Page/reference from *A6.4-SB004-AA-A10–APPENDIX 4*	**Notes/Input**
P6: Ensuring emission reductions are not overestimated, for instance, where applicable, by requiring the accounting of uncertainty associated with modelled and surveyed data.	In some parameters uncertainty is quite large and hard to characterize (fNRB being the most salient of these). This is perhaps a reason to rely more on defaults or ensure that when projects use their own estimate they have to take an a priori conservative haircut to account for the uncertainty.
P10,11: Performance standard: Projects with cookstoves that demonstrate top-tier performance (e.g., Tier 5 and 4 under ISO/TR 19867-3:2018) for all five parameters, i.e., efficiency, emissions of fine particulate matter (PM2.5), emissions of carbon monoxide, safety and durability in accordance with ISO/TR 19867-3:2018 or a comparable national standard, are considered automatically additional. The Supervisory Body may reassess the validity of the provision and update it if needed.]	Colorado State University is the only lab that can reliably test durability, and it is hard to extrapolate the durability test results to stove life. Safety ratings are unrelated to emissions. As such, consider this requirement focus on efficiency, PM2.5 and CO only. In a few low-fNRB countries with coal-intensive grids (e.g., India, Vietnam), a shift to electric cooking might not result in net emission reductions (depends on specific location and efficiency of the appliance), so calling this automatically additional could be problematic.
P12: Currently there is virtually no biomass stove design/product that meets higher tiers (i.e., 4 and 5)	Consider changing this to "Currently few biomass stove designs/products meet ISO tiers 4 and 5 for emissions and efficiency" as the Mimi Moto and Supamoto do.
P15: Table 1: Default values included in the existing CDM methodology and those proposed for the Article 6.4 Mechanism	4C agrees with the new defaults. That said, 15% thermal efficiency for a TSF is not conservative for lab testing. From the literature (not from PDDs), the ranges are ~12-20%. (Noting there are some less efficient traditional stoves, such as some in Peru that test at 10%.) Further, the default for charcoal conversion is too conservative. This default value for charcoal conversion seems to be based on the range of values reported in van Dam's 2017 FAO report. However, this report provided ranges from published studies rather than actual data points, so choosing a default based on these reports gives undue weight to outliers. Berkeley Air Monitoring Group collected published efficiencies from nearly 100 traditional kiln measurements and found the mean ± st dev to be 15 ± 8 % (median is 14% with IQR of 14%). The proposed default of 4:1 is more efficient than 87% of traditional kilns measured. Consider something slightly less conservative—perhaps the 67th or 75th percentile, which would be 19-22%. This is between 4.5:1 and 5:1 dry wood to charcoal. These data can be provided as needed.

P17: **Table 2. Default regional values of the emission factor of fossil fuels projected to be used to substitute non-renewable woody biomass by similar consumers**	There is a small typo in the caption ("woddy"). Project developers may point to these emission factors as inaccurate and unfair, however it seems nothing can be done to replace with emission factors from the woody fuels that used. 4C strongly advises dropping the fossil fuel EF. As per above, there historical reason for it being there, but it makes very little sense from carbon accounting perspective and runs in clear opposition to the mandate that meths be "real, transparent, conservative, credible..."
P19: Options 1 and 2: Thermal Energy Output (TEO) and rated capacity.	Do these need to be specified as only applying to stove/fuels that can be metered accurately?
P19,20: General	Like the cap on fNRB, consider a cap on these efficiency ratios. For example, a PD could game the CCT specific consumption estimates. A cap of around >0.4 (60% fuel savings or less) may be appropriate.
P21: The lifetime shall be tested in accordance with relevant international or national standards.	The ISO field testing standard should provide guidance on stove life; it may be best to call that out specifically. Consider adding language that stove life (for verification) is measured via survey/field test, which is significantly more accurate than alternatives.
P21: A default schedule of linear decrease in efficiency up to the terminal efficiency assumed as 30 20 per cent shall be applied through the life span of the project device13	It's unlikely that many project stoves are close to or below 30% TE.
P22: Example: For the representative sample of Batch 1, if the efficiency of a new project device is 40% and at the end of Year 1, the efficiency is monitored to be 39%; the loss rate is (40%-39%)/1=1%. Then this 1% loss rate is to be assumed to be applicable for all the devices in the first batch and subsequent batches for first year of operation	A change of 1% in thermal efficiency is well within the uncertainty of testing variability; in general, this may be a bit conservative.
p. 8: 12. The activity design document shall demonstrate that non-renewable biomass has been used in the activity region since 31 December 1989, using survey methods	This requirement seems like it would disqualify large IDP or refugee settlements that were created in the mid-90s; or an area that had been sparsely populated through the 90s but saw large in-migration in the 00's and now experiences unsustainable harvesting. Consider revisiting.

or by referring to published literature, or official reports or statistics.	
p. 11: 22. [Practice based method: Activity participants shall demonstrate ex ante that the penetration of the activity technology is equal to or less than 2.5 per cent of the technologies providing similar services to end-users based on the annual sales of units, or 1.5 per cent based on the stock of units, in the applicable geographic area in order to be considered as automatically additional.	The methodology should provide guidance on how to aggregate or disaggregate the activity technology when estimating market share. For example, whether to lump together the market share of all natural-draft rocket woodstoves or consider the individual market share of EcoZoom, Kuniokoa, Envirofit, etc.
P27. For user reported surveys, a 95 per cent confidence interval and a 5 per cent margin of error shall be achieved. When this option is selected, the average values and standard deviation shall be calculated and the lower bound of the 95 per cent confidence interval shall be used.	User-reported surveys of fuel consumption, especially of gathered/harvested fuel, will be inaccurate regardless of how many surveys are conducted. Getting more precision on an inaccurate result is not a good use of resources. Directly weighing B-old in a smaller sample size would provide a much more accurate estimate and should be incentivized in the method, e.g., the only way to not use the especially conservative default of 0.5 would be to conduct a baseline KPT.
P31 a) For a three-stone fire using firewood (not charcoal), or a cookstove with no improved combustion air supply or flue gas ventilation (i.e. without a grate or a chimney), the default value is 0.10 0.15; b) For other type of devices, the default value is 0.20 0.25.	Experts in Latin America should be consulted for feedback regarding chimney stove efficiencies.
P 36: Where required, the activity participant shall transparently and clearly describe additional parameters and assumptions and the data sources associated with the parameters, and include a definition of uncertainty and related adjustments where relevant.	As mentioned earlier, accounting for uncertainty can be difficult and can be carried out in many ways. So it may help to be more prescriptive here.
P 37: Measured directly or based on a representative sample. The “Standard: Sampling and surveys for Article 6.4 activities and programme of activities” shall be used for determining the sample size to achieve 90/10 confidence/precision levels when using data sensors/loggers or pay-as-you-go system31, else 95/05	Incentivizing the use of sensors is wise, but for this parameter (whether or not the stove is in operation), there is not much to be gained with the more stringent confidence intervals. Please also note that using loggers to determine whether a device is still in operation is a very expensive approach that would be the only option for most biomass stoves.

confidence/precision levels shall be achieved for user reported surveys.	
P 38 Alternatively, questionnaire surveys may be conducted using 95/5 confidence/precision for the sampling surveys in accordance with the "Standard: Sampling and surveys for Article 6.4 activities and programme of activities	As with fuel consumption estimates, reported usage rates are likely going to be inaccurate (non-conservatively biased) and while doing more sampling to meet stringent precision guidelines is a helpful incentive, it does not solve the problem of bias. The use of a conservative confidence bound is likely not enough to account for this bias. A potential alternative could be to, for example, mandate verification of stove usage rates with the use of sensors/loggers otherwise the stacking could be capped at 50%.
P42: The sampling requirements indicated in section 5.2 and guidance provided in the "Standard for sampling and surveys for Article 6.4 activities and programme of activities" shall be followed.	Once again, bias cannot be address through further sampling.
P43: The activity participants shall conduct a laboratory test of a sample of project cookstoves in accordance with ISO/TR 19867-1:2018 "Clean cookstoves and clean cooking solutions — Harmonized laboratory test protocols — Part 1: Standard test sequence for emissions and performance, safety and durability" or a comparable national standard and report the performance for thermal efficiency, emissions, safety and durability. 2. Where applicable, the activity participants shall meet the minimum conditions on the tiered performance targets set by the participating Parties. 3. The performance for efficiency and other parameters shall be based on certification by a national standards body or an appropriate certifying agent recognized by that body. 4. Manufacturer specifications may be used when the product has been tested as per the requirements above.	ISO thermal efficiency is reported two ways, assuming that the char produced is and is not used. Please see the quoted text below: "For solid-fuel stoves that produce char, thermal efficiency should be reported both 1) without energy credit and 2) with energy credit for remaining char. Thermal efficiency without char is applicable when users do not use the char remaining after cooking as fuel. Thermal efficiency with char is applicable when users use the char remaining after cooking as fuel." The more conservative one is without char. It is unclear how much capacity there is to have stoves tested with ISO protocols and approval from national certifying bodies. It may be best to add a caveat such as "where available." When not available, it may be best to test the stoves at the closest regional lab that performs testing in line with their respective national standards body.
P48: When biennial inspection is chosen, a 95 per cent confidence interval and a 10 per cent margin of error shall be achieved for the sampling parameter when	Please see the comments above that creating incentives to use sensors is wise; however, as above, there are parameters where additional sampling will not help with bias.

using data sensors/loggers; and a 95 per cent confidence interval and a [x] [5] per cent margin of error shall be achieved for user-reported surveys.	
p. 23 49. Leakage related to the non-renewable woody biomass saved by the project activity shall be assessed based on ex post surveys of users and the areas from which this woody biomass is sourced (using 90/30 precision for a selection of samples). The potential source of leakage due to the use/diversion of non-renewable woody biomass saved under the project activity by non-project households/users that previously used renewable energy sources shall be considered.	It would be difficult to design a survey question that would accurately determine the magnitude of fNRB leakage occurring in non-project households.
pp. 25-26 Tables 2-3	Choosing default per capita wood consumption based on UN and DHS data seems somewhat unreliable. DHS data does not measure the magnitude of wood consumption, so it is unclear where these values come from. It would seem these calculations use UNStats estimates of residential wood consumption and then divides by DHS estimates of the number of wood users. However, this is not a reliable calculation because UN stats are not always based on surveys—many are only estimates. A thorough literature review or meta-analysis of actual field measurements (such as the studies cited on p. 26 and 34) is strongly recommend, although any studies included in such an analysis should be vetted. For example, Brouwer and Falcão, 2004, which is cited on p. 34, did not actually measure kilns. The study cites an unpublished undergraduate thesis.
p. 28 – fNRB discussion	Consider leaving a space here for changes that will result from the new assessment of fNRB values that UNFCCC and the Stockholm Environment Institute are working on now.
p. 39 – stacking defaults	The studies cited here reporting stacking of baseline stoves when improved stoves are introduced were improved stove interventions but <u>not</u> CDM or projects. Is there any reason to think that CDM projects would result in lower stacking rates than non-CDM interventions? That is, do PDs put any incentives in place to reduce stacking that would justify a lower default?
p. 10	It is unclear how this affects projects promoting LPG. Presumably the language in the RMP allows for some flexibility based on host party priorities.

19. The activity participants are required to take a conservative approach that avoids locking in levels of emissions, technologies or carbon-intensive practices incompatible with the requirements described in paragraphs 38–39 of the RMP.	
p. 52-53 Survey questions	It is very difficult to quantify fuel consumption through a survey. If it is decided to include these "non-binding" questionnaires, consulting MTF survey instruments consumption surveys to see how other researchers have asked these questions will be crucial.