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Development of methodology for environmental effect analysis of electric vehicles according to energy sources

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In keeping with the global trend of suppressing the sales of internal combustion vehicles and promoting the use of eco-friendly cars, Korea has also been implementing policies for strengthening its electric car market through subsidies and building necessary infrastructure such as electric car charging stations. Furthermore, as it is expected that electric vehicles will become more common in the future and more attention is being given to the changes in the electricity mix. This goal to change the electricity mix makes it necessary to assess how such changes will affect the environmental impact of electric vehicles, which are expected to increase in number. This study, therefore, developed the methodology for environmental effect analysis of electric vehicles according to energy sources from the view point of well to wheel (WTW) based on the forecasts on electric car supply and the changes in the electricity mix. In this study total 5.0, the life cycle assessment software specifically designed for the environmental product declaration system and was used to evaluate the life cycle of electric vehicles. The inventories of fuels used by the vehicles and the energy sources were taken from the national life cycle inventory (LCI) database. The environmental impact caused by increasing electronic cars and replacing gasoline cars with electric vehicles using the changes in greenhouse gas (GHG) emissions as the indicator. Electric vehicles were found to emit 3.18 g/km of GHGs more than gasoline vehicles during the vehicle manufacturing and disposal stages. Also, assuming that the increase in electric vehicles will necessitate a 0.003% increase in electric power generation, this additional power generation will produce 0.0029 g/km of GHGs. When taken together, it became possible to predict a 61.7 g reduction in GHG emissions. In addition, greater efforts are required to make the shift to a more environmentally friendly electricity mix.

Biography

Sora Yi has completed her PhD at University of Tokyo and Postdoctoral studies from the Asian Natural Environmental Science Center. She is the Director of Division for Living Environment, Korea environment Institute. She has published more than 38 papers in reputed journals and has been serving as an Editorial Board Member of repute.

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