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Fighting Climate Change Now

CLIMATE CREDIT PILOT PROJECT

C2P2

C2P2 McQuown5000

First Roll Out of C2P2 Stoves in 5000 Homes: C2P2_McQuown5000

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Core C2P2 Institutions

The Energy and Resources Institute

UCSD

NEXLEAF ANALYTICS

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Mac and Leslie McQuown

UNEP

UKaid from the British people

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Goal of C2P2

The primary goal of C2P2 is to evaluate if rewarding women directly with micro-funds generated from carbon markets for using improved stoves and solar lighting will significantly enhance women's ability to sustain adoption of these energy efficient technologies.

The secondary goal of the project is to develop a source of revenue from the carbon market that is sufficient to make this micro-payment model self-sustaining and scalable. In order to develop this sustainable model, we have developed a new methodology that awards climate credits for reductions in non-carbon dioxide climate pollutants (including black carbon), in addition to reductions in carbon dioxide (CO2) for the use of improved cookstoves. By accounting for reductions in non-CO2 climate pollutants, along with reductions in CO2, each household can more than double the financial returns generated from a carbon market, thereby creating sufficient reveue to sustainably scale up the C2P2 model.

Conceptual Framework of C2P2

Please see C2P2 Booklet (Rehman et al, 2013). The booklet, along with more information about our work can be obtained at www.projectsurya.org (Project Surya) and http://cleancooking.org (C2P2 more specifically).

Specific Objectives Of C2P2

C2P2 will explore and demonstrate the efficacy of climate credits for incentivizing uptake and sustained usage of improved cookstoves. The specific objectives are as follows:

- Develop and field-test the mechanisms for linking climate credits with bank credit to users.
- Evaluate the accelerated uptake and sustained adoption based on climate credit incentives.
- Develop and field-test a scalable and sustainable method for monitoring the usage and calculating the avoided CO2 emissions and reduction in SLCPs emissions using cell phone based sensors.

What is C2P2_McQuown5000?

The first roll out of 5000 stoves under the C2P2 initiative, called C2P2_McQuown5000, will be launched in April, 2014 in India. A donation from the Mac and Leslie McQuown foundation made this launch possible. C2P2_McQuown5000 will be initiated in selected areas districts in the Indo-Gangetic Plains, the densest and most polluted region in India; and in one area in the

neighboring Indian Himalayas where glacier melt is most important. Specific sites will be in the states of Uttar Pradesh, Bihar, Odisha and Himachal Pradesh. It is a two-year project. C2P2 targets deployment of 2,500 stoves by the end of Year 1 of the project and another 2,500 by end of first quarter of Year 2 of the roject.

Only improved cookstoves, proven to significantly reduce fuel consumption as well as emissions of key pollutants will be used. This includes induction stoves, TERI's forced draft improved biomass cookstove with stainless steel interior, and TERI's forced draft single burner and double burner improved cookstove with mud exterior. The schematic for the enrollment of women and distribution of funds is detailed in the C2P2 Booklet (Rehman et al, 2013).

Measurable Impacts

The expected results of C2P2_McQuown5000 are summarized below:

- Each woman can cut down up to 5.3 tons of CO2 equivalent emissions, thereby generating up to 5.3 climate credits each year, if she uses one of the improved cookstoves recommended by the C2P2 project for all her cooking needs. This break down includes:
  a. Annual mitigation of 1.8 tons of CO2 from avoided biomass burning from non-renewable sources for each stove used.
  b. Annual mitigation of 3.5 (1.5 to 5.9) tons of equivalent CO2 due to mitigated emissions of black carbon, organic carbon, and ozone precursor gases (also called non-CO2 climate pollutants). The estimate is based on a 40-year timeframe for translating the impact of black carbon into CO2 equivalents, and also takes into account potential scattering by organic carbon.
- Each woman will therefore generate climate credits valued at up to $32 a year (using a conservative valuation of $6/ton of CO2e), thus contributing to the sustainability of her family and that of the planet through not only accelerated uptake but

sustained adoption of the stoves. Furthermore, in approximately two years, the user will be able to recover almost the entire cost of the stove.

- Assuming that the 5000 homes use the improved stoves for the full five-year life time of the stove, the mitigated global warming by C2P2_McQuown5000 will be about 133,000 tonnes of CO2e. We are aware of the problems in equating non-CO2 pollutants with CO2 due to huge differences in life times of CO2 and non-CO2 pollutants and until an alternate terminology is accepted by the community we are restricted to use the CO2e terminology.

Co-Benefits: In addition, C2P2 has significant impacts in terms of health, development, and agriculture. The Global Burden of Disease (2012) estimates that about a million lives are lost each year from household air pollution in about 150 million homes using mud stoves. Hence, 33 deaths a year can be attributed to mud stove usage for every 5,000 households. As 5,000 stoves are deployed under C2P2, assuming a life time of 5 years for each stove, 150 lives may be saved. In addition to the above, women and children spend hours collecting fuel. The Surya FD stove reduces fuel consumption by a factor of two, significantly reducing the burden on women and children. Mitigation of emission from residential biofuel combustion is also expected to improve agriculture productivity (UNEP-WMO 2011), stabilize rainfall patterns (Ganguly et al, 2012) and prevent glacier melting (Ramanathan et al, 2007; Menon et al., 2010) to an extent.

New C2P2 Methodology for Valuating, Validating, and Rewarding Reductions in Non-CO2

A detailed description of the methodology, analyses and model calculations that justify the climate credit estimates above are given in Ramanathan et al (2014) which is under review but can be shared with a limited group as appropriate. The executive summary of this C2P2 methodoldogy document is given in Rehman et al (2014; www.projectsurya.org and http://cleancooking.org). This new C2P2 methodology, for the first time, integrates all of the available simulated data on climate forcing of black carbon, organic carbon and ozone with field data collected by Surya to estimate the climate credit for both CO2 and non-CO2 climate pollutants. As a result, the methodology can be used to robustly estimate the total climate credits to be awarded to an individual household for use of an improved cookstove.

Climate Mitigation Fund: In order to administer the climate credits, Project Surya has created the Surya Climate Mitigation Fund

at the Scripps Institution of Oceanography at the University of California at San Diego and TERI, New Delhi. This fund, subscribed by the McQuown donation, will be used to reward customers who purchase and use improved biomass cookstoves. Valuation of climate credits will be based on estimates by a voluntary carbon registry. Funds from the Surya Climate Mitigation Fund will be deposited in each participant's bank account through participating banks.

Cell Phones for Monitoring and Evaluation Data : Rigorous monitoring and evaluation is essential for the success of C2P2_McQuown5000. Mitigation of CO2 and short-lived climate pollutants per stove will be estimated using individual-home data on hours of usage, energy efficiency, fuel use. Cell phone based data collection and thermal sensors placed in stoves will figure prominently in the evaluation. The cell phone enabled sensors are used as a scalable method for monitoring compliance. Cell phone enabled sensors will be used to wirelessly upload data to the C2P2 server on usage of improved cookstoves and on estimates of the fuel consumed.

Governance: In order to build a sustainable model for transferring and monitoring funds that are part of C2P2, participants will be organized into self-help-groups (SHGs) of 5 to 20 households. The SHGs will obtain a loan (for those who need it) from a government approved bank participating in the pilot for each individual to purchase a cook stove. Loans will be repaid in part from funds received from the Surya Climate Mitigation Fund. Village panchayat (governing body) chiefs and other community leaders will be involved to motivate the participants to adopt the new cookstove, guide the administration of the project, and to ensure fidelity of reporting by participants.

Transparency and Ouput Evaluation: A major focus will be to develop verifiable and internationally acceptable protocols for SLCPs mitigation and to register Surya-C2P2 in open voluntary carbon registries in the USA and European Union by the end of Year 1. An internationally recognized and independent voluntary carbon registry and accreditor/auditor will be brought in to ensure transparency and legitimacy of the entire process. In addition, an international group of renowned academics and social entrepreneurs will be brought in as part of an International Oversight Committee to guide the C2P2 team. Finally, The climate credit methodology and field results will be:

- Published in top-tier peer-reviewed journals.
- Sent to accredited climate credit agencies in the voluntary carbon market for verification and validation.

- Submitted to the United Nations Environment Program for wide spread dissemination of the findings.

Lead Institutions

The core institutions for C2P2 are Scripps Institute of Oceanography at University of California San Diego, The Energy and Resources Institute (TERI) at New Delhi, and Nexleaf Analytics at Los Angeles.

Scripps Institute of Oceanography at UCSD

Role: Lead for Science, policy and outreach.
Website: http://ramanathan.ucsd.edu/

The Energy and Resources Institute at New Delhi

Role: Lead for technology, field deployment and distribution of climate credits through the rural bank and co-lead in science and climate credit analysis.
Website: http://teriin.org

Nexleaf Analytics

Role: Lead in climate credits analyses, wireless sensor technology development for climate credits, and in accreditation of climate credit methodology.
Website: http://nexleaf.org

The Surya project has been incubated by UNEP sponsorhip.

International Advisory Committee for C2P2_McQuown5000

Dr. Margaret Leinen (Director, Scripps-UCSD, Chair)
Mr. Mac MCQuown
Dr. R K Pachauri (Director General, TERI)
Mr. Bhola Prasad (Chairman, Kashi Gomti Samyut Gramin Bank)
Dr. R Sullivan (Dean Rady School, UCSD)

Partners in C2P2_McQuown5000: C2P2 is a collaborative project spearheaded by The Energy and Resources Institute (TERI) and TERI University at New Delhi, India; the University of California at San Diego at La Jolla, California; and NexLeaf Analytics of Los Angeles, California. It has dozens of participating instiutions from around the world including the ABC_Asia project. C2P2 will be dovetailed with ongoing cook stove activities of the Government of India and the India program of the Department for International Development (DFID), UK government at TERI. C2P2_McQuown5000 relies on infrastructure, data and instruments that were funded by the United Nations Environment Program (UNEP), Qualcomm Inc, US National Science Foundation EAGER Program, Alderson and Vetlesen foundations. C2P2 has cooperative agreements with Regional

Rural Banks and micro-finance institutions in India including the Kashi Gomti Samyut Gramin Bank.

Documents Available Upon Request

- C2P2 Booklet describing the C2P2 approach (Rehman et al., 2014)
- Executive Summary for C2P2 methodology (Rehman et al., 2014)
- C2P2 methodology for valuating, validating, and rewarding reductions in non-CO2 emissions (Ramanathan et al., 2014)