

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 visualizations 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 accounting 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 differentiated 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.xim.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>.