



Carbon Insight User Manual

September, 2021

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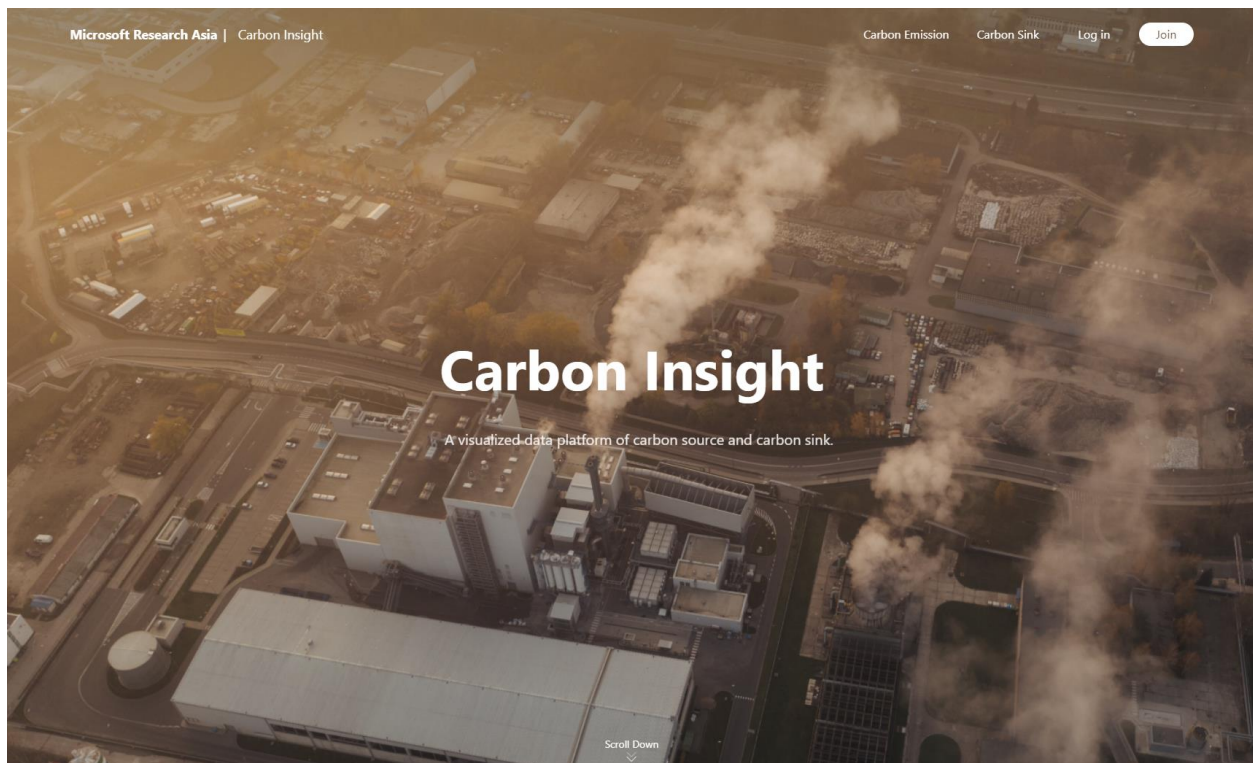
Overview

What is Carbon Insight?

Carbon Insight is a visualized data platform of global carbon data, including carbon emissions, sinks, and their connections to other socioeconomic factors. Carbon Insight lets you formulate and optimize carbon neutralization pathway to simulate and forecast the outcome. Through data and technology, Carbon Insight aims to address the grand challenges of global warming with users around the globe.

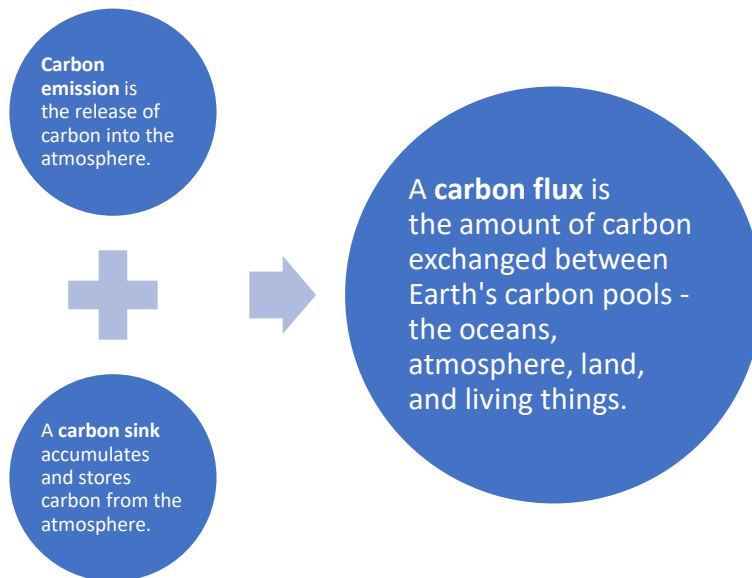
Log-in

After you have created an account, go to the home page at [this address](#). Click “Log in” on the up right corner and follow the instructions. You will be directed back to the home back and you can now freely browse the graphs, maps, and data on the website.



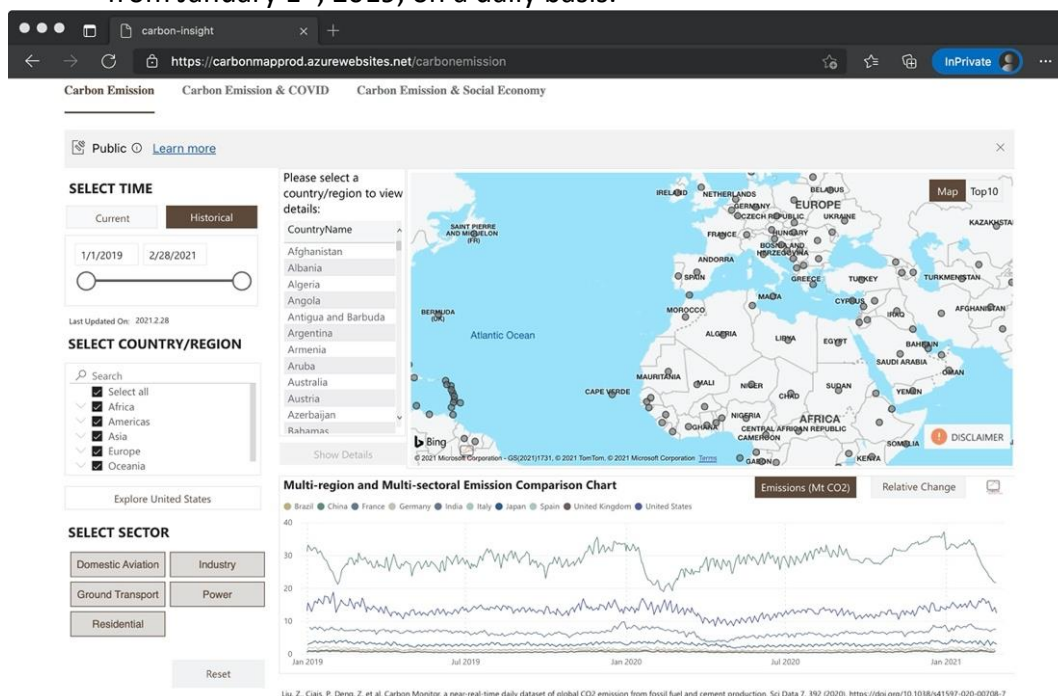
What is Carbon Neutrality?

Carbon neutrality refers to achieving net-zero carbon dioxide emissions. This can be done by removal of carbon in the atmosphere (often through carbon offsetting) and eliminating the source of carbon emissions from society (the transition to the "post-carbon economy"). In short, carbon neutrality is the balance between carbon emission and carbon sink.



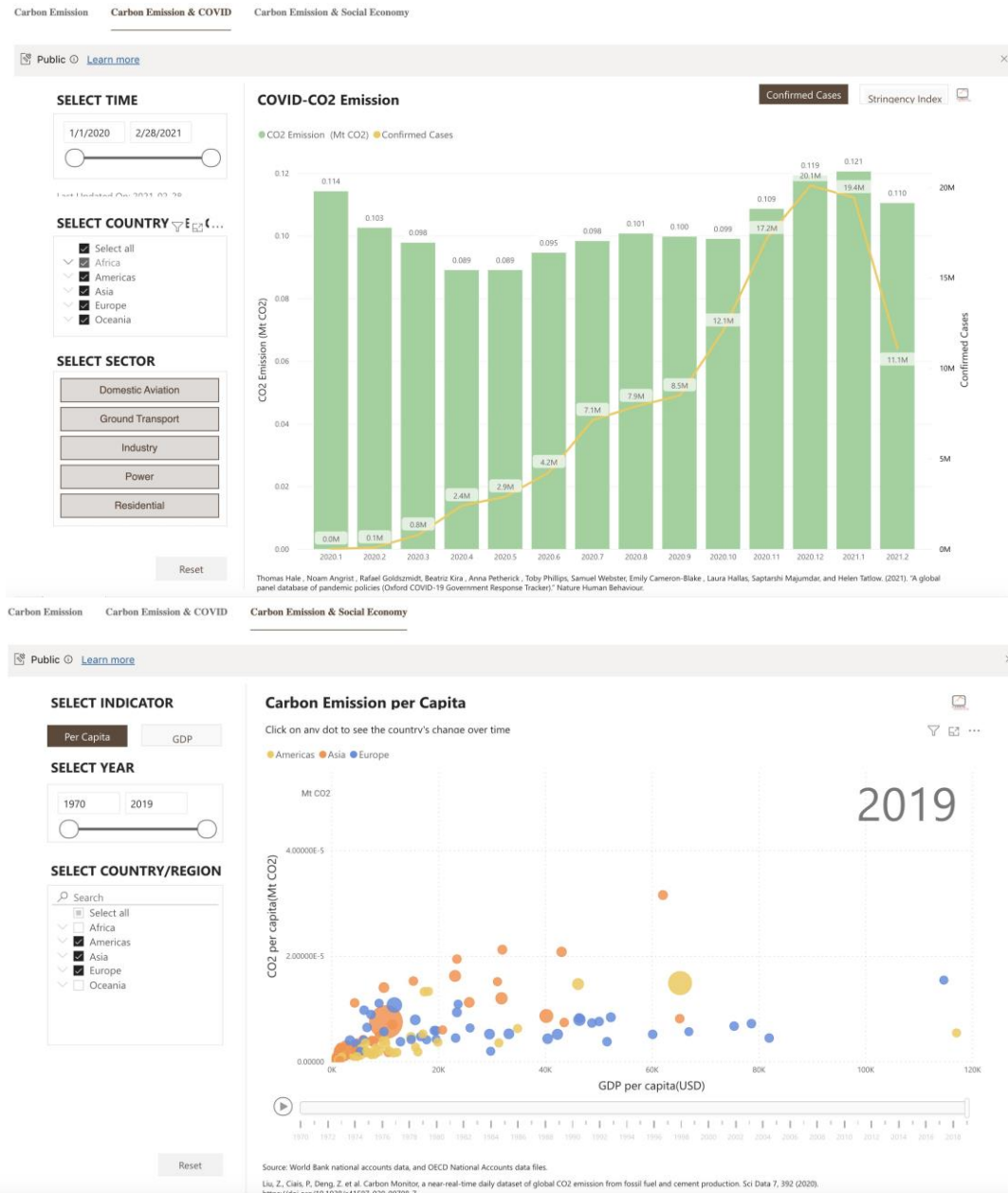
Carbon Insight addresses two components of global carbon data

- **Carbon Emission:** Carbon Insight tracks anthropogenic CO₂ emissions with a near-global coverage.
 - The sources of emissions are divided into five categories: Domestic Aviation, Industry, Ground Transport, Power, and Residential Buildings.
 - Carbon emissions of 206 countries around the world are displayed in the form of a world map, with a near-live current view and a historical view of emissions from January 1st, 2019, on a daily basis.

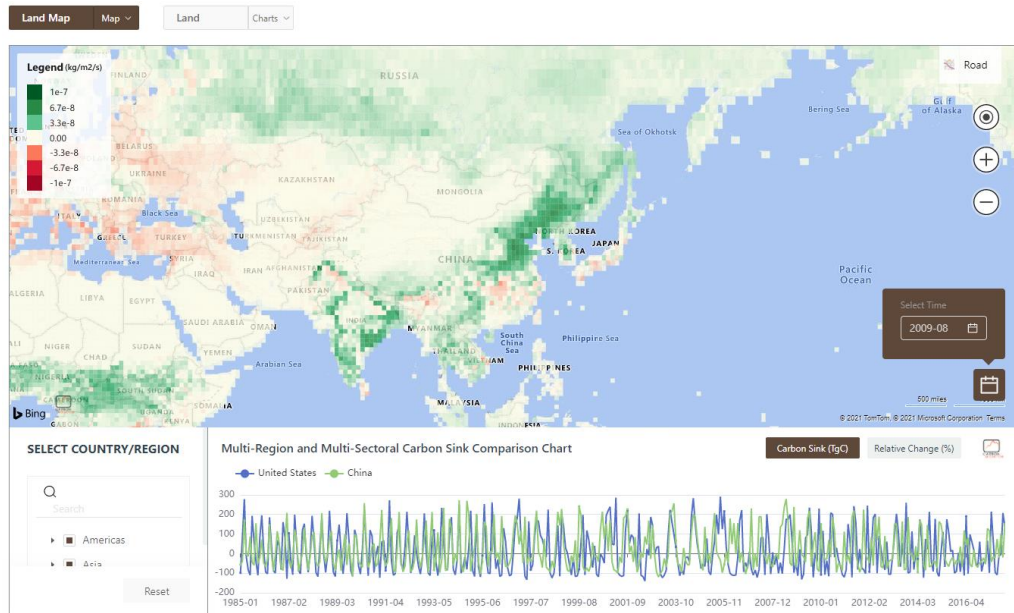


- Carbon Insight links carbon emissions with two socioeconomic factors: COVID-19 cases and per capita GDP. The change in carbon emissions of different countries

and COVID cases since January 2020 are displayed. The change in carbon emissions of different countries and per capita GDP from 1970 to 2019 are available.

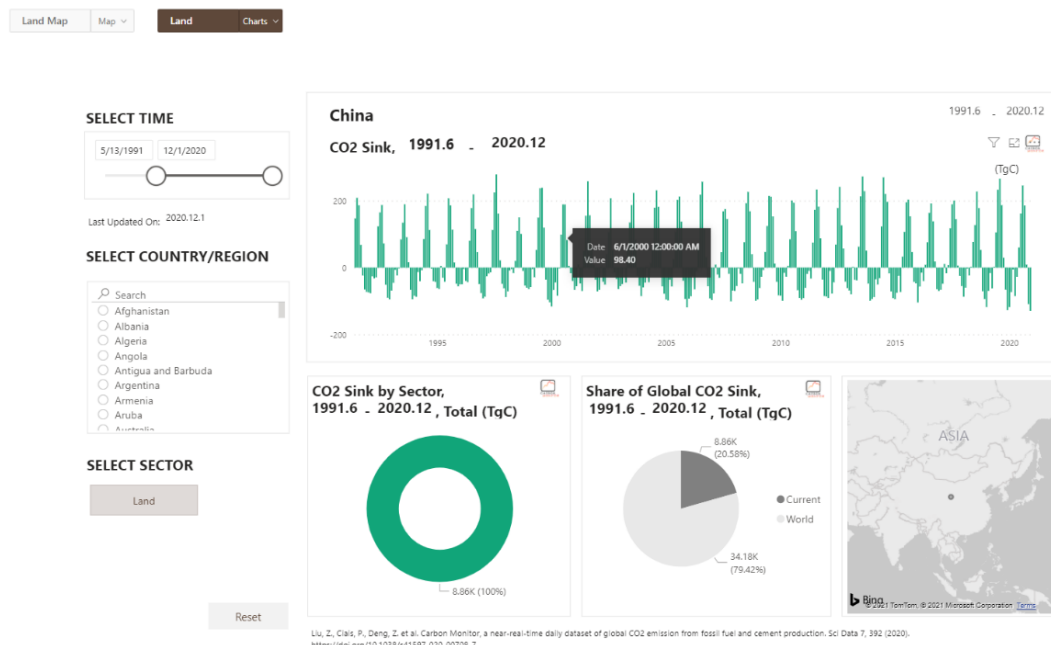


- **Carbon Sink:** Carbon Insight tracks carbon dioxide stored by the ocean and land separately.
 - The quantity of carbon deposited into land and partial pressure of carbon dioxide in the ocean are displayed on maps, with monthly data available from January 1979 to December 2020 for land and from January 1985 to January 2017 for ocean.



Liu, Z., Ciais, P., Deng, Z. et al. Carbon Monitor, a near-real-time daily dataset of global CO₂ emission from fossil fuel and cement production. *Sci Data* 7, 392 (2020). <https://doi.org/10.1038/s41597-020-00708-7>

- Details of change in carbon sink overtime for different countries and oceans are displayed.



What you can do with Carbon Insight

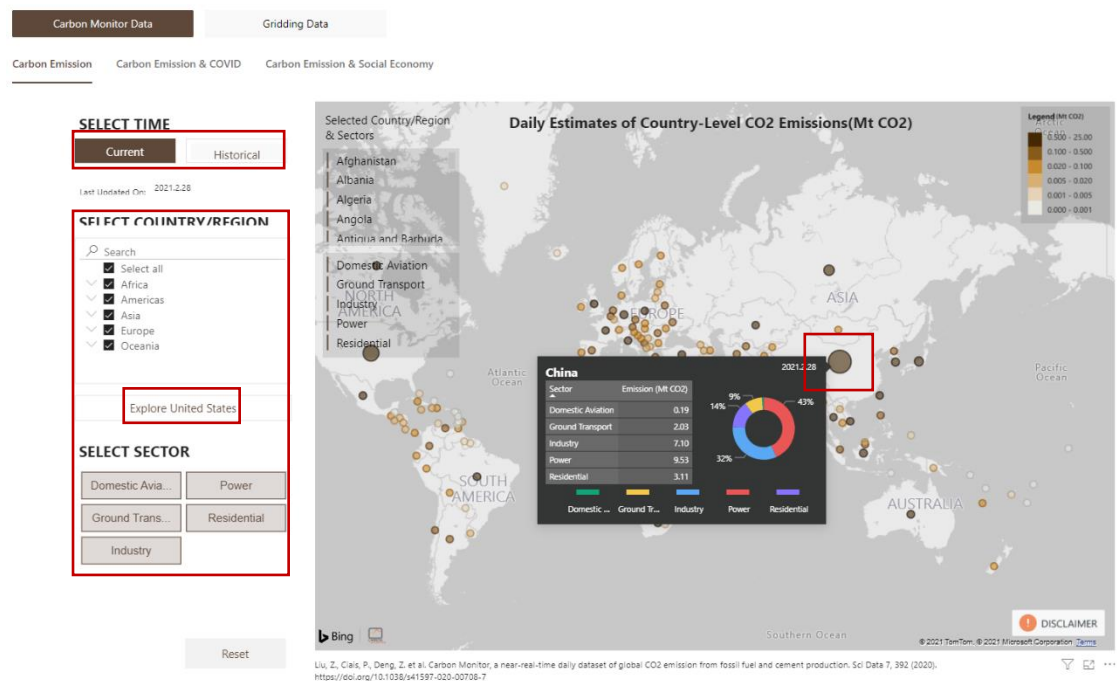
1. Carbon Emission

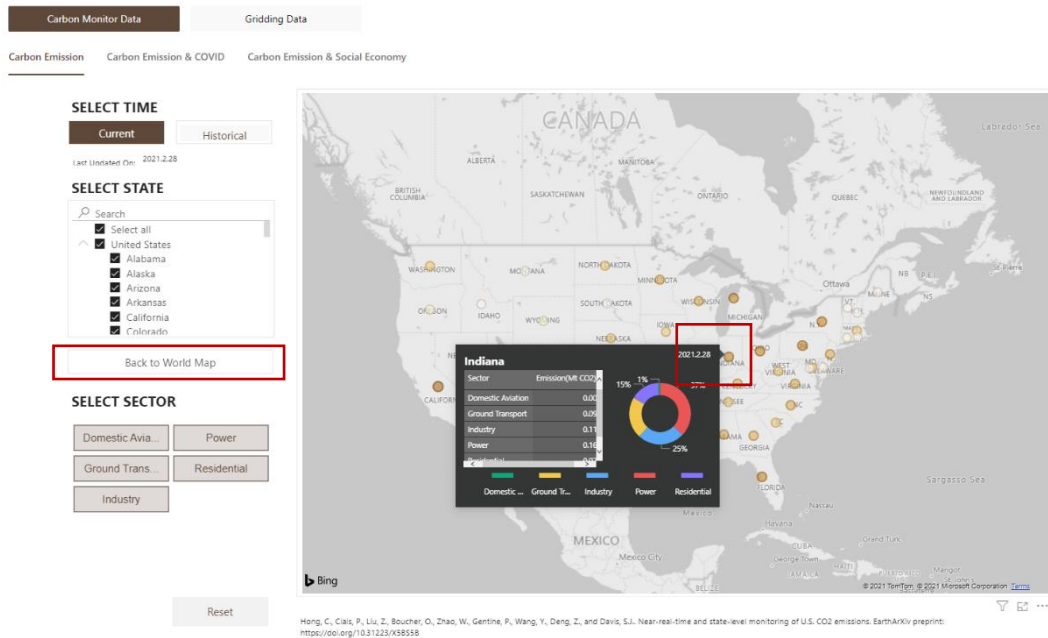
1.1. Carbon Emission

The Carbon Emission section lets you view human-caused carbon emission from different countries, sources, and timeframes. You can browse the up-to-date near-live global carbon emission distribution on maps and charts.

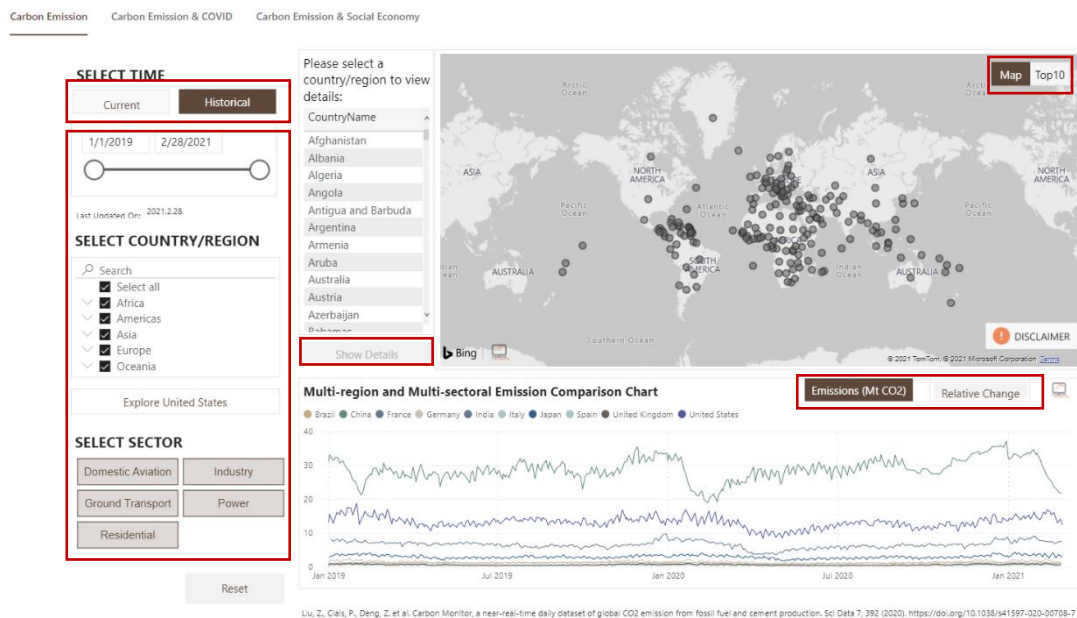
To view carbon emissions from different countries and time:

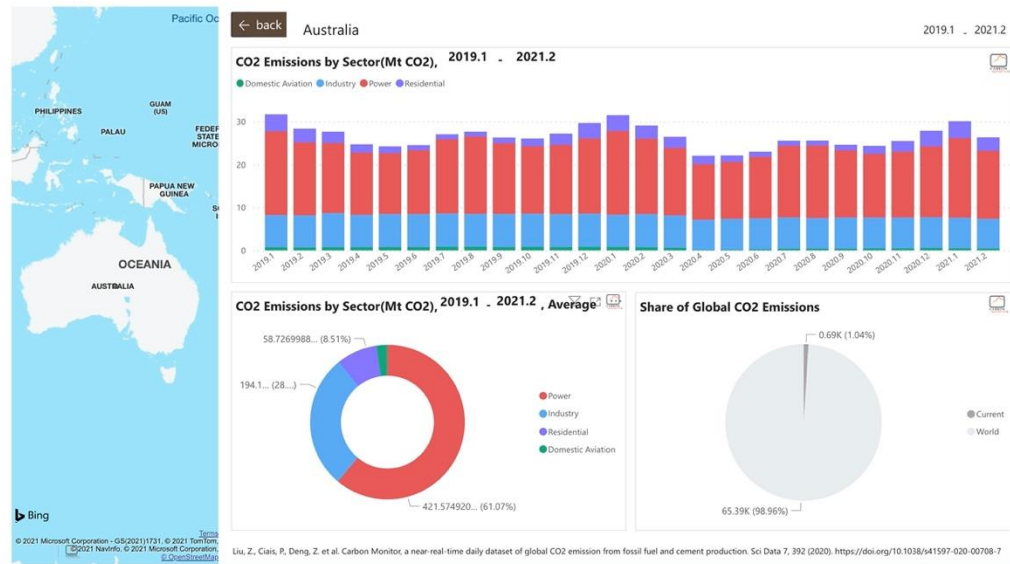
- With **Current** and **Historical** tabs, you can browse the browse near-live carbon emissions of 206 countries and their historical emissions since January 2019. For the United States, state-level emissions are also available.
- Use time, location, and sector filters, select conditions that match your needs.
- Under the **Current** tab, hover over the circle of each county to view details of its emission data, including quantity and percentage breakdown by sectors.



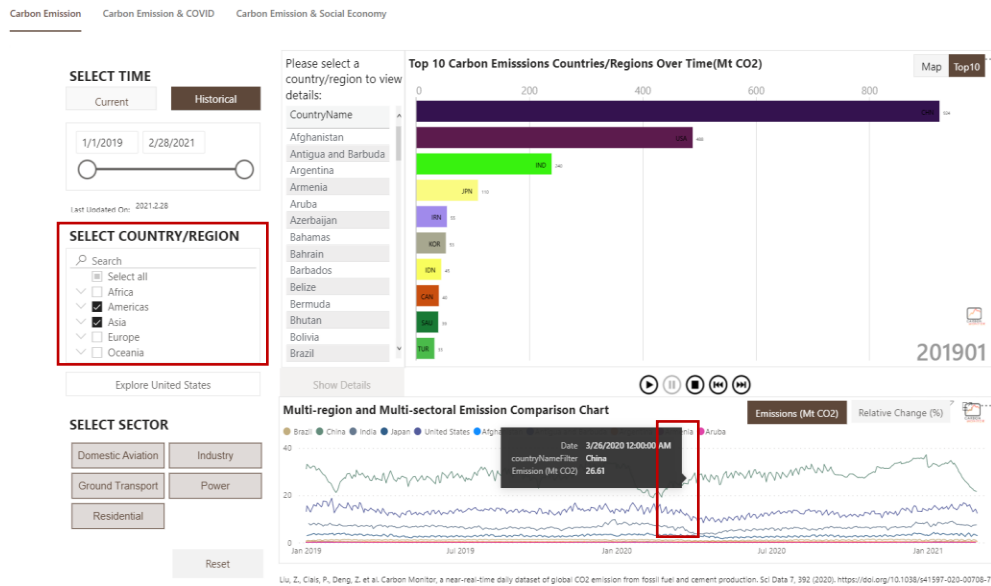


- Under the **Historical** tab, select "**Emission**" or "**Relative Change**" in the line graph to view the emission value and rate of change for selected counties during the selected time.
- Select a country, click "Show Details" to view the details of its carbon emissions since January 1919.





- Click the **"Top 10"** button to view Top 10 countries with the highest emissions and the change in the list over time. Select continents to view Top 10 counties in different regions respectively.



1.2. Carbon Emission & COVID

The change in carbon emissions of different countries and confirmed COVID cases since January 2020 are displayed.

This section lets you observe how carbon emissions in different countries change with the trends of the COVID-19 pandemic. The severity of the epidemic is shown in two aspects: the number of new diagnoses and the stringency and policy indices of governments.

In this page, you can:

- View the confirmed COVID cases/Stringency Index and carbon emissions in different regions throughout time.
- Use the time, location, and sector filters, select conditions that match your needs.



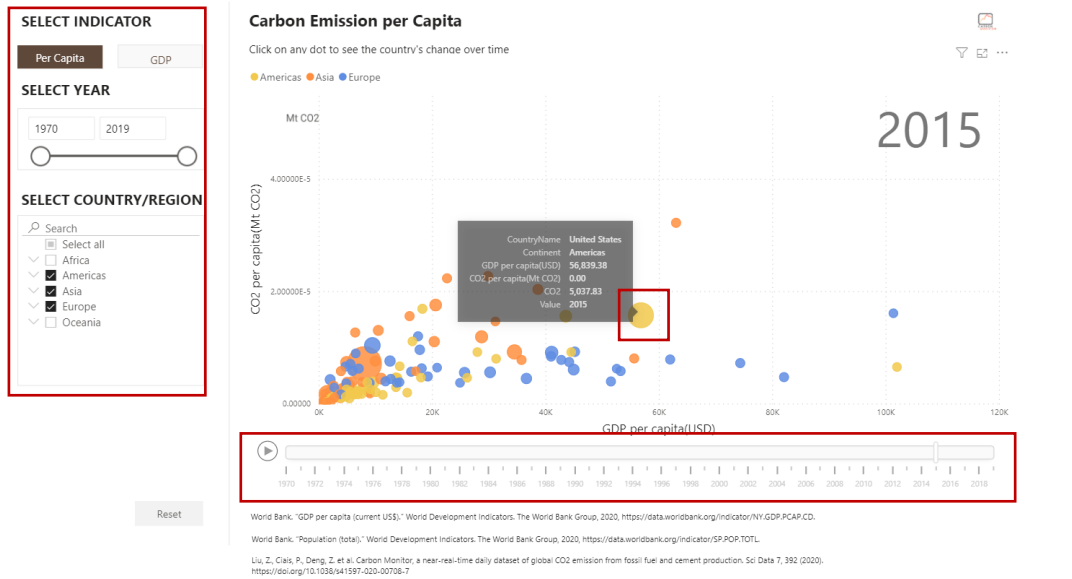
1.3. Carbon Emission & Social Economy

The change in carbon emissions of different countries and per capita GDP from 1970 to 2019 are displayed.

This section lets you compare the carbon intensity and the per capita emissions of different countries. You can observe how per capita emissions change over time in different countries and observe which countries have reduced their carbon intensity over time.


Under the "Per Capita" tab, you can:

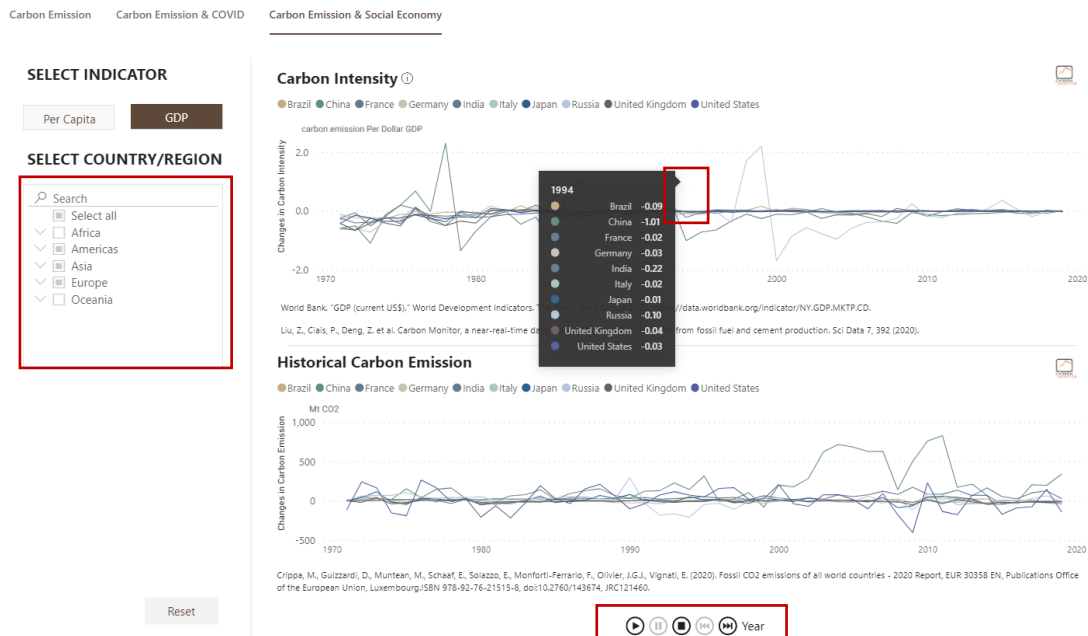
- View per capita GDP and per capita carbon emissions in different countries throughout time. Click the ▶ button to view animations of change in data of selected countries during the selected timeframe. Click any position on the timeline bar to view per capita GDP and per capita emissions of selected countries in that year
- Use time and location filters, select conditions that match your needs.
- Hover over the circle representing each country to view details of its per capita GDP and emissions data.



Under the "GDP" tab, you can:

View how Carbon Intensity of different countries changed throughout time.

- Select one or multiple countries to view respective carbon intensity and emission data. The numbers are shown as the difference from last year's data.
- Click the  button to view animations of change in carbon intensity and emissions of selected countries from 1979 to 2019.
- Hover over lines in each graph to view details of emission or intensity data of selected countries.



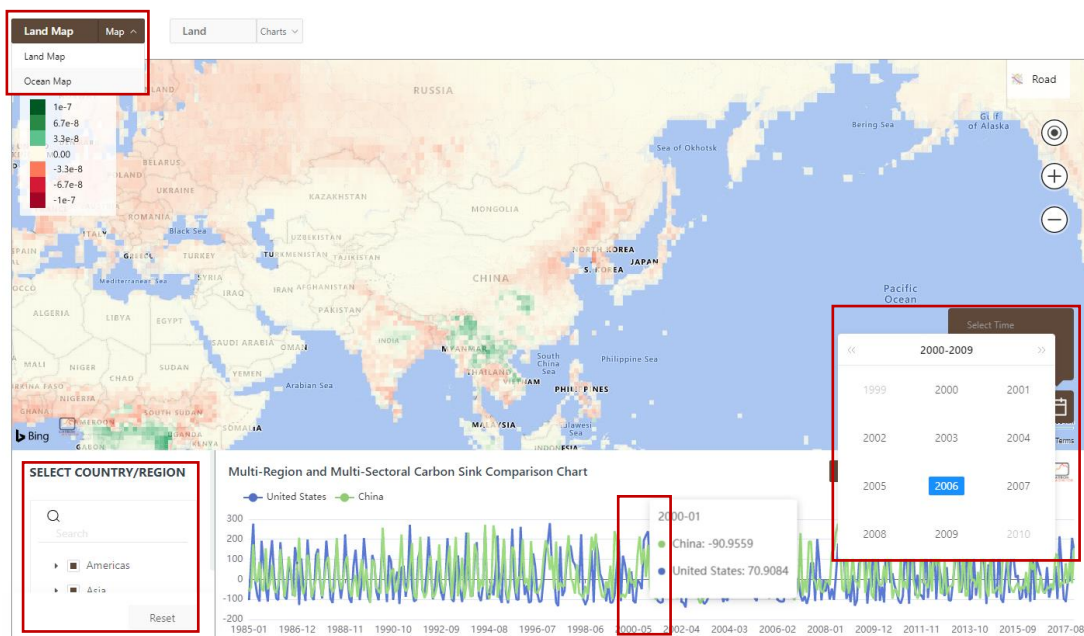
2. Carbon Sink

The carbon sink section lets you browse the global land and ocean carbon sinks on maps and understand how different types of carbon sinks in various countries change over time on a monthly basis.

2.1. Sink Maps

Land and ocean sinks are respectively shown on world-maps. To work with the data:

- Switch maps with the drop-down menu in the top left corner. Click the calendar on the lower right corner of the map to view the monthly change in world-wide carbon sink.
- In the Land Map view, you can browse the change in world-wide land sink data from 1979 to 2020 on the map and in the line graph. Select different regions and view their land sink data. Hover over points on the line graph to view specific sink values.
- In the Ocean Map view, you can browse the change in world-wide ocean sink data from 1985 to 2017 on the map. The ocean sink uses a pressure unit. Data in the mass unit will be released soon.

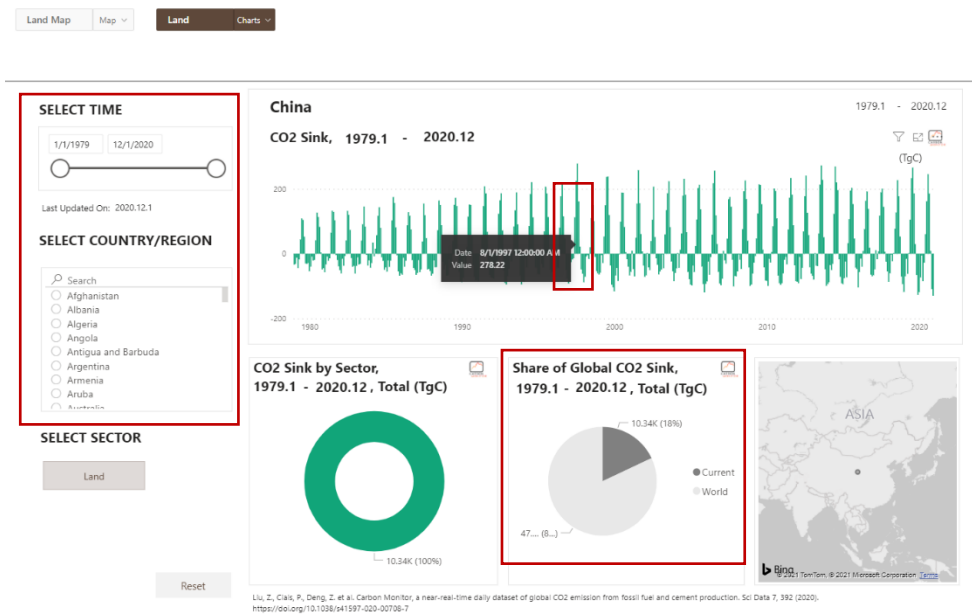


Liu, Z., Clais, P., Deng, Z. et al. Carbon Monitor, a near-real-time daily dataset of global CO₂ emission from fossil fuel and cement production. *Sci Data* 7, 392 (2020). <https://doi.org/10.1038/s41597-020-00708-7>

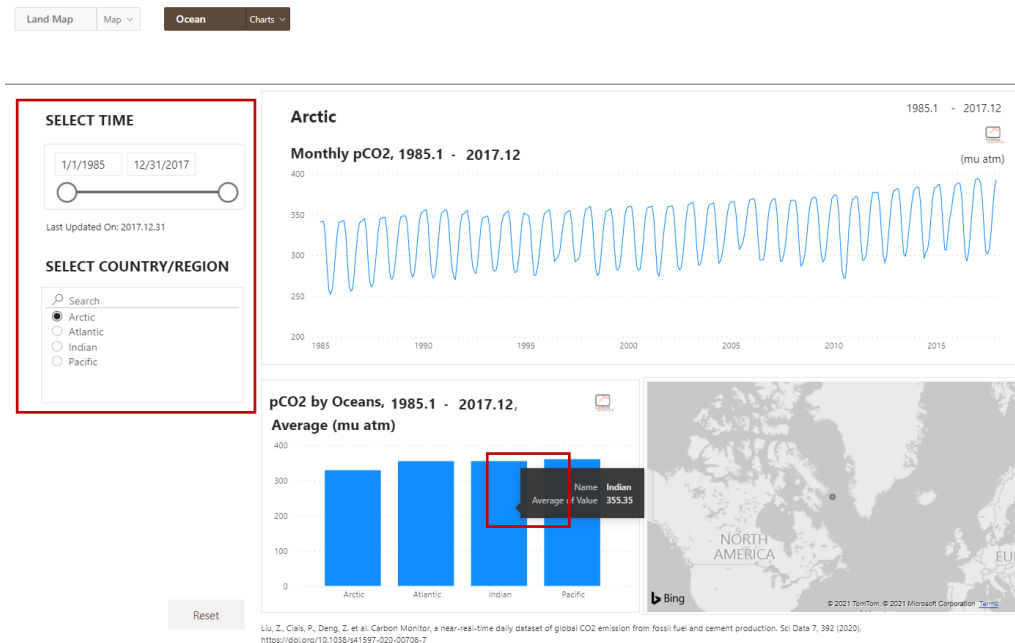
2.2. Sink Charts

In this page, you can view details of land or ocean sink in different forms of charts.

- For Land Sink, data in each of the 206 countries from January 1979 to December 2020 are available. You can find the proportion of the land sink in the selected country to the world land sink. Select any timeframe to view changes in land sink and proportion.



- For Ocean Sink, pCO₂ of four oceans—the Arctic, the Atlantic, the Indian and the Pacific— from January 1985 to December 2017 are presented separately.



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