



Prosperous countries – high CO₂-emissions

January 27, 2020

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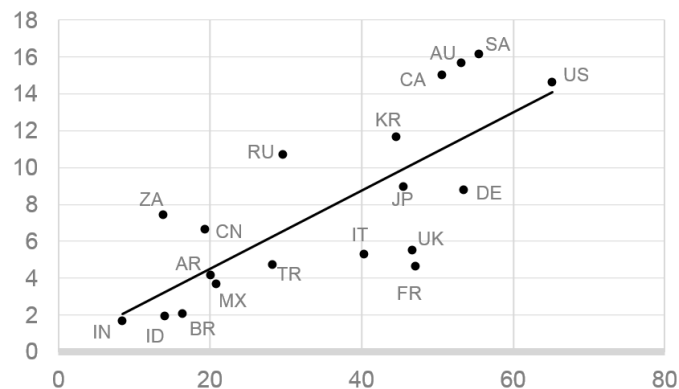


A country's prosperity is still closely linked to its energy consumption. As 80% of the global energy consumed is based on fossil fuels, high prosperity (measured as GDP per capita) tends to imply high per-capita CO₂ emissions. France is the G20 country which is closest to the goal of being quite prosperous on the one hand and keeping its per-capita carbon emissions relatively low on the other. Nevertheless, France is far from being a climate-neutral economy (which is the political goal).

The chart depicts the link between prosperity and CO₂ emissions for the G20 countries (the EU, as a G20 member, is not shown separately). However, several countries deviate considerably from the general trend, mainly due to differences in terms of energy production, consumption and production behaviour and energy prices.

Prosperous countries - high CO₂ emissions per capita

X axis: GDP per capita, in USD, 2019, nominal (PPP)
Y axis: CO₂ emissions per capita, 2017, in tons



Sources: IMF, IEA



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- The **US** are the country with the highest per-capita GDP (measured in terms of purchasing power parity, PPP). And they are also one of the countries with the highest CO₂ emissions per capita. While US per-capita CO₂ emissions have steadily declined in the last few years and were down by c. 28% in 2017 compared to 2000 – a development largely due to the fact that natural gas (produced by hydraulic fracturing) and renewable energies have replaced coal as a source of electricity – the US are still a carbon-intensive economy. Energy-related CO₂ emissions per unit of GDP (PPP) are almost 60% higher than in the European OECD countries. There are several reasons for this difference. Taxes on energy are relatively low and keep energy prices down, which is why energy efficiency, for example of buildings or electronic consumer goods, is not an important aspect for consumers. Average car fuel consumption is higher in the US than in Europe, not least due to the relatively large number of pickup trucks. Air travel is more common in the US than in most other countries in the world. More people use air conditioning than in Europe. And the list goes on. While manufacturing makes up only just above 11% of US GDP, relatively low industrial energy consumption is more than compensated by people's energy-intensive lifestyle. What we have just said about the US also applies (*mutatis mutandis*) to Australia, Canada and Saudi-Arabia.
- **China**, the country with the highest CO₂ emissions in absolute terms, is a carbon-intensive economy, too. It emits almost 160% more CO₂ per unit of GDP than the European OECD countries. Coal has a share of 62% in China's total primary energy demand. In addition, the country is the world's largest exporter of industrial goods. In a sense, it also exports CO₂ emissions to its customer countries. Per-capita CO₂ emissions in China rose by 170% between 2000 and 2017, even though the increase has stopped in the last few years (official figures for 2018 and 2019 are not yet available to the IEA). During the same period, nominal GDP per capita (in PPP terms) even ballooned by 470%. Hundreds of millions of Chinese have escaped poverty in the past 20 years.
- **India**, despite the strong growth rates of the last few years, is still a relatively poor country. In 2019, its GDP per capita (in PPP terms) was less than half of that in China and amounted to only 13% of the US average. The country's relatively low average standard of living is reflected by low energy consumption and low CO₂ emissions. While coal supplies 45% of India's primary energy demand and even 74% of the fuel needed for electricity generation, per-capita carbon emissions are below 2 tons. This is due to people's low individual mobility and the minor role of cars in the transport sector, low energy consumption for heating purposes and the lack of industrialisation. Nevertheless, India's energy demand is booming. According to IEA estimates, the country's primary energy consumption is likely to rise by more than 3% per year until 2040. Under the most probable IEA scenario, the share of coal in primary energy demand will decline by only 1 pp, to 44%. This means that per-capita CO₂ emissions will jump; in fact, they almost doubled in India between 2000 and 2017.



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- **Germany** registers relatively high CO₂ emissions per capita compared to other western European countries, but is also more prosperous than other large EU countries. One reason for the higher CO₂ emissions is that manufacturing makes an above-average contribution to gross value added in Germany (2019: 21.6%, compared to an EU average of about 16%). While industrial wages tend to be above the average, thus contributing to individual prosperity in Germany, the industry's large share in GDP, a sophisticated division of labour in manufacturing and the polycentric structure of the economy result in considerable road traffic, which drives up carbon emissions. In addition, cars in Germany tend to have larger engines than, say, in France. Moreover, carbon-intensive lignite still plays an important role in electricity generation. And last but not least, German households need more energy for heating than their counterparts in southern Europe. Energy-related CO₂ emissions in Germany were down 13% in 2017 compared to 2000.
- In **France**, manufacturing has a share of less than 11% in gross value added, down from 16% in 2000. That is one reason for the fact that per-capita CO₂ emissions declined by about 25% between 2000 and 2017 and amount only to about 52% of the German level. We already mentioned that car engines tend to be smaller and demand for heating energy lower. In addition, French CO₂ emissions are of course pushed down by the significant role of nuclear power generation.

Overall, all prosperous countries above the trend line in the chart have the best chances to reduce their energy consumption and their carbon emissions without (major) losses in prosperity. At the same time, France is the G20 country which is closest to the goal of being quite prosperous on the one hand and keeping its per-capita CO₂ emissions relatively low on the other. Nevertheless, France is far from being a climate-neutral economy (which is the political goal in the EU). Even African countries, which are among the poorest world-wide, where energy comes largely from renewables (wood), individual mobility plays no significant role and GDP per capita is only a fraction of that in the developed countries, are not climate-neutral.

Original in German published on January 24, 2020: "Reiches Land – hoher CO₂-Ausstoß"



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