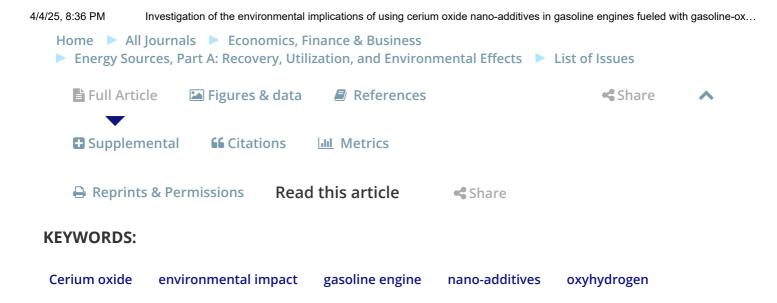


## ABSTRACT

This research aims to study the impact of incorporating cerium oxide nanoparticles into gasoline, along with oxyhydrogen injection. The engine performance and exhaust emission characteristics were analyzed in this study. The addition of nano-additives and oxyhydrogen has been found to enhance combustion characteristics by increasing the thermo-physical properties of the fuel. Cerium oxide at 25 ppm and 50 ppm enhances the engine's thermal efficiency by 6.9–10.2% and 12–18.1%, respectively, and significantly reduces fuel consumption by 3.3–18.8% and 13.3–18.7%, respectively, compared to base gasoline on a volumetric scale. Furthermore, cerium oxide at 25 ppm and 50 ppm has been shown to potentially reduce carbon

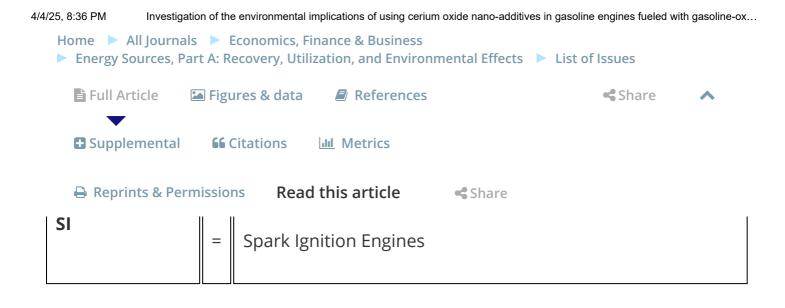


## Abbreviations

BTE	=	Brake Thermal Efficiency
CeO <sub>2</sub>	=	Cerium Oxide
CI	=	Compression Ignition Engines
со	=	Carbon monoxide
CO <sub>2</sub>	=	Carbon Dioxide
DOE	=	Design of Experiments
E	=	Ethanol

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G + HHO + 50CeO	=	100% Gasoline + 50 ppm of cerium oxide +0.20 kg/hr oxyhydrogen				
G + HHO	=	100% Gasoline +0.20 kg/hr oxyhydrogen				
G	=	Gasoline				
H <sub>2</sub> O	=	Water				
НС	=	Hydrocarbon				
нно	=	Oxyhydrogen				
HWI	=	Heated Water Injection				
NOx	=	Nitrogen Oxides				
ppm	=	parts per million				

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We would like to show our gratitude to the our institute Vel Tech Rangarajan Dr Sagunthala R&D Institute of Science and Technology, Chennai, India, for providing resources for this research in successful manner.

## **Disclosure statement**

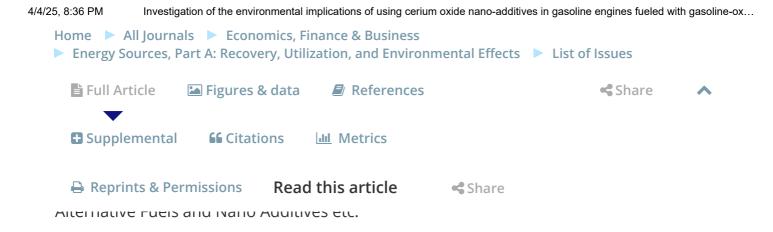
No potential conflict of interest was reported by the author(s).

# **Additional information**

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## Notes on contributors

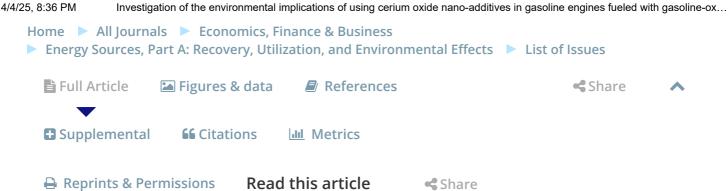


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systems and automotive engineering.

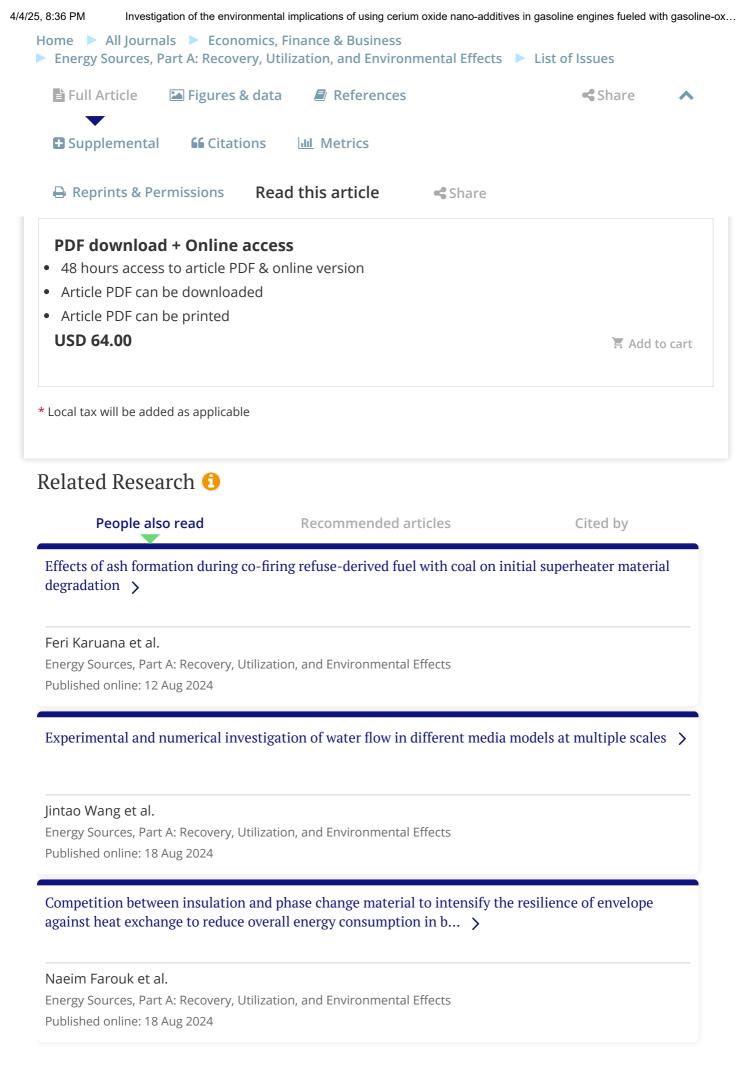
#### T Praveen Kumar

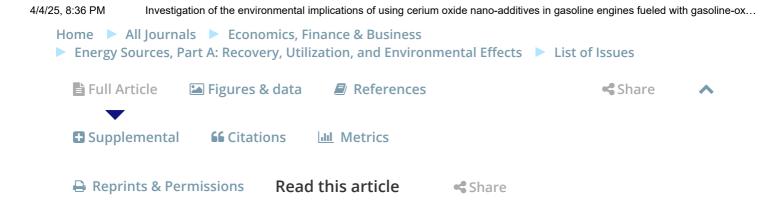
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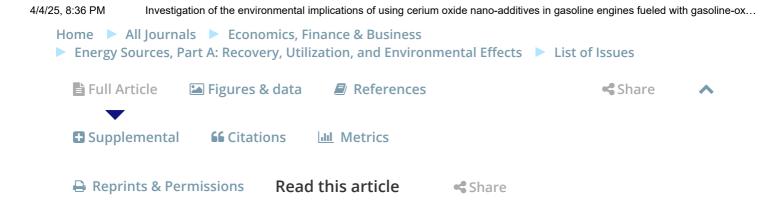
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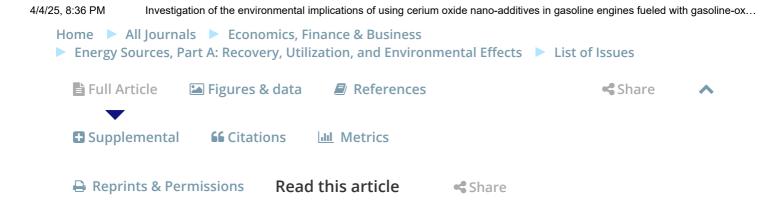
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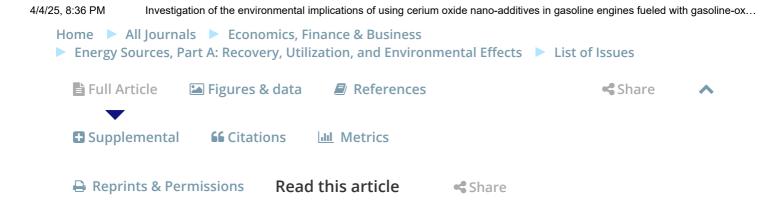
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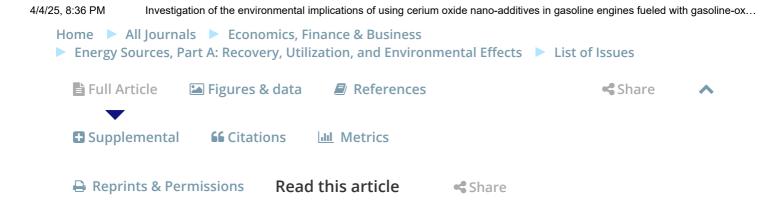


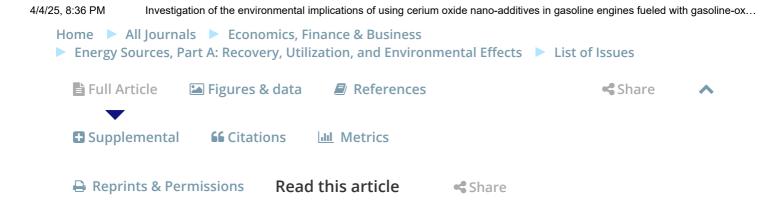












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