European Greenhouse Gas Emission

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Github link: *three links use the same content*

https://lzhang6.github.io/DataVisFinal/

https://valar3726.github.io/DataVisFinal/

https://zhelyu.github.io/DataVisFinal/

Background:

A greenhouse gas is any gaseous compound in the atmosphere that is capable of absorbing infrared radiation, thereby trapping and holding heat in the atmosphere. By increasing the heat in the atmosphere, greenhouse gases are responsible for the greenhouse effect, which ultimately leads to global warming.

Human activities since the beginning of the Industrial Revolution (taken as the year 1750) have produced a 40% increase in the atmospheric concentration of carbon dioxide, from 280 ppm in 1750 to 400 ppm in 2015.This increase has occurred despite the uptake of a large portion of the emissions by various natural "sinks" involved in the carbon cycle. Anthropogenic carbon dioxide (CO_2) emissions (i.e., emissions produced by human activities) come from combustion of fossil fuels, principally coal, oil, and natural gas, along with deforestation, soil erosion and animal agriculture.

It has been estimated that if greenhouse gas emissions continue at the present rate, Earth's surface temperature could exceed historical values as early as 2047, with potentially harmful effects on ecosystems, biodiversity and the livelihoods of people worldwide.

The EU has set itself objectives for reducing its greenhouse gas emissions progressively up to 2050. For 2020, the EU has committed to cutting its emissions to 20 % below 1990 levels. This commitment is one of the headline targets of the Europe 2020 growth strategy, known as the Climate and Energy package.

Motivation

In this project, the greenhouse gas emission from 1990 to now in whole European countries is displayed interactively. Data can be display in different methods to show different aspect of whole dataset. User can search for all kinds of information conveniently, like the tendency of emission change, the ranking in a concrete year.

Project Objectives.

The visualization system is designed to demonstrate the change of European CO2 emission as well as other greenhouse gases. In addition, we will compare the changes in different countries and provide the ranks. In sum, the visualization system is created to answer a question that how the change of greenhouse gases of EU. Specifically, the visualization system will be able to provide following benefits:

1. Show details on rating.
2. Human - computer interaction.
3. Provide more general and understandable image.
4. Compare the contribution of EU countries to climate change easily.
5. Forecasting trends of greenhouse emission in the future.

Data

EU CO2 emissions data from 1990 to 2012.
http://ec.europa.eu/eurostat/web/products-datasets/-/tsdgp410

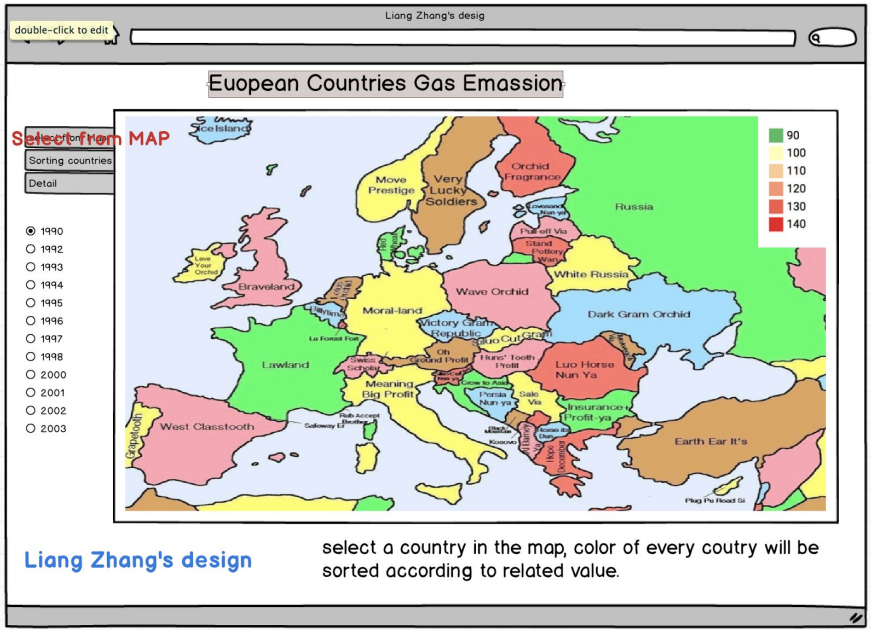
Data Processing.

We will select the different years and countries about the CO2 emissions data. And we will sort these data by country and year.

Visualization Design.

1. Liangzhang's design:

The information is convenient for users to find in two methods, one is selected from map while the other is ranked countries according to average gas emission. The value displayed is the summation of all years' value or average by default. In contrast. It can also show the concrete year.Once the country is fixed, the detail of that country display.


Liang Zhang's desig
double-click to edit
Euopean Countries Gas Emassion
Select from MAP
Sorting countries
Detail
1990
1992
1993
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1998
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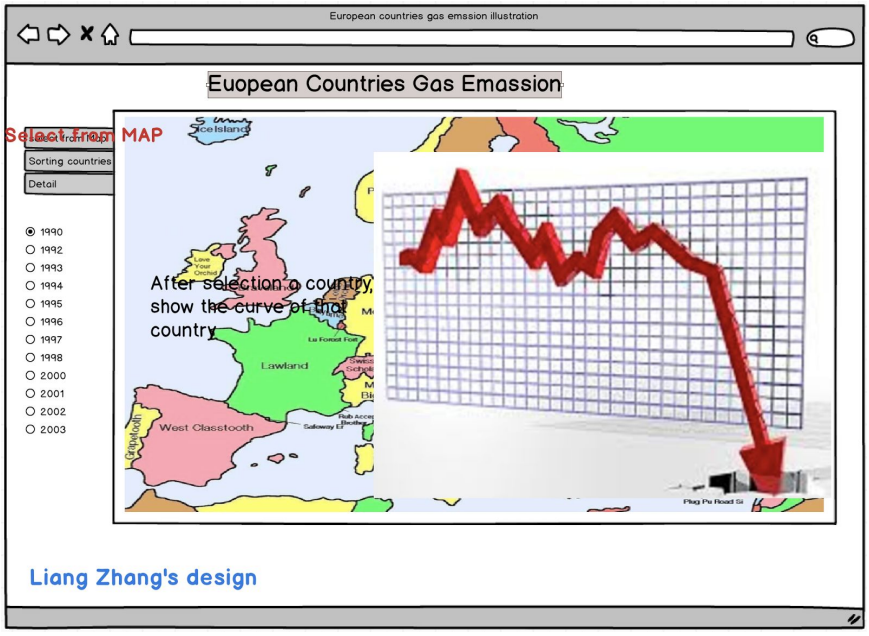
90
100
110
120
130
140
Move Prestige
Very Lucky Soldiers
Orchid Fragrance
Russia
Braveland
Wave Orchid
White Russia
Moral-land
Victory Grain Republic
Dark Gram Orchid
Lawland
Meaning Big Profit
Luo Horse Nun Ya
Insurance Profit-ya
West Classtooth
Earth Ear It's
Liang Zhang's design
select a country in the map, color of every coutry will be sorted according to related value.


European countries gas emssion illustration
Euopean Countries Gas Emassion
Select from MAP
Sorting countries
Detail
1990
1992
1993
1994
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1996
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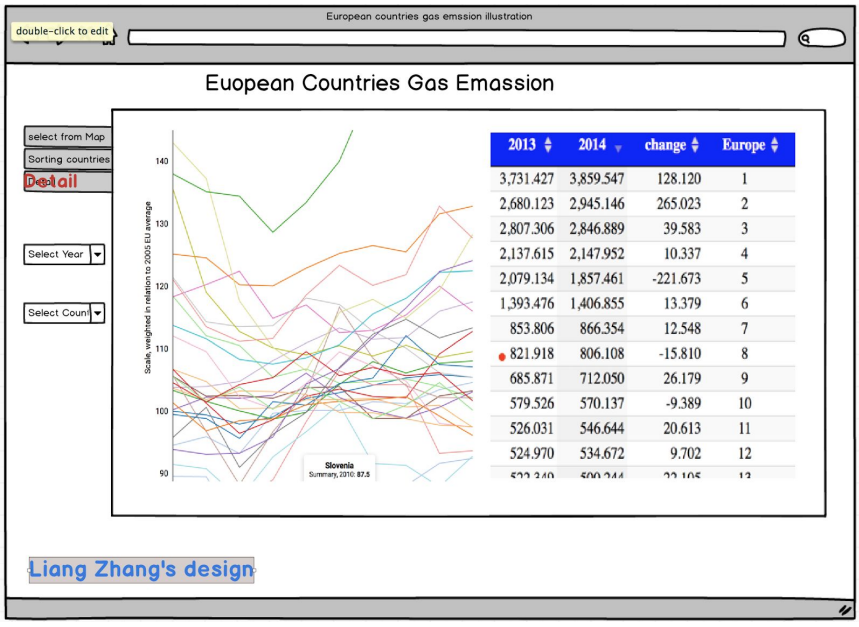
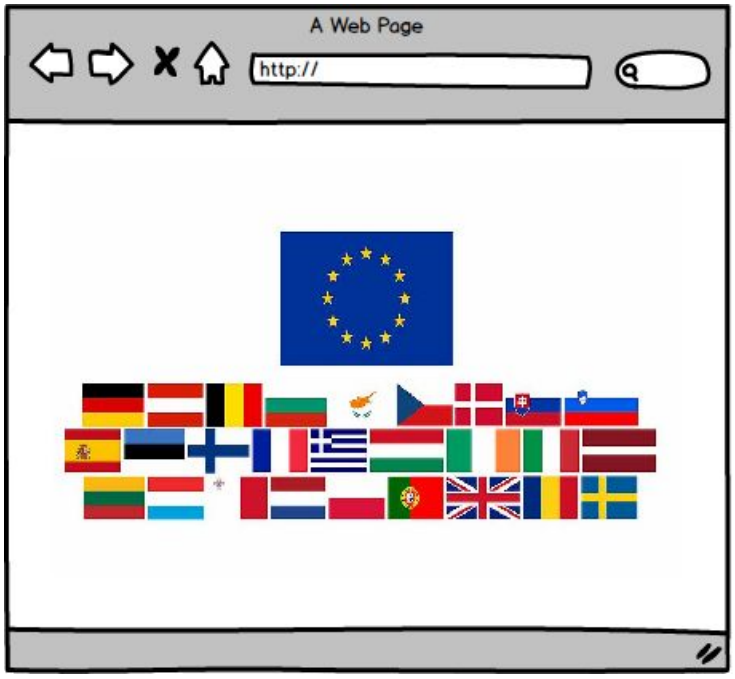
2000
2001
2002
2003
After selection a country, show the curve of that country
Lawland
West Classtooth
Liang Zhang's design



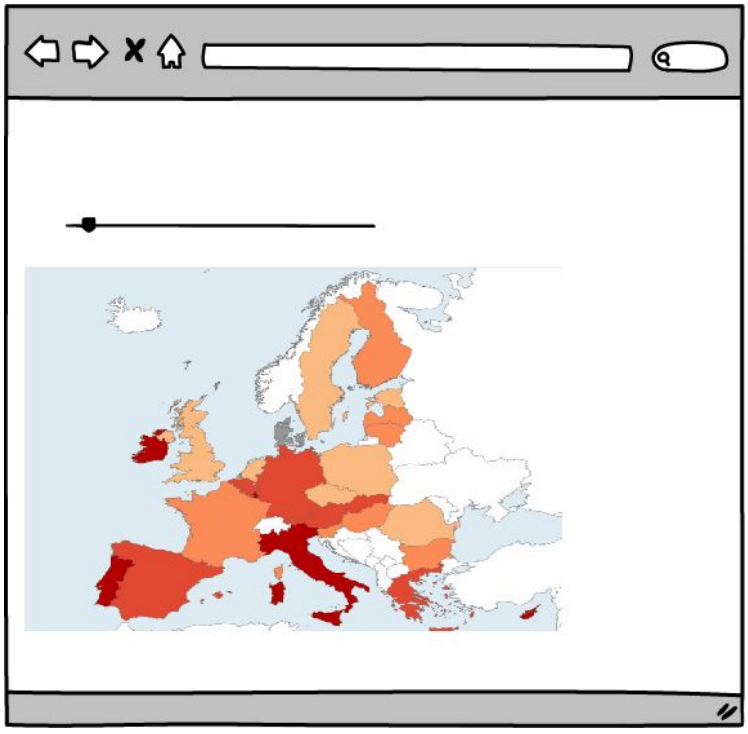
2. Zhe Lyu's Design:

First, the user will see the EU map, he can drag the timeline to get the results of different years. When a user clicks on a country, he can see the country's data changes from a line chart. The line of the selected country will be highlight. Users can also view the ranking of CO2 emissions. The ranking images are the flags for each country, the user can view the rankings for different years, or click the flag to view country specific

data. At the same time, users can also see pie charts and histograms showing the proportions of emissions from different countries.

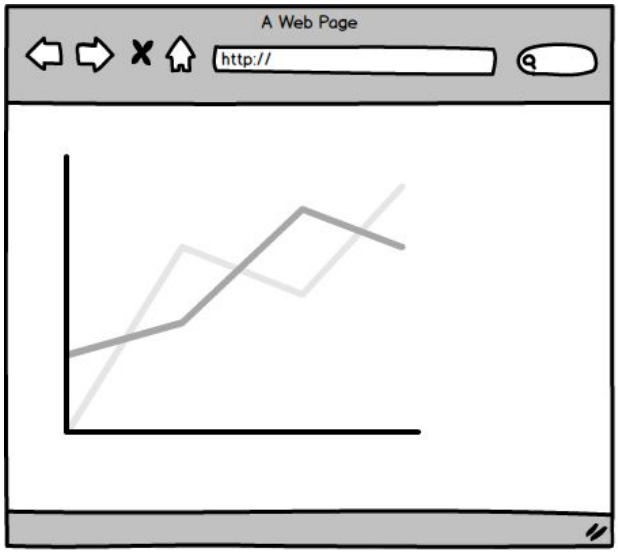


Item Name : Flag
Target: User could click flag to get data of different countrieds

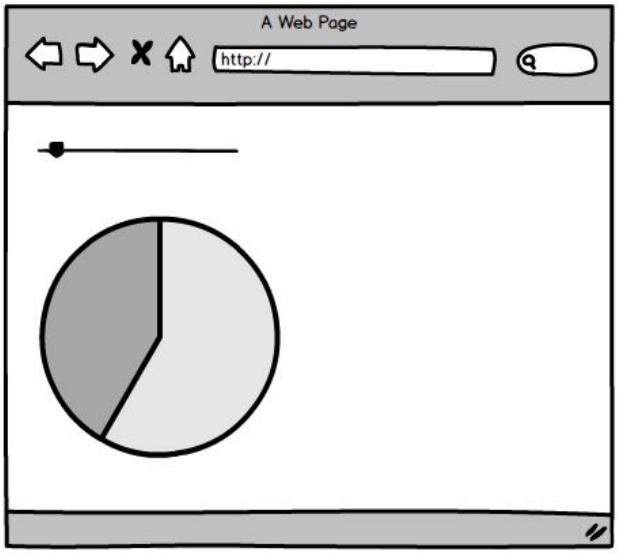


Zhe Lyu Designing

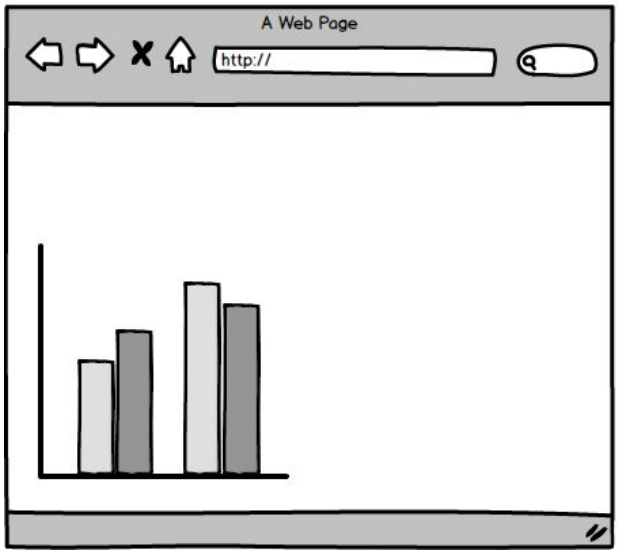
Item Name : Map
Target: Maoof EU with different rates of CO2 emission, changing with time line



Item Name: Line chart:
Target: Showing changes in CO 2 emissions over time in each EU country. Mouse up to highlight



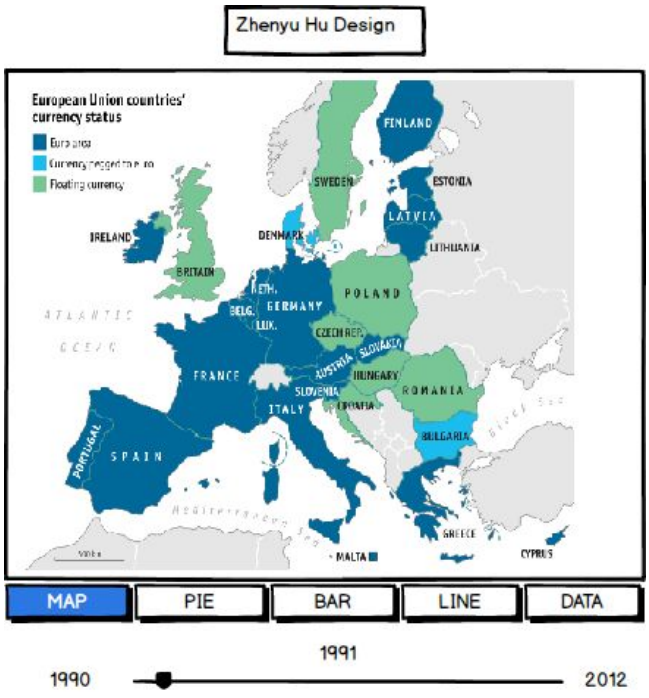
Item Name: Pie chart:
Target: Displays the proportion of CO2 emissions of EU
Changing by the time line.

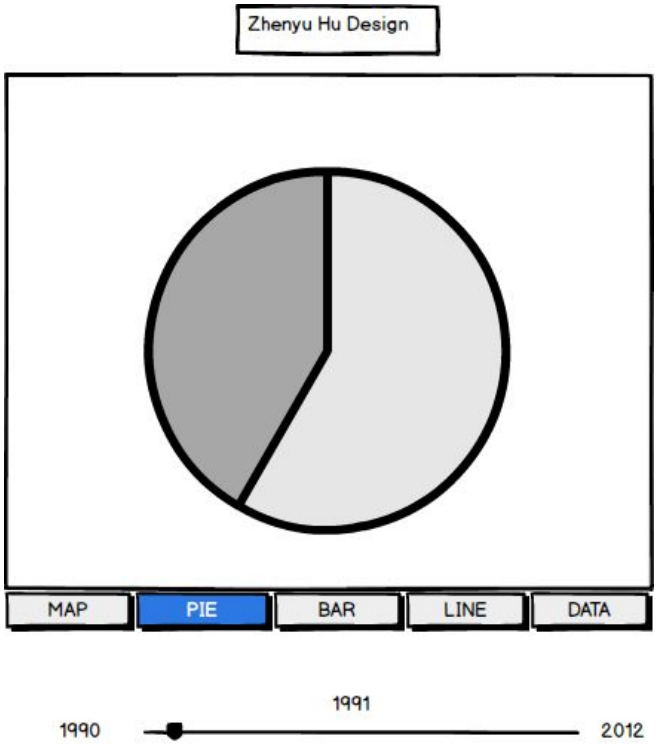


Item Name: Pie chart:
Target: Displays the proportion of CO2 emissions of one country when click this country from the map.
Changing by the time line.

3. Zhenyu Hu's Design:

The user will see the EU map different year's data by draging the timeline. When user click the country he will see the line chart data about this country. Users can also view the ranking of CO2 emissions. The ranking images are the flags for each country. As the same time, the user can see pie chart, line chart and bar chart by click the different buttons at the bottom.




Zhenyu Hu Design
MAP
PIE
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LINE
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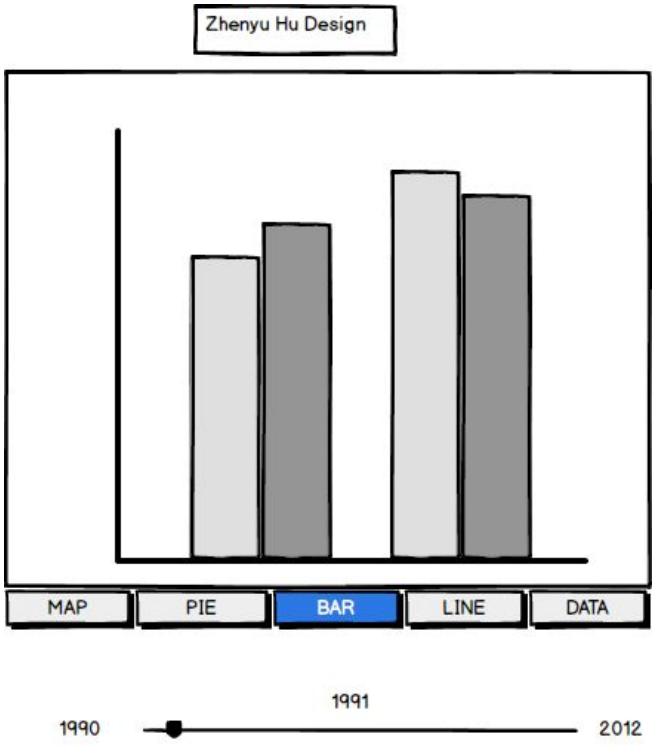
1991
1990
2012


Zhenyu Hu Design
MAP
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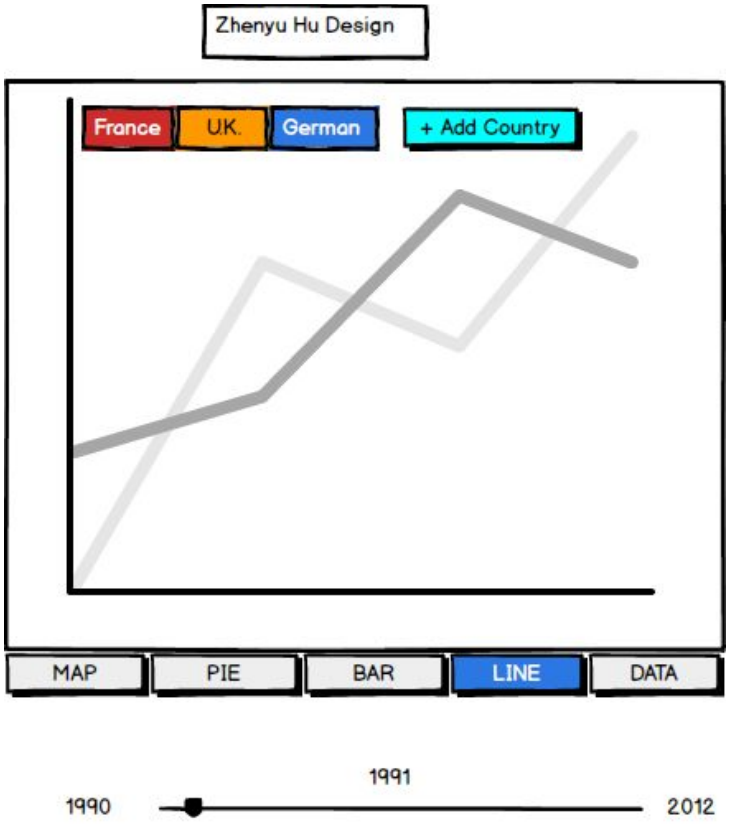
LINE
DATA
1991
1990
2012



Must-Have Features

1. Map view: it is default method to show the country. Move the mouse hover over the country, it will simple information about that country. Different country is displayed in different color which show the ordered category of gas emission level.
2. Ranked countries, show different countries orderly. The logo of every country is represented by the flag of country. It can display in ascending order or descending order. It also can be filtered by year.
3. Year feature, all above two features can display the information in concrete year. The year here is only considered from 1990 to current. Actually, the website only provide data in these years. Definitely, it can show data change in every country or whole European region for every year.
4. Detailed: once the filter condition like country, year is selected, the detail of gas emission will display in the format of curve diagram. The color of curve represent the category of gas emission level.

Optional Features

1. Pie-chart: Show the proportion of emissions.

2. Hilstrom: Show the data of different countries every year.
3. Click: Aggregate data for visualization with one click
4. Others: Filter data with mouse actions.

Project Schedule

Time	Task	Delivery file
6 Feb	Requirement collection	
11 Feb	analysis	
15 Feb	design	Project proposal
18 Feb	- mockup	
23 Feb	Coding Unit Test	Prototype & Feedback
28 Feb		
2 Mar	System Test	Final submission

Reference :

- http://ec.europa.eu/eurostat/statistics-explained/index.php/Greenhouse_gas_emission_statistics
- https://en.wikipedia.org/wiki/Greenhouse_gas