

# **Scope-based Carbon Footprint Analysis of Turkish Construction Industry**

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## **Abstract**

The construction industry has significant impacts on the environment and is responsible for a considerable amount of carbon emissions throughout the total life cycle of structures. While majority of carbon footprint analyses addressing construction industries differ in system boundaries, scopes, greenhouse gas selection, and methods selected, the increasing number of carbon footprint reporting in response to legal and business demand lead for worldwide use and adoption of the Greenhouse Gas Protocol (GHG Protocol) set by World Business Council for Sustainable Development (WBCSD). In this study, carbon footprint of Turkish construction industry will be analyzed in accordance with carbon footprint accounting standards and scopes set by WBCSD, in which carbon emissions are classified in three major scopes and all possible indirect emissions are considered. Multi-regional input-output methodology, a comprehensive consumption-based accounting approach, is utilized to calculate carbon emissions throughout the supply chains of construction industry including the impacts occur in countries outside of Turkey. In addition, Global Carbon Accounting Tool (G-CAT), a Web-based carbon accounting tool (see at <http://s3-lab.sehir.edu.tr/gcat>), is developed to disseminate the results as well as to allow researchers to conduct carbon footprint analysis of major industries including construction sector.

## **Keywords**

Construction Industry; Carbon Footprint Accounting; Multi-Regional Input-Output Analysis; Sustainable Construction.

## **Biography**

**Dr. Nuri Onat** serves as an Assistant Professor in the Department of Industrial Engineering and co-director of the Sustainable Systems & Solutions Lab (S3-Lab, <http://s3-lab.sehir.edu.tr/>) at Istanbul Sehir University, Turkey. He also holds the positions of Senior Sustainability Fellow at the Global Institute of Sustainability and an Online Adjunct Faculty at School of Sustainability at the Arizona State University, USA. Dr. Onat has over 30 publications (journal plus conference) in various topics: sustainable transportation, green buildings, sustainability assessment methods, system dynamics, and life cycle sustainability assessment.

**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,

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