

**Data Visualization Project**

**MASTER DEGREE PROGRAM IN DATA SCIENCE AND ADVANCED ANALYTICS**

**Global Energy Statistics - DV project**

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# Introduction

Data is one of the most important assets of our modern information society. But data is not useful when it’s unstructured and not organized. Especially when it comes to situations in which the metrics that matter most need to be fast and easy understandable. At this point dashboards are the perfect analytic tool to fulfil those needs. Therefore, we learn not only to create individual graphs from data sets, but also to develop coherent visualization components through which, in the form of a dashboard, the underlying story of the data set can be presented as comprehensibly as possible. In this sense, we are pleased to present below our data visualization project, the development of our comprehensive dashboard on Global Energy Trends.

# Visualization and interaction choices

Our goal with this dashboard was to give the recipient a profound look at various energy statistics from 1990 to 2020. With the help of a wide variety of interactive features, we wanted to arouse and ensure the customer's spirit of discovery, curiosity and full attention. In order to be able to display the different dimensions of our topic and at the same time not to lose any clarity and not to provoke any information overload, we decided to divide our sub-topics into a tab layout in addition to interactive buttons. For each of the four topics *Total Energy, Electricity, Renewable Energy* and *finally a Comparison* we created an own tab with an own script. The architecture/structure of the first three topics / tabs is very similar, only the underlying data varies. In the following, we will introduce the components and the architecture of these components:

The first two buttons can be used to change the data base (in this case the column of our dataframe) by comparing the click timestamps of both buttons with a callback function and an if-statement and displaying the last clicked one.

Choropleth\_mapbox: By adding the Iso3 codes to our dataset, we were able to connect them to a geojson through the Plotly Express "Choropleth\_mapbox", allowing us to visualize the production or consumption share of each country as a heatmap. To access special features like layouts, markers or designs, we use a Mapbox API Token.

Horizontal barplot: The horizontal barplot, which displays the proportionally largest or smallest 10 countries, serves as a complementary visualization to the heat map.

Button:

Larger/Smaller - Button: This button only affects the horizontal barplot, whether the largest or the smallest 10 are displayed accordingly.

Absolute/Relative button: This button introduces a metric that normalizes the underlying data by dividing the values by the population of the respective country and then multiplying by 10000 for better interpretability. This normalization affects both the ChoroplethMap and the horizontal barplot.

Animation: @Peter can you write that part, briefly explain what it does and how it is connected to our components

## General Overview

## Title 2.1

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Figure 2.1 – Illustrative figure

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Table 2.1 – Illustrative table

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### Title 2.1.1

Example of unnumbered list:

* Item 1
* Item 2
* Item 3

#### Title 2.1.1.1

Example of numbered list:

1. Item 1
2. Item 2
3. Item 3

# References

Author, A. A., Author, B. B., & Author, C. C. (Year). Title of article. *Title of Periodical, volume number* (issue number), pages.

# Appendix (Doesn’t count for the 10page limit)