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How much energy do we humans use? How much fossil fuel do we burn every year in the world? Which country emits more or less carbon dioxide? I'm going to show you the key indicator to use. It's carbon dioxide emission per person, and I'm going to show you how to compare countries. But there's a trap here, and you don't want to fall into it. It's the difference between emission per country and emission per person. In other words, the total amount and the rate. But first, have a look at this. I'm going to show how the emission in the whole world varies according to income, from the richest billion all the way down to the poorest billion.

I will show this. From the poorest billion to the richest billion, from the one who hardly can afford shoes to the one who fly with airplanes. Now this shows the total amount of fossil fuel used in the world during one year. Coal, oil, and natural gas, and it represents more or less the total emission of carbon dioxide. Now how much of that is used by the richest billion? Half of it. Now the second richest billion? Half of what's left. Then you understand what the third use, half of what's left, and the others use hardly anything. This is rounded numbers, but it clearly shows that almost all the fossil fuel is used here by the one, two, three richest billions, more than 85% they use. Now the richest billion here at least have stopped increasing, but we are yet to see whether they will decrease. And in the coming decades, it's the economic growth of these two that will increase the fossil fuel use and the carbon dioxide emission. Even if these ones over here come out of extreme poverty and get richer all the way to the motorbike, that doesn't contribute much to their emission of carbon dioxide.

This is a good website to find data on carbon dioxide emission. It's called UNdata. If you type carbon dioxide here and hit search, you get a number of different indicators, which you can use to compare countries in different ways. First here is carbon dioxide emission in tonnes, that's total amount per country. Next is carbon dioxide emission per capita, that is per person in the country, and there is also a number of other indicators you can use to compare.

This shot shows the carbon dioxide emission in 2011, the latest data for all major countries in the world. Each bubble is a country. On this axis, income, 400, 4,000, 40,000 dollar per capita. On this axis I show carbon dioxide emission per person, from a few tonnes per year to 10 and 20 tonnes per person and year. Now the size of the bubble, the total area of the bubble, that represents the total amount of carbon dioxide emitted from that country, and you can see that China has the biggest area. They have the highest emission per country. Number two, United States, number three, India. But these countries are on very different emissions per person, so China and India with relatively low emission per person have big bubbles because they have huge populations. United States, they have a big bubble because they're very high up, they have almost three times as much emission per person compared to China.

It's obviously important what big countries do, but the discussion about carbon dioxide emissions have sometimes got confused when it focus only on total emissions of the country. And some have blamed China for having the biggest emission, when they have a relatively average emission per person. It's a little as if you would say that the Chinese population is more obese than the American population because the total population weigh more than the American. You have to estimate obesity calculating weight per person, and I find it rational to do the same thing with carbon dioxide. Governments must be held responsible for the emission per person in their countries.

There are two more things you can see on this chart. First is as countries get richer they tend to have a higher carbon dioxide emission. Look here. Bangladesh, Pakistan, India, China, Russia, United States. The second thing you can see is that there is huge difference in carbon dioxide emission per person among the richest countries. They all have a very high income per person, but up here, Saudi Arabia, Australia, United States

and Canada with almost 18 to 20 tonnes per person. Down here, France, Sweden and Switzerland with quite low, 4 to 5 tonnes per person, and in the middle, Japan, Germany and United Kingdom.

So being rich doesn't mean that you have to have a very high emission per person. You can go yourself to this graph on the web and find out where is your country, and you can compare your country to other countries, how their emission per person have changed over time.

I am personally very interested to follow this data year by year into the future. Will these bubbles, countries with huge population, will they turn upwards here and emitting more and more to follow in this direction, or will they follow countries who have found a way to live well at lower emission levels? Then they may land somewhere over here, with the much smaller bubbles. This is the most crucial when it comes to what sort of climate change we will have in the future.