



MECS
Modern Energy
Cooking Services

2023: Global Market Assessment for Electric Cooking

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1. Introduction

According to World Health Organization (WHO), Covid 19 is to blame for the slow advancement of the global access to energy. About 675 million people continue to lack access to electricity and 2.3 billion people cook with fuels that largely impact on their health and environment (WHO, 2023). The Ukraine and Russia conflict has worsened the energy crisis, causing uncertainties in the energy market, and more so for cooking gas leading to increased oil and gas prices. Though renewable energy investment is expected to enhance global energy access, the low investment happening, is attributed to the financial burdens experienced by most developing economies in post Covid pandemic and lower renewable energy investment from declining international investment flows.

The GMA (2021) report highlights that opportunities to transition from biomass to electric cooking are fast growing among countries; either through the national grid, mini-grid and off-grid options depending on their country context. This report seeks to understand where the greatest opportunities and challenges for a scale up of electric cooking in the Global South lie in 2023 and compares the same findings for year 2020 with a close focus on the MECS and GECCO priority countries. The analysis follows closely the approach and method that was developed in the previous GMA (2021) report. The report produces a weighted score/index that measures the Global Market level of readiness for potential scale up of electric cooking. The weighted score is constructed from 40 indicators covering 130 countries in the Global South and is categorised into three avenues of supported electric cooking: the national grid, mini-grid and off-grid (standalone). Though the approach and methodology used is sound and robust, data for some indicators were last updated in 2020 and indicators measurement from a few international data sources have been reviewed. For instance, since the macro data required for indicators were international sourced, updated datasets from international sources for a few indicators were not available for the following indicators; affordability of electricity, credit sources, Photovoltaic power potential, ICT/internet adoption, Ease of doing business index, Number of displaced persons (DPs) per 1000 population, DPs using clean cooking fuels (grid), DPs using clean cooking fuels (off/mini grid), DPs with unrealised potential for eCook, Grid reliability (SAIDI * SAIFI), Number of mini-grid developers, Number of people connected to mini-grids. The pointed data limitations do not affect the authenticity of the computed GMA scores and also it does not cause any isolated country effects on the computed GMA scores.

The findings of GMA for electric cooking are based on the three supported electric cooking scenarios: national grid, mini-grid and off grid. The GMA scores are ranked as either high scores or low scores which indicate a better or worse viability of electric cooking among countries respectively. The discussion of findings focuses on; where the countries are ranked in 2023 and compares the country's ranking to that of 2020 ranking. It also provides the implications and the reasons or the factors explaining such changes.

The findings show that in 2023, among the Top 25 countries with the greatest opportunities for a scale up of electric cooking based on all round scoring analysis and within the MECS programme countries include India, Bangladesh, Indonesia, Nepal, Kenya, and Myanmar. Also included in the Top 25 countries are Laos and Morocco from GeCCo priority countries. Tunisia is the only GeCCo country that was in Top 25 countries in 2020 with the greatest opportunities for a scale up of electric cooking based on all round scoring analysis but is missing among the Top 25 in 2023 ranking. While Laos and Myanmar are GeCCo priority countries that emerged among the Top 25 countries in 2023 and were not part of the Top 25 in the 2020 rankings.

In overall among Top 80 countries in 2023, based on all round scoring analysis, the countries with the greatest opportunities for a scale up of electric cooking among GeCCo priority countries include India, Bangladesh, Indonesia, Laos, Nepal, then followed by Kenya, Morocco, Myanmar, Ecuador, Tunisia, Nigeria, Bhutan, Côte d'Ivoire, Tanzania, Ghana, Uganda, Fiji and Rwanda. Several factors affect scale up of electricity cooking such as: the infrastructure to support electricity cooking whether through the national grid, mini-grid, or off-grid; the grid reliability; and affordability or the potential to spend on energy away from the freely available biomass. In addition, the renewable energy capacity for mini-grid and off-grid including the number of mini-grid developers are also important factors in accelerating electricity access rate and scale up of electricity cooking.

The organisation of the report is structured in reference to the three infrastructure pillars supporting electric cooking and the other enabling environment. Thus, the discussion of the report has the following seven sections; (i) Introduction, (ii) National grid supported electric cooking, (iii) Mini grid supported electric cooking and (iv) Off-grid (standalone) supported electric cooking, (v) All-round scoring analysis, (vi) provides an in-depth discussion of other enabling environments in selected countries and lastly (vi) conclusion. Based on the structure, the discussion points out where the biggest movements have been (up and down) and whether

such movements are also positive or negative. In addition, the findings highlight how many and which countries in 2023, have surpassed the set GMA threshold for Top 25 countries in 2020; prioritising on the three infrastructure pillars that support electric cooking; natural grid, mini-grid and off-grid. Importantly, the discussion identifies the countries with the greatest opportunities for a scale up of electric cooking, where the all-round scoring analysis is deployed and integrates rankings of countries based on the three-infrastructure pillars that support electric cooking. Though the scope of the analysis focuses on the Global South, the discussion of the report also centres on the MECS and GECCO priority countries.

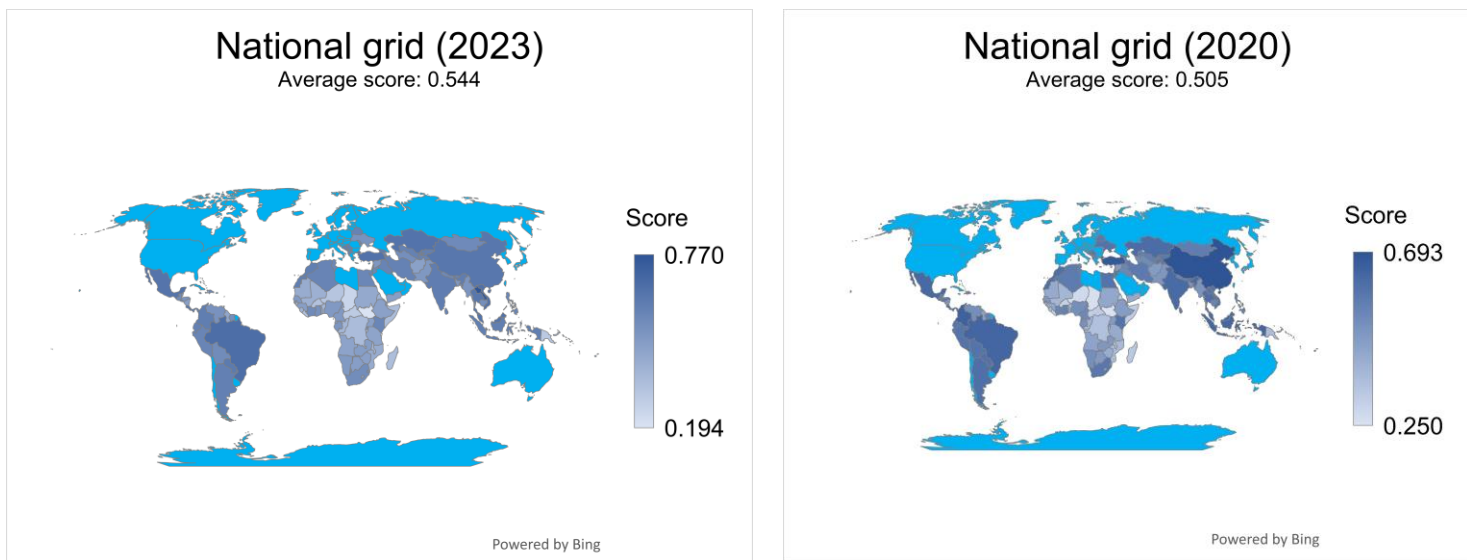
2. National grid supported electric cooking.

This section describes the global GMA score and country rankings including their movements (either up or down and whether positive or negative) for the national grid supported electric cooking. The detailed discussion explaining the factors driving the national grid GMA scores and ranking including their movements among selected countries is presented in section 6.

2.1 GMA Scores: National grid supported electric cooking.

The GMA score for national grid supported electric cooking had a higher average score of 0.544 in 2023 compared to 0.505 in 2020 as shown in figure 1. The improvement in the GMA score for national grid supported electric cooking is largely attributed to the high scores for indicators in capacity, policy, deforestation, health, and clean fuel users. Other indicators for manufacturing and imports and grid also explained the improved average score for national grid supported electric cooking. Figure 1 also presents GMA scores for national grid supported electric cooking for 130 countries.

Figure 1: National grid supported electric cooking.



2.2 Top and Bottom Rankings

Figure 2 shows the ranking of the Top 25 countries based on their GMA scores for national grid supported electric cooking between year 2023 and 2020. In 2023, the scale up of national grid supported cooking is most viable in Laos, Brazil, Vietnam, Turkey, Kazakhstan, Malaysia, Mexico, Thailand, China, Costa Rica, Paraguay, Georgia, India, Colombia, Bosnia and Herzegovina, Panama, Morocco, Indonesia, Serbia, Argentina, Albania, Montenegro, Kyrgyzstan, Ecuador and Uzbekistan. When compared to year 2020, in year 2023, 15 countries recorded upwards movements in Top 25 countries ranking. They include Laos, Brazil, Vietnam, Kazakhstan, Malaysia, Mexico, Thailand, Paraguay, Bosnia and Herzegovina, Albania, Montenegro, Kyrgyzstan, Ecuador, and Uzbekistan. While 11 countries that recorded downward movements in Top 25 countries ranking in year 2023

compared to year 2020 include: Turkey, China, Costa Rica, India, Colombia, Panama, Morocco, Indonesia, Serbia, and Argentina. Only Georgia retained its year 2020 position in Top 25 countries ranking in year 2023.

Figure 2: Ranking of national grid supported electric cooking for Top 25 Countries.

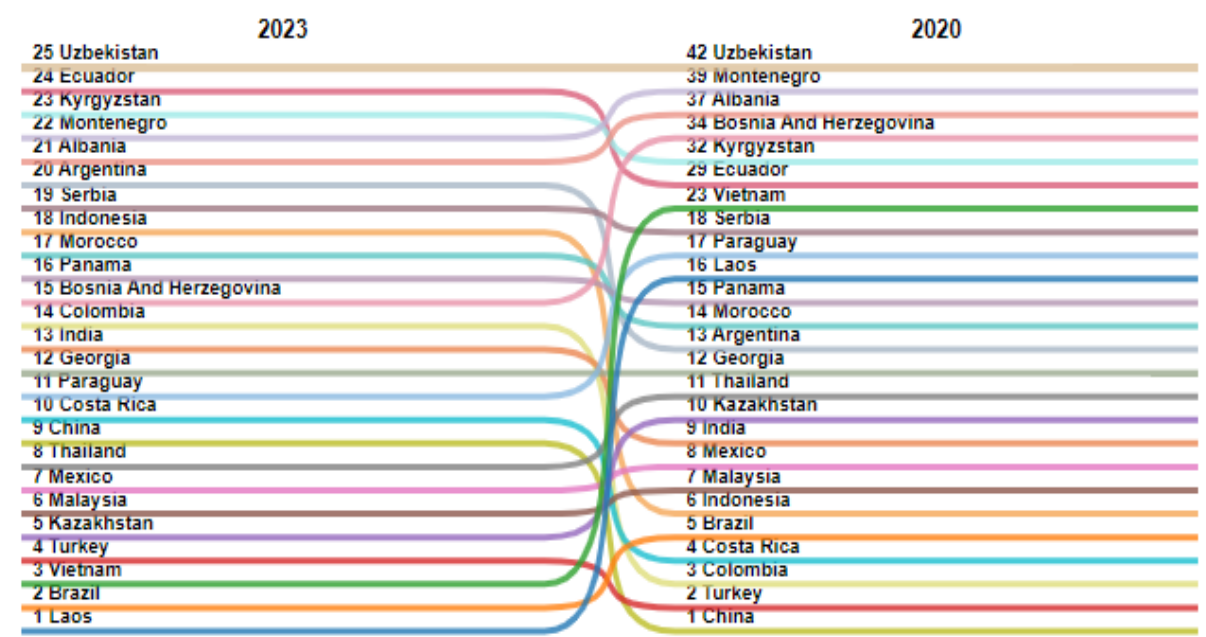


Figure 3 shows the ranking of the Bottom 25 countries based on their GMA scores for national grid supported electric cooking for year 2020 and 2023. When compared to year 2020, in year 2023, countries that recorded some upwards movements in ranking for national grid supported electric cooking and are also in the Bottom 25 countries ranking include: Central African Republic, Papua New Guinea, Guinea-Bissau, Madagascar, Congo Democratic Republic, Benin, Congo Republic, Gambia, Haiti, Mauritania and Sudan. South Sudan, Chad, and Mali are the only countries that retained their year 2020 position in Bottom 25 countries ranking in year 2023.

Figure 3: Ranking of national grid supported electric cooking for Bottom 25 Countries.

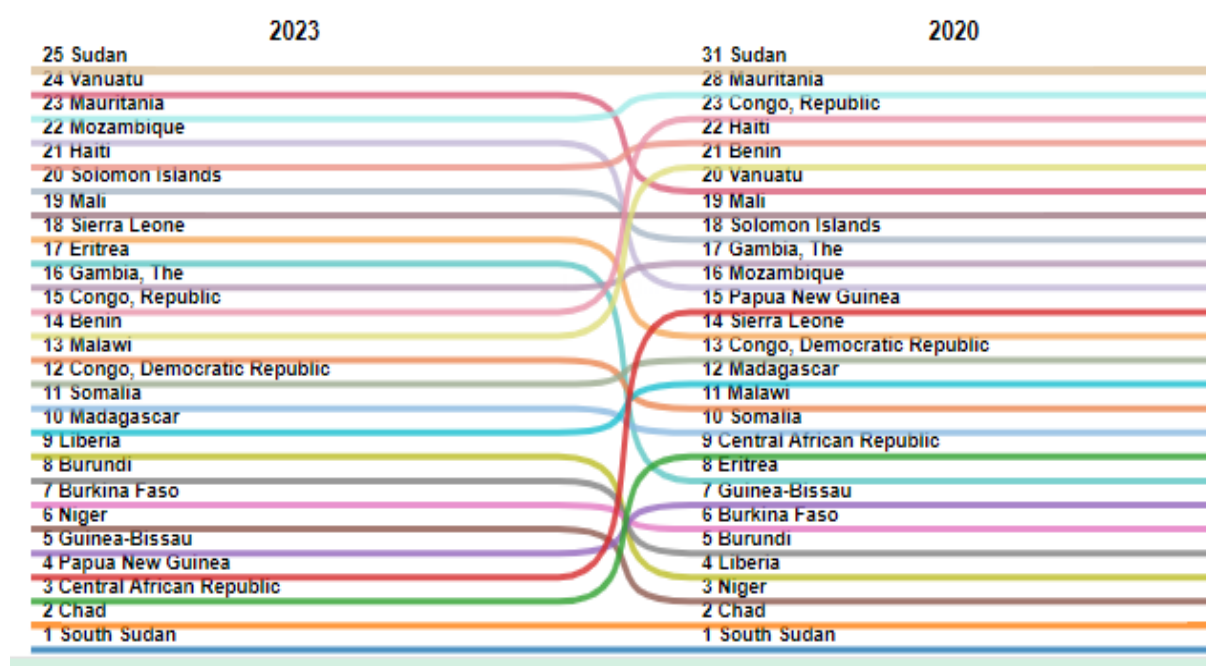
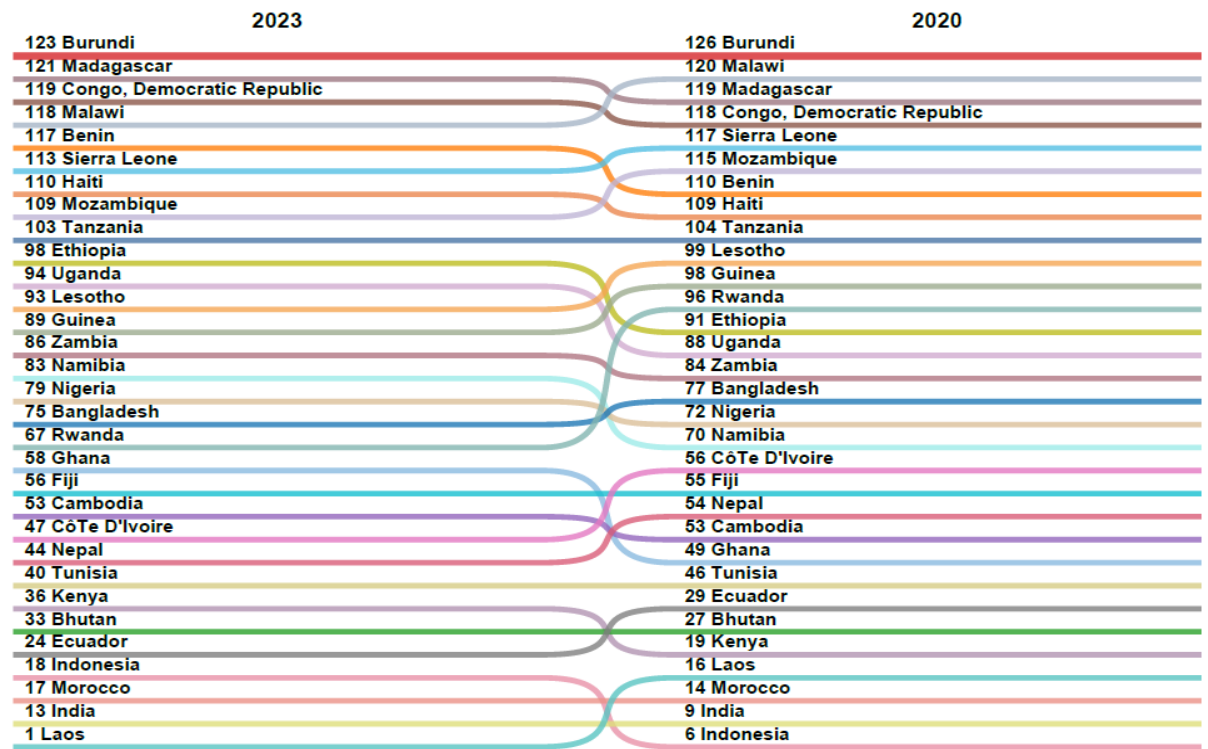


Figure 4 shows ranking of the GeCCo priority countries based on their GMA scores for national grid supported electric cooking for year 2020 and 2023. Analysis of the Top 25 countries ranking for national electric cooking among the Global Electric Cooking Coalition (GeCCo) priority countries, show that Laos, India, Morocco, Indonesia, and Ecuador are the only countries that made it to the Top 25 countries. With Laos and Ecuador recording upward movements in the ranking. At the same time analysis of the Bottom 25 countries ranking for national electric cooking among the GeCCo priority countries, show that Mozambique, Haiti, Congo Democratic Republic, Madagascar, and Burundi are the countries that are ranked Bottom 25 countries. However, even though ranked bottom 25, Burundi, Malawi, and Mozambique recorded some slight improvements in ranking of the national grid supported electric cooking.

Figure 4: Ranking of national grid supported electric cooking for GeCCo priority countries.

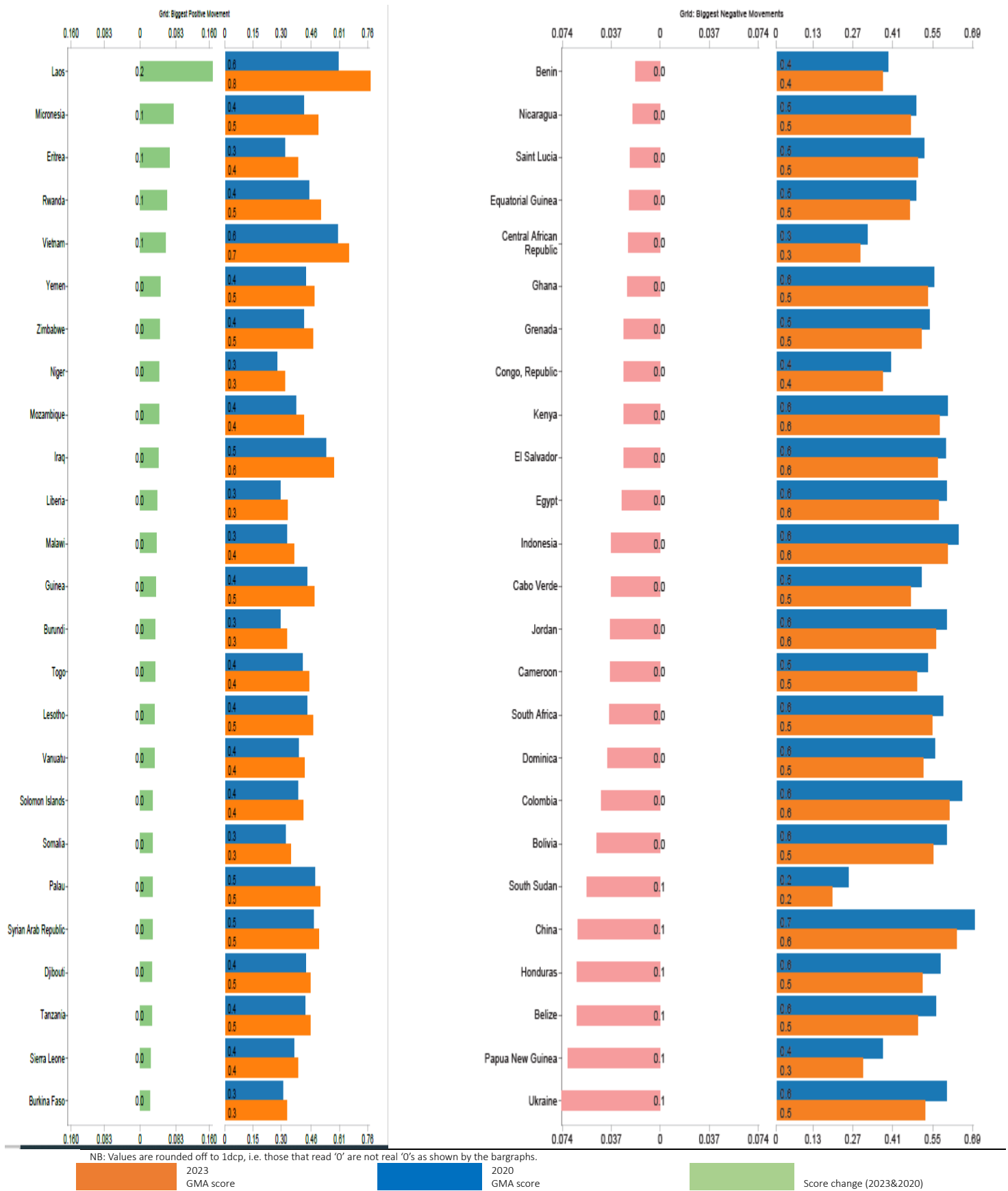


2.3 Biggest Movements and GMA Threshold score analysis

Biggest Movement Analysis

When compared to year 2020, out of 130 countries analysed, 72 countries recorded upward/positive movements while 58 countries had downward/negative movements on their GMA scores for national grid supported electric cooking in year 2023. The average positive growth rate was estimated at 5.23% and the negative growth rate at 4.47% during the period. Figure 5 presents both the positive and negative movements among Top 25 countries based on their GMA scores for national grid supported electric cooking between 2020 and 2023. Among the first ten (10) countries with the biggest upwards and positive movements include Laos, Micronesia, Eritrea, Rwanda, Vietnam, Yemen, Zimbabwe, Niger, Mozambique, and Iraq. While Ukraine, Papua New Guinea, Belize, Honduras, China, South Sudan, Bolivia, Colombia, Dominica, and South Africa are among the first ten (10) countries with the biggest downward and negative movements.

Figure 5: Biggest Movements among Top 25 Countries (2020 – 2023)



When compared to year 2020, out of the 31 GeCCo priority countries analysed, 16 countries recorded upward/positive movements while 15 countries had downward/negative movements on their GMA scores for national grid supported electric cooking in year 2023. Figure 6 presents both the positive and negative movements among GeCCo priority countries based on their GMA scores for national grid supported electric cooking between 2020 and 2023. The sixteen (16) countries with the biggest upwards and positive movements include Laos, Rwanda, Mozambique, Malawi, Guinea, Burundi, Lesotho, Tanzania, Sierra Leone, Haiti, Madagascar, Nepal, Tunisia, Côte d'Ivoire, Ecuador, and Bangladesh. While Indonesia, Kenya, Ghana, Benin, Namibia, India, Nigeria, Fiji, Bhutan, Morocco, Zambia, Ethiopia, Uganda, Congo Democratic Republic are among the fifteen (15) countries with the biggest downward and negative movements.

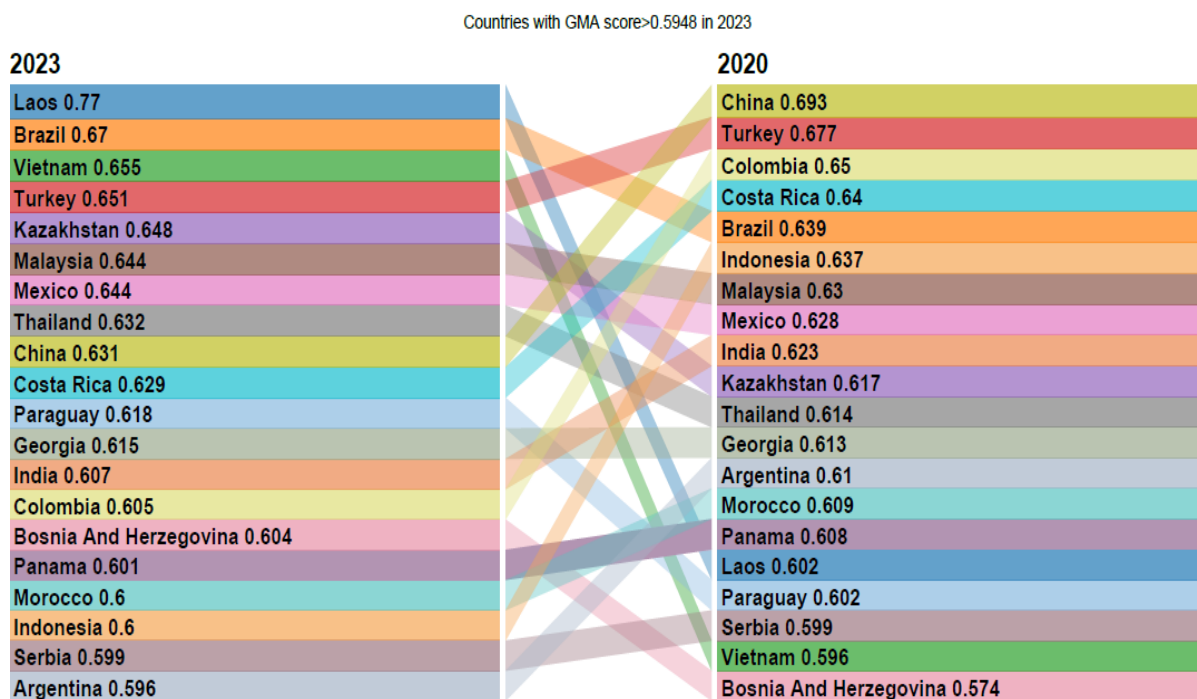
Figure 6: Biggest Movements among GeCCo Priority Countries (2020 – 2023)



GMA Threshold score analysis

Analysis of threshold score for the Top 25 countries in 2020 based on their GMA scores for national grid supported electric cooking is estimated at 0.5948. Only 20 countries in 2023 had surpassed this score. These countries include Laos, Brazil, Vietnam, Turkey, Kazakhstan, Malaysia, Mexico, Thailand, China, Costa Rica, Paraguay, Georgia India, Colombia, Bosnia and Herzegovina, Panama, Morocco, Indonesia, Serbia and Argentina as presented in figure 7. Laos, India, Morocco and Indonesia being among the GeCCO priority countries.

Figure 7: Countries with GMA score>0.5948 in 2023 (National Grid Supported Electric Cooking)



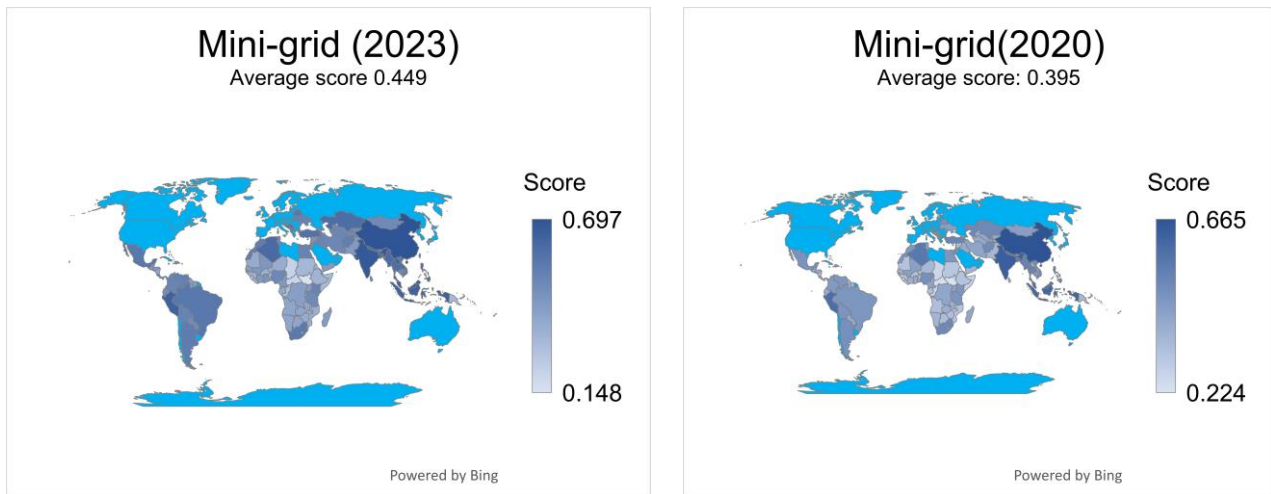
3. Mini grid supported electric cooking.

This section describes the global GMA scores and country ranking including their movements (either up or down and whether positive or negative) for the mini grid supported electric cooking. The detailed discussion explaining the factors driving the national grid GMA scores and ranking including their movements among selected countries is presented in section 6.

3.1 GMA Scores: Mini grid supported electric cooking.

The GMA score for mini grid supported electric cooking had a higher average score of 0.449 in 2023 compared to 0.395 in 2020 as shown in figure 8. The improvement in the GMA score for Mini grid supported electric cooking is largely attributed to the high scores for indicators in Mini grid, capacity, policy, health, deforestation, and clean fuel users. Other indicators for manufacturing and imports and logistics also explained the improved average score for Mini grid supported electric cooking. Figure 8 also presents GMA scores for mini grid supported electric cooking for 130 countries.

Figure 8: Mini grid supported electric cooking.



3.2 Top and Bottom Rankings

The ranking on the Top 25 countries based on their GMA scores for Mini grid supported electric cooking between year 2023 and 2020 is presented in figure 9. When compared to year 2020, in year 2023, 12 countries recorded an upward movement. They include Malaysia, Laos, Myanmar, Thailand, North Macedonia, Serbia, Bosnia and Herzegovina, Belarus, Brazil, Mexico, Maldives, and Morocco. China, India, Philippines, and Kazakhstan retained their 2020 ranking position in 2023.

Figure 9: Ranking of Mini grid supported electric cooking for Top 25 Countries.

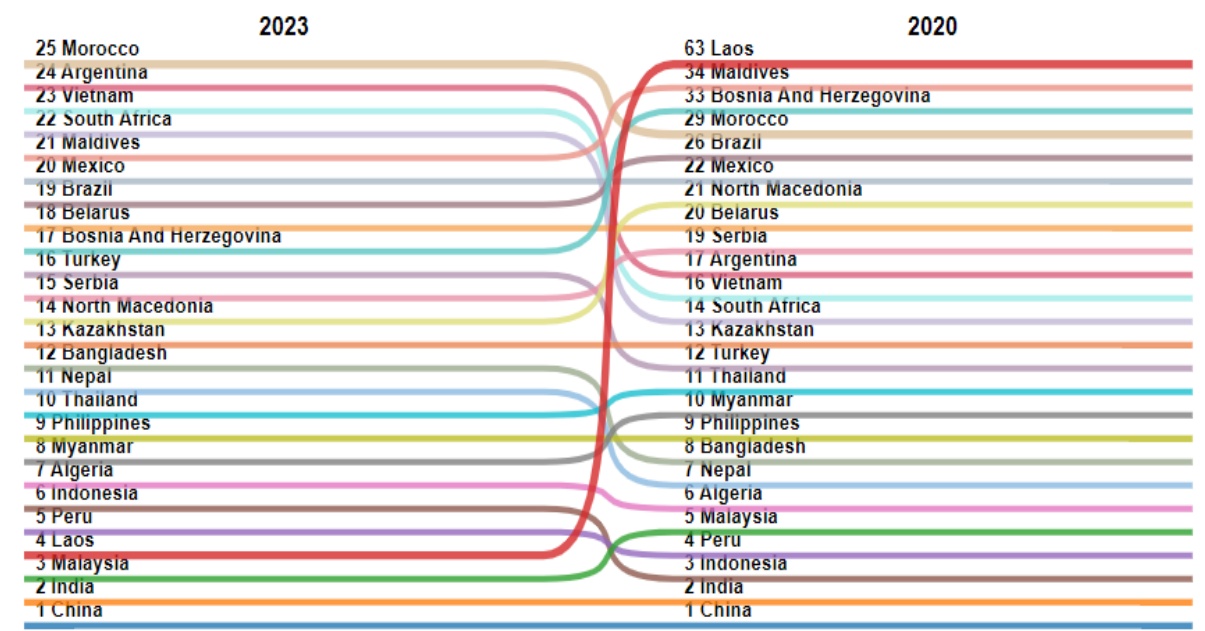


Figure 10 shows the ranking of the Bottom 25 countries based on their GMA scores for Mini grid supported electric cooking for year 2020 and 2023. When compared to year 2020, in year 2023, countries that recorded some upwards movements in ranking for Mini grid supported electric cooking and are also in the Bottom 25 countries ranking include: Burundi, Congo Republic, Equatorial Guinea, Somalia, Liberia, Malawi, Eritrea, Togo, and Mozambique. South Sudan and Seirra Leone are the only countries that retained their year 2020 position in Bottom 25 countries ranking in year 2023.

Figure 10: Ranking of Mini grid supported electric cooking for Bottom 25 Countries.

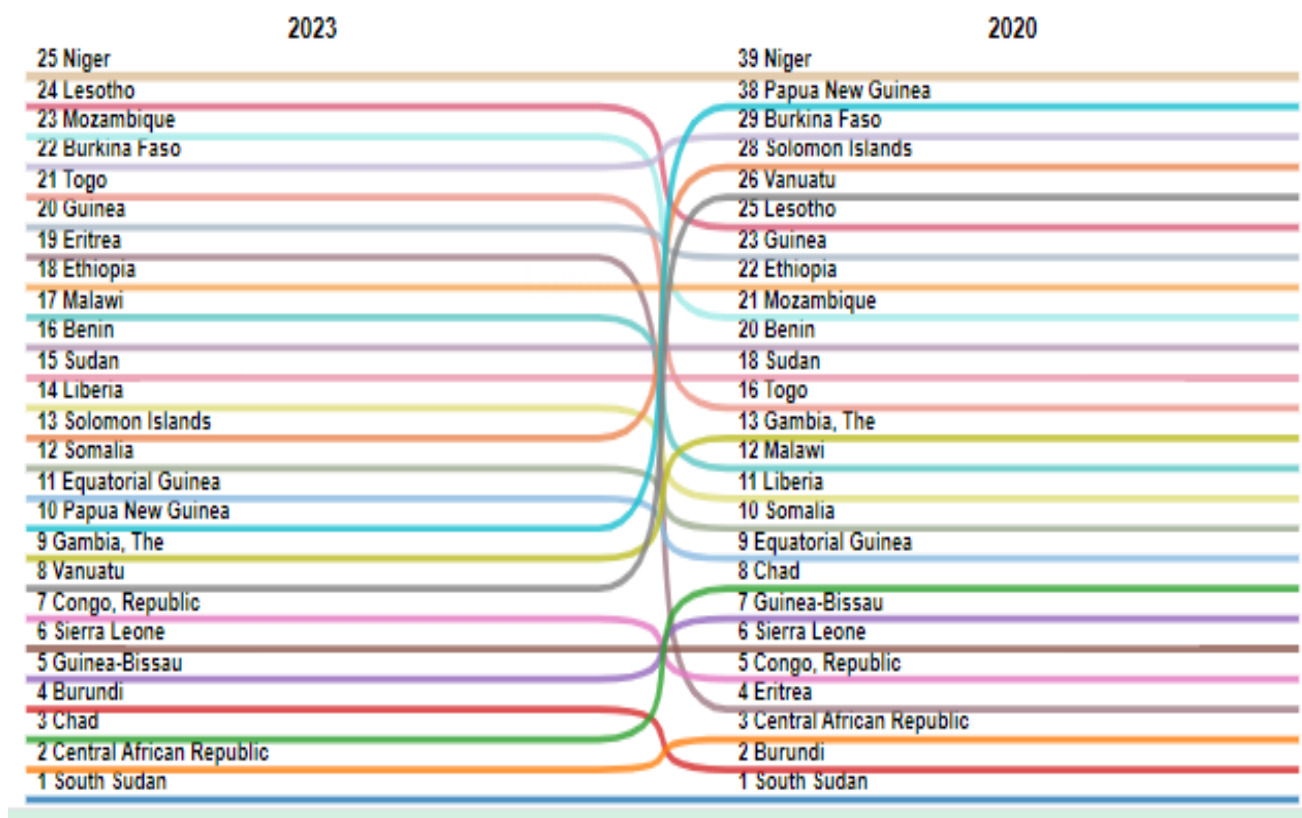
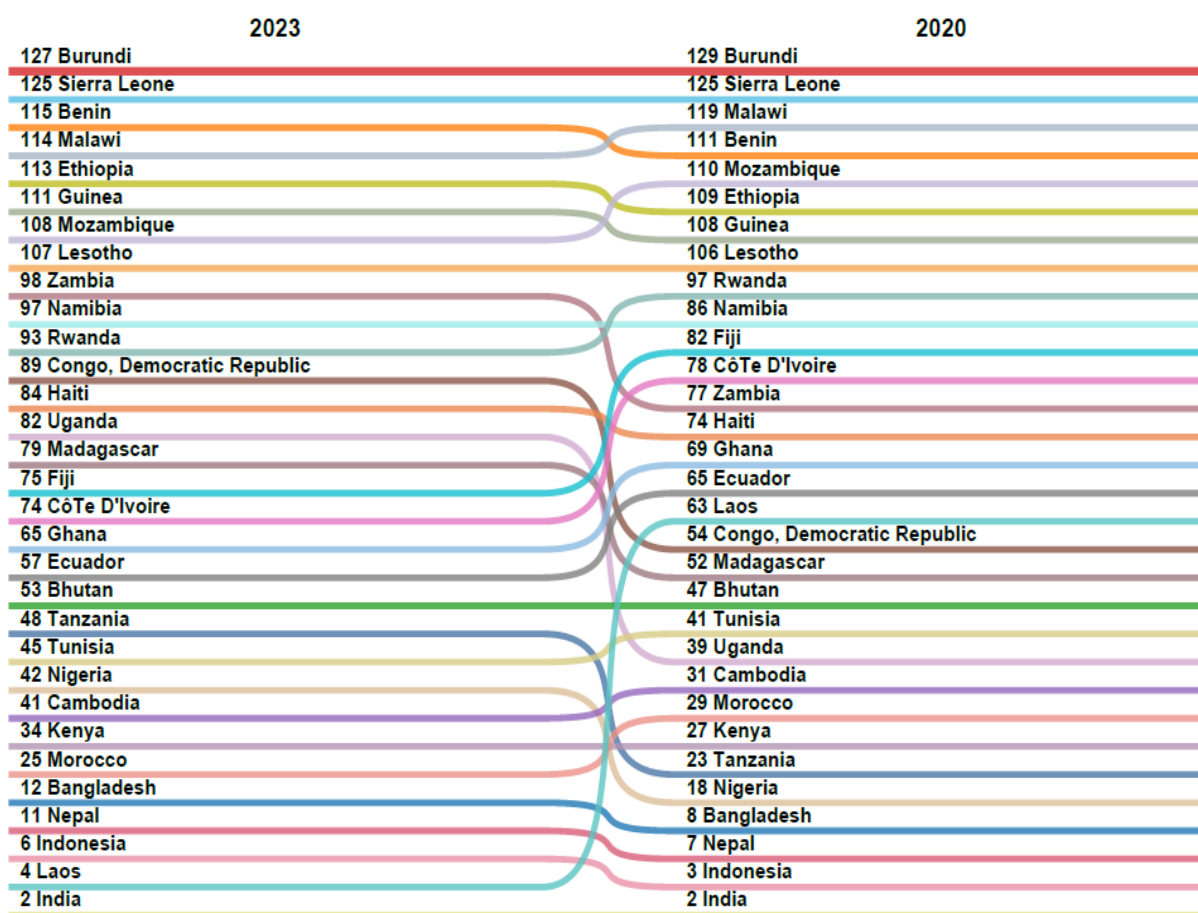


Figure 11 shows ranking of the GeCCo priority countries based on their GMA scores for Mini grid supported electric cooking for year 2020 and 2023. Analysis of the Top 25 countries ranking for Mini grid electric cooking among the Global Electric Cooking Coalition (GeCCo) priority countries in 2023, show that Laos, India, Indonesia, Nepal, Bangladesh, and Morocco, are the only countries that made it to the Top 25 countries. With Lars and Morrocco recording upward movements in the ranking while India maintained its 2020 position.

At the same time analysis of the Bottom 25 countries ranking for Mini grid electric cooking among the GeCCo priority countries, show that Burundi, Benin, Malawi, Ethiopia, Eritrea, Guinea, and Mozambique are on the bottom of the ranking. However, even though ranked bottom 25, Burundi, and Mozambique recorded some slight improvements in GMA scores for Mini grid supported electric cooking.

Figure 11: Ranking of Mini grid supported electric cooking for GeCCo priority countries.

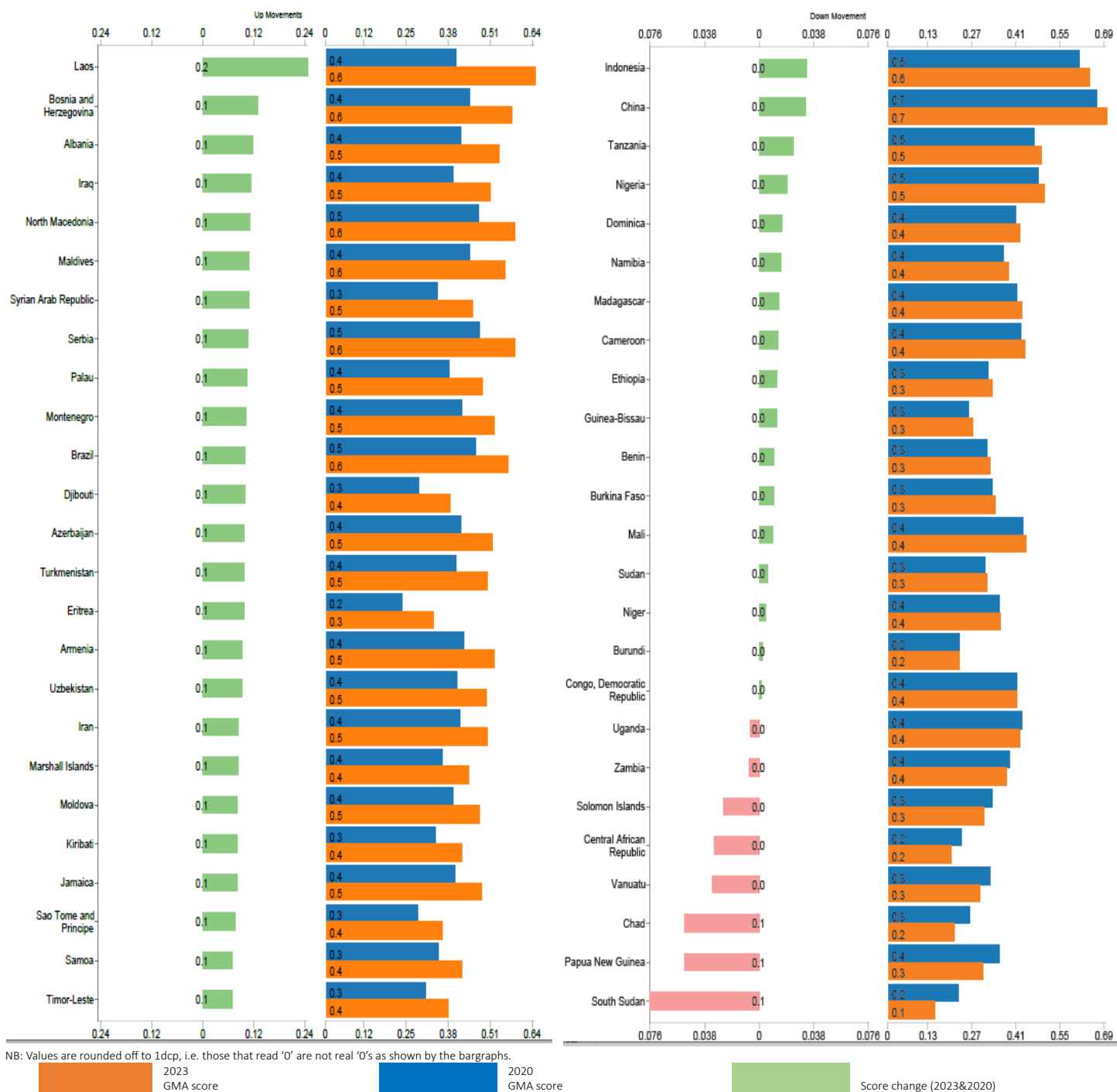


2.2 Biggest Movements and GMA Threshold score analysis

Biggest Movement Analysis

When compared to year 2020, out of 130 countries analysed, 122 countries recorded upward and positive movements while 8 countries had downward and negative movements on their GMA scores for Mini grid supported electric cooking in year 2023. Figure 12 presents both the positive and negative movements among Top 25 countries based on their GMA scores for Mini grid supported electric cooking between 2020 and 2023. Among the first ten (10) countries with the biggest upwards and positive movements include Laos, Bosnia and Herzegovina, Albania, Iraq, North Macedonia, Maldives, Syrian Arab Republic, Serbia, Palau, and Montenegro. While South Sudan, Papua New Guinea, Chad, Vanuatu, Central African Republic, Solomon Islands, Zambia, and Uganda are the only countries with the biggest downward and negative movements.

Figure 12: Biggest Movements among Top 25 Countries (2020 – 2023)



When compared to year 2020, out of the 31 GeCCo priority countries analysed, 29 countries recorded upward/positive movements while only 2 countries (Uganda and Zambia) had downward/negative movements on their GMA scores for Mini grid supported electric cooking in year 2023. Figure 13 presents both the positive and negative movements among GeCCo priority countries based on their GMA scores for Mini grid supported electric cooking between 2020 and 2023.

Figure 13: Biggest Movements among GeCCo Priority Countries (2020 – 2023)



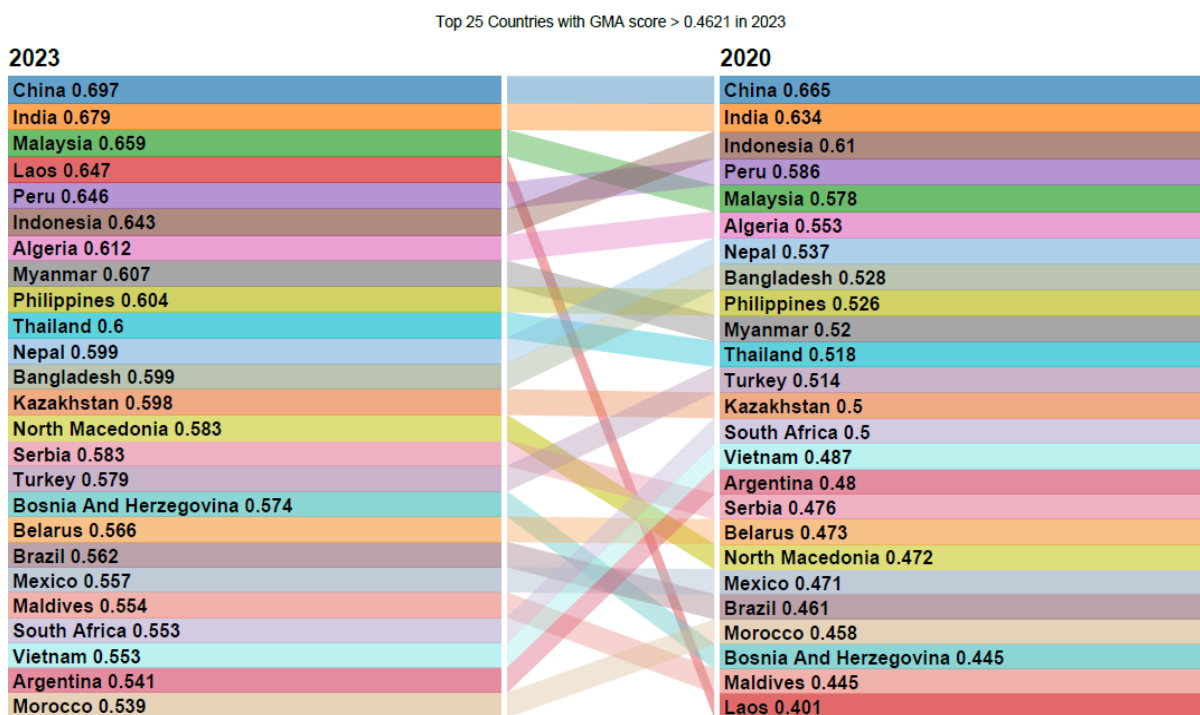
NB: Values are rounded off to 1dcp, i.e. those that read '0' are not real '0's as shown by the bargraphs.

■ 2023 GMA score
 ■ 2020 GMA score
 ■ Score change (2023&2020)

GMA Threshold score analysis

Analysis of threshold score for the Top 25 countries in 2020 based on their GMA scores for Mini grid supported electric cooking is estimated at 0.4621. About 61 countries in 2023 had surpassed this threshold score. Among the Top 25 countries that surpassed the threshold score include China, India, Malaysia, Laos, Peru, Indonesia, Algeria, Myanmar, Philippines, Thailand, Nepal, Bangladesh, Kazakhstan, North Macedonia, Serbia, Turkey, Bosnia and Herzegovina, Belarus, Brazil, Mexico, Maldives, South Africa, Vietnam, Argentina, and Morocco as presented in figure 14. Laos, India, Morocco and Indonesia being among the GeCCO priority countries.

Figure 14: Countries with GMA score > 0.4621 in 2023 (Mini Grid Supported Electric Cooking)



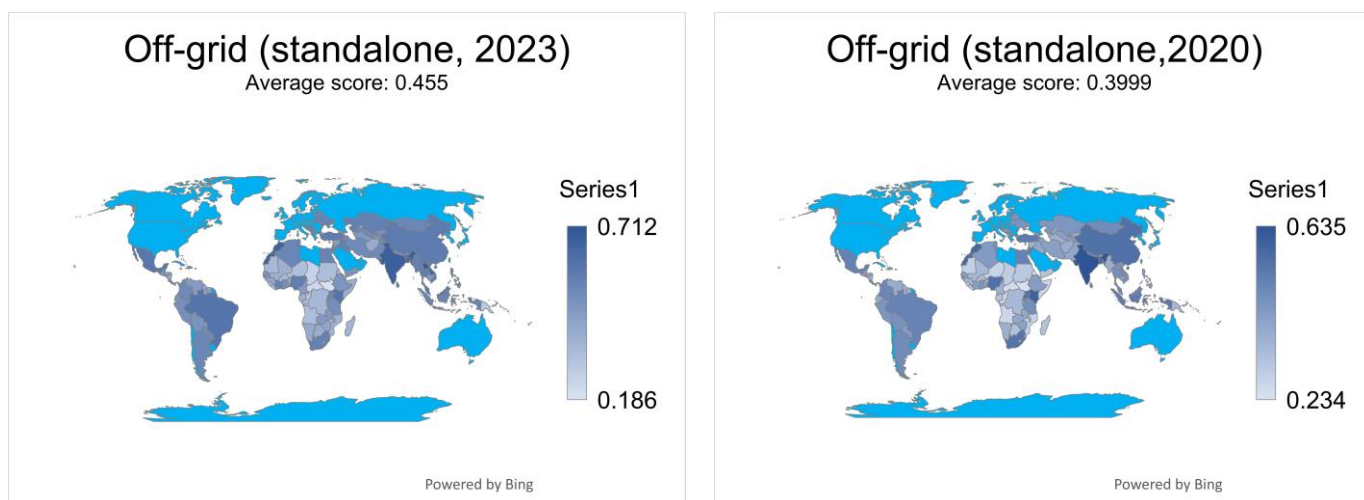
4. Off grid supported electric cooking

This section describes the global GMA scores and country ranking including their movements (either up or down and whether positive or negative) for the off-grid supported electric cooking. The detailed discussion explaining the factors driving the national grid GMA scores and ranking including their movements among selected countries is presented in section 6.

4.1 Overall GMA Scores: Off grid supported electric cooking.

The GMA score for Off grid supported electric cooking had a higher average score of 0.455 in 2023 compared to 0.399 in 2020 as shown in figure 15. The improvement in the GMA score for Off grid supported electric cooking is largely attributed to the high scores for indicators in Off grid, capacity, policy, deforestation, health, clean fuel users, and manufacturing and imports. Figure 15 presents GMA scores for off-grid supported electric cooking for 130 countries.

Figure 15: Off grid supported electric cooking.



4.2 Top and Bottom Rankings

The ranking on the Top 25 countries based on their GMA scores for Off grid supported electric cooking between year 2023 and 2020 is presented in figure 16. When compared to year 2020, in year 2023, 15 countries recorded upwards movements. They include Laos, Brazil, Mexico, Mauritius, Malaysia, Vietnam, Thailand, Iraq, Rwanda, Kazakhstan, Myanmar, Cote d’Ivoire, Ukraine, Serbia, and North Macedonia. Morocco, Turkey, Bangladesh, and Tunisia maintained their 2020 ranking position.

Figure 16: Ranking of for Off grid supported electric cooking for Top 25 Countries.

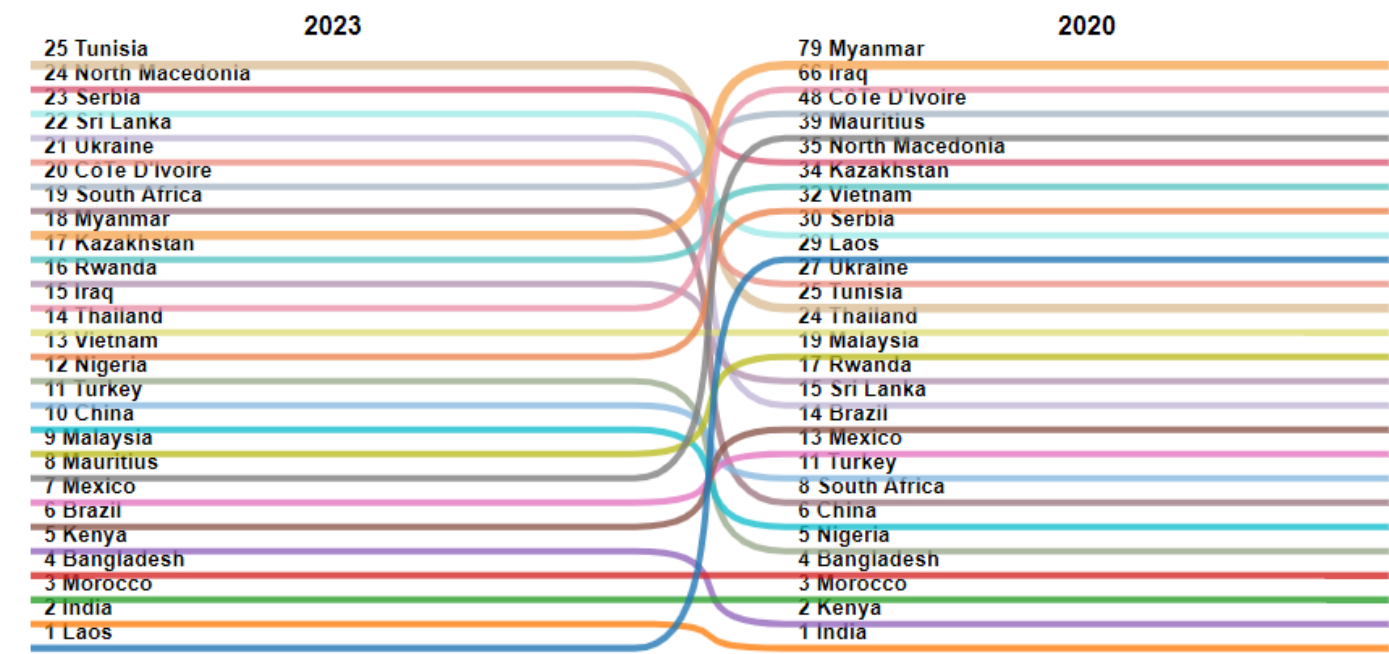


Figure 17 shows the ranking of the Bottom 25 countries based on their GMA scores for Off grid supported electric cooking for year 2020 and 2023. When compared to year 2020, in year 2023, countries that recorded some upwards movements in ranking for Off grid supported electric cooking and are also in the Bottom 25 countries ranking include: Burundi, Congo, Republic, Liberia, Angola, Mauritania, Sierra Leone, Eritrea, Mozambique, and Gabon. Equatorial Guinea is the only country that retained its year 2020 position among Bottom 25 countries ranking in year 2023.

Figure 17: Ranking of Off grid supported electric cooking for Bottom 25 Countries.

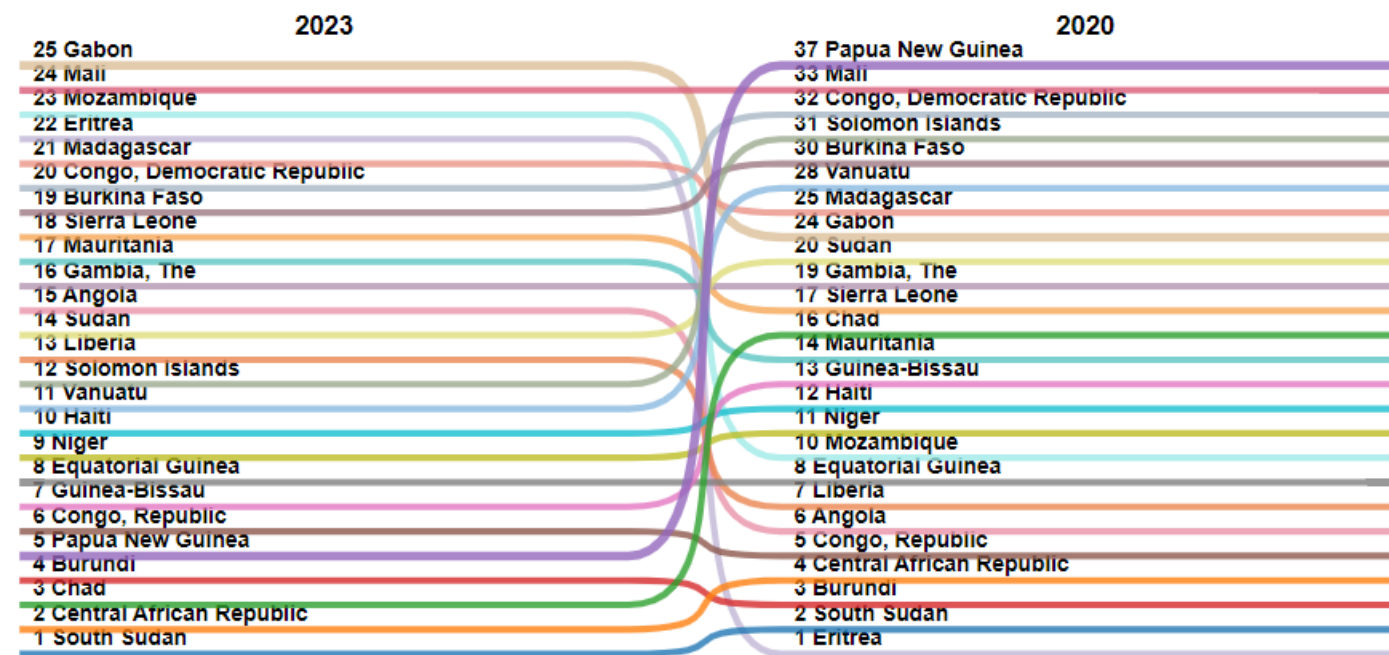
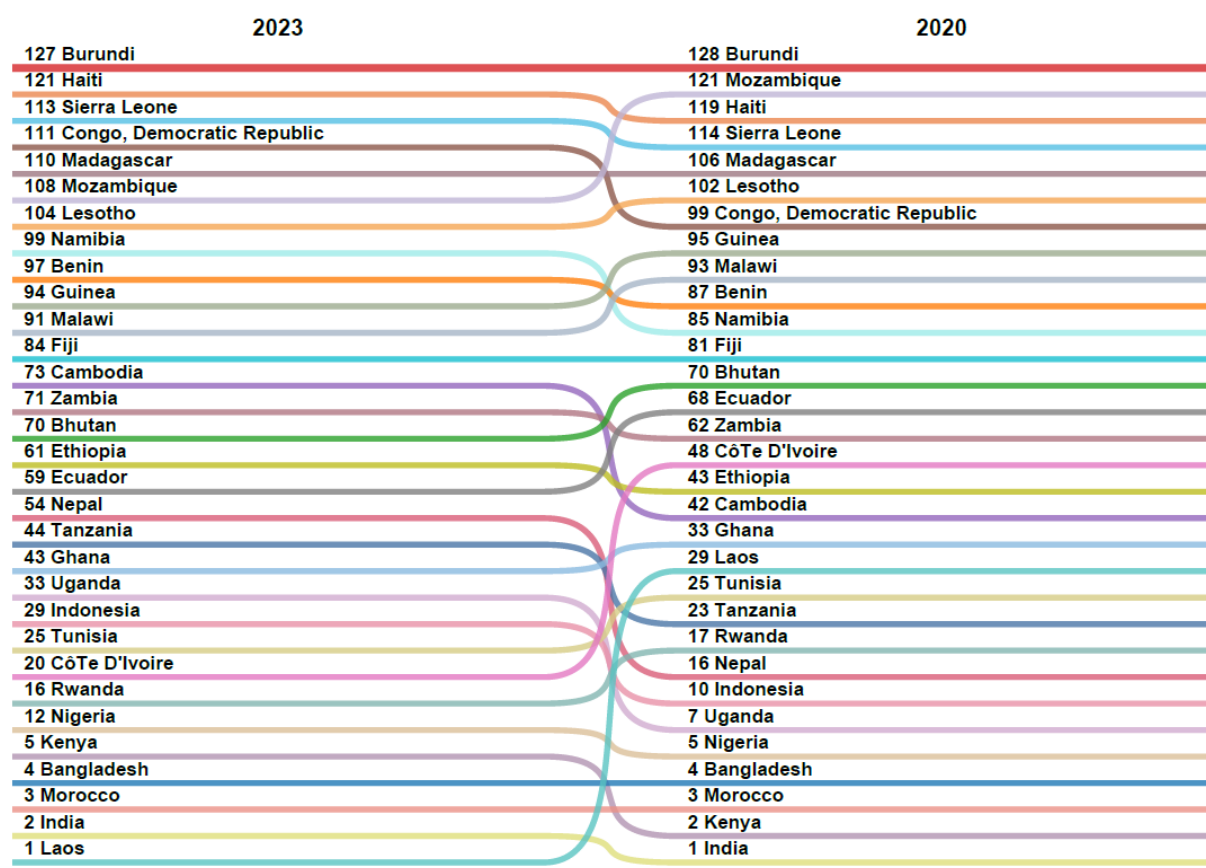


Figure 18 shows ranking of the GeCCo priority countries based on their GMA scores for Off grid supported electric cooking for year 2020 and 2023. Analysis of the Top 25 countries ranking for Off grid electric cooking among the Global Electric Cooking Coalition (GeCCo) priority countries in 2023, show that Laos, India, Morocco, Bangladesh, Kenya, Nigeria, Cote d'Ivoire, and Tunisia are the only countries that made it to the Top 25 countries. With Lars, Rwanda, and Cote d'Ivoire recording upward movements in the ranking while Morocco, Bangladesh, and Tunisia maintained their 2020 position.

At the same time analysis of the Bottom 25 countries ranking for Off grid electric cooking among the GeCCo priority countries, show that Burundi, Haiti, Congo, Democratic Republic, Madagascar, and Mozambique are on the bottom of the ranking. However, even though ranked among bottom 25 countries, Burundi, Congo Democratic Republic, and Mozambique recorded some slight improvements in ranking for Off grid supported electric cooking. Figure 18 shows ranking of the GeCCo priority countries based on their GMA scores for Off grid supported electric cooking for year 2020 and 2023.

Figure 18: Ranking of Off grid supported electric cooking for GeCCo priority countries (2023 and 2020)



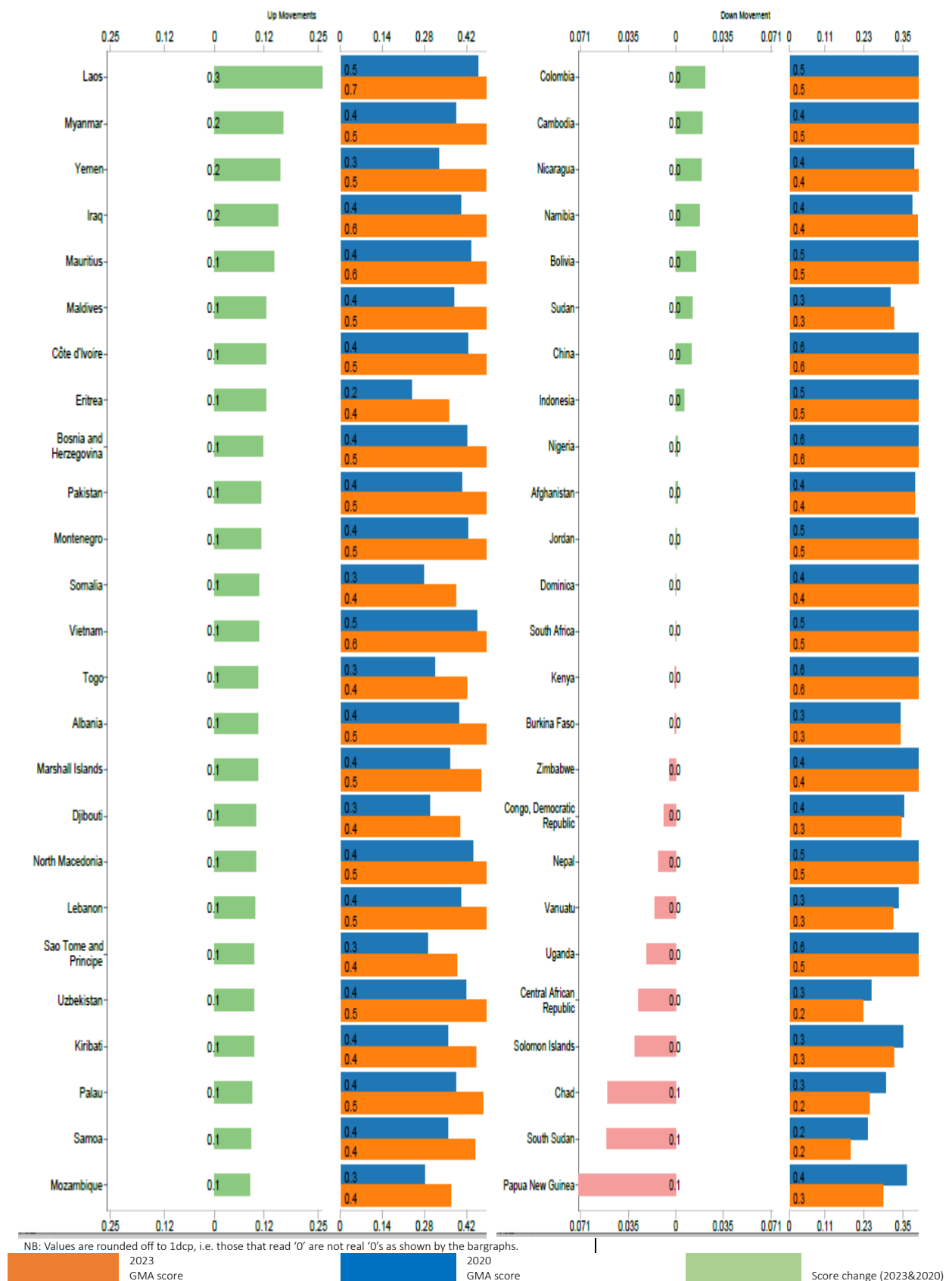
4.3 Biggest Movements and GMA Threshold score analysis

Biggest Movement Analysis

When compared to year 2020, out of 130 countries analysed, 118 countries recorded upward and positive movements while 12 countries had downward and negative movements on their GMA scores for Off grid supported electric cooking in year 2023. Figure 19 presents both the positive and negative movements among Top 25 countries based on their GMA scores for Off grid supported electric cooking between 2020 and 2023. Among the first ten (10) countries with the biggest upwards and positive movements include Laos, Madagascar, Myanmar, Yemen, Iraq, Mauritius, Maldives, Cote d'Ivoire, Eritrea, and Bosnia and Herzegovina. While Papua New Guinea, Chad, Solomon Islands, Central African Republic, Uganda, Vanuatu, Nepal, Congo Democratic

Republic, Zimbabwe, Burkina Faso and Kenya are the only countries with the biggest downward and negative movements.

Figure 19: Biggest Movements among Top 25 Countries (2020 – 2023)



When compared to year 2020, out of the 31 GeCCo priority countries analysed, 24 countries recorded upward/positive movements while only 4 countries had downward/negative movements on their GMA scores for Off grid supported electric cooking in year 2023. The countries with downward/negative movements include Kenya, Congo Democratic Republic, Nepal, and Uganda. Figure 20 presents both the positive and negative movements among GeCCo priority countries based on their GMA scores for Off grid supported electric cooking between 2020 and 2023.

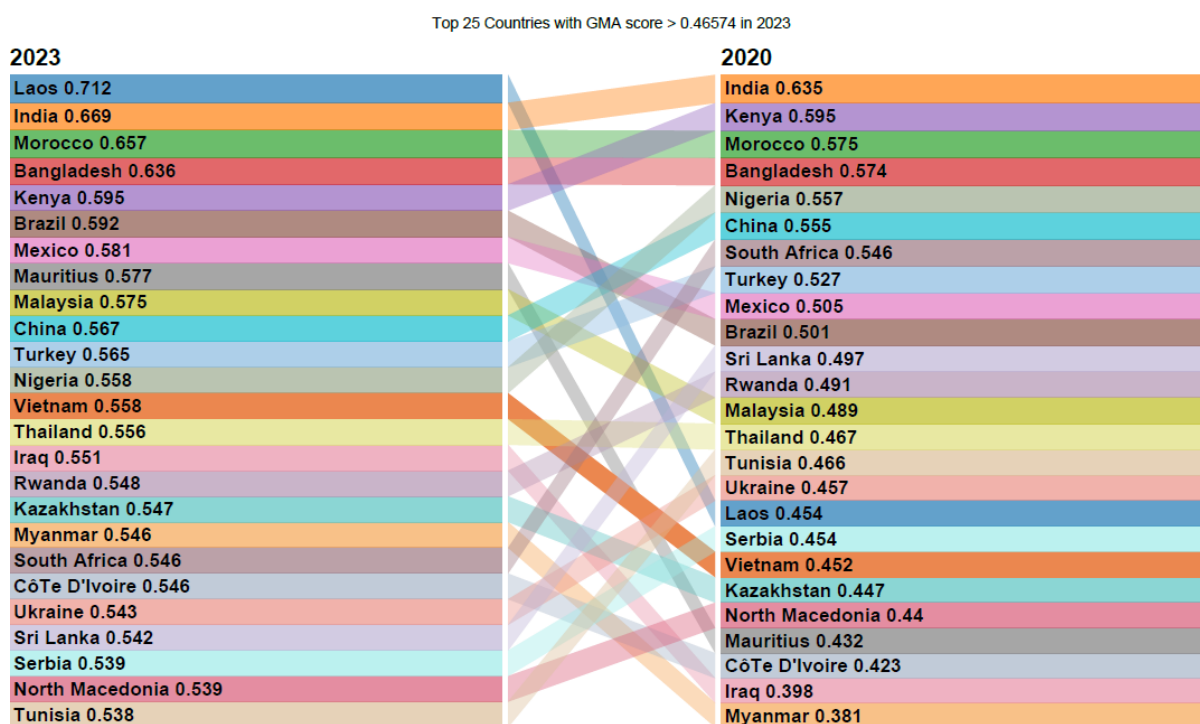
Figure 20: Biggest Movements among GeCCo Priority Countries (2020 – 2023)



GMA Threshold score analysis

Analysis of threshold score for the Top 25 countries in 2020 based on their GMA scores for Off grid supported electric cooking is estimated at 0.46574. About 67 countries in 2023 had surpassed this threshold score. Among the Top 25 countries that surpassed the threshold score include Laos, India, Morocco, Bangladesh, Kenya, Brazil, Mexico, Mauritius, Malaysia, China, Turkey, Nigeria, Vietnam, Thailand, Iraq, Rwanda, Kazakhstan, Myanmar, South Africa, Cote d'Ivoire, Ukraine, Sri Lanka, Serbia, North Macedonia, and Tunisia as presented in figure 21. Laos, India, Morocco, Bangladesh, Kenya, Nigeria, Rwanda, Cote d'Ivoire and Tunisia being among the GeCCO priority countries.

Figure 21: Countries with GMA score > 0.46574 in 2023 (Off Grid Supported Electric Cooking)



5. All-Round High Scoring Countries

This section describes the global GMA scores and ranking for the three electric cooking scenarios (National grid, mini-grid, and off-grid supported electric cooking) also known as the all-round high scoring countries. The detailed discussion explaining the factors driving the national grid GMA scores and ranking including their movements among selected countries is presented in section 6. Table 1 presents GMA scores including the ranking of the three scenarios (National grid, mini-grid, and off-grid supported electric cooking) for Top 80 countries.

In 2023, Top 25 countries in the Global South with the greatest opportunities for a scale up of electric cooking based on all round scoring analysis are: India, Bangladesh, China, Indonesia, Laos, Malaysia, Nepal, Peru, Algeria, Kenya, Philippines, Morocco, Brazil, Myanmar, Turkey, Kazakhstan, Thailand, Vietnam, Mexico, Argentina, Mauritius, Egypt, Albania, Bosnia and Herzegovina, and Colombia. The lists features MECS programme countries, i.e., India, Bangladesh, Indonesia, Nepal, Kenya, and Myanmar. Also included in the Top 25 countries are Laos and Morocco from GeCCo priority countries.

Based on all round scoring analysis, in 2023; the countries with the greatest opportunities for a scale up of electric cooking among GeCCo priority countries include India, Bangladesh, Indonesia, Laos, Nepal, then followed by Kenya, Morocco, Myanmar, Ecuador, Tunisia, Nigeria, Bhutan, Cambodia, Cote d'Ivoire, Tanzania, Ghana, Uganda, Fiji and Rwanda in that order.

In 2020, Top 25 countries in the Global South with the greatest opportunities for a scale up of electric cooking based on all round scoring analysis were India, Nepal, China, Indonesia, Peru, Algeria, Malaysia, Kenya, Bangladesh, Turkey, Afghanistan, Cambodia, Philippines, Kazakhstan, Thailand, Vietnam, Sri-Lanka, Argentina, Brazil, Iran, Egypt, Belarus, Morocco, Tunisia, and Jordan. Among these countries, GeCCo priority countries included: India, Nepal, Indonesia, Kenya, Bangladesh, Cambodia, Morocco, and Tunisia. However, Cambodia, Morocco, and Tunisia are not MECS programme countries.

Afghanistan, Cambodia, Sri-Lanka, Iran, Belarus, Tunisia (GeCCo priority country) and Jordan are countries that were in Top 25 countries in 2020 with the greatest opportunities for a scale up of electric cooking based on all round scoring analysis but are missing among the Top 25 in 2023 ranking.

Countries that emerged among the Top 25 countries in 2023 and were not part of the Top 25 country rankings in 2020; with the greatest opportunities for a scale up of electric cooking based on all round scoring analysis are Laos, Myanmar, Mexico, Mauritius, Albania, Bosnia and Herzegovina, and Colombia. Where Laos and Myanmar are GeCCo priority countries.

Table 1: All round GMA ranks and scores for Top 80 countries.

colour scale: light blue= GeCCo priority countries; light blue & bold font = MECS countries; red = high rank and green=low rank

Top80 Ranking	Country	GMA Score 2023	National Grid (Rank)	Mini grid (Rank)	Off-grid (Rank)
1	India	1.364	13	2	2
2	Bangladesh	1.237	75	12	4
3	China	1.208	9	1	10
4	Indonesia	1.207	18	6	29
5	Laos	1.202	1	4	1
6	Malaysia	1.200	6	3	9
7	Nepal	1.199	44	11	54
8	Peru	1.171	32	5	51
9	Algeria	1.170	30	7	34
10	Kenya	1.165	36	34	5
11	Philippines	1.162	35	9	37
12	Morocco	1.146	17	25	3
13	Brazil	1.141	2	19	6
14	Myanmar	1.135	66	8	18
15	Turkey	1.135	4	16	11
16	Kazakhstan	1.133	5	13	17
17	Thailand	1.132	8	10	14
18	Vietnam	1.099	3	23	13
19	Mexico	1.089	7	20	7
20	Argentina	1.088	20	24	35
21	Mauritius	1.086	52	50	8
22	Egypt	1.080	37	33	26
23	Albania	1.073	21	26	46
24	Bosnia and Herzegovina	1.072	15	17	27
25	Colombia	1.071	14	37	40
26	Serbia	1.070	19	15	23
27	Belarus	1.068	28	18	32
28	Iraq	1.068	31	38	15
29	Sri Lanka	1.063	34	60	22
30	North Macedonia	1.061	27	14	24
31	Maldives	1.060	57	21	45
32	Costa Rica	1.060	10	32	31
33	Venezuela	1.054	60	28	75
34	Armenia	1.044	38	30	56
41	Jordan	1.030	41	52	30
42	Ecuador	1.028	24	57	59
43	Tunisia	1.027	40	45	25
44	Nigeria	1.025	79	42	12
45	Iran	1.024	26	40	38
46	Turkmenistan	1.019	55	39	69
47	Montenegro	1.017	22	29	28
48	Dominican Republic	1.015	43	44	49
49	Uzbekistan	1.013	25	43	41
50	Tajikistan	1.013	29	55	65
51	South Africa	1.007	51	22	19
52	Bhutan	1.007	33	53	70
53	Kyrgyzstan	1.006	23	58	57
54	Mongolia	1.004	45	47	36
55	Cambodia	0.995	53	41	73
56	El Salvador	0.982	39	64	66
57	Moldova	0.978	46	56	50
58	Côte d'Ivoire	0.978	47	74	20
59	Jamaica	0.978	50	51	53
60	Lebanon	0.978	73	62	47
61	Tanzania	0.973	103	48	44
62	Guatemala	0.970	48	67	64
63	Pakistan	0.968	74	76	39
64	Antigua and Barbuda	0.963	59	61	67
65	Yemen	0.958	87	71	55
66	Suriname	0.957	54	80	85
67	Ghana	0.953	58	65	43
68	Cameroon	0.948	82	72	72
69	Ukraine	0.947	61	31	21
70	Uganda	0.946	94	82	33
71	Fiji	0.946	56	75	84
72	Rwanda	0.943	67	93	16
73	Saint Vincent and the Grenadines	0.938	64	73	80

35	Panama	1.042	16	46	48	74	Cabo Verde	0.930	90	70	96
36	Azerbaijan	1.041	42	36	62	75	Dominica	0.927	63	83	86
37	Paraguay	1.040	11	54	42	76	Grenada	0.927	68	68	76
38	Bolivia	1.040	49	35	60	77	Samoa	0.924	71	86	77
39	Afghanistan	1.038	97	27	100	78	Tonga	0.923	78	87	79
40	Georgia	1.033	12	59	52	79	Saint Lucia	0.923	80	81	83
						80	Belize	0.919	77	91	87

6. Discussion of findings for selected countries

This section provides an explanation on the findings presented on the national grid supported electric cooking (section 2), mini-grid supported electric cooking (section 3), and off-grid supported electric cooking (section 4), based on the findings of all-round high scoring countries (section 5). The discussion kicks off with the analysis of the Top 80 countries (see table 1) with the greatest opportunities for a scale up of electric cooking based on all round scoring analysis and targets. However, the scope of the country's coverage is limited to MECS programme countries as discussed below. It is important to note that the indicators used to measure the GMA scores heavily depend on the accessed international data sources. As such, based on our field experience, some of the data is not completely up to date. For instance, the renewable energy share for India is at 40% and not at 20% as reported from international sources. The same applies for Kenya, the renewable energy share reported in 2022 was 87% (90% in 2021, 93% in 2020, 88% in 2019 and 85% in 2018) and not 89% as reported from international sources. Thus, it is not within the scope of this report to double check for every country for such discrepancy.

India - is position 1 overall and is also ranked position 2 in both mini-grid and off-grid scenarios and position 13 for national grid scenario. Despite its large population of about 1.42 billion people, India has a very high national electricity access rate of 99.6% (with electricity access at urban areas at 100% and rural areas at 99.3%). Though renewable energy share is low at 20%, it has a national grid reliability at 8.88hrs/yr. Estimated population using electricity and commercial polluting fuels (i.e., kerosene, coal and charcoal) separately as primary fuels for cooking are quite low at 2% and 4.5% respectively. Thus, the large number of biomass users correlates with the high IAP attributed deaths estimated at 59 per 100,000 persons.

Bangladesh – is position 2 overall and is highly ranked at position 4 for off-grid and 12 for mini-grid scenarios. Its population is approximately 172 million people and has a high national electricity access rate of 99% (with electricity access in urban areas at 99.7% and rural areas at 98.5%). Its renewable energy share is very low at 1.95%, and it is faced with a weak national grid reliability at 4,673 hrs/yr. Estimated population using electricity and commercial polluting fuels (i.e., kerosene, coal, and charcoal) separately as primary fuels for cooking are quite low at 2.5% and 3.9% respectively. It has a high tree cover loss and high IAP attributed deaths estimated at 72 per 100,000 persons.

Indonesia – is ranked 4th overall, 6th for mini-grid and 18th for the national grid scenarios. It has a higher population than Bangladesh, estimated at 276 million people. Access to electricity on the national grid is estimated at 99.2% (with electricity access in urban areas at 99.9% and rural areas at 98.2%). Though renewable energy share is low at 19.6%, it has a strong national grid reliability at 6.16 hrs/yr. Estimated population using electricity and commercial polluting fuels (i.e., kerosene, coal and charcoal) separately as primary fuels for cooking are quite low at 1.9% and 10.4% respectively. It has a high tree cover loss and the IAP attributed deaths estimated at 34 per 100,000 persons.

Nepal - is ranked 7th overall and is also highly ranked at position 11 for the mini-grid scenario. It has a population of about 31 million people with a national electricity access rate of 89.9% (with electricity access at urban areas at 94.2% and rural areas at 93.5%). Though it has a very high renewable energy share of 100%, it has a weak national grid reliability at 490.38 hrs/yr. Estimated population using electricity and commercial polluting fuels (i.e., kerosene, coal and charcoal) separately as primary fuels for cooking are quite low at 1.75% and 3.30% respectively. The resulting deaths attributed to IAP is estimated at 88 per 100,000 persons which is higher than India, Indonesia, and Bangladesh.

Kenya - is position 10 overall and is highly ranked at position 5 for off-grid scenario. Its population is approximately 54 million people and has a national electricity access rate of 76.5% (with electricity access at urban areas at 97.5% and rural areas at 68.2%). Its renewable energy share is very high at 89.8%, and it has a

national grid reliability at 82.8 hrs/yr. Estimated population using electricity and commercial polluting fuels (i.e., kerosene, coal and charcoal) separately as primary fuels for cooking are quite low at 2.3% and 34% respectively. It has a high tree cover loss and the resulting deaths attributed to IAP is estimated at 42 per 100,000 persons.

Myanmar – is ranked 14th overall and 8th for mini-grid scenarios. It has almost the same population size as Kenya estimated at 54.2 million people. Access to electricity on the national grid is estimated at 72.5% (with electricity access in urban areas at 93.6% and rural areas at 62.8%). Though it has a renewable energy share of 41.8%, it has a weak national grid reliability at 799.92hrs/yr. Estimated population using both electricity and commercial polluting fuels (i.e., kerosene, coal and charcoal) separately as primary fuels for cooking are high at 57.30% and 23.40% respectively. It has a high tree cover loss and a high IAP attributed deaths estimated at 100 per 100,000 persons.

Nigeria- is ranked 44th overall and is also highly ranked at position 12 for the off-grid scenario. It has a population of about 218.5 million people and a national electricity access rate of 59.5% (with electricity access at urban areas at 89.2% and rural areas at 26.3%). It is faced with a very low renewable energy share of 27.5%, it has a weak national grid reliability at 2,690.29 hrs/yr. Estimated population using electricity and commercial polluting fuels (i.e., kerosene, coal and charcoal) separately as primary fuels for cooking is estimated at 3% and 39.7% respectively. The resulting deaths attributed to IAP is estimated at 66 per 100,000 persons.

Bhutan- is position 52 overall and is highly ranked at position 4 for off-grid and 12 for mini-grid scenarios. Its population size is very small of about 783 thousand people and has a very high electricity access rate of 100% at national level, urban and rural areas. Its renewable energy share is also very high at 100% and has a strong national grid reliability of 20.59 hrs/yr. Estimated population using electricity and commercial polluting fuels (i.e., kerosene, coal and charcoal) separately as primary fuels for cooking are at 94.5% and 10.2% respectively. IAP attributed deaths are estimated at 36 per 100,000 persons.

Tanzania- is position 61 overall. It has a population of about 65.5 million people and a national electricity access rate of 42.7% (with electricity access at urban areas at 77.3% and rural areas at 23.3%). It is faced with a very low renewable energy share of 44.1%, it has a weak national grid reliability at 978.12 hrs/yr. Estimated population using electricity and commercial polluting fuels (i.e., kerosene, coal and charcoal) separately as primary fuels for cooking is estimated at 3.9% and 44.6% respectively. The resulting deaths attributed to IAP is estimated at 44 per 100,000 persons.

Ghana- is ranked 67th overall. It has a population of about 33.5 million people and a national electricity access rate of 86.3% (with electricity access at urban areas at 95.2% and rural areas at 74%). It is faced with a very low renewable energy share of 34.9%, it has a weak national grid reliability at 2029.17 hrs/yr. Estimated population using electricity and commercial polluting fuels (i.e., kerosene, coal and charcoal) separately as primary fuels for cooking is estimated at 1.9% and 41.8% respectively. The resulting deaths attributed to IAP is estimated at 62 per 100,000 persons.

Uganda- is ranked 70th overall and has a population of about 47.2 million people and a national electricity access rate of 45.2% (with electricity access at urban areas at 72.3% and rural areas at 35.9%). Though it has a very high renewable energy share of 97%, it has a weak national grid reliability at 3072.66hrs/yr. Estimated population using electricity and commercial polluting fuels (i.e., kerosene, coal and charcoal) separately as primary fuels for cooking is estimated at 1.8% and 37.2% respectively. It has a high tree cover loss and the resulting deaths attributed to IAP is estimated at 42 per 100,000 persons.

Rwanda- is position 72nd overall and is also highly ranked at position 16 for the off-grid scenario. It has a population of about 13.8 million people with a national electricity access rate of 48.7% (with electricity access at urban areas at 98% and rural areas at 38.2%). Renewable energy share is about 60% and it has a strong national grid reliability at 29.12 hrs/yr. Estimated population using electricity and commercial polluting fuels (i.e., kerosene, coal and charcoal) separately as primary fuels for cooking is estimated at 0.6% and 11.6% respectively. The resulting deaths attributed to IAP is estimated at 55 per 100,000 persons.

7. Conclusion

The 2023 Global Market Assessment (GMA) for electric cooking report provides analysis on where the greatest opportunities and challenges for a scale up of electric cooking in the Global South lie, and in particular on the MECS and GECCO priority countries. The analysis undertaken relies on a weighted score constructed from 40 indicators covering 130 countries in the Global South and is categorised into three avenues of supported electric cooking: the national grid, mini-grid and off-grid (standalone). The weighted score produced for each country, also referred to as the “GMA for electric cooking score”, forms the basis for country rankings for supported electric cooking at the national grid, mini-grid, off-grid and overall (on grid, mini -grid and off-grid together).

The countries with the greatest opportunities for a scale up of electric cooking among GeCCo priority countries based on overall ranking (all round scoring analysis) include India, Bangladesh, Indonesia, Laos, Nepal, then followed by Kenya, Morocco, Myanmar, Ecuador, Tunisia, Nigeria, Bhutan, Côte d’Ivoire, Tanzania, Ghana, Uganda, Fiji and Rwanda.

Primarily while the infrastructure to support electricity cooking either through the national grid, mini-grid or off-grid is critical and offers a country an opportunity to scale up electric cooking, addressing other country context challenges such as grid reliability, electricity affordability, and renewable energy capacity is important.

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