

## Project Developer Forum Response to Claims of Over-Crediting from Cookstove Methodologies

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This document highlights shortcomings in the Gill-Wiehl et al. 2024 literature review titled “Pervasive over-crediting from cookstove offset methodologies.”

Research indicates that 2.3 billion people lack clean fuel or a clean, fuel-efficient device for cooking, leading to severe impacts on the climate and environment, public health, and economies. Improved cookstoves provide tangible benefits to local economies and the environment, especially among households across the Global South where women and children are often responsible for cooking.

Robust financing is the key to addressing this global problem. The positive impact of cookstoves indicates a desperate need for sustainable financing, and the carbon market is an immediate avenue to scale finance and fast-track industry expansion. The International Energy Agency (IEA) indicates that, to reach the UN's Sustainable Development Goal of universal access to clean cooking by 2030, "investment in clean cooking stoves, equipment, and infrastructure over this decade would need to reach about USD 8 billion annually."

Susanna Berkouwer, Assistant Professor of Business Economics & Public Policy at the Wharton School of the University of Pennsylvania, notes that “for every \$1 that the world spends reducing emissions, many more tons of CO<sub>2</sub> will be reduced if we spend it on improved cookstoves than, say, on solar or EV subsidies.” Tackling carbon emissions requires acting on the solutions and knowledge at hand while continuing to refine and improve methodologies.

On January 23, 2024, the journal Nature Sustainability released a paper titled “Pervasive over-crediting from cookstove offset methodologies,” which claims cookstove carbon methodologies overestimate emissions reductions.

The Project Developer Forum, along with non-member carbon project developers, have reviewed the research and identified substantial concerns with the paper’s findings. The key takeaways are summarized here, with a more detailed analysis in the pages that follow:

- The reference literature is outdated, and the study omits recent peer-reviewed randomized control trials.
- Conclusions about carbon cookstove projects cannot be drawn from research focused on non-carbon financed projects.
- The research consistently chooses the most harmful scenario as its point of comparison.



- The analysis applies outdated fNRB default values.
- The study overlooks ongoing improvements to cookstove carbon methodologies.
- Project data was not validated in consultation with project developers.
- The study reflects a misunderstanding of the process of carbon project validation and verification.
- The funders and author of the study have a conflict of interest and bias.
- The study disregards the constraints of the disadvantaged populations who are most helped by improved cookstove interventions.

The Project Developer Forum (<http://www.pd-forum.net>) is a collective voice to represent the interests of companies developing greenhouse gas emission reduction projects in international carbon markets, including in the Voluntary Carbon Market (VCM), with more than 40 current members from diverse international jurisdictions. We have a dedicated Household Devices working group within the Forum, which represents leading project developers involved in the sector.

The Project Developer Forum supports efforts to improve integrity across the carbon markets. However, as ongoing evolution of carbon standards and methodologies is already underway, any analysis must be done based on current knowledge and not limited to what has happened historically. As standards and methodologies go through a continuous review process with versions being constantly updated, it is important to reflect best practice as it exists in the present.



The Project Developer Forum has identified the following key issues with the Gill-Wiehl et al. literature review:

1. The reference literature is outdated and omits two recent Randomized Control Trials (RCTs)

Gill-Wiehl et al. is a literature review or meta-analysis that compares current cookstove carbon projects with outdated literature about cookstoves. It then takes default values from the literature to adjust findings from today's carbon projects. By concatenating downward adjustments to every variable in the carbon equation, the authors generate a total figure of 9.2x (average 6.6x) over-crediting. Statistical modelling obscures the reality that this study compares carbon projects to a small number of outdated publications focused on non-carbon market related projects.

In such research the data inputs really matter, and this publication omits key studies – including two recent peer-reviewed randomized control trials (from 2022 and 2016).

Omitting recent research is likely to have a major impact on the outcome. For example, the paper uses 9 studies — 7 of which were published before 2016 — to adjust all adoption rates down to 58%. However, a recent randomized controlled trial of 1,000 households in Nairobi found a sustained adoption rate of 86% three years after stoves were distributed.

2. Conclusions about carbon cookstove projects cannot be drawn from research focused on non-carbon financed projects.

Creating and managing a carbon cookstove project is a challenging and complex undertaking. Rigorous third-party verification is required, and every detail of the emissions reduction calculations must be scrutinized before carbon credits are issued. Carbon projects cannot afford abandoned stoves and thus are incentivized to use a project design that is readily adopted by stove users. They focus substantial time and resources on testing designs with local users to ensure high-level functionality, technical precision, and cultural acceptability.

In contrast, many donated or NGO-distributed stoves experience persistent problems with poor design, and often lack sufficient funding to ensure rigorous monitoring after the stove is installed. For example, the study cited a 2016 publication about a poor-quality NGO mud stove project conducted in India in 2005 – 2007.<sup>1</sup> It is unclear how the conclusions of this NGO project are relevant to contemporary cookstove carbon projects that distribute biomass stoves that can reduce fuel use up to 90%.

Cookstove carbon projects differ substantially from cookstove projects that lack the carbon incentive. However, the values used in the Gill-Wiehl et al. study are derived from old research on non-carbon cookstove projects, which cannot and should not be used to extrapolate claims about carbon

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<sup>1</sup> Hanna, R., Duflo, E. & Greenstone, M. Up in smoke: the influence of household behavior on the long-run impact of improved cooking stoves. *Am. Econ. J. Econ. Policy* 8, 80–114 (2016)



cookstoves. Of the 14 studies they use to adjust adoption usage and stacking, 7 were published in 2014 or earlier, and 5 were published between 2015 and 2019. The age of the studies examined matters as cookstove engineering continues to advance. Some of the latest stoves achieve a thermal efficiency of over 60% – up from ~40% only 3 years ago. Moreover, although the study draws conclusions about the over-crediting of carbon-financed cookstove projects, the sources indicate all but one project reviewed are not carbon-financed cookstove projects.

3. The research consistently chooses the most harmful scenario for interpretation of research.

Despite the variety of baseline and project stoves, fuelwood use patterns, and fuelwood types studied in the cited research, the authors repeatedly choose the most conservative values available to draw comparisons between the literature and project stoves. The study's projects also vary in construction, quality, suitability, durability, price, and geography. However, the authors do not adjust their conclusions to account for these differences, instead drawing broad conclusions and applying them to all project types.

The authors sum seven variables to reach a claim of over-crediting, assuming that the full weight of every potential source of over-crediting applies broadly to every project: adoption (1.4); usage (1.4); fNRB (1.7); stacking (1.1); fuel consumption (1.4); emission factors (0.6); firewood to charcoal conversion (1.5); and rebound effect (1.0). While it is possible that one project may be affected by one or more inaccuracies, it is unlikely that any given project is affected by all of these factors at once, or that that all projects are affected by all of these factors.

Moreover, the authors mistakenly assume the negative attributes were not mitigated by the reporting requirements of the carbon methodologies. For example, the presence of other stoves (stacking) is a well-known and documented aspect of cookstove distribution. Stove stacking is treated in the study as if it were disregarded in emissions reduction calculations. On the contrary, stove stacking is measured, documented, and verified in the project documentation and, before credits are issued, emission reduction claims are reduced accordingly.

4. The study uses outdated default values to reach a conclusion that fNRB figures are inflated across the industry.

It is well known that fNRB default values are currently under review and analysis by the UNFCCC Supervisory Body. A first-round public comment period closed January 31, 2024, and the issue is far from resolved. The Gill-Wiehl et al. study was released before the comment period had closed and uses outdated numbers from 2015 that are based on 2009 data.

fNRB calculations are complex and include a large number of assumptions that can vary widely by project type and location. The figures used by Gill-Wiehl et al. employ the most conservative values for each assumption, leading to the conclusion that project fNRB values are overstated. For example, household fuelwood consumption figures in the underlying research are far lower than most countries'



actual fuel consumption. Latin America, for example, shows average fuelwood consumption at the household level nearly triple that of the default value. By applying an artificially low figure, the resulting fNRB values are skewed and the reported over-crediting is exaggerated.

5. Cookstove carbon methodologies are continuously adjusted to account for current science, meaning that many of the study's conclusions are based on issues that have already been resolved.

Cookstove methodologies, like all carbon crediting methodologies, evolve over time as more information becomes available. While methodologies are created with the best science and experts available at the time, they must, and do, evolve as they are implemented in practice. Carbon standard setters are constantly working to ensure greater accuracy. The Gill-Wiehl et al. study references 8 different versions of the methodologies, published over a time span of 15 years, without adjusting for improvements made in the interim. Instead, the study draws sweeping and harmful conclusions and applies them to all cookstove projects, disregarding methodological improvements that have already mitigated many of the stated concerns.

In the addendum to the Gill-Wiehl et al. study, Table S4 ("Projects Evaluated") lists the 51 Gold Standard and VCS certified projects used in the study sample, along with the methodology version used by each project. Strikingly, the sample does not include projects that use the most recent versions of the included methodologies. This further exemplifies why the findings in the paper cannot be extrapolated to all cookstove projects, especially those using new versions of the methodologies.

Furthermore, one of the most widely used methodologies (VMR0006) was left out of the review. How can the study's claims be substantiated if methodologies in common use were omitted from the review?

Key stakeholders across cookstove carbon projects are working to ensure high integrity. For instance, The Clean Cooking Alliance has undertaken a thorough review of existing methodologies and has engaged comments from carbon crediting programs, academics, scientists and project developers to produce a harmonized cookstove carbon methodology that safeguards higher integrity in the market and meets Article 6.4 requirements.

6. Project data used in the study's sample were applied without confirmation from project developers.

The study uses sample data from carbon credit cookstove projects to evaluate potential over-crediting, yet no consultation was sought with the respective project developers to fully understand the data and how it was collected/applied. This data, which is used to reach research conclusions, should have been checked with every project developer to ensure accuracy.

In fact, not only did the authors fail to contact projects that were included in the study's sample, but project developers only received a copy of the study on January 23, 2024, the same day the article was



released in Nature Sustainability and covered in the Guardian and Financial Times. This provided no time for a response from project developers or the chance to identify inaccuracies or explain data that may have been misused or misunderstood by study researchers.

7. The study reflects a misunderstanding of the process of carbon project validation and verification.

The report states: “Most cookstove projects are structured as programme of activities, in which multiple similar project activities (called voluntary project activities (VPAs) on the VCM and component project activities on the CDM) are bundled together to allow for rapid replication, only requiring a quick check from a validator and not a full registration procedure.”

The above excerpt is incorrect and demonstrates a misunderstanding of the requirements for developing program of activities (PoAs) and component VPAs. VPAs undergo the full registration procedure by default, including validation by an independent auditor. VPAs that can be proven to be demonstrably homogenous to previously approved VPAs in the same PoA — for example, that they employ the same technology, in the same jurisdiction, with the same end user group — may be able to shorten the registration procedure, but still must be fully validated as homogenous. The report attempts to cast doubt over the integrity of the PoA/VPA structure, and we find this criticism to be flawed.

Moreover, in making these statements, the study references an old document from 2011 focusing on the CDM approach (“The handbook for programme of activities: practical guidance to successful implementation”). This reference is not up to date, nor is it pertinent to the VCM. Furthermore, the study seems to reference only the validation and registration process, while overlooking the fact that VPAs registered under a PoA also undergo an independent verification audit procedure before credits can be issued.

8. The funders and author of the study have a conflict of interest and bias.

Partial funders of the study include Carbon Direct, a company that sells carbon removal credits that compete with cookstove credits. Another funder is the Better Cooking Company, a venture-backed company seeking to generate carbon credits through fuel metered and measured energy cooking devices, which are the type of projects the authors favour and call on to be “prioritized.” In fact, a section in the report provides “Guidance for Buyers” including a “List of Quality Projects” with the company’s own project ranking among the five projects recommended. This raises a significant question of integrity in the report and suggests a potential conflict of interest in the findings. Furthermore, two of the projects listed by the authors as a “High Quality” project use an fNRB of 89% calculated with Tool 30, which is contradictory to their own recommendations on fNRB studies.



9. The study disregards the constraints of the disadvantaged populations who are most helped by improved cookstove interventions.

Although it is not a finding of the literature review, nor an outcome from the statistical analysis, the authors nonetheless recommend that the “VCM exclusively fund WHO-defined clean stoves.” However, the reality is that “clean” stoves are expensive, and many people in the Global South do not have access to an electric grid connection or LPG supply chains. Recommending that the VCM only fund “clean stoves” is therefore harmful to the 2.4 billion people who cook with wood and charcoal and are unable to switch to cleaner technologies (including improved biomass stoves) without the subsidies offered by carbon finance. Again, the IEA states: “In rural areas, where fuel and electricity infrastructure are lacking, improved cookstoves (ICS) serve as an interim solution to deliver health benefits and time savings in the near term. If minimum performance standards are enforced, ICS reduce fuel needs by 20-75% and drastically cut dangerous smoke and fumes.”

Communities across the Global South face the most severe climate impacts despite having little to do with creating the climate crisis. Without the subsidies offered by high-integrity carbon credit projects, these families will be stuck with traditional cookstove technologies that are harmful to people’s health, wellbeing, and economic mobility. Restricting carbon funding to only the cleanest technologies would effectively exclude those most in need of clean cooking projects.

Carbon financing has already enabled millions of households to transition from cooking on three-stone fires and inefficient charcoal stoves to improved biomass stoves. For these families, improved biomass stoves are the only realistic and accessible alternative in the near future.

## Conclusion

The critique of carbon credits associated with cookstove projects by Gill-Wiehl et al. raises significant concerns, as outlined above. The study’s focus on non-carbon financed projects, outdated data, and lack of consultation with project developers undermine the reliability of its conclusions. Furthermore, conflicts of interest among funders and authors bring into question the study’s objectivity. For these reasons, stakeholders are organizing an academic review of the study’s Monte Carlo simulation to check if the inputs were relevant to the conclusions drawn.

It is crucial not to overlook the benefits of carbon cookstove projects in mitigating climate change, improving public health, and promoting sustainable development. Collaboration among stakeholders is vital to address challenges whilst ensuring transparency, accountability, and scientific rigor in evaluating carbon credit programs. With integrity and persistence, we can effectively harness the potential of carbon credits to advance global climate goals while addressing critical societal needs.

Dr. Sven Kolmetz (on behalf of the Project Developer Forum)

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- ✓ Will be available to the press

