

Research about Zero-carbon Energy on Reduction of Carbon Emissions for Commercial Vehicles under "Dual-Carbon" Target

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Abstract

s: Driven by the "dual-carbon" target, it's best time for great development for zero-carbon energy, which is a huge role in promoting the emission reduction of commercial vehicles. Based on zero-carbon (Green Electricity, Green Hydrogen and Green Ammonia), this paper carries out the research about carbon emissions prediction between zero-carbon energy and diesel in light-duty trucks and different penetration projects of zero-carbon energy from 2020 to 2060, and the changes in the quantity of light-duty trucks (including stock, increment, scrap and total amount). The calculation results show that CO₂ emissions from Diesel is the largest, and shows a gradual upward trend in general, and reaches peak value in 2055 (1.793 billion tons). Based on different penetration projects for Green Electricity trucks, CO₂ emissions of peaking is in 2035. As penetration increases, CO₂ emissions gradually declines. Reduction of CO₂ emissions of Project_1 is 19.94% will stabilizes after 2055, however CO₂ emissions of Project_4 stabilizes after 2040 and 15 years earlier than Project_4's, and CO₂ emissions is nearly zero. The change rule of CO₂ emissions from "Diesel + Green Hydrogen" and "Diesel + Green Ammonia" is similar, and CO₂ emissions from "Diesel + Green Ammonia" is higher than that of "Diesel + Green Hydrogen". The permeability of Project_4 changes greatly, and the results is a large reduction. Based on 2020's data, and as gray ammonia is fuel, the results show that the current overall emission level can be reduced only when the CO₂ emissions level for the production of ash ammonia reduces less than 30% of the current level.

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