



ECOLOGY AND DEMAND FOR ENERGY

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Abstract

Global warming is the result of an enormous drive for energy during the last 150 years. And demand keeps going up making the COP goals unachievable. Fossils will still dominate with renewables as only increments. Author supports this inevitability argument with data about global trends and local analysis of a few of the heavy emitters of CO₂s. Since the demand for energy is still rising, one understands why China and India as well as Brazil and Indonesia renege on the COP ambitions. In fact, all states in the COP club renege somehow, because the demand for energy is overwhelming. Despite this several countries face today energy shortage.

Keywords: Energy, COP, Demand, Ecology

INTRODUCTION

Global warming is the result of an enormous drive for energy during the last 150 years – see Figure 1. And demand keeps going up making the COP goals unachievable. Fossils will still dominate with renewables as only increments. Figure 1 shows the major kinds of energy today as well as the global trend.

The global energy profile in Figure 1 indicates two of the fundamental facts for early 21th century, namely: enormous growth in energy consumption and an almost 90 reliance on fossils that result in CO₂s i.e. the predicament of a heating Earth.



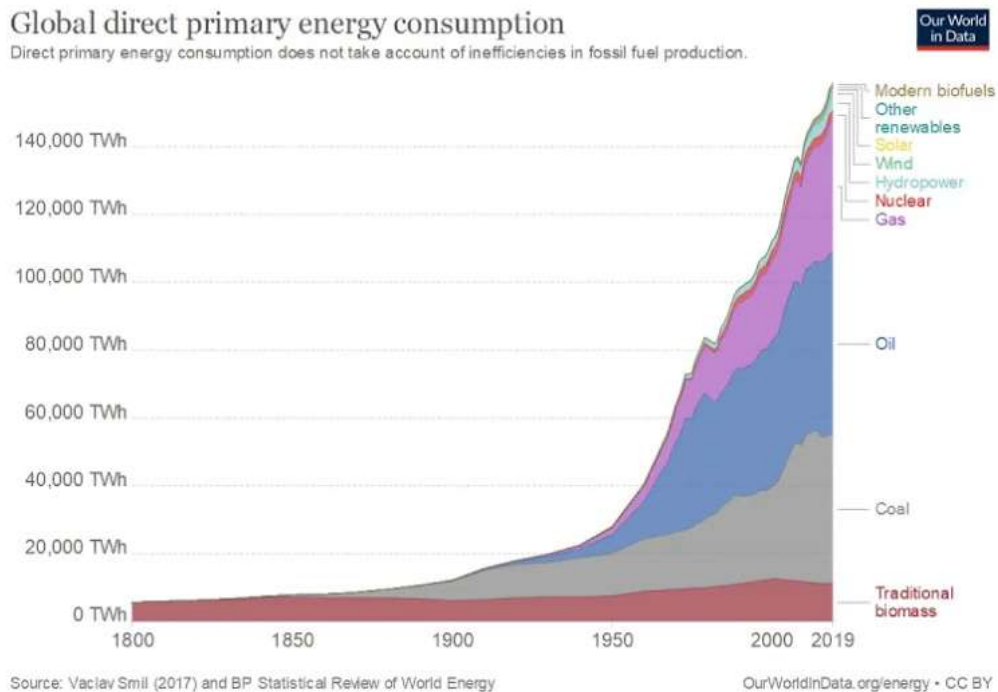


Figure 1: Energy consumption by source (Our World in Data, 2017)

CAPACITY TO DO WORK

Energy is so essential to humans and needed for its functions. Today total consumption of energy is roughly 70 Gigajoules per capita. Yet, the differences in per capita energy access are enormous – look at the following country numbers in Table 1.

Table 1. Per capita energy consumption (giga joules per year) (BP, 2021).

	2010	2019
Africa	15,4	15,2
Asia Pacific	50,7	60,9
Australia	240,5	233,2
Brazil	56	58,9
China	76,2	99,1
Germany	169,6	156,3
India	18,2	24,8
Japan	164,2	144,8
Middle East	135,3	146,2
Russia	195,1	204,9
South Korea	218,3	239,1
Sweden	229,8	223,4
United States	300,7	288,4

A human needs about 10 mega joules per day to survive healthy, or 3,8 GJ annually.

COAL POWER

The COP at *Glasgow* concentrated on phasing out *stone* coal power by 2030. Alas, coal figures too prominently in the *energy profile* of the huge polluters.

China and India

The energy situation in the most populous countries in the world is of great concern. It is not only that coal power makes up about half of total energy consumed – see Figure 2 and Figure 3.

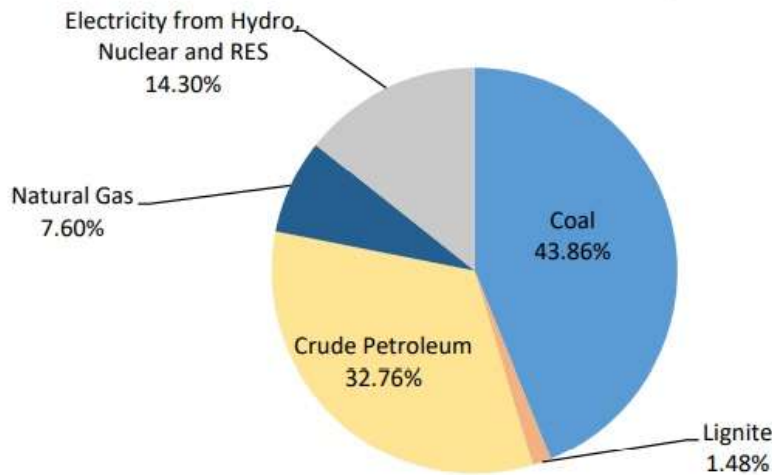


Figure 2. India consumption of energy 2019 (Energy India, 2021)

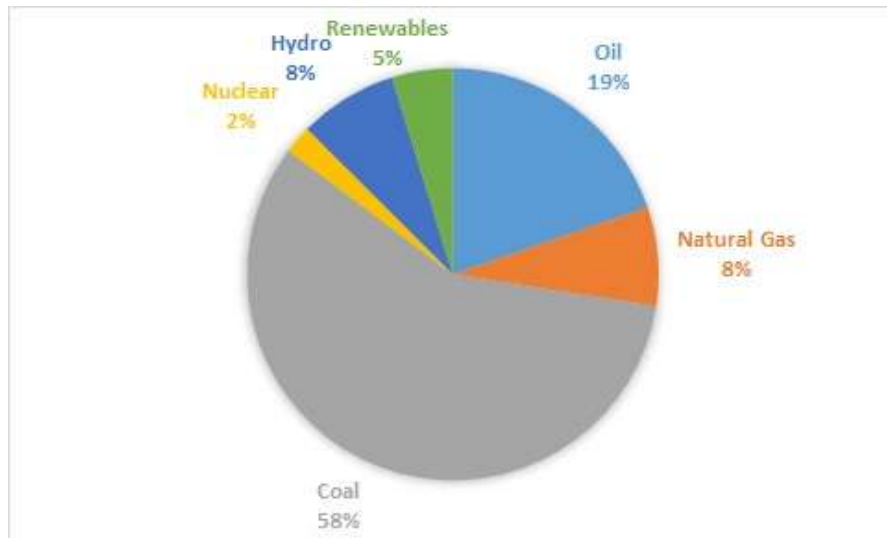


Figure 3. China consumption of energy 2019 (BP, 2021)

Although both countries have access to renewable power sources, coal and other fossil fuels dominate. In addition, the electric power in India and China is overwhelmingly produced by coal – see Figure 4 and Figure 5.

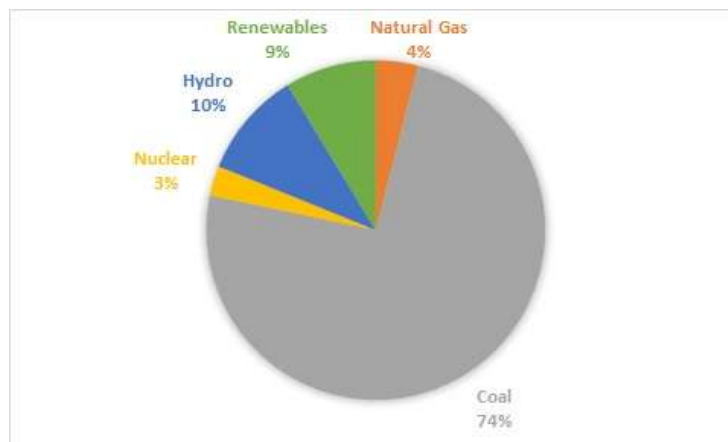


Figure 4. Electricity production in India 2019 (BP, 2021)

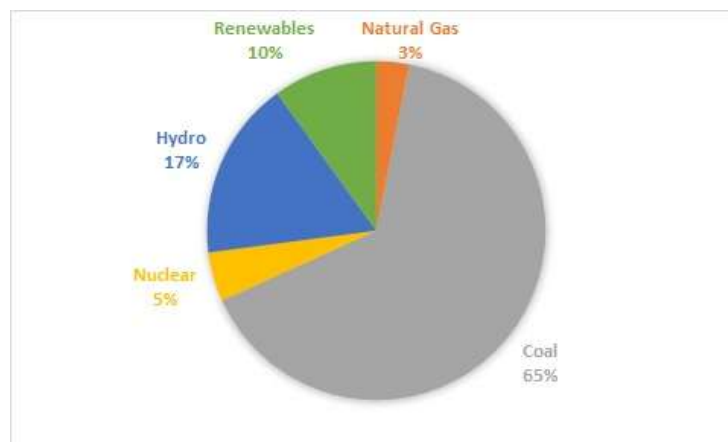


Figure 5. Electricity production in China 2019 (BP, 2021)

Both countries face enormous challenges:

- Retrieve electricity from non fossils;
- Replace fossil fuel power with electricity;
- Increase total power supply considerably.

China says it can accomplish all these goals by 2050, whereas India wants a delay until 2060.

Brazil and Indonesia

Global warming is attended by a whole set of commons deteriorations linked somehow to each other. There are two countries in particular that worsen the climate and ecology of Earth. First, Brazil and Indonesia have not protected the rainforests that are the lungs of Earth. Second, both resort to massive employment of coal and other fossils despite hydropower. Figures 6 and 7 display their fossil dependence.

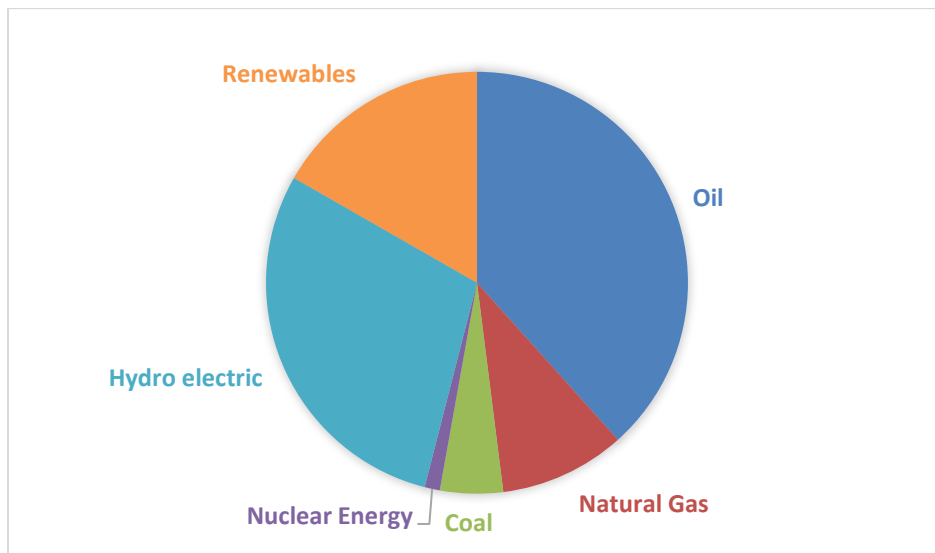


Figure 6. Primary Energy Consumption Brazil 2020 (BP, 2021)

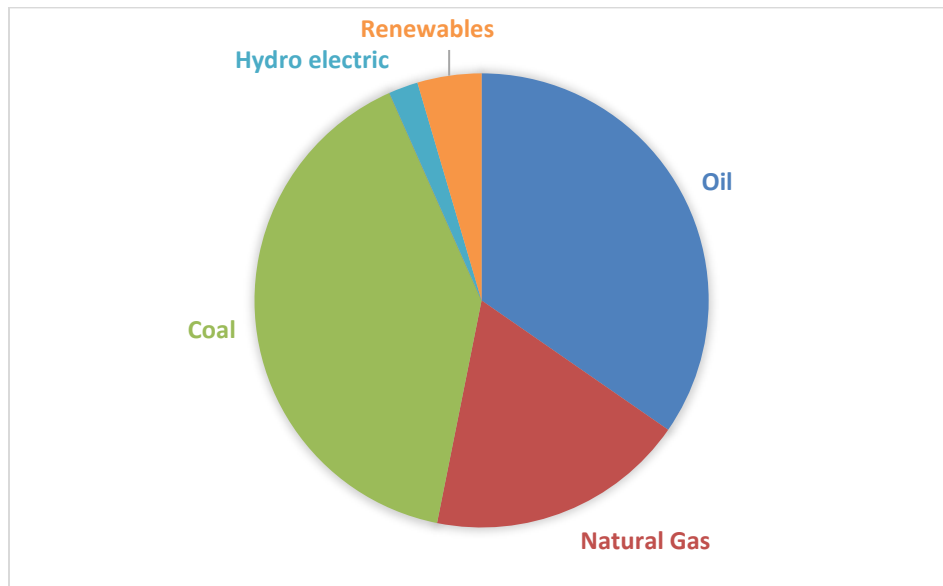


Figure 7. Primary energy consumption Indonesia

CO₂s

The amount of CO₂s in the atmosphere depends upon emissions of greenhouse gases and these depend upon the size and economic development. Table 2 defines the 20 biggest emitters of CO₂.

Table 2. CO₂ share of world emissions by country 2016 (Worldometers, 2021)

Country	Share of World emissions
China	29.18%
United States	14.02%
India	7.09%
Russia	4.65%
Japan	3.47%
Germany	2.17%
Canada	1.89%
Iran	1.80%
South Korea	1.69%
Indonesia	1.48%
Saudi Arabia	1.45%
Brazil	1.29%
Mexico	1.23%
Australia	1.16%
South Africa	1.09%
Turkey	1.03%
United Kingdom	1.03%
Italy	1.00%
France	0.93%
Poland	0.83%

The Keeling curve has increased by 2 percent per year since global warming was diagnosed by researchers at the NASA Goddard Space Center in 1988 (Hansen et al., 1988), driven by CO₂ emissions. The amount of greenhouse gases has augmented sharply, driven by energy increases. The latter will not decrease. On the contrary, both greenhouse gases and energy consumption is up 2021 from 2020. Here is the crux of the matter. When global emissions go up 1%, the Keeling curve goes up 2%, It is all about energy.

The demand for energy goes up year after year. Since 1990 the increase is 0,8 per cent. Figure 8 shows some estimates of future energy.

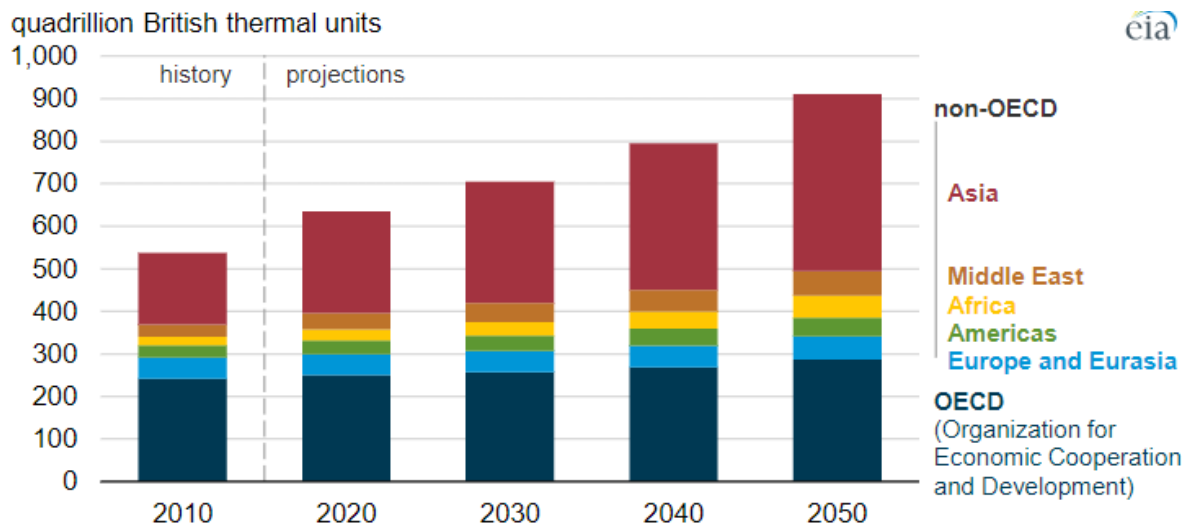


Figure 8. Projected Energy demand 2020-2050 (EIA, 2021)

CONCLUSION

Fossils play such a dominant role for the supply of energy that the use of renewables will be marginal among the big emitters of CO₂ – this analysis shows. Since the demand for energy is still rising, one understands why China and India as well as Brazil and Indonesia renege on the COP ambitions. In fact, all states in the COP club renege somehow, because the demand for energy is overwhelming, I would say. Despite this several countries face today energy shortage.

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