

Assessment of Carbon-Neutral Scenarios in the Japanese Automotive Sector for the Medium and Long Term

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The Japanese government aims to achieve carbon neutrality by 2050. It has introduced several policies for the automotive sector, including medium-term CO₂ reduction targets, strengthened fuel-efficiency standards, and the 7th Strategic Energy Plan. In this study, the authors perform scenario analyses under the framework of the 7th Strategic Energy Plan. These scenarios also incorporate technological advancements in vehicles and measures to promote the use of carbon-neutral fuels. Based on the scenario results, we estimate CO₂ emissions from the automotive sector in 2050. We also evaluate related factors such as energy consumption, fuel economy, and demand for rare metals(Fig.1~Fig.6).

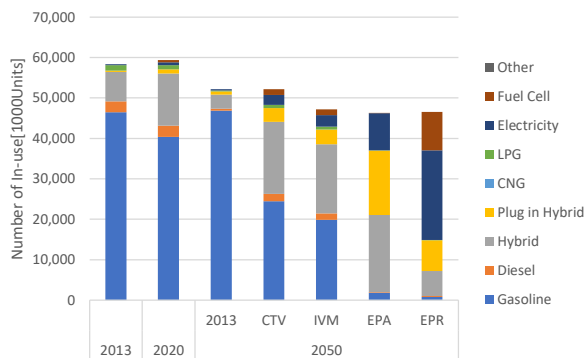


Fig.1 Number of In-use Passenger Cars

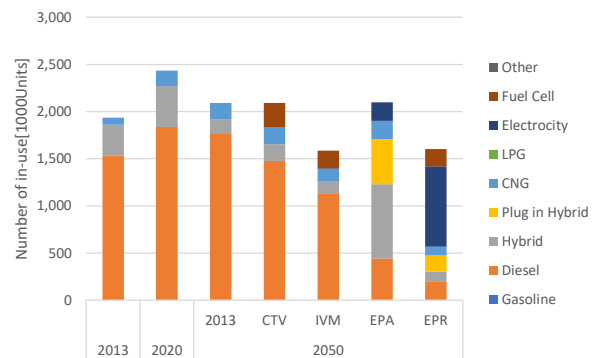


Fig.2 Number of In-use Heavy Duty Vehicles

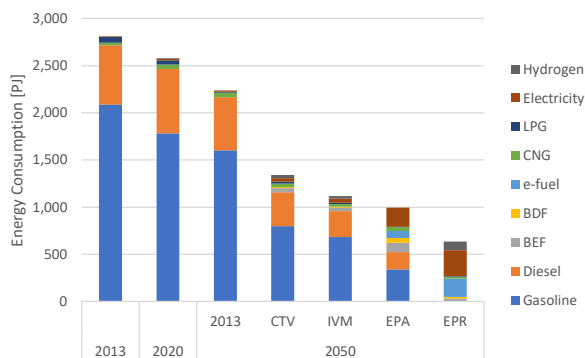


Fig.3 Energy Consumption by Energy Type (2050)

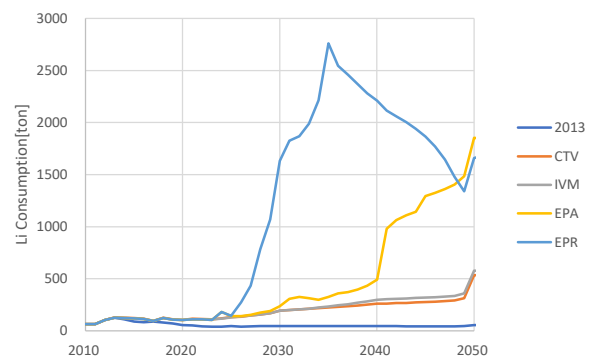


Fig.4 Lithium Consumption

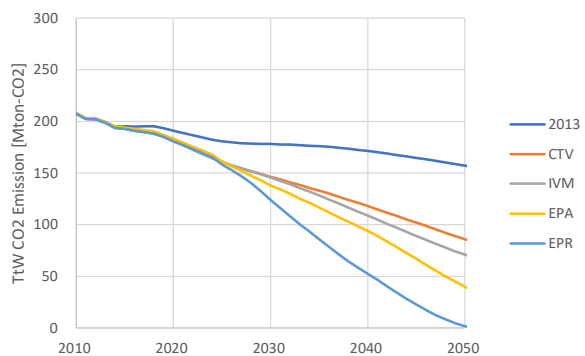


Fig.5 Tank to Wheel CO₂ Emissions of Automotive Sector

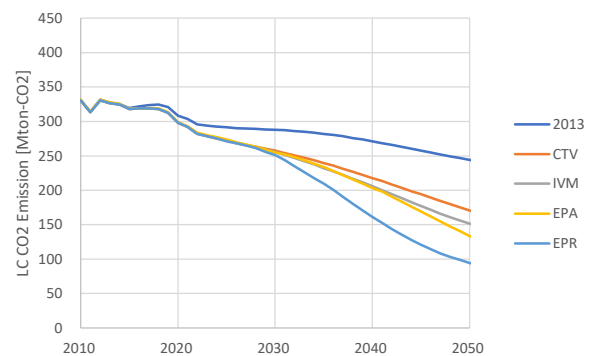


Fig.6 Life Cycle CO₂ Emissions of Automotive Sector