REFINITIV ESG CARBON DATA AND ESTIMATE MODELS

Analyzing companies using nonfinancial 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 Refinitiv 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 and estimate models. Our patented models are fully transparent, providing you with an estimated value when a reported value is not available.

The carbon data and estimate model is structured around four steps

Each model returns one value, which can be either 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 company. 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**

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CO2 model

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

1. Take the latest available total CO2 emissions. This might be from the current year, last year, two years ago, etc.
2. Divide this CO2 number by the number of employees for the same year as the CO2 number
3. Multiply by the number of employees for the current year, for which we are calculating an estimated CO2 number
4. Repeat steps 1 to 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 (or just one of them, if the other step is not available)

Energy model

If the CO2 model is unable to return a figure, then our model continues on to the next step – the energy model3.

1. Take the latest available total energy consumed. This might be from the current year, last year, two years ago, etc.
2. For companies in the utilities economic sector, the total energy produced should be used instead
3. Divide this energy number by the number of employees for the same year as the energy number
4. Compute the same ratio, but now for all the other companies in the same industry, i.e., eight TRBC digits. If the number of available ratios is smaller than 10, then the set of companies should be extended to the industry group (six TRBC digits). If the number of ratios is again smaller than 10, then the set of companies should be extended to the business sector (four 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 (two TRBC digits)
5. Compute the percentile rank of the main company (the number from point 2) within the ratios from point 3
6. Repeat step 3, but now with CO2 instead of energy. 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
7. 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
8. Multiply the resulting ratio by the data point used as the normalization data point for the target year (number of employees)
9. Repeat steps 1 to 7 with net sales (in USD) instead of number of employees
10. The estimate from this model is the average of the numbers from steps 7 and 8 (or just one of them, if the other step 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 in the same industry (eight TRBC digits). If the number of available ratios is smaller than 10, then the set of companies should be extended to the business sector (four 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 (two 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 multiply by the number of employees of the main company
3. Repeat steps 1 and 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 (or just one of them, if the other step is not available)

TRBC level

As you can see in both the energy and median models, we compare a company's performance with 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 industry (eight digits) to possible economic sector (two digits), the accuracy of the estimate may be reduced due to differences between the companies at these various levels.

Data points used in each model

Data point descriptions and codes:

Carbon data and estimate model1

- **Estimated C02 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

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