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Statistical Review of World Energy

2021 | 70th edition



Reviewing world energy
data for 70 years

Key minerals for the energy transition

Cobalt production

Mine production

Thousand tonnes	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Growth rate per annum		Share 2020
												2020	2009-19	
Australia	3.9	3.9	5.9	6.4	6.2	6.0	5.5	5.8	4.9	5.7	5.7	-1.0%	2.1%	4.4%
Canada	4.6	6.8	3.7	4.0	3.9	4.3	4.2	3.7	3.5	3.3	3.2	-4.3%	-1.6%	2.5%
China	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	3.1	2.5	2.3	-8.3%	3.1%	1.8%
Cuba	4.8	5.1	4.7	4.0	3.7	4.3	5.1	5.0	4.5	4.7	4.7	-0.5%	0.2%	3.7%
Democratic Republic of Congo	84.0	99.5	86.4	76.6	76.5	84.4	69.0	90.3	109.4	78.0	85.9	9.8%	3.3%	67.3%
Madagascar	0.2	0.5	0.6	2.4	3.4	4.0	3.8	3.4	2.8	2.9	0.7	-75.8%	n/a	0.5%
Morocco	3.1	2.2	2.0	2.0	2.2	2.3	2.7	2.5	2.1	2.3	1.9	-17.6%	-1.3%	1.5%
New Caledonia	2.9	3.1	2.7	3.2	4.0	3.7	3.4	2.8	1.7	1.2	0.7	-45.2%	-4.7%	0.5%
Papua New Guinea	–	n/a	0.5	1.0	2.1	2.5	2.2	3.3	3.3	2.9	2.8	-4.0%	n/a	2.2%
Philippines	2.1	2.0	2.7	2.8	4.6	4.3	4.1	4.6	4.4	4.6	4.5	-3.7%	12.7%	3.5%
Russian Federation	6.2	6.1	6.3	6.3	6.3	6.2	5.5	5.9	6.1	6.3	6.3	– ¹	0.3%	4.9%
South Africa	1.8	1.6	2.5	3.0	3.0	2.9	2.3	2.3	2.3	2.1	1.8	-14.5%	13.2%	1.4%
Zambia	8.6	7.7	5.4	5.9	4.6	3.0	5.0	2.6	1.6	4.3	4.3	– ¹	-3.2%	3.3%
Rest of World	5.8	8.3	9.9	11.4	7.5	7.1	4.8	4.0	2.8	3.0	3.1	3.1%	-2.6%	2.4%
Total World	129.5	148.2	134.7	130.5	129.4	136.5	119.1	137.8	152.6	123.8	127.7	2.9%	2.8%	100.0%

¹Zero (not leap year adjusted).
n/a not available.

Source: includes data from US Geological Survey, British Geological Survey © UKRI and World Mining Data.

Note: Other growth rates are adjusted for leap years.

Lithium production

Mine production

Thousand tonnes of lithium content	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Growth rate per annum		Share 2020
												2020	2009-19	
Argentina	3.0	3.0	2.7	2.5	3.2	3.6	5.8	5.7	6.4	6.3	6.2	-1.9%	11.0%	7.2%
Australia	8.5	11.7	12.7	10.1	12.4	11.9	14.0	21.3	57.0	45.0	40.0	-11.4%	23.4%	46.4%
Brazil	0.2	0.3	0.2	0.4	0.2	0.2	0.2	0.2	0.3	2.4	1.9	-21.0%	31.1%	2.2%
Chile	10.4	13.6	13.9	11.7	12.0	10.9	15.2	15.8	18.8	22.1	20.6	-7.0%	14.0%	23.9%
China	4.0	4.1	4.5	4.7	2.3	2.0	2.3	6.8	7.1	10.8	14.0	29.3%	11.1%	16.2%
Portugal	0.8	0.8	0.6	0.6	0.3	0.2	0.4	0.8	0.8	0.9	0.9	– ¹	n/a	1.0%
US	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	– ¹	-5.0%	1.0%
Zimbabwe	0.5	0.5	1.1	1.0	0.9	0.9	1.0	0.8	1.6	1.2	1.2	– ¹	11.6%	1.4%
Rest of World	n/a	n/a	–	–	–	–	0.2	1.1	2.3	0.5	0.5	– ¹	5.6%	0.6%
Total World	28.2	35.0	36.6	31.9	32.2	30.7	40.0	53.3	95.2	90.2	86.3	-4.6%	16.3%	100.0%

¹Zero (not leap year adjusted).
n/a not available.

Source: includes data from US Geological Survey, British Geological Survey © UKRI and World Mining Data.

Note: Other growth rates are adjusted for leap years.

Natural graphite production

Mine production

Thousand tonnes	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Growth rate per annum		Share 2020
												2020	2009-19	
Brazil ¹	92.4	105.2	88.1	91.9	87.0	75.1	85.0	85.0	95.0	96.0	95.0	-1.3%	4.9%	10.5%
Canada	20.0	25.0	24.0	20.0	30.0	30.0	30.0	40.0	40.0	11.0	10.0	-9.3%	-3.1%	1.1%
China	700.0	800.0	820.0	750.0	780.0	780.0	780.0	625.0	630.0	700.0	650.0	-7.4%	4.5%	71.7%
India ²	115.7	153.3	134.7	146.4	116.7	134.6	122.4	35.0	35.0	35.0	34.0	-3.1%	-11.9%	3.7%
Madagascar	3.8	3.6	2.9	4.3	5.3	8.1	9.2	13.3	48.1	53.6	29.0	-45.9%	31.6%	3.2%
Mexico	6.6	7.3	7.5	7.0	9.2	6.5	3.8	1.7	4.1	1.6	1.6	– ³	-11.0%	0.2%
Mozambique	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.3	104.0	153.0	12.0	-92.2%	n/a	1.3%
Norway	6.3	7.8	7.0	6.2	8.3	9.2	9.6	9.6	12.0	16.0	15.0	-6.5%	13.4%	1.7%
Russian Federation	7.7	20.7	14.3	20.2	17.6	15.9	19.4	19.5	11.9	17.5	17.5	– ³	2.3%	1.9%
Sri Lanka	3.4	3.4	4.2	3.1	4.0	4.2	4.0	3.5	4.0	4.0	3.5	-12.7%	2.3%	0.4%
Turkey	–	5.3	31.5	28.7	3.9	–	–	–	16.8	10.0	10.0	– ³	15.3%	1.1%
Ukraine	2.8	0.6	4.6	6.9	13.8	14.5	14.6	14.9	15.0	15.0	15.0	– ³	13.3%	1.7%
Rest of World	22.4	19.2	17.2	20.7	31.9	20.6	18.0	14.9	17.7	15.5	14.0	-9.9%	-11.7%	1.5%
Total World	981.1	1151.3	1156.1	1105.5	1107.7	1098.7	1096.1	862.7	1033.5	1128.2	906.7	-19.9%	*	100.0%

¹Including beneficiated and directly shipped material.

Source: includes data from US Geological Survey, British Geological Survey © UKRI and World Mining Data.

²Run of the mine.

³Zero (not leap year adjusted).

*Less than 0.05%.

n/a not available.

Note: Other growth rates are adjusted for leap years.

Rare earth metals production

Mine production

Thousand tonnes ¹	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Growth rate per annum		Share 2020
												2020	2009-19	
Australia	–	2.2	3.2	1.3	6.2	11.9	13.9	17.3	18.6	17.6	41.4	134.6%	n/a	15.5%
Brazil	0.1	0.1	1.6	0.3	–	0.9	2.2	1.7	1.1	0.7	1.0	40.5%	15.4%	0.4%
China	89.2	93.8	93.8	93.8	105.0	105.0	105.0	105.0	120.0	132.0	140.0	5.8%	0.2%	52.3%
India	n/a	n/a	n/a	0.3	1.7	1.0	1.5	1.5	2.9	3.0	3.0	– ²	68.8%	1.1%
Madagascar	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2.0	4.0	8.0	99.5%	n/a	3.0%
Russian Federation	1.5	1.4	2.1	1.4	2.1	2.3	3.1	2.5	2.6	2.6	2.6	– ²	3.2%	1.0%
Thailand	5.6	3.1	0.1	0.1	1.9	0.8	1.6	1.3	1.0	1.9	2.0	5.0%	-7.2%	0.7%
US	–	–	3.0	5.5	5.4	5.9	–	–	18.0	28.0	38.0	35.3%	n/a	14.2%
Rest of World	0.6	0.6	0.3	0.3	0.2	0.6	2.1	0.6	21.0	26.6	31.6	18.5%	114.3%	11.8%
Total World	97.0	101.3	104.2	103.0	122.6	128.3	129.4	129.8	187.2	216.4	267.7	23.3%	4.8%	100.0%

¹Thousand tonnes of rare earth oxide equivalent.

Source: includes data from US Geological Survey, British Geological Survey © UKRI and World Mining Data.

²Zero (not leap year adjusted).

n/a not available.

Note: Other growth rates are adjusted for leap years.

Reserves of key minerals

Cobalt reserves

Thousand tonnes	At end of 2020	Share	R/P ratio
Australia	1400	20.3%	247
Canada	220	3.2%	69
China	80	1.2%	35
Cuba	500	7.2%	107
Democratic Republic of Congo	3600	52.2%	42
Madagascar	100	1.4%	143
Morocco	14	0.2%	7
New Caledonia	64	0.9%	94
Papua New Guinea	51	0.7%	18
Philippines	260	3.8%	58
Russian Federation	250	3.6%	40
South Africa	40	0.6%	22
Zambia	270	3.9%	63
Rest of World*	53	0.8%	17
Total World	6902	100.0%	54

Natural graphite reserves

Thousand tonnes	At end of 2020	Share	R/P ratio
Brazil	70000	20.0%	737
Canada	n/a	n/a	n/a
China	73000	20.9%	112
India	8000	2.3%	235
Madagascar	26000	7.4%	895
Mexico	3100	0.9%	1948
Mozambique	25000	7.2%	2083
Norway	600	0.2%	40
Russian Federation	25703	7.4%	1469
Sri Lanka	1500	0.4%	428.6
Turkey	90000	25.8%	9009.0
Ukraine	n/a	n/a	n/a
Rest of World*	26600	7.6%	1893
Total World	349503	100.0%	385

Lithium reserves

Thousand tonnes	At end of 2020	Share	R/P ratio
Argentina	1900	10.0%	306
Australia	4700	24.8%	118
Brazil	95	0.5%	50
Chile	9200	48.5%	446
China	1500	7.9%	107
Portugal	60	0.3%	67
US	750	4.0%	833
Zimbabwe	220	1.2%	183
Rest of World*	530	2.8%	994
Total World	18955	100%	220

Rare earth metals reserves

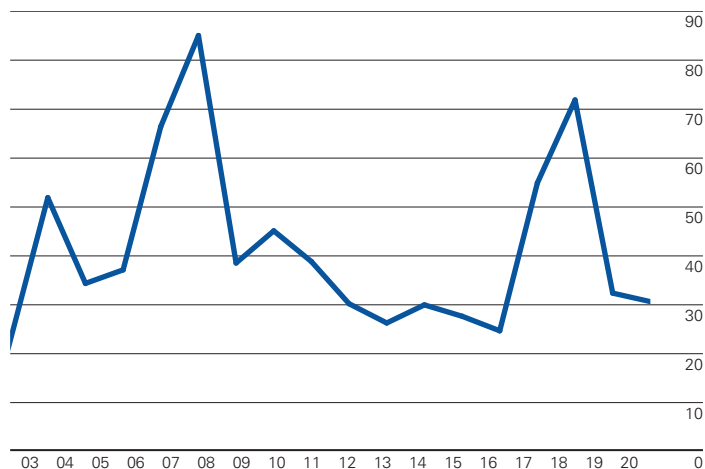
Thousand tonnes	At end of 2020	Share	R/P ratio
Australia	4100	3.3%	99
Brazil	21000	16.9%	21000
China	44000	35.4%	314
India	6900	5.6%	2300
Madagascar	n/a	n/a	n/a
Russian Federation	20602	16.6%	7924
Thailand	n/a	n/a	n/a
US	1500	1.2%	39
Rest of World*	26040	21.0%	824
Total World	124142	100.0%	464

*Rest of World is the sum of only recorded reserves.
n/a not available.

Source (for all tables): includes data from US Geological Survey.

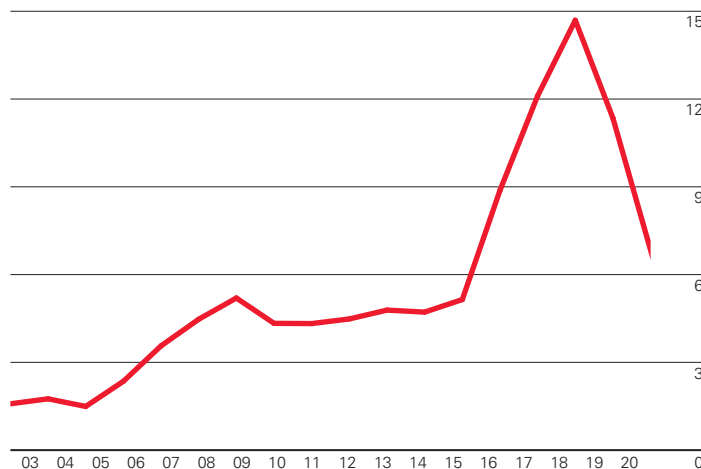
Cobalt prices

Thousands of US dollars per tonne*



Lithium carbonate prices

Thousands of US dollars per tonne†



*2000-2012 spot grade for cathodes, source US Geological Survey. Data from 2013 onwards: min purity 99.8%, source London Metal Exchange.

†2000-2008 unit value, data series 140, source US Geological Survey. Data from 2009 onwards: FOB South America, source Benchmark Mineral Intelligence.