

**O 27. ESTIMATING OF EMISSIONS FROM CARGO AIRPLANES: A COMPARATIVE ANALYSIS AT TURKISH AIRPORTS**

Ayşegül Toy<sup>1\*</sup>, Abdullah Oktay Dündar<sup>2</sup>

<sup>1</sup>*Necmettin Erbakan University, Konya, Türkiye*

<sup>2</sup>*Necmettin Erbakan University, Konya, Türkiye*

E-mail: *ayshegultoy@gmail.com, aodundar@erbakan.edu.tr*

**ABSTRACT:** The transportation sector has a significant portion in the emissions released into the atmosphere. In recent years, the greenhouse gas emissions from airplanes have been increasing as the aviation sector has been developing and negatively affecting climate change. In this study, greenhouse gas emissions from cargo flights between 2015-2020 at five airports in Turkey (Sabiha Gökçen, Atatürk, Istanbul, Adnan Menderes and Esenboğa) where air cargo traffic is intense were calculated. The Tier 2 method developed by IPCC (Intergovernmental Panel on Climate Change) was used in these calculations. The total amount of emissions from cargo flights at the relevant airports between 2015-2020 was measured as 775.565.104,46 kg CO<sub>2</sub>e. Atatürk Airport, where the busiest airplane traffic is experienced between 2015-2020, ranks first in all emission types and fuel consumption. Between 2015-2019, Esenboğa Airport ranked last in total CO<sub>2</sub>e emissions, while Adnan Menderes Airport ranked last in 2020. The highest total CO<sub>2</sub>e emission was measured as 139.473.435 kg CO<sub>2</sub>e at Atatürk Airport in 2020. The lowest total CO<sub>2</sub>e emission was measured in 2018 at Esenboğa Airport as 221.207 kg CO<sub>2</sub>e. The highest CO<sub>2</sub>e emission per LTO was measured as 8.711 kg CO<sub>2</sub>e at Esenboğa Airport in 2016. The lowest CO<sub>2</sub>e emission per LTO was measured as 4.804 kg CO<sub>2</sub>e at Sabiha Gökçen Airport in 2020. It has been observed that there was a continuous airplane traffic increase at Atatürk and Istanbul Airport between the relevant years and the total CO<sub>2</sub>e emissions increased continuously. A fluctuating change has been observed at the other three airports. As a result of the study, it was determined that the air cargo traffic in Turkey is increasing day by day after the opening of Istanbul Airport and the amount of emissions emitted from airplanes has also increased accordingly. The study concludes that taking the necessary measures to reduce the environmental impacts of air transportation can be effective in reducing greenhouse gas emissions even if airplane traffic increases.

*Keywords: Air Cargo Transportation, LTO, Greenhouse Gas Emissions, Tier 2*

*This study is derived from Ayşegül Toy's masters's thesis titled "Estimating of Emissions from Cargo Airplanes: A Comparative Analysis at Turkish Airports" at Necmettin Erbakan University, Institute of Social Sciences.*