

## AIR POLLUTION DETECTION IN ROAD VEHICLES

*Şükran Elçin Tekeli<sup>1</sup>, Nilhan Duran<sup>2</sup>, Anna Golovko<sup>3</sup>, Mustafa Kızıltan<sup>4</sup>, Deniz Oğul<sup>5</sup>, Ağça Gül Yılmaz<sup>6</sup>, Irde Çetintürk Gürtepe<sup>6</sup>, Canan Esin Köksal<sup>6</sup>, Şihomi Ara Aksoy<sup>7</sup>, Ahmet Burçin Yereli<sup>4</sup>, Merih Aydıncıalp Köksal<sup>8</sup>, Gülen Güllü<sup>8</sup>*

*Hacettepe University, Clean Renewable Energies, Ankara-Turkey<sup>1</sup> Başkent University, Industrial Engineering, Ankara-Turkey<sup>2</sup> Sosyoekonomi Journal, Economics, Ankara-Turkey<sup>3</sup> Hacettepe University, Finance, Ankara-Turkey<sup>4</sup> Middle East Technical University, Environmental Engineering, Ankara-Turkey<sup>5</sup> Ministry Of Environment And Urbanization, Air Management, Ankara-Turkey<sup>6</sup> Hacettepe University, Economics, Ankara-Turkey<sup>7</sup> Hacettepe University, Environmental Engineering, Ankara-Turkey<sup>8</sup>*

Emissions from road vehicles play a significant role in the deterioration of air quality in cities. NO<sub>x</sub> and CO<sub>2</sub> emissions from road vehicles accounted for 16% of total emissions in 2016 for Turkey. The total number of vehicles registered in traffic is 22,865,921 and the share of vehicles over the age of 16 is 35%, which is higher than most of the European countries. Older vehicles have higher fuel consumption per km of travel, and also have higher pollutant emission per mass of fuel consumed than the newer ones. In this study, it is aimed to reduce the emissions from road vehicles by replacing older vehicles with new generation technology environmentally friendly vehicles. The vehicle sales between 2019 and 2030 have been estimated by using econometric model based on various economic and demographic parameters. The model results show that the passenger cars and light commercials sales are expected to reach 1,557,567 in 2030. Based on expected number of vehicle sent to scrappage and sales forecast, the total number of passenger cars and light commercials in the fleet is determined annually. Then, COPERT emission model is used to estimate the annual pollutant and greenhouse gas emissions associated with the road transport in Turkey based on five scenarios. Based on the results of the best environmentally scenario which assumes that the hybrid and electric vehicle share will increase drastically by 2030, a significant decrease in CO and NO<sub>x</sub> emission are estimated. However, CO<sub>2</sub> emissions from this scenario are expected to decrease slightly when compared with the results of the business as usual scenario.