Assignment 1 Deep dive in carbon emissions

We have to deal with carbon to address climate change, so let's have a deep dive into the carbon emission data. One of my favorite sources and visulizations is Our World in Data. The raw data is also available here. Check also the efforts to improve the resolution of global carbon emission data/inventory, e.g. the Carbon Monitor.

Questions

Please use the most recent data and answer below questions:

- Top 10 countries by annual total energy related carbon emissions? (0.5pt)
- Top 10 countries by per capita average carbon emissions? (0.5pt)
- Top 5 countries with the highest and lowest carbon intensity (carbon emission/GDP), respectively? Offer your assumptions why this is the case, use data to show your assumptions if possible. (1pt)
- Top 10 countries by cumulative carbon emissions, 1750-2022? (0.5pt)
- List all countries that have reduced their carbon emissions since 1990/2000? (0.5pt)
- Change the acounting from production-based to consumption-based, describe how the ranks changing? What leads the changing? (1pt)
- Use global data to show how big impact of the pandemic on the global emission, using readings to explain how each factor has contributed the change? (1pt)
- What technology and methods made the near real-time carbon monitoring possible? Use one example to show how the daily carbon emission data could improve in the policy discussion? (1pt)

Note: please list countries and their corresponding data of those indicators. Plug: we will come back to this assignment when discuss sharing of "common but differntiated responsibilities" in climate negotiation and governance.

Further readings

- Dou, Xinyu, Yilong Wang, Philippe Ciais, Frédéric Chevallier, Steven J. Davis, Monica Crippa, Greet Janssens-Maenhout, et al. 2022. "Near-Real-Time Global Gridded Daily CO2 Emissions." *The Innovation* 3 (1). https://doi.org/10.1016/j.xinn.2021.100182.
- Friedlingstein, Pierre, Michael O'Sullivan, Matthew W. Jones, Robbie M. Andrew, Luke Gregor, Judith Hauck, Corinne Le Quéré, et al. 2022. "Global Carbon Budget 2022." *Earth System Science Data* 14 (11): 4811–4900. https://doi.org/10.5194/essd-14-4811-2022.