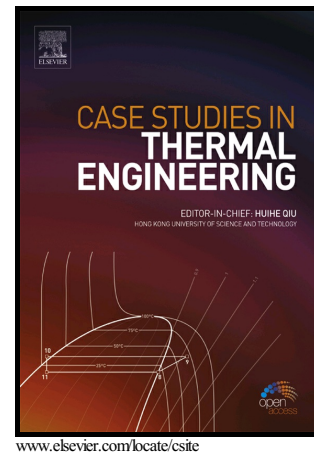


## Author's Accepted Manuscript

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PII: S2214-157X(18)30103-5  
DOI: <https://doi.org/10.1016/j.csité.2018.05.006>  
Reference: CSITE296

To appear in: *Case Studies in Thermal Engineering*

Received date: 17 April 2018  
Revised date: 8 May 2018  
Accepted date: 10 May 2018

Cite this article as: Dhruv Raj Karana and Rashmi Rekha Sahoo, Effect on TEG performance for waste heat recovery of automobiles using MgO and ZnO nanofluid coolants, *Case Studies in Thermal Engineering*, <https://doi.org/10.1016/j.csité.2018.05.006>

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**Effect on TEG performance for waste heat recovery of automobiles using MgO and ZnO nanofluid coolants**

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**Abstract**

Present study deals with the theoretical analysis for the performance comparison of automotive waste heat recovery system with EG-W, ZnO and MgO nanofluid as coolants for TEG system. Effects on performance parameters i.e. power output, conversion efficiency and circuit voltage of TEG system with exhaust inlet temperature, total area of TEG, Reynolds number and particle concentration of nanofluids for TEG system have been investigated. Theoretical performance analysis revealed enhancement in output power, conversion efficiency and voltage of the TEG system by the MgO nanofluid, followed by ZnO and EG-W coolants. The power output and the conversion efficiency using 1% vol. fraction MgO nanofluid at an inlet exhaust temperature of 500K, were enhanced by 11.38% and 10.95% respectively, as compared to EG-W coolants. The further increase of nanofluid concentration exhibited a progressive effect on output performance of the TEG system. Further analysis shows that there exists an optimal total area of TEGs for maximum output performance of the system. With MgO nanofluid as a coolant, total area of TEGs can be reduced by up to 33% as

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