Bitcoin Mining Now Consuming More Electricity Than 159 Countries Including Ireland & Most Countries In Africa

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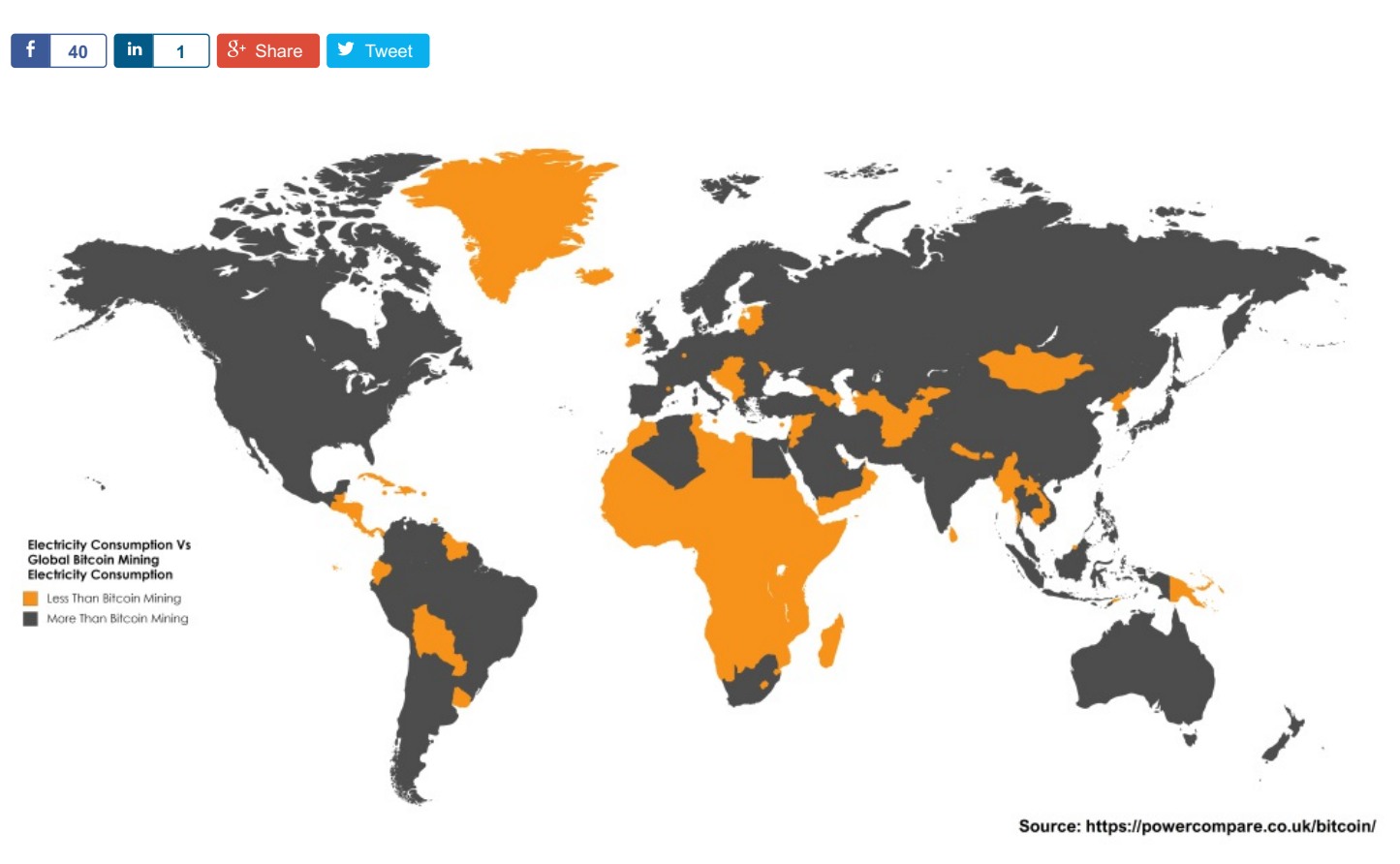

Electricity Consumption Vs Global Bitcoin Mining Electricity Consumption
🟧 Less Than Bitcoin Mining
⬛ More Than Bitcoin Mining

Source: https://powercompare.co.uk/bitcoin/

The map above shows which countries consume less electricity than the amount consumed by global bitcoin mining

Bitcoin's ongoing meteoric price rise has received the bulk of recent press attention with a lot of discussion around whether or not it's a bubble waiting to burst.

However, most the coverage has missed out one of the more interesting and unintended consequences of this price increase. That is the surge in global electricity consumption used to *"mine"* more Bitcoins.

According to Digiconomist's Bitcoin Energy Consumption Index, as of Monday November 20th, 2017 Bitcoin's current estimated annual electricity consumption stands at **29.05TWh**.

That's the equivalent of **0.13%** of total global electricity consumption. While that may not sound like a lot, it means Bitcoin mining is now using more electricity than 159 individual countries (as you can see from the map above). More than Ireland or Nigeria.

If Bitcoin miners were a country they'd rank **61st** in the world in terms of electricity consumption.

Here are a few other interesting facts about Bitcoin mining and electricity consumption:

- In the past month alone, Bitcoin mining electricity consumption is estimated to have increased by **29.98%**
- If it keeps increasing at this rate, Bitcoin mining will **consume all the world's electricity by February 2020**.
- Estimated annualised global mining revenues: **$7.2 billion USD (£5.4 billion)**
- Estimated global mining costs: **$1.5 billion USD (£1.1 billion)**
- Number of Americans who could be powered by bitcoin mining: **2.4 million** (more than the population of Houston)
- Number of Britons who could be powered by bitcoin mining: **6.1 million** (more than the population of Birmingham, Leeds, Sheffield, Manchester, Bradford, Liverpool, Bristol, Croydon, Coventry, Leicester & Nottingham combined)
- Bitcoin Mining consumes more electricity than **12 US states** (Alaska, Hawaii, Idaho, Maine, Montana, New Hampshire, New Mexico, North Dakota, Rhode Island, South Dakota, Vermont and Wyoming)

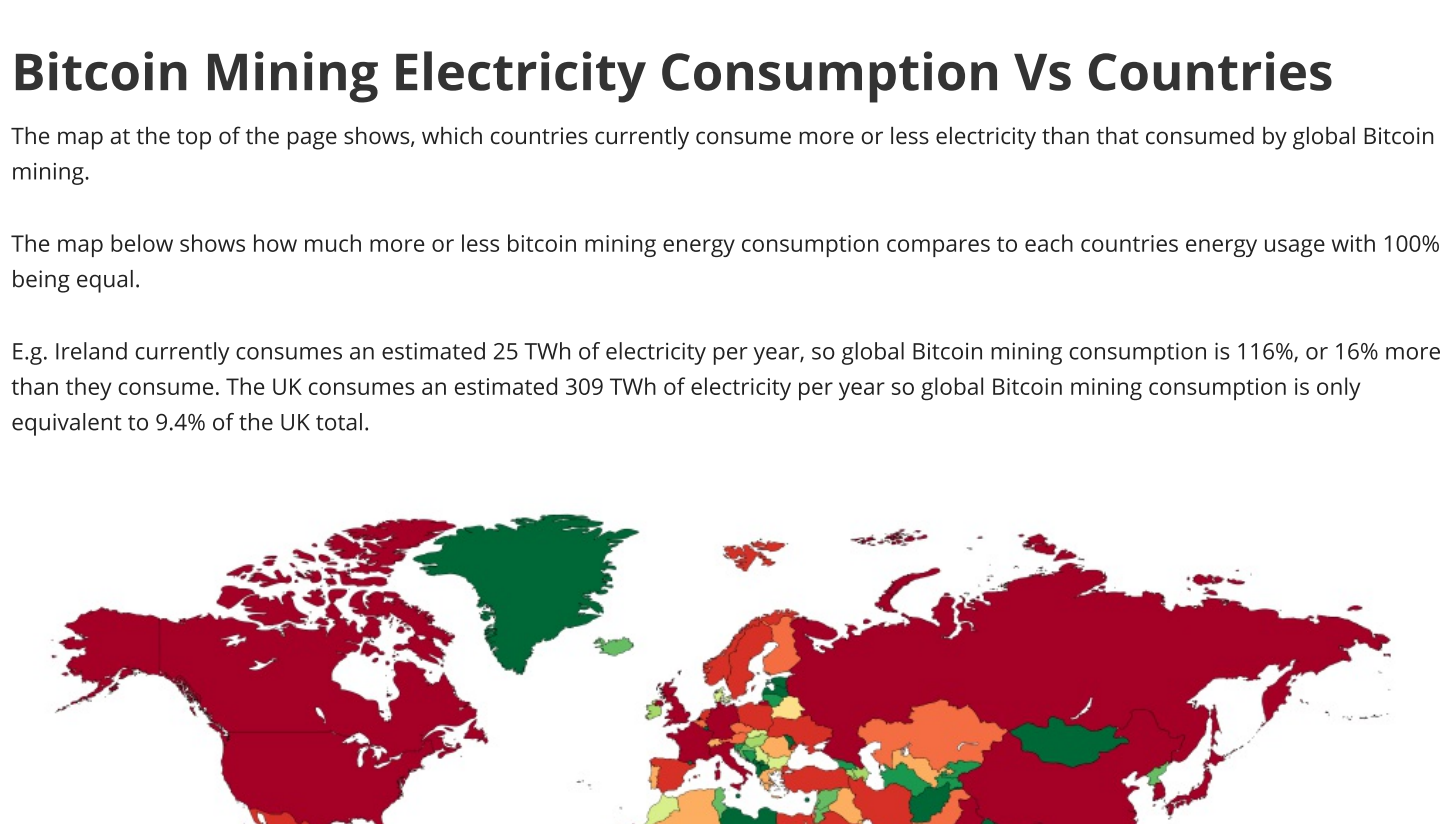
All maps created using Mapchart.net. For the full breakdown of data, please keep reading.

Bitcoin Mining Electricity Consumption Vs Countries

The map at the top of the page shows, which countries currently consume more or less electricity than that consumed by global Bitcoin mining.

The map below shows how much more or less bitcoin mining energy consumption compares to each countries energy usage with 100% being equal.

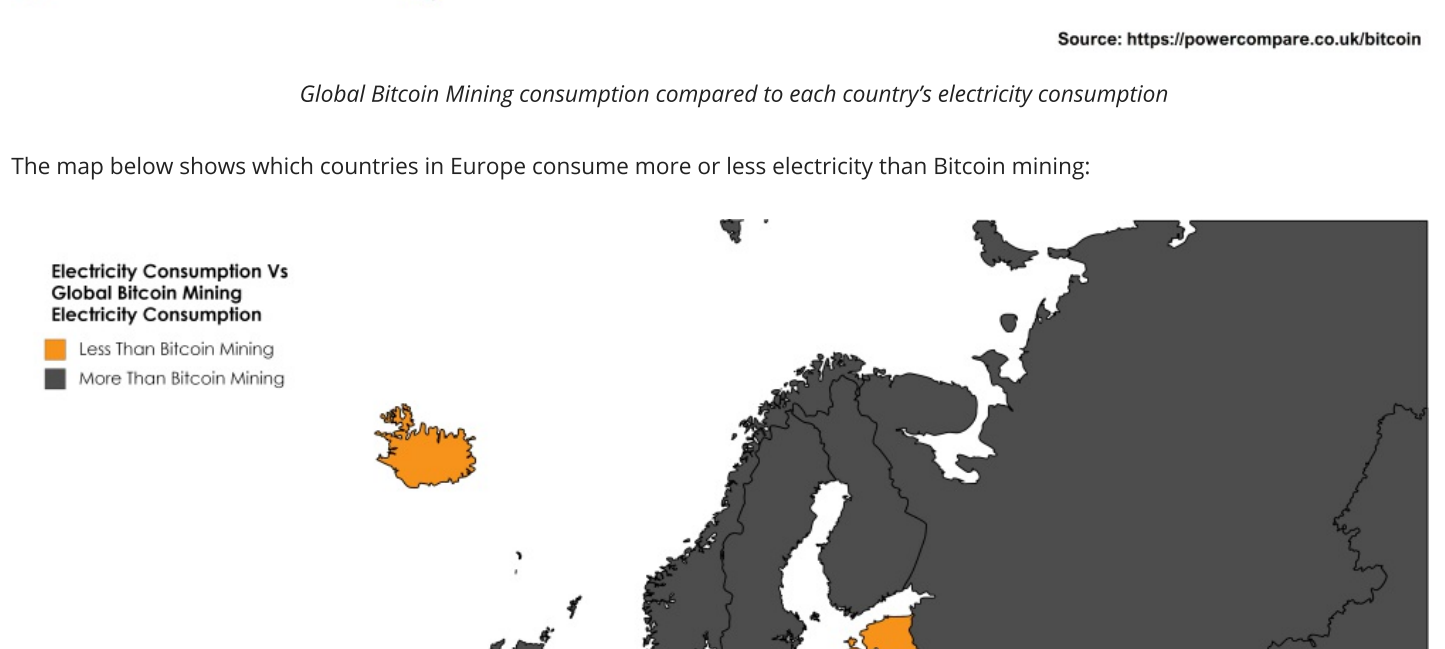
E.g. Ireland currently consumes an estimated 25 TWh of electricity per year, so global Bitcoin mining consumption is 116%, or 16% more than they consume. The UK consumes an estimated 309 TWh of electricity per year so global Bitcoin mining consumption is only equivalent to 9.4% of the UK total.


Global Bitcoin Mining Electricity Consumption Compared To Each Country's Electricity Consumption
Under 10%
10 - 30%
30 - 50%
50 - 70%
70 - 90%
90 - 110%
110 - 150%
150 - 200%
200 - 300%
300%+

Source: https://powercompare.co.uk/bitcoin

Global Bitcoin Mining consumption compared to each country's electricity consumption

The map below shows which countries in Europe consume more or less electricity than Bitcoin mining:


Electricity Consumption Vs Global Bitcoin Mining Electricity Consumption
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Source: https://powercompare.co.uk/bitcoin

Which European countries consume more or less electricity than the amount consumed by global bitcoin mining

As mentioned, above the data for Bitcoin mining energy consumption comes from the Bitcoin Energy Consumption Index. You can read about their assumptions here.

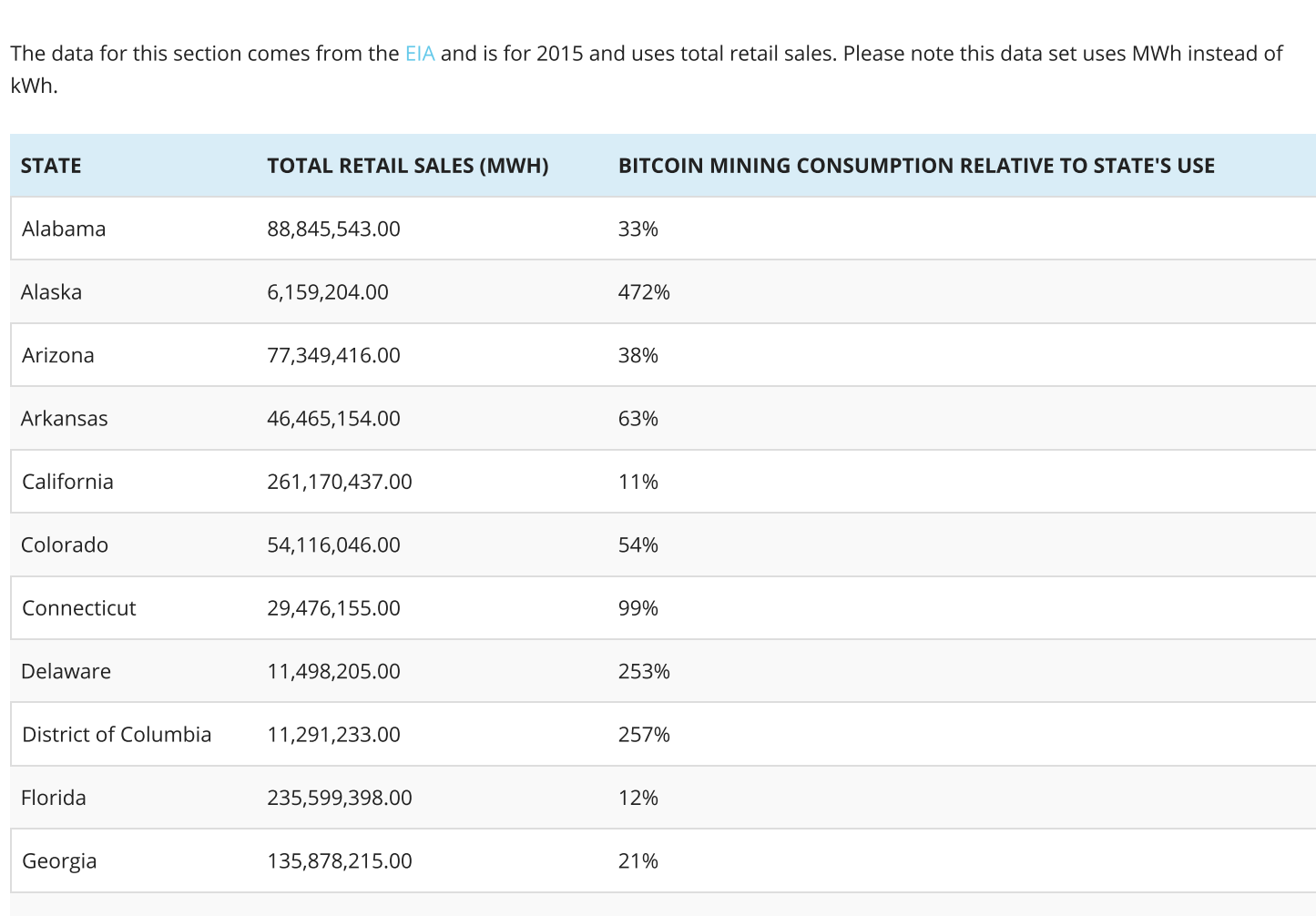
Electricity consumption data mostly comes from the CIA via Wikipedia and is mostly for 2014, since that's the most recent year available. Unlike some other sources it includes, residential, commercial and industrial use, so may be higher than other figures quoted elsewhere.

Below we have a table showing the data we used for each country:

RANK	COUNTRY	ELECTRICITY CONSUMPTION IN KWH/YEAR	BITCOIN MINING CONSUMPTION RELATIVE TO COUNTRY'S USE
1	China	5,920,000,000,000.00	0.49%
2	United States	3,913,000,000,000.00	0.74%
3	Russia	1,065,000,000,000.00	2.73%
4	India	1,001,191,000,000.00	2.90%
5	Japan	934,000,000,000.00	3.11%
6	Germany	533,000,000,000.00	5.45%
7	Canada	528,000,000,000.00	5.50%
8	Brazil	518,000,000,000.00	5.61%
9	Korea, South	495,000,000,000.00	5.87%
10	France	431,000,000,000.00	6.74%
11	United Kingdom	309,000,000,000.00	9.40%
12	Italy	291,000,000,000.00	9.98%
13	Saudi Arabia	272,000,000,000.00	10.68%
14	Taiwan	249,500,000,000.00	11.64%
15	Mexico	238,000,000,000.00	12.21%
16	Spain	234,000,000,000.00	12.41%
17	Australia	224,000,000,000.00	12.97%
18	Iran	218,000,000,000.00	13.33%
19	South Africa	212,000,000,000.00	13.70%
20	Turkey	207,000,000,000.00	14.03%
21	Indonesia	195,000,000,000.00	14.90%
22	Thailand	164,000,000,000.00	17.71%
23	Egypt	143,000,000,000.00	20.31%
24	Ukraine	143,000,000,000.00	20.31%
25	Poland	142,000,000,000.00	20.46%
26	Malaysia	131,000,000,000.00	22.18%
27	Sweden	127,000,000,000.00	22.87%
28	Norway	126,400,000,000.00	22.98%
29	Vietnam	125,000,000,000.00	23.24%
30	Argentina	116,000,000,000.00	25.04%
31	Netherlands	108,000,000,000.00	26.90%
32	United Arab Emirates	96,000,000,000.00	30.26%
33	Kazakhstan	91,000,000,000.00	31.92%
34	Philippines	90,797,891,000.00	31.99%
35	Pakistan	82,000,000,000.00	35.43%
36	Finland	81,000,000,000.00	35.86%
37	Belgium	81,000,000,000.00	35.86%
38	Venezuela	78,000,000,000.00	37.24%
39	Austria	69,750,000,000.00	41.65%
40	Chile	66,000,000,000.00	44.02%
41	Czech Republic	60,000,000,000.00	48.42%
42	Colombia	60,000,000,000.00	48.42%
43	Israel	59,830,000,000.00	48.55%
44	Switzerland	58,000,000,000.00	50.09%
45	Kuwait	54,000,000,000.00	53.80%
46	Greece	53,000,000,000.00	54.81%
47	Algeria	49,000,000,000.00	59.29%
48	Romania	48,000,000,000.00	60.52%
49	Uzbekistan	48,000,000,000.00	60.52%
50	Singapore	47,180,000,000.00	61.57%
51	Portugal	46,000,000,000.00	63.15%
52	Bangladesh	46,000,000,000.00	63.15%
53	Hong Kong	42,000,000,000.00	69.17%
54	Iraq	42,000,000,000.00	69.17%
55	New Zealand	40,000,000,000.00	72.63%
56	Peru	39,000,000,000.00	74.49%
57	Qatar	34,000,000,000.00	85.44%
58	Belarus	33,000,000,000.00	88.03%
59	Denmark	32,000,000,000.00	90.78%
60	Bulgaria	31,000,000,000.00	93.71%
61	Morocco	29,000,000,000.00	100.17%
62	Slovakia	28,360,000,000.00	102.43%
63	Serbia	26,910,000,000.00	107.95%
64	Bahrain	25,000,000,000.00	116.20%
65	Ireland	25,000,000,000.00	116.20%
66	Oman	25,000,000,000.00	116.20%
67	Nigeria	24,000,000,000.00	121.04%
68	Hungary	21,550,000,000.00	134.80%
69	Ecuador	21,000,000,000.00	138.33%
70	Azerbaijan	20,000,000,000.00	145.25%
71	Puerto Rico	19,000,000,000.00	152.89%
72	Iceland	17,000,000,000.00	170.88%
73	Syria	17,000,000,000.00	170.88%
74	Croatia	16,970,000,000.00	171.18%
75	Jordan	16,000,000,000.00	181.56%
76	Lebanon	16,000,000,000.00	181.56%
77	Dominican Republic	15,140,000,000.00	191.88%
78	Tunisia	15,000,000,000.00	193.67%
79	Cuba	15,000,000,000.00	193.67%
80	Korea, North	15,000,000,000.00	193.67%
81	Slovenia	13,000,000,000.00	223.46%
82	Turkmenistan	13,000,000,000.00	223.46%
83	Tajikistan	12,000,000,000.00	242.08%
84	Mozambique	12,000,000,000.00	242.08%
85	Kyrgyzstan	11,000,000,000.00	264.09%
86	Sri Lanka	11,000,000,000.00	264.09%
87	Zambia	11,000,000,000.00	264.09%
88	Bosnia and Herzegovina	11,000,000,000.00	264.09%
89	Myanmar	11,000,000,000.00	264.09%
90	Uruguay	10,000,000,000.00	290.50%
91	Lithuania	9,900,000,000.00	293.43%
92	Sudan	9,900,000,000.00	293.43%
93	Georgia	9,800,000,000.00	296.43%
94	Paraguay	9,700,000,000.00	299.48%
95	Libya	9,300,000,000.00	312.37%
96	Congo, Democratic Republic of the	9,300,000,000.00	312.37%
97	Costa Rica	9,200,000,000.00	315.76%
98	Ghana	9,200,000,000.00	315.76%
99	Trinidad and Tobago	9,100,000,000.00	319.23%
100	Guatemala	8,915,000,000.00	325.86%
101	Estonia	8,200,000,000.00	354.27%
102	Angola	8,100,000,000.00	358.64%
103	Zimbabwe	8,000,000,000.00	363.13%
104	Panama	7,800,000,000.00	372.44%
105	Albania	7,793,000,000.00	372.77%
106	Kenya	7,600,000,000.00	382.24%
107	Bolivia	7,500,000,000.00	387.33%
108	Macedonia	6,960,000,000.00	417.39%
109	Latvia	6,800,000,000.00	427.21%
110	Ethiopia	6,700,000,000.00	433.58%
111	Luxembourg	6,200,000,000.00	468.55%
112	Cameroon	6,100,000,000.00	476.23%
113	Ivory Coast	5,800,000,000.00	500.86%
114	El Salvador	5,700,000,000.00	509.65%
115	Mongolia	5,600,000,000.00	518.75%
116	Honduras	5,300,000,000.00	548.11%
117	West Bank	5,200,000,000.00	558.65%
118	Yemen	5,200,000,000.00	558.65%
119	Armenia	5,100,000,000.00	569.61%
120	Tanzania	5,000,000,000.00	581.00%
121	Afghanistan	4,700,000,000.00	618.09%
122	Macau	4,500,000,000.00	645.56%
123	Nicaragua	4,412,000,000.00	658.43%
124	Moldova	4,305,000,000.00	674.80%
125	Cambodia	4,100,000,000.00	708.54%
126	Laos	3,900,000,000.00	744.87%
127	Nepal	3,900,000,000.00	744.87%
128	Cyprus	3,900,000,000.00	744.87%
129	Brunei	3,766,000,000.00	771.38%
130	Botswana	3,700,000,000.00	785.14%
131	Namibia	3,700,000,000.00	785.14%
132	Papua New Guinea	3,000,000,000.00	968.33%
133	Senegal	3,000,000,000.00	968.33%
134	Kosovo	2,887,000,000.00	1006.23%
135	Montenegro	2,800,000,000.00	1037.50%
136	Jamaica	2,800,000,000.00	1037.50%
137	Uganda	2,700,000,000.00	1075.93%
138	Mauritius	2,600,000,000.00	1117.31%
139	Gabon	2,100,000,000.00	1383.33%
140	Bhutan	2,085,000,000.00	1393.29%
141	New Caledonia	2,000,000,000.00	1452.50%
142	Malta	2,000,000,000.00	1452.50%
143	Suriname	1,900,000,000.00	1528.95%
144	Malawi	1,900,000,000.00	1528.95%
145	Bahamas	1,600,000,000.00	1815.63%
146	Guam	1,500,000,000.00	1936.67%
147	Swaziland	1,500,000,000.00	1936.67%
148	Mali	1,400,000,000.00	2075.00%
149	Liechtenstein	1,360,000,000.00	2136.03%
150	Madagascar	1,300,000,000.00	2234.62%
151	Burkina Faso	1,200,000,000.00	2420.83%
152	Niger	1,200,000,000.00	2420.83%
153	Togo	1,100,000,000.00	2640.91%
154	Benin	1,000,000,000.00	2905.00%
155	Curacao	968,000,000.00	3001.03%
156	Congo, Republic of the	900,000,000.00	3227.78%
157	Guinea	900,000,000.00	3227.78%
158	Barbados	900,000,000.00	3227.78%
159	Mauritania	800,000,000.00	3631.25%
160	Lesotho	800,000,000.00	3631.25%
161	Guyana	800,000,000.00	3631.25%
162	Fiji	800,000,000.00	3631.25%
163	Aruba	800,000,000.00	3631.25%
164	French Polynesia	700,000,000.00	4150.00%
165	South Sudan	694,100,000.00	4185.28%
166	Jersey	630,100,000.00	4610.38%
167	Bermuda	600,000,000.00	4841.67%
168	Cayman Islands	600,000,000.00	4841.67%
169	U.S. Virgin Islands	600,000,000.00	4841.67%
170	Marshall Islands	600,000,000.00	4841.67%
171	Andorra	562,400,000.00	5165.36%
172	Rwanda	500,000,000.00	5810.00%
173	Burundi	400,000,000.00	7262.50%
174	Belize	400,000,000.00	7262.50%
175	Djibouti	400,000,000.00	7262.50%
176	Haiti	400,000,000.00	7262.50%
177	Seychelles	300,000,000.00	9683.33%
178	Somalia	300,000,000.00	9683.33%
179	Saint Lucia	300,000,000.00	9683.33%
180	Antigua and Barbuda	300,000,000.00	9683.33%
181	Cabo Verde	300,000,000.00	9683.33%
182	Eritrea	300,000,000.00	9683.33%
183	Faroe Islands	300,000,000.00	9683.33%
184	Gambia	300,000,000.00	9683.33%
185	Greenland	300,000,000.00	9683.33%
186	Liberia	300,000,000.00	9683.33%
187	Maldives	300,000,000.00	9683.33%
188	Chad	200,000,000.00	14525.00%
189	Saint Kitts and Nevis	200,000,000.00	14525.00%
190	Central African Republic	200,000,000.00	14525.00%
191	Sierra Leone	200,000,000.00	14525.00%
192	Turks and Caicos Islands	200,000,000.00	14525.00%
193	Gibraltar	200,000,000.00	14525.00%
194	Grenada	200,000,000.00	14525.00%
195	Micronesia, Federated States of	178,600,000.00	16265.40%
196	Timor-Leste	125,300,000.00	23184.36%
197	British Virgin Islands	100,000,000.00	29050.00%
198	Saint Vincent and the Grenadines	100,000,000.00	29050.00%
199	American Samoa	100,000,000.00	29050.00%
200	Samoa	100,000,000.00	29050.00%
201	Equatorial Guinea	91,140,000.00	31874.04%
202	Dominica	90,210,000.00	32202.64%
203	Western Sahara	83,700,000.00	34707.29%
204	Solomon Islands	79,050,000.00	36748.89%
205	Sao Tome and Principe	65,100,000.00	44623.66%
206	Vanuatu	55,800,000.00	52060.93%
207	Tonga	46,500,000.00	62473.12%
208	Saint Pierre and Miquelon	41,850,000.00	69414.58%
209	Comoros	40,920,000.00	70992.18%
210	Guinea-Bissau	31,620,000.00	91872.23%
211	Cook Islands	31,620,000.00	91872.23%
212	Kiribati	27,900,000.00	104121.86%
213	Nauru	23,250,000.00	124946.24%
214	Montserrat	21,390,000.00	135811.13%
215	Falkland Islands	13,950,000.00	208243.73%
216	Saint Helena, Ascension and Tristan da Cunha	9,300,000.00	312365.59%
217	Niue	3,720,000.00	780913.98%
218	Gaza Strip	202,000.00	14381188.12%
219	Northern Mariana Islands	48,300.00	60144927.54%

Bitcoin Mining Electricity Consumption Vs US States

While doing the research we also though it might be interesting to compare Bitcoin mining energy consumption to US states. So we created the map below:



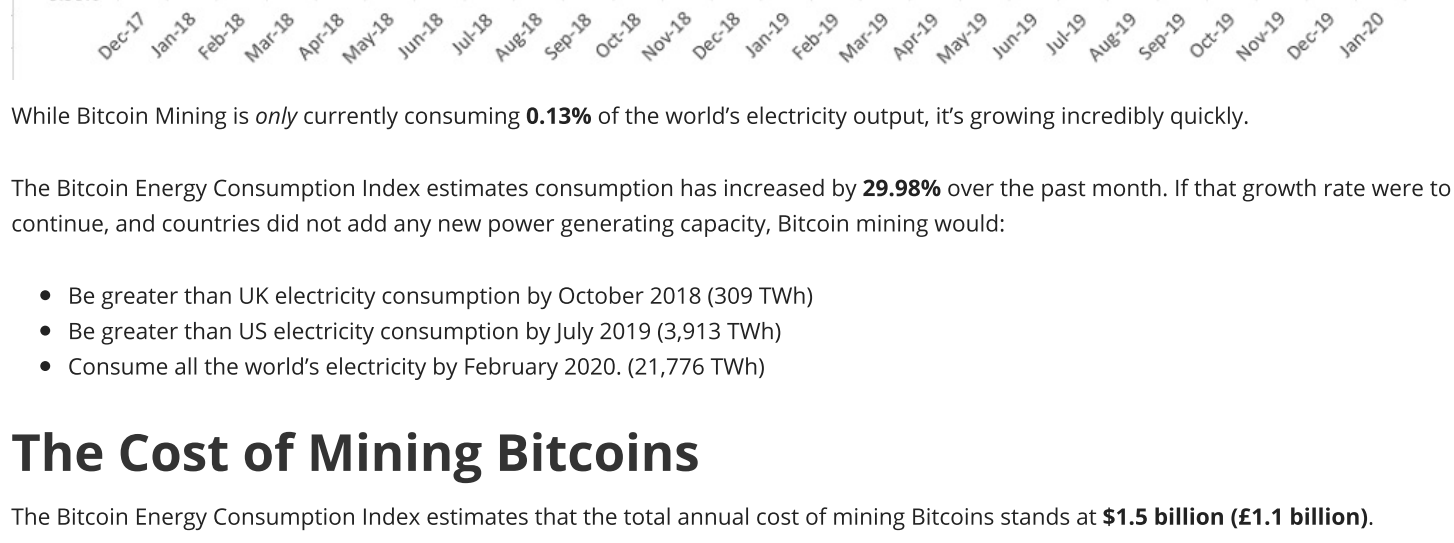
Source: https://powercompare.co.uk/bitcoin/

Overall, 12 States consume less electricity than Bitcoin Mining (Alaska, Hawaii, Idaho, Maine, Montana, New Hampshire, New Mexico, North Dakota, Rhode Island, South Dakota, Vermont and Wyoming).

The data for this section comes from the EIA and is for 2015 and uses total retail sales. Please note this data set uses MWh instead of kWh.

STATE	TOTAL RETAIL SALES (MWH)	BITCOIN MINING CONSUMPTION RELATIVE TO STATE'S USE
Alabama	88,845,543.00	33%
Alaska	6,159,204.00	472%
Arizona	77,349,416.00	38%
Arkansas	46,465,154.00	63%
California	261,170,437.00	11%
Colorado	54,116,046.00	54%
Connecticut	29,476,155.00	99%
Delaware	11,498,205.00	253%
District of Columbia	11,291,233.00	257%
Florida	235,599,398.00	12%
Georgia	135,878,215.00	21%
Hawaii	9,511,352.00	305%
Idaho	23,058,814.00	126%
Illinois	138,619,970.00	21%
Indiana	104,514,518.00	28%
Iowa	47,147,293.00	62%
Kansas	39,849,127.00	73%
Kentucky	76,038,630.00	38%
Louisiana	91,676,489.00	32%
Maine	11,888,168.00	244%
Maryland	61,781,719.00	47%
Massachusetts	54,621,088.00	53%
Michigan	102,479,921.00	28%
Minnesota	66,579,234.00	44%
Mississippi	48,691,529.00	60%
Missouri	81,504,081.00	36%
Montana	14,206,911.00	204%
Nebraska	29,495,073.00	98%
Nevada	36,019,690.00	81%
New Hampshire	10,999,149.00	264%
New Jersey	75,489,623.00	38%
New Mexico	23,093,553.00	126%
New York	148,913,655.00	20%
North Carolina	133,847,523.00	22%
North Dakota	18,128,948.00	160%
Ohio	149,213,224.00	19%
Oklahoma	61,336,385.00	47%
Oregon	47,263,974.00	61%
Pennsylvania	146,344,028.00	20%
Rhode Island	7,664,718.00	379%
South Carolina	81,328,246.00	36%
South Dakota	12,101,979.00	240%
Tennessee	99,632,108.00	29%
Texas	392,337,354.00	7%
Utah	30,192,350.00	96%
Vermont	5,521,109.00	526%
Virginia	112,009,045.00	26%
Washington	90,116,086.00	32%
West Virginia	32,303,026.00	90%
Wisconsin	68,698,932.00	42%
Wyoming	16,924,762.00	172%

Growth of Bitcoin Mining Electricity Consumption



While Bitcoin Mining is *only* currently consuming **0.13%** of the world's electricity output, it's growing incredibly quickly.

The Bitcoin Energy Consumption Index estimates consumption has increased by **29.98%** over the past month. If that growth rate were to continue, and countries did not add any new power generating capacity, Bitcoin mining would:

- Be greater than UK electricity consumption by October 2018 (309 TWh)
- Be greater than US electricity consumption by July 2019 (3,913 TWh)
- Consume all the world's electricity by February 2020. (21,776 TWh)

The Cost of Mining Bitcoins

The Bitcoin Energy Consumption Index estimates that the total annual cost of mining Bitcoins stands at **$1.5 billion (£1.1 billion)**.

However, that assumes Bitcoin mining is occurring in places with cheap electricity (not an unreasonable assumption).

The US average retail price per kilowatthour is 10.41 cents, which means using 28.05 TWh would cost: **$3.02 billion (£2.28 billion)**.

In the UK it would even more expensive, assuming you paid the rock bottom price of 10.10 pence per kilowatthour (Bulb's prices for London homes) it would still cost **£2.93 billion ($3.89 billion)**.

Interestingly, Bitcoin's price increase over the last month has been just over **40%**, which is greater than the increase in electricity consumption.

This means the estimated annualised global mining revenues now stand at **$7.2 billion USD (£5.4 billion)**, which even at the more expensive estimates listed above, means it's still very profitable.

How Does Bitcoin Mining Consume Electricity?

At a very basic level Bitcoin mining requires expensive and power hungry computer hardware. As the the IEEE explains:

> Mining power is high and getting higher, thanks to a computational arms race. Recall that the required number of zeros at the beginning of a hash is tweaked biweekly to adjust the difficulty of creating a block—and more zeros means more difficulty.
>
> The Bitcoin algorithm adds these zeros in order to keep the rate at which blocks are added constant, at one new block every 10 minutes. The idea is to compensate for the mining hardware becoming more and more powerful.
>
> When the hashing is harder, it takes more computations to create a block and thus more effort to earn new bitcoins, which are then added to circulation.

To better understand how this whole process works have a look at Investopedia's guide.

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