



# project surya

Fighting Climate Change Now

*Mitigating air pollution and climate changes from residential biomass combustion*

## Core Organizations

*Scripps Institution of Oceanography,  
University of California, San Diego*

*United Nations Environmental  
Programme*

*The Energy Resources Institute  
New Delhi, India*

*NexLeaf Analytics*

## Participating Organizations

*Department of Family and  
Preventive Medicine, UCSD School of  
Medicine*

*University of Iowa, Iowa City*

*University of Nairobi, Kenya*

*African Center for Technology  
Studies, Kenya*

*Department of Environment,  
Bangladesh*

*Dhaka University, Bangladesh*

*Alternative Energy Promotion  
Center, Nepal*

*National Environment Commission,  
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*For immediate release, November 09, 2012*

## **Project Surya: Carbon Credit Pilot Project (C2P2)**

**Project Surya ([www.projectsurya.org](http://www.projectsurya.org)) is now embarking on a major pilot project to explore if rewarding women directly with funds from carbon markets, for using improved stoves, will significantly enhance adoption.**

Improved stoves, which significantly reduce smoke indoors and outdoors, are currently too expensive. Improved solid-fuel, biogas and solar stoves are available on the market, but typically range from \$50 to \$90 USD. This is not affordable for the more than 2.5 billion people living under \$2 a day, who are currently forced to use primitive traditional cooking methods. Making matters worse, once distribution, maintenance and fuel supply are taken into account, the actual cost of the stoves increases further. A new approach is needed.

***The Surya Approach:*** Project Surya believes that carbon markets can and should provide sufficient funds for subsidizing the purchase of cook stoves. By channeling these funds directly to women they can figure out how best to sustainably adopt and maintain these new technologies.

To make this dramatic shift possible, Project Surya is exploring how to include Short Lived Climate Pollutants (SLCPs) including black and brown carbon, ozone producing gases (carbon monoxide and VOCs) and methane into carbon credit calculations. Preliminary estimates suggest that the potential for each cook stove to mitigate climate change is dramatically larger when taking SLCPs into account. This is because the climate change mitigation brought about by each cook stove's reduction in SLCPs may be much larger than that calculated with CO<sub>2</sub> alone. If this is borne out by the new Surya data, climate credits that include SLCPs could trade at higher prices, and radically change the game.

***What is new about Surya's Carbon-Credit Pilot Project (C2P2)?***

- First, Project Surya will use real-time cellphone based field data to affordably and scalably develop climate finance credits for not only the avoided-CO<sub>2</sub> emissions (as is currently done), *but also for mitigating emissions of short-lived climate pollutants (SLCPs) such as black carbon, ozone and methane.* One of the main objectives of C2P2 is to quantify

*emissions of short-lived climate pollutants (SLCPs) such as black carbon, ozone and methane.* One of the main objectives of C2P2 is to quantify the combined effects of CO<sub>2</sub> and SLCPs. We are developing methodologies for estimating the climate gains from reductions in emissions from cook stoves for SLCPs and carbon dioxide (CO<sub>2</sub>). Use of the stoves, fuel consumption and pollutant emissions will be documented using innovative and transformative wireless technologies using cell phones.

- Second, Project Surya will distribute the funds from climate credits directly to the participant women (through local rural banks), instead of the stove distributors or manufacturers.

We believe a confluence of issues will make this new approach possible. First, there is global interest in attaining mass-scale stove adoption, indicated by initiatives like the Global Alliance for Cookstoves formed by the United Nations Foundation under Secretary of State Clinton's leadership. Second, a growing body of scientific evidence is demonstrating the impacts of Short Lived Climate Pollutants, in addition to those well known by carbon dioxide (CO<sub>2</sub>), on climate warming. It turns out that annual emissions of these pollutants from burning solid fuels indoors, including in primitive cook stoves, are a major contributor to global warming. These pollutants also have grave human impacts, causing over 2 million deaths, tens of millions of dollars in crop damages, the melting of glaciers in the Himalayas/Tibetan region, and disruption of rainfalls.

### *Implementation*

Since 2010, Surya has completed pilot projects in India and Kenya on the scientific and technological aspects of cook stoves, pollutant emissions, human exposure and climate forcing. The C2P2 will be started initially in about 1000 homes located in the Indo-Gangetic Plains of India. We have identified a major rural bank for issuing low-interest loans to women participating in C2P2. Each participating woman will have a bank account. The Surya team will collect data on air pollution levels (indoor and outdoors), compliance (use of improved cook stoves) and fuels (types and amounts used). The data will be used to estimate climate credits in two ways: One is to use the literature values for climate effects of SLCPs and stove emissions to derive the conventional Reference Climate Credits (RCC). The second is to make new estimates that are consistent with Surya data to calculate the Surya Climate Credits (SCC). The credits will be converted to dollars/rupees using current rates, and distributed equally between the bank (to repay loans) and the women (to support increased adoption). The pilot phase is expected to run for about 18 months, and will last until the bank is paid off.

Project Surya will follow two distinctive pathways:

- *The Surya Pathway:* This pathway will adopt the climate credits derived from Surya data. Given its drastically different nature, in the short term it will likely not be accepted, neither by the compliance market (CDM), nor the non-compliance market (VCS). However, the methodologies and the protocols established by Surya's C2P2, will enable the CDM and the VCS markets to formulate a pathway of their own. All of C2P2s data protocols and conversion algorithms will be provided to these markets.
- *The VCS Carbon Credit Pathway:* In parallel, we will adopt literature published values and will initiate the process for applying to the voluntary carbon registry.

While waiting for market acceptance, to move forward, we have created the ***Surya Climate Mitigation Fund*** to be administered via the Scripps Institution of Oceanography at the University of California-San Diego to distribute equivalent carbon credits to the pilot project participants. It is estimated that C2P2 for 1000 homes will cost about \$125,000 including cost of the stoves and data collection and protocol developments. Donations of all sizes are needed and very much welcomed, please visit <<http://www.projectsurya.org/>> for information.