Press Release

Bengaluru among cities with the highest PM2.5 emissions from DG sets

For Immediate Release

Key Takeaways

- Many districts in Rajasthan, Uttar Pradesh, West Bengal, and Maharashtra show high $PM_{2.5}$ emissions, driven by high installed capacities of DG sets and frequent power cuts.
- Patna (Bihar), Gautam Buddha Nagar (Noida), Bengaluru Urban (Karnataka), Mumbai City (Maharashtra), and North 24 Parganas (West Bengal) have the highest $PM_{2.5}$ emissions from DG sets.
- The Indian DG set market is projected to grow at a compound annual growth rate (CAGR) of 8.8% by 2030.
- Solar photovoltaic systems with storage offer 100% emission reduction potential but currently only meet about 30% of the DG set demand, owing to high costs and land needs.
- Natural gas generators can offer a reduction of over 95% in primary $PM_{2.5}$ emissions. However, key challenges include high initial costs, a poor network of gas pipelines in remote areas, and safety risks.

Bengaluru, 21 August 2025

Bengaluru Urban, Mumbai, Patna, Gautam Buddha Nagar in Noida, and North 24 Parganas in West Bengal have the highest $PM_{2.5}$ emissions from diesel generator (DG) sets, with serious implications for human health and well-being. In its study, *Switch on, Smoke off: Reducing Emissions from Diesel Generator Sets*, the Center for Study of Science, Technology and Policy (CSTEP), a Bengaluru-based think tank, also estimated that many districts in Rajasthan, Uttar Pradesh, West Bengal, and Maharashtra have high $PM_{2.5}$ emissions, driven by DG sets.

The study found that a total of 14.7 lakh DG sets were operational in India in 2022. These DG sets contributed to 42 Gg of $PM_{2.5}$, 23 Gg of black carbon, and 877 Gg of nitrogen oxides (NO_X). The report was launched at the India Clean Air Summit 2025 on Wednesday.

With the DG set market in India forecasted to grow at a compound annual growth rate (CAGR) of 8.8% by 2030, promoting reliable and cost-effective alternatives is critical. Given this, the report suggests the use of solar DG sets, newer DG sets like CPCB IV+ with stringent emission controls, gas-based solutions, and retrofit emission control devices (RECDs) to mitigate air pollution.

Solar photovoltaic systems with storage offer 100% emission reduction potential but currently meet only about 30% of the DG set demand owing to high costs, land needs, and reliability concerns. Natural gas generators are another clean option, offering up to over 95% reduction in primary $PM_{2.5}$ emissions. However, key challenges include high initial costs, a poor network of gas pipelines in remote areas, and safety risks.

Broader policy (e.g. a national scrappage policy for outdated/super-emitter units) and economic support (e.g. financial incentives for rooftop photovoltaic systems incorporating battery storage or for the purchase of CPCB IV+ DG sets) are necessary to scale these measures and effectively reduce air pollution.

Older or poorly maintained diesel engines can violate emission standards set by the CPCB and emit significantly more than the permissible limits. These ageing units, which significantly contribute to air pollution, particularly in urban areas with frequent power outages, are super-emitters. Identifying them is essential. The study recommends that the government mandate regular emission testing to identify non-compliant units and implement corrective measures, such as retrofitting or replacement.

Similarly, in industrial areas where the government is expanding the PNG infrastructure, mandating the use of gas-based generators offers a cleaner alternative to diesel.

The full report is available **here**.

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

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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.

About CSTEP's Air Quality Sector: We are working with state pollution control agencies and the Central Pollution Control Board to scientifically identify the sources of pollution for effective and targeted interventions. With the use of emerging technologies such as low-cost sensors, mobile monitoring, and satellite-based monitoring of air pollution, CSTEP is looking at ways to make data on air pollution comprehensive, robust, and accessible.