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Report No: PADHP00175

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROGRAM APPRAISAL DOCUMENT

ON A

PROPOSED LOAN

IN THE AMOUNT OF JPY 46,188.1 MILLION  
(US\$299.66 MILLION EQUIVALENT)

TO

INDIA

FOR AN

UTTAR PRADESH CLEAN AIR MANAGEMENT PROGRAM

NOVEMBER 17, 2025

Environment Global Practice  
South Asia Region

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## CURRENCY EQUIVALENTS

(Exchange Rate Effective October 31, 2025)

Currency Unit = INDIAN RUPEE (INR)

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INR 88.7 = US\$1

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US\$1 = JPY 154.14

FISCAL YEAR

April 1 - March 31

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## ABBREVIATIONS AND ACRONYMS

AQM	Air quality management
BS	Bharat Stage
CAAQMS	Continuous ambient air quality monitoring station
CAQM	Commission for Air Quality Management
CEMS	Continuous Emissions Monitoring System
CEO	Chief Executive Officer
CO <sub>2</sub>	Carbon dioxide
CPCB	Central Pollution Control Board
DLI	Disbursement-Linked Indicator
DLR	Disbursement-Linked Result
DoA	Department of Agriculture
DoEFCC	Department of Environment, Forest and Climate Change
DoE	Directorate of Environment
DoHFW	Department of Health and Family Welfare
DoMSME	Department of Micro, Small and Medium Industries
DSS	Decision support system
DoT	Department of Transport
DoUT	Directorate of Urban Transport
EAP	Externally Aided Program
ESMAP	Energy Sector Management Assistance Program
ESSA	Environmental and Social Systems Assessment
FM	Financial management
GAINS	Greenhouse Gas and Air Pollution Interactions and Synergies
GDP	Gross domestic product
GoUP	Government of Uttar Pradesh
IA	Implementing Agency
IGP	Indo-Gangetic Plain
IGP-HF	Indo-Gangetic Plain and Himalayan Foothills
IVA	Independent Verification Agency
LPG	Liquified petroleum gas
M&E	Monitoring and evaluation
MFD	Maximizing Finance for Development
MoEFCC	Ministry of Environment, Forest and Climate Change
MSME	Micro, small and medium enterprise
NAAQS	National Ambient Air Quality Standards
NCAP	National Clean Air Programme
NCR	National Capital Region
NO <sub>x</sub>	Nitrogen oxides
NUE	Nitrogen Use Efficiency
PAP	Program Action Plan
PCE	Private Capital Enabling

PCM	Private Capital Mobilization
PDO	Program Development Objective
PEF	Program Expenditure Framework
PforR	Program-for-Results financing
PM <sub>2.5</sub>	Particulate matter with diameter equal to or smaller than 2.5 micrometers (µm)
PM <sub>10</sub>	Particulate matter with diameter equal to or smaller than 10 micrometers (µm)
PMUY	Pradhan Mantri Ujjwala Yojana
PNMP	Precision nutrient management practice
POM	Program Operations Manual
PPP	Public-Private Partnership
RA	Results Area
SOP	Standard operating procedure
SO <sub>x</sub>	Sulfur oxides
SPV	Special Purpose Vehicle
TERI	The Energy and Resources Institute
UCAP	Uttar Pradesh Clean Air Plan
UDD	Urban Development Department
UP	Uttar Pradesh
UPCAMP	Uttar Pradesh Clean Air Management Program
UPCAMPA	Uttar Pradesh Clean Air Management Project Authority
UPPCB	Uttar Pradesh Pollution Control Board
UPSIDA	Uttar Pradesh State Industrial Development Authority
UPSRLM	Uttar Pradesh State Rural Livelihoods Mission



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**DATASHEET**

**BASIC INFORMATION**

Project Beneficiary(ies)	Operation Name		
India	Uttar Pradesh Clean Air Management Program		
Operation ID	Financing Instrument	Does this operation have an IPF component?	
P510253	Program-for-Results Financing (PforR)	No	

**Financing & Implementation Modalities**

<input type="checkbox"/> Multiphase Programmatic Approach (MPA)	<input type="checkbox"/> Fragile State(s)
<input type="checkbox"/> Contingent Emergency Response Component (CERC)	<input type="checkbox"/> Fragile within a non-fragile Country
<input type="checkbox"/> Small State(s)	<input type="checkbox"/> Conflict
<input type="checkbox"/> Alternative Procurement Arrangements (APA)	<input type="checkbox"/> Responding to Natural or Man-made Disaster
<input type="checkbox"/> Hands-on Expanded Implementation Support (HEIS)	

Expected Approval Date	Expected Closing Date
10-Dec-2025	01-Jan-2032

Bank/IFC Collaboration
No

**Global Challenge Project (GCP)**

Is this a Global Challenge Project (GCP)?

No

To which GCP is this project primarily tagged?

**Proposed Program Development Objective(s)**

To strengthen airshed management systems and reduce emissions in Priority Sectors.



**Organizations**

Borrower:	India
Implementing Agency:	Department of Environment, Forests, and Climate Change, State of Uttar Pradesh

**COST & FINANCING (US\$, Millions)**

**Maximizing Finance for Development**

Is this an MFD-Enabling Project (MFD-EP)? Yes

Is this project Private Capital Enabling (PCE)? Yes

**SUMMARY**

<b>Government program Cost</b>	<b>1,509.00</b>
<b>Total Operation Cost</b>	<b>589.53</b>
Total Program Cost	588.78
Other Costs (Front-end fee,IBRD)	0.74
<b>Total Financing</b>	<b>585.13</b>
<b>Financing Gap</b>	<b>4.40</b>

**Financing (US\$, Millions)**

**World Bank Group Financing**

International Bank for Reconstruction and Development (IBRD)	299.66
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**Non-World Bank Group Financing**

Commercial Financing	149.90
Unguaranteed Commercial Financing	149.90
Counterpart Funding	130.57
Borrower/Recipient	130.57



Trust Funds	5.00
Energy Sector Management Assistance Program	5.00

**Expected Disbursements (US\$, Millions)**

WB Fiscal Year	2026	2027	2028	2029	2030	2031	2032
Annual	56.00	7.80	77.10	70.36	55.30	25.50	12.60
Cumulative	56.00	63.80	140.90	211.26	266.56	292.06	304.66

**PRACTICE AREA(S)**

**Practice Area (Lead)**

Environment, Natural Resources & the Blue Economy

**Contributing Practice Areas**

Agriculture and Food; Energy & Extractives; Governance; Transport

**CLIMATE**

**Climate Change and Disaster Screening**

Yes, it has been screened and the results are discussed in the Operation Document

**SYSTEMATIC OPERATIONS RISK- RATING TOOL (SORT)**

Risk Category	Rating
1. Political and Governance	● Moderate
2. Macroeconomic	● Moderate
3. Sector Strategies and Policies	● Moderate
4. Technical Design of Project or Program	● Substantial
5. Institutional Capacity for Implementation and Sustainability	● Substantial
6. Fiduciary	● Substantial
7. Environment and Social	● Moderate



8. Stakeholders	● Moderate
9. Overall	● Substantial

**POLICY COMPLIANCE**

**Policy**

Does the project depart from the CPF in content or in other significant respects?

Yes  No

Does the project require any waivers of Bank policies?

Yes  No

**Legal Operational Policies**

**Triggered?**

Projects on International Waterways OP 7.50

No

Projects in Disputed Area OP 7.60

No

**LEGAL**

**Legal Covenants**

**Sections and Description**

1. Section I.B.1, Schedule to the PA: The Program Implementing Entity shall vest the overall responsibility for the implementation of the Program activities in UPCAMPA and IAs.
2. Section I.B.2(a), Schedule to the PA: The Program Implementing Entity shall maintain throughout the Program implementation, the Governing Body, with mandate, functions, composition, and resources acceptable to the Bank. Without limitation to the foregoing, said body shall: (i) be chaired by the Chief Secretary; (ii) comprise of key government officials from departments involved in the Program, including the Principal Secretary of Finance; and (iii) be responsible for, inter alia, facilitating inter-departmental coordination, providing strategic oversight for Program implementation, approving annual plans, and monitoring of the Program.
3. Section I.B.2(b), Schedule to the PA: The Program Implementing Entity shall maintain throughout the Program implementation, the Executive Body, with mandate, functions, composition, and resources acceptable to the Bank. Without limitation to the foregoing, said body shall: (i) be chaired by the Additional Chief Secretary / Principal Secretary of Environment; (ii) comprise of full-time nodal officers from sector departments responsible for achieving the Program results; and (iii) be responsible for, inter alia monitoring the achievement of DLIs and DLRs.
4. Section I.B.2(c), Schedule to the PA: The Program Implementing Entity shall cause UPCAMPA to: (i) be headed by a chief executive officer appointed from the Department of Environment, Forests and Climate Change (“DoEFCC”); (ii) comprise of additional chief executive officer and deputy chief executive officer for finance, administration and sectors; (iii) be responsible for the overall day-to-day responsibility for implementation, management, and monitoring and



evaluation of the Program, under the aegis and direction of DoEFCC, and in accordance with the Program Operations Manual, including coordinating with different IAs for achievement of Program results.

5. Section I.B.2(d), Schedule to the PA: The Program Implementing Entity shall cause each IA to: (i) appoint technical staff for procurement, finance, environment and social management functions, as appropriate, and with terms of reference acceptable to the Bank; (ii) ensure compliance with relevant fiduciary, environmental and social assessment requirements and Program Action Plan requirements; (iii) provide support in implementation of Program activities and achievement of Program results; and (iv) report to the UPCAMPA with respect to Program activities, results and compliances.

6. Section I.D, Schedule to the PA: Not later than three (3) months after the Effective Date, the Program Implementing Entity shall, through UPCAMPA, prepare and adopt the Program Operations Manual in form and substance acceptable to the Bank.

7. Section III.B, Schedule to the PA: The Program Implementing Entity shall cause UPCAMPA to: appoint by no later than one month after the Effective Date, and thereafter, maintain, at all times during the implementation of the Program, one or more Independent Verification Agent(s); and (i) ensure that the Independent Verification Agent(s) carries out verification and process(es) in accordance with the Verification Protocol; and (ii) submits to the Borrower, Program Implementing Entity and the Bank the corresponding verification reports in a timely manner and in form and substance satisfactory to the Bank.

8. Section IV.1, Schedule to the PA: The Program Implementing Entity shall ensure that the Program’s activities involving collection, storage, usage, and/or processing of Personal Data are carried out with due regard to the Borrower’s and/or Program Implementing Entity’s existing legal framework and appropriate international data protection and privacy standards and practices and ensure legitimate, appropriate and proportionate treatment of such data; (b) in the event that the approval of any new legislation regarding Personal Data protection may have an impact on the activities financed by the Operation, ensure that a technical analysis of said impact is conducted, and that the necessary recommendations necessary to efficiently protect Personal Data, are implemented, as appropriate; and (c) in sharing any information, report or document, ensure that such information, report or document does not include Personal Data.

**Conditions**

Type	Citation	Description	Financing Source
Disbursement	1. Section III.B.1(a), Schedule 2 to the LA	No withdrawal shall be made on the basis of DLRs achieved prior to the Signature Date.	IBRD/IDA



## I. STRATEGIC CONTEXT

### A. Program Strategic Context

1. **While experiencing severe challenges with air quality, India is currently at a critical juncture to act in stabilizing air pollution. Uttar Pradesh (UP), India's most populous state, is among the states most severely affected by poor air quality, which has impacts on the health, productivity, and welfare of its population.** Although the rising trend of air pollution in India seems to be stabilizing since 2019, absolute numbers of air pollution the country, particularly annual concentration of fine particulate matter (PM<sub>2.5</sub>), remains two to four times higher than the National Ambient Air Quality Standards (NAAQS). In UP, the average PM<sub>2.5</sub> concentration was estimated at 94 µg/m<sup>3</sup> in 2020-2021.<sup>1</sup> Exposure to such high levels of air pollution is linked to severe health impacts and premature deaths, and disproportionately affects the poor and vulnerable groups, such as women, the elderly, and children under five years. In addition, air pollution adversely impacts the attractiveness and competitiveness of cities by reducing livability and productivity.

2. **The Uttar Pradesh Clean Air Management Program (UPCAMP, the "Program") supports the Government of Uttar Pradesh (GoUP) in implementing a multisectoral response to air pollution.** The Program builds on the Uttar Pradesh Clean Air Plan (UCAP) and is framed in three Results Areas (RAs) based on an airshed approach: (i) strengthening state capabilities for air quality management (AQM); (ii) advancing sector interventions for emissions reduction: to reduce PM<sub>2.5</sub> emissions from priority sectors, particularly household cooking, transport, agriculture and livestock, and industries; and (iii) enabling Indo-Gangetic Plain (IGP) airshed cooperation. This operation is also part of the World Bank-financed Regional AQM Program in the Indo-Gangetic Plains and Himalayan Foothills (IGP-HF) region, which focuses on coordinated regional actions for efficient and cost-effective reduction of air pollution in the region.

### B. Multi-Sectoral and Institutional Context

3. **UCAP identifies a wide range of activities contributing to PM<sub>2.5</sub> pollution in the state, such as power and industry, residential, agriculture, and transport, as well as transboundary emissions.** In 2019-2020, about 57 percent of the PM<sub>2.5</sub> in ambient air in UP originated from sources within the state, while 43 percent were imported from outside UP.<sup>2</sup> The largest source of PM<sub>2.5</sub> exposure in UP relates to residential cooking (31 percent), mainly from the use of solid fuels and traditional cookstoves. UCAP also indicates other major sources such as agriculture and livestock (19 percent), power generation and industrial activities (16 percent), transport (14 percent), and open burning of solid waste (4 percent).

4. **The Government of India has advanced national-level programs and policies critical to mitigation of air pollution from these major sources, and the GoUP has complemented these policies with state-level interventions.** Since 2016, national policies have included: (i) tighter vehicular emission and fuel quality standards – i.e. *Bharat Stage* (BS) VI; (ii) the voluntary vehicle scrappage policy; (iii) emission norms for industries on nitrogen oxides (NO<sub>x</sub>) and sulphur oxides (SO<sub>x</sub>); and (iv) the rollout of the *Pradhan Mantri Ujjwala Yojana* (PMUY), which has expanded access to liquified petroleum gas (LPG) for cleaner household cooking. In 2019, the Ministry of Environment, Forest and Climate Change (MoEFCC) launched the National Clean Air Programme (NCAP) to reduce PM<sub>10</sub> and PM<sub>2.5</sub> concentrations by 20-30 percent by 2024, compared to 2017 levels. This target has been revised to achieve up to a 40 percent reduction in PM<sub>10</sub> levels or meet the national standards (60 µg/m<sup>3</sup>) by 2025-2026. NCAP consolidated fragmented AQM efforts and initially targeted 131 non-attainment cities across the country.<sup>3</sup> To support this agenda, the Fifteenth Finance Commission allocated INR 121,390,000,000 (approximately US\$1.36 billion) in performance-based grants to 42 cities with one million-plus

<sup>1</sup> Average of PM<sub>2.5</sub> across the 25 continuous air quality monitoring stations (2020-2021) (UCAP 2024).

<sup>2</sup> Among external sources, 13 percent of air pollution came from the neighboring states, six percent from other Indian states in the IGP, five percent from other regions in India, nine percent from other countries, and 10 percent from natural soil dust.

<sup>3</sup> NCAP considers non-attainment cities those that have not met NAAQS for five or more consecutive years.



population for the period 2021–2026, linking funding to improvements in air quality indicators. Seven of these eligible cities are in UP, placing the state at the center of India’s urban clean air financing framework.

5. **India’s evolving air quality governance has recognized that effective pollution control requires state-led planning and regional coordination, particularly in the IGP<sup>4</sup>.** Under India’s federal system, AQM is a shared responsibility between central, state, and local governments. While the central government issues national policy, sets regulatory standards, and finances key schemes, states are primarily responsible for planning, implementation, and institutional coordination, including with municipal bodies, line departments, and the private sector. In UP, non-attainment cities manage air quality cells, while the Uttar Pradesh Pollution Control Board (UPPCB) and the Department of Environment, Forest and Climate Change (DoEFCC) serve as nodal agencies for AQM. These institutions are supported by oversight mechanisms at the district and state levels, including a Chief Secretary-level dashboard to track compliance and performance. Signalling a shift from city to state-led planning, MoEFCC has also directed states to develop their own state clean air action plans. In 2020, as a first attempt at regional airshed governance, the national government established the Commission for Air Quality Management (CAQM) in National Capital Region (NCR) and Adjoining Areas to coordinate AQM across Delhi and the five surrounding states, including 17 UP districts. The CAQM has regulatory authority over transboundary and sectoral sources.

6. **UP continues to face critical institutional and capacity challenges in implementing AQM effectively, despite growing political commitment and national support.** UP is the first state to adopt its own science-based, multisectoral clean air plan – the UCAP – and is among the first states in India to adopt Green Budget Tagging in FY 2024-2025. The Green Budget Tagging covers 17 key departments that systematically track public spending on environmental priorities, including air quality. Other promising innovations include the use of webcam-based industrial surveillance and a three-tier compliance monitoring system that reports environmental performance data from district offices to the Chief Secretary’s level through a centralized dashboard. Multiple challenges, however, hamper the effectiveness of UP’s AQM initiatives. While UPPCB has demonstrated strengths in grievance redressal mechanisms, public information dissemination, and citizen engagement, significant gaps remain in enforcement, inter-agency coordination, and emissions monitoring, especially at the municipal level. A 2020 audit conducted by Central Pollution Control Board (CPCB) recommended increasing staffing levels at UPPCB, enhancing budget allocations for core functions, expanding accredited laboratory infrastructure, and initiating studies on the health and environmental impacts of pollution.<sup>5</sup>

7. **At the sector-level, UP faces multiple challenges to control air pollution and incentivize cleaner production, including:**

(a) **Residential Cooking:** Many rural and low-income households continue to rely on firewood, dung, and crop residue - despite national efforts such as the PMUY, which has provided around 17 million rural households in UP with LPG connections - due to affordability, inconsistent LPG refill access, entrenched cooking practices, and other cultural barriers.

(b) **Agriculture and Livestock:** Ammonia release due to fertilizer application and crop residue burning are major contributors to secondary PM<sub>2.5</sub> formation in UP.<sup>6</sup> Current fertilization practices often lead to excessive nitrogen use and low nutrient efficiency. In addition, livestock waste management, particularly from large cattle shelters (*gaushalas*), remains underregulated and also contributes to ammonia emissions. Although the Department of Agriculture (DoA) has promoted initiatives on nutrient use efficiency and sustainable agriculture practices,

<sup>4</sup> Indian IGP states include the following jurisdictions: Punjab, Haryana, Delhi, Uttar Pradesh, Jharkhand, Bihar, and West Bengal.

<sup>5</sup> Central Pollution Control Board, 2020. Report of the Performance Audit of State Pollution Control Boards/Pollution Control Committees.

<sup>6</sup> Secondary PM<sub>2.5</sub> is formed in the atmosphere through chemical reactions between precursor gases such as NO<sub>x</sub>, SO<sub>x</sub>, ammonia, and volatile organic compounds.



enforcement and implementation vary widely across districts.<sup>7</sup>

(c) **Transport:** Emissions from vehicles, road dust, and congested traffic flows are increasingly contributing to deteriorating air quality. The uptake of electric mobility is in early stages in UP. Key subsidy schemes at the national level, such as PM E-Drive (Electric Drive Revolution in Innovative Vehicle Enhancement), the PM eBus Sewa, and the State Electric Vehicle Policy (2022) aim to increase the adoption of clean transport technologies. However, the low modal share of public transport and poor last-mile connectivity, combined with limited enforcement of vehicle emissions, continue to exacerbate emissions, especially in dense urban areas.

(d) **Industries, particularly Micro, Small and Medium Enterprises (MSMEs):** Brick kilns, textiles, metal processing, and other MSMEs contribute significantly to localized PM<sub>2.5</sub> and SO<sub>x</sub> emissions. Compliance remains partial, despite the regulatory requirement for the conversion of traditional kilns to zig-zag technology. Industrial clusters in the NCR, Kanpur, and eastern UP often operate with outdated technologies, poor emissions monitoring, and limited enforcement. The UP MSME Promotion Policy 2022 and the guidelines under CPCB encourage cleaner production, but implementation challenges persist, especially around data collection on emissions and regulatory oversight.

8. **Building on the UCAP, the Program focuses on integrated solutions for a clean air transition across multiple sectors, and on helping the government strengthen the UCAP implementation systems needed in the long term.** UPCAMP will support the GoUP to: (i) consolidate the governance framework needed for UCAP implementation; (ii) better engage with key stakeholders and coordinate actions under NCAP and UCAP; (iii) expand and prioritize sector investments for clean air, while leveraging and ensuring alignment of various financing streams through ongoing and evolving programs; and (iv) monitor progress of different initiatives for common air pollution reduction goals, enabling citizen-driven accountability and informing new policy development.

9. **Regional cooperation is crucial in the IGP-HF region. Single-country solutions are insufficient for addressing pollutants that travel across borders within airsheds.** Countries like India – and states like UP – depend on the actions of neighboring jurisdictions to achieve clean air targets. This need for coordination is highlighted in the Thimphu Outcome (2024).<sup>8</sup> Through the IGP-HF AQM Program, the World Bank provides support to Bangladesh, Bhutan, India, Nepal, and Pakistan in: (i) institutional strengthening and reduction of emissions, and (ii) regional knowledge exchanges and analytics. The World Bank has already approved financing for operations in Bangladesh and Pakistan (Punjab). Uttar Pradesh and Haryana will be the first states with World Bank-financed operations under the IGP-HF AQM Program in India. An operation is also being prepared in Nepal.

## II. PROGRAM DESCRIPTION

### A. Program Development Objective(s) (PDO)

10. The PDO is to strengthen airshed management systems and reduce emissions in Priority Sectors.

### B. Theory of Change and PDO Indicators

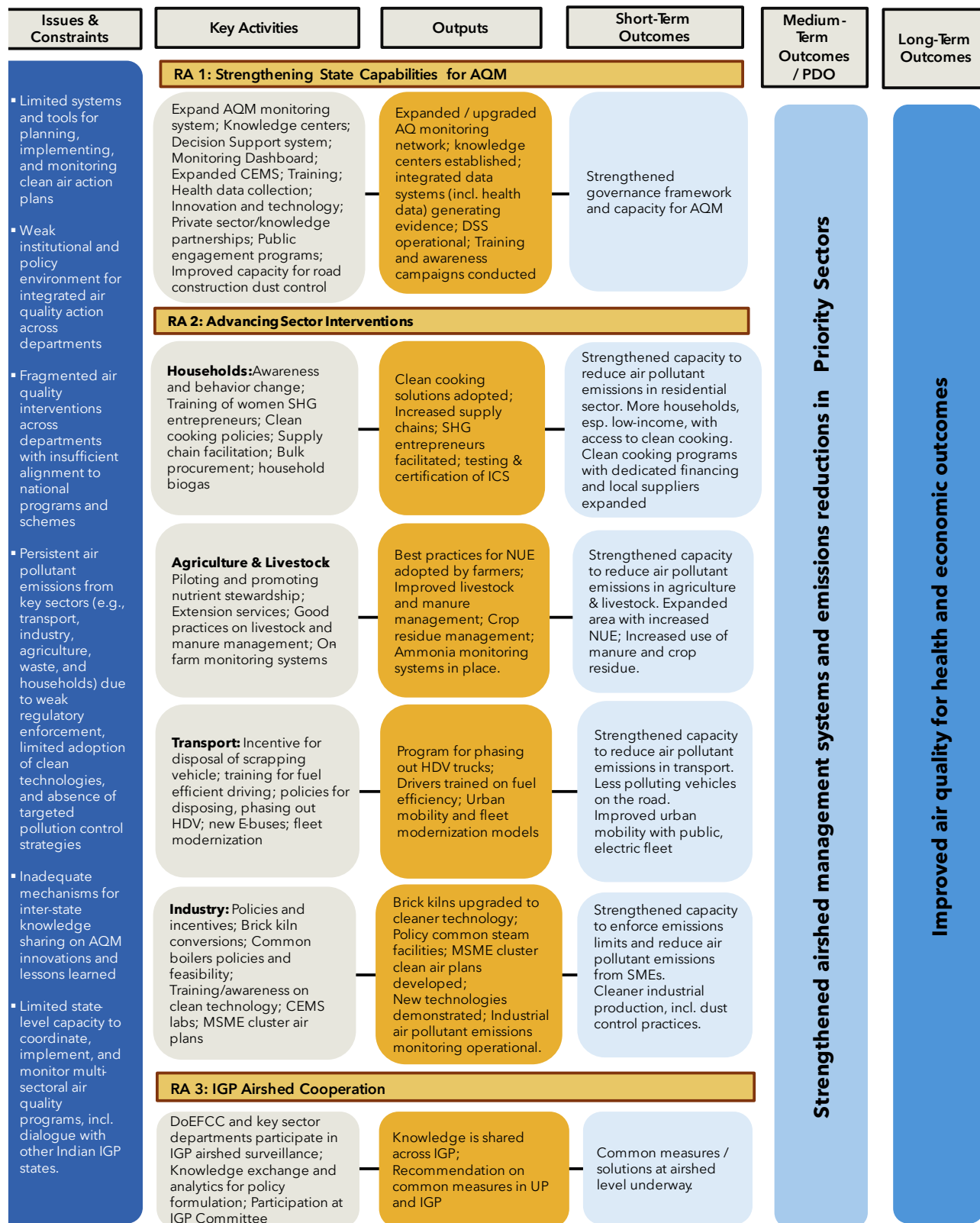
11. The Program will achieve its PDO through three RAs, which together present a comprehensive strategy for AQM in UP, as illustrated in the Theory of Change (Figure 1).

<sup>7</sup> Within the agriculture and livestock sector, PM<sub>2.5</sub> is largely attributed to NO<sub>x</sub> and ammonia emissions resulting from imbalanced use of synthetic fertilizers and soil-applied manure, as well as from livestock manure. The Program aims to facilitate good practices for improved management of livestock manure, such as in *Gaushalas*, and optimize nutrient management, fostering adaptation amongst beneficiaries, while reducing PM<sub>2.5</sub> across Program areas.

<sup>8</sup> International Centre for Integrated Mountain Development, 2024. The Thimphu Outcome Towards Clean Air in IGP-HF.



Figure 1. Theory of Change





12. Key assumptions for the Program’s success are: (i) the GoUP – not only DoEFCC – remains committed to UCAP, with improved coordination led by the Special Purpose Vehicle (SPV) and shared responsibilities across implementing agencies (IAs); (ii) institutional arrangements, strong leadership by the SPV, DoEFCC, Departments of Transport, Agriculture, MSME, Industrial Development, and the UP State Rural Livelihood Mission (UPSRLM), and other IAs, and management capacity are maintained throughout the Program; (iii) UCAP implementation remains funded in the long term; (iv) collaboration with neighboring states and countries, also facilitated through the World Bank-financed operations as part of the IGP-HF AQM Program, will be effective; and (v) the GoUP adopts the policy reforms required to implement Program activities across sectors. These reforms include the State Clean Cooking Action Plan for scaling up clean fuel access at households, agricultural and livestock sector reforms to promote precision nutrient management and improve manure handling, and incentives for industrial modernization under the UP MSME Promotion Policy 2022 for brick kilns and clusters, among other policies envisaged in Disbursement-Linked Results (DLRs).

13. **The PDO level Indicators are:**

- Airshed management decision support system in operation and use (Text).
- Citizen and private sector programs increased for air pollution reductions (Number).
- Emission reductions from major sources supported by the Program (disaggregated by PM<sub>2.5</sub> and Black Carbon) (Text)
- Program beneficiaries with enhanced environmental resilience (Number).

### C. PforR Program Scope

(i) **Summary of the ongoing government program**

14. **UCAP is the strategic framework of the GoUP to control air pollution.** UCAP aims to improve air quality in the 2024–2030 timeframe throughout UP with the goal of building institutional capacity to progressively meet NAAQS for PM<sub>2.5</sub>. The Plan envisages science-based, cost-effective actions in both urban and rural areas, integrating the Clean Air Action Plans for UP’s 17 non-attainment cities to ensure complementarity between city- and state-wide AQM efforts. The Plan focuses on interventions with the highest potential for sustained PM<sub>2.5</sub> reductions, leveraging existing policies, programs, and institutional structures. UCAP also emphasizes capacity development, demonstration pilots, standard operating procedures (SOPs) for key sectors, and the integration of air quality and public health data.

(ii) **Program Boundary and Results Areas**

15. **The proposed UPCAMP (“P”) will be an essential financing source for delivery of the goals and vision of the UCAP (“p”) and will contribute to priority interventions tied to the most polluting sectors. The Program will support the GoUP to establish the institutional and technical backbone to implement UCAP at scale and with accountability.** The Program will focus on RAs and a combination of interventions to strengthen the core functions of AQM (such as planning, monitoring, enforcement, and stakeholder engagement), sector investments, and institutional capacity for results. The Program will help the GoUP achieve outcomes in four priority sectors for substantial reductions in PM<sub>2.5</sub> concentrations, through a focus on cost-effectiveness, effective geographical coverage, improved spending, and a shift toward a system of accountability for results. In addition, the Program will support the GoUP to institutionalize the coordination of UCAP through a recently created SPV and technical units at select IAs, and anchoring implementation in existing government systems and financing. In parallel, the UCAP (“p”) will continue the work already being implemented as well as a subset of additional priorities to be implemented by 2030. The Program will achieve its objectives through three RAs, as summarized below.

***RA1: Strengthening State Capabilities for Air Quality Management (US\$107.45 million equivalent, of which US\$89.73 million IBRD, US\$5.22 million GoUP, US\$12.5 million private capital)***



16. **Building on UP's ongoing initiatives to achieve NCAP targets, this RA will enhance the GoUP's capacity for the core functions of AQM.** Led by DoEFCC and UPPCB, in collaboration with the Department of Health and Family Welfare (DoHFW) and other IAs, this RA will support the development of a robust scientific, evidence-based AQM decision support system (DSS) for the state. The Program will support: (i) expansion and upgrade of UP's Continuous Ambient Air Quality Monitoring network; (ii) introduction of a real-time source apportionment network of "Supersites"; (iii) undertaking of regular work for emissions inventory; (iv) expansion of Continuous Emissions Monitoring Systems (CEMS) by providing financial and technical support for the installation of monitoring devices at small and medium enterprises; (v) setting up of a centralized virtual monitoring platform and surveillance system integrating information technology tools to enhance monitoring and control of point emissions from road dust, construction sites, and MSME clusters; and (vi) integration of air pollution and public health data. With data from these activities, the DSS will help government decision-makers prioritize actions and design policies, as well as keep the public informed about air quality matters and enable stakeholder participation in decision-making. RA 1 will also help increase staff trained for work on AQM and build institutional capacity for nested airshed management planning. It will expand stakeholder and citizen engagement programs to increase awareness, behavior change, and incentives for stakeholder-driven research and development and solutions. A network of universities will be established to help develop the next generation of practitioners while expanding local monitoring capacity.

***RA2: Advancing Sector Interventions for Emissions Reduction (US\$386.43 million equivalent, of which US\$162.28 million IBRD, US\$125.35 million GoUP, US\$5 million Energy Sector Management Assistance Program (ESMAP) grant, and US\$93.8 million private capital)***

17. **Implementing a multisectoral pollution reduction strategy is key to reducing air pollution in UP.** The air pollution reduction measures in the Program will be implemented throughout the state, while introducing a Program implementation and monitoring framework to ensure proper on-ground implementation. Background analysis and consultations identified four critical sectors with cost-effective measures to achieve substantive reductions in PM<sub>2.5</sub> concentrations in UP.

18. **Expanding access to clean cooking.** In UP, 25 million rural households still burn solid fuels for cooking. The Program will support a clean cooking pilot combining financial incentives, awareness and behavior change campaigns to promote multiple technologies and practices such as: (i) electric-induction; (ii) hybrid solar and solar-battery-based heating technology; (iii) household biogas digesters; and (iv) improved cookstoves fueled by biomass, when other options are not available.<sup>9</sup> Based on the results of the pilot, the Program will support the GoUP to develop a comprehensive state clean cooking plan and scale up the most appropriate solutions for different types of households. The women's livelihoods program under UPSRLM will serve as the sales and service delivery platform for cooking technology distribution and after-sales service, enhancing women's employment, and creating a broader market ecosystem around clean cooking.

19. **Improving agriculture and livestock management practices.** The Program will promote nitrogen use efficiency (NUE) interventions in selected districts to effectively manage ammonia and nitrous oxide emissions from excess usage of fertilizers, with customized pilots on the rate, time, place, and form of fertilizer for different cropping systems through precision nutrient management practices (PNMPs). By adopting NUE practices, farmers will reduce input costs through more efficient fertilizer application, as well as improve crop productivity leading to economic and environmental benefits. Key activities will include identifying demonstration clusters/plots; engaging lead farmers (group of farmers); adopting technologies to promote good agriculture practices; and implementing PNMPs with a focus on increased availability of slow and controlled-release fertilizers, nano fertilizers, and nitrogen inhibitors applied in different crop stages in consultation with technical partners and the DoA. In addition, UPCAMP will promote an on-farm monitoring system for NUE and strengthen labs at State Agriculture Universities for spatial and temporal capture of NUE. The Program will

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<sup>9</sup> Eligible cookstove devices will perform at least at a Tier 3 level of the World Bank's Multi-Tier Framework for cooking solutions.



support improvements in the management of livestock waste at cowsheds and develop and implement SOPs, including through use of manure-based fertilizers and biogas slurry in the NUE program.

20. **Reducing air pollution in the transport sector.** The Program will support the GoUP in establishing model cities for improved urban planning and mobility by increasing the modal share of public transport on clean fuel. In particular, the Program will expand the electric bus fleet and e-3 wheelers (passenger and freight) in the model cities of Lucknow, Kanpur, Varanasi, and Gorakhpur. Once implemented, these models will inform the scale-up of improved practices to other cities in UP. The Program complements the ongoing UP Electric Vehicle Policy and converges with the PM Electric Drive Revolution in Innovative Vehicle Enhancement (E-Drive) and PM e-Bus Sewa schemes. In addition, UPCAMP will support good practices in training and capacity building of drivers and integrated planning of passenger and freight transport, which are replicable and scalable across the state. This results area will also promote women's employment in the transport sector. Additional measures for transport are further described below under RA3.

21. **Promoting cleaner technology in industries.** The Program will promote technological upgrades and emission reductions from highly polluting MSMEs through: (i) demand-side policies and financial incentives to up to 760 brick kilns to move to cleaner and resource-efficient technologies in brick manufacturing, in combination with zig-zag kiln conversions that are already legally required and complementing the UP Micro and Small Industry Technical Upgradation Scheme; (ii) incentives for the first models of state-of-the-art tunnel kiln technology under the UP MSME Promotion Policy 2022 and the national government's Micro and Small Enterprises Cluster Development scheme; (iii) development of comprehensive clean air management plans for industrial clusters; and (iv) design of policies and feasibility studies for a shift from mini boilers to common steam boiler facilities in MSMEs.

***RA3: Enabling IGP Airshed Cooperation (US\$90.5 million equivalent, of which US\$46.9 million IBRD and US\$43.6 million private capital)***

22. **UP can further reduce air pollutant emissions and lower the costs of AQM by working closely with other India IGP states.** Heavy-duty vehicle emissions stemming from neighboring states equal those generated within UP. Long-range air pollutants from other sectors such as power generation and heavy industries require airshed-wide solutions. Therefore, measures for the abatement of emissions would benefit from common regulatory and policy approaches and pan-IGP knowledge sharing. The World Bank is working closely with the MoEFCC and other IGP jurisdictions to improve coordination within the airshed, mobilize funding, and develop state operations to help amplify impact under a common airshed plan.

23. **RA3 will promote inter-state knowledge sharing and dialogue to help stimulate the development of common AQM solutions across the IGP airshed.** Under RA3, efforts will be made to work with other states to promote more harmonized programs and emission control policies. GoUP will convene neighboring states for developing and advancing common measures for improved AQM, notably for accelerating the transition of UP's heavy-duty vehicle fleet to cleaner fuels. Through policy and financial incentives, the GoUP will stimulate scrapping of old and polluting heavy-duty vehicles and transition to new, lower emitting vehicles (LNG and electric vehicles). This will complement the financial incentives for electric heavy-duty vehicles under the national level program, i.e., PM e-DRIVE. In addition, UP will work with other states to define common sector approaches, harmonize state policies, influence national policies and schemes, exchange knowledge, and co-lead transboundary regional-level initiatives.<sup>10</sup>

24. **UPCAMP ("P") will support part of UCAP ("p"), focused on top priority measures for air pollution reduction and the enabling work that will strengthen the Government's capability in the long term (Table 1).** The UCAP relies on the

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<sup>10</sup> UP's participation in international IGP-HF meetings, such as the World Bank-sponsored Air Quality Science-Policy-Finance Dialogue for the IGP-HF countries, could potentially lead to cooperative programs with other countries, for example with Nepal's directly bordering foothill districts, which can further help reduce emissions in UP. These potential collaboration programs could be further supported by UPCAMP.



convergence of funds from various devolved central and state programs to reduce air pollution. States like UP may fill funding gaps with their own resources and leverage their own state sector budgets and programs for air pollution benefits. All funds for AQM that flow to urban and rural local bodies originate at either the state or are passed through state-level bodies.

25. **Excluded activities.** The Program (“P”) excludes major infrastructure and high-value contracts that are above the thresholds of the World Bank Operational Procurement Review Committee (OPRC), except for two higher-value Public-Private Partnership (PPP) gross cost contracts under the nodal Directorate of Urban Transport (DoUT). These contracts will hire a service provider to procure and operate 500 electric buses in the four cities, which are crucial for achieving results under DLI 6. The World Bank management approved the limited exception for inclusion of the high-value contract under the PforR operation on March 9, 2024. This activity does not involve large-scale infrastructure works. The Environmental and Social Systems Assessment (ESSA) describes additional excluded activities: large-scale biogas facilities; scrapping facilities; new waste management facilities such as landfills or waste to energy; construction of new buildings or any construction beyond the existing plot of buildings; any activities involving land acquisition or with the potential for involuntary resettlement; and any activities involving asbestos or lead-acid batteries. The World Bank is supporting a risk sharing facility for large private sector biogas facilities through a separate IBRD operation, which will drive the aggregation of agriculture and urban biomass waste streams, but remains outside of the Program boundary.

Table 1. UCAP versus UPCAMP Boundaries

UCAP (“p”)	UPCAMP (“P”)	Specific features aligning with the Medium-Term Program
<b>Objective</b>		
To promote pathways to achieve NAAQS, pilots, and standard practices including in sectors needing greater attention in alignment with the NCAP.	To strengthen airshed management systems and reduce emissions in Priority Sectors.	“P” funds costs of actions in the sectors that contribute the most to PM <sub>2.5</sub> in selected geographic areas, enhances state capabilities, and supports collaboration across India’s IGP states.
<b>Duration</b>		
2025-2035, updates expected to continue.	2026-2031	“P” will span the first phase of the UCAP.
<b>Geographic coverage</b>		
The State of Uttar Pradesh	Actions are both statewide and focused on specific districts across UP, depending on applicable sub-measures.	The “P” is focused on a subset of districts with the highest exposure to PM <sub>2.5</sub> concentration from the highest contributing sectors.
<b>Result Areas</b>		
Measures across all source contributions (residential and commercial, large industry, medium and small-scale industry, fertilizers, livestock manure, crop residue burning, transport, waste, power plants, road dust, and construction); PM <sub>2.5</sub> control strategies under current policies, with additional policies and contributions from other states.	<b>RA 1:</b> Strengthening State Capabilities for Air Quality Management. <b>RA 2:</b> Advancing Sector Interventions for Emissions Reduction. <b>RA 3:</b> Enabling IGP Airshed Cooperation.	“P” supports the convergence of state budget funds to help implement selected interventions in the highest contributing sectors and to strengthen the state systems for evidence-based airshed management planning for AQM. “P” is designed to help activate and transform “p” to a higher impact, higher result, and stronger convergence system. Sector interventions under “P” focus on scalability within UP and coordination with other IGP states to amplify benefits to the UP population.



UCAP (“p”)	UPCAMP (“P”)	Specific features aligning with the Medium-Term Program
<b>Overall financing for six years</b>		
<p>US\$1.5 billion, combining current and projected budget from: (i) the Externally Aided Program of about US\$309 million equivalent for UPCAMP, and (ii) budget provisions totaling US\$1.2 billion under Department of Transport (DoT), DoUT, DoA, and Rural Development Department for key UCAP actions.<sup>11</sup></p>	<p>US\$299.66 million IBRD loan. US\$5 million ESMAP grant. US\$130.57 million GoUP counterpart funding<sup>12</sup> US\$149.9 million private capital</p>	<p>The “P” focuses on the priority actions of UCAP, complementing existing funds of “p” and helping the GoUP to spend those resources better. The “p” includes government schemes specifically directed toward pollution abatement measures under the UCAP framework across departments, comprising a mix of the state’s share in centrally sponsored schemes and state-sponsored schemes. These include financing interventions like clean transport and charging infrastructure, green road development, sustainable agriculture, etc.</p>

**(iii) Program Beneficiaries**

26. **The Program is expected to benefit multiple stakeholder groups, directly impacting both citizens and institutions.** It will help those affected by air pollution within UP to reduce their exposure to critical environmental health risks, with spillovers in neighboring jurisdictions. Over 250 public officials from departments such as the Environment, Urban Development, Transport, Agriculture, and MSME will benefit from structured training programs, exposure to international best practices, and enhanced access to DSS and technologies that strengthen air quality governance. Up to 3.9 million households will benefit from access to clean cooking. 780 brick kilns and other MSMEs in designated industrial clusters will benefit from financial incentives and technical support to adopt cleaner, resource-efficient technologies. 1,000 MSMEs will benefit from partial grants to install CEMS at their facilities. Farmers in 18 divisions in the state’s agro-climatic zones will receive extension services to adopt NUE practices and low-emission machinery. The Program will enhance the quality of transport services for users, while operators of 15,000 electric 3-wheelers in priority cities will benefit from targeted financial incentives to support the transition to cleaner mobility. As part of this, around 10,000 drivers will be trained, and owners of over 13,500 heavy-duty vehicles will benefit from financial incentives to phase out their old, polluting vehicles. Equipment suppliers, civil works contractors, and engineering service providers will have business opportunities driven by increased demand for goods and services associated with CEMS, air quality monitoring technology, tunnel kilns, and e-vehicle infrastructure.

**(iv) Program Expenditure Framework and Program Financing**

27. **Table 2 summarizes Program (“P”) expenditures, totaling US\$435.23 million for the six-year period of Program implementation (India FY26-31), while Table 3 summarizes Program Financing.** In February 2025, the GoUP created a new Externally Aided Program (EAP) budget line for UPCAMP in the Directorate of Environment (DoE), totalling INR 27,415,304,000 (US\$309.07 million equivalent). The EAP amount includes the IBRD loan (US\$299.66 million equivalent), a grant of US\$5 million from the Energy Sector Management Assistance Program Clean Cooking Fund, and a financing gap for clean cooking activities under UPSRLM (US\$4.4 million equivalent). The EAP budget line will finance expenses on small

<sup>11</sup> Selected budget lines are: (i) Motor Vehicle Testing Station (4059–80–800–8901), Chief Minister’s “Gram Jodo Yojana” – Procurement of medium-class electric buses (5055–190–04–0403), Establishment of Charging Stations (5055–190–04–0404), and Subsidy on electric vehicle (3055-00-800-06-00) under DoT; (ii) Chief Minister Green Road Infrastructure Development Scheme (CM-GRIDS) (2217-05-800-11-35) under DoUT; (iii) state share of 40 percent in Food and Nutrition Security (Krishi Unnati Yojana) (2401-00-103-27-00), and National Mission on Agriculture Extension and Technology (2401-00-109-103-00, 2401-00-109-104-00, 2401-00-109-105-00, and 2401-00-109-106-00) under DoA; (iv) State share of Startup Village Entrepreneurship Programme (2501-01-800-89-04) under Rural Development Department; (v) Revenue expenses (3435-04-001-03-00) under DoE; and (vi) Promotion Policy 2022 (2851-00-102-28-00) under DMSME.

<sup>12</sup> Counterpart funding is provided through the following budget lines: 3055-00-800-06-00 (DoT); 3435-04-001-03-00 (DoE); and 2851-00-102-28-00 (DMSME).



works, goods, information technology equipment, consultancies, non-consulting services, information technology services, financial incentives to beneficiaries, training, and Program management, including staff costs. The activity-wise cost details are outlined in the approved Detailed Project Report. The expenditure framework also comprises air quality schemes that are funded exclusively by the GoUP through the existing budget lines of IAs.

28. **The operation will be co-financed with a grant of US\$5 million from ESMAP**, a multi-donor Trust Fund managed by the World Bank. The grant will be disbursed against DLRs 3.1 and 3.2 on clean cooking, with a first allocation of US\$4 million once DoEFCC approves the details of the large-scale pilot for at least four clean cooking solutions. The remaining US\$1 million will be disbursed upon the GoUP's approval of the state clean cooking plan based on the results of the pilot. During Program implementation, the World Bank will support the GoUP to raise additional grant funds to close the financing gap and implement the plan. If approved, separate grant agreement(s) will be signed and additional funds added to the corresponding Disbursement Linked Indicator (DLI).

**Table 2. Summary of Program Expenditure Framework by Implementing Agency for FY26–31 (US\$ million)**

Implementing Agency		UPCAMP in EAP Budget Line	Ongoing schemes(a)	Total
Department of MSMEs	GD <sup>(b)</sup>	42.50	75.73	118.23
DoT	GD	55.68	49.62	105.29
DoUT (Urban Development Department, UDD)	GD	37.34	-	37.34
UPSRLM (Rural Development Department)	AA <sup>(c)</sup>	51.80 <sup>(d), (e)</sup>	-	51.80
Directorate of Environment (DoEFCC)	GD		5.22	5.22
Uttar Pradesh Clean Air Management Project Authority (UPCAMPA) (DoEFCC)	AA	48.23	-	48.23
UPPCB (DoEFCC)	AA	38.95	-	38.95
Department of Agriculture	GD	28.20	-	28.20
UP Industrial Development Authority	AA	1.59	-	1.59
DoHFW	GD	0.38	-	0.38
	<b>Total</b>	<b>304.66</b>	<b>130.57</b>	<b>435.23<sup>(f)</sup></b>

Notes: (a) Complying with the 30 percent counterpart share of GoUP, (b) GD = Government Department, (c) AA = Autonomous Agency, (d) A financing gap from grants has been deducted from the original amount allocated for clean cooking activities in the EAP (US\$55.45 million), (e) Amount does not reflect the IBRD loan front-end fee (US\$0.749 million) to be deducted from DLI 3 on clean cooking, and (f) total expenditures do not include private capital expected to be mobilized for the Program (US\$149.9 million).

**Table 3. Program Financing (US\$ million)**

Source	Amount (US\$, million)
Counterpart Funding	130.57
IBRD (incl. DLIs and front-end fee)	299.66
Trust Fund – ESMAP	5.00
Private Capital Mobilization Estimate	149.90
Total Financing	585.13
Financing Gap (Clean Cooking)	4.40



**D. Disbursement Linked Indicators**

29. Program resources will be disbursed based on the achievement of eight DLIs (Table 4). Resources allocated to the DLIs do not represent the total financial outlay required. Annex 1 presents a complete DLI matrix.

**Table 4. Resources allocation for Disbursement-Linked Indicators (IBRD and ESMAP Grant)**

DLIs and purpose	Financing (US\$, Million)
<b>DLI 1: Airshed management decision support system in operation and use</b> <i>To establish a comprehensive data-driven decision support system and virtual monitoring platform for air quality planning, decision-making, and reporting in Uttar Pradesh.</i>	84.350
<b>DLI 2: Increased human resource capacity for airshed management</b> <i>To strengthen institutional capacity through structured training and knowledge building for effective air quality management.</i>	5.381
<b>DLI 3: Households using clean cookstoves to meet cooking needs</b> <i>To promote large-scale adoption of clean cooking technologies to reduce household air pollution.</i>	51.071 <sup>(a)</sup>
<b>DLI 4: Development and validation of package of practices for NUE and manure management</b> <i>To reduce agricultural and livestock air pollutant emissions by implementing and validating nitrogen-efficient farming and improved manure management practices.</i>	28.185
<b>DLI 5: Brick Kilns and MSMEs transition to improved air pollution control technology and resource efficient technology</b> <i>To enable the adoption of cleaner production technologies in brick kilns and MSME clusters.</i>	41.002
<b>DLI 6: Good practice models of improved urban mobility for clean air</b> <i>To implement integrated and electric-based urban transport models that improve air quality in key cities.</i>	47.022
<b>DLI 7: Registered heavy-duty vehicles (BS III and below) scrapped and taken off the road</b> <i>To phase out old, polluting heavy-duty vehicles through a targeted scrappage policy and driver retraining initiatives.</i>	44.806
<b>DLI 8: Common measures with other IGP states</b> <i>To foster inter-state collaboration for joint regional strategies to address transboundary air pollution in the IGP region.</i>	2.093
<b>Total</b>	<b>303.91</b>

Note: (a) The loan front-end fee (US\$0.749 million has been deducted from the IBRD funds allocated to the DLI 3.

**E. Role of Partners**

Name of Partner	Nature of Involvement /Description
Clean Air Fund and Bloomberg Philanthropies	These funds have supported the DoE to establish and maintain the Strategic and Policy Advisory Unit. Operated with technical support from The Energy and Resources Institute (TERI), this unit has enabled the rollout of the UCAP and key inputs for UPCAMP. The unit will continue to support the DoE during Program implementation.



Swiss Agency for Development and Cooperation	The Clean Air Project (CAP-India), implemented with TERI in cities like Lucknow and Kanpur, supported the GoUP to strengthen air quality monitoring, prepare city action plans, and build stakeholder awareness. In Phase II, the Swiss Development Corporation is expanding its work to the IGP region to regional airshed planning across UP, Bihar, Bangladesh, and Nepal.
GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit)	The GIZ-financed Advancing Integrated Solutions for Clean Air Restoration and Engagement (AIR CARE) Project provides technical support to MoEFCC and the environment departments of UP and Haryana to (i) strengthen capacities for AQM, and (ii) promote solutions for pollution reduction. GIZ provides policy advice, technical assistance, and capacity building (e.g. developing the UP-level PRANA tool to monitor implementation of NCAP).

### F. Lessons Learned and Reflected in the Program Design

30. **Global experience has shown that addressing air pollution effectively requires a comprehensive, multisectoral approach that integrates interventions across key pollution-generating sectors.** Tackling this complex problem demands integrated planning and coordination across departments, programs, and levels of government. This foundational insight has shaped the design of UPCAMP, drawing on global and national experiences. A notable precedent is the World Bank-financed Hebei Air Pollution Prevention and Control Program (P154672) in China, which deployed an integrated strategy addressing urban mobility, industrial emissions, residential heating, and agriculture, resulting in measurable reductions in PM<sub>10</sub> pollution levels. The Hebei model has influenced subsequent World Bank-financed operations, including the Greater Cairo Air Pollution Management and Climate Change Project (P172548) in Egypt, which incorporates air quality interventions through improvements in solid waste management and urban transport, and the Air Quality Improvement Project (P176040) in Bosnia and Herzegovina and the Kyrgyz Republic Air Quality Improvement Project (P177467), both of which focus on clean heating, low-emission urban transport, and green infrastructure. These experiences validate the importance of tackling air pollution through a systems-level, cross-sectoral lens. This approach is also endorsed by the World Bank’s Independent Evaluation Group, which emphasizes the necessity of integrated design in air quality operations.

31. **The design of UPCAMP reflects lessons from targeted, sector-specific operations that provided valuable insights into effective implementation strategies.** For instance, the Supporting the introduction of e-buses in the Integrated Transport System of the Aburra Valley (Medellin, Colombia) (P169735) illustrated successful pilot programs and multi-stakeholder partnerships, including government, automakers, and private sector actors, to catalyze the scaling up of electric mobility in Latin American cities. Similarly, the World Bank-financed Second Ho Chi Minh City Environmental Sanitation Project (P127978) in Viet Nam offered important lessons on the value of coupling infrastructure investments with institutional capacity building and public engagement to achieve meaningful environmental outcomes at the urban scale. In addition, the India - Financing Energy Efficiency at MSMEs (P100530) provided insights into technology adoption in the industrial sector. It demonstrated that a combination of financial incentives, technical assistance, and sustained engagement with industry associations can build trust and accelerate the uptake of clean technologies among MSMEs. Such projects and programs also highlighted the need for continuous handholding and tailored support throughout the adoption process to overcome behavioral and financial barriers. The PforR modality used in the Hebei Air Pollution Prevention and Control Program also served as a key reference for UPCAMP, showing how DLIs can drive strong implementation momentum, while providing operational flexibility to refine and adjust program activities in response to changing needs on the ground. This modality was instrumental in aligning financial flows with tangible outcomes and in fostering institutional accountability. Informed by these global and national examples, UPCAMP has been designed as a systems-oriented, results-based operation that combines data systems, regulatory interventions, infrastructure investments, and institutional capacity to deliver durable air quality improvements across UP.



### III. PROGRAM IMPLEMENTATION

#### A. Institutional and Implementation Arrangements

32. **The GoUP has established the UPCAMPA<sup>13</sup>, the SPV embedded in DoEFCC, as the nodal agency for the Program.** The SPV will govern and implement the Program through a three-layer structure. At the apex level, an already established and functional governing body - a multi-department committee chaired by the Chief Secretary, with representation from each of the state departments and the Principal Secretary of Finance - will facilitate inter-departmental coordination. The committee will provide strategic directions for Program implementation, approve annual plans, and oversee monitoring and evaluation. The Principal Secretary of Finance will support the financing of key activities in RAs, departmental/IA budgets, and review expenditures and fund flow arrangements, particularly in a timeframe to inform the annual and semi-annual budget review process. At the operational level, an executive body, chaired by the Additional Chief Secretary / Principal Secretary of Environment and comprising full-time nodal officers from the sector departments, will be responsible for achieving the results agreed under the Program. A Chief Executive Officer (CEO) will be responsible for day-to-day management, coordination, and monitoring and evaluation (M&E) of the Program. The CEO is supported by an Additional CEO and a Deputy CEO for Finance, Administration, and the Sectors. The SPV will collaborate and coordinate with all IAs and other relevant departments through UPCAMPA cells in DoA, DoT, the Department of MSMEs, UDD, and Rural Development Department. The SPV will recruit human resources with adequate qualifications for day-to-day Program implementation.

33. **UPCAMPA will work closely with all sector departments that are primarily responsible for respective DLIs.** Technical staff for procurement, finance, environmental, and social functions will report to the CEO. The IAs will establish similar capacities where there are gaps. They will also be responsible, either directly or through coordination and oversight, for ensuring compliance with the relevant recommendations from Program's fiduciary and environmental and social system assessments, Program Action Plan (PAP) requirements, grievance redressal, labor management, and procurement and financial management. The SPV will hire Independent Verification Agencies (IVAs) not later than one month after loan effectiveness to verify the DLIs and results under the Program. Each of the IAs will have a role in the implementation of interventions and achievement of results under the Program.

#### B. Results Monitoring and Evaluation, and Verification Arrangements

34. **The Program Results Framework focuses on the most critical indicators to support UP's shift to an airshed management approach and reduction in emissions from major sources of air pollution.** Program monitoring will comprise standard progress monitoring, verification of DLIs by the IVAs, and Program evaluations for learning and scale-up. UPCAMPA will be responsible for reporting progress across the Program and the IAs will be responsible for monitoring activities within their departments. A Program data dashboard will be established to support integrated monitoring and reporting. A Program Operations Manual (POM) will be developed and adopted not later than three months after loan effectiveness and will elaborate on the Program M&E framework and process for all IAs.

35. **The achievement of DLIs will be reviewed and confirmed by the IVAs.** The GoUP will contract independent firms to conduct third-party verification for all DLIs, with the verification reports to be submitted as part of the Annual Program Report. The DLIs will be verified through a combination of data sources in accordance with an agreed verification protocol (Annex 1). The IVAs will deploy a suitable methodology depending on the RA and the specific DLR, which may include desk reviews of documents, baseline surveys, and inspection and field visits for activities funded by the Program. All disbursement requests to the World Bank will be submitted along with the results of the independent verification.

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<sup>13</sup> UPCAMPA is structured as a registered society under the Indian Societies Registration Act, 1860.



### C. Disbursement Arrangements

36. **The DLI/DLR matrix and the annual financial allocations are presented in Annex 1.** The GoUP will pre-finance Program expenditures using budgetary resources through the identified budget lines of the Program Expenditure Framework (PEF). Upon certification by IVAs, the DoEFCC will communicate the DLR achievement to the World Bank in the agreed format. Based on the World Bank's approval letter, disbursement requests will be submitted to the World Bank by the Controller of Aid, Accounts, and Audit, using the World Bank's e-Business platform. Many DLRs are scalable, with funds being disbursed in proportion to results achieved. Where actions are not achieved in any particular year, the allocated amount will be carried over to the subsequent year. If targets are reached before deadlines, disbursements may be made earlier after clearance from the World Bank. The funds will be disbursed by the World Bank to a Special Account for IBRD Loan in the Reserve Bank of India. These amounts will be released by the Controller to the Finance Department of the GoUP.

## IV. PROGRAM ASSESSMENTS SUMMARY

### A. Technical

37. **Strategic relevance.** The Program is highly relevant as air pollution in India, the IGP, and in UP is the most significant environmental and public health challenge. As air quality is a public good, AQM requires government-led capacity, interventions, and systems for cooperation. UP has been an early leader in AQM and began working with the World Bank in 2021 on analytics, with a goal to inform priorities for increased funding to shift to an airshed approach. UP's pioneering work in this area has been widely recognized in India and is held up by the MoEFCC as the model for other India IGP states. The Program has also enjoyed support and recognition at the highest political and administrative levels of the state.

38. **Technical soundness.** Program development followed a rigorous scientific and evidence-based process to establish priority measures for both UCAP and UPCAMP. This involved three key stages of analysis: (i) refining the technical understanding of sector contributions throughout UP (for an airshed level understanding); (ii) determining current measures applied under existing programs and the additional measures needed; and (iii) technical discussions with stakeholders in UP on knowledge on sources of emissions, prioritized abatement measures, and geographic focus coupled with a better understanding of related government programs under implementation and additional needs. Part of Stage 3 involved substantive collaboration between the GoUP, an established UPCAMP working group, TERI, and the World Bank, resulting in updates on the findings for Stages 1 and 2. Based on these three stages, recommendations were made for specific sub-measures to be prioritized in the UCAP ("p") and in the Program ("P"). Many of the ongoing or planned interventions/initiatives were compatible with the measures already identified. Further measures across departments and sectors were scoped as well, beyond those already ongoing or planned, as additional control options required to catalyse the airshed management approach in UP.

39. **The Program results chains presented in the Technical Assessment** were prepared and aligned with the Program's theory of change and RA outcomes to better understand the underlying activities needed to reach the results' targets. Discussions on the results chains helped identify actions that could be effectively implemented using ongoing government budget programs and systems, ongoing government programs and systems that could achieve more with adjustments, and activities that were new and required new budget lines to be established. The results chains were also used to help vet activities for inclusion in the PAP.

40. **Institutional arrangements.** The Program's institutional arrangements are described in Section III and in more detail in the Technical Assessment. The World Bank had the opportunity to review and comment on the SPV structure



developed by GoUP during Program preparation and the suggestions have been incorporated. An interim working group was established in January 2023 for Program preparation with the stated intention of providing initial staffing for the SPV. The state cabinet established the SPV during Program preparation. The state also established a three-year memorandum of understating with TERI for a supporting technical team to bolster the capacity for Program preparation and implementation.

41. **Adequacy of the Expenditure Framework.** The GoUP has projected its fiscal deficit as 3 percent of UP's gross domestic product (GDP) in 2025-2026, lower than the revised estimate for 2024-2025 (3.4 percent of the state GDP). The state has projected a revenue surplus of 2.6 percent of its GDP in 2025-2026, compared to a revenue surplus of 2.1 percent in 2024-2025. At the end of 2025-2026, UP's outstanding liabilities are estimated at 29.4 percent of the state GDP, lower than the revised estimate for 2024-2025 (30.8 percent of the state GDP). Outstanding liabilities are estimated to be lowered to 27.5 percent of the state GDP by the end of 2028-2029. In the medium term, the finances of the state are sustainable, since UP aims to remain within the targets permissible under the Fiscal Responsibility and Budget Management Act.

42. **The Fiscal Responsibility and Budget Management targets for the next three years are to maintain the fiscal deficit at 2.9 percent and debt is projected to reduce from 29.4 percent in 2025-2026 to 27.5 percent by 2028-2029.** The debt path is sustainable, although UP's debt levels are slightly higher than the average for all states. Overall, most of the states' outstanding liabilities as a percentage of the state GDP have moderated from the peaks reached during the COVID pandemic. Debt consolidation thus creates the necessary fiscal space needed for development spending. UP has gradually reduced its outstanding liabilities to GDP in this regard. The PEF is consistent with the medium-term fiscal policy and does not cause any significant deviations to the medium-term framework during Program life. The overall government resource envelope ensures adequate funding to achieve results. The interventions under the Program would help improve the effectiveness and efficiency of spending across various sectors on clean air through the convergence of funds and improved coordination. More details on the expenditure framework are provided in the Technical Assessment.

43. **Results Framework and M&E capacity.** The existing government program has an established three-tier M&E framework corresponding to NCAP requirements, with regular monitoring at prescribed intervals across the three levels of government within the state, and regular progress reporting between the state and central governments. The Government's performance has been satisfactory in achieving the objectives it was established for, but will be further strengthened for higher impact, in line with the Program's shift to an airshed management approach. Current system functions are primarily based on process-oriented reporting for actions at the city level. The SPV structure and systems being introduced will further strengthen capacities for more outcome-oriented results M&E. The operation will help elevate the importance and inclusion of multi-sector budget monitoring at the apex level governing body chaired by the Chief Secretary. The SPV CEO will hold the primary responsibility for Program M&E in coordination with all IAs through the UPCAMPA cells. UPCAMPA will have a dedicated M&E cell, and the Program will introduce an integrated management information system to support coherence and convergence in reporting and results. Third-party IVAs for DLI achievements will also help drive outcome-focused monitoring systems.

44. **Program economic analysis.** Economic benefits from investing in UCAP arise primarily from building pathways to achieve reductions in air pollution-related health damage and the avoidance of associated costs to society. Other benefits are expected in terms of energy savings, increased attractiveness of the quality of life, and revenue generation from tourism. The economic impact of the Program was assessed through a cost-benefit analysis based on the projected benefits of reduced air pollution in 2031, taken as the sum of: (i) stunting reduction, (ii) reduced health expenditure, and (iii) productivity gains; mortality costs were excluded from the analysis. The analysis considered a PM<sub>2.5</sub> baseline exposure of 63.3 µg/m<sup>3</sup> in 2025, and reductions to 44 µg/m<sup>3</sup> by 2031 were attributable to UCAP. The economic analysis considered a marginal abatement cost curve that identified the least-cost options for air pollution abatement and evaluated the Program's economic costs for reducing concentrations from 63.3 to 44 µg/m<sup>3</sup> at about US\$1.56 billion by 2031. The net



present value of the benefits from improved air quality has been estimated at US\$9.6 billion (excluding climate co-benefits), for an economic internal rate of return of 15 percent, and based on a six percent discount rate.

45. **Paris Alignment and climate co-benefits.** The Program is fully aligned with India’s strategies (for example, Mission Lifestyle for Environment, Nationally Determined Contribution, upcoming National Adaptation Plan, and Long-Term Low Emission Development Strategy) and the Uttar Pradesh State Climate Change Plan, especially related to low emission technology shifts and improved operational practices that reduce both greenhouse gas and air pollution emissions for household cooking, transportation, and MSMEs. The Uttar Pradesh State Action Plan on Climate Change identifies structurally high climate vulnerability—ranking many districts as highly vulnerable across the sectors due to high exposure and low adaptive capacity. Floods are the most damaging climate disaster in UP. The Program is Paris aligned with low adaptation and mitigation risks as the operation does not introduce any major new infrastructure. Additionally, several interventions are on the list for universal alignment (for example, clean cooking, electric passenger and freight transport) or are recognized under the World Bank Global Practice sector notes for Paris Alignment. By achieving its main objective of tackling air pollution, the Program will generate adaptation and mitigation co-benefits. Air pollution emission reduction measurement and monitoring systems in the Program’s Monitoring, Reporting, and Verification system will ensure awareness of any unexpected negative impacts and a strong focus on accounting for contributions to India’s and UP’s transition to low carbon development. The Program will contribute to improved NUE for crops<sup>14</sup>, vehicle scrapping and replacement with lower emitting vehicles, cleaner cooking methods, and improved operational practices at MSMEs. For example, the Program will incentivize the transition to zig-zag and tunnel brick production<sup>15</sup>. Climate risk screening for floods, wind, drought, and construction material durability will be integrated into contracts for minor works such as household biogas systems to ensure that climate adaptation risks are kept low.

46. **The Program was evaluated for climate co-benefits using the Greenhouse Gas and Air Pollution Interactions and Synergies (GAINS) model.** The analysis estimated that carbon dioxide (CO<sub>2</sub>) emissions in UP can potentially be reduced by about 21.3 percent (77.1 MT CO<sub>2</sub>e) and black carbon (BC) by about 84 percent (90.5 MT CO<sub>2</sub>e). **Substantive** reductions in BC will come from: (i) decreased residential combustion through cleaner cooking (up to 40 million kilo tons reduction), (ii) interventions in industrial and brick kiln technology (up to 13 kilo tons), and (iii) cleaner vehicle fleet, with reduced diesel use in heavy- and light-duty vehicles (by almost 9 kilo tons). The largest CO<sub>2</sub> reductions will come through the implementation of cleaner production in industrial combustion—PM, SO<sub>2</sub>, and NO<sub>x</sub> control.

47. **Gender.** There is a significant gender gap in labor force participation in UP. Only 27.2 percent of women aged 15 and above are in the labor force, which is below the national average of 35.6 percent and far lower than the male participation rate in the state, which stands at 77.6 percent. In the transport sector, women occupy 0.4 percent of roles across job categories<sup>16</sup>. Key constraints limiting women’s entry into this sector include: (i) limited access to technical sectors such as transport, (ii) insufficient training and technical skills, and (iii) safety concerns. To address these barriers and promote women’s employment in this male-dominant sector, the Program will support targeted interventions under RA2 to enable women to work in electric 3-wheeler fleet services. Evidence from a neighboring state show that e-rikshaw initiatives for women drivers have been successful and can be replicated in other states. Planned interventions to narrow the gender gap include: (i) government-led technical training programs for women to operate and manage three-wheelers; (ii) equipping women with the skills and information needed to secure jobs in government-operated three-wheeler services; (iii) launching information campaigns to encourage female applicants; (iv) supporting the GoUP to establish “pink police booths” staffed by female police officers along transport routes for the safety of female employees

<sup>14</sup> NUE reduces nitrous oxide emissions by enhancing crop uptake of applied nitrogen, thereby lowering both direct soil emissions and upstream emissions from fertilizer production. Shcherbak, I., N. Millar, and G. P. Robertson. “Global Meta analysis of the Nonlinear Response of Soil Nitrous Oxide (N<sub>2</sub>O) Emissions to Fertilizer Nitrogen.” *PNAS* 111, no. 25 (2014): 9199–9204.

<sup>15</sup> Brooks et al. “Reducing Emissions and Air Pollution from Informal Brick Kilns: Evidence from Bangladesh.” *Science*, May 8, 2025.

<sup>16</sup> Periodic Labour Force Survey, Government of India, 2023-2024.



and passengers; and (v) providing gender sensitization training to Transport Department staff and authorities. The results of those interventions will be measured by the intermediate result indicator on the number of female staff employed as drivers of electric 3-wheeler fleets (target: 1,500).

48. **Citizen engagement.** The Program will support increased citizen engagement for air pollution reduction through several activities. Comprehensive public awareness and public engagement programs at the state level will be led by the DoEFCC, while Knowledge Centers geographically spread across the state will hold more localized citizen engagement and public awareness and education events. Activities linked to specific sector emission reductions that require behavior change will also promote different forms of public engagement targeted at specific stakeholder groups. For example, households using clean cooking solutions will integrate public awareness and citizen engagement work building on lessons from PMUY. Progress on citizen engagement will be measured through the PDO indicator “Citizen and private sector programs increased for air pollution reductions.”

49. **Maximizing Finance for Development (MFD).** The Program aligns with the World Bank’s MFD approach, and private investment will be counted as both Private Capital Enabling (PCE) and Private Capital Mobilization (PCM) under RA1 and RA2. The following RAs are verified as MFD-enabling: (i) RA1 improves awareness, monitoring and compliance mechanisms for AQM, removing regulatory and operational constraints for private industries, thereby enabling future private investments in cleaner production technologies to meet new standards; (ii) RA2 expands and aligns sector investments that are financed through various financing streams; (iii) RA1 and RA2 offer financial incentives and technical assistance for expanding CEMS to MSMEs; and (iv) RA1 and RA2 promote policy reforms such as the State Clean Cooking Action Plan and the Multisectoral Pollution Reduction Strategy, that will envisage incentives for privately financed pollution control. RA2 is also verified for PCE. In RA2, the Program will stimulate demand for clean cooking solutions and create a broader market ecosystem to incentivize investments from women's Self Help Groups up to US\$10 million in the supply chain of solar based cooking technologies, as tracked by PDO indicator on Program beneficiaries with enhanced environmental resilience.<sup>17</sup> Partial government incentives will enable industry investments (notably by brick kilns) from own resources and commercial loans for approximately US\$146 million,<sup>18</sup> as tracked under the DLI/intermediate result indicator: Brick Kilns and MSMEs transition to improved air pollution control technology and resource efficient technology.

50. **RA1 and RA2 will contribute an estimated US\$149.9 million in PCM.** Under RA1 (DLI#1), the Program will finance 20 percent of the installation costs of new CEMS in 1,000 MSMEs and private industries will co-finance the remaining 80 percent from their own resources and commercial loans with an aggregate value of US\$12.5 million.<sup>19</sup> Under RA2 (DLI#6), the Program will support the provision of e-bus services through gross costs contracts. To fulfill these contracts, private operators will mobilize capital to procure, own, and operate 500 e-buses with an aggregate amount of US\$75 million from equity and commercial loans.<sup>20</sup> Other policy and financing incentives under RA2 (DLI#6) and RA3 (DLI#7) will mobilize private investments through equity and commercial loans from: (i) individual beneficiaries for purchasing and operating e-3 wheelers, totaling US\$18.8 million,<sup>21</sup> and (ii) owners or operators for heavy-duty vehicles conversion, totaling US\$43.6 million.<sup>22</sup>

<sup>17</sup> Estimated amount based on the supply costs of 50,000 of solar based cooking systems by 1,000 Self Help Groups, covering Program period and three years after its implementation.

<sup>18</sup> The total investment considers 760 kilns. The average cost per facility is US\$240,000, with government incentives financing 20 percent of capital costs (or US\$48,000 cap).

<sup>19</sup> The unit cost of CEMS is estimated at US\$15,000, with a cap of US\$3,000 for the 20 percent of incentive from UPCAMP.

<sup>20</sup> The average cost of an e-bus is estimated at US\$150,000.

<sup>21</sup> The total cost of 15,000 e-3 wheelers is US\$67.5 million. With Program incentives up to US\$48.7 million (expected disbursement in DLI), the PCM is estimated at US\$18.8 million.

<sup>22</sup> The total cost of 1,500 heavy-duty vehicles is US\$90 million (US\$60,000 per unit). With Program incentives up to US\$44.8 million (expected disbursement against DLI#7), the PCM is estimated at US\$43.6 million.



## B. Fiduciary

51. **The fiduciary risk for the Program is Substantial.** The fiduciary systems assessment completed in July 2025 determined that the fiduciary systems, capacity, and performance of the IAs are adequate to provide reasonable assurance, subject to timely and material implementation of agreed mitigation measures. The identified fiduciary risks will be mitigated through appointment of financial management (FM) and procurement personnel at UPCAMPA and participating IAs, statutory audit of UPPCB annual financial statements, hiring of audit firms as per audit terms of reference acceptable to the World Bank, and timely submission of programs' internal and financial audit reports. The Program expenses include goods, small works, financial incentives to beneficiaries and hiring of service providers through PPP mode to operate e-buses, consulting and non-consulting services, development of information technology systems, trainings and workshops, staff costs, and Program management expenses.

52. **The GoUP has created an EAP budget line in the Demand for Grants of DoE to finance the Program activities mentioned in the PEF ("P").** UPCAMPA and the participating IAs will open separate Program bank accounts. On approval of the annual budget by the State Assembly at the beginning of each FY, the funds will be released by DoE to the bank account of UPCAMPA, which will transfer the funds to the participating IAs as per the activity-wise budget approved by Program Governing Body, the SPV apex level committee. UPCAMPA will monitor the expenses incurred by the IAs, and will regularly obtain utilization certificates and detailed expenditure reports. The FM systems of UPCAMPA will be strengthened under the Program. The accounting, financial reporting and audit systems of the one existing IA (UPPCB) are assessed to be weak and require further strengthening. The World Bank will disburse funds to GoUP on achievement of DLIs. The internal audit will be conducted by a private firm of chartered accountants as per terms of reference acceptable to the World Bank. The external audit will be conducted by private firm of chartered accountants appointed by UPCAMPA, and the audit report will be submitted to the World Bank within 12 months from the end of each financial year. For the ongoing schemes of PEF, the IAs will use the existing FM systems of GoUP for budgeting, flow of funds, accounting, and financial reporting. The Finance Accounts of GoUP provide details on funds spent by IAs on the scheme budget lines. These Finance Accounts are audited annually by the Comptroller and Auditor General of India, and the audit reports are published at the website of the Comptroller and Auditor General. UPCAMPA will provide the audited Finance Accounts of GoUP to the World Bank within 12 months from the end of each financial year.

53. **Procurement risk is rated Substantial.** The Program is not expected to be procurement intensive, as over 65 percent of the expenses are intended to be incentives to either service providers or direct beneficiaries under the Program. Procurement would be for Consultancy / Non-consultancy services, Goods, Small Works, and Information Technology systems. However, procurement of service providers for e-buses in four cities, as discussed below, has been identified as a high-value contract. Per the fiduciary systems assessment, IAs are primarily using the Government e-Marketplace (GeM)<sup>23</sup>, which offers a credible platform with its own regulatory compliance and complaint-handling system, for most of their procurements. The FM and procurement capacity of the IAs varies, and some of them would require additional staffing and training. Various mitigation measures to manage the key risks identified to deliver the Program objectives have been noted in the assessment.

54. **The Program includes two high-value contracts for the DoUT/UDD for hiring a Concessionaire to procure and operate 500 e-buses for 10-12 years in Lucknow, Varanasi, Gorakhpur, and Kanpur.** These PPP contracts with an estimated contract value varying from US\$75 to US\$110 million, depending on the number of e-buses in each contract, is a part of the "P". It falls under the High-Value Contract thresholds defined by the World Bank (see paragraph 25 above). The contract is deemed to be important to achieving the Program's objective. The fiduciary systems assessment covers the additional due diligence on the IAs' proposed approach to the procurement, the complexity and competitiveness of

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<sup>23</sup> GeM is India's national public procurement portal designed to facilitate the online procurement of goods and services by Central and State government ministries, departments, and public sector undertakings.



the market, contract implementation risks, and the IAs' skills and previous experience in handling such contracts. Based on the assessment, the system, skills, and experience are found to be reasonable to carry out these procurements.

55. **Compliance with fiduciary requirements.** UPCAMPA will document the FM and procurement procedures in the POM. This will be further monitored through the PAP, the Program's internal and external audits, and reporting on Key Performance Indicators. The Program will be implemented in line with the World Bank "Guidelines on Preventing and Combating Fraud and Corruption in Program-for-Results Financing," dated February 1, 2012, and revised July 10, 2015 (Anti-Corruption Guidelines). The protocol for Anti-Corruption Guidelines has been developed and agreed with UPCAMPA and covers key compliance issues related to reporting, investigations, and mechanisms to exclude firms/ individuals in the World Bank's debarred list. The protocol for these guidelines will be included in the POM.

### C. Environmental and Social

56. **An Environmental and Social Systems Assessment was conducted to determine the GoUP's capacity and systems to manage the environmental and social effects of this Program. The environmental risks associated with the Program have been rated Moderate.** These include: (i) waste generation from the scrapping of vehicles, including hazardous waste from batteries for which sound management of recyclable materials is critical; (ii) worker health and safety in vehicle scrapping centers and industrial enterprises; (iii) negative environmental impacts from battery changes of e-vehicles, if they are not properly managed in the long term, and if recycling and recovery are not handled adequately; (iv) inadequate infrastructure and supervision for collecting and storing manure, risking contamination of air and surface water; (v) long-term operational impacts of the installation and operation of biogas digestors, including the disposal of sludge, odor control, and combustion risks, if they are not managed properly; (vi) construction of small-scale infrastructure, such as bus depots, that affect the surrounding environment with dust, noise, soil contamination, and waste; and (vii) inappropriate use of monitoring equipment procured. These risks were assessed as minor, localized, generic, and reversible, and can be mitigated effectively. The respective departments have the capacity to manage these limited construction-related impacts with the support of external consultants as necessary. The Program does not support the construction of large new infrastructure (such as vehicle scrapping facilities, large boilers, and landfills) or activities that may lead to heavy emissions or to the generation and discharge of large volumes of waste and wastewater. The UPCAMPA structure will help in bridging gaps in environmental management capacity and good practices in the DoEFCC and the implementing departments, and in aligning with sector experiences. There are some gaps in capacity and environmental management, and recommendations for strengthening systems have been made in the PAP. A draft ESSA was prepared and consulted on May 9, 2025, as part of a multi-stakeholder consultation dialogue. The draft ESSA was disclosed on GoUP webpages<sup>24</sup> and the World Bank webpage<sup>25</sup> on June 25 and July 14, 2025, respectively.

57. **The social risks are rated Low,** reversible, and localized, and are expected to be managed through mitigation strategies built into the Program design as well as additional risk management measures. The operation is expected to result in the reduction in household level health expenditures, and improved health and overall wellbeing of the state's residents as well as those living in the IGP. The Program is also expected to improve public awareness of air quality through awareness generation and proactive public disclosure of air quality information for improved transparency. Access to efficient cooking solutions at the household level is expected to contribute to the health of women and overall time saving, while the interventions in the agriculture and animal husbandry sectors are likely to improve farm level efficiencies, with better farm and livestock productivity resulting in likely improvements in incomes. The Program does not envisage land acquisition, and land requirements are expected to be met from existing government properties or land pools. In the absence of information regarding the location of air quality monitoring, testing laboratories and offices, there is a likely risk of such lands not being unencumbered and may potentially include informal occupants, who may get displaced. The

<sup>24</sup> Can be accessed at: [https://upccce.org/public/UPLOADS/REPOSITORY/DOC/54\\_UPCAMP\\_Final\\_ESSA\\_P510253.pdf](https://upccce.org/public/UPLOADS/REPOSITORY/DOC/54_UPCAMP_Final_ESSA_P510253.pdf)

<sup>25</sup> Can be accessed at: <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/099071425165523315>



scale of construction is moderate, and labor deployment will be moderate and local, and likely will not lead to labor influx and related Sexual Exploitation and Abuse and Sexual Harassment risks. There are Occupational Health and Safety risks for workers engaged in construction activities, vehicle scrapping, brick kilns, electric vehicle charging facilities, apart from Community Health and Safety risks for those operating cook-stoves, decentralized bio-gas plants, and electric vehicle users. Effective measures will be ensured to include different stakeholders like women, smallholders, small dairy farmers, and members of poor households among those receiving benefits under RA2. The shift towards cleaner and efficient energy sources is also likely to adversely impact the livelihoods of those engaged by traditional value chains, like domestic fuelwood suppliers, workers in traditional brick kilns, single truck owners, and hired drivers. All activities involving land acquisition or leading to involuntary resettlement will be excluded from the Program. The state grievance redress mechanism is effective and accountable and is fit for use by the Program. In addition to robust social screening, the Program will also need to assess the livelihood benefits attributable to the Program, and if they are found to have any adverse livelihood impacts, the state may need to adopt measures for the restoration of livelihoods. The social capacities of the nodal department will require augmentation both through a social development specialist position in UPCAMPA, and capacity building during the Program.

58. **Grievance Redress.** Communities and individuals who believe that they are adversely affected as a result of a Bank supported PforR operation, as defined by the applicable policy and procedures, may submit complaints to the existing program grievance mechanism or the Bank’s Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address pertinent concerns. Project affected communities and individuals may submit their complaint to the Bank’s independent Accountability Mechanism (AM). The AM houses the Inspection Panel, which determines whether harm occurred, or could occur, as a result of Bank non-compliance with its policies and procedures, and the Dispute Resolution Service, which provides communities and borrowers with the opportunity to address complaints through dispute resolution. Complaints may be submitted at any time after concerns have been brought directly to the Bank’s attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the Bank’s Grievance Redress Service (GRS), visit <https://www.worldbank.org/GRS>. For information on how to submit complaints to the Bank’s Accountability Mechanism, visit <https://accountability.worldbank.org>.

#### D. Program Action Plan

Action Description	Source	DLI #	Responsibility	Timing		Completion Measurement
Annual financial statements of UPPCB (FY23-24) will be audited by the statutory auditor and audit report will be shared with the Bank.	Fiduciary Systems	NA	UPPCB	Other	Within 6 months from Program effectiveness	Audit report of UPPCB for FY23-24 submitted to the Bank.



Appoint audit firm to review FM and procurement aspects of the Program	Fiduciary Systems	NA	UPCAMP Authority	Other	Within 9 months from Program effectiveness	Firm engaged to conduct an internal audit for FM and procurement aspects of the program
Appoint full-time environmental , social, FM, procurement and M&E specialists for the UPCAMPA, with qualifications and experience satisfactory to the Bank	Other	NA	UPCAMP Authority	Other	Within 6 months of the Program effectiveness	Designation of qualified staff , as per the Legal Agreement and POM.
Bidding documents for construction and procurement to clearly specify the labor management related obligations of the Contractor-Supplier, including their responsibility to ensure non-usage of forced-bonded labor by their	Environmental and Social Systems	NA	UPCAMP Authority and other IAs	Other	Within one year of Program effectiveness	Review of program tenders and bidding documents



primary suppliers						
Develop an environmental and social screening checklist to be used by Implementing Agencies before commencement of any civil works to rule out any impacts and apply appropriate mitigation where needed	Environmental and Social Systems	NA	UPCAMP Authority	Recurrent	Continuous	<ol style="list-style-type: none"> <li>1. Environmental screening checklists developed for site selection and investment planning.</li> <li>2. Program Implementing Agencies trained on use of checklists.</li> <li>3. Checklists monitored by Environment Specialist of UPCAMPA.</li> </ol>
Environment, Health and occupational safety audit of vehicle scrapping facilities to assess conformity to national standards with corrective recommendations to be implemented through the Program.	Environmental and Social Systems	NA	UPCAMP Authority and Department of Transport	Other	Within 24 months of the Program effectiveness	Completion of audit/assessment and recommendations for improvement to be implemented throughout the Program (on sample basis)
Layer-wise protocol to review, appeal and resolve the procurement-	Fiduciary Systems	NA	UPCAMP Authority	Other	Within one year from Program effectiveness, Integrated Grievance	Complaint handling mechanism and protocol incorporated in POM and published on the website of UPCAMPA / IAs.



related complaints will be prepared and housed on the website of UPCAMPA / IAs for this Program					Redressal System website linked with UPCAMP	
Undertake a program assessment of livelihood or income related impacts and benefits, including the employment generation	Environmental and Social Systems	NA	UPCAMP Authority	Other	Assessment in Year 2 of Program implementation	Submission of assessment report
UPPCB to fill a minimum of 5 vacant positions for air quality management functions	Technical	NA	UPPCB	Other	Within one year of Program effectiveness	UPPCB Staff Roster
Disclose Program's Annual Work Plan including information on procurement activities.	Fiduciary Systems	NA	UPCAMP Authority	Recurrent	Yearly	Annual disclosure of work plans by UPCAMPA

**V. KEY RISKS**

59. **The overall Program risk to achieving its development outcomes is rated Substantial**, mainly driven by substantial risks related to technical design, institutional capacity for implementation and sustainability, and fiduciary aspects.

60. **The technical design risk is rated Substantial, due to the multisectoral nature and novelty of the Program.**



UPCAMP is pioneering an integrated airshed-level approach, new not only for UP but also for India, while also serving as the first PforR operation in the state. The Program involves a diverse set of activities, ranging from policy and planning measures to infrastructure investments such as procurement of e-buses, establishment of cutting-edge DSS for AQM, piloting new technologies like tunnel kiln systems, and promotion of clean cooking solutions. This breadth of activities across multiple sectors requires careful sequencing, coordination, and timely delivery. These risks will be mitigated through the following measures: (i) the establishment of UPCAMPA as a dedicated SPV to lead coordination and implementation across departments; (ii) setting up a comprehensive, virtual monitoring dashboard for the Program that will be integrated with state performance monitoring systems; (iii) formalization by MoEFCC of a national governance structure for IGP airshed coordination; and (iv) the World Bank providing targeted implementation support to specific sectors to strengthen capacity and ensure timely delivery, including knowledge exchange and other activities.

61. **Institutional capacity for implementation and sustainability risk is rated Substantial.** UPCAMPA is still in the early stages of operationalization. The appointment of the CEO and the ongoing recruitment for other key positions reflects strong government commitment, and the institutional capacity of the SPV and its coordination with line departments will be developed progressively during the initial years of the Program. The IAs bring varying levels of institutional capacity and may face constraints in coordinating interventions with the SPV. To mitigate these risks, there are specific PAP actions to strengthen the capacity of the SPV and other key agencies, such as UPPCB. Dedicated Program implementing units will be established within IAs with higher implementation risks, such as the UDD. The World Bank will also provide targeted sectoral technical assistance to support institutional development and enhance systems, particularly in areas that may benefit from global knowledge and best practices.

62. **Fiduciary risk is rated Substantial.** Given the Program's multi-sector, multi-agency structure, there is a risk of varying fiduciary capacity and non-compliance with the fiduciary requirements, as well as with the anti-corruption guidelines. UPCAMPA needs to strengthen the FM and procurement systems of the Program, with adequate procedures and qualified staff, for the timely preparation of procurement and contract management reports, financial reports and audited financial statements. The accounting and audit systems of UPPCB are assessed to be weak and need to be strengthened under the Program. These fiduciary risks will be addressed through measures in the POM and actions outlined in the PAP, including: (i) appointment of FM and procurement staff at UPCAMPA and other IAs; (ii) Statutory Audit of the UPPCB annual financial statements; and (iii) development of terms of reference for internal and external audit, hiring of audit firms to review fiduciary aspects of the Program, and timely submission of internal and financial audit reports.



ANNEX 1. RESULTS FRAMEWORK

Program Development Objective(s)

To strengthen airshed management systems and reduce emissions in Priority Sectors.

PDO Indicators by Outcomes

Baseline	Period 1	Period 2	Period 3	Period 4	Period 5	Closing Period
<b>Strengthened state capabilities for airshed management</b>						
<b>Airshed management decision support system in operation and use (Text) <sup>DU</sup></b>						
Mar/2023	Mar/2026	Mar/2027	Mar/2028	Mar/2029	Mar/2030	Mar/2031
First State Emission Inventory established with best available data up to 2020.	(i) AQM DSS is adopted and a policy decision for its adoption is notified by DoEFCC; (ii) UPPCB establishes the statewide siting plan for continuous ambient air quality monitoring station (CAAQMS).	(i) Up to 50 new CAAQMs installed with data received by UPPCB (Cumulative); (ii) 4 mini superstations and 3 superstations are generating real time air quality data for decision making; (iii) 1000 new CEMS installed in MSMEs and generating data integrated into the DSS; (iv) In 5 smart cities, use of mechanized-road sweeping audit operations generating data to inform AQM decisions and for	(i) DSS has been established and a trial run and testing has been completed; (ii) Up to 100 new CAAQMs installed with data received by UPPCB (Cumulative).	(i) DSS is used with data from the expanded network to generate and publish a first Uttar Pradesh state clean air report; (ii) Up to 150 new CAAQMs installed with data received by UPPCB (Cumulative).	(i) Up to 193 new CAAQMs installed with data received by UPPCB (Cumulative).	DSS is used with data from the expanded network to generate and publish a second Uttar Pradesh state clean air report.



		audit-based payments.				
<b>Citizen and private sector programs increased for air pollution reductions (Number)</b>						
Apr/2023	Mar/2026	Mar/2027	Mar/2028	Mar/2029	Mar/2030	Mar/2031
Ad hoc citizen and private sector awareness and engagement programs. Some initiatives have been taken but are limited in scale and scope.	Conduct a needs assessment new stakeholder engagement initiative; if achieved = 1	Implementation of the roadmap and monitoring outcomes milestone 1; if achieved = 1	Implementation of the roadmap and monitoring outcomes milestone 2; if achieved = 1	Implementation of the roadmap and monitoring outcomes milestone 3; if achieved = 1	Implementation of the roadmap and monitoring outcomes milestone 4; if achieved = 1	State has an established program for citizen and private stakeholder participate on air pollution reduction initiatives with a long-term vision and time frame. Target score of 5.
<b>Reduced emissions in priority sectors</b>						
<b>Emission reductions from major sources supported by the Program (disaggregated by PM2.5 and Black Carbon) (Text)</b>						
Mar/2023	Mar/2026	Mar/2027	Mar/2028	Mar/2029	Mar/2030	Mar/2031
The program baseline starts at zero. There is no regular state report on reductions in air pollution or climate change emissions. The state has climate change and air actions plans with goals to reduce emissions.	System for program reporting across sector interventions established by UPCAMPA	First program report with cumulative emission reductions reported	Cumulative measurements	Second program report with cumulative emission reductions reported and an independent evaluation completed with recommendations for enhancing emission reduction reporting	Cumulative measurements	Final program report with cumulative emission reductions reported
<b>Program beneficiaries with enhanced environmental resilience (Number)</b>						
Mar/2023	Mar/2026	Mar/2027	Mar/2028	Mar/2029	Mar/2030	Mar/2031
Air pollution is an environmental harm that weakens the resilience of 240 million people living and working in Uttar Pradesh. Reduction in air pollution is possible when more and more stakeholders are	System agreed for program reporting across sector interventions established by UPCAMPA for people directly benefitted by the program including those who work or live near interventions	Number of direct beneficiaries included in annual reports.	Number of direct beneficiaries included in annual reports.	Number of direct beneficiaries included in annual reports.	Number of direct beneficiaries included in annual reports.	Final reporting of increased number of people in Uttar Pradesh with enhanced environmental resilience from program interventions that reduce primary PM2.5 emissions at households or workplaces.



involved in implementation of air action plan.	that generate emissions.					
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**Intermediate Indicators by Results Areas**

Baseline	Period 1	Period 2	Period 3	Period 4	Period 5	Closing Period
<b>Strengthening State Capabilities for Air Quality Management</b>						
<b>Increased human resource capacity for airshed management (Text) <sup>DLI</sup></b>						
Mar/2023	Mar/2026	Mar/2027	Mar/2028	Mar/2029	Mar/2030	Mar/2031
Lack of capacity for AQM, auditing and monitoring of air pollution control operations in data interpretation/use with UPPCB, Industries, Knowledge Centers and implementing agencies.	(i) Governing Body approves the capacity building plan for IAs, line department industries, and knowledge centers.	(i) Governing Body approves training curriculum and its delivery package with baseline targets; (ii) Training and capacity building of IAs, industries and knowledge centers implemented as per 4 annual training plans.	Training and capacity building of UPPCB, Industries, Line departments Implementing Agencies and Knowledge Centers	(i) Training and capacity building of IAs, industries and knowledge centers implemented as per 4 annual training plans.	(i) Training and capacity building of IAs, industries and knowledge centers implemented as per 4 annual training plans.	Well-capacitated Human resources for airshed AQM in the State
<b>Improved integration of air pollution and public health data to inform AQM planning and decision making (Text)</b>						
Mar/2023	Mar/2026	Mar/2027	Mar/2028	Mar/2029	Mar/2030	Mar/2031
No coordination between air pollution and public health authorities and public health data and collection systems relevant for AQM. NCDC collection system available.	SOP protocol agreed for the systematic collection of relevant health data for AQM planning by DoEFCC and DoHFW	Training on data collection app completed in 5 public hospitals (tertiary or secondary level) as per protocol. (Y2 and Y3)	Meetings to review semi-annual reports for joint planning and decision-making held between DoEFCC and DoHFW	Semi-annual reports from public health data from the public hospitals utilized in AQMC meetings to guide health system preparedness (Y3-Y5)	Semi-annual reports from public health data from the public hospitals utilized in AQMC meetings to guide health system preparedness (Y3-Y5)	Health Data is collected through an application in at least 5 public hospitals (tertiary or secondary care) and AQM planning, and health system preparedness informed.
<b>Improved Road Dust Control (Text)</b>						
Mar/2023	Mar/2026	Mar/2027	Mar/2028	Mar/2029	Mar/2030	Mar/2031



Urban local bodies in the NCR districts of UP have established required dust cells but they are not active	Educational workshops on good dust management practice held with dust cells. Program for road dust management and monitoring designed by Knowledge Network.	Program for measuring and monitoring effectiveness of road dust management deployed	Knowledge Centres related to NCR urban local bodies (ULBs) actively report results of road dust monitoring programs to ULBs and DOEFC	Knowledge Centres related to NCR, Lucknow and Varansi ULBs actively report results of road dust monitoring programs to ULBs and DOEFC	Scale-up good practices to other Non-attainment ULBs in UP	Demonstrating good road dust management practice models in all Non-attainment ULBs in UP
<b>Advancing Sector Interventions for Emissions Reduction</b>						
<b>Female staff employed as drivers of electric 3-wheeler fleets (Number)</b>						
Mar/2023	Mar/2026	Mar/2027	Mar/2028	Mar/2029	Mar/2030	Mar/2031
0	0	300 (Cumulative)	600 (Cumulative)	900 (Cumulative)	1,200 (Cumulative)	1,500 (Cumulative)
<b>Households using clean cookstoves to meet cooking needs (Number) <sup>DLI</sup></b>						
Mar/2023	Mar/2026	Mar/2027	Mar/2028	Mar/2029	Mar/2030	Mar/2031
20 million households using primarily solid fuels; 17 million households with LPG connections	(i) DoEFCC approves details to deploy large-scale pilot for at least 4 clean cooking solutions.	(i) DoEFCC accepts detailed design of the scale-up for the state clean cooking plan based on the pilot. (ii) Up to 95,000 households have adopted tier 3 or improved clean cooking solutions (Cumulative).	(i) Up to 650,000 households have adopted tier 3 or improved clean cooking solutions (Cumulative).	(i) Up to 1.73 million households have adopted tier 3 or improved clean cooking solutions (Cumulative).	(i) Up to 2.67 million households have adopted tier 3 or improved clean cooking solutions (Cumulative).	Up to 3.9 million households have adopted tier 3 or improved clean cooking solutions (Cumulative).
<b>Development and Validation of Package of Practices for NUE and manure management (Text) <sup>DLI</sup></b>						
Mar/2023	Mar/2026	Mar/2027	Mar/2028	Mar/2029	Mar/2030	Mar/2031
Farmers field schools well established but no nitrogen use program in UP and no field testing on air emissions	(i) Approval of knowledge-based standard operating procedures (SoPs) for NUE application, testing and validation by DoA.	(i) SoPs for manure management and its alternative productive use developed by DoA for gaushalas.	(i) Plan for testing of NUE SoPs including training of farmers developed by DoA	(i) Testing and validation of SoPs on 32000 hectares of land across 9 agro climatic zones distributed across 18 administrative divisions of Uttar Pradesh (Cumulative);	(i) Validated package of practice for NUE for different agro climatic zones developed by DoA; Scalable DLRs continue. (ii) Testing and validation of SoPs on 48000 hectares of land across 9 agro	Validated package of practice for NUE for different Agro climatic Zones developed



				(ii) Testing and validation of SoPs for manure management and its productive use in 216 gaushalas distributed across 18 administrative divisions of Uttar Pradesh.	climatic zones distributed across 18 administrative divisions of Uttar Pradesh (Cumulative);	
<b>Good practice models of improved urban mobility for clean air (Number) <sup>DU</sup></b>						
Mar/2023	Mar/2026	Mar/2027	Mar/2028	Mar/2029	Mar/2030	Mar/2031
No model of integrated comprehensive city mobility planning in UP comprising both passenger and freight transport. 600 E-buses and 10,000 3W proposed to be deployed in Lucknow and Varanasi under UP-CAMP.	Comprehensive mobility plans developed in Lucknow and Varanasi and accepted by the DoEFCC and DoUT. (Scalable: No)	Up to 30% of target e-buses and 3W deployed. (Target: (i) 500 e-buses deployed and 15,000 E-3W deployed)	Up to 60% of target e-buses and 3W deployed. (Target: (i) 500 e-buses deployed and 15,000 E-3W deployed)	Up to 80% of target e-buses and 3W deployed. (Target: (i) 500 e-buses deployed and 15,000 E-3W deployed)	Up to 100% of target e-buses and 3W deployed. (Target: (i) 500 e-buses deployed and 15,000 E-3W deployed)	Increased number of electricity based public transport vehicles (buses and 3W) in the total fleet and using the NCMC.
<b>MSME clusters with clean air plans and improved air pollution monitoring systems (Text)</b>						
Mar/2023	Mar/2026	Mar/2027	Mar/2028	Mar/2029	Mar/2030	Mar/2031
No comprehensive air action plan for MSME clusters exists. MSMEs have limited monitoring capability/infrastructure.	ToR for agency to develop air action plans and for CEMS calibration lab finalized.	Agency selection for developing air action plans and establishing CEMS portal.	(i) 2 Air action plans in targeted industrial cluster developed. (ii) 2 CEMS labs installed in MSME Clusters.	(i) 2 Air action plans in targeted industrial cluster developed. (ii) 2 CEMS labs installed in MSME Clusters.	(i) 3 Air action plans in targeted industrial cluster developed. (ii) 2 CEMS labs installed in MSME Clusters.	(i) Setting up calibration labs in 4 numbers of identified industrial cluster. (ii) Preparation of 4 air action plans in the targeted industrial clusters.
<b>Brick Kilns and MSMEs transition to improved air pollution control technology and resource efficient technology (Text) <sup>DU</sup></b>						
Mar/2023	Mar/2026	Mar/2027	Mar/2028	Mar/2029	Mar/2030	Mar/2031
Less than 10 Resource efficient brick manufacturing units in the State. No common	(i) Department of Micro, Small and Medium Industries (DoMSME) approves incentive scheme for	(i) 152 brick kilns transition to improved air pollution control and resource efficiency technology	(i) 304 brick kilns transition to improved air pollution control and resource efficiency technology	(i) 456 brick kilns transition to improved air pollution control and resource	(i) 608 brick kilns transition to improved air pollution control and resource	(i) 760 brick kilns transition to improved air pollution control and resource efficiency technology (Cumulative)



steam facilities exist in MSME clusters in UP.	accelerated adoption of resource-efficient brick production (on top of zig zag upgrades); (ii) DoEFCC and Department of Housing and Urban Planning notify a policy/scheme to boost demand for resource efficient / perforated bricks; (iii) DoMSME introduces a policy mandating integration of common steam boilers for any greenfield MSME clusters approved for development in Uttar Pradesh.	(Cumulative); (ii) 4 MSME cluster clean air plans adopted and accepted by the DoEFCC and the Uttar Pradesh State Industrial Development Authority (UPSIDA) (Cumulative); (iii) 20 tunnel kilns established.	((Cumulative); (ii) 6 MSME cluster clean air plans adopted and accepted by the DoEFCC and UPSIDA (Cumulative);	efficiency technology (Cumulative).	efficiency technology (Cumulative).	(ii) 6 MSME cluster clean air plans adopted and accepted by the DoEFCC and UPSIDA (Cumulative) (iii) 20 tunnel kilns established.
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**Enabling IGP Airshed Cooperation**

**Registered heavy-duty vehicles (Bharat Stage III and below) scrapped and taken off the road (Number) <sup>DLU</sup>**

Mar/2023	Mar/2026	Mar/2027	Mar/2028	Mar/2029	Mar/2030	Mar/2031
Eight vehicles scrapping centers in UP operational and ten approved but not yet operational (as of March 2023). No incentives in place for scrapping heavy duty vehicles registered in UP.	DoT notifies plan/program for scrapping BS I, BS II and BS III heavy-duty vehicles through graded incentives based on vehicle age and fuel type	(i) DoT has developed training program, modules, and resource planning for heavy-duty vehicle drivers on fuel efficient driving and clean operation and maintenance; (ii) 1,356 polluting heavy-duty vehicles scrapped and taken off the road (Cumulative).	4,070 polluting heavy-duty vehicles scrapped and taken off the road (Cumulative).	8,140 polluting heavy-duty vehicles scrapped and taken off the road (Cumulative).	13,567 polluting heavy-duty vehicles scrapped and taken off the road (Cumulative).	13,567 polluting heavy-duty vehicle scrapped and taken off the road.

**Common measures with other IGP states (Text) <sup>DLU</sup>**



Mar/2023	Mar/2026	Mar/2027	Mar/2028	Mar/2029	Mar/2030	Mar/2031
No common measures or agreements across IGP states. UP districts within NCR are coordinated with NCR districts in other states.	DoEFCC has organized an inter-state meeting for knowledge sharing and joint solutions.	DoEFCC co-published a white paper on regional airshed action with partners and a consortium of technical institutes.	(i) 2 inter-IGP state dialogue events organized by DoEFCC to motivate all IGP states to agree on regional airshed common measures (Cumulative). (ii) 2 awareness, orientation, and capacity building events held for environment departments/pollution control boards of other IGP jurisdictions (Cumulative).	(i) 4 inter-IGP state dialogue events organized by DoEFCC to motivate all IGP states to agree on regional airshed common measures (Cumulative). (ii) 4 awareness, orientation, and capacity building events held for environment departments/pollution control boards of other IGP jurisdictions (Cumulative).	(i) 5 inter-IGP state dialogue events organized by DoEFCC to motivate all IGP states to agree on regional airshed common measures (Cumulative). (ii) 6 awareness, orientation, and capacity building events held for environment departments/pollution control boards of other IGP jurisdictions (Cumulative).	Improved coordination, awareness, orientation and capacity building of Environment Departments/Pollution Control Boards of IGP states. Common measures or agreements with other IGP states established.

**Disbursement Linked Indicators (DLI)**

Period	Period Definition
Period 1	India FY 2025-2026
Period 2	India FY 2026-2027
Period 3	India FY 2027-2028
Period 4	India FY 2028-2029
Period 5	India FY 2029-2030
Period 6	India FY 2030-2031

Baseline	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6
<b>1:Airshed management decision support system in operation and use (Text )</b>						



First State Emission Inventory established with best available data up to 2020.	1.1 (i) AQM DSS is adopted and a policy decision for its adoption is notified by DoEFCC; 1.1 (ii) UPPCB establishes the CAAQMS statewide siting plan.	1.2 (i) 193 new CAAQMs installed with data received by UPPCB (Scalable); 1.2 (ii) 4 mini superstations and 3 superstations are generating real time air quality data for decision making (Scalable);; 1.2 (iii) 1000 new CEMS installed in MSMEs and generating data integrated into the DSS (Scalable);; 1.2 (iv) In 5 smart cities, use of mechanized-road sweeping audit operations generating data to inform AQM decisions and for audit-based payments (Scalable).	1.3 DSS has been established and a trial run and testing has been completed.	1.4 DSS is used with data from the expanded network to generate and publish a first Uttar Pradesh state clean air report		1.5 DSS is used with data from the expanded network to generate and publish a second Uttar Pradesh state clean air report
0.00	21.65	8.70	33.50	12.10	7.50	.90
DLI allocation		84.35		As a % of Total DLI Allocation		27.69%
<b>2:Increased human resource capacity for airshed management (Text )</b>						
Lack of capacity for AQM, auditing and monitoring of air pollution control operations in data interpretation/use with UPPCB, Industries, Knowledge Centers and	2.1 Governing Body approves the capacity building plan for IAs, line department industries, and knowledge centers.	2.2 (i) Governing Body approves training building plan for IAs, line department industries, and knowledge centers with baseline targets; 2.2 (ii) Training and capacity building of IAs, industries and knowledge centers				



implementing agencies.		implemented as per 4 annual training plans (Scalable).				
0.00	1.80	1.57	.67	.67	.67	0.00
DLI allocation		5.38	As a % of Total DLI Allocation		1.77%	
<b>3:Households using clean cookstoves to meet cooking needs (Number )</b>						
20 million households using primarily solid fuels; 17 million households with LPG connections	3.1 DoEFCC approves details to deploy large-scale pilot for at least 4 clean cooking solutions.	3.2.(i) DoEFCC accepts detailed design of the scale-up for the state clean cooking plan based on the pilot. 3.2.(ii) 3.9 million households have adopted tier 3 or improved clean cooking solutions (Scalable).				
0.00	8.71	6.63	5.33	10.36	9.00	11.81
DLI allocation		51.84	As a % of Total DLI Allocation		17.02%	
<b>4:Development and Validation of Package of Practices for NUE and manure management (Text )</b>						
Farmers field schools well established but no nitrogen use program in UP and no field testing on air emissions	4.1 Approval of knowledge-based standard operating procedures (SoPs) for NUE application, testing and validation by DoA.	4.2 SoPs for manure management and its alternative productive use developed by DoA for gaushalas.	4.3 Plan for testing of NUE SoPs including training of farmers developed by DoA.	4.4 (i) Testing and validation of SoPs on 48000 hectares of land across 9 agro climatic zones distributed across 18 administrative divisions of Uttar Pradesh (Scalable); 4.4(ii) Testing and validation of SoPs for manure management and its productive use in 216 gaushalas distributed across 18 administrative	4.5 Validated package of practice for NUE for different agro climatic zones developed by DoA.	Scalable DLRs continue.



				divisions of Uttar Pradesh (Scalable).		
0.00	12.79	.42	1.96	8.42	2.37	2.22
DLI allocation		28.18		As a % of Total DLI Allocation		9.25%
<b>5:Brick Kilns and MSMEs transition to improved air pollution control technology and resource efficient technology (Text )</b>						
Less than 10 Resource efficient brick manufacturing units in the State. No common steam facilities exist in MSME clusters in UP.	5.1 (i) DoMSME approves incentive scheme for accelerated adoption of resource-efficient brick production (on top of zig zag upgrades); 5.1 (ii) DoEFCC and Department of Housing and Urban Planning notify a policy/scheme to boost demand for resource efficient / perforated bricks 5.1 (iii) DoMSME introduces a policy mandating integration of common steam boilers for any greenfield MSME clusters approved for development in Uttar Pradesh.	5.2 (i) 760 brick kilns transition to improved air pollution control and resource efficiency technology (Scalable); 5.2(ii) 6 MSME cluster clean air plans adopted and accepted by the DoEFCC and UPSIDA (Scalable); 5.2 (iii) 20 tunnel kilns established (Scalable).				
0.00	2.27	12.22	7.01	6.50	6.50	6.50
DLI allocation		41.00		As a % of Total DLI Allocation		13.46%
<b>6:Good practice models of improved urban mobility for clean air (Number )</b>						
No model of integrated comprehensive city	6.1 Comprehensive mobility plans developed for	6.2 (i) 15,000 e-three wheelers deployed in model cities		Scalable DLRs continue.		



mobility planning in UP comprising both passenger and freight transport. 600 E-buses and 10,000 3W proposed to be deployed in Lucknow and Varanasi under UP-CAMP.	Lucknow and Varanasi and accepted by DoEFCC and DoUT (Scalable).	(Scalable); 6.2 (ii) 500 e-buses deployed in model cities (Scalable).				
0.00	4.85	2.78	10.13	12.37	16.87	0.00
DLI allocation		47.00		As a % of Total DLI Allocation		15.43%
<b>7:Registered heavy-duty vehicles (Bharat Stage III and below) scrapped and taken off the road (Number)</b>						
Eight vehicles scrapping centers in UP operational and ten approved but not yet operational (as of March 2023). No incentives in place for scrapping heavy duty vehicles registered in UP.	7.1 DoT notifies plan/program for scrapping BS I, BS II and BS III heavy-duty vehicles through graded incentives based on vehicle age and fuel type.	7.2 (i) DoT has developed training program, modules, and resource planning for heavy-duty vehicle drivers on fuel efficient driving and clean operation and maintenance; 7.2 (ii) 13,567 polluting heavy-duty vehicles scrapped and taken off the road (Scalable).				
0.00	3.60	4.93	8.06	12.09	12.09	4.03
DLI allocation		44.80		As a % of Total DLI Allocation		14.71%
<b>8:Common measures with other IGP states (Text)</b>						
No common measures or agreements across IGP states. UP districts within NCR are coordinated with NCR districts in other states.	8.1 DoEFCC has organized an inter-state meeting for knowledge sharing and joint solutions.	8.2 DoEFCC co-published a white paper on regional airshed action with partners and a consortium of technical institutes.	8.3(i) 5 inter-IGP state dialogue events organized by DoEFCC to motivate all IGP states to agree on regional airshed common measures (Scalable). 8.3(ii) 6			



			awareness, orientation, and capacity building events held for environment departments/ pollution control boards of other IGP jurisdictions (Scalable).			
0.00	.37	.46	.45	.45	.36	0.00
DLI allocation		2.09		As a % of Total DLI Allocation		0.69%



## Monitoring & Evaluation Plan: PDO Indicators by PDO Outcomes

<b>Strengthened state capabilities for airshed management</b>	
<b>Airshed management decision support system in operation and use (Text) <sup>DLI</sup></b>	
Description	This indicator monitors the progress in UP to establish elements of a comprehensive decision support system that will inform the ongoing evidence base and management decisions.
Frequency	Quarterly
Data source	SPV monitoring report would summarize the progress and activities on this indicator quarterly.
Methodology for Data Collection	An M&E coordinator in the SPV would liaise with the State Pollution Control Board team on this indicator and establish a template for quarterly program reports. The indicator would be monitored using text and key elements of a comprehensive DSS, such as: (1) Institutional framework for decision support system; (2) Information technology system for integrated platform with updated data; (3) Integration of various systems; (4) Capacity building: knowledge centers, trained people, research linkages, etc.; and (5) Government institutions using decision support system.
Responsibility for Data Collection	DoEFCC SPV core implementation team working with an Indian institute of repute (that is, IIT Kanpur) and the DoEFCC on this indicator.
<b>Citizen and private sector programs increased for air pollution reductions (Number)</b>	
Description	This indicator measures the number of GoUP programs that broaden and activate citizens and the private sector contributing to the reduction of air pollution in UP. For example, partnerships with Energy Efficiency Services Limited and the Indian Oil Corporation Ltd. Planned on clean cooking. This may include farmer engagement programs on NUE and programs targeted at private owners of vehicles under the scrapping program. Also, it includes outreach programs/events for different stakeholders. This indicator also measures citizen engagement, as per World Bank's corporate commitments.
Frequency	Quarterly
Data source	Records of outreach events. Letters of Intent or Agreement with collaborating organizations or updated or new government program documents that state the program's work on clean air objectives.
Methodology for Data Collection	Participating units will be encouraged to promote the expansion of programs and progress will be reported in regular program reports.
Responsibility for Data Collection	DoEFCC SPV core implementation team
<b>Reduced emissions in priority sectors</b>	
<b>Emission reductions from major sources supported by the Program (disaggregated by PM2.5 and Black Carbon) (Text)</b>	
Description	This indicator measures emissions reductions in PM <sub>2.5</sub> , SO <sub>x</sub> , NO <sub>x</sub> , ammonia, and BC generated by activities implemented under the Program. This indicator also measures climate co benefits as per World Bank's corporate commitments.
Frequency	Annual
Data source	Data will vary by sub-interventions but will include carbon finance Monitoring, Reporting, and Verification reports particularly for clean cooking and reduction estimations based on standard emission factors for other topics.
Methodology for Data Collection	Data will be generated through each of the Results Area 2 measures and for road dust under Results Area 1. The standard emission factor referred by CPCB will be used throughout the Program. Agreed emission factors will be applied to Program interventions. All emission factors available in India and literature will be reviewed with concerned stakeholders and selected for application to Program interventions.
Responsibility for Data Collection	DoEFCC SPV core implementation team and UPPCB technical AQM team
<b>Program beneficiaries with enhanced environmental resilience (Number)</b>	
Description	This indicator measures the number of program beneficiaries benefiting from reductions in environmental risk generated by air pollution. The population qualifying will be those who work or live near interventions that generate emission reductions generated under the program. For example, the number of beneficiaries living in households with improved cookstoves; the number of people employed at brick kilns with improved emission controls; and the population of citizens using the new electric vehicle fleet. This indicator also measures enabled private capital, as per World Bank's corporate commitments.



Frequency	Annual
Data source	This indicator aggregates data collected across the intervention in the Program
Methodology for Data Collection	The SPV M&E Unit will ensure that the counting of program beneficiaries is integrated as a requirement across all program DLIs generating primary PM2.5 emission reductions. The indicator conservatively focuses on primary PM2.5 emission reductions. Although people living further away would also increase environmental resilience from program interventions that reduce secondary PM2.5 this is more difficult for direct attribution to a particular population. Data for this indicator will be reported as part of more comprehensive benefits monitoring that also includes other benefits such as income generation, asset creation, employment, honorarium, capacity building, etc. GAINS model will be used for indirect benefit estimates.
Responsibility for Data Collection	The SPV M&E unit with UPCAMPA units of relevant implementing departments.

### Monitoring & Evaluation Plan: Intermediate Results Indicators by Results Areas

<b>Strengthening State Capabilities for Air Quality Management</b>	
<b>Increased human resource capacity for airshed management (Text) <sup>DU</sup></b>	
Description	This indicator measures progress in strengthening human resources capacity for air quality management in UP needed for implementation of the program and for longer-term airshed management capacity.
Frequency	Quarterly program monitoring reports
Data source	Training records, budget documents, HR staff data
Methodology for Data Collection	Program monitoring reports
Responsibility for Data Collection	DoEFCC SPV core program implementation team
<b>Improved integration of air pollution and public health data to inform AQM planning and decision making (Text)</b>	
Description	This indicator supports the rollout of a health data surveillance system to monitor the incidence of respiratory disease in public hospitals and use it for AQM and public health planning.
Frequency	Semi-annual reports on data collected will be prepared for discussion
Data source	The Acute Respiratory Disease Incidence (ARI) app minutes of meeting and reports
Methodology for Data Collection	ARI app used by doctors will be rolled out in hospitals for data collection system.
Responsibility for Data Collection	Department of Health, DoEFCC
<b>Improved Road Dust Control (Text)</b>	
Description	This indicator measures results from work with 19 dust cells in UP: 17 that are already formed in the Delhi NCR area and 2 new ones proposed in Lucknow and Varanasi as part of the model city work.
Frequency	Years 1 and 2 will be spent establishing the system and working with fewer city trials with demonstration learning; rollout to all 19 in Year 3.
Data source	MRS Audit System will track data on dust collected along with spot testing.
Methodology for Data Collection	Data collected will feed into the DoEFCC and ULB air cell portals and a testing protocol will define a threshold to trigger more frequent road cleaning as required based on dust levels.
Responsibility for Data Collection	Department of Environment and Urban Development with 19 ULBs
<b>Advancing Sector Interventions for Emissions Reduction</b>	
<b>Female staff employed as drivers of electric 3-wheeler fleets (Number)</b>	
Description	This indicator measures the number of newly recruited women who remain employed as drivers in electric three-wheeler fleets under UPCAMP interventions. This job-focused indicator captures progress toward women's inclusion in the labor force of the urban transport sector, as well as the effectiveness of the Program-supported incentive scheme in encouraging women's participation in the sector. This is a corporate results indicator to measure people benefiting from actions to advance gender equality.



Frequency	Annual
Data source	Transport Department/Regional Transport Office registration records
Methodology for Data Collection	Cross-check names of beneficiaries, vehicle registration numbers, and subsidy disbursement lists with RTO data.
Responsibility for Data Collection	Transport Department
<b>Households using clean cookstoves to meet cooking needs (Number) <sup>DLI</sup></b>	
Description	This indicator measures the number of households supported under the program that shift from air polluting cooking methods to cleaner and healthier alternative cooking methods and fuels.
Frequency	Quarterly
Data source	Reporting and geo reference photos by the implementing agencies with sample third party field spot checks.
Methodology for Data Collection	App based geo-referenced remote monitoring system.
Responsibility for Data Collection	Rural Development, UPSRLM, Uttar Pradesh New and Renewable Energy Development Agency, Energy Efficiency Services Limited, SPV
<b>Development and Validation of Package of Practices for NUE and manure management (Text) <sup>DLI</sup></b>	
Description	This indicator measures progress in hectares in improved practices for applying fertilizer within and across nine agro-ecological zones. It will also measure success in knowledge transfer for progressive scale-up for different soil and crops. This indicator measures the progress in development of NUE SOP and its testing and validation across 9 agro climatic zones. It will also help to measure the knowledge transfer for progressive scale-up.
Frequency	Quarterly
Data source	Field-based, standard agronomic measurements and soil laboratory and water quality data, procurement receipts/rec
Methodology for Data Collection	Measurement will be focused largely in the field with some cross-checking of related data linked to inputs
Responsibility for Data Collection	DOA
<b>Good practice models of improved urban mobility for clean air (Number) <sup>DLI</sup></b>	
Description	Indicator tracks the award of contracts between Directorate of Urban Transport (DoUT) and private operators for electric bus services as well as details of beneficiaries/operators for electric three-wheelers (e-3W). The number of buses and e-3W added are tracked in absolute numbers.
Frequency	Half yearly
Data source	Signed contract between DoUT in cities and private operators, record of UP Transport Department for e-3W
Methodology for Data Collection	DUT/SPV signed contracts for bus operation and documentary evidence by UP Transport Department for the beneficiaries/operators of the e-W. The IVA will confirm the number of buses and e-3W.
Responsibility for Data Collection	DoUT, DoT
<b>MSME clusters with clean air plans and improved air pollution monitoring systems (Text)</b>	
Description	This indicator measures the progress of development of air action plans of targeted industrial clusters and establishment of CEMS lab along with installation of CEMS.
Frequency	Half yearly
Data source	Signed contracts between DoMSME and vendors /agencies. Reports from MSME Department including verification reports, inspection reports from UPPCB
Methodology for Data Collection	Internal reporting system of MSME
Responsibility for Data Collection	Department of Environment with Department of MSME, SPV
<b>Brick Kilns and MSMEs transition to improved air pollution control technology and resource efficient technology (Text) <sup>DLI</sup></b>	
Description	This indicator measures the number of brick kilns adopting zig-zag along with resource efficient brick making technology, that leads to reduction in air pollution. This indicator also measures enabled private capital, as per World Bank's corporate commitments.



Frequency	Quarterly
Data source	Reports from MSME department including the verification reports. Inspections reports from UPPCB.
Methodology for Data Collection	Internal reporting system of MSME, consent to operate certification issued by UPPCB.
Responsibility for Data Collection	UPPCB, DoMSME
<b>Enabling IGP Airshed Cooperation</b>	
<b>Registered heavy-duty vehicles (Bharat Stage III and below) scrapped and taken off the road (Number) <sup>DLI</sup></b>	
Description	This indicator measures the number of most polluting heavy-duty vehicles taken off the road while ensuring scrapping.
Frequency	Half Yearly
Data source	Scrapping certificates from registered vehicle scrapping facilities (RVSF), and incentive records
Methodology for Data Collection	Certificate of scrapping from RVSF and expenditure statement from UP DoT,
Responsibility for Data Collection	UP DoT
<b>Common measures with other IGP states (Text) <sup>DLI</sup></b>	
Description	This indicator will measure progress in work at the IGP level working toward common measures across states.
Frequency	UPCAMP will monitor attendance at IGP meetings and include this in regular annual reports.
Data source	Meeting minutes, attendance lists, documents on common measures, and next steps agreed
Methodology for Data Collection	Largely process measurements with regular check-ins at the IGP State convening's to request attendees to report on progress being made
Responsibility for Data Collection	DoEFCC and Sector Departments

## Verification Protocol: Disbursement Linked Indicators

<b>DLI#1: Airshed management decision support system in operation and use (Text)</b>	
Formula	<p><b>DLR 1.1:</b>                      (i) Design of the AQM Decision Support System is adopted and a policy decision for its adoption is notified by DoEFCC. Disburse US\$9,019,000 when the design of the AQM Decision Support System is adopted and a policy decision for its adoption is notified by DoEFCC. (Year 1)                      (ii) UPPCB establishes the CAAQMS statewide siting plan. Disburse US\$12,626,000 when UPPCB establishes the CAAQMS statewide siting plan.</p> <p><b>DLR 1.2:</b>                      (i) 193 new online CAAQMs generating ambient air data are installed and data is received by UPPCB (Scalable: Yes). Formula: US\$174,503 per each new CAAQMs installed with data received by UPPCB up to an aggregate amount of (equivalent to 193 new CAAQMs) US\$33,679,000.                      (ii) 4 mini superstations and 3 superstations are generating real time air quality data for decision making (Scalable: Yes). Formula: US\$1,546,143 per superstation and mini-superstation generating data up to an aggregated amount of (equivalent to 7 superstations and min-superstations) US\$10,823,000.                      (iii) 1000 new CEMS installed in MSMEs and generating data integrated into the DSS (Scalable: Yes). Formula: US\$3,608 per each CEMS installed up to an aggregated amount of US\$3,608,000 (equivalent to 1000 CEMS)                      (iv) In 5 smart cities, use of mechanized-road sweeping audit operations generating data to inform air quality management decisions and for audit-based payments. Formula: US\$1,533,200 per each Smart city that adopts the use of mechanized road sweeping audit operations, up to an aggregated amount of US\$7,666,000 (equivalent to 5 Smart cities) (Scalable: Yes)</p> <p><b>DLR 1.3</b>                      DSS has been established, and a trial run and testing has been completed. Disburse: US\$2,645,000 when DSS has been established, and a trial run and testing has been completed.</p> <p><b>DLR 1.4</b>                      DSS is used with data from the expanded network to generate and publish the first UP state clean air report. Disburse US\$3,382,000 when DSS is used with data from the expanded network and UP state clean air report published.</p> <p><b>DLR 1.5</b>                      Disburse \$US902,000 towards DSS is used with data from the expanded network to generate and publish a second UP state clean air report.</p>
Description	This indicator monitors the progress in UP with expansion of the network and infrastructure for air quality monitoring and refine a state emissions inventory.
Data source/ Agency	SPV monitoring report would summarize the progress and activities on this quarterly. Procurement documents, annual state report, policy documents etc.
Verification Entity	IVA
Procedure	(i) IVA will verify the Government orders for the policy adoption and design of AQM DSS along with its implementation in the first year and onwards. Also, will verify the adoption of CAAQMS siting plan. (ii) IVA will cross-check the establishment of CEMS, CAAQMS and Supersites/Mini Supersites using installation completion certificate, photo evidence and site visit if required on sample basis. (iii) IVA will verify use of mechanized road sweeping audit operations.
<b>DLI#2: Increased human resource capacity for airshed management (Text)</b>	
Formula	<p><b>DLR: 2.1:</b> Training and capacity building of UPPCB, Implementing Agencies, Industries, and Knowledge Centers (100 percent of target). Disburse US\$1,804,000 when UPCAMPA Governing Body approves the capacity building plan for UPPCB, Implementing Agencies, line departments industries, and knowledge centers.</p> <p><b>DLR 2.2</b>                      (i): UPCAMPA Governing Body approves the training curriculum and its delivery package with baseline targets. Disburse US\$902,000 when the UPCAMPA Governing Body approves the training curriculum and delivery package with baseline targets.                      (ii) Training and capacity building of UPPCB, Implementing Agencies, industries, and knowledge centers. Formula: US\$668,750 per each of 4 annual training plans implemented against targets up to an aggregate amount of US\$2,675,000. (Scalable: Yes)</p>

Description	This indicator measures the progress with Training and capacity building of UPPCB, Implementing Agencies, Industries, and Knowledge Centers
Data source/ Agency	Monitoring Reports of UPCAMPA; Training Records of Apex Institute; training records of knowledge centers; evaluation reports
Verification Entity	IVA
Procedure	(i) IVA will verify the approval of capacity building plan in 1 <sup>st</sup> year. (ii) IVA will verify the approval of training curriculum and delivery package for capacity building. (iii) IVA will verify the implementation of annual training plans through attendance records and photographs.
<b>DLI#3: Households using clean cookstoves to meet cooking needs (Number)</b>	
Formula	<b>DLR 3.1:</b> Approval by DoEFCC of details to deploy large-scale pilot for at least 4 clean cooking solutions. Disburse US\$8,710,000 (including US\$4,000,000 from ESMAP grant) upon approval by DoEFCC of details to deploy large-scale pilot for at least 4 clean cooking solutions along with business models. <b>DLR 3.2</b> (i) Disburse US\$5,710,000 (including \$1,000,000 from ESMAP grant) upon acceptance by DoEFCC for the detailed design of the scale-up for the state clean cooking plan based on the pilot (ii) 3.9 million households have adopted tier 3 or improved clean cooking solutions. US\$9.4 for each household that has adopted tier 3 or better improved clean cooking solutions up to an aggregate amount of US\$36,651,850. (Scalable: Yes)
Description	This indicator measures the number of households supported under the program that shift from traditional cookstoves/solid fuels to cleaner cookstoves and fuels and continue to use them.
Data source/ Agency	DoEFCC
Verification Entity	IVA
Procedure	Year 1: (a) IVA will verify that the UPCAMP clean cooking program framework is established. The Program framework will detail the institutional and implementing arrangements for managing and administering clean cooking technologies to rural poor. This framework, along with operating guidelines, is disclosed on the website of relevant government departments (Departments of Rural Development, New and Renewable Energy, and Environment Forestry and Climate Change) Years 2–6: (a) IVA will verify households have adopted tier 3 or better clean cooking solutions; (b) IVA will cross-check data on core beneficiary households in DoEFCC database and income levels and check for duplication; (c) IVA will verify beneficiary households who have received financial assistance through UPCAMP for adopting clean cooking solutions and that their bank accounts have been credited in time according to the payment guidelines; and (d) IVA will corroborate households that have adopted clean cooking solutions are continuing to use them (through agreed sampling strategy) to measure effectiveness of the Program.
<b>DLI#4: Development and Validation of Package of Practices for NUE and manure management (Text)</b>	
Formula	<b>DLR: 4.1</b> (i) Approval of knowledge-based SoP for NUE application, testing and validation by DoA. Disburse US\$12,787,000. (ii) Disburse US\$423,000 when SoP for Manure management and its alternative productive use developed for Gaushalas. (iii) Disburse US\$1,959,000 when plan for testing of NUE SoP including training of farmers developed. <b>DLR 4.2:</b> (i) Year 2-6: Testing and validation of SoPs on 48,000 hectares of land across 9 agro climatic zones distributed across 18 administrative divisions. (Formula: US\$148 for each hectare of land brought under testing and validation of NUE up to an aggregate amount of US\$7,117,000) (Scalable: Yes) (ii) Year 2-6: Testing and validation of SoPs for manure management and its productive use in 216 Gaushalas distributed across 18 administrative divisions of UP. (Formula: US\$16,995 for each Gaushala that adopts SOP practice up to an aggregate amount of US\$3,671,000) (Scalable: Yes) <b>DLR 4.5:</b> (1) Disburse US\$2,228,000 when the validated package of practice for NUE for different agro-climatic zones is developed.
Description	This indicator measures progress in hectares in improved practices for applying fertilizer within and across nine agro-ecological zones. It will also help measure success in knowledge transfer for progressive scale-up for different soil and crop conditions. .
Data source/ Agency	Field-based, standard agronomic measurements and soil laboratory and water quality data, procurement receipts/records
Verification Entity	IVA

Procedure	IVA will verify adoption of nutrient management practices by number of farmers through conducting on-field survey and cross-verifying databases established by DOA. IVA will verify the data generated for NUE after application of PNMPs with baseline data, three monitoring labs at SAUs in pilot fields. IVA will verify that subsidies are disbursed to the farmers.
<b>DLI#5: Brick Kilns and MSMEs transition to improved air pollution control technology and resource efficient technology (Text)</b>	
Formula	<p><b>DLR 5.1:</b></p> <p>(i) Implementation of incentive scheme for resource efficient Brick manufacturing technology upgrades in addition to zig-zag chimneys to reach the target of 760. Disburse US\$902,000 when DoMSME approves incentive scheme for accelerated adoption of resource efficient brick production (on top of zig-zag upgrades).</p> <p>(ii) Disburse US\$902,000 when DoEFCC and Department of Housing and Urban Planning notifies a policy/scheme to boost demand for resource efficient / perforated bricks.</p> <p>(iii) Disburse US\$473,000 when DoMSME introduces a policy mandating integration of common steam boilers for any greenfield MSME clusters approved for development in the state.</p> <p><b>DLI 5.2</b></p> <p>(i) Disburse US\$32,468,000 when brick kilns transition to improved air pollution control and resource efficiency technology. (US\$42,721 per brick kiln transitioned to improved air pollution control and resource efficiency technology up to an aggregate of 760 brick kilns) (Scalable: Yes)</p> <p>(ii) 6 MSME cluster clean air plans adopted and accepted by the DoEFCC and UPSIDA (Formula: \$263,000 per MSME cluster clean air plan adopted and accepted by the DoEFCC and UPSIDA up to an aggregate amount of US\$1,578,000) (Scalable: Yes)</p> <p>(iii) 20 tunnel kilns established (Formula: US\$233,950 for each MSME tunnel kiln established up to an aggregate amount of US\$4,679,000) (Scalable: Yes)</p>
Description	This indicator measures the number of brick kilns adopting resource efficient technology, that leads to a reduction of air pollution.
Data source/ Agency	Inspections carried out by UPPCB Regional Offices; Budgetary documents from DoMSME.
Verification Entity	IVA
Procedure	Year 1: IVA will verify that scheme operational guidelines to provide incentive for resource efficient brick manufacturing technology along with zig-zag kiln adoption is established by MSME Department. Years 2-4: (a) IVA will verify that brick kilns have adopted resource efficient brick manufacturing technology along with zig-zag technology. IVA will cross-check data on Consent to Operate Certificates issued by the UPPCB and conduct random field audits;(b) IVA will verify that incentives have been disbursed to the beneficiaries by MSME Department; (c) IVA will verify that training has been conducted for kiln operators.
<b>DLI#6: Good practice models of improved urban mobility for Clean Air (Number)</b>	
Formula	<p><b>DLR 6.1</b> Comprehensive mobility plans are developed for Lucknow and Varanasi and accepted by the DoEFCC and DoUT (Formula: US\$2,429,500 for each comprehensive mobility plan developed and accepted by the DoEFCC and DoUT up to an aggregate amount of US\$4,885,513)</p> <p><b>DLR 6.2</b></p> <p>(i) US\$1,082,000 for the first lot of 2,000 electric 3-wheelers introduced, US\$1,623,000 for each subsequent lot of 3000 electric 3-wheelers (or in similar proportion if more than 3,000 electric e-wheelers) up to an aggregate amount of US\$8,117,000. (Scalable: Yes)</p> <p>(ii) US\$1,702,300 for the first lot of 25 buses, US\$3,404,600 for each subsequent lot of 50 buses (or in similar proportion if more than 50 buses) after the contract(s) with private bus operator(s) has/have been signed up to an aggregate amount of US\$34,046,000. (Scalable: Yes)</p>
Description	Indicator tracks (a) Establishment of comprehensive mobility plans for Lucknow and Varanasi, and (b) Award of contracts between DoUT and private operators for additional electric bus services and details of beneficiaries/operators for electric three-wheelers (e-3W). The number of buses and e-3W added are tracked in absolute numbers
Data source/ Agency	Signed contract between DoUT and private operators and record of UP transport department for e-3W, approval of comprehensive mobility plan documents.
Verification Entity	IVA
Procedure	IVA will verify the approval of urban mobility plans, incentive scheme documents and assess and verify vehicles registration data from DoUT for the cities to ascertain growth in electric mobility and e-3W beneficiaries who received financial incentives.
<b>DLI#7: Registered heavy-duty vehicles (Bharat Stage III and below) scrapped and taken off the road (Number)</b>	

Formula	<p><b>DLR 7.1</b> Disburse US\$3,608,000 when DoT notifies Plan/Program for scrapping heavy duty vehicles for non-BS, BS1, BSII and BSIII HD Vehicles through graded incentives based on vehicle age and fuel type.</p> <p><b>DLR 7.2</b></p> <p>(i) Disburse US\$902,000 for Development of training program, modules, and resource planning for heavy-duty vehicle drivers on fuel efficient driving and clean operation and maintenance.</p> <p>(ii) Disburse US\$40,296,000 when 13,567 polluting heavy-duty vehicles scrapped (Formula: US\$2,970 for each polluting heavy-duty vehicle scrapped and taken off the road up to an aggregate amount of US\$40,296,000) (Scalable: Yes)</p>
Description	This indicator measures the number polluting heavy-duty vehicles (BS- III AND below) taken off the road while ensuring scrapping.
Data source/ Agency	Scrapping records from Registered Vehicle Scrapping Facility (RVSF), photo evidence, and budget records
Verification Entity	IVA
Procedure	Year 1: IVA will verify that incentive scheme operational guidelines for scrapping of heavy-duty vehicles has been established Year 2-5: (a) IVA will analyze and verify scrapping records/certificates issues by DoT, (b) IVA will verify that incentives have been disbursed to heavy-duty vehicles owners.
<b>DLI#8: Common measures with other IGP states (Text)</b>	
Formula	<p><b>DLR 8.1</b> Disburse US\$365,000 when DoEFCC has organized an inter-state meeting for knowledge sharing and joint solutions.</p> <p><b>DLR 8.2</b> Disburse US\$464,000 when DoEFCC co-published a white paper on regional airshed action with partners and a consortium of technical institutes.</p> <p><b>DLR 8.3</b></p> <p>(i) Disburse US\$92,800 for each inter-IGP state dialogue events organized to motivate all IGP states to agree on regional airshed common measures, (up to 5) up to a total aggregate amount of US\$464,000 (Scalable: Yes)</p> <p>(ii) Disburse US\$133,333.3 for each awareness, orientation, and capacity building event for Environment Departments/Pollution Control Boards of other IGP jurisdictions, (up to 6) for a total of US\$800,000 (Scalable: Yes)</p>
Description	This indicator will measure progress in work at the IGP level working toward common measures across states.
Data source/ Agency	Meeting minutes, attendance lists, documents on inter IGP state dialogues and exposure visits.
Verification Entity	IVA
Procedure	IVA will establish a mechanism of collecting and verifying minutes from meetings and exposure events between IGP states