

**INDIA'S EFFORTS TO IMPROVE
AIR POLLUTION, JAPAN'S
COOPERATION AND
FUTURE DIRECTIONS**



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10 Japan Cooperation on Air Pollution

AIR POLLUTION IN INDIA: AN OVERVIEW

01

Constitutional Mandate for Clean Environment:

India is committed to pollution-free air and water, as mandated in the constitution

02

Implementation of Environmental Commitments:

- Administrative measures and statutes to address environmental conservation and SDGs
- The Air (Prevention and Control of Pollution) Act, 1981, enacted under Art. 253

03

Challenges of a Growing Economy:

- India being the populous country, is putting every effort to sustainably meet its population needs
- Accelerated industrial and infrastructural activities in the past three decades contribute to challenges

04

Inherent Disadvantages:

- The Indo-Gangetic plain is essentially landlocked, the Himalayas prevent polluted air from escaping to the north creating the so called "valley effect" and dry alluvial soil significantly contributes to wind-blown dust, compounds the air pollution woes for the region

AIR POLLUTION IN INDIA: AN OVERVIEW

05

Rise in Air Pollution:

- Vehicular, industrial and infrastructural growth leads to manifold increases in air pollution, affecting towns and cities
- Recent years show a surge in pollution, impacting non-attainment cities

06

Air Pollution Emission Sources:

- Multiple sectors contribute to air pollution, including power, transport, industry, residential, construction, and agriculture
- Fossil fuel combustion contributes to both air pollution and global climate change

07

Local Air Quality and Specific Pollutants:

- As per the data gathered over the years under National Air Quality Monitoring Programme (NAMP), PM10 and PM2.5 are the major pollutants exceeding their NAAQS limit
- Other pollutants such as SO_x, NO_x, and ozone (O₃) are mostly observed to be within their NAAQS limit

08

Health Concerns and Ambiguous Statistics:

- Rise in air pollution is impacting public health
- Perplexing international statistics correlating air pollution with health impacts without the use of indigenous dose response functions, further complicate public perception

CHALLENGES FACED BY INDIA



Challenges in Regional Air Quality Cooperation:

Inadequate information exchange hampers collaborative efforts



Public Indifference:

The lack of public interest in the emission control measures



Data Reliability Issues in Indian Cities:

Limited monitoring infrastructure leads to unreliable air quality data



Research Gap in Medium-Scale City Pollution:

Lack of research on pollution concentrations in expanding medium-scale cities



Traffic Inefficiency:

Inefficient traffic management lead to congestions resulting in rise in pollutant concentration

INDIA'S APPROACH TO TACKLE AIR-POLLUTION



Legislation and Policies

India implements laws like the Air (Prevention and Control of Pollution) Act and formulates policies like the National Clean Air Program (NCAP)



Collaborative Governance

The government collaborates with Central Ministries, State Governments, and stakeholders to develop and implement air pollution control measures



Identification of Polluted Cities

The Central Pollution Control Board (CPCB) identifies polluted cities based on National Ambient Air Quality Standards (NAAQS) violations



Data-Driven Action

Utilizing ambient air quality data, particularly for pollutants like PM10, PM2.5, and NO₂, informs targeted interventions in non-attainment cities



Global Engagement

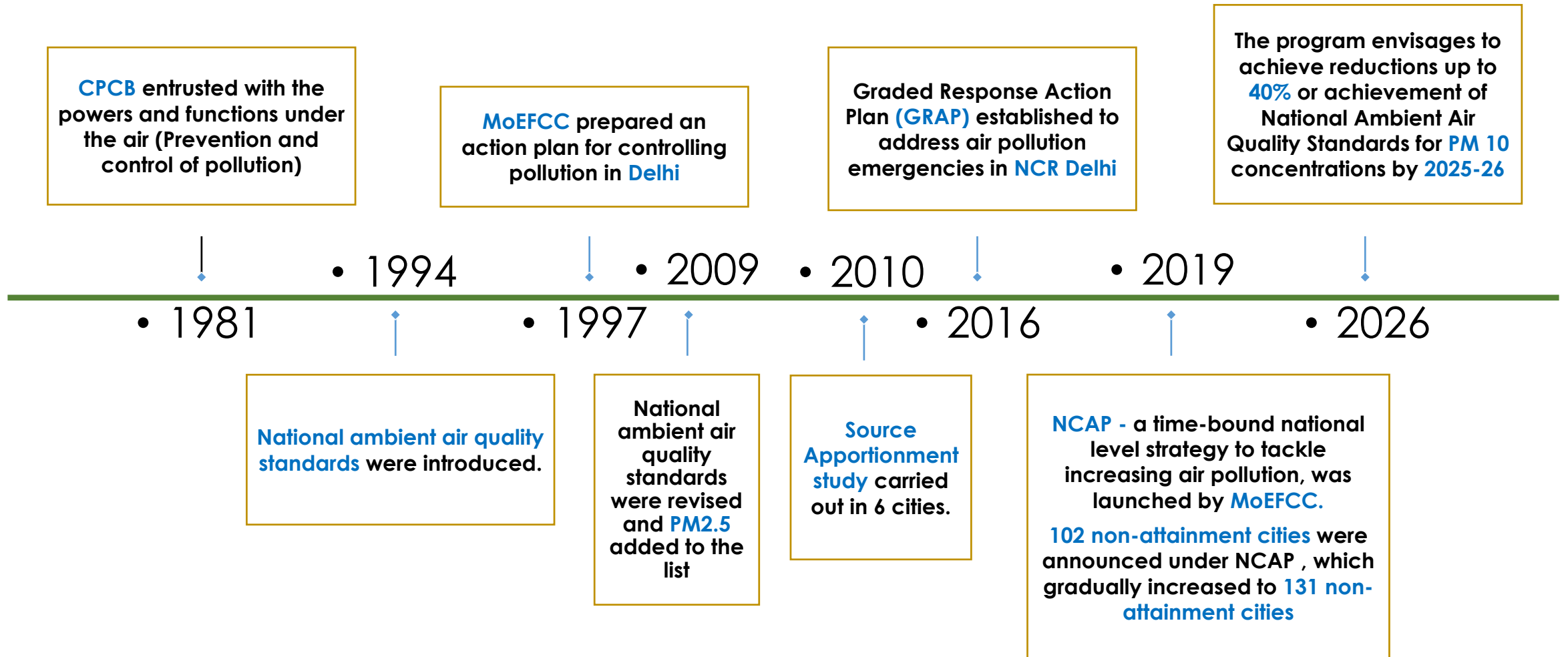
India engages with global entities like the World Health Organization (WHO) to stay updated on air quality benchmarks and collaborate on solutions



Awareness and Response

Regular updates on air quality, like WHO's Ambient Air Quality Database, raise public awareness, facilitating a more robust response to protect public health

Milestones of India's Effort to Control Air Pollution



NATIONAL CLEAN AIR PROGRAM (NCAP)

Acknowledging the transboundary impact of air pollution, **NCAP** was formulated with an aim to improve air quality in India.

1.

PROCESS FOR FORMULATION OF NCAP

The NCAP, formed collaboratively with Central Ministries, State Governments, and stakeholders, underwent online sharing, meetings, and amendments, gaining unanimous approval in October 2018.

2.

DEFINING NON-ATTAINMENT CITIES

CPCB identifies polluted cities based on National Ambient Air Quality Standards (NAAQS) violations. Non-attainment cities consistently violate NAAQS for PM₁₀ or NO₂ over 5 years.

3.

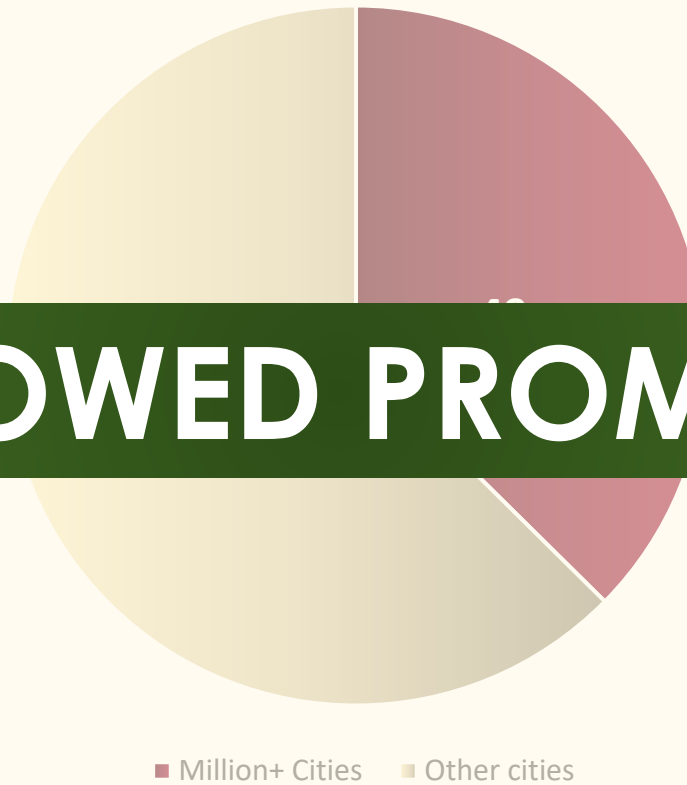
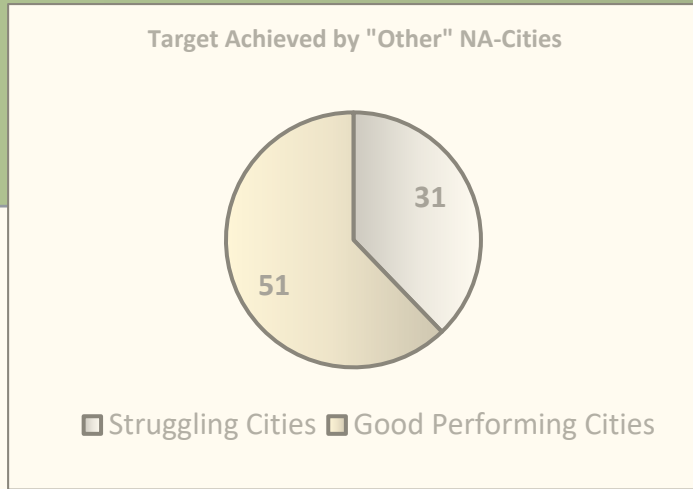
NATIONAL CLEAN AIR ACTION PLAN

A dynamic five-year initiative from 2019, scalable to 2025-2026, targeting 20-30% reduction in PM₁₀ and PM_{2.5}, driven by collaborative, multi-sectoral strategies.

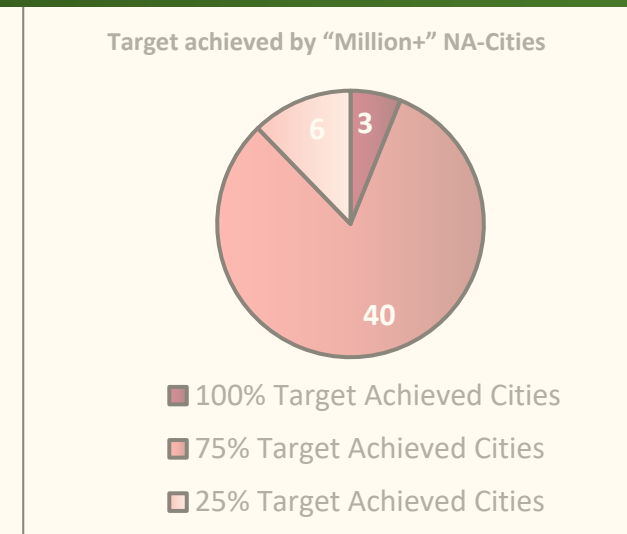
NATIONAL CLEAN AIR PROGRAM (NCAP): Targets and Achievements

Under NCAP, 82 cities were given the annual target of 3-15% reduction of PM10 levels in order to achieve overall reduction of air quality up to 40% PM10 levels, and 49 cities (having population more than 1 million, called million+ cities) under 15th Finance Commission air quality grant, were given an annual target of 15% reduction in annual average PM10 concentrations and improvement of 15 numbers of good air quality days (AQI<200)

REDUCTION of PM10 in 131 NON-ATTAINMENT CITIES (FY:2019-20 to FY: 2021-22)



71% CITIES SHOWED PROMISING RESULTS



Source: PIB: National Clean Air programme (NCAP) to improve air quality in 131 cities by engaging all stakeholders (23 March 2023)

ONGOING GOVERNMENT INITIATIVES

1.

NATIONAL AIR QUALITY MONITORING PROGRAM (2023):

931 operating manual stations in 398 cities/towns to monitor key pollutants—SO₂, NO₂, PM₁₀, PM_{2.5}. Plus, 423 real time CAAQMS stations in 221 cities/towns track 8 pollutants, aiding air quality determination, non-attainment city identification, and integrated meteorological monitoring.

2.

National Ambient Air Quality Standards (NAAQS):

- It sets outdoor air quality standards aiming to protect vegetation, health, and property. Annual compliance requires 98% adherence, allowing a 2% chance of limit exceedance.
- MoEF&CC covers 84 sectors and mandates continuous monitoring in 17 highly polluting industries.

3.

NATIONAL AIR QUALITY INDEX (AQI) (2015, expanded to 71 cities):

- AQI simplifies air data for public understanding, categorizing in six levels based on eight pollutants.
- Overall AQI determined by the worst sub-index, emphasizing effective communication.

ONGOING GOVERNMENT INITIATIVES

4.

FORTY-TWO ACTION POINTS: It addresses major cities, including Delhi and NCR. Covering vehicular emissions, road dust, biomass/MSW burning, industrial pollution, C&D activities, and general measures, initially for NCR and extended to non-attainment cities

Specific directions target 22 districts in NCR, focusing on road dust, garbage burning, traffic management, and stubble burning.

5.

ENVIRONMENT POLLUTION (PREVENTION AND CONTROL) AUTHORITY (EPCA) :

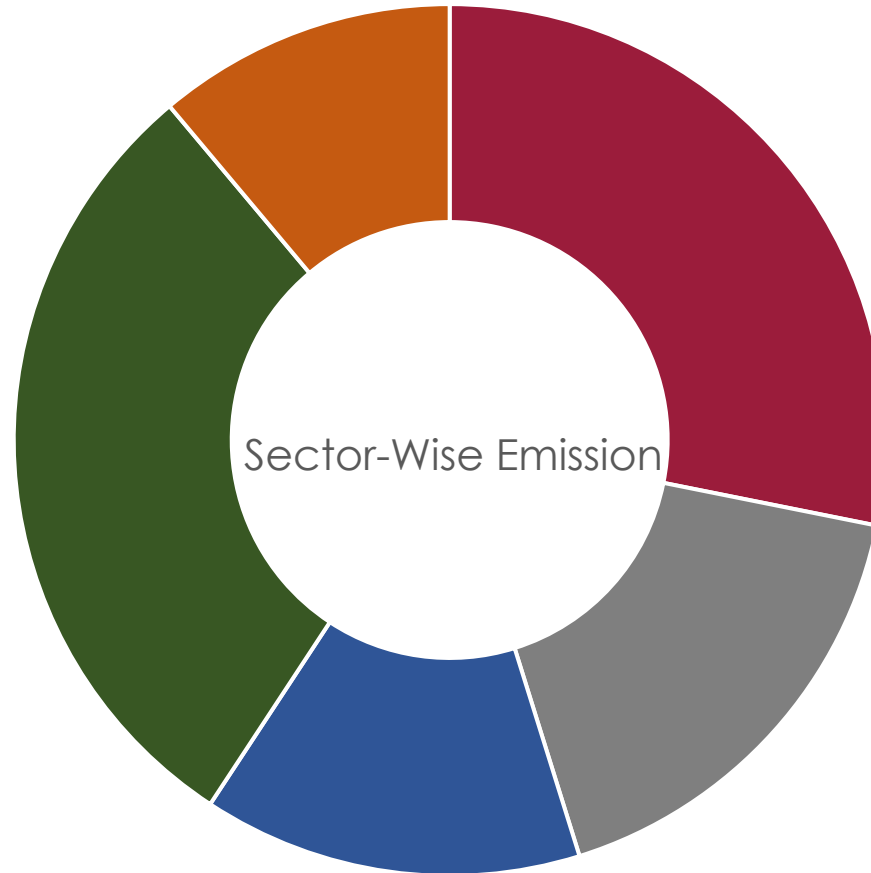
EPCA, formed in 1998 under the Environment Act, addresses NCR environmental pollution. Initially comprised of specified members, reconstituted periodically with extended tenure and new members.

6.

GRADED RESPONSE ACTION PLAN (GRAP):

Government-notified GRAP for Delhi and NCR adopts graded measures and health advisories based on AQI categories. It targets key pollution sources and acknowledges seasonal variations, including stubble and biomass burning.

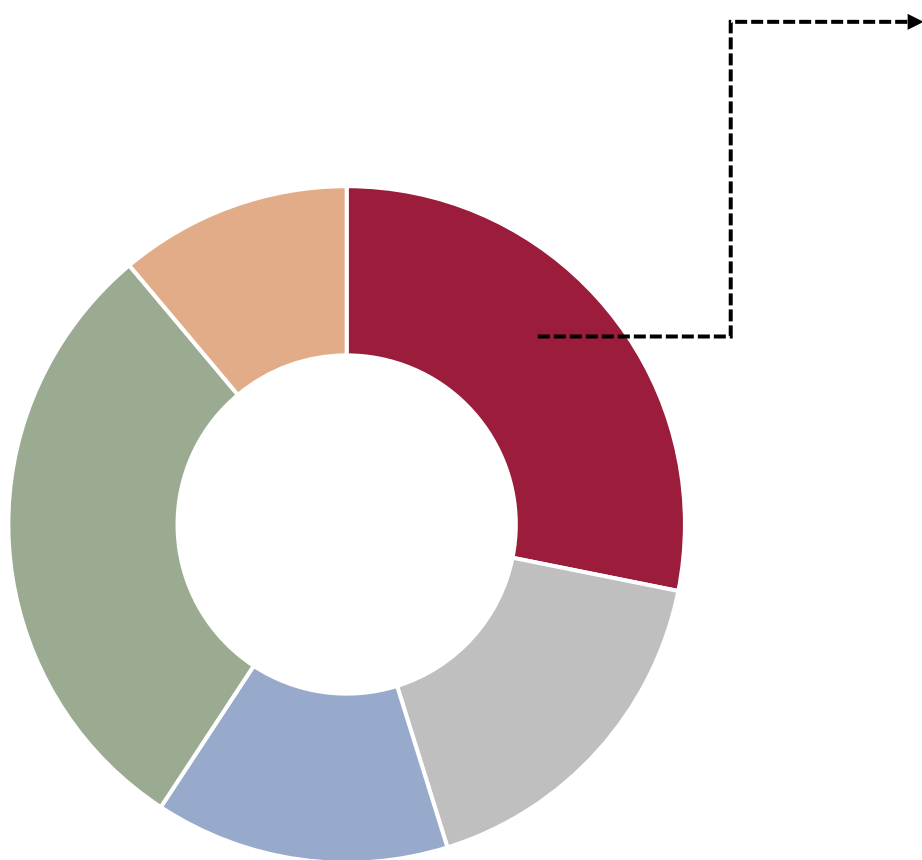
SECTOR-WISE INITIATIVES



■ Vehicular ■ Dust & Construction ■ Biomass burning ■ Industries ■ Other

Source: NCAP REPORT (2019)

SECTOR-WISE INITIATIVES - Vehicular Emissions



Vehicular Emissions

TARGET: Reduction of SO₂

INITIATIVE 1

Bharat Stage-4 to Bharat Stage-6

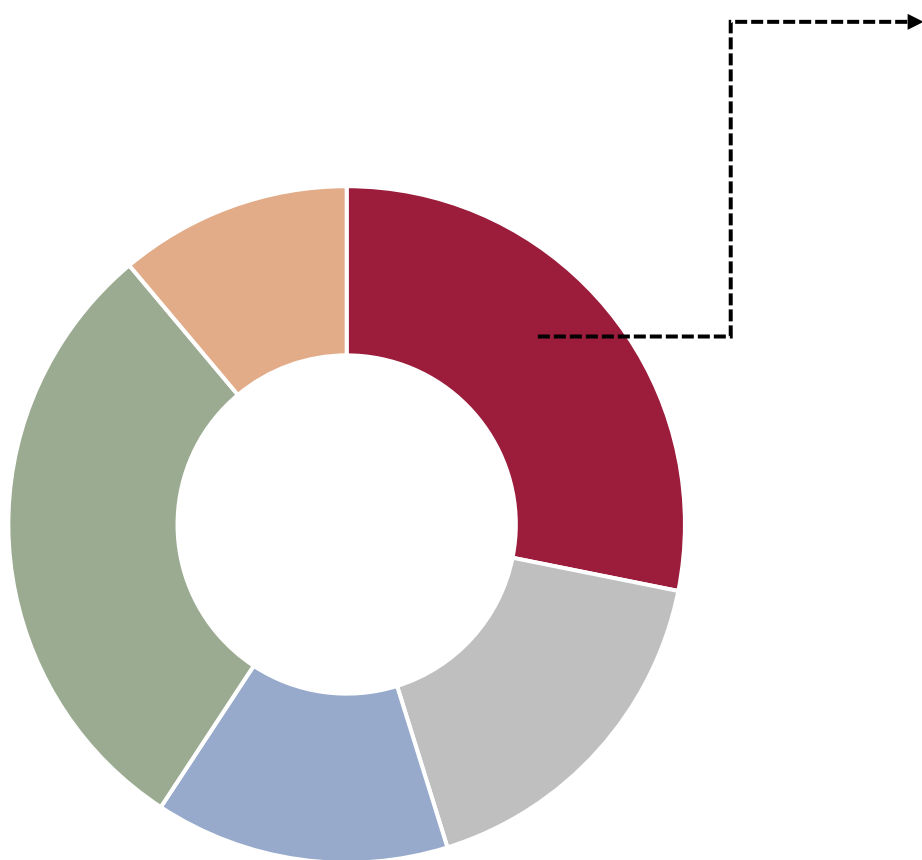
Leapfrogging Emission Standards:

Transitioned from BS-IV to BS-VI norms for fuel and vehicles since April 2018 (NCT of Delhi) and April 2020 (rest of the country).

Impact

The fuel quality has improved significantly by reducing the permissible Sulphur content from **50 ppm** in BS-IV to maximum **10 ppm** in BS-VI compliant fuel.

SECTOR-WISE INITIATIVES - Vehicular Emissions



Vehicular Emissions

TARGET: Reduction of PM, SO₂,NO₂

INITIATIVE 2

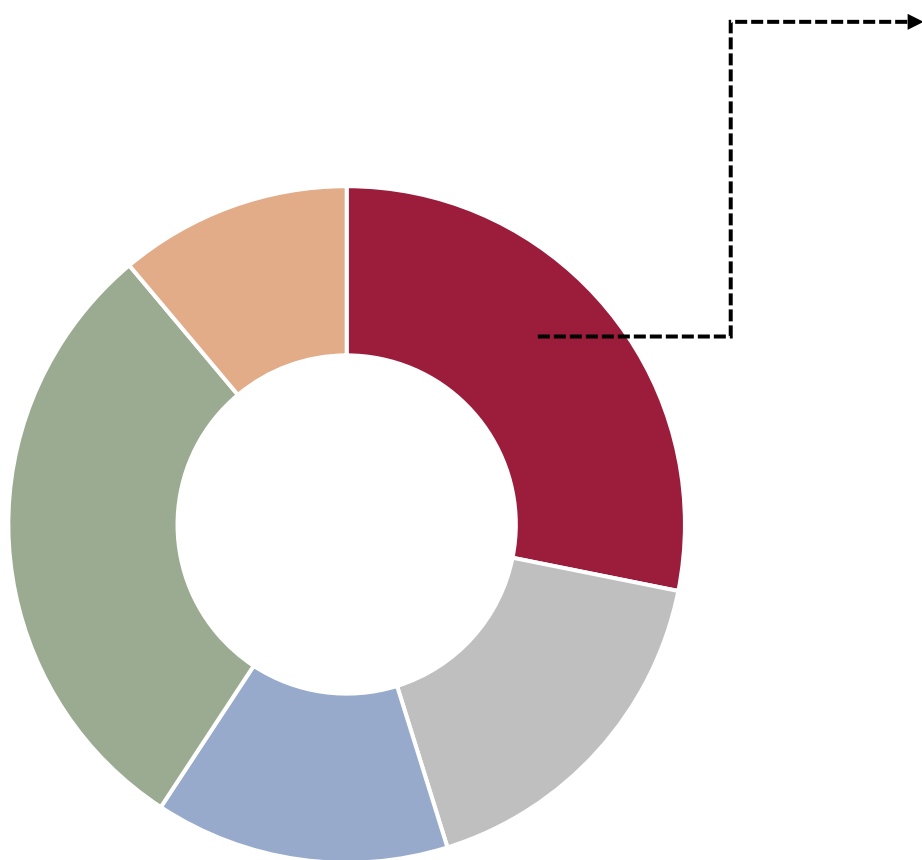
Vehicle Age Restrictions

Implemented a ban on 10-year-old diesel vehicles and 15-year-old petrol vehicles in Delhi NCR.

Impact

An ecosystem to phase out older, unfit polluting vehicles across the country, has been created.

SECTOR-WISE INITIATIVES - Vehicular Emissions



Vehicular Emissions

TARGET: Reduction of PM, SO₂, NO₂

INITIATIVE 3

Cleaner/Alternate Fuels Adoption:

Introduced cleaner/alternate fuels like CNG, LPG, and **ethanol blending** in petrol.

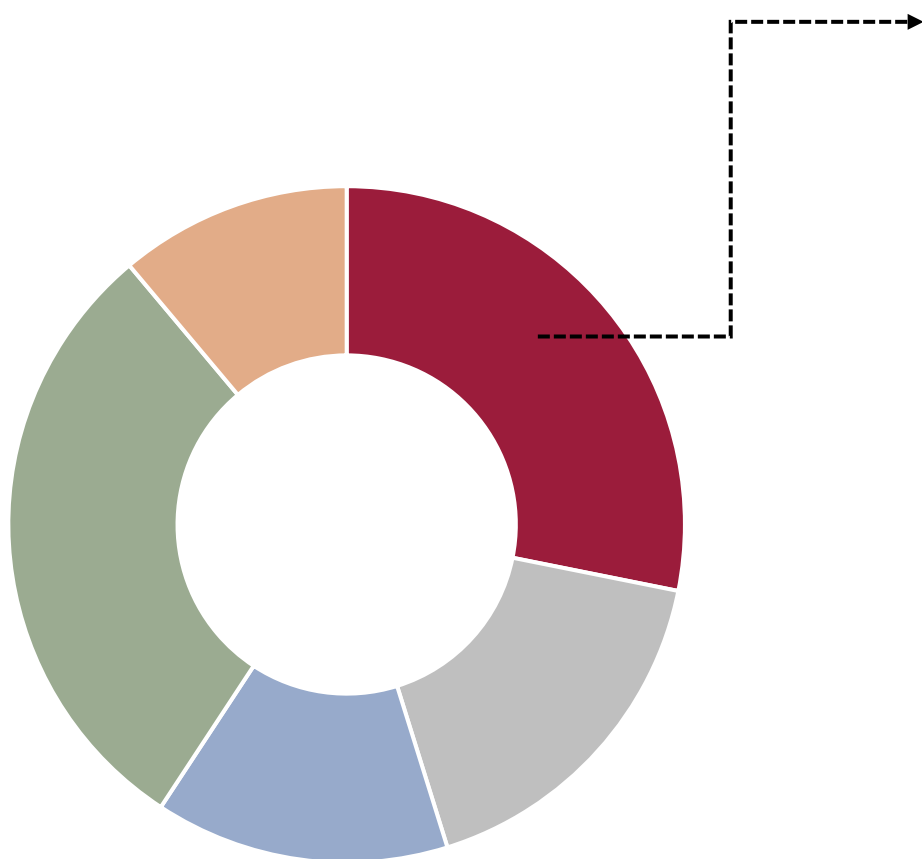
Impact

The **National Biofuel Policy** aims for **20%** ethanol blending in petrol by **2025-26**, saving over Rs. 22,600 Crore on crude oil imports in 2021-22.

Public sector OMCs has achieved **10% ethanol blending**.

The Government of Delhi implemented **CNG or LPG** (Autogas) fuel for all **autos-rickshaw** and for the **entire bus fleet** in and around the city.

SECTOR-WISE INITIATIVES - Vehicular Emissions



Vehicular Emissions

TARGET: Electric Vehicles Promotion

INITIATIVE 4

Faster Adoption and Manufacturing of Electric Vehicles (FAME)-2:

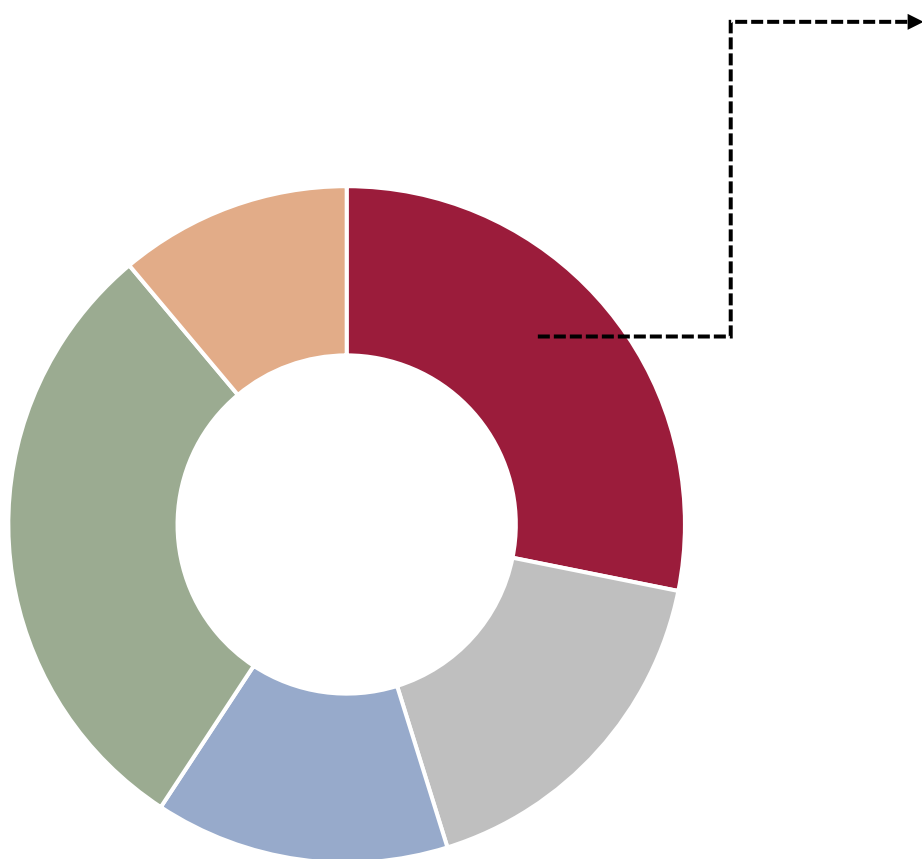
Launched in April 2019, it supports EV adoption with a Rs. 10,000 crore budget, providing subsidies for e-Buses and various types of electric vehicles.

Impact

Production linked incentive, Rs. 25,938 crores over 5 years, for the manufacturers of Advanced Chemistry Cells **reduces EV battery costs.**

Ministry of Road Transport & Highways exempts battery vehicles from permits since October 18, 2018. **Registration fees waived** since August 2, 2021, and All India Tourist Permit issued without fees since April 18, 2023

SECTOR-WISE INITIATIVES - Vehicular Emissions



Vehicular Emissions

TARGET: Reduction of PMs, SO₂, AND NO₂ concentration from Delhi

INITIATIVE 5

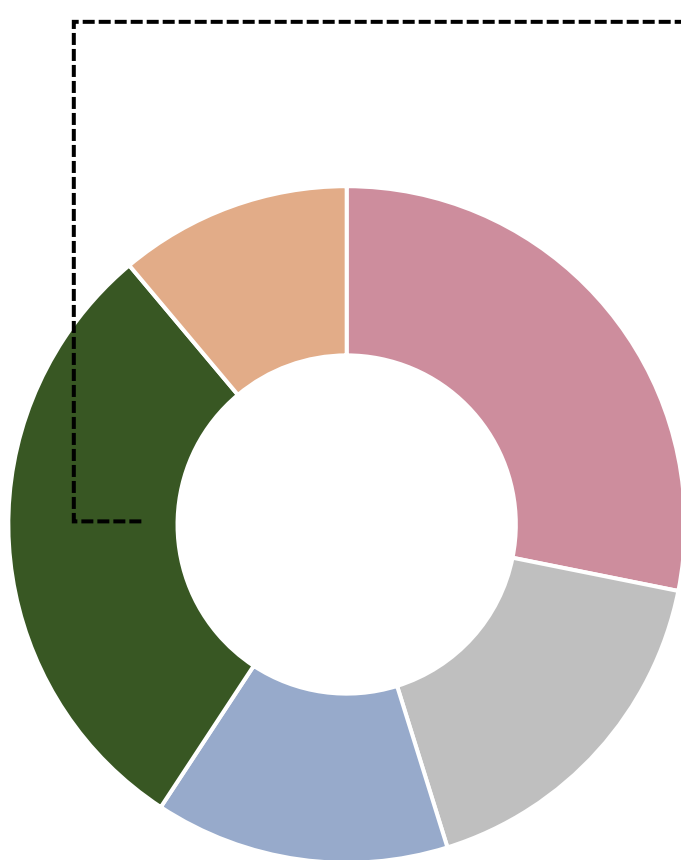
Peripheral Expressways Operation:

Operationalized Eastern and Western Peripheral Expressways to divert non-destined traffic from Delhi.

Impact

The Eastern Peripheral Expressway (EPE), contributes towards the twin objectives of **decongesting** and **de-polluting** the national capital by diverting traffic not destined for Delhi.

SECTOR-WISE INITIATIVES - Industrial Emissions



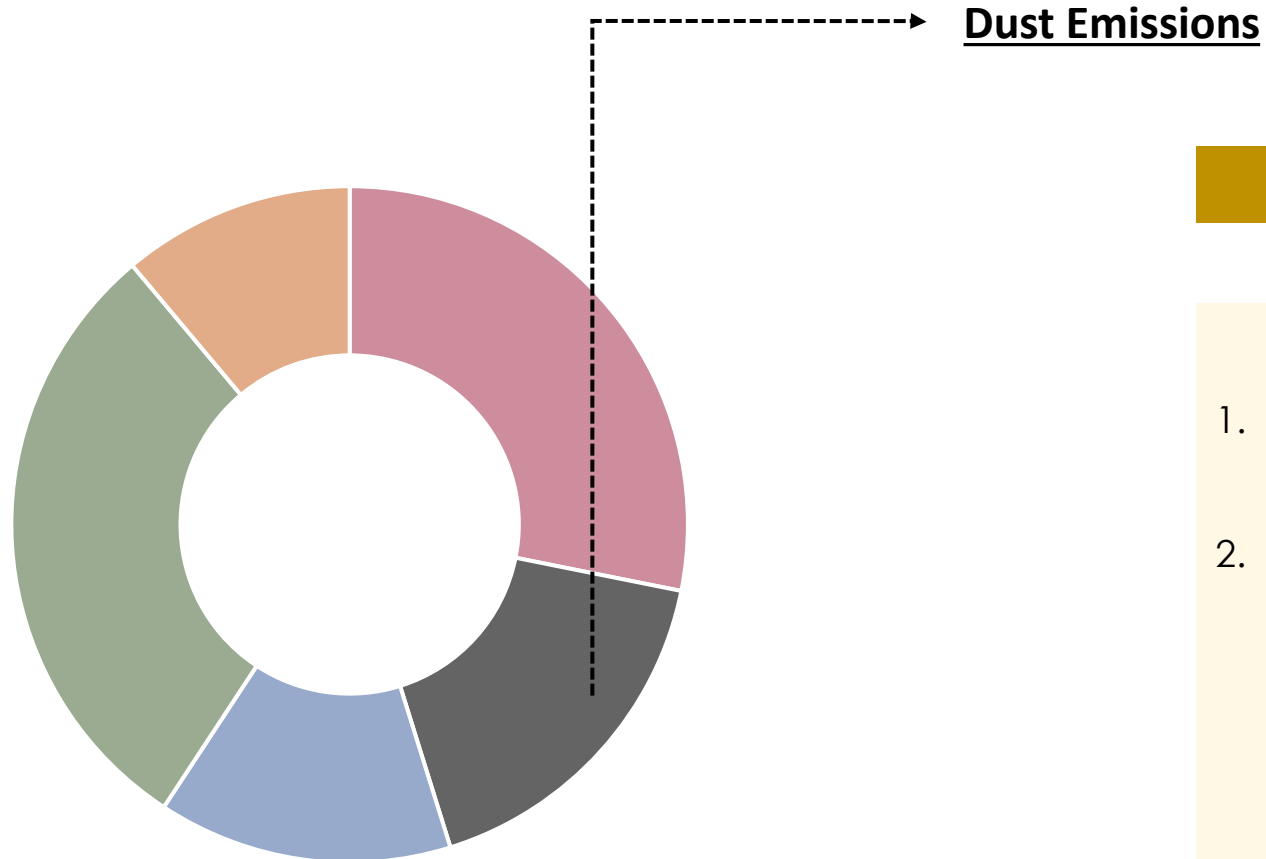
Industrial Emissions

Target: Reduction of Various Pollutants

INITIATIVES

1. Statutory Directions **mandate** NCR's shift to approved clean fuels, ending coal, diesel oil, LDO, etc. Industries transition to approved fuels by 30.09.2022 (gas infrastructure available) and 31.12.2022 (no gas infrastructure).
2. Regulations for Power Generating Sets:
 - DG sets allowed for emergency during GRAP.
 - DISCOMS ensure power supply, reducing DG set use.
 - Industrial DG sets regulated during GRAP, with retrofitting ECD, dual fuel (gas/diesel).
3. Strict emission norms for Coal-based Thermal Power Plants (TPPs).

SECTOR-WISE INITIATIVES - Dust Emissions

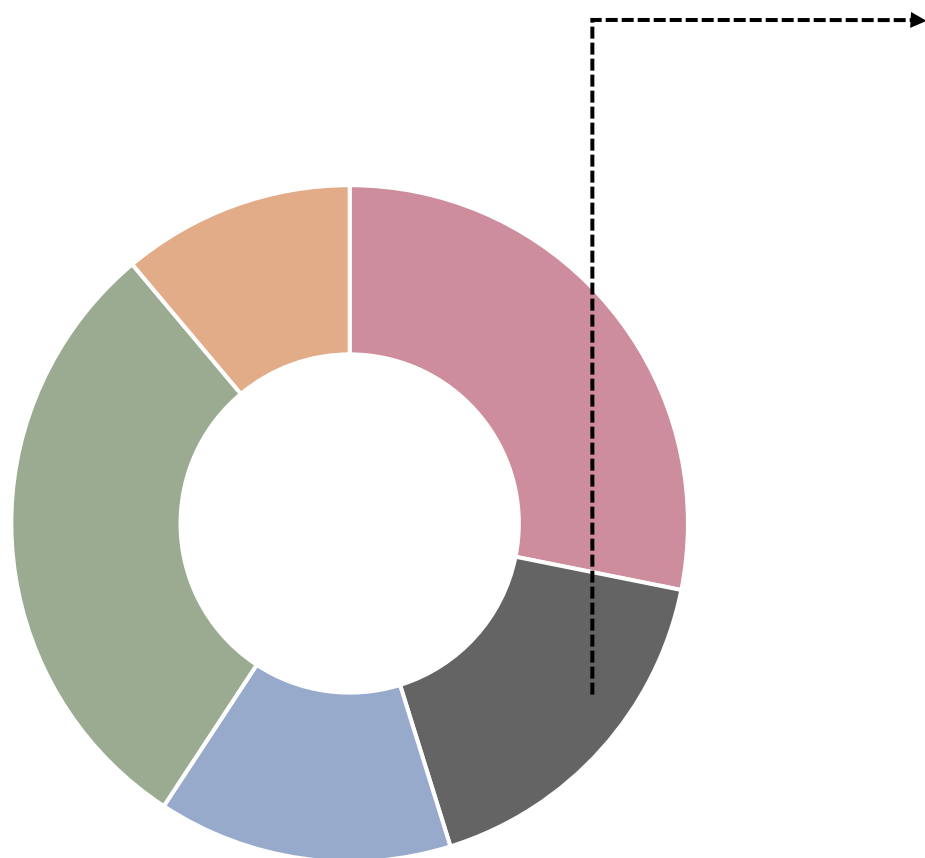


TARGET: Reduction PM₁₀ and PM_{2.5}

INITIATIVES

1. Statutory directions mandate road agencies to establish '**Dust Control and Management Cells (DCMCs)**'.
2. Key actions include using sweeping machines, scientific
 - dust disposal,
 - water and dust suppressant application,
 - enhancing machines,
 - road maintenance,
 - mechanized sweeping support,
 - greening,
 - addressing hot spots.
3. Sixty DCMCs established: Delhi (11), Uttar Pradesh (18), Haryana (17), Rajasthan (14).

SECTOR-WISE INITIATIVES - Construction Emissions



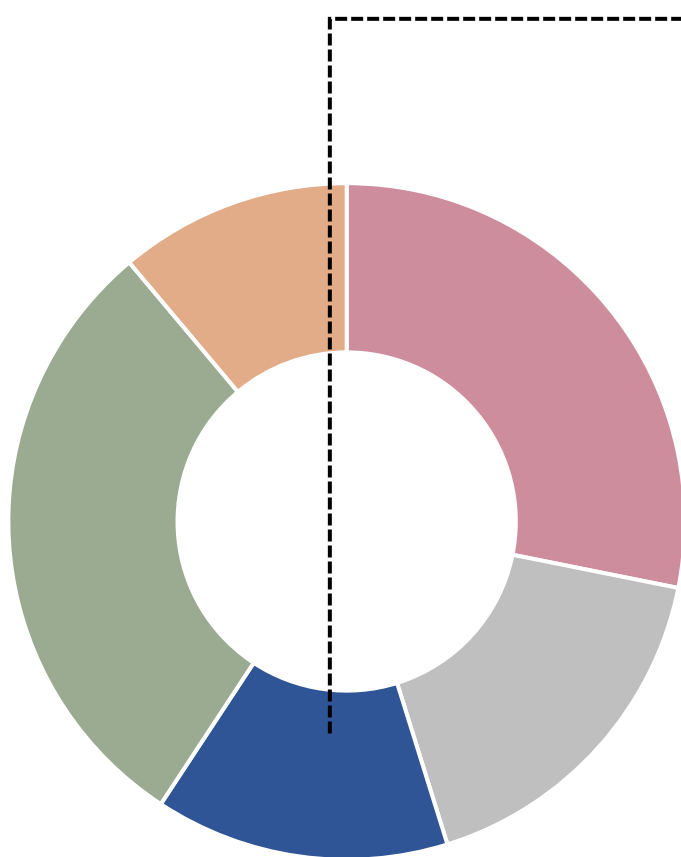
Construction Emissions

Target: Reduction PM₁₀ and PM_{2.5}

INITIATIVES

1. Statutory directions mandate project registration (≥ 500 sq mtr.) on **the C&D web portal**.
2. Portals operate in Delhi, Haryana, and Uttar Pradesh, developing in Rajasthan. **Self-certification by proponents with cross-verification**.
3. Compliances include **wind breakers, dust screens, water sprinkling, dust suppressants**, soil stabilization at C&D sites.
4. **Anti-smog gun** deployment based on construction area.
5. Compliance for covering construction materials and using **covered vehicles for C&D material transportation**.

SECTOR-WISE INITIATIVES - Biomass Emissions



Biomass Emissions

TARGET: Reduction PMs, NOX, SO₂, CO, FURAN, DIOXIN

INITIATIVES

1. Intensified winter inspections, proper solid waste collection, and disposal, clearance after road cleaning.
2. Notification of **8 waste management rules**, infrastructure setup, and **Extended Producer Responsibility (EPR)** for various wastes.
3. Ban on biomass/garbage burning

JAPAN



INDIA

JAPAN COOPERATION ON AIR POLLUTION: INTRODUCTION



Post WWII

Rapid industrialization in Japan post-World War II led to unchecked pollution in the 1960s.



Steep Economic Growth

Steep economic growth increased poor visibility and dust fall, impacting people in large towns. point of view.



Similarity

Similar pollution challenges exist in today's Indian cities and population.



Global Leader Japan

Japan, now a global leader in eco-friendly technologies, shares expertise with India for sustainability.



Japan+India

Collaborations between the governments address environmental issues for a more sustainable future.

JAPAN - INDIA: BLUE SKY INITIATIVE



BLUE SKY INITIATIVE

The Embassy of Japan in India launched 'Blue-Sky Initiatives' for India's air pollution, fostering cooperation and implementing Japanese technologies.

THRUST AREAS

1. Waste-to-energy plant,
2. Solar irrigation,
3. Coal power environmental equipment,
4. Dust suppressants,
5. Next-gen vehicles,
6. And an intelligent transport system.

INITIATIVES TAKEN

Mitsubishi-Hitachi Power's **Flue-gas Desulfurization** for NTPC, 2009 PM_{2.5} study in Delhi-NCR (Horiba India), Ahmedabad ITS (Zero-sum), JICA grant for Bengaluru.

JAPAN-INDIA TECHNOLOGY MATCHMAKING PLATFORM (JITMAP)

JITMAP

Amid India's rapid urbanization and industrialization, industries seek **cost-effective pollution reduction**. Japanese firms employ low carbon, renewable tech. JITMAP facilitates knowledge exchange.

THRUST AREAS

JITMAP facilitates engagement between Japanese and Indian stakeholders, promoting **mutually beneficial transactions in environmental** and low carbon technologies, **including energy-efficient and renewable solutions**.

INITIATIVES TAKEN

1. **TERI** and **IGES** facilitate LCT transfer from Japan since 2010, achieving **substantial energy savings: 20%-40%** (hard technologies) and **5%-10%** (soft technologies).
2. MoU with APSEEDCO in Andhra Pradesh for energy-efficient tech promotion.
3. Notable technologies: Gas Heat Pump (GHP) - **50% energy saving, 49% CO₂ reduction**, Electric Heat Pump (EHP) - **35% energy saving, 40% CO₂ reduction**.
4. **TERI-IGES-SHAKTI Program** drives environmental collaboration.

INDIA- JAPAN CLEAN ENERGY PARTNERSHIP (CEP)

CEP

1. India and Japan collaborate for secure energy supply, **promoting sustainable economic growth**, and **addressing climate change goals**.
2. **India** targets **net zero by 2070**, **Japan** by **2050**.
3. Aligned with the 2007 India-Japan Energy Dialogue, supporting India's Clean Energy Transition and Japan's Asia Energy Transition Initiative.

THRUST AREAS

- Electric Vehicles (EV), batteries, EV charging infrastructure.
- Energy conservation in buildings, industries, and efficient appliances.
- Development of Solar Energy, including PV cells.
- Clean and Green Hydrogen, Ammonia.
- Carbon Capture, Utilization & Storage (CCUS), Recycling.
- Clean Coal Technology.
- Emerging fuels: Biofuels, CBG.

JAPAN, INDIA METEOROLOGICAL DEPARTMENT, AND UNDP

IMD+JAPAN+UNDP

1. **IMD**, Government of Japan, and **UNDP** announce initiative for climate action.
2. Aims to accelerate climate-resilient development across 10 states/Union Territories.
3. **IMD-UNDP** collaboration supports NDCs for net-zero emissions and climate-resilient development.
4. **Japan** grants **\$5.16 million** to **UNDP India** for the IMD-UNDP project

THRUST AREAS

- **Deploy clean energy in key sectors:** Transport, Health, MSMEs, Agriculture, solarizing facilities, EV stations, and solar storage.
- Demonstrate **grassroots climate planning in 30 Gram Panchayats** with climate information flow systems.
- **Focus on net-zero emissions**, climate-resilient development, and advocate climate mitigation in Agriculture, Health, Transport, MSMEs.

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

JICA

1. JICA is a Japanese agency **promoting international cooperation**, providing Official Development Assistance (ODA).
2. JICA supports Indian infrastructure projects through ODA, technical cooperation, and grants, fostering sustainability and pollution reduction.

ACHIEVEMENTS

1. **Contributes to India's railway sector**, enhancing interstate travel speed with projects like Dedicated Freight Corridor and Mumbai-Ahmedabad High-Speed Rail.
2. **Promotes Intelligent Transport Systems** in cities like Delhi and Bengaluru, improving travel speed and reducing congestion.
3. **Funds 39 solar PV**, wind, and small hydro projects through IREDA, promoting renewable energy.
4. **Supports solar power projects in Telangana** under JICA's credit line to IREDA and IIFCL.
5. **Provides a loan** for the **Ganga Action Plan** in Varanasi.
6. **Signs a Loan Agreement with Department of Economic Affairs (DEA)** for Japan-India Cooperation Actions on Sustainable Development Goals (SDGs).

JAPAN INDIA: OTHER COLLABORATIONS

INDIA-JAPAN FUND (IJF)

1. **National Investment and Infrastructure Fund** collaborates with JBIC for **\$600 million** India-Japan Fund (IJF), focusing on **environmental sustainability** and **low carbon emission strategies**.
2. IJF actively invests in India's environmental preservation sector, including renewable energy, e-mobility, circular economy.
3. Govt contributes **49%, JBIC 51% in the fund**, a key milestone in the Japan-India strategic partnership.

INDIA-JAPAN ACT EAST FORUM (AEF)

1. Established in **2017**.
2. AEF aligns **India's Act East Policy** with **Japan's Indo-Pacific** vision.
3. Aims for India-Japan collaboration in **North-Eastern region's sustainable development**.
4. Focus on connectivity, people-to-people ties, hydropower, forest management, and water infrastructure.

FUTURE APPROACH

6. Public Transport Promotion and Smart Planning:

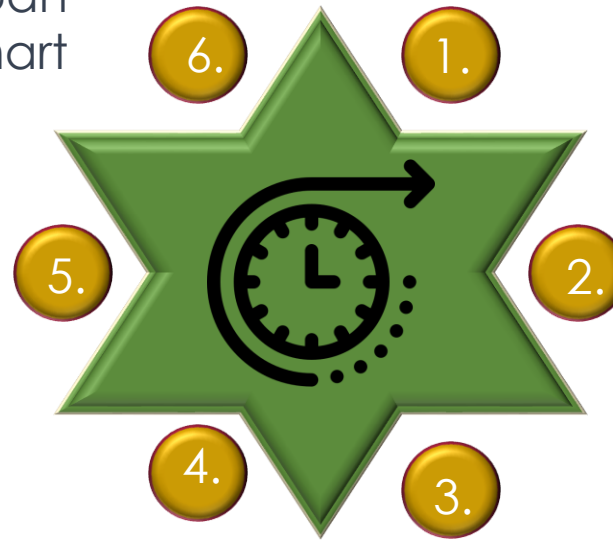
Motivate the adoption of efficient public transport, emphasizing sustainable urban and environmental planning for smart cities.

5. Simultaneous Urbanization and Pollution Mitigation:

Address urbanization-altered temperatures alongside pollution mitigation, acknowledging the interlink between pollution and urban meteorology.

4. Integrated Cost-Effective Solutions:

Develop cost-effective solutions through advanced research, integrating them into policy frameworks across sectors like transport, health, and industry.



1. Regional Airshed Approach:

Develop strategies for controlling air pollution, adopting a regional airshed approach, e.g., in high-density areas like the Indo-Gangetic Plain.

2. Comprehensive Approach:

Go beyond urban programs like NCAP and GRAP, recognizing that air pollution extends beyond geographical boundaries.

3. Coordinated Initiative for Fundamentals:

Initiate well-coordinated, sponsored efforts to address urban air pollution fundamentally, fostering regional cooperation and international collaboration

THANK YOU