burn
life · saving · stoves

RE: Call for public comment on Information note: ***Default values for fNRB***

We appreciate the important work that has gone into this research and the opportunity to participate by sharing our feedback.

The concept of fNRB was constructed purely for purpose of carbon crediting, but it fails to capture some crucial realities of how woodfuel is harvested, consumed, and regrown at both micro and macro levels.

We write to propose a concept for how to better reflect reality when calculating atmospheric greenhouse gas reductions resulting from introduction of fuel-efficient cookstoves.

Concept 1 - Replace fNRB with sustainable/unsustainable consumption rates (SCR/UCR)

At a macro level, within any given geographical boundary we can think about total woodfuel consumption for cooking as being split into two distinct categories – the Sustainable Consumption (SC) and Unsustainable Consumption (UC) portions.

$$total\ woodfuel\ consumption\ rate\ (TCR) = SCR + UCR$$

Where the SC is found by knowing the regrowth rate of the accessible portions of forest:

$$SCR = accessible\ forest\ regrowth\ rate$$

And therefore, UCR can be deduced as simply:

$$UCR = TCR - (accessible\ forest\ regrowth\ rate)$$

Where both TCR and the accessible forest regrowth rate can be reasonably estimated from existing literature and models such as MoFuSS.

It stands to reason that, if TCR were to be brought down to the same rate as that which the accessible forests can regenerate (TCR = SCR), then UCR would equal 0 and forest cover affected by cooking would be balanced in perfect equilibrium, neither growing nor shrinking in total mass. In such a scenario, no net emissions would be produced from biomass cooking. *This implies that, from a climate perspective, the most critical goal for fuel-efficient or fuel-switch cooking projects should be to bring TCR down to SCR (UCR down to 0). Any further reduction in TCR beyond this point*, while possibly creating some sequestration benefits, *will not create clear-cut net emission reductions.*

Therefore, it is only the unsustainably consumed woodfuel (UCR) that produces net emissions. This concept lays out how projects can best quantify their contribution to reducing UCR, and the resulting emissions reductions.

Take an example of a country with the given consumption rates, demographics, and implied fNRB:

TCR (t/y)	SCR (t/y)	UCR (t/y)	woodfuel-reliant households	TCR/household (t/y)	fNRB
10,000,000	6,000,000	4,000,000	4,000,000	2.5	40%

Year 0 TCR

Then, take an example of a cookstove project that reaches 10% of the woodfuel-reliant households (400,000 homes) over the course of one year, and this project is able to reduce woodfuel consumption in those homes by 50%. We will then have 2 cohorts:

	TCR (t/y)	woodfuel-reliant households	TCR/capita (t/y)
baseline stove users	9,000,000	3,600,000	2.5
project stove users	500,000	400,000	1.25
Total	9,500,000	4,000,000	2.375

Year 1 TCR

In such a scenario, we can then calculate UCR in Year 1 as:

$$UCR_{yr1} = TCR_{yr1} - (accessible\ forest\ regrowth\ rate)_{yr1}$$

Note that the forest regrowth rate can be assumed to stay constant over short periods of time, and therefore:

$$UCR_{yr1} = 9{,}500{,}000 - 6{,}000{,}000 = 3{,}500{,}000$$

Giving the following picture of net change in the country's consumption:

	TCR (t/y)	SCR (t/y)	UCR (t/y)	woodfuel-reliant households	fNRB
Year 0	10,000,000	6,000,000	4,000,000	4,000,000	40%
Year 1	9,500,000	6,000,000	3,500,000	4,000,000	37%
delta	500,000	0	500,000	0	N/A

Crucially, note here that at a macro level 100% of the project's reduced fuel consumption is a reduction in unsustainable consumption (UCR). The project therefore can clearly take credit for emission reductions coming from 100% of the fuel savings. This concept would continue to apply until enough fuel-efficient cooking was adopted in the country to bring TCR = SCR.

Note, also, the absurdity of the fNRB concept in such an example. Although the project should theoretically take 100% of the emission reductions credit related to ΔUCR, existing methodologies would force a 60% discount (1 – fNRB).

Even more oddly, because Year 1 fNRB is reduced further *because of the project's activities,* an even greater discount of 63% would be at risk of being applied. In this example use of fNRB forces a majority of the net emission reductions to go uncredited, resulting in vast undercrediting.

The UCR concept also can be applied neatly at a micro (household) level.

Take an example of one home, where TCR = 2.5. We can assess this home's individual SCR as the equivalent per-household rate based on the country-wide figures:

$$SCR_{home1} = \frac{accessible\ forest\ regrowth\ rate}{total\ households} = \frac{6{,}000{,}000\ t/y}{4{,}000{,}000} = 1.5\ t/y$$

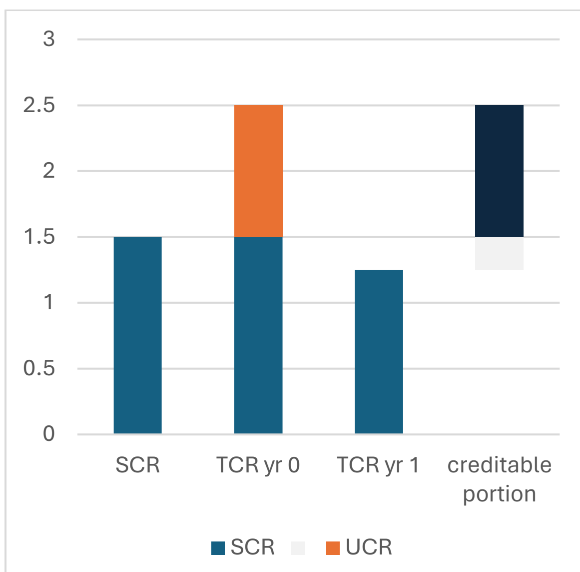
And therefore, our main climate goal is to bring this household's woodfuel consumption to at or below sustainable levels, where:

$$TCR_{home1} \leq SCR_{home1}$$

And

$$UCR_{home1} = 0$$

For accounting of emission reductions then, we should say that any unsustainable woodfuel consumption reduced in this home should be 100% credited for emission reductions, and any additional fuel savings beyond this point need not be credited at all:



In simplified terms, at a household level, 100% of emission reductions should be allowed pertaining to the household-level UCR. This aligns well with any concept where individuals and societies have target levels of sustainable resource consumption, but current levels of consumption that exceed that level. In any such case, we should credit for all (100% of) efforts that bring that consumption down to sustainable levels, and by definition the unsustainable portion of consumption is always the 'first to reduce' at both a household and societal level.

The implication of this approach at a household level would be that project developers would be equally incentivized to get every biomass-reliant home to a sustainable consumption level, but no further. This has fairness benefits over applying the UCR approach at a geography-wide level but comes with the obvious drawback of not incentivizing further reductions below this level (which in truth would have large ER benefits especially for the early mover households). Concept 2 addresses this drawback in part.

Concept 2 – Sequestration benefits of reducing consumption below SCR

Even the harvesting of the "renewable" portion of wood for cooking is stopping the storage of additional carbon. If this renewable portion was not cut down at all, then trees would actually grow at *above* replacement rate (instead of just regrowing at exactly replacement rate, i.e. "renewal" rate), creating additional carbon sequestration. This would mean additional limb growth, or in some cases additional trees growing.

For example, in a case of a 40% fNRB for a cookstove project:

- 40% of the wood we avoid burning is non-renewable, so saving these trees/wood equates to the avoided emissions that we can count for ERs in the current methodologies.
- 60% of the wood we avoid burning is renewable, but because we avoid burning it, it creates some amount of tree growth above baseline, these are sequestered emissions that we cannot count for ERs in the methodologies.

But for the reduced consumption of the renewable portion, how much tree growth does it create above baseline? The simple answer seems to be that *all* of the avoided consumption from this portion will grow as additional woody biomass, *minus the portion that would be deforested.* And we should assume that the amount deforested would simply be equal to the background deforestation rate of accessible forests.

This is the additional amount that should be credited from the renewable portion of consumption *(i.e. the amount of SCR reduction to credit)*

The implication of this is that the current methodologies that use fNRB are already conservative, excluding a big portion of the CO_2 benefit.

These concepts should be taken into account in the updated tools and methodologies – the BURN team remains committed to the continuing efforts ensure high-integrity in the carbon space.

Sincerely,

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