

Researchers develop a more precise carbon footprint measurement method

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Bayreuth researchers want to calculate the carbon footprint of companies more accurately in the future. The term "carbon footprint" refers to the recording of climate-impacting greenhouse gases and the compilation of these in a greenhouse gas balance.

For more precise calculations, Nora Kuhn compared 8,500 products in her bachelor's thesis at the Chair of Environmental Production Technology (LUP) at the University of Bayreuth with the support of Dr. Bernd Rosemann, Academic Director of the LUP, and Dominik

Roppelt, Nora Kuhn's bachelor's thesis supervisor and doctoral student in this department.

The products were analyzed on the basis of their weight, in contrast to the previously used spend-based method. Spend-based emission factors estimate how much greenhouse gas a company emits based on the money it spends on products. But this can be inaccurate because it assumes that all products in a category emit the same amount of greenhouse gases. In addition, prices can fluctuate due to market conditions, but the weight remains the same.

The Bayreuth study uses a weight-based approach and compares 8,500 products in 200 sub-categories and seven main procurement categories.

The study found that the spend-based approach in a real-life case study showed an overestimation of 11%. "One of the reasons for this is that the categories used in the spend-based approach are much broader. The calculated carbon footprints are therefore only imprecise average values," says Nora Kuhn.

However, the spend-based approach is easier for companies to use as the data is usually already available. "But it is simply too generalized. The deviations within the purchasing categories are 61% on average, which can lead to incorrect prioritization," she explains. "In order to reduce [greenhouse gas](#) emissions, it is necessary to find the right areas. The weight-based method is proving to be a more reliable and accurate tool for targeting strategies to reduce carbon emissions."

With the help of Dr. Bernd Rosemann and Dominik Roppelt, Nora Kuhn's research has now been compiled into a [white paper](#) for the DFGE—Institute for Energy, Ecology and Economy.

For over 20 years, DFGE has been offering companies consulting,

software and auditing services to help them realize a green vision and integrate it into their [business processes](#). In its latest newsletter, it provides information about its core business of addressing the question of whether and, above all, how a sensible combination of ecology and economic efficiency can be achieved.

"The comparison that Ms. Kuhn has made is also groundbreaking for the economy," says Dr. Bernd Rosemann. "The decision-making basis for reduction measures is much better and companies can reduce their CO₂ emissions more effectively."

More information: Comparing spend-based vs. weight-based approach: More accurate Greenhouse Gas Calculation using the TopDown weight-based Approach. [dfge.de/en/download-whitepaper ... ight-based-approach/](https://dfge.de/en/download-whitepaper-weight-based-approach/)

Provided by Bayreuth University

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