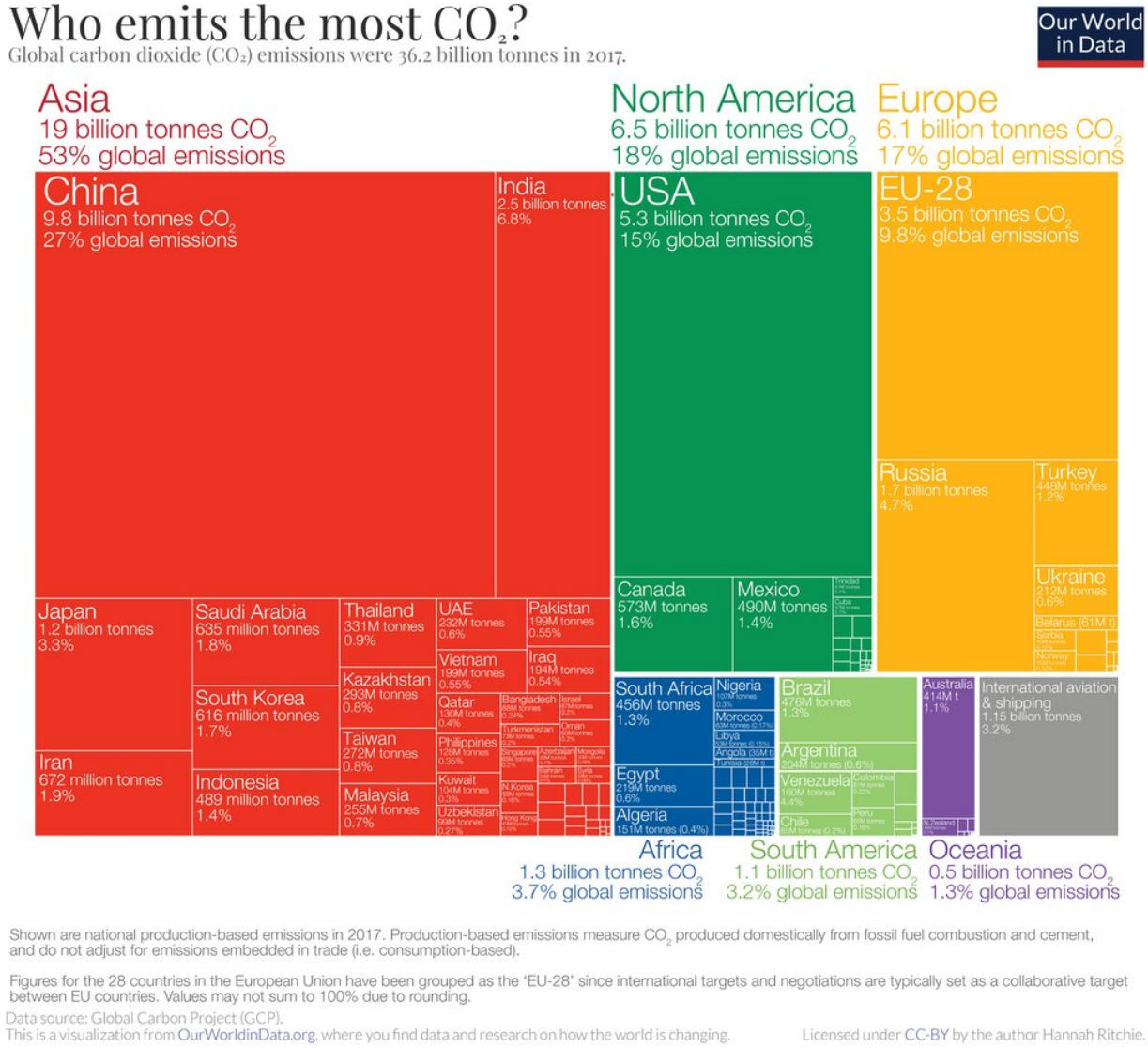
After net zero, we will need to go much further and clean up historic emissions

June 10 2021, by Tim Kruger



The biggest emitters today are China, the US and (collectively) the EU. (Note: this is production-based emissions, and does not account for emissions

embedded in trade). Credit: OurWorldInData.org, CC BY-SA

As the G7 summit gets underway, all the group's members are now firmly committed to achieving net zero by 2050. This is quite a turnaround from just two years ago when the UK became the first major economy to make such a pledge. At the time of writing 121 countries are signed up to the UNFCCC's Climate Ambition Coalition and 35 of the 38 members of the OECD (to name and shame the laggards, they are Australia, Israel and Turkey) are committed to net zero by mid-century.

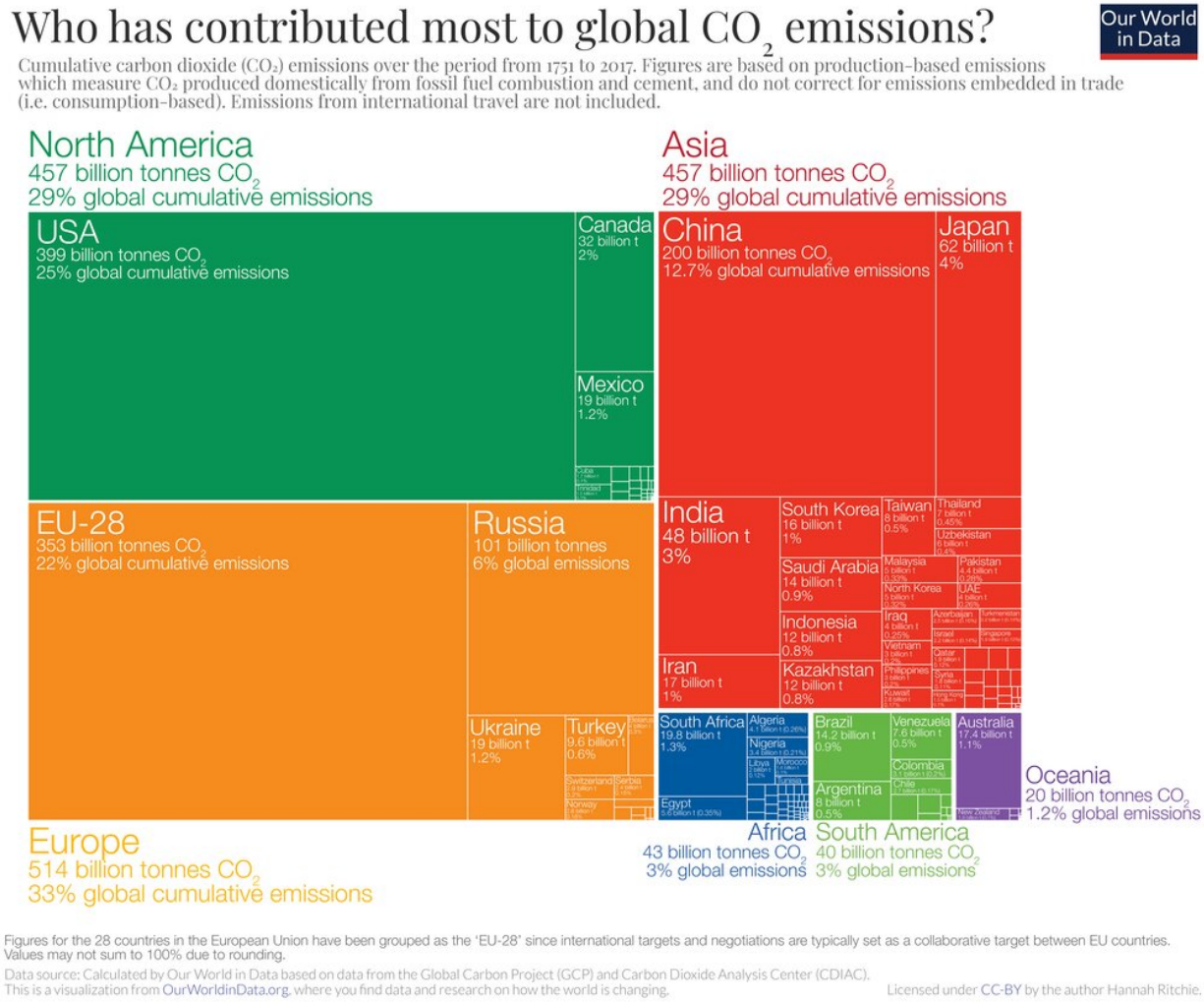
These pledges are significant, but still insufficient: to have a good chance of holding the rise in global temperatures to 1.5°C would require us to achieve planetary net zero by 2050. This will require major emitters such as China (which has a 2060 pledge), India and Russia to increase their ambition. And it will also require that pledges are delivered upon—the gap between current action and future ambition is stark.

While achieving a balance between emissions and removals by a particular date is important, the long-lived impact of carbon dioxide in the atmosphere means that the key determinant of how far global temperatures will rise is the cumulative amount of carbon dioxide emitted—the total amount since the industrial revolution.

For countries to cancel out their contribution to climate change requires that they not only achieve net zero, but that they also take out of the air as much carbon dioxide as they put in over the past few hundred years.

Microsoft is a leader in this regard. It has pledged to not only eliminate its current emissions, but also to remove sufficient carbon dioxide from the air to counter all of its historic emissions too. Countries that

industrialized early need to make pledges in a similar direction. It is only fair that they do—even though the historic emissions were made without an understanding of their impact, the benefits of early industrialisation have flowed to those countries and the costs should be borne by them too.



Cumulative emissions 1751–2017. Countries like China and India are much smaller than on the graph above, while the US and Europe are much larger. Credit: OurWorldInData.org, CC BY-SA

It is also difficult to make a persuasive case to countries such as India and China about their need to rapidly cut emissions, while the historic mess of early-industrialisers remains in the atmosphere contributing to climate change. Countries need to pledge not only to reach net zero targets by mid-century, but also to address their historic emissions as well.

The difference between current and cumulative emissions can be stark. For example in 2019, the UK emitted about 350 million tons of CO_2, accounting for slightly less than 1% of the global total. But due to its early industrialisation, the UK is responsible for cumulative emissions of about 78 billion tons of CO_2—about 5% of the the global total of 1.5 trillion tons. Even if the UK achieves its goal of net zero by 2050, it will still have accumulated a "carbon hangover" of well over 80 billion tons and if that debt were to be paid off by the end of the century removals averaging 1.6 billion tons a year would be required. This would be over four times what the country currently emits each year.

For a country like India, the numbers are reversed—about 7% of current global emissions, but only 3% of cumulative emissions—reflecting the fact that its economy has only more recently industrialized. Even so, it will have accumulated a substantial carbon hangover by the middle of the century which will also have to be paid off at some stage.

Humanity needs to work together to affect what we might call the "great restoration"—a multi-generational endeavour to undo the damage that we have wrought on the world. We need to restore the atmosphere, drawing down carbon dioxide back to a level that is compatible with a stable climate and healthy oceans. We need to restore the planet's complex living systems—sometimes actively, sometimes just by leaving natural systems to find their own way to recover. And we need to achieve this restoration in a way that is compatible with the wide range of other societal ambitions that we collectively share.

The great restoration will be an enormous undertaking. You could describe it as a cathedral project. Those involved at the outset may draft the plans and dig the foundations, but they will not raise the spire to its full height. That task, that privilege, belongs to our descendants. None of us will see that day, but we must start in the hope that future generations will be able to finish the job.

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