Reality Math
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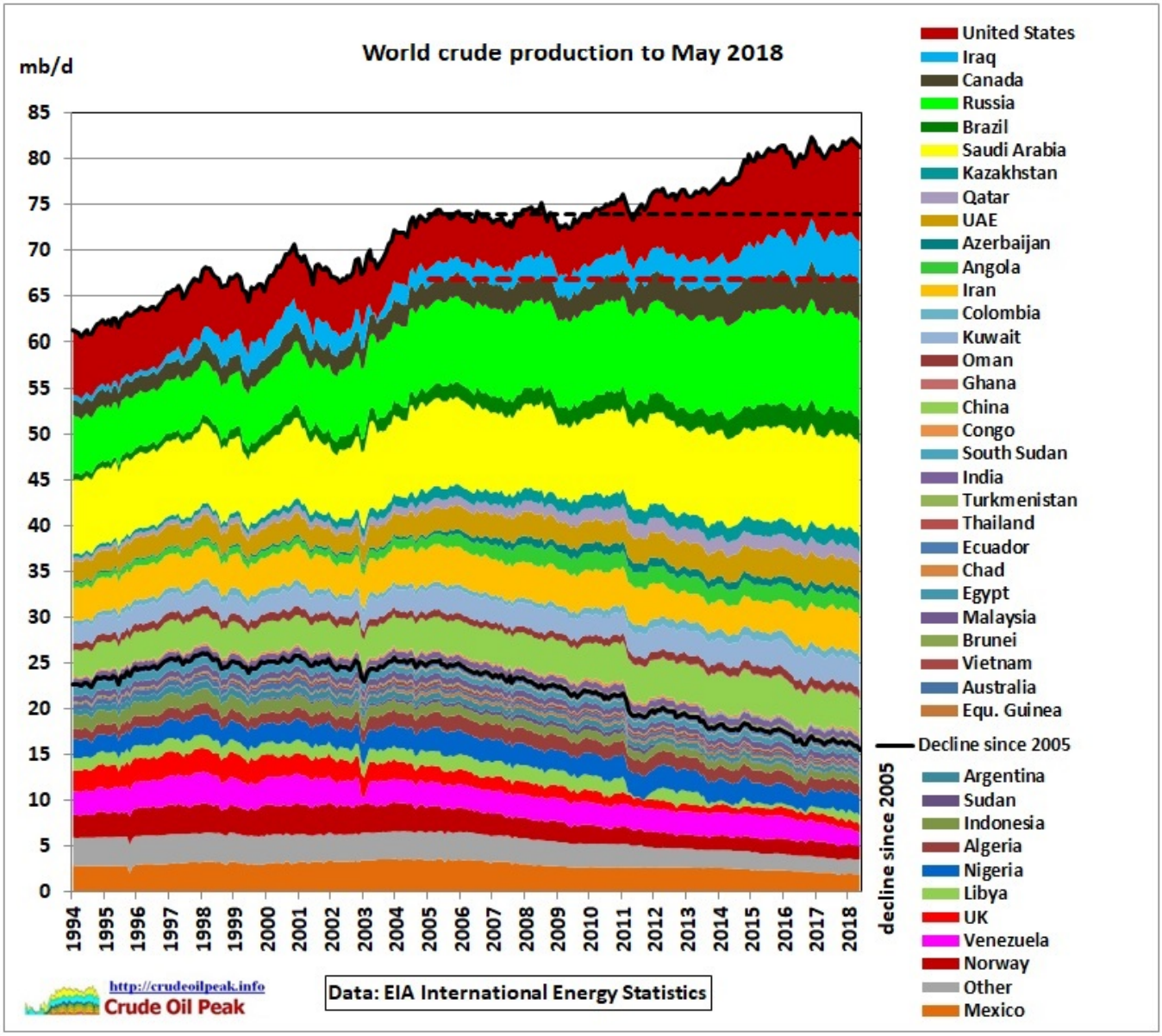
World Oil

I. World Oil Production

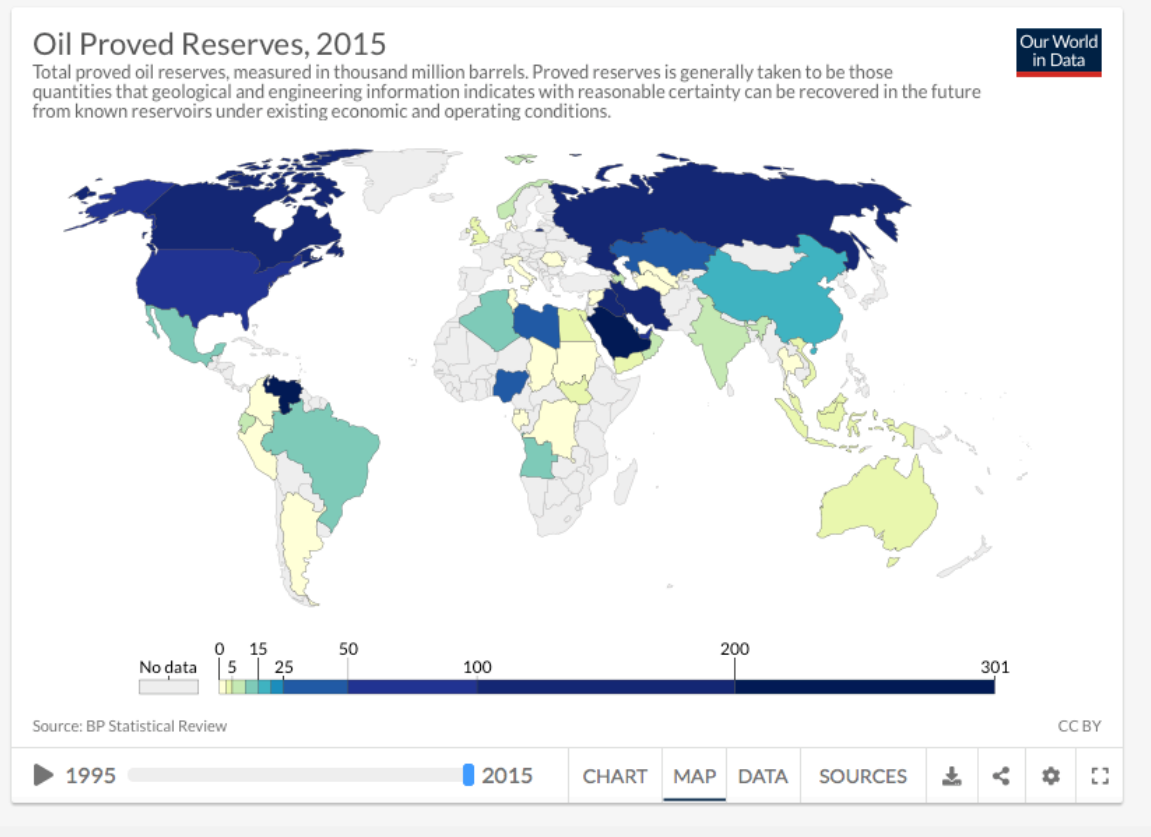


This is a stacked line graph. The width of each color measures production of that nation. For example, Saudi Arabia's production in 1994 was about 45 – 37 = 8 mb/d
By the way, mb/d mean million barrels per day.
http://crudeoilpeak.info/latest-graphs

1. (a) Which three countries are the big oil-producing countries in 2018?

   (b) Iraq, Canada, and what other four countries are also pretty big producers? Name all 6.

II. World Oil Reserves

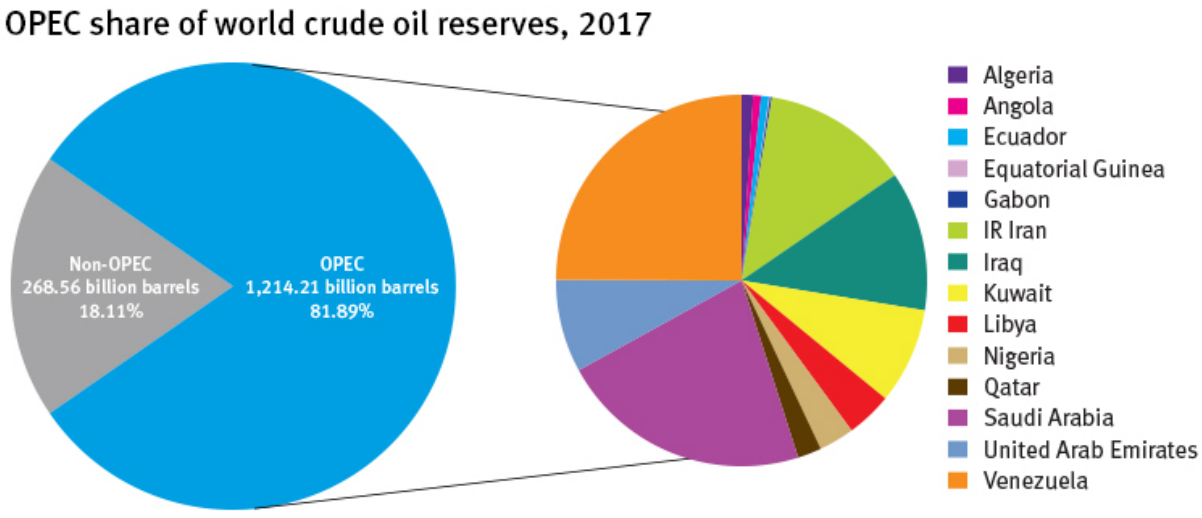


This is an interactive map of oil reserves at https://ourworldindata.org/fossil-fuels Clicking on each country with a lot of oil reserves we get the following information.

Country	Oil reserves billion barrels
Canada	172.2
US	55.0
Venezuela	300.9
Saudi Arabia	266.6
Iran	157.8
Iraq	143.1
Russia	102.4

Looking at the first graph, we might estimate that the US, Saudi Arabia, and Russia are producing about 10 million barrels of oil per day.

2. How long would their oil reserves last if each country continues to produce oil at the rates shown in the first graph? Give your answers in days and years.
   (a) Saudi Arabia
   (b) Russia
   (c) United States
   (d) Venezuela



OPEC proven crude oil reserves , at end 2017 *(billion barrels, OPEC share)*

Venezuela	302,81	24,9%	Kuwait	101,50	8,4%	Qatar	25,24	2,1%	Gabon	2,00	0,2%
Saudi Arabia	266,26	21,9%	UAE	97,80	8,1%	Algeria	12,20	1,0%	Equat. Guinea	1,10	0,1%
IR Iran	155,60	12,8%	Libya	48,36	4,0%	Angola	8,38	0,7%			
Iraq	147,22	12,1%	Nigeria	37,45	3,1%	Ecuador	8,27	0,7%			

Source: OPEC Annual Statistical Bulletin 2018.

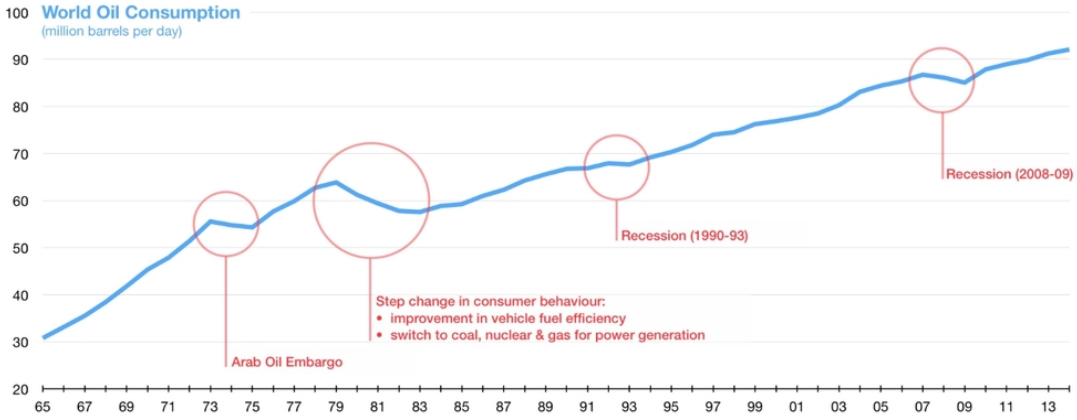
3. "OPEC Share of World Crude Oil Reserves 2017" graph

   (a) According to this OPEC graph, how many barrels of oil are in world oil reserves?

   (b) Do the numbers for Venezuela and Saudi Arabia agree with the numbers from the Our World in Data graph?

   (c) Is it always a good idea to look up important numbers on different authoritative websites?

III. World Oil Consumption



In 2019 global oil consumption is 100 million barrels per day.

4. (a) At the current rate of consumption, how long will oil reserves last? Give your answer in days and years.

   (b) Do you think the rate of world oil consumption will increase or decrease in the next several decades?

   (c)If the consumption rate increases, will the reserves last longer?

   (d) Find the percentage increase in world oil consumption from 1965 to 2019.

IV. Passenger Vehicle and Light Truck Oil Consumption

The passenger-car vehicle miles traveled in the US in 2007 were 1,670,994 **million** mile**s**. Pay attention to the word million in this number.

5. If all those miles had been traveled in a gasoline-powered car getting 25 mpg,

   (a) how many gallons of gasoline would have been used?

   (b) Every gallon of gasoline burned produces 20 lbs CO_2. How many tons of CO_2 came from passenger vehicles in 2007?

   (c) A barrel of oil is 42 gallons. How many barrels of oil would have been used by these 25 mpg vehicles. (Somewhat oversimplified here.)

   (d) How many mb/d are used by passenger vehicles?

(e) What percent of US Oil Consumption in 2007 went to passenger vehicles?

6. If all those miles had been traveled in a gasoline-powered car getting 50 mpg,

   (a) how many mb/d of oil would be saved if our average vehicle mileage was 50 mpg compared to 25 mpg?

   (b) If our passenger vehicles were all electric, how many barrels of oil would that save in a year?

   (c) By how many mb/d would US oil consumptions fall if all passenger vehicles were electric?

The vehicle miles traveled in the US in 2007 by other 2-axle 4 tire vehicles (light trucks) was 1,111,277 **million** miles. Again, don't miss the million word in this number.

7. If those miles were traveled in a gasoline-powered light truck getting 20 mpg,

   (a) how many gallons of gasoline would have been used?

   (b) Every gallon of gasoline burned produces 20 lbs CO2. How many tons of CO2 came from light trucks in 2007?

   (c) A barrel of oil is 42 gallons. How many barrels of oil would have been used by these 20 mpg light trucks. (Somewhat oversimplified here.)

   (e) How many mb/d are used by light trucks?

   (f) What percent of US Oil Consumption in 2007 went to light trucks?

   (g) Electrifying passenger vehicles and light trucks would save what percent of US oil consumption?

   (h) Electrifying passenger vehicles and light trucks would keep how many tons of CO2 out of the atmosphere each year?