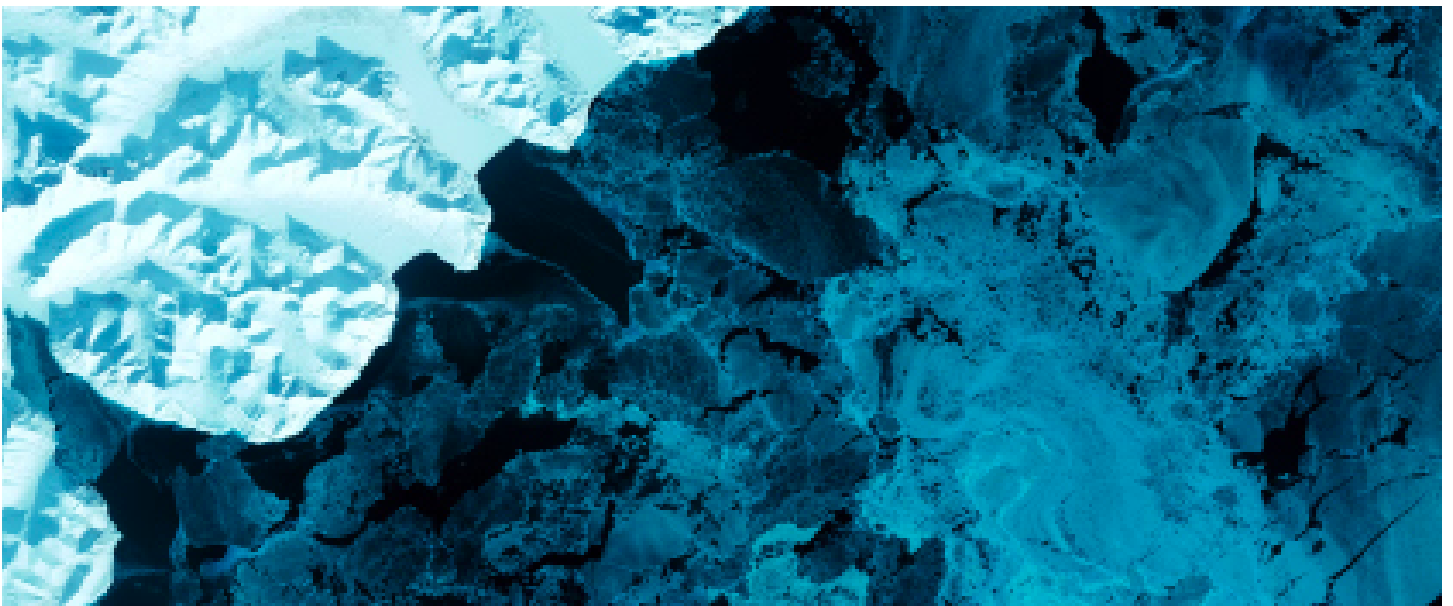


What you need to know: Environmental Costs and Impact Ratios or How to Quantify Environmental and Climate Issues



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One of the challenges of environmental data is being able to quantify it and understand the value or effect it has on society and our world. The **Trucost Environmental** dataset aims to identify the 'true cost' of environmental damage through its environmental damage costs and impact ratio metrics.

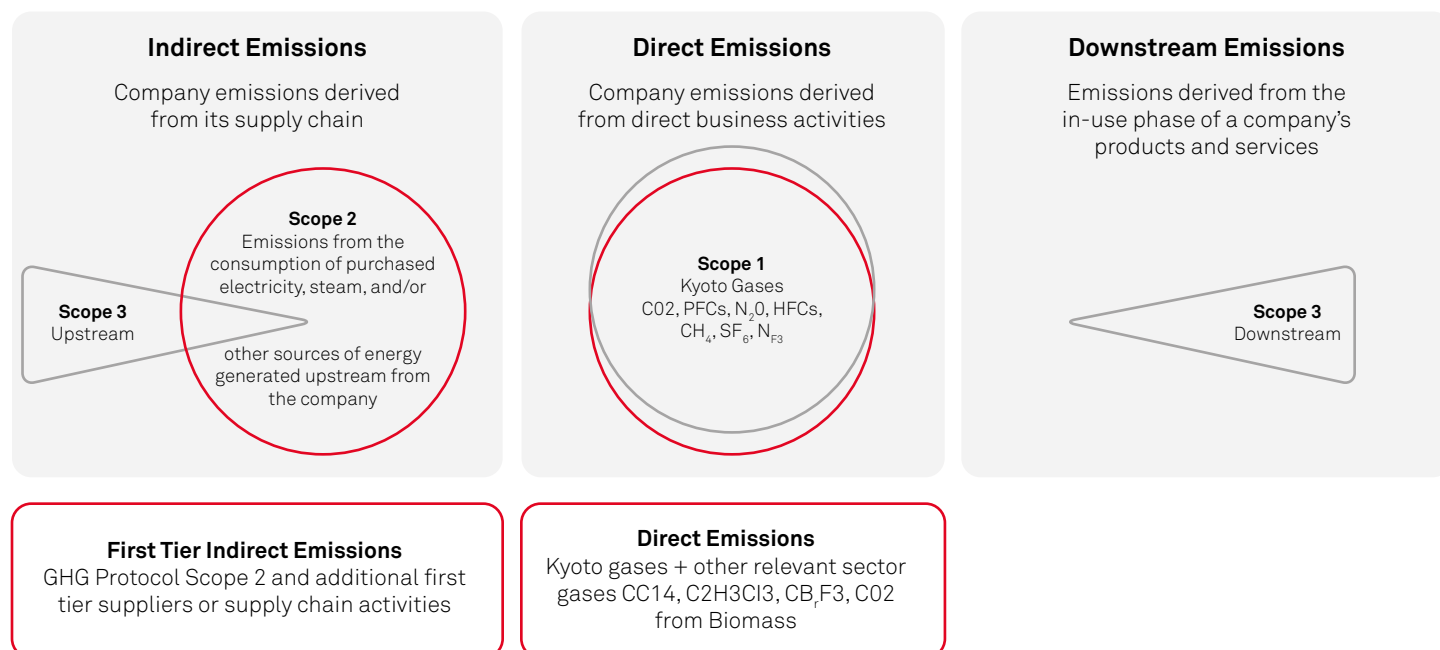


Figure 1: Greenhouse Gas classification as per S&P Global Trucost Environmental data in accordance with the GHG Protocol

What is the **Environmental Damage Cost**?

For each metric or KPI, there are at least a dozen resources needed to build it up. Take Scope 1 of greenhouse gas (GHG) emissions, for example. As per the GHG Protocol¹, Scope 1 is made up of the 7 Kyoto gases as depicted in Figure 1.

With the help of academics and by leveraging different pricing tables from various world-renowned sources like the World Bank and the OECD, the Trucost team identified a dollar value to attribute to each resource. The cost given to each resource is based on different relevant research to each KPI. For example, for our Carbon metric, we speak of the social cost of carbon. Air, Land and Water Pollutants

take into account the impact on human health and the disability adjusted life years (DALYs) as a measure of that impact from environmental issues. Additional modelling includes the effects of water consumption and the impacts of landfill and incineration among other metrics included in the Environmental database.

Once a dollar value is given to each resource, it is then aggregated on the KPI level to finally produce the Total Environmental Damage Cost in \$mm. Assuming each tonne of methane from biomass costs \$875, if a company emits 1,000tCO₂e in a given financial year, their cost is \$875,000.

¹ [Greenhouse Gas Protocol](#)

Where does the **Impact Ratio** fit in?

That environmental damage cost is then transformed to a percent of revenue.

Hypothetically, if the company had to pay back for that cost, how much of its revenue would be impacted? Using the above example and assuming there were no other environmental issues, for a revenue of \$10mm the Impact Ratio is cost/revenue; 8.75%. that is to say that 8.75% of the company's total revenue would be converted to additional costs for the environmental damage they have caused in the given year.

There are cases where a company's impact ratio can outweigh its revenue i.e., be greater than 100%. Although rare, in the event the emissions are higher than the revenue, they would hypothetically owe more in damage costs than they would have made in revenue. In such cases it is especially crucial to understand two things –

1. Company Stage: Companies or start-ups that are still in their growth phase may in their initial years since founding emit more and therefore have higher environmental damage costs than what they gain in revenue.

2. Estimations: Part of the Trucost environmental methodology includes using an econometrics environmental input-output model to estimate emissions of companies without disclosures. This is done using their business activities and leveraging the business activity's intensity factor. It becomes a challenge when small private companies have more homogenous business activities that are known to have high intensity factors. When multiplied by the company's relatively smaller revenue, these result in large emission values and therefore larger impact ratios.

Greenhouse Gas	Cost \$US
Carbon Dioxide	42
Carbon Tetrachloride (Tetrachloromethane)	58,317
Dinitrogen Oxide (Nitrous Oxide)	12,413
HFCs	99,972
Methane	1,041
PFCs	326,992
Methane from Biomass	875
Nitrogen trifluoride [NF3]	716,468

Figure 2: Example of S&P Global Trucost environmental damage issue costs in \$US for CY2021²

How can this be **interpreted** and used in various workflows?

The Environmental Damage Cost and Impact Ratio metrics are mainly used as risk measurements and benchmarks to identify the ratio of environmental issue to revenue of a company. Rather than just a hypothetical value, the aim is to raise the risk with investors and their clients to spark conversations and engagement. More importantly, by engaging with investors and in turn having them engage with their clients and with corporates, the end goal is to reduce the emissions. This would ultimately lead to

a transition to activities and practices that are more renewable or lower in their emissions and are therefore less harmful to our society and our world.

Other personas can also be inspired by such metrics as a starting point to other questions. For an insurance company or a bank, the question of doing business with the company comes into play. How will pricing change for the underwriters? Taken these costs into account, how should interest rates change on loans?

² S&P Global Sustainable1 offers custom analytics services where clients can choose official sovereign costs to be used in their analyses.

Limitations and Upcoming Enhancements

Besides the limitations of growth and estimations, our main limitation is, that the current values used are global costs that do not necessarily consider how sovereigns might be taking different stances on environmental issues and therefore be more strict or flexible about carbon or environmental pricing, taxes, or costs. To complement this, the Carbon Earnings at Risk dataset was developed to incorporate the jurisdictions' pricing and identify the reduction in earnings using EBIT/DA based on carbon emissions³.

The Trucost resource costs are currently updated and recalibrated on an annual basis. However, the underlying research has since seen massive improvements and new literature. In 2023, the Trucost Environmental Research and Modelling team is developing a new environmental input output model. This model will further expand on the environmental damage issues and adjust pricing to the current climate⁴ of environmental pricing.

³Click [here](#) to learn more about our Carbon Earnings at Risk dataset

⁴Pun unintended

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