Greenhouse Gas Emissions - tracking the UK progress to reach net zero emissions by 2050

Visualisation Summary

Greenhouse gas emissions are crucial and should not be disregarded since they have a considerable impact on the Earth's climate change, warming the Earth's surface and creating the greenhouse effect. The United Nations has foreseen this critical issue and called for action to reach net zero greenhouse gas emissions by 2050 [1]. To follow the plan, it is worth having some tools for tracking the progress of reducing carbon emissions. Carbon dioxide (CO2) was selected to visualise since it is the majority of greenhouse gas emissions. Therefore, we conducted a website to show carbon emissions across the country by local authorities in the UK. This will help the governor monitor the situations and identify areas that need improvement. Moreover, a breakdown of the causes of carbon emissions by sector is also provided.

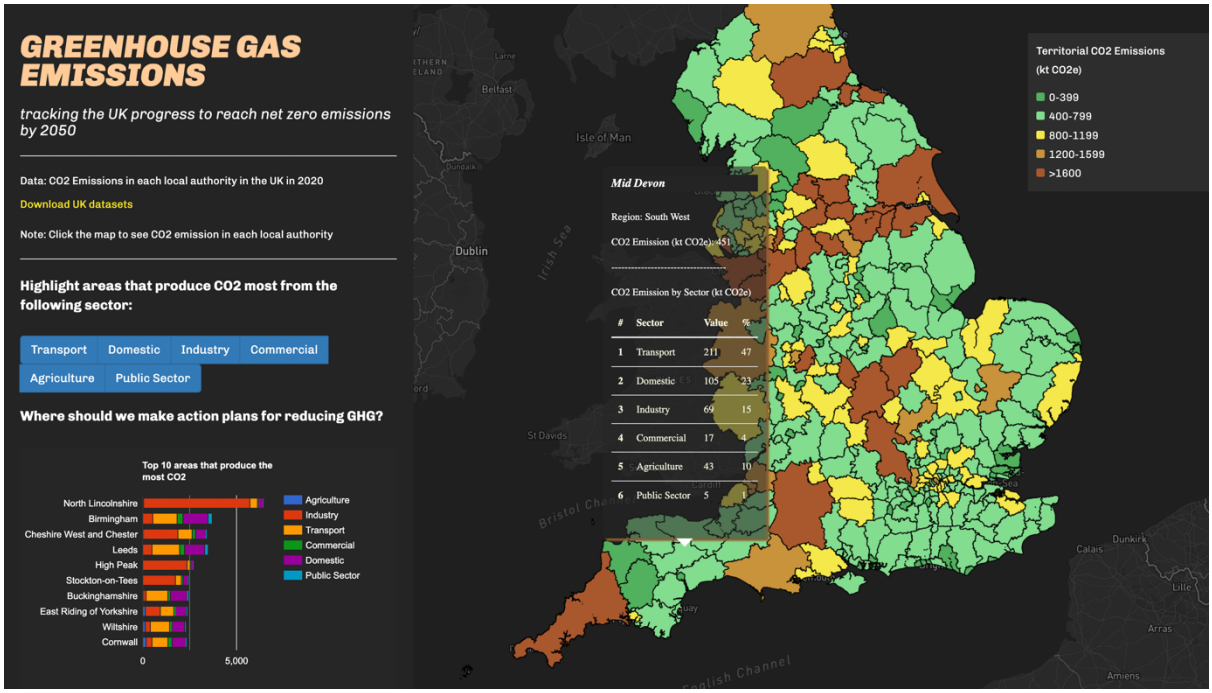

Fig 1. User Interface of the UK greenhouse gas emissions monitoring system

Systems and Design Techniques

The website was built based on Mapbox GL javascript and Google charts to visualise CO2 emissions in the UK. The interactive choropleth map was conducted to show large quantities of spatial information, which is carbon emissions in all local authorities, and also help users see if the spatial patterns exist. Map tiling was also set to provide the functionality of zooming from levels 4 to 9, considering the effectiveness of systems and their usage. After looking at the overall map, users are also able to click on the map to see the quantity of carbon emissions along with the breakdown by sector of the corresponding area. Moreover, if they want to know the main causes of carbon emissions in each area, they can look through it

by choosing their interested sectors in the sidebar. The system will highlight all areas that have the main causes of carbon emissions from the selected sector. Furthermore, the summary of the top 10 districts that produce the most carbon dioxide is also provided in the sidebar. The horizontal stacked bar chart is used to help users understand the proportion of each sector producing CO2.

Data Manipulation

Carbon emissions data and the UK local authority boundaries were collected from the UK government website [2] and processed using python. Data preprocessing steps include data aggregation of carbon emissions from the emission by sector to the grand total emissions. Data pivoting and filtering were also conducted for the ease of use from the frontend.

Word Count: 400

References

[1] Pedersen, C.S. (2018) The UN sustainable development goals (SDGs) are a great gift to business!. *Procedia Cirp*, *69*, pp.21-24.

[2] UK Government, D. for B., Energy &. Industrial Strategy (2022) UK local authority and regional greenhouse gas emissions national statistics, 2005 to 2020, GOV.UK. Available at: https://www.gov.uk/government/statistics/uk-local-authority-and-regional-greenhouse-gas-emissions-national-statistics-2005-to-2020 (Accessed: 8 March 2023).