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Analyzing Consumer Preferences for Electric Vehicles using Online Crowd Sourced Data: Insights for Energy Policy in India

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ABSTRACT

The increasing environmental concerns and strategic government initiatives have positioned electric vehicles (EVs) as pivotal to India's climate and energy policies. Understanding consumer preferences is crucial to accelerate EV adoption and inform effective policymaking. This study analyses consumer sentiments using a comprehensive dataset from YouTube EV review videos in India, offering richer insights than other word-limited platforms. We employed Natural Language Processing (NLP) techniques, sentiment and emotional analysis with NRC and VADER lexicons, and advanced AI tools to process video transcripts. Our research identifies critical factors influencing consumer attitudes, such as cost, charging time, range, and charging infrastructure. Topic modelling methods, including Latent Dirichlet Allocation (LDA) and Nonnegative Matrix Factorization (NMF) were applied to identify prominent topics discussed by the consumers. A significant part of our analysis examined the influence of media content, particularly YouTube titles and subtitles, on public perception. We observed that misleading practices like clickbait distort consumer views, often creating misconceptions about EVs. Our findings reveal a growing positive sentiment driven by technological advances and environmental awareness, yet significant concerns persist regarding high costs and infrastructure limitations. Policy recommendations include expanding charging infrastructure, offering financial incentives, regulating misleading content and launching targeted awareness campaigns to highlight EV benefits. This research provides actionable insights for policymakers, manufacturers, and stakeholders, aligning climate and energy strategies with consumer needs and fostering sustainable transportation.

Keywords: EV adoption; EV policy; Public Shift; Sustainable Transportation; YouTube Sentiment Analysis