

THOMSON REUTERS ESG CARBON DATA AND ESTIMATE MODELS

Analyzing companies using non-financial information, such as environmental data, is becoming more important when assessing investment risk and opportunities. Despite the shift in attention, only half of all companies in the Thomson Reuters ESG coverage report on CO2 emissions data. Responding to the void between the need for carbon data and the data that is reported and available, we have developed sophisticated Carbon Data & Estimate models. Our patented models are fully transparent providing you with an estimated value when a reported value is not available.

THE CARBON DATA & ESTIMATE MODEL IS STRUCTURED AROUND FOUR STEPS.

Each model returns one value (reported or estimated). In the listing that follows we use one of the following four numbers:

1. **Reported:** If available, we provide the reported CO2 Emissions data from the company¹. If there is available carbon emission data reported by the company then the model stops there.
2. **CO2 Model.**
3. **Energy Model.**
4. **Median Model.**

CO2 MODEL

If a company has not already reported on its Total CO2 Emissions for the year, we use the CO2 model². Below is the CO2 model process:

1. Take the latest available Total CO2 Emissions, from last year, else from 2 years ago, etc.
2. Divide this CO2 number by the Number of Employees (during the same year as the CO2 number).
3. Multiple by the Number of Employees (during the same year as the CO2 number).
4. Repeat steps 1-3 with Net Sales (in USD) instead of Number of Employees.
5. The estimate from this model is the average of the numbers from steps 3 and 4 (else only of them, in case the other is not available).

ENERGY MODEL

If the CO2 model is unable to return a figure, then our model continues onto the next step – the Energy Model³.

1. Take the latest available Total Energy Consumed (from current year, else from last year, else from two years ago, etc.)
 - a. For companies in the Utilities economic sector, the Total Energy Produced should be used instead.
2. Divide this Energy number by the Number of Employees (during the same year as the Energy number).
3. Compute the same ratio but now for all the other companies in the same industry (8 TRBC digits). If the number of available ratios is smaller than 10, then the set of companies should be extended to the industry group (6 TRBC digits). If the number of ratios is smaller than 10, then the set of companies should be extended to the business sector (4 TRBC digits). If the number of available ratios is still smaller than 10, then the set of companies should be extended to the economic sector (2 TRBC digits).
4. Compute the percentile rank of the main-company (the number from point 2) within the ratios from point 3.
5. Repeat 3 now with CO2 instead of Energy and take the percentile that was obtained from step 4. To create the corresponding CO2 percentile rank the same TRBC code level should be used as in step 4. If the number of companies in the CO2 group is less than 10 then go back to step 4 and go one level up in the TRBC hierarchy.
6. This percentile is used to find the ratio for the CO2 number. If we don't have an exact matching percentage then the ratio is found by interpretation of the two closest ratios using the corresponding percentiles.
7. Multiply the resulting ratio by the data point used for the normalization data point for the target year (Number of Employees).
8. Repeat steps 1-7 with Net Sales (in USD) instead of Number of Employees.
9. The estimate from this model is the average of the numbers from steps 7 and 8 (else only one of them, if case the other is not available).

MEDIAN MODEL

If the Energy Model does not return a number then our systems continue on to the Median Model⁴

1. Compute the CO₂/Number of Employees ratio for all the companies the same industry (8 TRBC digits). If the number of available ratios is smaller than 10, then the set of companies should be extended to the business sector (4 TRBC digits). If the number of available ratios is still smaller than 10, then the set of companies should be extended to the economic sector (2 TRBC digits). The data to be used should be from the same year as the year for which we are computing an estimate.
2. Compute the median of the above numbers and multiple by the Number of Employees of the main-company.
3. Repeat steps 1-2 with Net Sales (in USD) instead of Number of Employees.
4. The estimate from this model is the average of the numbers from steps 2 and 3 (else only of them, if case the other is not available).

TRBC LEVEL

As you can see in both the Energy and Median models we compare a company's performance to that of its peers. As stated above, we require at least 10 companies within the same TRBC level for our comparison. Please note that as we "move up" the TRBC code from the industry (8 digits) to possible economic sector (2 digits), the accuracy of the estimate may be reduced due to differences between the companies at these various levels.

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Visit [TRBC Sector Classification](#)

DATA POINTS USED IN EACH MODEL

DATA POINT DESCRIPTIONS & CODES

Carbon Data & Estimate Models¹

- **Estimated CO₂ Equivalents Emission Total**
The estimated total CO₂ and CO₂ equivalents emission in tonnes.
– TR.AnalyticEstimatedCO₂Total
- **CO₂ estimation method**
CO₂ estimate method.
– TR.CO₂EstimationMethod

CO₂ Model²

- **CO₂ Equivalents Emission Total**
Total CO₂ and CO₂ equivalents emission in tonnes.
– TR.CO₂EmissionTotal
- **Total Revenue**
Represents revenue from all of a company's operating activities after deducting any sales adjustments and their equivalents.
– TR.TotalRevenue
- **Number of Employees**
Represents the number of full-time employees and full-time equivalents of part-time/temporary employees, as reported, as of the fiscal period end date.
– TR.Employees

Energy Model³

- **Energy Use Total**
Total direct and indirect energy consumption in gigajoules.
– TR.EnergyUseTotal
- **Energy Produced Direct**
Direct energy produced in gigajoules.
– TR.EnergyProducedDirect
- **Total Revenue**
Represents revenue from all of a company's operating activities after deducting any sales adjustments and their equivalents.
– TR.TotalRevenue
- **Number of Employees**
Represents the number of full-time employees and full-time equivalents of part-time/temporary employees, as reported, as of the fiscal period end date.
– TR.Employees

Median Model⁴

- **CO₂ Equivalents Emission Total**
Total CO₂ and CO₂ equivalents emission in tonnes.
– TR.CO₂EmissionTotal
- **Total Revenue**
Represents revenue from all of a company's operating activities after deducting any sales adjustments and their equivalents
– TR.TotalRevenue
- **Number of Employees.**
Represents the number of full-time employees and full-time equivalents of part-time/temporary employees, as reported, as of the fiscal period end date.
– TR.Employees