

## Cradle to gate life cycle assessment of solar selective surfaces produced by continuous electrochemical process

Gokcen Alev Ciftcioglu<sup>1\*</sup>, M.A. Neset Kadırgan<sup>1</sup>, Figen Kadırgan<sup>2</sup>

<sup>1</sup>Chemical Eng Dept, Eng Faculty, Marmara University, Turkey

<sup>2</sup>Selektif Technology Co. Inc., ITU Ayazaga Kamp, Turkey

The consumption and production activities are one of the biggest factors in all environmental damages, especially in global warming. Thus, the need to minimize greenhouse gas emissions becomes more and more important in the recent years. Reduction of CO<sub>2</sub> may prove to be one of the most important political and technical challenges faced today. In the recent years, the use of renewable energy sources to reduce the damage to the environment by reduction of CO<sub>2</sub> gradually started to become widespread. Solar selective surfaces are used in manufacturing of solar collectors and have the main duty in direct heating. Life cycle assessment (LCA) is a tool to better understand the energy and environmental performance of these systems. In this study, the environmental performances of the solar selective surface prototype plant in SELEKTİF TEKNOLOJİ Co. Inc. Ltd., Istanbul, Turkey is analyzed. The new production process is a continuous electrochemical process, which differs from the conventional batch systems. Data is collected directly from the live prototype plant and managed following international ISO 14040 and 14044 standard procedures to implement carbon management strategies using the Greenhouse Gas Protocol. The aim is to trace the CO<sub>2</sub> foot print of SELEKTİF's eco-profile that synthesizes the main energy along with the environmental impacts related to the whole product's life cycle. After compiling an inventory of relevant energy and material inputs, environmental releases and evaluating the potential impacts associated with identified inputs and releases, CO<sub>2</sub> footprint was calculated as low as 0.321 kg/m<sup>2</sup>

### Biography

Gokcen Alev Ciftcioglu has completed her PhD at the age of 29 years from Istanbul Technical University and is an Assist. Professor in Chemical Engineering Department at Marmara University since 2008. Her researches are green technologies, renewable energy, life cycle assessment, polymers, and modeling.

gciftcioglu@marmara.edu.tr