

Press release

## **One third of the problem still ignored: Why the NCAP must target the source of gases that form PM<sub>2.5</sub>**

**New Delhi, 27 June 2025** – A new analysis from the [Centre for Research on Energy and Clean Air \(CREA\)](https://energyandcleanair.org) reveals that secondary pollutants, particularly ammonium sulfate formed from the reaction between sulfur dioxide (SO<sub>2</sub>) and ammonia (NH<sub>3</sub>) in the atmosphere, are responsible for one-third of India's fine particulate matter (PM<sub>2.5</sub>) pollution. This widespread presence of ammonium sulfate has been observed across nearly all National Clean Air Programme (NCAP) cities, irrespective of their proximity to major emission sources, due to the transboundary nature of pollution.

CREA's study shows that the nationwide average concentration of ammonium sulfate is 11.9 µg/m<sup>3</sup>, accounting for approximately 34% of the PM<sub>2.5</sub> mass. SO<sub>2</sub> is the main driver of ammonium sulfate formation and more than 60% of SO<sub>2</sub> emissions in India originate from coal-fired thermal power plants. This makes them a critical target for reducing secondary PM<sub>2.5</sub> pollution through the implementation of flue gas desulfurization (FGD) systems.

Also, ammonium sulfate concentration is 2.5 times higher within 10 km of coal-fired power plants (15 µg/m<sup>3</sup>) compared to areas beyond 10 km (6 µg/m<sup>3</sup>). While the contribution to PM<sub>2.5</sub> is 36% near coal-fired thermal power plants, it remains significant at 23% in other areas, indicating both local and transboundary impacts of SO<sub>2</sub> emissions.

Across the 130 NCAP cities, concentrations ranged from 3.9 to 22.5 µg/m<sup>3</sup>, with the share of PM<sub>2.5</sub> from ammonium sulfate ranging between 20% and 43%. Notably, ammonium sulfate made up more than 30% of the total PM<sub>2.5</sub> levels in 114 out of 130 NCAP cities.

This evidence makes clear that India's air pollution challenge cannot be effectively tackled without addressing the sources of the growing burden of secondary particulate matter. What makes secondary pollution especially challenging is its ability to travel across city and state boundaries, affecting air quality in regions far away from the original source of emissions. This transboundary nature means that even cities without large local emission sources may experience high levels of PM<sub>2.5</sub> due to the drift of secondary particles.

In addition to ammonium sulfate, other secondary pollutants like ammonium nitrate also contribute significantly to PM<sub>2.5</sub> mass. In fact, secondary particles can account for up to 50% of total PM<sub>2.5</sub> mass. Therefore, it is crucial for the NCAP to prioritize controlling secondary sources.

The current NCAP primarily focuses on reducing PM<sub>10</sub>. However, PM<sub>2.5</sub> is far more toxic to human health because it penetrates deeper into the lungs and enters the bloodstream, increasing the risk of heart disease, lung disorders, and premature death. Despite this, PM<sub>2.5</sub> has not received adequate focus in clean air action plans, and the role of precursor gases (SO<sub>2</sub>, NO<sub>2</sub> and NH<sub>3</sub>) in forming PM<sub>2.5</sub> has been largely overlooked.

To make real progress, the NCAP must evolve to include targeted measures for reducing secondary pollutants, with city and state-level clean air action plans explicitly addressing major sources of precursor gases such as coal-fired thermal power plants, fertilizer application, and agricultural livestock waste.

*‘Alongside targeted strategies such as deploying flue-gas desulfurization in coal-fired thermal power plants to reduce sulfur dioxide and promoting efficient fertilizer management to reduce ammonia, it is essential that all polluting sectors fully comply with existing emission norms. Ensuring both source-specific actions and regulatory compliance is critical for reducing precursor gas emissions and tackling the growing burden of secondary PM<sub>2.5</sub> pollution in India,’* said Manoj Kumar, Analyst at CREA.

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## Contact

Manoj Kumar, Analyst, Centre for Research on Energy and Clean Air (CREA)

Contact: +91 9842350543

Mail: [manojkumar@energyandcleanair.org](mailto:manojkumar@energyandcleanair.org)

## About CREA

The Centre for Research on Energy and Clean Air (CREA) is an independent research organisation focused on revealing the trends, causes, and health impacts, as well as the solutions to air pollution. We use scientific data, research and evidence to support the efforts of governments, companies and campaigning organisations worldwide in their efforts to move towards clean energy and clean air. [www.energyandcleanair.org](http://www.energyandcleanair.org)