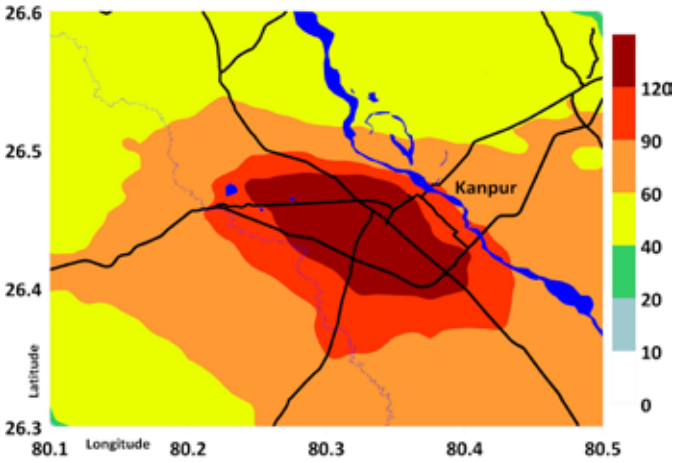
Modeled annual average $PM_{2.5}$ concentration (2015) µg/m³



For urban Kanpur, average $PM_{2.5}$ concentration was 114.1 ± 25.6 µg/m³. This is almost 3 times the national standard (40) and more than 11 times the WHO guideline (10).

Air monitoring infrastructure

Kanpur has 1 Continuous Air Monitoring Station (CAMS) reporting data for all the criteria pollutants and 8 manual stations reporting data on PM_{10}, SO_2, and NO_2. There should be at least 27 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
421.1 ± 188.5	70.7 ± 32.0	14.0 ± 11.7

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

URBAN emissions .info

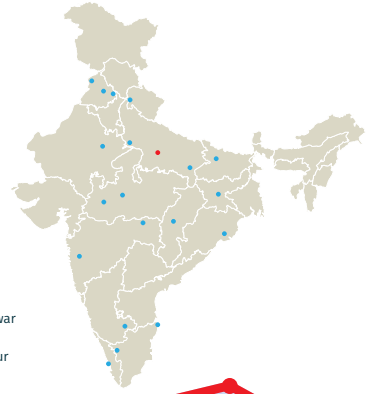
SHAKTI SUSTAINABLE ENERGY FOUNDATION

APnA CITY PROGRAM

Clearing the air with data

The Air Pollution Knowledge Assessment (APnA) City Program

Clearing the air with data



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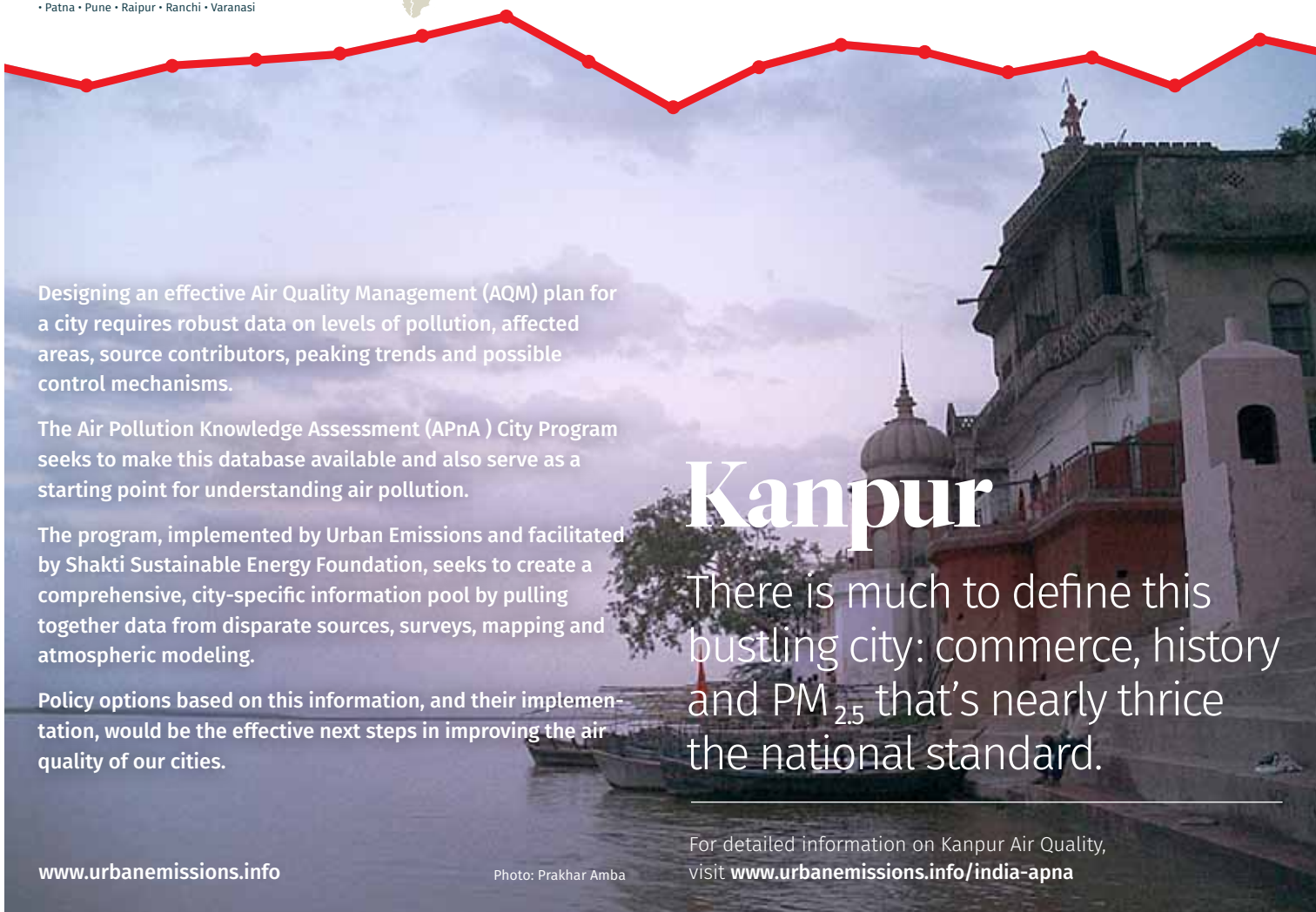
• Indore • Jaipur • Kanpur • Kochi • Ludhiana • Nagpur
• Patna • Pune • Raipur • Ranchi • Varanasi



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.

Kanpur

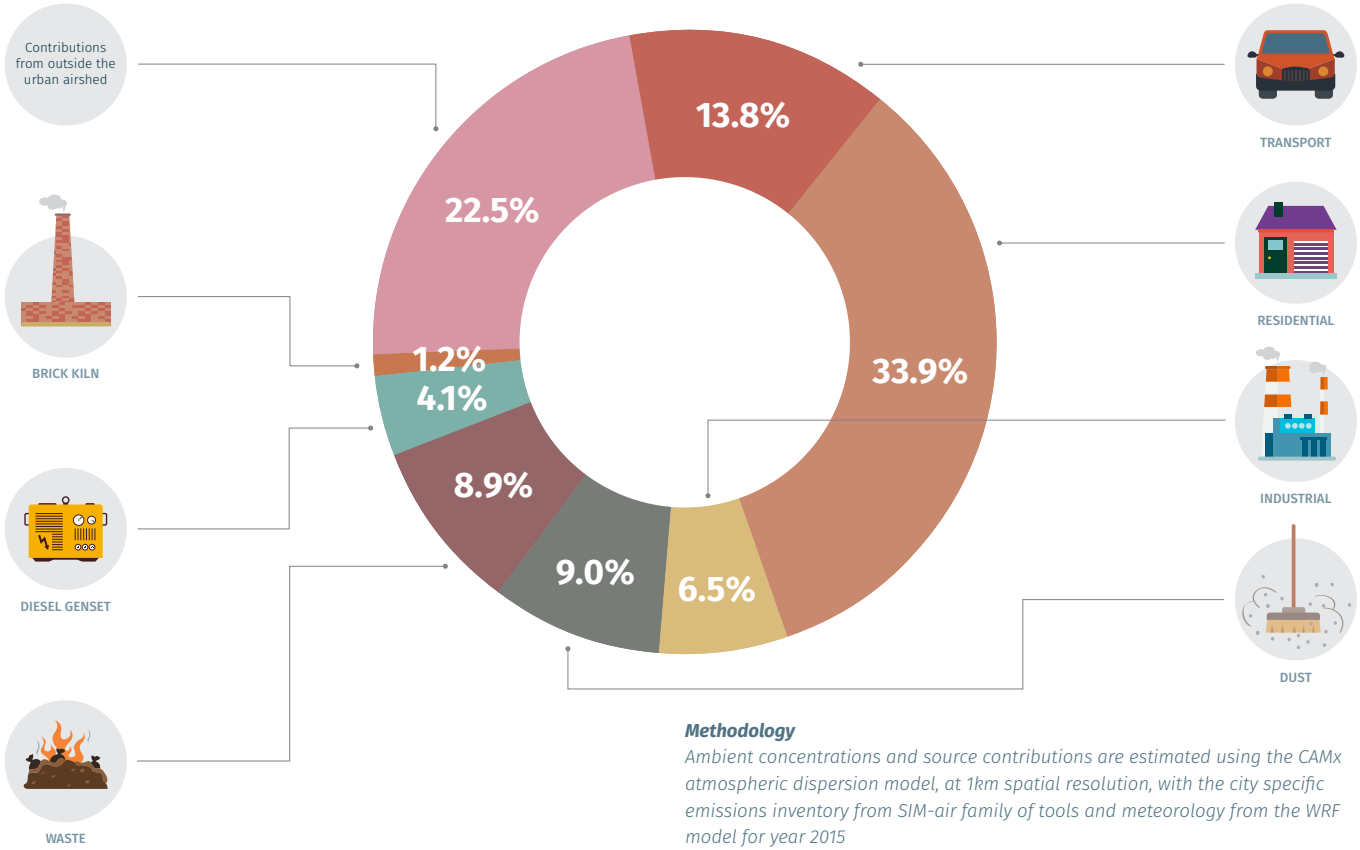
There is much to define this bustling city: commerce, history and $PM_{2.5}$ that's nearly thrice the national standard.

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

www.urbanemissions.info

Photo: Prakhar Amba

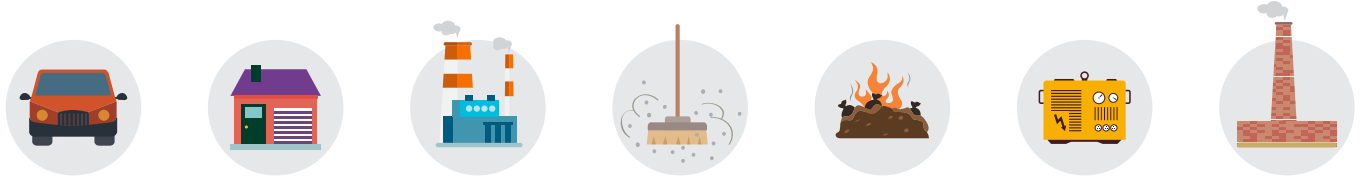
How various sources contributed annually to the modeled ambient $PM_{2.5}$ concentrations in 2015



Methodology

Ambient concentrations and source contributions are estimated using the CAMx atmospheric dispersion model, at 1km spatial resolution, with the city specific emissions inventory from SIM-air family of tools and meteorology from the WRF model for year 2015

$PM_{2.5}$ estimated annual emissions inventory: 2015 and 2030



9.0%	14.2%	62.1%	4.1%	3.9%	2.3%	4.5%
10.9%	14.6%	56.0%	6.3%	4.9%	2.4%	5.0%

Total emissions in 2015 = 34,550 tons **Total emissions in 2030 = 39,850 tons**

Findings & Recommendations

- The modeled source contributions highlight transport (including on-road dust), domestic cooking and heating, industries (small and medium) and open waste burning as the key air pollution sources in the urban area.
- The city has an estimated 23% of the ambient annual $PM_{2.5}$ pollution (in 2015) originating outside the urban airshed, which strongly suggests that air pollution control policies in the Indo-Gangetic plain need a regional outlook.
- The city needs to aggressively promote public and non-motorized transport as part of the city's urban development plan, along with the improvement of the road infrastructure to reduce on-road dust re-suspension.
- By 2030, the share of emissions from residential cooking and lighting is expected to decrease with a greater share of LPG, residential electrification, and increasing urbanization. However, biomass and coal burning to provide warmth in the winter will still be an issue.
- 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.
- The 125 brick kilns in the urban airshed (and more outside) are fueled mostly by coal, agri-waste, and other biomass. These kilns can benefit from a technology upgrade from the current fixed-chimney and clamp-style baking to (for example) zig-zag.
- Most of the small and the medium industries need an energy efficiency plan to address the emissions from coal, heavy fuel oil and gas combustion, or shift towards using electricity.
- Open waste burning is dispersed across the city and requires stricter regulations for addressing the issue; garbage generation is increasing but not the city's capacity to sort and dispose it.