PRESS RELEASE

The number of vehicles in Bengaluru will increase by 1.5 times in 2030, but the addition of 2.3M electric vehicles will prevent approximately 3.3M tonnes of CO_2 emissions

For Immediate Release

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The on-road vehicle stock in Bengaluru is expected to grow by 1.5 times, with the total vehicular population projected to increase from 5.7M to 8.9M by 2030. Of note, the city's electric vehicle (EV) fleet is projected to grow from 75,000 to 2.3M, with the most significant increase in the number of two wheelers, followed by three and four wheelers. However, despite the addition of 3.2M vehicles by 2030, CO_2, nitrogen oxides (NOx), and particulate matter (PM) emissions are expected to increase by only 25%, 13%, and 8%, respectively, owing to the deployment of EVs, according to a study by a Bengaluru-based think tank—the Center for Study of Science, Technology and Policy (CSTEP). Further, to aid in the green transition of the transport sector, the study suggests that the share of renewable energy sources in the overall energy mix should be enhanced. The study notes that of the city's 3.2GW of rooftop solar potential, roughly 40% coverage will be sufficient to meet the entire charging demand of all EVs in 2030.

The study titled '*Bengaluru 2030: Impact of EVs on Vehicular Emissions*' exemplified the impact of electrification on the tailpipe emissions of all vehicles plying in Bengaluru and determined the overall impact on the electrical grid managed by Bangalore Electricity Supply Company (BESCOM).

In India, the transportation sector accounts for roughly **10% (290 million tonnes) of the total CO_2 emissions per year**, with road transport being the leading contributor. A previous CSTEP study (2022) concluded that vehicle electrification is an efficient means to curb vehicular emissions and significantly reduce sources of urban pollution, such as $PM_{2.5}$, PM_{10}, NOx, and black carbon.

In the current study, the on-ground vehicle stock in the last 20 years (2001–2021) in Bengaluru was obtained. In addition to relying on the transport department's vehicle registration data to estimate the number of on-road vehicles, the study accounted for the vehicles that were retired and slated for retirement (through projections). This approach could more accurately account for the number of on-road vehicles in the city. The vehicle population was projected to the horizon year (2030) by extending the past growth trends in each vehicle class. The projections revealed that the **on-road vehicle stock grows 1.5 times**, at an overall growth rate of 5%.

During the same period, the **city's EV fleet is projected to grow at a weighted average compound annual growth rate (CAGR) of 56%**. Electric two wheelers (e2Ws) will experience the most significant growth (2M vehicles in 2030), followed by electric four wheelers (e4Ws; 140k vehicles) and electric three wheelers (e3Ws; 130k vehicles). If this growth is sustained till the horizon year, **100% EV sales penetration can be witnessed in 2030** for all vehicle classes except for four wheelers.

The study also found that the **switch to EVs could help avoid emissions of roughly 3.3M tonnes of CO_2/year**, i.e. greenhouse gas emissions would only increase by ~1.25 times (from 11.1M tonnes to 13.8M tonnes of CO_2). This finding can be directly attributed to the deployment of 2.34M EVs with zero tailpipe emissions, which is equivalent to the removal of 4.85M conventional two wheelers plying in Bengaluru. In addition, the projected EV fleet size will contribute to an overall reduction of NOx, $PM_{2.5}$, and PM_{10} emissions. Further, the increased adoption of e2Ws can help curb tailpipe emissions for all three pollutant classes from these vehicles. However, four wheelers would remain the largest source of emissions, as e4Ws showed the lowest penetration among all analysed vehicle classes.

The study also examined the energy requirement for charging the projected EV fleet based on the daily distance travelled by each vehicle class. For the 2.34M projected EVs, approximately **6.2M units of electricity will be needed to meet the daily energy requirement for charging**. Currently, 55% of BESCOM's energy mix is generated from thermal power plants. To ensure a completely green transition, a combination of renewable energy sources, such as solar, wind, biomass, and hydro, available in Karnataka should be used for power generation. For instance, to fulfil the charging requirements of all projected EVs, **1.37 GW of rooftop solar installations (total rooftop area of 16.4 sq km) will be sufficient**, which is an achievable target considering the city's rooftop solar potential of 3.2 GW.

This analysis provides an overview of the EV growth projections and estimates the trends in vehicular tailpipe emissions for the next 7 years in Bengaluru.

The full report is available **here**.

For more details and interviews, please write to us at cpe@cstep.in

About CSTEP: The Center for Study of Science, Technology and Policy (CSTEP) is one of India's leading think tanks, involved in solving Grand Challenges that the country faces. These include Sustainable and Secure Future, India's Green Energy Transition, Clean Air for All, and Digital Transformation.