

# **Global Carbon Accounting Tool (GCAT) for Manufacturing Supply Chains: The World Model**

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## **Abstract**

This research presents a global carbon accounting tool (GCAT) developed by the Sustainable Systems & Solutions Lab (S3-Lab) at Istanbul Sehir University, Turkey. This tool is able to capture the regional and global carbon footprints of manufacturing supply chains for world's 40 major economies. The GCAT will enable users to conduct carbon footprint analysis for the specific industry of selected country in 5 steps (<http://s3-lab.sehir.edu.tr/gcat.html>). The European food and drink industry will be chosen as a case study to conduct supply chain-based carbon footprint analyses including production versus consumption based analysis, sector breakdown for supply chain components, scope-based analysis and impact-by-country analysis for supply chain carbon emissions.

## **Keywords**

Multi-region input-output analysis; carbon footprint accounting; sustainable manufacturing; supply chain management.

## **Biography**

Dr. Murat Kucukvar serves as the Chairman and Assistant Professor of the Department of Industrial Engineering at Istanbul Sehir University, Turkey. He holds the positions of International Programs and Erasmus Coordinator, Member of the Board of Directors in the Graduate School of Natural and Applied Sciences, and Member of Quality Commission. Dr. Kucukvar is also a founding member and co-director of the Sustainable Systems & Solutions Lab (S3-Lab, <http://s3-lab.sehir.edu.tr/>) at Istanbul Sehir University.

Dr. Nuri Cihat Onat serves as an Assistant Professor at the Department of Industrial Engineering at Istanbul Sehir University (SEHIR) and Co-director of Sustainable Systems & Solutions Lab (S3-Lab). Prior to joining the SEHIR, he worked as a Walton Postdoctoral Research Fellow in Julie Ann Global Sustainability Institute at the Arizona State University as part of the Walton Sustainability Fellowship Program. Dr. Onat received his Ph.D. from the Civil, Environmental, and Construction Engineering Department at the University of Central Florida (UCF).

Muhammet Ali Taşkın serves as a research assistant in Computer Engineering Department at Istanbul Sehir University and employed as full time researcher in S3-Lab.