

# What are Jakarta's main sources of air pollution?

Information on leading sources is needed to identify the most effective clean air solutions.

- Annual average PM<sub>2.5</sub> concentrations in Jakarta are four to five times higher than the World Health Organization's health-based Air Quality Guidelines (10ug/m<sup>3</sup> annual PM<sub>2.5</sub> average).
- Rapid development in Jakarta has worsened air quality in recent years.
- Among all Indonesian provinces, DKI Jakarta accounts for the largest percentage of deaths related to air quality.<sup>1</sup>

## Source apportionment study in Jakarta

Air quality experts from Bandung Institute of Technology collected air pollution samples (PM<sub>2.5</sub> filters) from three urban background locations in Jakarta—Gelora Bung Karno (GBK), Kebon Jeruk (KJ) and Lubang Buaya (LB)—during the wet (October 2018–March 2019) and dry seasons (July–September 2019). Samples were analyzed for their chemical composition to identify leading sources of air pollution during each season.



32–41% (wet) | 42–57% (dry)

### Vehicular emissions



11% (wet) | 9% (dry)

### Open burning of biomass and other fuels



6–16% (wet) | 1–7% (dry)

### Secondary aerosol<sup>4</sup>



1–6% (wet) | 9% (dry)

### Paved road dust



14% (wet)

### Coal combustion



10–18% (dry)

### Resuspended soil particles<sup>2</sup>



13% (wet)

### Construction activities



1–10% (wet) | 19–22% (dry)

### Sea salt<sup>2,3</sup>

<sup>1</sup> Institute for Health Metrics and Evaluation. GBD Compare. Retrieved from <https://vizhub.healthdata.org/gbd-compare/>.

<sup>2</sup> Natural sources

<sup>3</sup> Sea salts are formed due to wind action at the ocean surface.

<sup>4</sup> Secondary inorganic aerosol such as ammonium nitrate and ammonium sulfate are formed within the atmosphere as a result of chemical reactions, that is, conversion from precursor gaseous pollutants e.g., nitrogen oxides and sulfur oxides.

## Solutions to Air Pollution in Jakarta

The following proven solutions can rapidly improve air quality, promote public health and save lives:



### Control Vehicle Exhaust

- Implement control strategies that target fuel quality and emissions control standards, compulsory emissions testing, and clean vehicle technologies
- Maintain roads
- Accelerate the expansion of public transit systems
- Modernize emissions requirements for vehicles to the latest standards



### Reduce Coal Combustion

- Introduce stringent emission standards for coal-based industries, including power generation
- Monitor and maintain emission levels through regular inspections and reporting
- Mandate the installation of continuous emission monitoring systems (CEMS), and install air filtering tools and cleaner production technologies
- Switch to cleaner fuel and expand to renewable energy



### Enforce Bans on Open Burning

- Strengthen enforcement of the ban on open burning of biomass (Local Government Regulation No. 2/2005)
- Improve waste collection and supporting services and conduct regular campaigns on cleaning and awareness
- Include open burning of other fuels or materials in the ban



### Control Construction and Paved Road Dust, and Exposed Soil

- Water all exposed soils and surfaces in construction sites and roads
- Apply dust suppressants (e.g., chemical reagents) to maintain wet surfaces
- Cover vehicles transporting soil or sand
- Plant appropriate vegetation to maintain soil moisture

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For further details, visit [www.vitalstrategies.org/source-apportionment-report](http://www.vitalstrategies.org/source-apportionment-report).