Prospectus - User Perception of Carbon Footprint by States

Kayla Aonfesca, Christian George, Daniel Onyema

1 Introduction

As the climate crisis accelerates, public understanding of carbon emissions, especially at the local level, has become essential. Despite the abundance of data on carbon footprints across the United States, much of this information remains inaccessible or difficult for the average person to interpret. This project explores how users perceive and understand carbon footprint data when it is presented visually, specifically through an interactive scatter map. By focusing on emissions data at the county level, this visualization aims to not only inform users about the size and sources of carbon emissions in their own communities, but also to evaluate how effectively such visual tools can enhance public awareness and promote informed climate action. The goal is to create a compelling and educational visual that bridges the gap between data and meaningful user engagement in the fight against climate change.

2 One-sentence description

The purpose of this study is to determine how large each state's carbon footprint is, understand how well users are able to extract that same information from an interactive scatter map, and (in the case of an evident lack of carbon emission awareness) see how one can create visuals that highlight the severity of CO2 emissions at the local level and promote climate change efforts in minimizing them.

3 Project Type

Application-based experiment.

4 Audience

The audience for this project is the public, as the goal of this project is to educate them and us on carbon emissions in the United States through our visualization. If the goal of this project is not met, the general public's climate change literacy/awareness will remain as is and any changes the public could make based on their understanding of this data may remain unseen.

5 Approach

In creating our visualization, we used data containing each zip code in every state, their carbon footprint from various sources, and their total carbon footprint. Minimal cleaning was performed during our EDA. We only ignored unneeded attributes such as elevation, CBSAT, PMSA_Name, and others. For this project, we used only the following: longitude; latitude; zip code; city; state; county; transport-based, housing-based, food-based, goods-based, and service-based carbon footprint metrics; and electricity, oil, and gas usage. The actual visualization will be a scatter map of carbon emissions throughout the states by counties, wherein the more emissions a county has, the darker its shade of red on the map will be.

5.1 Evidence for Success

At the bare minimum, anyone who uses the visualization will be exposed to relevant data regarding carbon emissions

throughout the states in recent years, which will dismantle any misconceptions they may have on its severity.

6 Best-case Impact Statement

The good/best case scenario is we can gauge how users understand/interact with our visualization, why that is, and how we can apply our newfound understanding of the results to creating more impactful visualizations highlighting the severity of CO2 emissions and promoting climate change efforts.

Major Milestones

7 Obstacles

1. Finding data that is relevant; recent; contains information on emissions by state (preferably by county/zip code), per person, per industry.

2. The size of the data. Given what we want to learn from whatever data we find and convey to users, it will almost certainly be very, *very* large. Cleaning it, removing unnecessary attributes or grabbing the useful ones, and possibly getting rid of any missing or null values proved difficult depending on the size. Moreover, larger data may make the site slower due to loading time.

3. Building the site to not only be as fast as possible, but also as engaging as possible.

8 Define success

A fully functioning, interactive, user-friendly scatter map depicting and comparing carbon emissions throughout the states based on county. One that can show total emissions, emissions per indust**ry**, per region, and per person.