

Effects of the CAFE standards on CO2 emissions in Japan

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Since the Paris agreement was adopted on 12 December 2015, the global warming issue has become important increasingly. According to the report of the Ministry of the Environment of Japan (Ministry of the Environment of Japan, 2016), transportation sector occupied a large portion of 18% in the total amount of CO2 emissions of Japan in 2015 and especially 86% of the emissions from transportation was caused by the automobile sector (Ministry of Land, Infrastructure, Transport and Tourism, 2016). The Japanese government will introduce the Corporate Average Fuel Economy (CAFE) Standard that has been already introduced in the U.S., aiming that CO2 emissions from the transportation sector will be reduced more aggressively and the automobile market will be expanded through shifting toward a more flexible fuel regulation (Ministry of Land, Infrastructure, Transport and Tourism, 2011). This study estimated the corporate average fuel economy of the three car manufactures (Toyota, Nissan, and Honda) by using the detailed new car sales data by car models and companies in 2015 (Japan Automobile Dealers Association, 2016) and the fuel economies data by car models and companies (Ministry of Land, Infrastructure, Transport and Tourism, 2016). Using CO2 emission inventories such as environmental input-output database, we further estimated the life-cycle vehicle emissions by 15 vehicle weight classes of a company under the corporate average fuel economy case. The results show that Toyota attains the CAFE standard in 2015, whereas Nissan does not attain it. However, an important finding is that even if Toyota attains the CAFE standard, the life-cycle vehicle emission of Toyota is much higher than that of Nissan. We finally conclude that the government should introduce the CAFE standard considering the life-cycle vehicle emissions.