W200 Project #2 Proposal
EU and USA Pollutants

Names:
Miroslava Walekova
Matthew DeGostin

Repository:
https://github.com/UCB-INFO-PYTHON/Project_2_Walekova_DeGostin

Primary Datasets:

EU Pollution Data

Format: .csv (*Output_Table.zip*)
Number of rows: 735580
Years: 1990 - 2016
Pollutants: PM10 , PM2.5, NOx, BC, NH3, NMVOC, SOx
Countries: EU 28 (by country)
Sectors: 139 sectors
Variables: Country, pollutant, sector, year, emissions, unit

US Pollution Data

Format: .xlsx (*US_by_state_emissions.xlsx*)
Number of rows: 5320
Years: 1996 - 2017
Pollutants: CO, NH3, NOx, PM10, PM2.5, SO2, VOC
States: 50
Sectors (tiers): Fuel combustion, chemical, metals, etc. (12 in total)
Variables: State, tier, pollutant, emissions 1996, emissions 1997, etc.

Secondary Datasets:

EU (by country) - Causes of Death

File: *EU Underlying Cause of Death.tsv*
Description: Tab-delimited text file of death rates by EU country, contains year, CD10 classification of cause of death, sex, and number of incidents.

EU (by country) - GDP

File: *EU28 GDP.xls*

Description: Excel table w/ a row for each country, and columns per year. GDP data shown in the table from 1990 - 2016, with some missing values.

USA (by state) - GDP

File: *US GDP by state.xls*
Description: Excel table w/ a row for each state, and each column is a year. The GDP values fill in the data points.

USA (by state) - Causes of Death

File: *USA Underlying Cause of Death, 1999-2017.txt*
Description: Tab-delimited file of death rates by state, contains year, state cause of death, and number of incidents.

EU Target Pollution Levels

File: *Air quality 2018 - TH-AL-18-013-EN-N.pdf*
Description: Table 1.1 on page 12 contains air quality standard guidelines for target pollutant levels across Europe. This data may be used as a reference in our exploration.

Additional Emissions Data (mostly for cross-checking)

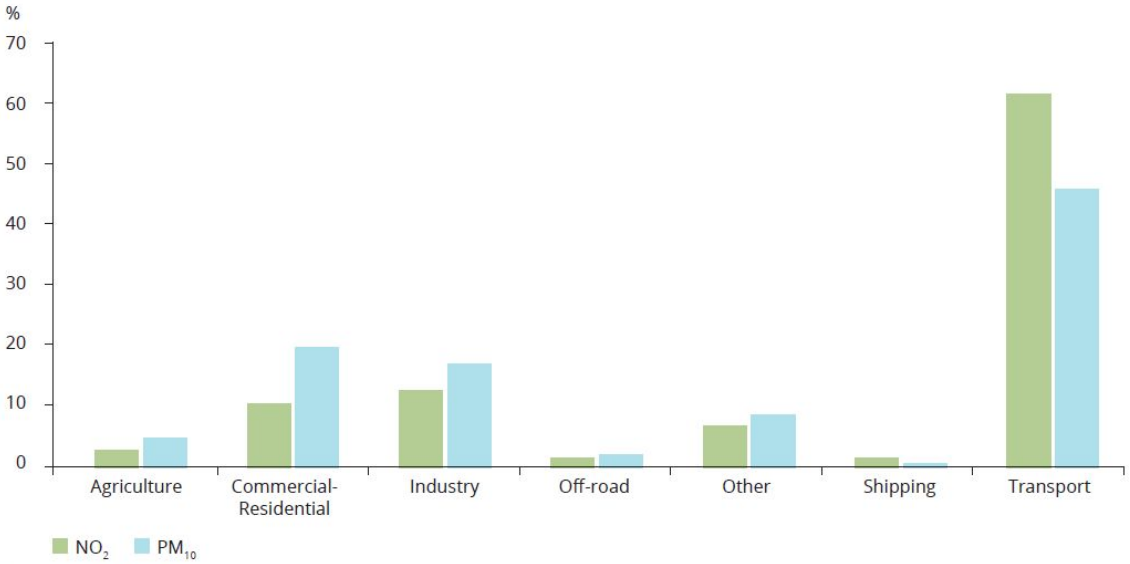
File: *US_national_emissions.xlsx*
Description: Combined data for entire US, includes distinction of how much pollution attributed to wildfires in addition to sectors

File: *US_UK_annual_emissions_summary.csv*
Description: Combined data for UK and US, years 1970-2016, various pollutants

Initial Plots / Figures / Tables:

The report *Air quality 2018 - TH-AL-18-013-EN-N.pdf* in the repository is an 88-page summary report of pollution data in the EU and partnering countries. This includes a detailed description of many topics related to pollution trends and its effects. An example chart from this report is shown below, which describes pollution levels by sector. The intent of our project will be to perform our own exploration of this data, create an original exploration w/ associated plots and figures, and extend to include comparisons with US pollution levels as well.

Figure 1.2 **Sectors addressed by the measures reported by the EU-28 Member States for PM_{10} and NO_2**



Source: EEA, 2018h.

What kind of insights you expect to glean:

- Generic trends in managing pollutant levels across EU and USA, and comparison of the two
    - How have pollution levels changed over time in the different regions?
    - Which countries (in the EU) or states (in the US) have higher, or lower, emissions?
- Correlation of pollutant levels in EU and USA relative to any introduced policies
    - How effective were the policies?
    - How long did it take for the policies to make a noticeable impact?
- Correlation of pollutant levels and GDP
    - Do increases in GDP correlate to increases in pollution levels?
    - Has society reached the point where economic growth is decoupled from emission levels?
- Correlation of pollutant levels and mortality rate and/or other health indicators
    - How does pollution impact the health of nearby populations?
    - Are certain pollutants worse for human health than others?
    - Does the economic status of a country impact pollution-dependent mortality?

Final report outline:

1. Introduction
2. Brief description of pollutants and emission data
3. Description of pollutant levels in EU

4. Contribution of different sectors in EU to pollution levels (TBC)
5. Description of pollutant levels in USA
6. Contribution of different sectors in USA to pollution levels (TBC)
7. Comparison of pollutant level between EU and USA
8. Impact of EU policies on pollutant levels
9. Impact of US policies on pollutant levels
10. GDP and Pollution correlation
11. Mortality rates and Pollution correlation
12. Conclusion