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## Nine Countries and Territories Advance in Top 100 Ranking on Gasoline Benzene Limits

Stratas Advisors

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Stratas Advisors' Top 100 gasoline benzene ranking confirms the continued worldwide movement toward benzene elimination in gasoline and cites several countries that have positioned themselves through policy initiatives to make advances in this area given the well-known fact that benzene is a carcinogen. However, aspects other than benzene elimination — among them sulfur, aromatics, olefins and volatility — are important in determining gasoline quality as well as influencing vehicle emissions.

The last ranking for benzene was carried out in 2020 (see Insights, [Sept. 29, 2020](#)). South Korea continues to reign No. 1 with the world's strictest benzene limit of 0.7 vol% followed by China with 0.8 wt% and Taiwan with 0.9 vol%, while EU countries continue to dominate the Top 35 as benzene-free gasoline (less than 1 vol%) was legislatively required since January 2000. Currently, a total of 143 countries regulate benzene in gasoline as compared to 139 countries from the 2020 ranking. In addition, Stratas Advisors observes that 82 countries (57%) now set a maximum benzene limit of 1 vol% and below, compared to the 78 countries from the 2020 ranking.

In the 2022 ranking, a total of nine countries and territories moved up or entered the Top 100 for the first time. They include:

- Armenia
- Guatemala
- Honduras
- Mauritius
- Morocco
- Panama
- Taiwan
- Timor Leste
- U.A.E.

These countries and territories moved up or newly entered the 2022 ranking, because they either:

- Implemented a stricter benzene limit;
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- Set a new benzene spec for the first time;
- Supplied gasoline with benzene content lower than their legislated limit; or
- New information was found for them since the last ranking.

Of the nine countries and territories, Taiwan jumped the highest in the ranking with 15 places to rank at 3rd place behind South Korea and China with the switch to a 0.9 vol% benzene limit in place since July 2020. In addition, Morocco made the biggest jump with 51 places to rank at 77th, followed by Mauritius which moved up 38 places to rank at 82nd place and Panama 37 places to rank at 88th. It is also worthwhile to note that besides Morocco, Mauritius and Panama, three other countries of Guatemala, Honduras and Timor Leste entered the Top 100 for the first time, with Timor Leste making the highest entry at 61st place, followed by Guatemala and Honduras co-ranking at 100th. Last but not least, Armenia moved up 29 places to rank at 36th place and the U.A.E. slightly moved up 6 places to rank at 76th place. Because of the above mandatory or voluntary reductions in benzene levels, five countries of Saudi Arabia, Georgia, Angola, Syria and Bahrain dropped out of the 2022 ranking.

Top gasoline markets that dropped in the rankings including Canada, Mexico and U.S. did not alter their gasoline specifications but were simply passed by others that implemented stricter benzene limits. On the other hand, top markets of Indonesia and Saudi Arabia are outside of the Top 100. As indicated, Guatemala and Honduras co-rank at 100th place with a limit of 2.5 vol%, as compared to 3 vol% from the 2020 ranking thereby showing a slight reduction in benzene limits across the board.

Even though cities and provinces are not officially ranked, it is worthwhile noting that even though the U.S. state of California currently requires a benzene cap of 1.1 vol%, as compared to the current U.S. federal maximum average limit of 1.5 vol%.

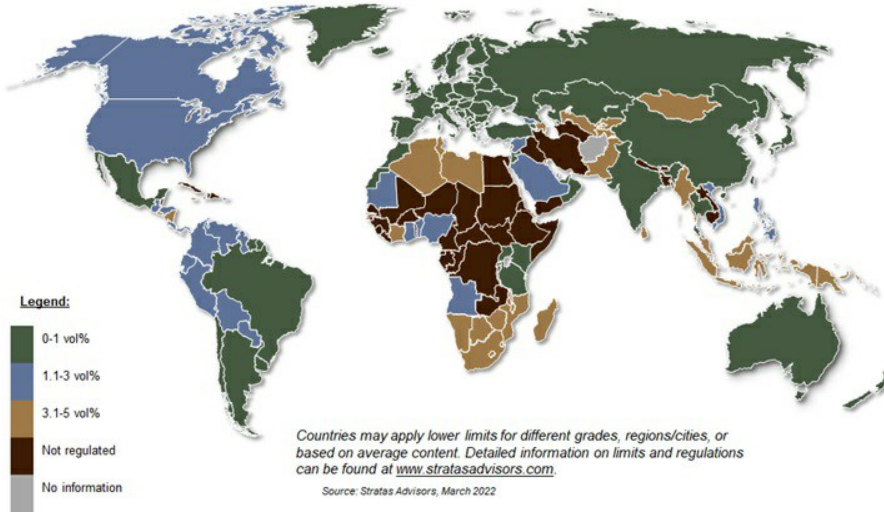
To establish this ranking, four primary criteria were used in the following order of importance:

- Maximum allowable limits in national standards and legislation;
- Year of implementation for benzene limits as required by legislation and year of voluntary implementation, if any;
- Limits in local or regional standards (such as specifications for cities or states); and
- Market levels are also used wherever available to more accurately rank countries sharing the same legislated limit.

### **Maximum Gasoline Benzene Limits (2022)**

## Maximum Gasoline Benzene Limits

Parts of Africa and Middle East yet to regulate benzene



Source: Stratas Advisors, March 2022

### 2022 Top 100 Gasoline Benzene Ranking

Rank	Country/ Region	Change
1	South Korea	+0
2	China	+0
3	Taiwan	+15
4	Belgium	-1
	Ireland	-1
	Luxembourg	-1
7	Germany	-1
8	Italy	-1
	France	-1
	United Kingdom	-1
11	Netherlands	-1
	Sweden	-1
	Austria	-1
	Finland	-1

15	Greece	-1
	Denmark	-1
	Spain	-1
	Portugal	-1
19	Iceland	-1
	Japan	-1
	Liechtenstein	-1
	Norway	-1
	Switzerland	-1
	Hong Kong	-1
25	Romania	+0
26	Hungary	+0
27	Slovakia	+0
28	Poland	+0
	Malta	+0
30	Slovenia	+0
31	Latvia	+0
32	Cyprus	+0
33	Czech Republic	+0
34	Estonia	+0
35	Lithuania	+0
36	Jordan	+0
	Chile	+0
	Armenia	+29
39	French Guiana	-1
	Guadeloupe	-1
	Israel	-1
	Martinique	-1
43	New Zealand	-1

44	Australia	-1
45	Croatia	-1
46	Bulgaria	-1
47	Fiji	-1
	Turkey	-1
49	Bosnia & Herzegovina	+0
	Albania	+0
	Macedonia	+0
	New Caledonia	+0
53	India	-1
54	Montenegro	-1
	Russia	-1
	Kosovo	-1
57	Thailand	-1
	Argentina	-1
59	Belarus	-1
	Serbia	-1
61	Brazil	-1
	Timor Leste	NEW
	Uruguay	-1
	Ukraine	-1
65	Kazakhstan	-2
	Lebanon	-2
67	Macau	-1
	Singapore	-1
	Ghana	-1
70	Moldova	-1
	Kenya	-1
	Nepal	-1

	Rwanda	-1
	Uganda	-1
	Oman	-1
76	United Arab Emirates	+6
77	Morocco	+51
78	Bahamas	-3
79	Iran	-3
	Seychelles	-3
81	Suriname	-3
82	Mauritius	+38
#	California	
83	United States	-4
84	Venezuela	-4
85	Canada	-4
86	Paraguay	-3
87	Costa Rica	-3
88	Panama	+37
89	Iraq	-4
90	Guyana	-4
91	Colombia	-4
92	Ecuador	-4
93	Mexico	-4
94	Philippines	-4
95	Nigeria	-4
96	Mauritania	-4
97	Benin	-4
98	Vietnam	-4
99	Peru	-4
100	Guatemala	NEW

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	Honduras	NEW
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Notes: # Not actually included in ranking; highlighted for significant achievement.

*Source: Stratas Advisors, March 2022*

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