City of eThekwini (Durban)

Controlled fuels policy

Background

C40 and eThekwini (Durban) partnered to develop a controlled fuels policy for the city, with support from Airshed Planning Professionals and SRK Consulting. The policy will control emissions from carbon-intensive fuels, such as coal and heavy fuel oil, used in industrial and commercial activities. This will help the city to reduce ambient particulate matter (PM) concentrations and, ultimately, to meet the new, more stringent South African PM2.5 standard that will come into effect in 2030. The resulting better air quality will improve the health and livelihoods of communities currently affected by industrial and commercial emissions.

Approach

The controlled fuels policy was developed using the Rapid & Participatory Policy Analysis framework, which provides a structure for policy analysis, procedures, and practical guidelines.

1. **Legal assessment (≈ 1 month)**
   - Review existing legislative framework and eThekwini's ability and authority to implement policy.
   - Analyse the municipality's powers related to reducing the use of controlled fuels.
2. **Baseline estimate (≈ 3 months)**
   - Identify and assess the fuels currently used in eThekwini.
   - Identify the sources of emissions in eThekwini, in consultation with stakeholders.
   - Estimate the emissions from fuel usage using measured emissions and emission factors.
   - Use atmospheric dispersion modelling to assess the baseline and six emissions-reduction interventions and strategies.
   - Rank interventions according to multiple screening criteria.
3. **Policy recommendations and impact analysis (≈ 4 months):**
   - Identify potential interventions.
   - Conduct impact analysis and rank interventions.
   - Compile policy recommendations with participation and input from stakeholders (see below).
4. **Stakeholder mapping and engagement (≈ 3 months):**
   - Develop and refine a comprehensive database of stakeholders likely to be affected by the policy.
   - Distribute an information document and invite stakeholder input.
   - Include stakeholders in three virtual meetings and one in-person workshop during the policy development process.
5. **Develop a roadmap for implementation (≈ 1 month):**
   - Policy to be implemented in the eThekwini Metropolitan Municipality, focussing on industrial and commercial facilities.
6. **Public participation (≈ 4 months):**
   - Open house meetings post policy development to seek input and acceptance from industry, environmental health practitioners, and community-based organisations.

Outcomes

1. The controlled fuel policy is a supporting document for the implementation of an existing city by-law. The basis for prohibiting or restricting certain fuels already exists in the eThekwini Air Quality Management By-Law, which was adopted by the city's council in 2020. Section 10(2)(b) of this by-law states that the municipality may "prohibit or restrict the combustion of certain types of fuel".
2. The controlled fuels policy has been approved by the city council and has received high rates of acceptance among stakeholders, as a result of the consultation processes.

Learnings & Recommendations

The following two interventions have been recommended for concurrent implementation in eThekwini (based on screening criteria developed during the baseline estimate process):

1. Achieving 10% reduction in emissions by improving industrial process efficiencies to reduce fuel usage; and
2. Achieving 20% reduction in emissions through the use of "best available technology", including additional abatement equipment where necessary.

Implementing these interventions together is likely to result in improvements in ambient air quality throughout eThekwini. They are considered technically feasible, and allow operators of fuel-burning appliances to achieve emissions reductions in a flexible manner suited to their operational requirements. Operators can also choose the most cost-effective way to reduce emissions, by either installing abatement equipment, making operational changes, or switching fuels. To achieve the envisaged reductions, emission limits should be set for fuel-burning appliances based on fuel usage or energy input.

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C40 CITIES

Dakar

Development of Air Quality Management Plan

Background

C40 and Dakar have collaborated to create Dakar's first air quality management plan (AQMP), with the support of Senegal's national Centre for Air Quality Management (CGQA). The plan involves identifying the city's air quality management challenges and opportunities, alongside mapping and engaging all key stakeholders to strengthen their capacity. It also includes the creation of a strategic communication plan, ensuring that news and information about the city's efforts to improve air quality and health are shared with all key stakeholders.

Approach

1. **Air quality stakeholder mapping and interviews (≈ 2 months)**
    - Identify key pollutant emitters, air quality management authorities, impacted people by the emissions, and those likely to be impacted by interventions.
    - Gather information about public perception of air pollutant emissions and health impacts.
2. **Assess the current monitoring network and other relevant data sources (≈ 3 months)**
    - Assess the existing air quality monitoring network in Dakar.
3. **Establish baseline air quality (≈ 4 months)**
    - Assess the current air pollutant concentrations levels and their projected trends towards 2035.
4. **Assess air pollutant emission sources (≈ 5 months)**
    - Identify the main emission source categories (including direct, mobile, and diffuse sources) that contribute to the main air pollutants; quantify current emissions and develop emission scenarios.
5. **Assess the health and economic implications of air pollutant concentration levels (≈ 2 months)**
    - Estimate the current and projected health impacts of air pollution and the potential costs of inaction.
6. **Develop a detailed implementation plan (≈ 3 months)**
    - Create a roadmap to achieving the AQMP objectives, including responsibilities, timelines, and indicators. Additionally, establish a long-term air quality vision and strategic objectives for quality management.
7. **Develop an air quality communication strategy (≈ 3 months)**
    - Create a plan to disseminate information and key messages about the AQMP and the city's efforts, including awareness-raising activities.
8. **Capacity-building (≈ 3 months)**
    - Engage city stakeholders and raise awareness of air pollution issues among municipal and national decision-makers.

Outcomes

1. Development of a long-term air quality vision and an air quality management plan to create sustainable clean air momentum, improve air quality, and minimise the health impacts of air pollution.
2. Creation of a comprehensive communication strategy to ensure inclusive stakeholder-participation and spatial equity.
3. Dissemination of the AQMP's outcomes among all relevant stakeholders to break silos in the implementation of air quality action.

Learnings & Recommendations

This project made clear that Dakar suffers from a lack of effective coordination between and among the stakeholders, projects, and systems concerned with air quality measurement and monitoring. This lack of coordination, together with the absence of a centralised data management policy, is a major challenge for the implementation of Dakar's new AQMP. However, the existence of research institutions focussed on the spatio-temporal dynamics and health impacts of air pollution is an asset to the city, and presents an opportunity for successful implementation of the plan.

The main recommendations are to:

1. use air quality monitoring data to inform specific policies or to implement ambitious projects to reduce air pollutant concentration levels estimated as part of the air quality baseline;
2. strengthen the capacities of the Senegal National Air Quality Observatory to monitor the effectiveness of air quality improvement policies; and
3. strengthen the collaboration between the CGQA and the city of Dakar by transferring to the city, more air quality management duties such as governance, operations, and communication and dissemination.

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Addis Ababa

Addis Ababa's building-energy-efficiency code

Background

C40, the Addis Ababa Environmental Protection Authority (EPA), and Ethio Resource Group collaborated to establish Addis Ababa's first building-energy-efficiency (BEE) regulation. The technical assistance was aimed at reducing air pollutants and greenhouse gas emissions from energy use in the city's buildings. It provided practical recommendations for adopting energy-efficient practices and clean renewable-energy solutions, targeting building types that had been identified as major emission sources and faced significant energy-efficiency challenges. Upon enforcement, the regulation will require building owners to reduce emissions from energy consumption, significantly impacting overall emissions reduction and improving public health by minimising exposure to harmful pollutants.

Approach

1. **Develop strategic evidence (≈ 6 months)**
   - The project team analysed the energy-efficiency landscape; studied building energy use; assessed technologies available for effective policy solutions; conducted impact analyses; and estimated the air quality, health, and economic benefits of energy-efficiency measures. These outputs provided the foundation for drafting the BEE regulation.
2. **Stakeholder consultation and capacity-building (≈3 months)**
   - Four workshops were conducted to consult key stakeholders on the strategic evidence findings and draft regulation.
   - Communication materials, including guidance documents, posters, and bulletins, were developed to disseminate strategic evidence and keep stakeholders informed about the project's progress and findings.
3. **Draft regulation and auditing checklist (≈5 months)**
   - A technical working group, led by the Addis Ababa EPA in collaboration with relevant sectoral offices, reviewed and refined an initial draft directive, which was then upgraded into a draft regulation, aligned with the city's standard regulatory template.
   - An action plan and detailed timeline were prepared to guide the adoption process. These steps included finalising the regulation, sharing it with the city justice office for review, and subsequently submitting it to the city cabinet for approval.
   - An auditing checklist was prepared for use after the regulation's adoption, to ensure compliance.

Outcomes

The outcome of the project was the city's first draft BEE regulation, along with a checklist to facilitate its implementation and ensure energy-efficiency compliance in targeted buildings. The process increased awareness of building energy efficiency and air quality, addressed data gaps in energy usage, and demonstrated how evidence influenced policy decisions.

Learnings & Recommendations

The establishment of a technical working group, together with the use of stakeholder engagement through workshops, proved to be highly effective in gathering diverse perspectives and valuable feedback to enhance and refine the content of the draft.

The main recommendations of the project included:

1. Implement a long-term capacity-building programme for energy-sector stakeholders;
2. Ensure the BEE regulation is regularly updated;
3. Conduct routine energy audits to ensure compliance with the regulation;
4. Strengthen stakeholder collaboration; and
5. Design and implement awareness campaigns.

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C40 CITIES

Lagos

Integrated GHG and Air Quality Emissions Inventory, Health Impact Analysis, and Air Quality Monitoring Support

Background

C40 and Lagos State have collaborated to improve air quality data evidence and management in Lagos, by developing a comprehensive integrated greenhouse gas (GHG) and air pollutant emissions inventory and expanding the city's air quality monitoring network. The technical assistance project aimed to establish baseline emissions levels and assess the health impacts of and community vulnerability to air pollution. It also provided Lagos with guidance on low-cost sensors and deployment strategies to expand the city's air quality monitoring capacity and network. This partnership enhanced understanding and management of air quality issues in Lagos.

Approach

Integrated GHG and air pollutant emissions inventory and health impact analysis

1. **Stakeholder engagement (≈ 2 months)**
   - Conduct interviews with key stakeholders to collect the required data, identify data gaps, and seek opportunities for long-term institutional collaboration.
2. **Framework and roadmap (≈ 3 months)**
   - Create a framework and roadmap to guide the development of the integrated greenhouse gas (GHG) and air pollutant emissions inventory for Lagos State.
3. **Health impact assessment (≈ 2 months)**
   - Analyse the health implications of air pollution and emissions reduction co-benefits, and assess the vulnerability of Lagos residents using C40's Pathways AQ tool.

Air quality monitoring support

1. **Assessment of air quality monitoring capacity and guidance (≈ 3 months)**
   - Desktop research to assess the requirements of an air quality monitoring plan; guidance on the selection of air quality sensors; and strategic recommendations for Lagos State.
2. **Procurement and deployment of air quality sensors (≈ 6 months)**
   - Deploy 18 low-cost sensors (Airly), comprising 9 sensors monitoring PM1, PM2.5, NO2, and O3, and another 9 sensors monitoring PM1, PM2.5, PM10, SO2, and CO. In addition, deploy 18 solar panels to ensure an uninterrupted power source for the sensors. Real-time data access allows Lagos State to efficiently monitor, report, and track pollution levels across the network.
3. **Capacity building (≈ 3 months)**
   - Train Lagos State personnel and institutional stakeholders to strengthen their capacity for developing an integrated GHG and air pollutant emissions inventory, and conducting a health impact analysis.

Outcomes

The project resulted in:

1. development of the first-ever integrated GHG and air pollutant emissions inventory and air quality monitoring strategy in Lagos; and
2. creation of a city-wide air quality monitoring network, enhancing Lagos's capacity to monitor air quality and to access and own real-time data.

Learnings & Recommendations

Cooperation and engagement of institutional stakeholders enhanced the data collection process, and created opportunities for discussion with city officials on the major challenges and benefits of an integrated GHG and pollutant emissions inventory.

This project showed the importance of having adaptable delivery strategies in complex logistics environments, and the value of continuous technical support and capacity building.

The main recommendations are to:

1. improve inter-agency collaboration on data collection and sharing, to further establish the Lagos Bureau of Statistics as the repository of all data, including health-related data;
2. develop a strategy to report, record, and ascertain the cause of mortalities that occur outside hospitals, to help bridge the data gaps around air-pollution-related premature deaths;
3. expand the air quality monitoring network to better monitor population-based exposure and to strengthen the basis for air quality modelling; and
4. use evidence from Lagos air quality studies to argue for improvements to national ambient air quality standards that are consistent with the city's air quality commitments under the Clean Air Accelerator.

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C40 CITIES

Johannesburg

Feasibility study for the implementation of low emission zones (LEZ) in Johannesburg and Sandton Central Business Districts

Background

C40 and Johannesburg have collaborated to assess the feasibility of the city's (and Africa's) first low emission zone (LEZ), with support from the Council for Scientific and Industrial Research. The initiative aims to promote a shift to greater use of public and non-motorised transport, by reducing reliance on private vehicles while developing scalable strategies for LEZ policy and implementation. The plan also includes stakeholder mapping and engagement.

Approach

1. **Legal assessment review (≈ 2 months)**
   - Conduct an in-depth study to identify legislative pathways for LEZ enforcement. This includes a top-down legal assessment examining existing international, national, provincial, and local legislation to determine the applicability and feasibility of implementing LEZ initiatives within this legal framework.
2. **Stakeholder engagement (≈ 4 months)**
   - Develop a list of prospective stakeholders to ensure diverse representation and inclusive participation in the LEZ feasibility study.
   - Organise focus-group discussions to facilitate meaningful dialogue, allowing stakeholders to share their insights, perceptions, and concerns regarding the LEZ initiative.
   - Emphasise transparency and inclusivity, ensuring that stakeholder feedback is integrated to create a more effective and widely supported LEZ strategy.
3. **Air quality baselines (≈3 months)**
   - Assess current pollution levels, specifically focusing on NO_2 and PM2.5 concentrations within the proposed LEZs in the Johannesburg and Sandton Central Business Districts (CBDs). Passive samplers and existing low-cost sensors were deployed to monitor these pollutants over a six-month period.
   - Analyse the baseline data using air quality modelling techniques, providing a comprehensive understanding of existing air quality conditions and enabling the evaluation of potential improvements under LEZ scenarios.
4. **Policy scenarios (≈ 1 month)**
   - Develop scenarios based on previous work packages, targeted towards achieving World Health Organization air quality interim targets and guidelines by 2030. These scenarios should consider interventions to reduce vehicular emissions, such as vehicle restrictions, mode shifts to public transport, and incentives for cleaner technologies. They provide a framework for assessing the effectiveness of different strategies in reducing air pollution and improving public health outcomes in the CBDs.
5. **Impact and feasibility analysis (≈4 months)**
   - Evaluate the economic, social, environmental, and technical feasibility of implementing the proposed LEZs. Metrics include hospitalisation costs, revenue implications, public and business acceptability, and reductions in transport-related emissions.
   - Assess implementation complexity and departmental capacity, providing a robust understanding of potential benefits and challenges.
6. **Capacity building (≈ 2 months)**
   - Deliver workshops to enhance the skills of city officials in interpreting air quality data and conducting feasibility analyses. These workshops facilitate knowledge transfer, promote interdepartmental collaboration, and provide actionable insights into the design and evaluation of LEZs. Outcomes from the sessions inform recommendations for improving evidence-based decision-making in LEZ implementation.

Outcomes

Air quality baseline measurements and transport modelling were completed, legal frameworks for LEZs were identified, and feasible policy scenarios were drafted alongside associated impact analyses. A detailed feasibility study report was developed, and city officials' capacity in air quality data interpretation and LEZ planning was enhanced.

Learnings & Recommendations

Key learnings include the importance of interdepartmental collaboration for effective data sharing and implementation; the need for improved stakeholder engagement, with better outreach and inclusivity; and the critical importance of calibrating air quality sensors to ensure accurate baseline estimations.

Recommendations include periodically updating transport models to reflect evolving dynamics; conducting further studies on the minibus taxi industry and the transition to electric vehicles; enhancing public awareness and communication about the benefits of LEZs; and strengthening technical, legal, and institutional capacity to support LEZ implementation.

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