Terrascope CDA On-The-Job Assignment

Guidance

The candidate can select which date they start the assignment, and the candidate has 7 days to submit the assignment. We schedule the presentation on the 7th day (next business day).

On the start day of the case study, the candidate should receive

1. This instruction document
2. “raw\_data” folder
3. “guides\_and\_dbs” folder

Overview

Welcome!

In this assignment, you will work with sample raw data that represents business activities of a particular company to measure carbon emissions across Scope 1, 2, and 3.

The case study is broken down into 3 parts:

1. Research and data analysis
2. Report
3. Presentation

The focus of this case study is for you to have a glimpse of how raw data from clients could look like and how you can calculate emissions based on it. This would require you to dig into GHG guidelines, emission factors, and calculation methodologies.

Feel free to use any tool you're comfortable with for data wrangling (although Excel should work just fine if that's your preference) and visualization throughout the case study.

# 1. Research and data analysis

The tasks that you are expected to work on are as follows:

1. Understand the raw data, including what the columns represent and which fields to focus on conduct any preprocessing/transformations if necessary
2. Conduct checks on the data, identify errors and rectify them if necessary
3. Identify the Scope and Scope Category of each type of business activity
4. Research and identify the emission factors for the given business activity. In your submission, please show the emission factor name and source that you have used
5. Calculate the emissions for **each** activity
6. Map certain codes to the organizational unit/business unit according to the org mapping
7. Summarize the emissions across all data and for each Scope

You are free to make any assumptions that you feel are necessary but make sure to keep track of them as it will come in handy in part 2!

At the conclusion of Part 1, you are required to submit **all** your Excel files containing the complete set of emission factors and the corresponding calculations. All work should be clearly organized, with calculations and data readily accessible for review.

## 1.1 Raw Data

Here are the contents of the raw data

* org\_mapping.xlsx : A reference that maps SAP codes to business units
* biodiesel.xlsx : Purchase & usage of biodiesel
* business\_travel.xlsx : Summary on amount of business travel (this one is given as a freebie!)
* fertilizer.xlsx : Purchase & use of fertilizer
* natural\_gas\_and\_elecricity.xlsx : Summary of natural gas & electricity usage
* trading\_and\_imports.xlsx : Transaction data on imports of purchased goods
* upstream\_transportation.xlsx : Transaction data on upstream transportation of goods (Hint: you can assume that data here is from a third party transportation provider)
* warehousing\_spend.xlsx : Data on warehousing
* waste\_disposal.xlsx : Data on waste and disposal methods

## 1.2 References, guides and emission factor databases

Here are some guides and emission factor databases that you can use

* Video on GHG accounting [here](https://www.youtube.com/watch?v=ON41g_RzM8M)
* GHG Scope 3 Guidance
  + This will help you understand the fundamentals of GHG carbon emission calculations and the categorization of each activity to the relevant scope categories
  + HINT: While it's not necessary to read the entire guidance to complete the case study, there are key pieces of information that will be helpful. So, be sure to skim through and focus on the most relevant sections!
* DEFRA
* ADEME
* Biograce v4
* EEIO

You are not limited to the above. Please feel free to use any other external resources that you feel will add accuracy or completeness to your measurement.

# 2. Report

After completing the measurement, it is important to document the steps and assumptions you made to arrive at the numbers. You will need to fill the tables below.

## **Table 1. Data transformation and key assumptions**

| **Category**  <Edit the table to only keep the relevant categories> | **File name** | **Transformations** | **Key data gap, omissions and assumptions**  **Emission factor database used** |
| --- | --- | --- | --- |
| **Scope 1** |  |  |  |
| Stationary sources | E.g. file\_name.xlsx | E.g.  All data in gallons converted to liters | E.g. The total amount of fuel burnt was unavailable, data collected was the amount spent on fuel. Hence the assumption of $3.52 USD per gallon of gasoline was used to convert spend data into activity data. |
| Mobile sources |  |  |  |
| Process emissions |  |  |  |
| Fugitive emissions |  |  |  |
| **Scope 2** |  |  |  |
| Electricity |  |  |  |
| Heat |  |  |  |
| Cooling |  |  |  |
| Steam |  |  |  |
| **Scope 3** |  |  |  |
| 3.1 Purchased goods & services |  |  |  |
| 3.2 Capital goods |  |  |  |
| 3.3 Fuel & energy related |  |  |  |
| 3.4 Upstream transportation & distribution |  |  |  |
| 3.5 Waste generated in operations |  |  |  |
| 3.6 Business travel |  |  |  |
| 3.7 Employee commuting |  |  |  |
| 3.8 Upstream leased assets |  |  |  |
| 3.9 Downstream transportation & distribution |  |  |  |
| 3.10 Processing of sold products |  |  |  |
| 3.11 Use of sold products |  |  |  |
| 3.12 End-of-life treatment of sold products |  |  |  |
| 3.13 Downstream leased assets |  |  |  |
| 3.14 Franchises |  |  |  |
| 3.15 Investments |  |  |  |

## **Table 2. GHG inventory**

| **#** | **Scope** | **Emissions (tCO2e)** | **Percentage of total emissions** |
| --- | --- | --- | --- |
| 1 | **Scope 1** |  |  |
|  | Stationary sources |  |  |
|  | Mobile sources |  |  |
|  | Process emissions |  |  |
|  | Fugitive emissions |  |  |
| 2 | **Scope 2** |  |  |
| 3 | **Scope 3** |  |  |
| 3.1 | Purchased goods & services *(Please delete Scope 3 categories that are not relevant)* |  |  |
| 3.2 | Capital goods |  |  |
| 3.3 | Fuel & energy related |  |  |
| 3.4 | Upstream transportation & distribution |  |  |
| 3.5 | Waste generated in operations |  |  |
| 3.6 | Business travel |  |  |
| 3.7 | Employee commuting |  |  |
| 3.8 | Upstream leased assets |  |  |
| 3.9 | Downstream transportation & distribution |  |  |
| 3.10 | Processing of sold products |  |  |
| 3.11 | Use of sold products |  |  |
| 3.12 | End-of-life treatment of sold products |  |  |
| 3.13 | Downstream leased assets |  |  |
| 3.14 | Franchises |  |  |
| 3.15 | Investments |  |  |
|  | **Total Net Emissions** |  |  |

# 3. Presentation

Now that you have completed carbon measurement of the organization, you must document your assumptions and methodology, and present your work to the Chief Sustainability Officer of the organization.

Prepare a presentation (Powerpoint or Google Slides) that should include the following

1. Summary of carbon emissions measured
2. What were the assumptions made and why did you choose to make these assumptions (HINT: As there is a limitation of time given, you will need to prioritise ONLY the most impactful assumptions)
3. Emissions by BUs or any other interesting insights that you find
4. What are some data gaps that if filled, will help the organization to have a more accurate / complete measurement in the subsequent year?
5. What are some (2 or 3) decarbonisation levers that you would recommend to the CSO?

The time to present the above is a 30 minute presentation and 15 minutes for Q&A.

# 4. Recap of items to be submitted

At the end of the case study, you will be required to submit:

* All working files of emission factors matched and their emission calculations
* Report of the 2 tables which contains all assumptions made for each data file and the consolidated emission numbers
* Slides on the presentation

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