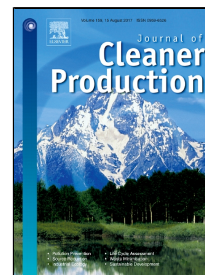


Accepted Manuscript

Development of electric vehicles for China's power generation portfolio: a regional economic and environmental analysis



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PII: S0959-6526(17)31193-9
DOI: 10.1016/j.jclepro.2017.06.024
Reference: JCLP 9774
To appear in: *Journal of Cleaner Production*
Received Date: 26 December 2016
Revised Date: 28 April 2017
Accepted Date: 04 June 2017

Please cite this article as: Yuepeng Zhang, Qinglan Han, Development of electric vehicles for China's power generation portfolio: a regional economic and environmental analysis, *Journal of Cleaner Production* (2017), doi: 10.1016/j.jclepro.2017.06.024

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Development of electric vehicles for China's power generation portfolio: a regional economic and environmental analysis

Abstract: Electric vehicles are an effective way to mitigate carbon emissions but it is not known whether this alternative approach could reduce costs and have a beneficial effect on the environment. This study compared a gasoline hybrid electric vehicle (HEV), a gasoline plug-in hybrid electric vehicle (PHEV), and an all-electric vehicle with gasoline-powered vehicles (GV) with respect to cost and environmental benefits. We did this from a life-cycle perspective and optimization of the regional power generation portfolio in order to improve the value of electric vehicles in different regions of China and assess the benefit to China both economically and environmentally. This study has demonstrated the importance of regional power generation portfolio in relation to the cost and environmental impact associated with electric vehicles, and the results demonstrate that 1) under the current power generation portfolio of China, HEV are the most cost-effective and environmental-friendly means of transport. 2) Regional optimization has the greatest potential to reduce costs and environmental impacts. 3) Electric vehicles are competitive compared to HEV on the basis of similar cost and offer more potential for reduction of carbon emissions. 4) Electric vehicles are more suitable than HEV in developed regions. Policy implications are also discussed to inform Chinese policymakers on production of electric vehicles and economic and environmental impact.

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