CLEAN AIR FUND

Low-cost Air Quality Sensor Procurement and Deployment in South Africa

Request for Expression of Interest (EOI)

August/September 2024

1. Project Summary

Air pollution is a significant environmental health risk that affects millions of people worldwide, with both short-term and long-term effects on human health. Vulnerable groups, such as children, the elderly, and those with pre-existing health conditions, are particularly at risk. To better understand pollution sources and assess exposure levels, it is essential to monitor the state of air quality. Low-cost sensors have over the years revolutionized air quality monitoring and management. They allow for widespread and real-time monitoring of air quality, making it possible to identify pollution hotspots and track trends over time.

The purpose of the project is to strategically deploy a network of low-cost air quality sensors in the Gauteng province and northern part of the Free State province, focusing on low-income and informal settlements where communities have historically suffered poor air quality. The selected sensor network will provide data on the ambient concentrations of particulate matter pollutants ($PM_{2.5}$ and PM_{10}). The project is expected to provide hyperlocal and real-time data for the targeted areas. This granular and localised data will empower policy makers, communities, and researchers with the necessary information needed to address air pollution effectively.

The successful service provider will also be required to develop a community outreach plan to engage communities on the data generated form the project and to raise awareness on air pollution and its impact on health. The generated air quality data must be fully open-access, through online platforms such as the South African Air Quality Information System (SAAQIS) and OpenAQ. By making air quality data more accessible and actionable for citizens, the project aims to foster a societal demand for clean air and accelerate grassroots advocacy efforts. The data can empower communities to demand emissions reduction measures from industries, stricter enforcement of standards by authorities, and greater investments in clean air projects.

Additionally, the successful service provider will also be expected to provide capacity building and training for the air quality officials in the areas of deployment on the air quality monitoring techniques and health impact assessment.

2. Background to Project

South Africa has around 130 fully automated continuous ambient monitoring stations across the country owned and operated by government and the private sector. Government stations are located in areas with high population density, in order to measure human exposure to air pollution. These stations monitor a range of pollutants, including meteorological parameters. While providing crucial data, the ambient air quality monitoring stations do not fully capture micro-variations in pollution levels that South Africans are exposed to daily, particularly in fence line communities near industrial areas, low-income settlements, and along transport corridors with high emission loads.

The high costs and infrastructure requirements associated with reference grade ambient air quality monitoring stations limit their deployment at a scale broad enough to provide detailed and granular data, resulting in gaps in spatial coverage. Therefore, there is a need to find cost-effective solutions, while at the same time not compromising data quality.

In the long run, the project aims to catalyze a data-driven approach to air quality management in South Africa, where interventions are targeted to maximize public health benefits and resources are allocated based on evidence-based priorities. By demonstrating the value of low-cost sensor networks and fostering multi-stakeholder collaboration around clean air goals, the project can inspire similar initiatives in other parts of Africa and beyond.

3. Background to Clean Air Fund

Launched in 2019, the Clean Air Fund (CAF) is a philanthropic initiative with a mission to tackle air pollution around the world. Our aim is to help build and support a powerful global movement for clean air. We achieve this by bringing together funders, researchers, policy makers and campaigners working on a wide range of issues to find and scale solutions that will provide clean air for all.

More information about the Clean Air Fund can be found on our website: www.cleanairfund.org

4. Project Outcomes and Prospective Activities

This Expression of Interest (EoI) invites organizations, experienced consultants, and/or networks of partners to register their interest and provide a high-level summary of their approach, relevant experience and indicative budget. Further guidance is provided below. This will be followed by a request for a more detailed proposal from the top 1 or 2 bidders.

We welcome and encourage collaborations /consortia of organizations that bring together the necessary expertise (for example, data management, air quality expertise, stakeholder engagement and management) to apply.

The activities listed below are indicative: we welcome creativity in the high-level approach proposed in order to achieve outcomes.

Outcome 1: By 2026, there's openly accessible hyper-local air quality data for the Gauteng province and northern part of Free State province.

Main Activities:

- **Activity 1.1: Procurement of low-cost sensors**
  The Service Provider shall procure low-cost air quality sensors with competitive pricing for the sensors, any necessary accessories or software, and any shipment costs. The Service Provider must supply detailed specifications of the proposed sensors, including their capabilities, lifespan, maintenance requirements, and any additional features. The sensors are expected to be cost-effective, while not compromising data quality. The sensors should at minimum meet the following criteria:
    - The proposed sensors should be capable of measuring particulate pollutants ($PM_{2.5}$, PM_{10}) with real-time reporting of data.
    - The sensors must have undergone calibration and testing to ensure accurate and consistent measurements (calibration certificates and documentation should be provided with the sensors).
    - The sensors should be durable and able to withstand varying environmental conditions.

- **Activity 1.2: Deployment Planning and Site Selection:**
  The Service Provider shall develop a comprehensive deployment plan for the Gauteng province and northern part of the Free State province, outlining the number of sensors to be deployed, deployment timeline, and selection of strategic deployment location. Bidders should propose the accuracy and density of the proposed network, or provide estimated costings for several options of network size/ scope.

- **Activity1.3: Data Management:**
  The Service Provider shall provide the data access process that will ensure that the air quality data generated from the deployment of the low-cost sensors is available in real-time and can be easily accessed through platforms such as the South African Air Quality Information System (SAAQIS) and OpenAQ websites.

Outcome 2: By 2026, Government is supported in taking evidence-based air quality action.

Main Activities:

- **Activity 2.1: Capacity Building and Training:** The service provider shall develop and deliver training for government officials on (i) air quality monitoring (reference monitoring, low-cost sensors, and remote sensing), (ii) air quality modelling, and (iii) health impact assessment and the application of the associated evidence for air quality action. Proposals should describe the format, duration, content and number of training sessions to be provided and how training approaches will ensure training outcomes aligned with the above outcome.
  Activity 2.2: Technical Support: The Service Provider shall provide training for air quality officials in the deployment area on the installation, operation and maintenance (calibration and repair) of the low-cost sensors.
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Outcome 3: By 2026, local stakeholders and communities have access to air quality data, are made aware of the impacts of air pollution as well as solutions for clean air.

Main Activities

- **Community Outreach:** The Service Provider shall develop a community outreach plan to facilitate dissemination of data generated form the project, raise awareness on air pollution and its impact on health to drive demand for action on air pollution.

5. Project duration and budget

The project will be delivered over a period of 18 months and the Clea Air Fund has budgeted for a maximum amount of **$310 000 USD**. Bidders are required to provide a budget breakdown in **US$** and **ZAR** for each outcome and activity.

6. What is the Clean Air Fund looking for?

The following criteria will be used to assess the proposals submitted:

1. **Low-cost sensor specification, cost effectiveness and durability:** proposed low-cost sensors are cost effective and meet or exceed the minimum performance and durability requirements.
2. **Technical suitability and track record:** a track record and expertise (and or the ability to bring relevant expertise) in ambient air quality monitoring, data management of related topics.
3. **Creativity:** in proposing an approach that meets the brief and ensures success of the project
4. **Value for money:** ensuring long-term viability that can succeed without ongoing (long-term) from the Clean Air Fund
5. **Sustainability:** explore and propose co-funding opportunities for continuity of the project beyond the duration of the project

7. What to include in the expression of interest

The Clean Air Fund is structuring this project by first inviting expressions of interest (EoI) with the intention of understanding the range of different proposer and approaches that could deliver this work.

Please consider the following points in your EoI response:

1. **Strategic Approach:** How will you approach the project? Please outline your broach approach, including key activities, milestones, and the expected outcomes.
2. **Capacity and Expertise:** What are your relevant qualifications and experience for delivering this project successfully, especially in designing a low-cost sensor deployment plan, managing air quality data and facilitating stakeholder engagements.
3. **Equity and Inclusivity:** How will your organisation ensure a participatory and equitable approach in building and managing the project
4. **Budget and timeline:** What are the indicative costs and timeline of delivering the activities.

8. How to submit your express of interest and process

To submit your expressions of interest, please send your response to the five points above and additional information deemed relevant in document format to vsenene@cleanairfund.org by the deadline set out below. This should be limited to 3 pages: we are looking for a high-level concept at this stage. For the expression(s) of interest that are the best fit for this funding, we will invite the submission of a more detailed proposal.

Timeline

Activity	**Deadline**
Publish Expression of Interest	08 August 2024
Deadline for questions	22 August
Deadline for Expression of Interest	**05 September**
Review of Expression of Interest	06 - 13 September
Final Clean Air Fund decision to invite full proposal	16 September