design of a novel solar cooking—a thermosyphon heat transport device. Their system works far more efficiently than a simple closed thermosyphon. Coupled with a hob-top parabolic dish reflector, the new design allows highly efficient solar-powered cooking and if adopted widely might bite into millions of tons of carbon dioxide emitted by cooking with firewood or LPG.

Of course, such a solar-powered cooking system can only be active during daylight hours when the sun's intensity is sufficient to generate

enough heat in the pan.

More information: Varun et al, Role of solar indoor cooker with natural circulation in mitigation of carbon emissions, *International Journal of Global Warming* (2021). DOI: 10.1504/IJGW.2021.119011

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