TABLE FOR COMMENTS

Name of submitter: \_\_\_Advanced Carbon Asset Management Co., Ltd.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Affiliated organization of the submitter (if any): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Contact email of submitter: \_\_baoji@icebergchina.com\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| **#** | **Para No./ Annex / Figure / Table** | **Line Number** | **Type of comment**  **ge** = general  **te** = technical **ed** = editorial | **Comment**  **(including justification for change)** | **Proposed change**  **(including proposed text)** | **Assessment of comment**  **(*to be completed by UNFCCC secretariat*)** |
| **1** | **Table 1** | **Not applicable** | **ge** | **The huge difference of fNRB values may influence the solidarity in the international community for fighting against climate change. Nowadays many African countries plan to attract investment from green finance and obtain incomes from sale of carbon credits generated in their countries.[[1]](#footnote-1),[[2]](#footnote-2) Clean cookstove is an important project type which attracts green investment and generates carbon credits. So the decision on fNRB values is not only a technical decision, but also a political and economic decision. Most of the old fNRB values are from 70%-98%, which usually do not have enough influence on country choice of clean cookstove investment for investors. However, the current difference between highest and lowest value is 62 times (Niger VS Sao Tome and Principe). No country can accept its potential for attracting green investment and obtaining incomes from carbon credits is only half or even one fifth of other countries inherently. It will fight for this once it recognizes this point. Moreover, the too low fNRB values of some countries may prevent their efforts to promote clean cooking and related technologies, which may be crucial for them to protect their forest and reduce carbon emissions.** | **Using a globally uniform fNRB default value, or at least a regionally uniform fNRB default value, like the regional default values of 𝐸𝐹𝑝𝑟𝑜𝑗𝑒𝑐𝑡𝑒𝑑\_𝑓𝑜𝑠𝑠𝑖𝑙 𝑓𝑢𝑒l in Table 2 of CDM Methodology AMS-I.E.** |  |
| **2** | **Table 1** | **Not applicable** | **te** | **The too low fNRB values result in a conclusion that defies common sense-electric stove has higher GHG emissions than improved firewood cookstove in half of the African countries we have related data (21 out of 42). The thermal efficiency of the improved firewood cookstove is 36%. It generates 0.005616TJ energy for cooking when 1 ton firewood is burned in it (the NCV of firewood is 0.0156TJ/t), which requires 1.56MWh of power output when an electric stove with 100% thermal efficiency is used. We compare the GHG emissions of 1t firewood combustion and 1.56MWh grid power usage in 42 African countries and find that in 21 countries the latter has higher GHG emissions. The result may prevent the development of clean cooking in many countries, which needs more consideration. The calculation process is as below:** | **More review on the fNRB value** |  |
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| Item | Value | Data source |
| Thermal efficiency of the improved cookstove | 36% | Technical specification |
| NCV of firewood (TJ/t) | 0.0156 | IPCC (2006) "IPCC Guidelines for National Greenhouse Gas Inventories", Volume 2, Energy, Chapter 1, Introduction, Page 1.19, Table 1.2 |
| Energy output of 1t firewood (TJ) | 0.005616 |  |
| CO2 emission factor of firewood (tCO2e/TJ) | 112 | IPCC default value for Wood: IPCC 2006 Guidelines for National Greenhouse gas Inventories Chapter 2: Stationary Combustion Page 2.23 Table 2.5 |
| Non CO2 emission factor of firewood (tCO2e/TJ) | 9.46 | IPCC default value for Wood: IPCC 2006 Guidelines for National Greenhouse gas Inventories Chapter 2: Stationary Combustion Page 2.23 Table 2.5 IPCC Fifth Assessment Report: Climate Change 2014 |
| CO2 emissions of renewable and non-renewable firewood (tCO2e) | 1.894776 |  |
| Assumed thermal efficiency of electric stove | 100% |  |
| Power required for the same energy output (MWh) | 1.56 |  |

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| **Country** | **Grid emission factor (tCO2e/MWh)\*** | **Power required (MWh)** | **CO2 emissions from Power (tCO2e)** | **fNRB** | **CO**2 emissions of renewable and non-renewable firewood (tCO2e) | **CO**2 emissions of non-renewable firewood (tCO2e) | **CO**2 emissions reduction from electric stove to ICS (tCO2e) |
| Sao Tome and Principe | 0.71308 | 1.56 | 1.11241 | 0.01 | 1.89478 | 0.01895 | -1.09347 |
| Mauritius | 0.65073 | 1.56 | 1.01515 | 0.06 | 1.89478 | 0.11369 | -0.90146 |
| South Africa | 0.86650 | 1.56 | 1.35175 | 0.08 | 1.89478 | 0.15158 | -1.20017 |
| Botswana | 0.85966 | 1.56 | 1.34108 | 0.09 | 1.89478 | 0.17053 | -1.17055 |
| Namibia | 0.03809 | 1.56 | 0.05942 | 0.10 | 1.89478 | 0.18948 | 0.13006 |
| Comoros | 0.79231 | 1.56 | 1.23601 | 0.16 | 1.89478 | 0.30316 | -0.93285 |
| Zimbabwe | 0.39607 | 1.56 | 0.61787 | 0.18 | 1.89478 | 0.34106 | -0.27681 |
| Cote d'Ivoire | 0.40343 | 1.56 | 0.62936 | 0.19 | 1.89478 | 0.36001 | -0.26935 |
| Chad | 0.76675 | 1.56 | 1.19614 | 0.19 | 1.89478 | 0.36001 | -0.83614 |
| Ghana | 0.33563 | 1.56 | 0.52358 | 0.20 | 1.89478 | 0.37896 | -0.14463 |
| Madagascar | 0.53016 | 1.56 | 0.82706 | 0.22 | 1.89478 | 0.41685 | -0.41021 |
| Liberia | 0.33587 | 1.56 | 0.52396 | 0.23 | 1.89478 | 0.43580 | -0.08816 |
| Togo | 0.49698 | 1.56 | 0.77530 | 0.23 | 1.89478 | 0.43580 | -0.33950 |
| Angola | 0.18537 | 1.56 | 0.28918 | 0.26 | 1.89478 | 0.49264 | 0.20346 |
| Burkina Faso | 0.68818 | 1.56 | 1.07357 | 0.27 | 1.89478 | 0.51159 | -0.56198 |
| Congo | 0.35343 | 1.56 | 0.55136 | 0.27 | 1.89478 | 0.51159 | -0.03977 |
| Eritrea | 0.77470 | 1.56 | 1.20855 | 0.30 | 1.89478 | 0.56843 | -0.64011 |
| Sierra Leone | 0.07546 | 1.56 | 0.11772 | 0.30 | 1.89478 | 0.56843 | 0.45072 |
| Gambia | 0.79231 | 1.56 | 1.23601 | 0.32 | 1.89478 | 0.60633 | -0.62969 |
| Democratic Republic of Congo | 0.00215 | 1.56 | 0.00336 | 0.32 | 1.89478 | 0.60633 | 0.60297 |
| Zambia | 0.06617 | 1.56 | 0.10323 | 0.33 | 1.89478 | 0.62528 | 0.52205 |
| Mozambique | 0.10527 | 1.56 | 0.16422 | 0.34 | 1.89478 | 0.64422 | 0.48000 |
| Benin | 0.75930 | 1.56 | 1.18451 | 0.35 | 1.89478 | 0.66317 | -0.52134 |
| Cameroon | 0.29822 | 1.56 | 0.46523 | 0.36 | 1.89478 | 0.68212 | 0.21689 |
| Ethiopia | 0.00059 | 1.56 | 0.00093 | 0.36 | 1.89478 | 0.68212 | 0.68119 |
| Mali | 0.50868 | 1.56 | 0.79354 | 0.36 | 1.89478 | 0.68212 | -0.11142 |
| Central African Republic | 0.00000 | 1.56 | 0.00000 | 0.38 | 1.89478 | 0.72001 | 0.72001 |
| Uganda | 0.02414 | 1.56 | 0.03766 | 0.38 | 1.89478 | 0.72001 | 0.68235 |
| Nigeria | 0.31727 | 1.56 | 0.49494 | 0.39 | 1.89478 | 0.73896 | 0.24402 |
| Mauritania | 0.58159 | 1.56 | 0.90729 | 0.40 | 1.89478 | 0.75791 | -0.14938 |
| Guinea-Bissau | 0.79231 | 1.56 | 1.23601 | 0.42 | 1.89478 | 0.79581 | -0.44021 |
| Guinea | 0.21660 | 1.56 | 0.33790 | 0.42 | 1.89478 | 0.79581 | 0.45790 |
| Gabon | 0.43964 | 1.56 | 0.68584 | 0.43 | 1.89478 | 0.81475 | 0.12891 |
| Kenya | 0.08078 | 1.56 | 0.12602 | 0.45 | 1.89478 | 0.85265 | 0.72663 |
| Senegal | 0.54280 | 1.56 | 0.84678 | 0.45 | 1.89478 | 0.85265 | 0.00587 |
| Malawi | 0.12332 | 1.56 | 0.19238 | 0.47 | 1.89478 | 0.89054 | 0.69816 |
| Tanzania | 0.36013 | 1.56 | 0.56181 | 0.47 | 1.89478 | 0.89054 | 0.32874 |
| Equatorial Guinea | 0.54681 | 1.56 | 0.85302 | 0.54 | 1.89478 | 1.02318 | 0.17016 |
| Rwanda | 0.31692 | 1.56 | 0.49441 | 0.59 | 1.89478 | 1.11792 | 0.62351 |
| Burundi | 0.24284 | 1.56 | 0.37883 | 0.60 | 1.89478 | 1.13687 | 0.75803 |
| Djibouti | 0.79231 | 1.56 | 1.23601 | 0.61 | 1.89478 | 1.15581 | -0.08020 |
| Niger | 0.70428 | 1.56 | 1.09868 | 0.62 | 1.89478 | 1.17476 | 0.07608 |

\*Data source: https://www.carbonfootprint.com/international\_electricity\_factors.html

1. https://www.bloomberg.com/news/articles/2023-09-27/zimbabwe-amends-carbon-law-to-boost-developers-profit-share#xj4y7vzkg [↑](#footnote-ref-1)
2. https://www.bloomberg.com/news/articles/2023-08-24/kenya-lawmakers-grant-locals-40-of-profits-from-carbon-credit-projects [↑](#footnote-ref-2)