Abstract

This resource provides a new way for people to investigate greenhouse gas emissions data from a wide variety of countries and from a global perspective. The creators of the database are aiming to inform corporate investors and policy makers, but it will be found by high school students and college students needing data for their papers concerning global warming. When researchers come across a new resource that provides global information on fossil fuel production and storage, the user should be cognizant of a bias to the presentation of the data. This resource is not immune to that issue. Overall, this resource is recommended, but the user should look carefully at the publishing source, the Carbon Tracker Initiative, to understand its motivations for creating this resource.

Pricing Options

Not applicable (OA).

Product Overview/Description

This resource claims to be “the first open-source database of oil, gas and coal production and reserves globally, expressed in CO2-equivalent” emissions, and that does appear to be the case. While a researcher can find data concerning production of these three types of fossil fuels broken down by country, they can be expressed as terawatt-hours of energy, barrels per day of oil, million cubic feet of natural gas (or some other unit of volume), or tonnes of coal and/or lignite.

The main entrance into the database is by clicking on the big “Explore Data” button (see Figure 1). From there, one is given the option of looking at four premade reports concerning the Global View, Economics, Reserves, and Carbon Intensity. There is a graphical interface where the user can click on the map to investigate the combustion, precombustion, or both concerning all three fossil fuels, or one of the three types of energy sources for a chosen country. In addition to clicking on the map, the user can also pick a country on a drop-down list (see Figure 2).

The user of the database should be familiar with terminology used by global warming researchers. Many words and acronyms are used, but one may need to dig into the website or read elsewhere to find what the word or acronym means. For example, I was unfamiliar with the following words and concepts used in some of the sections on the website:
GWP20 and GWP100: Global warming potential (GWP) is a measure of heat absorbed by greenhouse gases in the atmosphere. GWP is 1 for carbon dioxide.


Rents: This is a word “used by economists to denote profits above those expected, or which are necessary to run a project on a commercial basis.” See <https://fossilfuelregistry.org/economics>.

Sustainable Development Scenario (SDS): The SDS “posits more radical action to curb emissions, at the same time as achieving the Sustainable Development Goals set by the United Nations.” See <https://fossilfuelregistry.org/global>.

WA: This term denotes weighted average. See <https://fossilfuelregistry.org/emissions-methodology>.

In three of the four premade reports, the user can download data as csv files to investigate further. The Global View report (<https://fossilfuelregistry.org/global>) has the heading “Matching future production to the energy transition. Future Production Scenarios: extrapolating from Global to National.” Here, the user can play with the data to adjust four different future production scenarios, and the Methane Factor can be changed to be either GWP20 or GWP100.

The Economics report (<https://fossilfuelregistry.org/economics>) discusses how fossil fuel rents are distributed. It presents a chart with natural resource rent and GDP data from the World Bank from the top 10 producing countries of oil, gas, and coal. The user can download the data associated with this chart.

The Reserves report (<https://fossilfuelregistry.org/reserves>) shows a nice chart with text explaining that current reserves already exceed any 1.5-degree carbon budget.

The fourth report, concerning Carbon Intensity (<https://fossilfuelregistry.org/carbon-intensity>), discusses the emissions from getting fossil fuels out of the ground. It has a chart where the user can modify the confidence interval from P5 or P95 to WA. The chart viewer can change the fuel from gas to oil. Data can be downloaded as well.

If a user wishes to look at the calculated emissions for the production and storage of fossil fuels for a specific country, either they can click on the bubbles on the map, or they can use the drop-down list of countries in the database. Once at a country snapshot page, the user can view many dynamically generated charts and download relevant data.

At the time of the review, the resource provided the text of several new publications that others have written using its data at <https://fossilfuelregistry.org/analysis>.

**User Interface/Navigation/Searching**

The four premade reports are very useful, but the interface encourages users to go in and click on the bubbles to investigate the emissions from most countries. The size of the bubble appears to be proportional to the total emissions for most countries. For example, the size of the bubble for Australia looks to be approximately the same size as that for Indonesia, with 1,634 million tonnes CO₂ equivalent (CO₂e) for Australia and 1,589 million tonnes CO₂ for Indonesia, but I was not able to confirm whether the bubble size represented such proportionality. However, I did see that the bubble for China is not twice the size of Russia, even though the publisher calculated that China has more than twice the total emissions of Russia (10,858 million tonnes CO₂e for China versus 4,484 million tonnes CO₂e for Russia). Maybe there is a maximum size for the bubble for some countries.

Many countries do not have a very big emissions footprint with regard to production and storage of fossil fuels. It is difficult to click on some bubbles to see country data, such as Italy, Albania, and Macedonia. Clicking on the country name does not do anything. One needs to click on the teeny tiny dot. The bubble does not always float over the country boundaries. When I zoomed in, the bubble for Vietnam is shown to be in Laos (see Figure 3). The user should choose countries with small production emission footprints from the drop-down list.

**FIGURE 2** Various resources are available to the user after clicking on the Explore Data button.
The names of the countries on the map do not match all of the countries in the drop-down list. Macedonia is in the list as North Macedonia. South Sudan is in the list, but the country name is not on the map.

It is difficult to click on the minus button to zoom out because it is a narrow clickable area. Users who are visually impaired would be advised to skip using the map to pick a country and to instead use the drop-down list for the country they want to investigate. For the country data, one can also go to a specific URL. For example, if a user wanted to get data about China, they could just navigate to <https://fossilfuelregistry.org/country/cn> by using a two-letter country code in the URL. I was not able to find a list of the country codes for all of the countries in this database.

Critical Evaluation

This resource does a poor job of showing who created it. It does say that the producers are from the Carbon Tracker Initiative, which has offices in NYC and London, but it does not list the responsible parties, nor does it link to the Carbon Tracker Initiative website. There are no names, departments, or offices from the Carbon Tracker Initiative listed on the Global Registry of Fossil Fuels website. At the bottom of the <https://fossilfuelregistry.org/datasets> page under the Other Documents section, there is a link to a Registry Launch Paper, which is a 50-page PDF on Google Drive entitled “Tracking emissions to source: introducing a global registry of fossil fuels to drive corporate and government accountability” (<https://drive.google.com/file/d/1L3ynIC6pL3Fm4emAoF2xGJoS2v_bEb5_/view>). This report explains why the Carbon Tracker Initiative created this database. This report has two authors: Johnny West (Advisor to Carbon Tracker and Founder, Koinon Consulting) and Robert Schuwerk (Executive Director, North America, Carbon Tracker). This link could have been put into the About Us page at <https://fossilfuelregistry.org/about>.

Sources of data are listed at <https://fossilfuelregistry.org/data-documentation>. A link to this information could also have been on the About Us page where it states, “Data in the Global Registry of Fossil Fuels is drawn from a wide range of sources.”

When a user wants to leave feedback or ask the producers a question, there is a Google Form link at the very bottom of each page footer (<https://docs.google.com/forms/d/e/1FAIpQLSc1IZcMMyNKnF86PSbm6CiZiK0s4mlOg-LXh27o11-j1GGWNGcQ/viewform>). The menu option at the top for Other | Feedback does not go to the feedback link. This was a problem in both Chrome and Firefox. The user does not see who the response is going to, and the user can leave only one response for each Google account or email address. In short, there is no name or email address of a responsible person listed on the website or at the feedback link.

I was surprised to see that there were no production data for coal for Mexico, even though such data are available at <https://www.eia.gov/international/overview/country/MEX>. If Mexican coal production data are missing, I wonder what other data are missing.

This resource attempts to distill a difficult concept into an easy-to-read and easy-to-use graphical interface. However, to really understand the data, the user should also understand many of the underlying fundamental concepts.

The user should also read about the methodology (<https://fossilfuelregistry.org/emissions-methodology>) used to convert oil, natural gas, and coal energy production into a CO$_2$e measurement expressed as million tonnes of CO$_2$e. The database producers could more easily convert oil and natural gas production data into CO$_2$e, but they explain that “the main issue with coal combustion is that the IPCC range estimates have margins of uncertainty that are much wider than for oil and gas.” So, they employed Monte Carlo stochastic simulations and other statistical analyses to estimate the amount of CO$_2$e emissions derived from coal production.

While the publisher attempted to create this “as a policy-neutral tool to improve supply-side transparency” (<https://carbontracker.org/reports/tracking-emissions-to-source/’>), the lack of documentation on the website concerning the management of the data-
Global Registry of Fossil Fuels

Review Scores Composite: ★★★ 1/4

The maximum number of stars in each category is 5.

Content: ★★★
The data are locally held on a Google Drive, and the resource explains where it gets its data from. The premade reports cover several of the questions many people may want answered from a global perspective.

User Interface/Searchability: ★★ 1/2
The graphical interface is intriguing for investigating country data, but it is difficult to use for many countries. It is easier to use the drop-down list of countries.

Pricing: NA
OA

Purchase/Contract Options: NA
OA

Base is a yellow flag. The About Us page does state, “The Global Registry of Fossil Fuels was developed by Carbon Tracker, with data support from Global Energy Monitor. The Global Registry of Fossil Fuels is supported by the New York Community Trust and Generation Foundation.” It does not link to any of these organizations, and I do not know of their reputations. The researcher should investigate those organizations before deciding whether this truly is a policy-neutral tool.

For the most part, the user could trust the data gathered for country-level data from BP Global Statistical Analysis (BP), the US Energy Information Administration (EIA), and the database of the Oil Producing and Exporting Countries (OPEC). This resource also gathers data from dozens of other processed and unprocessed sources listed at <https://fossilfuelregistry.org/data-documentation>, but the quality of the data may differ from one source to the next.

Overall, this resource is still worth taking the time to add to your Springshare LibGuides (or similar library subject guides), since students and researchers would appreciate the quick access to see and download fossil fuel footprint data.

Competitive Products
Resources that also cover global and country-specific emission data from production are:

- <https://ourworldindata.org/fossil-fuels> (published by the Global Change Data Lab and the University of Oxford)
- <https://www.oecd.org/fossil-fuels/countrydata/>

However, at the time of this review, none of these related resources converted energy production emission into CO₂e units.

Purchase & Contract Provisions
Not applicable.

Authentication
Not applicable.

Author’s References
Not applicable.

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Phone: None provided
Producer URL: <https://fossilfuelregistry.org>
Product URL: <https://fossilfuelregistry.org>

Free Text Keywords: global warming | climate change | oil | gas | coal | carbon dioxide

Primary Category: Science, Technology, Computers, Engineering (including Environment), Mathematics

Secondary Categories: Multidisciplinary (or interdisciplinary)

Type of Product Being Reviewed: Data sets; Statistical database; Website

Target Audience: General public; Undergraduate (including community colleges); Graduate/Faculty/Researcher

Access: Open access (OA)