OPEN LETTER

Experts challenge misguided criticism of clean cookstoves funding

Cookstove experts are calling out recent research on 'Cookstoves Offset Methodologies' as misguided and threatening to critical funding for clean alternatives to solid fuel stoves – affecting the health and lives of 2.3 billion people.

4 September 2023

The undersigned researchers and experts on energy poverty and improved cooking in low-income countries are writing to 1) express methodological concerns about a recent publicly posted document entitled "Cooking the Books: Pervasive Overcrediting from Cookstoves Offset Methodologies" by Annelise Gill-Wiehl, Daniel Kammen, and Barbara Haya of University of California, Berkeley (hereafter referred to as Gill-Wiehl et al., 2023) and 2) call for the funding of primary and unbiased research on the climate and social impacts of the growing field of climate-financed improved cookstove projects. Our collective expertise from designing, implementing, monitoring, and researching cookstove projects across Africa, Latin America, and Asia informs these comments.

Kindly note that the technical substantiation for the following concerns can be found below the signatories of this letter.

Key Concerns:

1. **Unsubstantiated Assumption:** The authors rely on the unsubstantiated assumption that the design, target population, and performance of cookstove projects in the academic literature selected by the authors are representative of the design, target populations, and performance of cookstove projects financed by carbon offset credits. This assumption is incorrect.

2. **Incomplete and Selective Review of the Academic Literature:** The minimum and maximum values input into the Monte Carlo Analysis (a mathematical technique that predicts possible outcomes of an uncertain event) determine the findings of the analysis. A cursory review found relevant findings of highly regarded research[1] outside the figures considered in the Monte Carlo Analysis, the entire range of which is typically included in this Analysis. These omissions suggest a fundamental problem with the paper inputs and the limitations of a Monte Carlo Analysis in this context.

3. **Unrepresentative Sampling of Carbon Cookstove Projects:** The sample of cookstove carbon projects was first constructed by selecting the largest projects by quantity of credits produced in certain countries – an attribute which is correlated with higher per-stove crediting. Accordingly, this method of sample selection introduces a selection bias into an analysis that claims to arrive at findings representative of the entire carbon cookstove market. A second version of the paper obscured the selection methodology

as "purposive." Because carbon financed cookstove projects are not adequately similar to the cookstove projects in the academic literature selected by the authors, even a comparison to 100% of cookstove carbon projects wouldn't allow meaningful inference. The opaque sampling methods, applied by researchers who understand sampling bias, raise concerns about the integrity of the analysis.

4. **Conflict of Interest and Possible Bias:** We also note that financing for the analysis was provided by The Better Cooking Company, a venture-backed company seeking to create carbon credits on a type of stove project[2] which the authors favor and call on to be "prioritized." Carbon Direct, a New York-based company, is also listed as a funder of Dr. Haya. Carbon Direct's business focuses on selling carbon removal credits that compete with carbon reduction credits, such as those from cookstove projects. The authors disclose The Better Cooking Company was offered an opportunity to review the document prior to its publication.

In striving for the advancement of knowledge and the betterment of the world's marginalized cooks, the cookstove community places immense value on accurate and well-founded research. The methodologies employed by climate-financed projects in the cookstove domain have been rigorously scrutinized and enriched through extensive peer reviews and the contributions of scientific experts across numerous years and continue to improve. In fact, significant progress has been made by the Clean Cooking and Climate Consortium (4C)—a group of partners convened by the Clean Cooking Alliance—to use modern science to build upon past methodologies for clean cookstove projects.[3]

The paper in question coherently summarizes many of the issues of ongoing discussion within the cookstove community, particularly concerning the improvement of fuel carbon intensity and the use of United Nations approved fNRB (fraction of non-renewable biomasses) assessment methods and charcoal-to-wood ratios, both of which are presently undergoing comprehensive evaluations at various levels. These discussions underscore the need for more profound analyses and untainted primary research, which can subsequently refine and enhance the methodologies employed.

It is important to reiterate for the carbon offset community that the development of improved methodologies and deployment strategies is rooted in the desire for good public health and environmental science and, ultimately, to empower disadvantaged individuals with efficient and smoke-free cooking solutions that also have a climate impact. In light of this, the significance of meticulous research cannot be overstated.

However, concern arises when evaluating the conclusions drawn by Gill-Wiehl et al., 2023. These conclusions rest upon an examination of academic literature that has omitted the examination of substantial subsets of carbon cookstove projects. The potential bias in the selection of the sample, the reference studies, and Monte Carlo inputs, and the clear absence of a well-rounded review and consideration of existing literature further undermine the integrity of the study's findings. Moreover, the study has received funding from parties with vested interests in the results of the author's findings and clear conflicts of interest, raising concerns about the intentions of the study. Such an approach not only veers away from objective truth but diminishes the credibility of the study itself. As a community committed to meaningful progress, it's crucial that we uphold rigorous research standards and embrace a spirit of transparency and inclusiveness.

[1] Ruiz-Mercado et al. 2013. "Quantitative Metrics of Stove Adoption Using Stove Use Monitors (SUMs)". Biomass and Bioenergy 57: 136-148.

[2] https://registry.goldstandard.org/projects/details/3373

[3] https://cleancooking.org/cca-led-clean-cooking-climate-consortium-makes-significant-progress-in-developing-clean-cooking-carbon-methodology

Signatories

Ivan Hernandez, CEO
SAJOMA Technical Consulting

Colum Muccio, Development Director, *ARCAS*

Hesbon Nyangena, Manager, Carbon Project Development, *Biolite*

Joseph Ndemere Arineitwe, Owner. *Centre for Integrated Research and Community Development (CIRCODU). Assistant Lecturer, Faculty of Technology at Makerere University*

Rohit Lohia, Director
Climate Secure

Maureen Tsodzo, Country Manager, Zimbabwe,
Peris Ruru, Country Manager, Kenya
Alfred Adjabeng, Country Manager, Ghana
CQuest Capital

Harish Anchan, Managing Director
Earthfit Solutions

Moreen Akankunda, Country Director
Impact Carbon

Deep Gupta, VP – Carbon Business Development
OYU Green

Emilia Mendoza, Founder and Director
Proyecto Mirador

Sandeep Roy Choudhury, Director
Value Network Ventures Advisory Services Pvt. Ltd.

Technical Comments:

1 The authors rely on the unsubstantiated assumption that the design, target population, and performance of cookstove projects researched in literature is similar to the design, target populations, and performance of cookstove projects financed by carbon offset credits. This assumption is incorrect.

The financing structure of carbon offset-based cookstove projects is fundamentally different from cookstove projects that are donated by NGOs, implemented for research purposes, or deployed by governments. Specifically, cookstove carbon projects receive funds based on the quantity of emissions reduced, as estimated by the underlying methodology. In contrast, projects deployed with grant-driven objectives or research objectives (often to test health benefits) are typically not structured to reach users with the highest baseline fuel use, don't target areas and fuel types with dirtier fuels (e.g., high fNRBs), often don't target users most likely to use the stoves, and often don't support usage programs such as warranties that seek to maintain project performance.

This distinction is important because the authors' methodology compares carbon-financed cookstoves to cookstoves studied in the literature that are typically donated by NGOs, implemented for research purposes, or deployed by the government without an explicit focus on reducing GHG emissions. To our knowledge, the academic articles referenced by the authors have few, if any, carbon-financed cookstoves in their samples. As one example, the authors rely on Shankar et al. (2020) to estimate stacking rates, although Shankar et al. (2020) does not include any carbon-financed cookstoves.[4]

4 Shankar et al. 2020. "Everybody Stacks: Lessons from Household Energy Case Studies to Inform Design Principles for Clean Energy Transitions". Energy Policy.

The authors say they have "no reason to believe" that the performance of carbon cookstove projects would differ compared to cookstove projects studied in the literature and that "if anything" the cookstove projects studied in the literature "likely represent the higher end" of performance. They attribute this potentially superior performance to "highly engaged" researchers who likely improved adoption and usage rates for cookstoves studied in the literature. However, the authors fail to present any research on the extent of engagement by carbon cookstove practitioners in maximizing cookstove performance. The authors further do not account for the fact that program design elements, such as the intentional targeting of stove users with higher propensity for adoption and usage, are drivers of cookstove carbon project performance unrelated to "engagement", which is not well defined in any case.

Based on our technical expertise and extensive experience, we put forward additional examples below of "highly engaged" practices from carbon cookstove developers. We note that many projects in the literature do not have the features that we discuss below. Because of these and other examples, carbon cookstove projects clearly differ from the sample selected by the authors to represent the literature.

The lack of comparability between carbon-financed cookstoves and cookstoves studied in the literature means that the underlying methodology employed by Gill-Wiehl et al. (2023) is inappropriate. It is not plausible to assume that the performance of carbon-financed cookstove projects can be directly compared to values identified in a literature review of cookstove projects that are not financed by carbon offsets. To appropriately research the performance of carbon-financed cookstoves, it would be necessary to make a technical advancement that goes well beyond a simple literature review.

a. Example #1: Frequent Follow-Up Surveys

Some carbon supported cookstove projects within the authors' sample pay and train locals to monitor and survey cookstove adoption, usage, and stacking. These surveys have been shown to improve performance. For example, Wilson et al. (2016)[5] find that a simple follow-up survey, like those used in many carbon cookstove projects, significantly increased adoption by "converting 83 percent of prior non-users to users with average daily adoption of 1.7 cooking hours over 2.2 meals." Wilson et al. (2016) finds that using these simple-follow up surveys achieved an adoption rate of 71 percent, 6 percentage points beyond the apparent maximum value assumed by Gill-Wiehl et al. (2023).[6] As a result, the validity of the adoption rate distribution used in the Monte Carlo Analysis performed by Gill-Wiehl et al. (2023) shows underlying unrepresentative reference selection.

b. Example #2: Regular Household Trainings

At least one project within the authors' sample requires educational instruction on stove use and maintenance for households at implementation and construction and then follow-up trainings at three-, six-, and twelve-month intervals. This level of effort is above and beyond the typical practice for cookstove projects that rely on donations, grants, or subsidies.

2 Incomplete Review of the Academic Literature Used to Inform Monte Carlo Analysis Inputs and Possible Bias in Selection

The minimum and maximum values selected for input into the Monte Carlo Analysis determine the findings of that analysis. A cursory review revealed relevant research findings of highly regarded researchers outside the ranges considered in the Monte Carlo Analysis that suggest a possible problem with the paper inputs. In one example, the authors appear to omit research by some of the leading researchers in the field of clean cooking. Omitted research indicates usage or adoption rates beyond the maximum values used in the Monte Carlo Analysis performed by Gill-Wiehl et al. (2023). For example, Ruiz-Mercado et al. (2013)[7] finds a combined adoption and usage rate exceeding 80 percent, which is above the maximum value of adoption rates, usage rates, and a combined adoption and usage rate (which we calculate as 65% * 85% = 55%) asserted by Gill-Wiehl et al. (2023). Additionally, as

5 Wilson et al. 2016. "Measuring and Increasing Adoption Rates of Cookstoves in a Humanitarian Crisis". Environmental Science & Technology 50(15): 8393-8399.

6 It is possible that Gill-Wiehl et al. (2023) would classify this as a usage rate rather than an adoption rate. It is difficult to discern because the underlying reference for usage rates seem to be incorrect. That reference is as follows: Jueland et al. 2018. "The Need for Policies to Reduce the Costs of Cooking in Low Income Settings: Implications from Systematic Analysis of Costs and Benefits". Energy Policy 121: 275-285.

7 Ruiz-Mercado et al. 2013. "Quantitative Metrics of Stove Adoption Using Stove Use Monitors (SUMs)". Biomass and Bioenergy 57: 136-148.

previously mentioned, Wilson et al. (2016) estimates an adoption rate that exceeds the maximum value asserted by Gill-Wiehl et al. (2023). These quickly identified exclusions raise the possibility of a greater problem within the study: systematic bias in the selection of references used to inform the Monte Carlo Analysis. Given the conflict of interest and bias concerns, an independent and unbiased third party would need to independently build a reference set and selection of input distributions to test the replicability of the author's findings. This would require a detailed assessment of the selection and use of academic paper references to inform MCA input distributions.

As another example of the incomplete review of the academic literature, Berkouwer and Dean (2022) found a negligible rebound effect in their randomized control trial of a cookstove project in Kenya. However, Gill-Wiehl et al. (2023) uses five pieces of literature (three remarkably from the same project) to imply an additional 22 percent over crediting for projects that do not require a kitchen performance test, ignoring relevant reference research.

3 Unrepresentative Sampling of Carbon Cookstove Projects

The authors' first version of the submitted paper indicated that the sample of cookstove carbon projects was constructed by selecting the largest projects by quantity of credits produced in certain countries. The quantity of credits produced is correlated to higher per-stove crediting. Accordingly, this method of sample selection would introduce bias into an analysis that claims to arrive at findings representative of the entire carbon cookstove market. An updated version of the paper states a "purposive" selection process without detailing how the sample was chosen or how similar the sample is to the first version of the paper's selection methodology which obscures the author's underlying methods. Though the description of sampling methodologies changes, both paper versions state the sample covers 37% of the market, suggesting the sample may be substantially similar. Because carbon financed cookstove projects are not adequately similar to the cookstove projects in the academic literature selected by the authors, even a comparison to 100% of cookstove carbon projects wouldn't allow for the claimed inference. Therefore, the sampling methods, applied by researchers who understand sampling bias, raise concerns about the integrity of the analysis.

Conflict of Interest and Possible Bias:

We also note that the research was funded by The Better Cooking Company, a venture-backed company selling "forced-draft pellet stoves" described by Gill-Wiehl et al. (2023). Remarkably, the authors call for "prioritizing metered fuel switch projects" as they are "most aligned with [their] estimates, have the greatest abatement potential." This recommendation could directly benefit The Better Cooking Company, which has applied to Gold Standard to generate carbon credits from metered fuel switch projects. Concerningly, according to the pre-print version of the article, The Better Cooking Company's leadership provided comments on a draft of the manuscript. The authors also state that Matthias Olsen, the CEO of Emerging Cooking Solutions which also distributes pellet stoves, reviewed a draft of the paper.

In addition, a New York-based company, Carbon Direct, is listed as a funder of Dr. Haya. Carbon Direct's business focuses on selling carbon removal credits that compete with carbon reduction credits, such as those from cookstove projects.[8] In addition, Dr. Haya has written a number of academic papers criticizing voluntary carbon market projects and has publicly stated her opposition to the concept of carbon credits.[9]

8 https://www.carbon-direct.com/solutions-remove
9 https://www.ecowatch.com/carbon-offset-market-dubious-credits.html