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Council for International Economic Understanding | Dalberg

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Unlocking India's Blue Skies Economy

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Air is Free, Cleaning It Isn't: Making Clean Air Investible

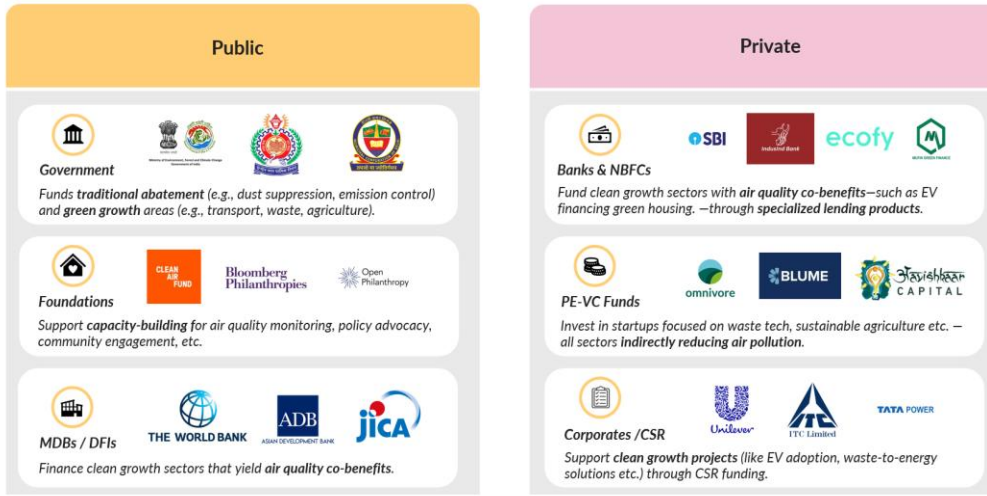
Context and rationale

Air quality management (AQM) funding remains limited and poorly targeted, undermining the fight against India's escalating pollution crisis. India, despite being among the world's most polluted countries, received only $16.2 billion in overall air quality funding between 2018 and 2022—just 14% of global flows and far below what's needed to address its severe air pollution levels[1]. Worse still, this funding is heavily skewed: 61% of all explicit outdoor air quality funding globally went to the transport sector, while crucial sources such as waste (5%), construction/buildings (2%), and agriculture (less than 1%) were starkly underfunded. Only 0.5% of funding supported monitoring and modelling systems, limiting data-driven action. This mismatch limits the effectiveness of interventions, especially in complex and multi-source airsheds like the Indo-Gangetic Plain (IGP), where comprehensive, cross-sectoral action is critical.

India's air quality financing ecosystem is characterized by a growing diversity of players spanning both public and private domains, each operating with distinct mandates, capacities, and incentives. On the public side, funding flows through three primary channels: Government allocations via the National Clean Air Programme (NCAP) and municipal budgets; Philanthropic foundations like Bloomberg Philanthropies and the Clean Air Fund support enabling infrastructure and ecosystem funding; and multilateral development banks (MDBs) and development finance institutions (DFIs) including the World Bank, ADB, JICA and KfW, which integrate air quality within broader climate and development portfolios. Private capital, while more nascent, is steadily evolving through three types of actors—comprising commercial banks & non-banking financial companies (NBFCs), private equity and venture capital (PE-VC) funds, and corporate social responsibility (CSR) arms of large firms. These actors are increasingly exploring opportunities to align environmental goals with returns or reputational value. Together, these stakeholders form a complex but converging landscape—one that offers not only financial depth but also strategic levers to mainstream clean air as a cross-cutting development priority.

[1] CPI, The State of Global Air Quality Funding 2024

Exhibit 1: A list of illustrative sources for air quality financing in India



Public capital actors in India's air quality ecosystem primarily focus on a mix of traditional abatement measures and clean growth sectors, with distinct orientations across government bodies, foundations, and development finance institutions. Government funding primarily supports traditional measures such as emission control, road dust suppression, mechanized sweeping, air quality monitoring, and public awareness, while increasingly expanding into green growth areas like clean transport, waste management, and sustainable agriculture. Philanthropic foundations concentrate on strengthening the enabling environment by funding air quality monitoring systems, data platforms, institutional capacity, and regulatory frameworks. Multilateral development banks (MDBs) and development finance institutions (DFIs) predominantly channel their capital into clean growth sectors, where air quality improvements are achieved as co-benefits of broader climate and infrastructure investments.

On the other hand, private capital in India is predominantly oriented toward climate-linked sectors, where air quality improvements emerge as important but indirect co-benefits. Commercial banks and NBFCs are increasingly financing electric mobility, decentralized renewable energy, green housing, and sustainable agriculture solutions, all of which help mitigate key air pollution sources over time. Private equity and venture capital (PE-VC) funds similarly back startups innovating in agri-residue management, waste management, clean logistics, and carbon capture technologies—sectors that drive emission reductions as part of broader climate transition strategies. Corporate CSR programs, while more fragmented, also contribute through a blend of traditional environmental abatement activities (such as urban afforestation and air quality monitoring) and clean growth initiatives like EV ecosystem development and circular economy projects.

Public capital is often used ineffectively due to limited implementation capacity, weak policy execution, and a complex governance structure. Nearly 60% of funds[2] allocated under

[2] CREA, Tracing the Hazy Air 2024: Progress Report on National Clean Air Programme (NCAP)

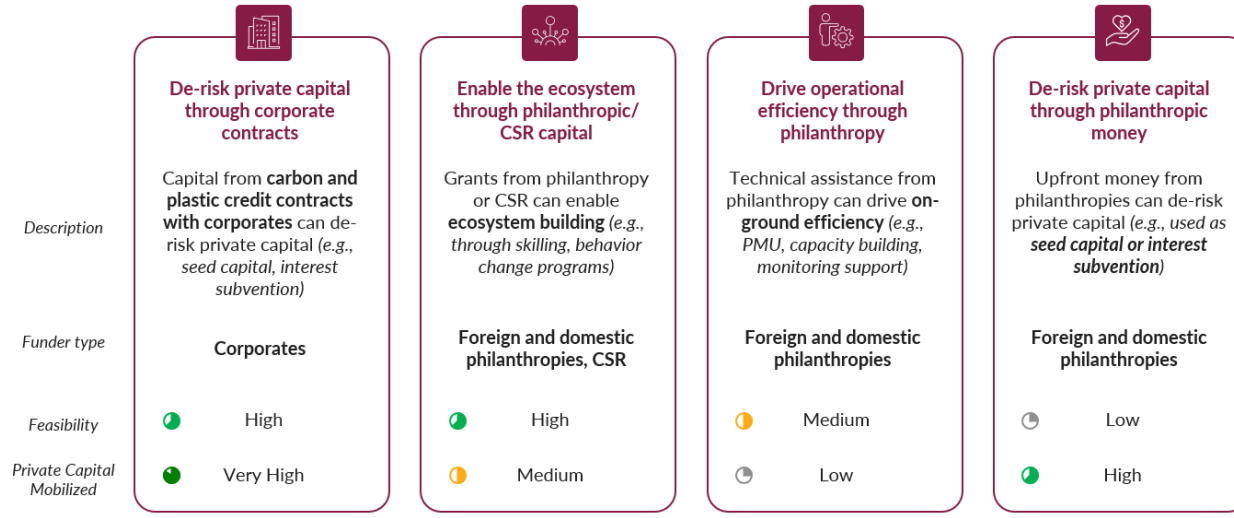
the National Clean Air Programme (NCAP) remain unspent, highlighting capacity gaps among state governments and urban local bodies in planning, executing, and monitoring air quality measures. These challenges are compounded by weak institutional capacity across key implementing agencies, including issues such as staffing shortages, limited technical expertise, and outdated infrastructure. Fragmented coordination among multiple authorities further weakens accountability and slows policy execution. Simultaneously, India's green bond market faces headwinds: in November 2024, 70% of a 10-year sovereign green bond was devolved to primary dealers due to low investor interest[3]. High currency hedging costs (~7–7.5% annually), absence of sovereign guarantees, and lack of regulatory clarity continue to deter foreign investors, constraining the flow of public capital into clean air and environmental sectors.

The limited flow of private capital into air pollution reduction is largely driven by perceived investment risks, including regulatory uncertainty, lack of transparent and bankable projects, and low direct financial returns. These risks result in stringent lending terms, higher interest rates, and restricted access to affordable capital—over 90% of air quality finance globally is loan-based[4], with less than half being concessional, making investments less attractive. Additionally, the absence of strong policy incentives and enforcement mechanisms further deters private investors, as the social benefits of pollution reduction, though immense (valued at trillions annually), are not easily monetized. Private equity investment in pollution control is sensitive to environmental liability risks, highlighting how risk perception shapes capital flows.

In response to the barriers limiting private capital flow, blended finance has emerged as a catalytic approach to mobilize commercial investment in sustainable, impact-driven sectors. Blended finance (BF) refers to the strategic use of concessional capital from public or philanthropic sources to de-risk investments and attract private sector participation in underserved markets. In India, BF has gained momentum, with a market size of $1.3 billion in 2022, growing at a CAGR of 18.8% over the past decade[5]. This growth is driven by a diverse set of catalytic instruments—including credit guarantees, concessional and subordinated debt, technical assistance (TA), and results-based financing (RBF), each aligned to specific risk-return profiles. Guarantees are the most prominent, featuring in nearly 50% of Indian blended deals, and have played a critical role in attracting private capital by mitigating credit risk. Concessional debt is also gaining prominence in India. A leading example is the ADB's $40 million financing package with GreenCell Express Private Limited (GEPL) to deploy 255 electric buses across 56 intercity routes in India.

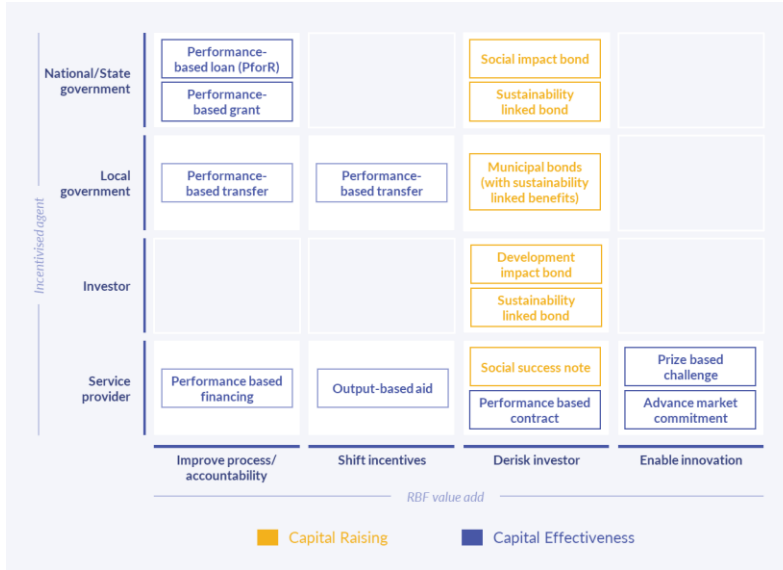
[3] Reuters, India cenbank devolves 70% of new green bonds, cutoff below 10-year note
[4] Our Common Air, Investing in Clean Air
[5] Asha Impact, The Blended Finance India Narrative

Exhibit 2: Ways in which results-based financing instruments can de-risk capital and strengthen ecosystem delivery



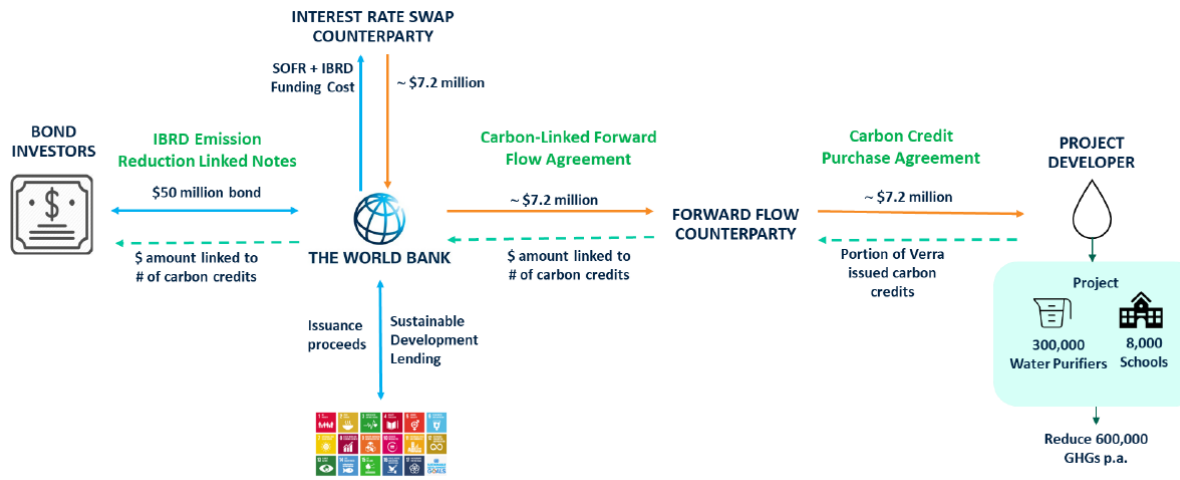
Results-based financing (RBF) is emerging as a powerful tool within India's blended finance landscape—particularly well-suited for complex, impact-focused sectors like air pollution mitigation. RBF links disbursement of funds to the achievement of pre-defined outcomes, making it highly relevant for air quality interventions where measurable improvements—such as PM2.5 reductions or clean technology adoption—are critical. In the context of air pollution, RBF structures can mobilize corporate contracts to de-risk investments, enable ecosystem building through philanthropic and CSR capital, drive operational efficiency through technical assistance, and deploy philanthropic money to further reduce early-stage risks. Each pillar plays a complementary role in strengthening accountability, unlocking larger capital flows, and creating scalable demonstration effects. (see exhibit 2 for more details)
In India, RBF instruments have demonstrated a leverage ratio of approximately 2.2x[6], and while the financial leverage may be modest compared to guarantees or concessional debt, RBF creates substantial demonstration effects and strengthens accountability, innovation, and data-driven decision-making. The instruments are categorized into capital-raising and capital-effectiveness instruments (see exhibit 3). Understanding the primary objective and incentivized stakeholders is crucial for choosing the appropriate RBF instrument.

Exhibit 3: An illustration showcasing the basket of RBF instruments



Global experiences from South Asia illustrate the growing potential of RBF-linked instruments to finance environmental outcomes—including air pollution mitigation. In Vietnam, the World Bank issued a $50 million Emission Reduction-Linked Bond (see exhibit 4 for the transaction structure) that tied investor returns to carbon credits generated by distributing water purifiers, reducing emissions from biomass burning while delivering clean water to two million schoolchildren. Similarly, the $100 million Plastic Waste Reduction-Linked Bond in Indonesia and Ghana mobilized $14 million upfront by linking returns to verified plastic and carbon credits, financing waste collection and recycling while supporting livelihoods.

Exhibit 4: Transaction structure of the Emission Reduction-Linked Bond



This session aims to bring together senior government officials, multilateral funders, private sector financiers, and philanthropic leaders to discuss unlocking innovative financing pathways for clean air in India. The focus of the session will be to understand how to deploy blended finance instruments (for instance, results-based financing) to crowd in private capital and improve the effectiveness of existing air quality investments.

Potential Opportunities and Challenges

The opportunities for mobilizing private capital into clean air solutions in India include:

- **$18 billion market opportunity in Indian air pollution control systems market by 2030[6]:** India's growing urbanization and industrialization is projected to drive demand for pollution control technologies—such as electric mobility, clean cookstoves, air filtration systems, and industrial emission control—creating a multi-billion-dollar investable market by the end of the decade.
- **Results-based and blended finance can de-risk $170 billion in near-term investments for climate change sectors (including air pollution) in India[7]:** Targeted use of RBF and blended finance can mobilize significant private capital by mitigating risks for early-stage and commercially unproven air quality interventions, especially in sectors like agriculture (e.g., crop residue management) and construction.
- **Up to 3% GDP gain from improved air quality will be a macro incentive for capital flows:** Estimates from 2019 suggest that reducing PM2.5 to WHO standards could have increased India's GDP by 3%[8]—a directional indicator that the economic rationale for public-private investment in pollution reduction is likely even stronger today.
- **Investment-ready pipeline emerging across transport, waste, and clean energy sectors:** Sub-national and private players are developing a growing pipeline of bankable projects—like low-emission buses, decentralized waste-to-energy plants, and green construction materials—that can absorb private capital if bundled and structured well.

Key challenges would have to be overcome to leverage these opportunities. Some of these challenges include:

- **Fragmented and Small-Scale Project Landscape:** Air quality interventions in India are often decentralized and hyper-local—spanning sectors like waste, transport, and agriculture—but remain too fragmented and small in scale to attract institutional capital or offer predictable returns.
- **Weak Revenue Models for Private Investors:** Unlike sectors such as renewable energy, most air pollution solutions lack direct user-payment models or monetizable

[6] Research and Markets, India Air Pollution Control Systems Market Report 2024-2030: Clean Air Initiatives Spurs Investments, Surge in Regulatory Mandates, Rising Environmental Awareness Fueling Developments
[7] IFC, Blended Finance for Climate Investments in India
[8] World Economic Forum, Solving India's Air Pollution Can Boost Economy and Business. Here's How

revenue streams, making them less commercially viable and heavily dependent on public or philanthropic funding.

- **Uncertainty Around Policy and Outcome Visibility:** Investors face high perceived risk due to weak enforcement of pollution norms, inconsistent policy signals, and limited clarity on long-term government commitment to clean air—undermining trust in the durability of returns.
- **Limited Measurement and Attribution Infrastructure:** The absence of reliable, intervention-linked air quality hampers both risk assessment and impact verification, deterring outcome-based investments like results-based financing or ESG-linked bonds.
- **Institutional Gaps in Local Governments and Project Design:** Urban local bodies and state agencies often lack the technical and financial capacity to design, structure, and implement bankable clean air projects—resulting in a weak pipeline of investment-ready opportunities.

Key Focus for Discussion

With a focus on identifying challenges and potential unlocks to achieve India's clean air goals, below are the key questions for the panel discussion:

- Why does private capital remain largely absent from India's clean air ecosystem, and what are the risks perceived by investors?
- What structural barriers—such as project fragmentation, weak revenue models, or data gaps—are preventing air quality solutions from becoming investable?
- How can blended finance and results-based financing mechanisms be leveraged to de-risk clean air investments and improve capital flow?
- What tools and systems are needed to build robust Monitoring, Reporting, and Verification (MRV) infrastructure and enable outcome-based financing for air quality interventions?
- What co-benefits—such as health improvements, climate resilience, or economic productivity—can be monetized or bundled into financing strategies to attract diverse capital for clean air solutions?
- What institutional capacities and support systems are required at the city and state level to create a pipeline of bankable clean air projects?
- How can India's clean air initiatives be integrated with carbon finance mechanisms, such as voluntary carbon markets or climate bonds, to unlock new funding streams and drive long-term sustainability?
- Which case studies or financing models offer replicable pathways to scale public-private investment in India's clean air agenda?

Session Flow

Panel Discussion - Air is Free, Cleaning It Isn't: Making Clean Air Investible	
Featured Speech (5 minutes)	The session will open with a featured speech that makes the case for positioning clean air as a **high-impact, investable opportunity**.
Opening Remarks (2 minutes)	• The emcee will provide a **brief context on the urgent need to unlock private capital** and **innovative financing mechanisms** to accelerate clean air solutions at scale. • The emcee will **invite the panellists** on stage and introduce them. • The emcee will then hand the session over to the **moderator**.
Moderator Opening Remarks (3 minutes)	The moderator will emphasize that despite air being a public good, cleaning it requires **significant capital**, highlighting the need for synergy among policymakers, financial institutions, and innovators **to overcome investment barriers and mobilize sustainable finance** for air quality.
Panel: Opening Question (5 minutes)	• Moderator asks each panellist an **introductory question** to address • Panellists give **brief opening statements** from their vantage point
Structured Panel Discussion (25 minutes)	• The moderator asks **pointed questions** to panellists • Each panellist may choose to **build upon or challenge** the view of the previous • Panellists are encouraged to share their **reflections on the featured speech**
Closing thoughts and optional audience Q&A (5 minutes)	• Each panellist concludes with a **closing thought and key takeaway(s)** • They emphasize a **critical call-to-action** for the audience • Time permitting, the panellists may **answer questions** received from the audience