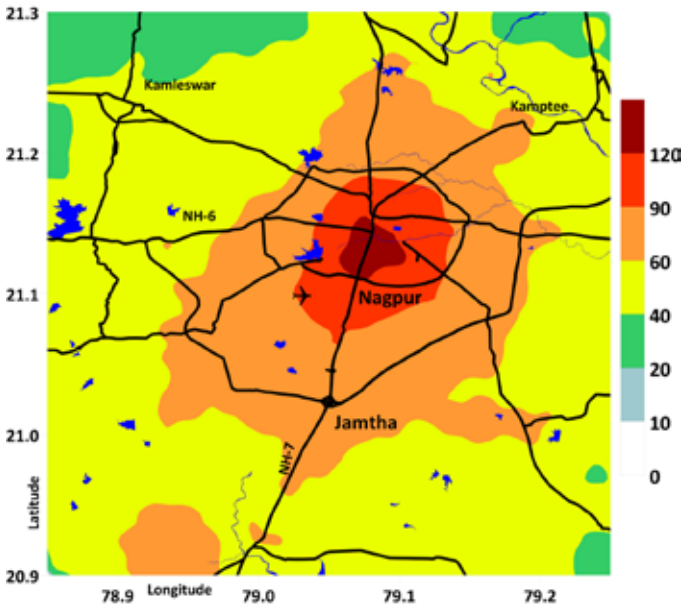
Modeled annual average $PM_{2.5}$ concentration (2015) µg/m³



For urban Nagpur, average $PM_{2.5}$ concentration was 84.9 ± 19.1 µg/m³. This is twice the national standard (40) and more than 8 times the WHO guideline (10).

Air monitoring infrastructure

Nagpur has 1 Continuous Air Monitoring Station (CAMS) reporting data for all the criteria pollutants and 7 manual stations reporting data on PM_{10}, SO_2, and NO_2. There should be at least 22 CAMS in the city for efficient reporting.

Annual averages from the national ambient monitoring program (2011-2015) µg/m³

PM_{10}	NO_2	SO_2
192.1 ± 112.5	64.7 ± 36.0	20.7 ± 18.8

Trend in $PM_{2.5}$ concentrations, based on satellite observations and global model simulations (1998-2014) µg/m³

URBAN emissions .info

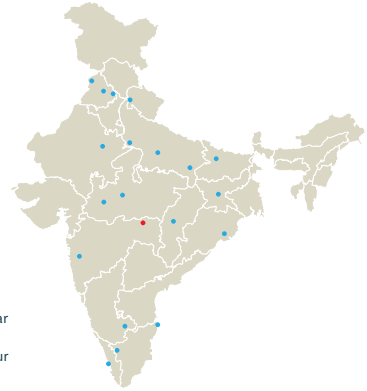
SHAKTI SUSTAINABLE ENERGY FOUNDATION

APnA CITY PROGRAM

Clearing the air with data

The Air Pollution Knowledge Assessment (APnA) City Program

Clearing the air with data



• Agra • Amritsar • Bengaluru • Bhopal • Bhubaneswar
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• Indore • Jaipur • Kanpur • Kochi • Ludhiana • Nagpur
• Patna • Pune • Raipur • Ranchi • Varanasi

Designing an effective Air Quality Management (AQM) plan for a city requires robust data on levels of pollution, affected areas, source contributors, peaking trends and possible control mechanisms.

The Air Pollution Knowledge Assessment (APnA) City Program seeks to make this database available and also serve as a starting point for understanding air pollution.

The program, implemented by Urban Emissions and facilitated by Shakti Sustainable Energy Foundation, seeks to create a comprehensive, city-specific information pool by pulling together data from disparate sources, surveys, mapping and atmospheric modeling.

Policy options based on this information, and their implementation, would be the effective next steps in improving the air quality of our cities.

www.urbanemissions.info

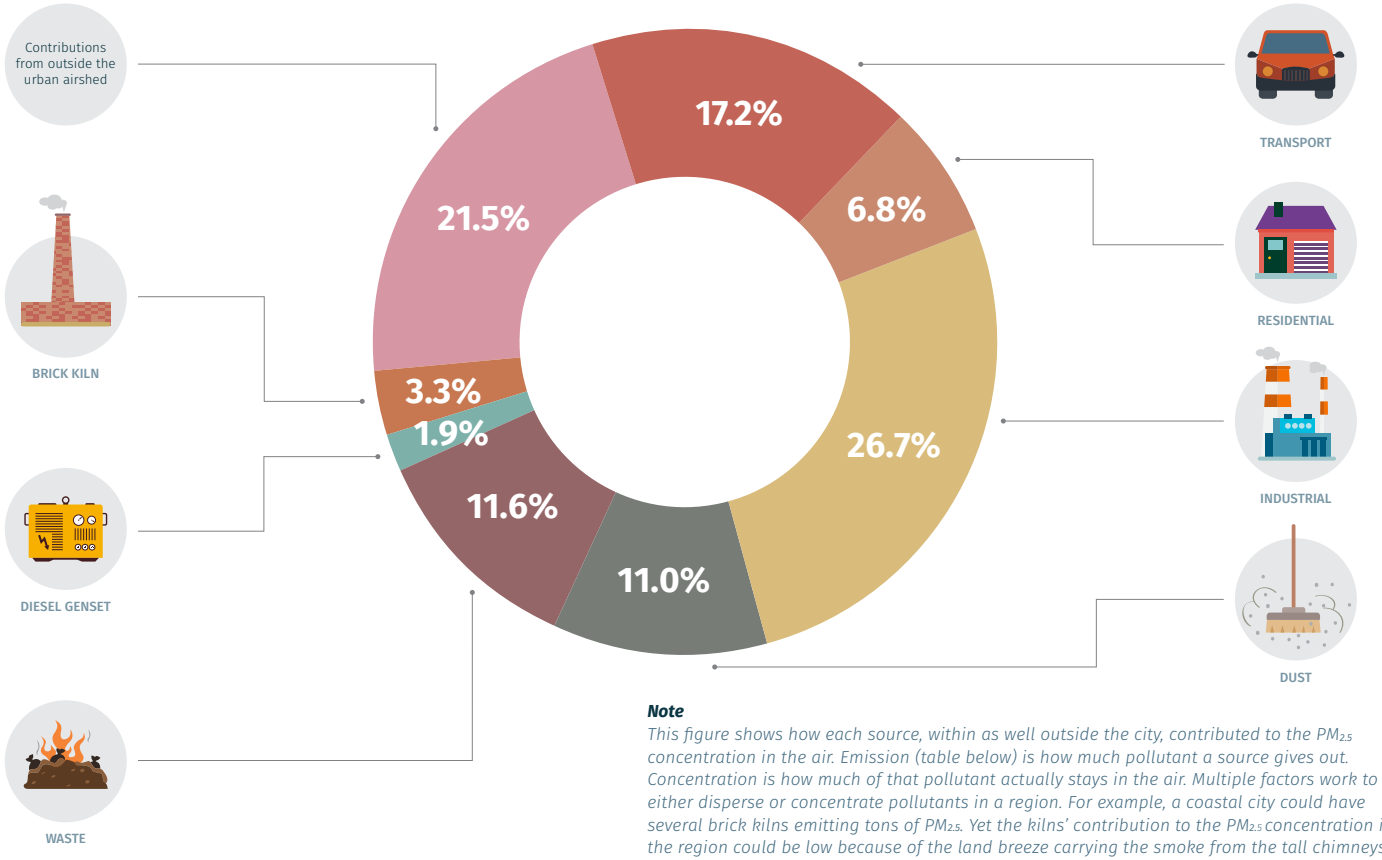
Photo: Sankara Subramanian [CC BY 2.0]

Nagpur

The air quality in this city of oranges is tending towards red. The $PM_{2.5}$ level is twice the national standard.

For detailed information on Nagpur Air Quality, visit **www.urbanemissions.info/india-apna**

$PM_{2.5}$ concentration : source–wise percentage share in 2015



Note

This figure shows how each source, within as well outside the city, contributed to the $PM_{2.5}$ concentration in the air. Emission (table below) is how much pollutant a source gives out. Concentration is how much of that pollutant actually stays in the air. Multiple factors work to either disperse or concentrate pollutants in a region. For example, a coastal city could have several brick kilns emitting tons of $PM_{2.5}$. Yet the kilns' contribution to the $PM_{2.5}$ concentration in the region could be low because of the land breeze carrying the smoke from the tall chimneys to the sea. To know how source concentration is calculated please visit the APnA city website.

$PM_{2.5}$ emissions : source–wise share in tons in 2015 and 2030 (projected)

5,050	950	55,650	2,200	1800	400	1050
7,550	1,100	64,400	3,800	2,600	450	1,350

Total emissions in 2015 = 67,100 tons | Total emissions in 2030 = 81,250 tons

Findings & Recommendations

- The modeled source contributions present an even share of transport (including on-road dust), domestic cooking and heating, industries, open waste burning, and influence of outside sources as the key air pollution sources in the urban area.
- In 2015, an estimated 21% of the ambient annual $PM_{2.5}$ pollution originated outside the urban airshed; some regional interventions could reduce the pollution loads. This contribution stemmed largely from coal-fired power plants, large (metal and non-metal processing) industries, and brick kilns located outside the urban airshed.
- The city needs to aggressively promote public and non-motorized transport and improveme road infrastructure to reduce on-road dust re-suspension.
- By 2030, the vehicle exhaust emissions are expected to remain constant, if and only if, Bharat 6 fuel standards are introduced nationally in 2020, as recommended by the Auto Fuel Policy.
- By 2030, the share of emissions from residential cooking and lighting is expected to decrease with an increase in LPG consumption, residential electrification and urbanization. However, since biomass and coal is easily available, their use will continue unless there is an aggressive program for a 100% technology shift to cleaner options.
- The 120 brick kilns in the urban airshed(largely clamp style), are fueled mostly by coal and agri-waste. A technology upgrade to (for example) zig-zag and fixed-chimney kilns can make them more energy efficient. Coal-fired power plants need to enforce stricter environmental standards for all the criteria pollutants.
- Open waste burning is dispersed across the city and requires stricter regulations for addressing the issue.