

## **1-INTRO:**

Hello, Everyone. My name is Dongyi Zhao, my advisor is Dr Guler. I am so glad to presenting my final capstone presentation, and my topic is “V-Carbon”, Designning a world CO2 emission obseration and learning Mobile Application.

## **2-3 Agenda:**

There will be mainly of four part of my presentation, the background, Objective, methodology, and results. I will start with the background.

## **4-Global situation:**

The current global situation will be the simple but most important reason of why I am selecting CO2 emission as my topic, because It is one of the most significant situation that the world is facing to.

--First of all ,the co2 emissions are seriously effecting the global natural balacing and healthy, including the effects on greenhouse effect, ecosystem crisis, sea level rising, and natural desasater, and so on. Especially In the last 20 years, a series of global issues such as global warming, glacier melting, sea level rising, all of these hazy weather effect shows that the greenhouse effect is seriously affecting the future of human beings.

## **5.**

Based on the data of “our world in Data” website, the human activities contains a large portion of total Co2 Emisisions. The global carbon emissions generated by major electricity and heat production activities reached 13.98 billion tons, accounting for 41.7% of global carbon emissions in that year. So it is necessary to deliver the awareness of co2 emission to the world.

## **6:**

Based on the Net Zero Tracker data, Out of the 135 countries pledging carbon neutrality, only 66 have put a target year on their policies, laws or propositions.

Therefore, the reduction of greenhouse gas emissions is a key part of the net zero concept to combating [climate change](#).

## **7-联合国:**

And Finally, There are more and more worldly actions and plans are making the co2 emission monitoring as the key goal. For example, United Nations take the climate action as the global sustainable development goals as 13 position, it deliver the central ideas of taking urgent action to combat climate change and its impacts.

The 13 goals says, the climate change is having profound consequences on our planet’s diversity of life and people’s lives. Sea levels are rising and oceans are warming. Longer, more

intense droughts threaten freshwater supplies and crops, endangering efforts to feed a growing world population. Without action, the changing climate will seriously compromise food production in countries and regions that are already highly food insecure.

## **8-Objectives**

Based on the Context, the project aims to elaborate on the design of a CO2 emission observation and learning application, including the application prototyping procedures, the purpose of designing, the designing of application main modules and layout, and the expected deliverables. That will enable to :

- a. Query, visualize, and report the effective carbon emissions status of each country and region.
- b. Identify, compare and analyze the performance of carbon emissions for each area.
- c. Allow users to receive essential messages related to co2 emissions and take action.

SO basically, With the use of this application, it will assist users in obtaining a systematic knowledge of carbon emission and learning about the status of carbon in different countries and categories around the world.

## **9-Data**

The Data resource make up a large part in this project, since the data analyzing and visualization are major deliverable in the final. Basically, the Application will take the open source data from website such as “our world in Data”, “World Bank” “Carbon Monitor” and Climate Watch.

## **10-Our world in data**

In the main features, most of the data comes from the Our World in Data website. This website was created by Letscher of Oxford University in the UK who invested time in studying decades of data on human living standards in various countries, which shows how living conditions around the world are changing in a subtle way and what the implications are for the future. Through the Our World in Data website, the application uses the carbon emissions data from different regions, years, and industries around the world and formed into maps, charts, or tables for users to browse or download.

## **13Prototyping**

The prototype of “V-Carbon” is designed with the software Modao. It is a type of online cooperative tool that integrates prototyping, designing, processing and mind mapping for creation and management. With Modao, design teams can start from mind mapping by recording ideas to prototyping, designing and flow charts of recording the process. All the files can be managed with Modao and be mutually imported and exported as well. Hence, the software can also be used in multiple scenarios.

## 14-15

Now I am introducing the main module and platform of the application.

The “V-Carbon” CO<sub>2</sub> emission observation&learning APP primarily focuses on enabling users to systematically and directly to observe and learn about carbon emission data. It is both an interactive design and a conceptual design of early warning for the APP. To be more specific, in the concept of “low-carbon city”, the APP visualizes the data and applies it to mobile clients.

“V-Carbon” has two major functions: knowledge graph and data observation. Similar to knowledge tree, knowledge graph concludes, summarizes and conveys most of the current information and news about “low carbon city”. With the knowledge graph, users can search or save to learn about related information. Data observation is the core function of “V-Carbon”. It allows users to select specific the year, region and type of carbon emission, so that they visualize the maps, conduct chart analyses, browse data forms and search the sources of results. Additionally, “V-Carbon” has some basic APP functions, such as pages of login, registration, personal and save, etc.

### **Welcom, Login Page, and Registration**

The starting page of “V-Carbon” helps users gain a subtle sense of activation. With Earth as the background picture of the APP, it shows the importance of low carbon city to Earth and sustainable development. In accordance with the common principles of operation and information spread, the APP shows the core functions with one slogan. Users can enter the next page by sliding left with thumbs. Besides, users can choose to log in directly or register on the registration page. Personal passwords can be reset in the registration center afterwards.

### **11-Data Observation-Define the categories**

Take the carbon emission data of South Africa in 2021 for example. Through data visualization, it is shown on the operation interface of touch screens. Besides, time and space graphs are connected to display the information of temporal and spacial distribution and changes in information data in South Africa.

“V-Carbon” is designed with fixed navigation bars, which are extended to several commonly used buttons: back to previous page, back to homepage, text hints, personal center, search and editing. Firstly, in the fixed menu bars on the top section, users choose temporal intervals, carbon emission types (total carbon emission, carbon emission from transport, land use, building and construction), and region positioning.

### **12-Data Observation-Define the categories**

### **13-Data Observation-Data Analysis**

After choosing the three conditions, data is transmitted to the front page through API port or server of the website. In the meantime, users can choose the functions they want through the switch bar in the bottom. They can realize the visualization of global carbon emission data with the “map” function.

Through the map, users could observe the world carbon emissions data distribution by playing the map, as well as change the categories from the top of the page anytime. In the navigation menu, users also find Country Profiles, so they can see how different country is doing in reducing emissions, and the CO2 Data Explorer where people can browse all of these metrics in one place.

Line charts, pie charts and bar charts are included to reveal trends of data variations. The “chart” function enables users to browse and download detailed data. They also learn about the source and relevant knowledge of data through the “source” function. After users position a certain region and year, they can save this option for subsequent browsing.

#### **14-Knowledge Module**

The knowledge module is related to primary information source websites of “low carbon city”, which stated above such as Climate Watch website, World Bank website, or Carbon Monitor website. The knowledge module selects the main content and most relevant information about carbon emissions, and shares it with users.

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Based on the concepts of “low carbon city”, the design of mobile phone APP interfaces, open data and early warning assistance, this paper aims to deal with the disorderly information of carbon emission and systematically incorporates data, data analysis, charts and related knowledge into one APP. Low-carbon living is not only a way of life but also a sense of environmental protection responsibility for sustainable development. Low-carbon lifestyle requires people to have new viewpoints of life and consumption, reduce carbon emission and achieve harmonious development. Furthermore, it is an important approach to regulating economic society and environmental protection. In the context of low carbon economy, the negative impact on people’s life due to unreasonable use of energy can be gradually eliminated, so that they will be able to enjoy the new “low-carbon life” on the basis of economical energy and green energy.