New College of the Humanities
19 Bedford Square
London WC1B 3HH
United Kingdom

Tel: +44 (0)20 7637 4550
info@nchlondon.ac.uk
nchlondon.ac.uk

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A compound index of renewables consumption

Andrea Gatto and Carlo Drago

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Andrea Gatto[1]* Carlo Drago[2]

Abstract

Renewables play a crucial role in sustainable development and energy security achievements. SGDs recommend a number of actions to enhance the implementation of renewables both in OECD and non-OECD countries. A prime policy consequence of renewables use is entrepreneurship enhancement. Microbusiness implementation can empower women, rural, youth, and vulnerable categories, especially when coupled with microfinance and policies. Those policies are nowadays detected as important strategies by the International Community for reaching increased resilience in energy, food and resource. The work exploits a statistical approach useful to measure energy policy effectiveness. A composite indicator on renewables policy is built, exploring different approaches. The determinants of energy policy effectiveness are analyzed, considering some other relevant variables which can be identified from the recent literature. A statistical comparison of the different results is particularly relevant to ensure the robustness of the factual implications. We confirm that green countries, e.g. Scandinavia, are keeping a green consumption attitude. We discover that countries endowed with rich resources, like Brazil, are managing to perform better in terms of renewable energy consumption. We also validate that countries that are oil exporters, like most Arab countries, are usually less prone to use renewable energy.

Keywords: compound index, renewables, energy policy, sustainable development, rural development, women entrepreneurship.

[1] * Corresponding author. Natural Resources Institute, Greenwich University, Central Avenue, Chatham Maritime ME4 4TB, UK. New College of the Humanities at Northeastern University, 19 Bedford Square, Fitzrovia, London WC1B 3HH, UK. Centre for Studies on Europe, Azerbaijan State University of Economics (UNEC), Azerbaijan. Email: a.gatto@greenwich.ac.uk.

[2] Carlo Drago, University of Rome "Niccolò Cusano" Via Don Carlo Gnocchi 3, 00166, Rome. Email: carlo.drago@unicusano.it.

1. Renewable energy and sustainable development

Energy policy is at the core of Agenda 2030. United Nations' Sustainable Development Goal (SDG) 7 is dedicated to reaching energy security, particularly affordable and clean energy parameters, by 2030 (UN, 2015, IBRD, 2018). SDG7 aims to "endure access to affordable, reliable, sustainable and modern energy for all". It stresses on ensuring universal access to electricity (7.1.1), and clean fuels and technologies for cooking (7.1.2). Target 7.2 focuses on renewable energy, aiming to "Increase substantially the share of renewable energy in the global energy mix". Finally, target 7.3 is based on Energy efficiency, aiming to "double the global rate of improvement in energy efficiency".

Among the energy policy goals, one turns pivotal to facilitate entrepreneurship, facilitating business implementation: renewable energy. It must be considered that the use of renewable energy worldwide has been increasing dramatically in the consumption trends: its consumption arrived at 17.5% in 2015 when in fact in 2010 it consisted in some 16.7% in 2010. The 17,5% share was made of 9,6% of modern renewable energy – including solar and wind -, and only 7,9% of traditional biomass (IBRD, 2018).

Another stylized fact to be pointed outcomes from international policy trends: world growth has led many countries in changing consumer attitudes, hence their energy consumption and energy mixes. Though, developing countries did not always manage to couple high growth rates with consistent renewable Energy consumptions (IBRD, 2018). Many of these countries, though, converted their industrial models towards more sustainable, ecological models – take the case of Circular Economy implemented in China as a benchmark (Agovino et al. 2018).

The need for composite indicators to describe, define and gauge energy facts, arise clearly. The World Bank (2018) considers composite indicators as a methodology to assess the national policy, where the regulatory framework turns crucial. The final goal is to progress towards sustainable energy targets. In fact, energy security, and more particularly renewable energy implementation is a multidimensional concept, worth to be analysed and shaped by composite indicators. Though, the risk of aggregating complex phenomena as renewable energy lies in synthesising in information losses (Drago & Gatto, 2018).

In this section we dealt with the problem of renewable energy policy and energy security, framing the issue within the Agenda 2030. Besides the first part, the paper illustrates the adoption of data and methodologies used to build the renewable energy composite indicator in par. 2. Following, the par. 3 presents the results acquired through the methodology chosen and presents international ranking. Thus, in par. 4, the paper draws some important policy implications concerning renewable energy for entrepreneurship. More particularly, this strategy results to be valuable for women, rural people, youth, and vulnerable categories. We finally present our conclusions in par. 5.

2. Data and Methodology

Composite indicators are increasingly important instruments for policy analysis sakes. Though they need attention on their application: albeit being highly effective on the message they convey, synthetic indicators raise potential critiques due to the inherent subjectivity of some choices. Composite indicators can be usefully considered to aggregate different single indicators and obtain a unique measure; this measure can be usefully compared between several statistical units. In the last years, many composite indicators have been developed with the purpose of solving compelling issues and facing social phenomena (Nardo et al. 2005, Mazziotta Pareto 2013, Freudenberg 2003). A major strength of composite indicators is the possibility to aggregate and synthesize complex measures and give the general picture about a specific phenomenon (Saisana, M., Saltelli, A., & Tarantola, S. 2005). In this framework, the facility to communicate synthetic indicator's outputs and a specific ranking to the public opinion is intuitively a lead asset.

The paper constructs a composite indicator of renewable energy. In this respect, the indicators considered are four:

1. Renewable Energy (renen 2015);
2. Liquid Biofuels (liquid 2015);
3. Wind (wind 2015);
4. Solar (solar 2015).

The four variables were considered as the share in total final energy consumption, computed in percentage. We adopted WB data (2018). More specifically, they were exploited three data sources:

1. Energy balances from UN Statistics Division (2017);
2. World Energy Balances from IEA (2017);
3. World Bank analysis, based on the World Energy Statistics and Balances, from the IEA (2017); Energy Balances, UN Statistics Division (2017).

The data units analyzed were 206 countries, territories, and regions worldwide, including OECD and non-OECD countries. The rationale of considering such a big dataset is to give a whole picture of the different attitudes on renewable energy consumptions.

The variables are chosen in order to obtain a composite indicator of renewable energy. In this sense, we have considered the different indicators which can be part of our specific composite indicator. Data consists of a cross-section dataset concerning 2015. For this scope, the designed composite indicator measures renewable energy and could be considered each of the selected variables as the different

components of the composite indicator chosen. In this sense, it is possible to evaluate each indicator a relevant part of the final composite indicator constructed.

Secondarily, we examine a complete statistical analysis, assessing both univariate and multivariate analyses. The reason for this step is to explore the indicators as single components of the composite indicator (Nardo et al. 2005, Saisana et al. 2013).

More specifically, we are considering eventual problems lying in the data quality, which may potentially affect the construction of the composite indicator. At the same time, the multivariate analysis is conducted on the different indicators in order to evaluate the existence of different correlations between the different indicators. This moment can be useful to identify some overlapping contributions to single dimensions on the final definition of the composite indicator, as well in this sense we observe that the different single indicators do not show any particular strong correlation. Thus, we can consider the different single indicators as a part of the entire composite indicator (see Saltelli et al. 2005).

The multivariate analysis based also on other statistical visual methods shows no relevant association between the different components of the composite indicator.

The composite indicator is constructed by taking into account all the different indicators in a unique composite indicator. The different indicators are standardized in order to obtain the same scale for different indicators. The final components are aggregated on the final composite indicator.

For this scope, we consider all the different indicators and we build a first composite indicator using all the different indicators weighted with the same value. The equal weighting is assessed by considering different weightings, a fact that can allow obtaining different results. The weighting is an extremely relevant problem, to be handled carefully into the construction of composite indicators (see Becker et al. 2017 Greco et. al 2018). A different approach is followed by Drago (2017) and Gatto & Drago (2017) which consider an approach based on Interval Data to approach the uncertainty of the composite indicators (about Interval Data see Gioia Lauro 2005).

Hence, we obtain finally the composite indicator and the rank considering the different indicators equally weighted.

Finally, we calculate also the sensitivity analysis in which we compute 10000 different random weights of the composite indicator.

The procedure to simulate the different weights for the components is considered as follows:

1) We simulate for each component a different “candidate” weight from 0 to 1. The single weights are generated by a uniform distribution with minimum 0 and maximum 1.

2) The different candidate weights are summed all.
3) Thus, the final weight for the component is obtained by dividing the single simulated weight for the total.
4) By considering the procedure, we are able to obtain a different weight-related with the different components for each simulation.

For each weighting obtained on the 10000 different simulations, we are able to compute the different composite indicators. Simultaneously, it is computed the final rank in each simulation.

The different ranks are collected and finally averaged in order to obtain a final score for each country examined. More specifically, the 10000 simulations are useful to analyze the sensitivity of the different results of the composite indicator by selecting different weightings. In this sense, it is compared also the result that it is possible to consider from the different weighting than the equal-weight scenario.

The sensitivity analysis is useful to validate the robustness of the findings, obtained considering the composite indicator using all equal weights. When the different ranks on the sensitivity analysis tend to diverge from the ranking obtained in the equal-weight scenario, the meaning is that there is a specific good result for some indicator, wherein other indicators there is no the same good performance.

3. Results and ranking

We obtain a composite indicator equal-weights-based. The country ranking first in Denmark. The Scandinavian countries perform generally well, where Sweden is second on the ranking on equal weights and Finland is 17th of the final ranking (14th considering the analysis based on 10000 simulations and different weightings). Brazil also shows a very good performance on the final composite indicator ranking. The result can be explained by considering the wide and rich natural resources embedment of Brazil and the good position obtained for every single indicator. It is remarkable the position of Portugal, ranking fifth on the final calculation (equally weight-based) and fourth by considering the average rank between the different simulations. This shows that Portugal seems to perform better on a single different indicator than on the other one. In fact, where there is a difference between the two rankings, revealing relevant differences in the performances between the different indicators. Uruguay obtained good results, where its position on the equal weight scenario is the 8th, and the result on the average rank is the 6th. Austria displays a good performance as well: 9th in the equal weight scenario and 9th position on the average rank sensitivity analysis.

4. Policy implications

A common strategy to achieve sustainable development purposes through renewable energy is the adoption of microfinance programs. The empowerment of the woman in the context of energy policy effectiveness through microfinance tools is particularly relevant (Rao et al. 2009, Farhar 1998, Bhattacharyya 2013). It is shown that ad hoc microfinance policies foster women and rural people entrepreneurship and resilience in the least developed countries and depressed areas (Agovino et al. 2018, Gatto et al. 2015, Yunus 1999).

While the adoption of green consumption has a strong implication for environmental, societal and institutional reasons, it is less evident and explored the economic dimension of the policy. The enhancement of new generation energies is reputed an asset for sustainable growth and job creation around the world. It can be considered as well as a powerful measure to tackle brain drain in depressed areas, facing economic stagnations. It can be examined as well as a way to solve job loss issues due to long term economic crises, not solely in the least developed regions, but even in industrialized countries (Rao et al. 2009, Farhar 1998, Bhattacharyya 2013).

It must be underlined an outstanding policy fact. In many regions of developing countries, they were launched renewable energy programs that implied job creation and energy saving. These policies were often boosted by microfinance programs and gender empowerment schemes. A typical example comes from the solar mini-grid implementation, that became trendy in sub-Saharan Africa (IBRD 2018, WB 2018, Rao et al. 2009, Farhar 1998, Bhattacharyya 2013). In these regards, renewable energy consumption strategies outline as a set powerful policy tool for innovative business implementation, to be considered in the framework of sustainable development as a development priority.

5. Conclusions

Clean energy is a core issue in the development agenda. More and more advises are recommended from the United Nations and the international community to solve environmental, societal, institutional and economic problematics. A useful solution may come from the implementation of sound energy policies devoted to renewable energy, to address entrepreneurial problems and improvements, especial considering innovative business. In this field, microgrids creation, and in particular solar grids, was considered as a job for rural women in sub-Saharan Africa and developing countries. Recently, it has become an innovative strategy to tackle economic crises and job unemployment.

This work proposed a new statistical approach for the measurement of renewable energy. We built a cross-section dataset for the year 2015. We computed a new index that considers renewable energy consumption, regarding renewable energy, solar energy, wind energy and liquid biofuels in 2015. The new index is considerable for practical policy implications, in particular for the field of innovative business implementation, and job creation targeted for women, rural people, youth and vulnerable categories. The methodology reveals an exploratory aim in providing higher robustness. The measures can be used for microcredit and microfinance policies to boost women entrepreneurship in developing countries, especially rural areas, as well as on geographical zone affected by high unemployment and poverty.

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Appendix I - Final ranking equal weights (composite indicator 1: all the single indicators considered)

id	Country	score	rank
48	Denmark	9.890302	1
139	Niue	9.871167	2
27	Brazil	9.8665	3
108	Liechtenstein	7.704786	4
151	Portugal	7.038614	5
177	Sweden	6.88536	6
171	Spain	4.82101	7
197	Uruguay	4.618551	8
12	Austria	4.126822	9
10	Aruba	3.604662	10
70	Greece	3.52861	11
87	Ireland	3.454447	12
109	Lithuania	3.432025	13
67	Germany	3.179822	14
147	Paraguay	2.989235	15
47	Cyprus	2.91982	16
61	Finland	2.763288	17
110	Luxembourg	2.481441	18
45	Cuba	2.16244	19
90	Italy	2.135515	20
196	United States	2.022332	21
62	France	1.951286	22
148	Peru	1.700691	23
154	Romania	1.688989	24
141	Norway	1.65947	25
195	United Kingdom	1.656469	26
136	Nicaragua	1.545007	27
29	Bulgaria	1.437454	28
2	Albania	1.348601	29
31	Burundi	1.343766	30
58	Ethiopia	1.339936	31
168	Somalia	1.294314	32
82	Iceland	1.243115	33
42	Costa Rica	1.213201	34
182	Thailand	1.197748	35
206	Zimbabwe	1.174653	36
19	Belgium	1.151034	37
118	Malta	1.131042	38
36	Chad	1.118919	39
192	Uganda	1.108246	40
205	Zambia	1.070179	41

156	Rwanda	1.048402	42
23	Bhutan	1.0314	43
76	Guinea-Bissau	1.029621	44
138	Nigeria	1.02215	45
128	Mozambique	1.013611	46
181	Tanzania	0.994171	47
132	Nepal	0.973054	48
106	Liberia	0.92289	49
114	Malawi	0.915775	50
44	Croatia	0.894709	51
150	Poland	0.865958	52
64	Gabon	0.857428	53
56	Eritrea	0.79306	54
34	Canada	0.782407	55
149	Philippines	0.761006	56
137	Niger	0.758423	57
199	Vanuatu	0.749092	58
162	Sierra Leone	0.702668	59
91	Jamaica	0.666903	60
35	Central African Republic	0.663889	61
79	Honduras	0.663513	62
33	Cameroon	0.662822	63
75	Guinea	0.653216	64
8	Argentina	0.648839	65
78	Haiti	0.646101	66
30	Burkina Faso	0.578505	67
95	Kenya	0.550215	68
184	Togo	0.474975	69
165	Slovak Republic	0.472152	70
203	Palestine (State of)	0.462738	71
113	Madagascar	0.436196	72
103	Latvia	0.384494	73
74	Guatemala	0.314656	74
135	New Zealand	0.307315	75
133	Netherlands	0.30258	76
57	Estonia	0.297934	77
176	Swaziland	0.291398	78
167	Solomon Islands	0.258543	79
32	Cambodia	0.249417	80
43	Côte d'Ivoire	0.235542	81
174	Sudan	0.131301	82
117	Mali	0.128811	83
129	Myanmar	0.128811	84
59	Faroe Islands	0.088901	85
81	Hungary	0.085323	86
172	Sri Lanka	0.060173	87

202	United States Virgin Islands	0.05972	88
11	Australia	0.052732	89
102	Lao People's Democratic Republic	0.050186	90
84	Indonesia	0.001998	91
120	Mauritania	-0.08988	92
89	Israel	-0.09957	93
38	China	-0.12497	94
188	Turkey	-0.1494	95
83	India	-0.17099	96
146	Papua New Guinea	-0.19245	97
105	Lesotho	-0.20526	98
65	Gambia	-0.22767	99
21	Benin	-0.23036	100
166	Slovenia	-0.25011	101
5	Angola	-0.29669	102
93	Jordan	-0.31814	103
143	Pakistan	-0.3388	104
37	Chile	-0.36866	105
51	Dominican Republic	-0.41667	106
127	Morocco	-0.41983	107
40	Comoros	-0.44754	108
178	Switzerland	-0.46119	109
180	Tajikistan	-0.47137	110
157	Samoa	-0.51069	111
126	Montenegro	-0.51511	112
159	Senegal	-0.53564	113
145	Panama	-0.56057	114
112	Macedonia, FYR	-0.57777	115
68	Ghana	-0.587	116
25	Bosnia and Herzegovina	-0.61048	117
170	South Sudan	-0.64982	118
201	Vietnam	-0.79809	119
16	Bangladesh	-0.80351	120
152	Puerto Rico	-0.81209	121
20	Belize	-0.81434	122
60	Fiji	-0.88029	123
115	Malaysia	-0.89836	124
187	Tunisia	-0.94228	125
66	Georgia	-1.00996	126
26	Botswana	-1.02767	127
130	Namibia	-1.0419	128
92	Japan	-1.06196	129
169	South Africa	-1.06949	130
134	New Caledonia	-1.08447	131
39	Colombia	-1.10161	132
77	Guyana	-1.16157	133

122	Mexico	-1.17229	134
175	Suriname	-1.17402	135
54	El Salvador	-1.19216	136
101	Kyrgyzstan	-1.23094	137
97	Democratic People's Republic of Korea	-1.2377	138
160	Serbia	-1.30197	139
99	Kosovo	-1.31737	140
98	Republic of Korea	-1.32382	141
4	Andorra	-1.3576	142
52	Ecuador	-1.38433	143
1	Afghanistan	-1.40491	144
183	Timor-Leste	-1.41203	145
24	Bolivia	-1.42264	146
96	Kiribati	-1.47486	147
63	French Polynesia	-1.48066	148
9	Armenia	-1.49	149
121	Mauritius	-1.49144	150
71	Greenland	-1.50773	151
161	Seychelles	-1.50836	152
49	Djibouti	-1.51307	153
124	Moldova	-1.53897	154
125	Mongolia	-1.55674	155
185	Tonga	-1.5745	156
200	Venezuela	-1.60343	157
119	Marshall Islands	-1.64277	158
53	Egypt	-1.66712	159
72	Grenada	-1.67174	160
18	Belarus	-1.67655	161
104	Lebanon	-1.68009	162
193	Ukraine	-1.68525	163
46	Curaçao	-1.75109	164
50	Dominica	-1.78167	165
55	Equatorial Guinea	-1.78203	166
111	Macao (SAR, China)	-1.80942	167
88	Isle of Man	-1.91046	168
123	Micronesia (Federated States of)	-1.93582	169
155	Russian Federation	-1.93773	170
80	Hong Kong (SAR, China)	-1.94043	171
198	Uzbekistan	-1.95458	172
17	Barbados	-1.96098	173
116	Maldives	-1.97323	174
22	Bermuda	-1.97628	175
13	Azerbaijan	-1.97806	176
204	Yemen	-1.97913	177
94	Kazakhstan	-1.98268	178
107	Libya	-1.99016	179

163	Singapore	-2.00944	180
131	Nauru	-2.01653	181
14	Bahamas	-2.01719	182
85	Iran (Islamic Republic of)	-2.01939	183
86	Iraq	-2.03178	184
194	United Arab Emirates	-2.03483	185
190	Turks and Caicos Islands	-2.03996	186
179	Syrian Arab Republic	-2.04174	187
186	Trinidad and Tobago	-2.05028	188
3	Algeria	-2.053	189
28	Brunei Darussalam	-2.05478	190
6	Anguilla	-2.05633	191
164	Sint Maarten (Dutch part)	-2.05846	192
173	Sint Maarten (Dutch part)	-2.05846	193
189	Turkmenistan	-2.05882	194
158	Saudi Arabia	-2.05989	195
7	Antigua and Barbuda	-2.06024	196
15	Bahrain	-2.06024	197
41	Cook Islands	-2.06024	198
69	Gibraltar	-2.06024	199
73	Guam	-2.06024	200
100	Kuwait	-2.06024	201
140	Northern Mariana Islands	-2.06024	202
142	Oman	-2.06024	203
144	Palau	-2.06024	204
153	Qatar	-2.06024	205
191	Tuvalu	-2.06024	206

Appendix II - Sensitivity analysis on 10000 simulations based on different weightings

ID	Country	average rank	final rank
48	Denmark	3.9158	1
177	Sweden	5.3674	2
27	Brazil	5.8182	3
151	Portugal	6.035	4
108	Liechtenstein	9.6339	5
197	Uruguay	9.6967	6
171	Spain	12.1725	7
139	Niue	12.4316	8
12	Austria	12.5055	9
70	Greece	16.9872	10
109	Lithuania	18.3709	11

67	Germany	20.7009	12
147	Paraguay	21.3332	13
61	Finland	21.9795	14
47	Cyprus	25.8194	15
87	Ireland	25.9103	16
110	Luxembourg	28.7793	17
90	Italy	30.4973	18
141	Norway	32.1174	19
10	Aruba	32.5625	20
58	Ethiopia	35.4137	21
31	Burundi	36.0372	22
154	Romania	36.8413	23
62	France	37.1791	24
168	Somalia	37.7905	25
196	United States	37.8519	26
136	Nicaragua	38.5711	27
82	Iceland	39.3325	28
45	Cuba	40.1111	29
206	Zimbabwe	40.6796	30
36	Chad	41.3049	31
148	Peru	41.3345	32
195	United Kingdom	42.3615	33
192	Uganda	42.4631	34
29	Bulgaria	43.2802	35
2	Albania	43.4129	36
205	Zambia	44.0979	37
156	Rwanda	44.3787	38
23	Bhutan	46.2046	39
42	Costa Rica	47.0689	40
76	Guinea-Bissau	47.271	41
138	Nigeria	48.5193	42
128	Mozambique	49.6509	43
19	Belgium	50.1562	44
181	Tanzania	50.2928	45
132	Nepal	52.0852	46
44	Croatia	52.3244	47
182	Thailand	52.3925	48
118	Malta	53.4152	49
106	Liberia	53.8001	50
114	Malawi	54.9043	51
199	Vanuatu	55.9935	52
64	Gabon	56.7913	53
56	Eritrea	57.758	54
34	Canada	58.0188	55
79	Honduras	58.1312	56
150	Poland	58.5257	57

137	Niger	59.5213	58
149	Philippines	61.0827	59
162	Sierra Leone	61.7269	60
35	Central African Republic	63.2451	61
33	Cameroon	64.2607	62
91	Jamaica	65.3637	63
75	Guinea	65.3942	64
78	Haiti	66.4925	65
103	Latvia	67.7807	66
95	Kenya	68.3036	67
30	Burkina Faso	68.5292	68
203	Palestine (State of)	69.3902	69
8	Argentina	69.7743	70
135	New Zealand	70.3155	71
57	Estonia	71.0432	72
165	Slovak Republic	71.5778	73
184	Togo	71.7876	74
74	Guatemala	73.0341	75
113	Madagascar	73.3795	76
133	Netherlands	73.4421	77
167	Solomon Islands	76.8965	78
176	Swaziland	77.0633	79
11	Australia	78.3765	80
32	Cambodia	79.2198	81
43	Côte d'Ivoire	80.6016	82
81	Hungary	80.6712	83
172	Sri Lanka	81.4531	84
59	Faroe Islands	81.8305	85
202	United States Virgin Islands	81.8558	86
84	Indonesia	82.5086	87
120	Mauritania	83.1592	88
174	Sudan	83.7177	89
38	China	83.7703	90
117	Mali	84.7643	91
129	Myanmar	84.7643	92
188	Turkey	84.8044	93
83	India	86.5733	94
89	Israel	87.0856	95
102	Lao People's Democratic Republic	88.1528	96
166	Slovenia	89.7868	97
93	Jordan	92.9607	98
37	Chile	93.2645	99
146	Papua New Guinea	94	100
105	Lesotho	95.2935	101
51	Dominican Republic	95.3087	102
21	Benin	95.9585	103

65	Gambia	96.9524	104
178	Switzerland	97.1577	105
127	Morocco	97.5141	106
143	Pakistan	98.898	107
5	Angola	99.9103	108
157	Samoa	101.2892	109
145	Panama	102.4301	110
112	Macedonia, FYR	103.1609	111
40	Comoros	104.6276	112
180	Tajikistan	106.1665	113
126	Montenegro	107.0868	114
159	Senegal	109.0955	115
152	Puerto Rico	110.8141	116
68	Ghana	111.5106	117
25	Bosnia and Herzegovina	113.0692	118
170	South Sudan	113.587	119
187	Tunisia	114.9474	120
115	Malaysia	115.3753	121
201	Vietnam	118.5637	122
16	Bangladesh	118.986	123
92	Japan	119.8511	124
60	Fiji	120.6332	125
20	Belize	120.8856	126
134	New Caledonia	121.0653	127
169	South Africa	122.0822	128
66	Georgia	125.5835	129
130	Namibia	125.6514	130
122	Mexico	126.1402	131
39	Colombia	126.9666	132
26	Botswana	127.5874	133
98	Republic of Korea	131.6397	134
77	Guyana	132.2346	135
175	Suriname	133.507	136
54	El Salvador	134.9185	137
101	Kyrgyzstan	136.7213	138
97	Democratic People's Republic of Korea	137.8406	139
52	Ecuador	138.5736	140
160	Serbia	139.7786	141
96	Kiribati	139.792	142
99	Kosovo	140.1379	143
161	Seychelles	141.0801	144
63	French Polynesia	142.9241	145
4	Andorra	142.9247	146
121	Mauritius	144.9023	147
125	Mongolia	144.9642	148
1	Afghanistan	144.9866	149

185	Tonga	145.2399	150
24	Bolivia	145.9298	151
183	Timor-Leste	146.1952	152
9	Armenia	149.1677	153
71	Greenland	151.1253	154
49	Djibouti	152.2718	155
104	Lebanon	152.6703	156
124	Moldova	152.7724	157
193	Ukraine	153.0989	158
53	Egypt	153.1428	159
18	Belarus	154.4753	160
46	Curaçao	156.1754	161
200	Venezuela	156.319	162
119	Marshall Islands	156.9953	163
72	Grenada	159.7619	164
50	Dominica	163.4615	165
55	Equatorial Guinea	164.4698	166
111	Macao (SAR, China)	166.1551	167
123	Micronesia (Federated States of)	168.2304	168
88	Isle of Man	169.0995	169
80	Hong Kong (SAR, China)	169.1785	170
155	Russian Federation	170.2366	171
198	Uzbekistan	172.13	172
116	Maldives	172.7418	173
17	Barbados	173.3352	174
22	Bermuda	174.9637	175
94	Kazakhstan	175.102	176
13	Azerbaijan	176.0575	177
204	Yemen	177.1133	178
163	Singapore	178.4218	179
107	Libya	178.7986	180
131	Nauru	179.0271	181
85	Iran (Islamic Republic of)	181.1646	182
14	Bahamas	181.7556	183
194	United Arab Emirates	183.2178	184
86	Iraq	184.2282	185
190	Turks and Caicos Islands	185.6673	186
179	Syrian Arab Republic	186.7638	187
3	Algeria	188.0156	188
186	Trinidad and Tobago	188.3854	189
28	Brunei Darussalam	189.6734	190
6	Anguilla	190.4627	191
164	Sint Maarten (Dutch part)	191.861	192
173	Sint Maarten (Dutch part)	191.861	193
189	Turkmenistan	193.899	194
158	Saudi Arabia	195	195

7	Antigua and Barbuda	196	196
15	Bahrain	196	197
41	Cook Islands	196	198
69	Gibraltar	196	199
73	Guam	196	200
100	Kuwait	196	201
140	Northern Mariana Islands	196	202
142	Oman	196	203
144	Palau	196	204
153	Qatar	196	205
191	Tuvalu	196	206