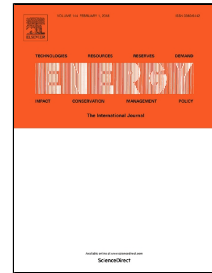


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Generation of a driving cycle for battery electric vehicles: A case study of Beijing

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Abstract

Driving cycle, which is widely adopted as a standard measurement procedure for evaluation of fuel economy, emission and driving range, can facilitate vehicle design and performance evaluation of emerging vehicular technologies. However, all current popular driving cycles are developed based on the operation characteristics of conventional vehicles, while the driving characteristics of battery electric vehicles could be quite different, which means traditional driving cycles may not be suitable for evaluating and improving battery electric vehicles. Thus it is important to develop a new driving cycle, which is consistent with real-world situations of battery electric vehicles for the development of new energy auto industry. In this study, the real-world operation data of battery electric vehicles in Beijing are collected with high frequency and the usage and driving characteristics of battery electric vehicles are analyzed based on the real-world data and compared with several standard cycles, such as New European Driving Cycle, Federal Test Procedure-75, and Japan 10-15. Then the Beijing driving cycle is developed using statistic and Markov chain method. The following evaluation proves the new developed driving cycle represents the real-world driving well, which establishes a solid foundation for accurate performance evaluation of battery electric vehicles at least in Beijing.

Keyword: battery electric vehicle; driving cycle; energy consumption

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