CO2 Reduction Potential of Expanding Car Sharing Services: The case of Japan

Topic: Input-output analysis for policy making I (Chair: Francesco Tonini, Polytechnic University of Milan)
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In September 2020, the Japanese government has declared the goal of achieving a carbon-neutral, decarbonized society by 2050. Looking at CO2 emissions by sector in Japan in 2020, the transportation sector accounts for 18.6% of the total emissions. More specifically, passenger cars account for 45.9% of the total emissions from the transportation sector. Therefore, it is crucial to reduce CO2 emissions from passenger cars in order to achieve the carbon neutrality by 2050. Among the expected evolution of passenger cars in the future, car sharing service is a method that will most significantly change the way we use cars. It is important to understand the effect of expanding car sharing services on the overall CO2 emissions of passenger cars. This study develops a new framework for analyzing the life-cycle CO2 emissions of passenger cars associated with expanding car sharing services in a country. Based on the analysis framework, we quantify CO2 reduction potential of expanding car sharing services in the society through a comparison between the baseline scenario where no car sharing service exists in the society and the counterfactual scenario where the number of car-sharing users increases at a certain rate during the study period between 2009 and 2018. We assume that the percentage of owners choosing car-sharing services would gradually increase during the study period, reaching Ï•% in the final year (i.e., 2018). A comparison between the baseline and counterfactual scenarios shows that the Ï•=10% increase in car-sharing services would have led to a decrease of 6 million t-CO2-eq. during the study period, accounting for 3% of the CO2 emissions from Japanâ€™s transportation sector. This study finally presents an effective CO2 mitigation policy through improving car sharing services.